



**Lambton Facility 2019 Annual  
Landfill Report Biomonitoring  
Program**

2018 Field Year

February 14, 2020

Prepared for:

Clean Harbors Canada Inc.  
4090 Telfer Road, RR 1  
Corunna ON N0N 1G0

Prepared by:

Stantec Consulting Ltd.  
1-70 Southgate Drive  
Guelph ON N1G 4P5

Project No.: 122160003



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## Technical 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 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 Site are collected and submitted to the analytical laboratory to determine the concentration of selected metals, pesticides, chlorinated phenols, and dioxins and furans. In 2018, 13 test Sites were monitored.

The review and comparison of the 2018 data relative to the upper control limits (UL18)<sup>1</sup> for each Site and on a Site-wide basis was completed for inorganic analytes. The concentrations of 20 inorganic analytes (15 Group 1<sup>2</sup> analytes (i.e., barium, boron, calcium, chloride, chromium, cobalt, iron, magnesium, manganese, molybdenum, phosphorus, potassium, silicon, strontium and sulfur) and five Group 2 analytes<sup>3</sup> (i.e., aluminum, lead, mercury, vanadium and zinc)) exceeded their respective Site-specific UL18 while one Group 1 analyte (i.e., manganese) exceeded the Site-wide UL18.

Within the 15 Group 1 analytes which exceeded the Site-specific UL18, the concentrations of two Group 1 analytes in soil collected in 2018 also exceeded the O. Reg. 153/04 Table 1 Site Condition Standards (SCS) and/or the Ontario Typical Ranges for Rural Parkland Soil (OTR<sub>98</sub>) (Ministry of Environment, Conservation and Parks (MECP), 2011). The concentration of one Group 1 analyte in sediment also exceeded the O. Reg. 153/04 Table 1 SCS and/or the Provincial Sediment Quality Guidelines (PSQG) (MECP, 2008). Concentrations of three of inorganic chemicals in natural grasses also exceeded the rural Upper Limit of Normal (ULN) (MECP, 1989). No criteria were available for comparison of UL18 exceedances identified in crops. The exceedances of the Group 1 analytes do not warrant additional investigation at this time.

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<sup>1</sup> 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 UL18 values were calculated using data collected from 1991-2017.

<sup>2</sup> 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).

<sup>3</sup> Group 2 Analytes are known to have toxicological effects (Appendix A).



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The concentrations of Group 2 analytes in soil and sediment collected in 2018 which exceeded the Site-specific UL18 were below the O.Reg.153/04 Table 1 SCS. The concentration of one Group 2 analyte in natural grasses exceeded the ULN. The exceedances of the Group 2 analytes do not warrant additional investigation at this time.

Group 3 organic analytes<sup>4</sup> were not detected at concentrations representative of concern for ecological health during the 2018 Field Year.

Organochlorine pesticides (OCP) analytes were measured at concentrations greater than their applicable reporting detection limits (RDL)<sup>5</sup>. However, detected concentrations of OCPs were less than their respective guidelines, where available for comparison. There are no standards available for comparison of vegetation. Monitoring should continue but no additional investigation is proposed.

The concentrations of polychlorinated biphenyls (PCBs) were measured greater than their applicable RDLs. Detected concentrations of PCBs were below their respective guidelines, where available for comparison. There are no standards available for comparison of vegetation. Monitoring should continue but no additional investigation is proposed.

Pentachlorophenols (PCPs) were not identified at concentrations greater than their respective RDLs. Monitoring should continue but no additional investigation is proposed.

Dioxins/furans (PCDD/DF) were not reported at concentrations greater than the SCS or OTR<sub>98</sub> in the 2018 Field Year, with the exception of hexachlorodibenzo-p-dioxin in soil at Site E6. The upper and lower bound PCDD/DF TEQ was below the OTR<sub>98</sub> TEQ at Site E6. No criteria were available for comparison of PCDD/DF concentrations in natural grasses. Monitoring should continue but no additional investigation is proposed.

Of the 55 statistically significant ( $p < 0.003$ ) linear regressions, 17 showed decreasing trends and 38 showed increasing trends. Approximately 8% of the analytes with increasing trends had measured concentrations greater than their applicable guidelines.

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<sup>4</sup> Organic analytes with reported toxicity that are produced when certain waste streams are incinerated. These organic analytes are documented to accumulate in the environment.

<sup>5</sup> The low concentration at which laboratory analyses will consistently detect the analytes when present.



## Abbreviations

ANOVA	Analysis of Variance
CALA	Canadian Association for Laboratory Accreditation Inc.
CEC	Cation Exchange Capacity
ECA	Environmental Compliance Approval
FC	Field Corn
GLP	Good Laboratory Practice
GC/HRMS	High Resolution Mass Spectrometry/Gas Chromatography
H <sup>+</sup>	Hydrogen Ion
ISO	International Organization for Standardization
LL	Lower Control Limit
MDL	Method Detection Limit
meq	Milliequivalent
MECP	Ministry of the Environment, Conservation and Parks (formerly the Ministry of the Environment and Climate Change)
NG	Natural Grasses
OCDD	Octachlorodibenzodioxin
OCP	Organochlorinated Pesticide
ODWS	Ontario Drinking Water Standard
OM	Organic Matter
OECD	Organization for Economic Cooperation and Development
OTR <sub>98</sub>	Ontario Typical Range
PCB	Polychlorinated Biphenyls
PCDD	Polychlorodibenzo-p-Dioxin
PCDF	Polychlorodibenzo-Furan
PCP	Pentachlorophenol
pH	-log[H <sup>+</sup> ]



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pg	Picograms
ppm	Parts per Million
PSQG	Provincial Sediment Quality Guidelines
QA/QC	Quality Assurance/Quality Control
RDFN	Raw Data File Notebook
RDL	Reporting Detection Limit
RPD	Relative Percent Difference
SCC	Standards Council of Canada
SCS	Site Condition Standard
SD	Sediment
SB	Soybean
SS	Soil
Stantec	Stantec Consulting Ltd.
SWEDAC	Swedish Board for Accreditation and Conformity Assessment
TEF	Toxic Equivalency Factor
TEQ	Toxicity Equivalents
UL	Upper Control Limit
ULN	Upper Limit of Normal
US EPA	United States Environmental Protection Agency
WHO	World Health Organization
WW	Winter Wheat



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## 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 kilometres 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 2018 Field Year and compared these data to accumulated biomonitoring data. Analytical testing of the 2018 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.



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3. Gather information (e.g., crop growth, sediment fertility and characterization<sup>6</sup> 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 summarized in the text below.

### 1.2.1 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 was based on the results of the above-mentioned risk assessments.

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 list of analytes required by the Ministry of Environment, Conservation and Parks (MECP) to monitor is provided in **Table 1** and in the design and operation manual which is an attachment to operating ECA No. A031806.

**Table 1: List of Analytes, by Group, Monitored during the 2018 Biomonitoring Program, Lambton Facility**

GROUP 1 ANALYTES			
Barium	Fluoride <sup>7</sup>	Potassium	Zirconium
Beryllium	Iron	Silicon	
Boron	Magnesium	Silver	
Calcium	Manganese	Sodium	
Chloride	Molybdenum	Strontium	
Chromium	Nickel	Sulphur	
Cobalt	Phosphorus	Titanium	
GROUP 2 ANALYTES			
Aluminum	Copper	Thallium	
Arsenic	Lead	Vanadium	
Cadmium	Mercury	Zinc	

<sup>6</sup> The influence of soil and sediment characterization/fertility is discussed in Section 2.2 and Appendix B.

<sup>7</sup> The monitoring of fluoride was added to the Biomonitoring Program in the 2018 Field Year as per the MECP approved changes.



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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	
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)

Based on toxicity information in the scientific literature and on public perception of chemicals the analytes were grouped into three categories (**Table 1**):

**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.

## 1.2.2 Selection of Environmental Media for Analysis

Several natural and agricultural media were considered for inclusion in the Biomonitoring Program. These include soil, grass from hay or pastured fields, grain and oilseed crops, corn silage, sediment from drainage ditches and maple leaves. Maple leaves were collected and reported outside of the Biomonitoring Program (i.e., Maple Leaf Sampling Program). The Maple Leaf Sampling Program was discontinued in the 2018 Field Year. 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, field corn and winter wheat rotations and natural grasses are more



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prevalent in the vicinity of the Lambton Facility than other agricultural crops and natural vegetation. The environmental media being tested for Group 1, 2 and 3 analytes are provided in **Table 2**.

**Table 2: List of Analytes, by Group and Environmental Matrix, Monitored during the 2018 Biomonitoring Program, Lambton Facility**

Group	Environmental Media			
	Soil (SS)	Drainage Ditch Sediment (SD)	Natural Grasses (NG)	Agricultural Crop (e.g., Winter Wheat - WW, Soybean - SB, and Field Corn - FC)
1	All analytes	All analytes	All analytes	All analytes
2	All analytes	All analytes	All analytes	All analytes
3 <sup>A</sup>	OCP PCB PCDD/DF	OCP PCB	OCP PCB PCDD/DF	OCP PCB PCP PCDD/DF

**Notes:**

<sup>A</sup> OCP/PCB/PCP samples analyzed on 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 a randomly selected control site. 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. The 2018 Field Year is Year 2.

### 1.2.3 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 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 of Appendix A**). The selection of Sites was based on criteria that would allow long-term, representative sampling of the media of interest. Existing test Site information (e.g., years in program and location relative to the facility) is provided in **Section 2.1**.

In 2018 the MECP approved two changes in test Sites for the Biomonitoring Program, specifically:

- The addition of a new Site downwind from the Facility (i.e., northeast) was approved based on a review of the predominant wind direction. This Site will be added in the 2019 Field Year.
- Site S5 was removed from the Biomonitoring Program due to the abundant number of Sites located south of the facility. Site S5 was removed starting in the 2018 Field Year.





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## 1.2.4 Frequency of Sampling

The frequency of sampling was based on the outcomes from the first six years (1991-1996) of the Biomonitoring Program.

The content of emissions released from the Lambton Facility between 1991 and 1996 varied. As such, sampling less frequently than annually could result in an incomplete understanding of changes in the concentrations of analytes in environmental media over time. Hence, annual sampling events were continued.

## 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 Biomonitoring Sampling Program (Stantec, 2015) and as amended and filed in the Raw Data File Notebook.
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 2018 data to the upper control limits (UL18) for each Site and on a Site-wide basis. Results with concentrations greater than the UL18 (referred to as exceedances) have been reviewed and reported herein.
5. Review and compare the exceedances (inorganic analytes) or detections (organic analytes) in the 2018 data to applicable guidelines relevant for various media as outlined in **Section 2.6**.
6. Follow up on MECP approved changes to the Biomonitoring Program and recommendations identified in the 2018 Annual Landfill Report (Clean Harbors, 2018).

Provide recommendations regarding further investigation or issues to consider during future Biomonitoring Program events.



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Materials and Methods  
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## 2.0 MATERIALS AND METHODS

The sampling and reporting cycles; location and management of test Sites; and methods used to characterize, collect, analyze and statistically analyze the data are summarized below. The field protocol for the 2018 Biomonitoring Program and field phase test records from the 2018 Field Year are included within the Raw Data File Notebook (RDFN) (Stantec, 2018). The field protocol for the Biomonitoring Program describes the methods used during the field and analytical phases of the program.

**Table 3** details the sampling and reporting cycles of the Clean Harbors Biomonitoring Program and has been updated to reflect MECP approved changes to the Biomonitoring Program. More details regarding the MECP approved changes are provided in **Appendix G**.



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**Table 3: Sampling and Reporting Cycles, Biomonitoring Program, Lambton Facility**

Task	Timing	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
<b>Sampling Task</b>						
Collect biomonitoring chemistry samples at all Sites	annual	X	X	X	X	X
Collect sediment fertility & characterization samples at applicable Sites	3 yr cycle*	X	X	X		
Collect soil fertility & characterization samples at all Sites	6 yr cycle*			X		<sup>D</sup>
<b>Analysis Task</b>						
Laboratory analysis of inorganics and PCDD/DF	annual	X	X	X	X	X
Laboratory analysis of PCB, PCP and OCP	3 yr cycle	X	X	X <sup>A</sup>	X <sup>B</sup>	X <sup>B</sup>
<b>Reporting Task</b>						
Compare annual findings with control chart upper limits	annual	X	X	X <sup>C</sup>	X	X
Compare annual findings with government guidelines, where they exist	annual	X	X	X	X	X
Follow up on identified issues, if any	annual	X	X	X	X	X
Update control chart limits used for annual comparisons (inorganic and organic if applicable)	3 yr cycle			X (UL18, LL18)		
Update inorganic Site-specific trends	3 yr cycle	X			X	
Update inorganic Site-wide trends	3 yr cycle		X			X
Update organic Site-specific/Site-wide trends	6 yr cycle					X

**Notes:**

<sup>A</sup> Year 1, all samples will be submitted for analysis.

<sup>B</sup> Years 2 and 3, two samples per environmental media will be submitted for analytical testing: the Site with highest historical concentration and a randomly selected control site. 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.

<sup>C</sup> 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).

\* Recommend collecting sediment fertility and characterization samples at all applicable Sites every four years and soil fertility and characterization samples every eight years.

<sup>D</sup> Site E7 will be added to the Biomonitoring Program in the 2019 Field Year. Soil at this Site will be analyzed for fertility and characterization.



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Materials and Methods  
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## 2.1 LOCATION AND MANAGEMENT OF TEST SITES

The lands surrounding the Facility are predominantly agricultural, used for the production of crops. General descriptions of the test Sites are provided in **Table 4**. 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 is provided in **Figure 1** of **Appendix A**. All Sites, except three within the Clean Harbor facility (i.e., S7, E6, N5), were managed under a crop rotation that included soybean, winter wheat and field corn. In 2018, four of the Sites were cultivated with soybean (S1, S2, S4, and E2), four with field corn (W4, N2, E1, and E5) and two Sites with winter wheat (W2 and N4).

**Table 4: 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 <sup>1</sup>	1991-present	South: located in an agricultural field approx. 0.2 km from the property boundary
S2	1991-present	South: located in an agricultural field approx. 0.4 km from the property boundary
S3	1991-2015	South: located on the cap of a previously filled waste cell at the property
S4 <sup>2</sup>	1991-present	South: located in an agricultural field approx. 2.4 km from the property boundary
S5	1995-2017	South: located in an agricultural field approx. 0.8 km from the property boundary
S7	2016-present	South: located on the cap of a previously filled waste cell at the property
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

**Notes:**

<sup>1</sup> 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.

<sup>2</sup> Only sediment monitored from 1991-1992; all media in 1993–present.



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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<sup>8</sup> completed by the land managers (farmers) responsible for crop cultivation at the various test sites, Site W4 was tilled in June 2018 to a depth of 7.6 cm. Site S4 was tilled in May 2018 to a depth of 3.8 cm. Site W2, N4, S1, and S2 were managed using a no-till system in 2018. Site N2 was primary tilled to a depth of 17.8 cm in November 2017 and secondary tilled in May 2018 to a depth of 6.3 cm. Sites E1 and E5 were primary tilled to a depth of 5 cm and secondary tilled to a depth of 3.8 cm in May 2018. Site E2 was tilled to a depth of 7.6 cm in November 2017.

Sites S7 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.

## 2.2 CHARACTERIZATION OF TEST SITES

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 2018 RDFN (Stantec, 2018). Sediment sampling for fertility and characterization (concentrations of nutrients, organic matter (OM), pH, cation exchange capacity (CEC) and texture) is completed on a three-year cycle and was completed in the 2017 Field Year. Soil characterization and fertility sampling (concentrations of nutrients, OM, pH, CEC and texture) occurs on a six-year cycle and was completed in the 2017 Field Year. The characterization of sediment and soil is further discussed in **Appendix B**.

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 Site S1 was moved back near its original location (under tree cover) north of the crop. 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. 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.

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<sup>8</sup> Cultural Practice Surveys are sent out to land managers of record for cropped test Sites following the conclusion of the sampling program to gather information on field management practices. Completed Cultural Practice Surveys are on file in the RDFN.



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Given the distance of Sites W4, S4 and E2 from the Lambton Facility, (approximately 1.4 km, 2.4 km, and 1.75 km, respectively), it is likely that data collected from these Sites are more influenced by activities unrelated to the Lambton Facility rather than activities related to the Lambton facility.

### 2.3 COLLECTION OF SAMPLES FOR CHEMICAL ANALYSES

Samples of soil, drainage ditch sediment, natural grasses and agricultural crop were collected as per the methods outlined in the Revised Biomonitoring Sampling Program (Stantec, 2015). Soil and natural grasses samples were collected from 13 Sites in 2018. Agricultural crops were sampled at 10 of the 13 Sites<sup>9</sup>. Samples of drainage ditch sediment were collected from test Sites where drainage ditches were present (i.e., S7, N5, S1, S4, E2, and N2).

Since the samples were analyzed to determine the concentration of organic chemicals, 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.

A photo log is provided in **Appendix D**.

### 2.4 ANALYTICAL PROCEDURES

The samples for chemical analysis from the 2018 Field Year were submitted to ALS Laboratories for the list of Group 1, 2 and 3 analytes identified in **Table 1**.

Analysis of PCB, PCP and OCP occurs on a three-year cycle. In the 2018 Field Year organic analysis was completed for one sample from the Site that historically has the highest concentrations (i.e., the worst-case scenario) and one sample from a randomly selected control site. In the 2017 Field Year, the sites with the highest number of OCP detections and the highest upper bound PCDD/DF toxicologically equivalent (TEQ) were selected as the Site with the highest organic concentration (i.e., the worst case scenario). Site E6 was selected as the worst case for soil and natural grasses and Site E2 was selected as the worst case for crops and sediment. The randomly selected control sites were chosen to correspond to the parent samples of the field duplicates. The locations of the field duplicates were randomly selected during the sampling program. The field duplicate locations are Sites W4 and N4 for natural grass, N4 and S1 for soil, W4 for field corn, E2 for soybeans, N4 for winter wheat and N2 for sediment. However, since a field duplicate sample of soybeans was collected for Site E2 (i.e., a worst-case scenario), there is no randomly selected control site for soybeans.

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

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<sup>9</sup> The three remaining Sites (i.e., S7, E6, N5) are not managed under a crop rotation.



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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.

### 2.5 QUALITY ASSURANCE/QUALITY CONTROL

A QA/QC program, based on principles embodied in the United States Environmental Protection Agency (US EPA) Good Laboratory Practices (GLP) standards (US EPA, 1989) and the Organization for Economic Cooperation and Development (OECD) principles of good laboratory practice (OECD, 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 Vancouver, British Columbia and Burlington, Ontario 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/sediment, 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 (International Organization for Standardization (ISO) 17025). Accreditation by SWEDAC is accepted in Canada (ALS, 2009). An Analytical Data Summary Package is provided by ALS and provides detailed documentation of the actual procedures used during laboratory phase of the 2018 Biomonitoring Program and is on file with Stantec (Guelph).

The 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.

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. Eight blind field duplicates were collected and submitted for laboratory analysis to evaluate both laboratory precision and field sampling and handling procedures.

The formula used to determine the relative percent difference (RPD) from the mean between two concentrations, the original (a) and the duplicate (b), is provided below:

$$RPD (\%) = 100 \times \frac{(a - b)}{(a + b)/2}$$



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The applicable limit of the RPD is 40% for soil and sediment samples and 60% for tissue samples. Field duplicates were considered acceptable if the RPD met the applicable limit set by the laboratory. The RPD could not be calculated if either of the concentrations were less than 5 times the method detection limit (MDL).

### 2.6 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 2018 field year of the Biomonitoring Program.

The analytical data obtained during the 2018 field year are compared to applicable guidelines, where available. Soil analytical data are preferentially compared to the soil O. Reg. 153/04 Table 1 Site Condition Standards<sup>10</sup> (SCS) (MECP, 2011). Where soil SCS are unavailable, the soil analytical data are compared to the rural parkland Ontario Typical Range (OTR<sub>98</sub>) (MECP, 2011). Sediment analytical data are preferentially compared to the sediment O. Reg. 153/04 Table 1 SCS. Where sediment SCS are unavailable, the sediment analytical data are compared to the Provincial Sediment Quality Guidelines (PSQG) (MECP, 2008). Natural grasses analytical data are compared to the Upper Limit of Normal (ULN) (MECP, 1989). There are no guidelines available for agricultural crops (i.e., soybeans, field corn and winter wheat).

The statistical conventions used in the statistical analysis include:

- The use of actual values of the Reporting Detection Limits (RDLs, reported by the analytical laboratory) to represent the concentrations of those analytes that were not detected in the samples. 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 MDL which 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 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 greater than its RDL. This is viewed as a "worst case" estimate of the concentration of the analyte.
- Assessment of normality prior to statistical analysis. For the data up to and including 2018, the normality of analytical datasets was assessed on a Site-wide basis for each analyte-matrix pair by comparing histograms of both the log-transformed and untransformed dataset. In all cases, log-transformation improved the normality of the plotted data. Therefore, all statistical analyses in the current report were performed assuming an underlying lognormal distribution. Reported results (e.g.,

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<sup>10</sup> 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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regression values, upper limits and lower limits) have been back transformed to the original scale for final reporting.

- Assessment of appropriate start date prior to statistical analysis. As noted in prior reports, RDLs have shifted since 1991 for certain analyte-matrix pairs due to changes in analytical methods. In most cases, RDLs have decreased because of increased sensitivity of the analytical method. However, in other cases, RDLs have increased, generally as a trade-off for greater sensitivity for other analytes. For analyte-matrix pairs that have large proportions of non-detect data, these changes in RDL can have major impacts on statistical results for analyses that consider all data collected throughout the Biomonitoring Program (e.g., linear regressions and calculations of upper and lower limits). Therefore, prior to analyses carried out in the present report, analytical data were reviewed for each analyte-matrix pair on a Site-wide basis to determine the appropriate start date for statistical analyses. This review is discussed in detail in **Appendix E**. Statistical analyses (e.g., linear regression and calculation of upper and lower limits) in this report and future reports will rely on the analyte-matrix specific start dates indicated in **Appendix E** unless future analysis indicates that a more recent start date is appropriate. Historical data will be retained for historical comparison purposes only.
- 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 TEQ amount of 2,3,7,8-TCDD, the most toxic congener.
- Duplicate samples were relied on only to assess analytical and/or sampling variability as discussed in **Section 2.5**. To avoid overrepresentation of individual samples, further statistical analysis (e.g., linear regression and calculations of upper and lower limits) excluded duplicate results and relied only on ‘parent’ sample results (when available).

### 2.6.1 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.

Two critical components of a control chart are the UL and LL. In industrial process control charts, these limits are chosen such that almost all data points will fall between them as long as the process remains in-control (i.e., observations that fall below the LL or above the UL indicate potential process errors). These control limits are frequently derived to capture the mean value for the in-control process plus or minus three standard deviations of the mean (an approximate probability of 0.997).



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In the Biomonitoring Program, LLs and ULs have been calculated using a similar approach that relies on an overall annual mean<sup>11</sup> (or geometric mean, if data are determined to be log-distributed) of observed concentrations plus or minus three standard deviations of the overall annual mean (or geometric mean) calculated on a Site-wide or Site-specific basis. The resulting LLs and ULs describe a range of concentrations for each analyte in a given matrix that can be considered “typical” or “expected” (with an approximate probability of 0.997) for the monitored areas in the program (i.e., Site-wide and Site-specific). Individual values that fall outside of these control limits, and especially that are greater than an upper limit, are atypical for that Site-wide or Site-specific area and should be flagged for further consideration.

To generate upper and lower limits, the normality of each analyte-matrix pair was first assessed on a Site-wide basis. In general, the data collected in this program are largely lognormal and normality will be improved if data are log-transformed prior to analysis. As such, statistical analyses are typically performed on log-transformed data, which are back-transformed to regular units prior to report upper and lower limits. However, if analysis indicated that data were normally distributed, this process could also be carried out using un-transformed data.

The overall annual mean (or geometric mean, for lognormal data) for each analyte-matrix pair was calculated on a Site-wide and Site-specific basis by as a mean of annual means (or mean of annual geometric means for lognormal) to account for potential variability of sample numbers collected in individual years.

To calculate standard deviations for each analyte-matrix pair, the log-transformed (or normally distributed) data for each analyte in each medium on a Site-wide basis were then subjected to an analysis of variance (ANOVA) Type III model using Year and Site as independent variables with no interaction. Both Year and Site were considered categorical variables and Year was considered a random variable. The residual and year variance components were estimated from the ANOVA tables and used to compute the standard deviation for Site-specific and Site-wide concentrations of each analyte for each year.

For analyte-matrix pairs that were log-transformed, the mean and mean  $\pm 3$  standard deviations, or upper and lower control limits (UL and LL), were computed on the log scale and then transformed back (by taking the antilog) before the control charts were prepared. For normally distributed data, the mean and mean  $\pm 3$  standard deviations, or upper and lower control limits could be computed directly.

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

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<sup>11</sup> This overall mean was calculated as a mean of annual means (or mean of annual geometric means for samples with lognormal distributions) to account for potential variability of sample numbers collected in individual years.



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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  $\pm 3$  standard deviations, or control limits, to be wide.

Following this approach, LLs and ULs were initially calculated in 1997 using data from the first six years of the program (1991-1996). Since then, these limits have been periodically updated to encompass new data, as it became available, on a three-year cycle. The most recent update of these values prior to the current report incorporated data available between 1991 and 2017 (i.e., the UL18 and LL18 values). Throughout this program, LLs and ULs were not developed for Sites and matrices where concentrations of an element were not detected greater than the RDL. Also, LLs and ULs were not developed when less than six data points were available.

When evaluating the data collected in the 2018 Field Year, the UL18 and LL18 values were considered indicative of the 'typical range' of concentrations specific to the local environment (Site-wide and/or Site-specific). Therefore, samples collected during the 2018 Field Year with concentrations that were higher than the applicable UL18 concentration for that analyte in that matrix (Site-wide and/or Site-specific) were treated as 'exceedances' that warranted further consideration (**Section 3.3.2** and **Section 3.3.3**). In addition, measured concentrations of these analyte-matrix pairs (Site-wide and/or Site-specific) were compared with relevant guidelines when available. These guidelines include the rural parkland Table 1 SCS, OTR<sub>98</sub>, ULN, and the PSQG.

### 2.6.2 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.

Prior to completing regression analyses, data were screened to identify only datasets with at least six samples ( $n \geq 6$ ). In addition, only datasets for which at least 50% of samples had measured concentrations greater than the reported detection limit were considered appropriate for regression analysis. The screening based on proportion of detected samples was introduced in the 2018 field-year report in order to minimize the generation of spurious or uncertain regressions that are highly influenced by non-detect samples that have been assigned the value of the full reported detection limit. Screening for number of samples and proportion of detected samples was completed on a Site-wide or Site-specific basis, depending on the linear regressions being updated (i.e., Site-wide if completing Site-wide regressions or Site-specific if completing Site-specific regressions). Only samples collected after the appropriate analyte-matrix specific start date described in **Appendix E** were included in determining suitability for regression analysis.



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For each dataset identified as suitable for linear regression, a regression analysis was performed with year of sample collection as the independent variable and either concentration or log-transformed concentration as the dependent variable. In most cases, the data collected in this program have been shown to be lognormal, therefore linear regressions were completed using log-transformed concentrations. However, if data were observed to have a normal distribution, regression could be completed using un-transformed concentrations. Linear regressions were considered to be statistically significant when the regression p-value was less than 0.003 ( $p < 0.003$ ).

Site-wide inorganic trend lines were last updated in the 2017 Annual Landfill Report (2016 Field Year) (Clean Harbors, 2017). Site-specific trend lines for the inorganic analytes are updated in this report. Additional details of the established reporting cycles of the Biomonitoring Program are provided in **Table 3**.



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## 3.0 RESULTS AND DISCUSSION

### 3.1 FACTORS AFFECTING THE RESULTS

Environmental factors can affect the movement and fate of chemicals in the environment. Factors potentially affecting the results of the Biomonitoring program include:

- Soil and sediment characteristics (e.g., CEC, OM, clay content and pH):
  - These factors can impact the movement and fate of chemicals in the local environment. Further discussion of these characteristics is provided in **Appendix B**.
- Continued use of the Ontario ULN and OTR, which may not be specific or relevant to the Site:
  - The ULN represent findings from the 1980s, which may not adequately represent current environmental conditions.
  - The rural parkland OTR<sub>98</sub> values represent samples collected across the province. However, the land use surrounding the Lambton Facility could be better characterized by “rural agricultural” land use, thus the rural parkland OTR<sub>98</sub> values are not necessarily specific to the conditions of the Lambton Facility.

Another factor that can affect the results of the Biomonitoring Program is climate. Plant growth and environmental conditions are influenced significantly by precipitation, temperature and wind. Climate in the Sarnia-Lambton region is interpolated from data obtained at the Sarnia Climate weather station at the Sarnia Chris Hadfield Airport (Environment Canada, 2019a), which is approximately 15 km north of the Lambton Facility.

The Sarnia Climate weather information may provide a general indication of weather conditions during the 2018 growing season relative to the Canadian Climate Normals and Averages (1981-2010) for the region (Environment Canada, 2019b).

The 2018 growing season (April to October) experienced comparable overall precipitation (533 mm) to the 30-year climate normal (572 mm). During the months of April, June, July, and August Sarnia received approximately 30.6 mm, 2.2 mm, 26.3 mm, and 6.1 mm more precipitation, respectively, than the 30-year climate normals. In the months of May, September, and October, Sarnia received 40.3 mm, 53.3 mm, and 10.2 mm less precipitation, respectively, than the 30-year climate normals. The decreased precipitation measured during the months of May, September, and October in the 2018 growing season 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 mean monthly temperatures over the growing season of April to October (15.6°C) were comparable to the 30-year mean for that time period (15.1°C), confirming the overall climate conditions supported good plant growth.



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## 3.2 QUALITY ASSURANCE/QUALITY CONTROL

Eight blind field duplicates were analyzed for inorganic and organic analytes. The RPD of titanium in soil collected from Site N4 and the RPD of titanium in sediment collected from Site N2 exceeded the acceptable range outlined in **Section 2.5**. Where the RPDs exceeded the acceptable range, the results should be viewed with discretion and considered estimates. Although these results represented decreased precision, the results did not affect the overall interpretation of sample quality. The RPDs for inorganic and organic field duplicates are provided in **Tables C-1a** through **C-1d** and **Table C-2a** through **C-2d**.

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 laboratory certificates provided in **Appendix H**.

Three field blanks (laboratory supplied distilled water) were collected from laboratory supplied containers to evaluate if sample handling practices would result in an artificial increase of the analytical results. In addition, in the 2018 Field Year, a rinsate sample (store bought distilled water) from every store-bought bottle of distilled water used for decontamination of field equipment was collected upon opening. The purpose of the rinsate samples are to verify that store bought distilled water used for decontaminating field equipment did not introduce detectable concentrations of confounding inorganics. Field blanks were collected at Sites E1, N4 and S4 while the rinsate blanks were collected from newly opened bottles at Sites E1, N4 and W2. Three trip blanks (laboratory supplied distilled water in sealed containers) were also sent for analysis. The data quality objective for field, rinsate and trip blanks are concentrations less than or near the RDL. The analytical data from field blanks, rinsate blanks and trip blanks are provided in **Table C-1e**.

The trip blanks and field blanks met the data quality objective (no detectable analytes). Overall, the rinsate blanks met the data quality objective. Calcium was detected in all of the rinsate blanks at concentrations greater than the RDL. Nickel was detected in the rinsate blank at E1; silicon was detected in the rinsate blanks collected at Sites E1 and W2 at concentrations greater than the RDL. In addition, aluminum was detected in all of the rinsate blanks and copper was detected in the rinsate blank for Site W2 greater than the RDL. Although these analytes were detected greater than the RDL in rinsate blanks, the equipment rinse is not expected to have meaningfully influenced analytical results. A new brand of distilled water was chosen to rinse field equipment in the 2018 Field Year.

## 3.3 INORGANIC ANALYTES

The analytical results for the 2018 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**.



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### 3.3.1 Annual Findings

In 2018, the concentrations of 20 analytes (15 Group 1 analytes and five Group 2 analyte) exceeded their respective Site-specific UL18 within various environmental media (**Table C-3** and **Table C-4** of **Appendix C**). The concentrations of manganese and phosphorous exceeded their Site-wide (analyte by media) UL18 (**Table C-5** of **Appendix C**).

### 3.3.2 Group 1 Analytes

The Group 1 analytes exceeding the UL18 are summarized and discussed below.

#### 3.3.2.1 Barium

The barium concentration exceeded the Site-specific UL18 in sediment at the Site N2. The concentration of barium in sediment at Site N2 in the 2018 field year was less than 1% greater than the Site-specific UL18. The concentrations of barium in sediment at Site N2 in the 2016 and 2017 field years were less than their applicable upper limits (UL15). Although Table 1 SCS or PSQG values for sediment were not available for comparison, barium concentrations in sediment did not exceed the applicable upper limits in the previous two years, suggesting that this is not a recurring exceedance.

On a Site-wide basis, barium did not exceed the Site-wide UL18 in the media sampled.

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

#### 3.3.2.2 Boron

The boron concentrations exceeded the Site-specific UL18 in soybeans at Sites S1 and S2. There are no guidelines available for comparison for agricultural crops. An investigation in the 2010 Annual Landfill Report reported a threshold injury level (300 mg/kg) where no visible foliar injury could be induced. The concentrations of boron in soybeans at Sites S1 and S2 in the 2018 field year were less than the threshold injury level.

On a Site-wide basis, boron concentrations did not exceed the Site-wide UL18 in the media sampled.

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

#### 3.3.2.3 Calcium

The calcium concentration exceeded the Site-specific UL18 in soil at Site S4. The concentration of calcium in soil at Site S4 were less than the OTR<sub>98</sub> guideline.

The calcium concentration exceeded the Site-specific UL18 in soybeans at Sites S1 and S2. The concentrations of calcium in soybeans at Sites S1 and S2 in 2015 and 2017 were less than their UL15 (soybeans were not planted in 2016), suggesting that this not a recurring exceedance.

On a Site-wide basis, calcium concentrations did not exceed the Site-wide UL18 in the media sampled.



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

### 3.3.2.4 Chloride

The chloride concentration exceeded the Site-specific UL18 in sediment at Site S4. There are no Table 1 SCS or PSQG values for chloride available for comparison. The concentrations of chloride in sediment at Site S4 in 2015, 2016 and 2017 were less than their UL15, suggesting that this not a recurring exceedance.

The chloride concentration exceeded the Site-specific UL18 in soil at Sites E2, E6, N4 and W4. There are no soil guidelines available for comparison. The exceedances at Sites E2 and W4 were due to the RDL of 5.0 mg/kg which exceeded the corresponding UL18 values. The increased RDL was a result of a change in analytical testing facility for chloride from ALS Edmonton (RDL of 0.5 mg/kg) to ALS Vancouver in the 2018 Field Year. The concentrations of chloride in soil at Sites E6 and N4 have historically been measured at concentrations higher than 5.0 mg/kg and are thus unaffected by the change in RDL in 2018. Concentrations of chloride in soil at Sites E6 and N4 in 2015, 2016 and 2017 were less than their UL15, suggesting that these are not recurring exceedances.

On a Site-wide basis, chloride concentrations did not exceed the Site-wide UL18 in the media sampled.

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

The RDL for chloride differed in the 2018 and 2017 field years. The chloride RDL for soil and sediment was 5.0 mg/kg in the 2018 field year and 0.50 mg/kg in the 2017 field year. The chloride RDL for plant tissue and agricultural crops was 20 mg/kg in the 2018 field year and 10 mg/kg in the 2017 field year. The change in RDLs from the 2017 to the 2018 field year do not require additional investigation.

### 3.3.2.5 Chromium

The chromium concentration marginally exceeded the Site-specific UL18 in sediment at Site N2. The chromium concentration in sediment at Site N2 exceeded the sediment Table 1 SCS. The sediment Table 1 SCS is based on the LEL for chromium from the PSQG. The LEL indicates "a level of contamination that can be tolerated by the majority of sediment-dwelling organisms", and sediments meeting the LEL are "considered clean to marginally polluted." (MECP, 2008). More importantly, the sediment concentrations at Site N2 are considerably less than the PSQG Severe Effect Level (SEL) guideline (110 mg/kg), which is a guideline associated with potential adverse effects to sediment dwelling organisms. Additionally, this is the first exceedance of the Site-specific UL18 reported for chromium in sediment at Site N2, suggesting that this is not a recurring exceedance.

The chromium concentration marginally exceeded the Site-specific UL18 in soil at Site S2. The chromium concentration in soil at Site S2 is less than the soil SCS.

On a Site-wide basis, chromium concentrations did not exceed the Site-wide UL18 in the media sampled.

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





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### 3.3.2.6 Cobalt

The cobalt concentration exceeded the Site-specific UL18 in soybeans at Site S1. Prior to 2018, the last detected concentration of cobalt in soybeans was in 1992, suggesting that this is not a recurring exceedance. There are no guidelines available for comparison for agricultural crops.

On a Site-wide basis, cobalt concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.2.7 Iron

The iron concentration exceeded the Site-specific UL18 in natural grasses at Site N4. The concentration of iron in natural grasses at Site N4 was less than the ULN guideline.

On a Site-wide basis, iron concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.2.8 Magnesium

The magnesium concentration exceeded the Site-specific UL18 in natural grasses at Site N2. There is no ULN guideline for natural grasses available for comparison. Magnesium in natural grasses was investigated in the 2011 Annual Landfill Report where it was concluded that it is an essential plant nutrient and its presence in plants is not expected to result in detrimental effects on plant health (Clean Harbors, 2011).

The magnesium concentration exceeded the Site-specific UL18 in soybeans at Sites S1 and S2. There are no guidelines available for comparison for agricultural crops. The concentrations of magnesium in soybeans at Sites S1 and S2 in 2015 and 2017 (soybeans were not planted in 2016) were less than their UL15, suggesting that this not a recurring exceedance.

On a Site-wide basis, magnesium concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.2.9 Manganese

The manganese concentration exceeded the Site-specific UL18 in natural grasses at Sites E1, N2, N4, S1 and W4. The manganese concentration in natural grasses at Site E1 was less than the ULN guideline. The manganese concentrations in natural grasses at Sites N2, N4, S1 and W4 exceeded the ULN guideline. An investigation into the manganese concentrations in natural grasses was conducted in the 2010 Annual Landfill Report and it was concluded that the injury threshold level in plants reported in scientific literature was 500 mg/kg dry weight (Clean Harbors, 2010). The concentration of manganese in natural grasses at Sites N2, N4, S1 and W4 were less than the injury threshold level in plants.



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The manganese concentration exceeded the Site-specific UL18 in soybeans at Sites S1 and S2. There are no guidelines available for comparison for agricultural crops. The concentrations of manganese in soybeans at Sites S1 and S2 were less than the injury threshold level in plants.

The manganese concentration exceeded the Site-specific UL18 in soil at Sites E1, E6, S2 and S4. The manganese concentrations in soil at Sites E1, E6, S2 and S4 were less than the OTR<sub>98</sub> guideline.

On a Site-wide basis, manganese concentrations exceeded the UL18 and ULN in natural grasses but were less than the injury threshold level in plants.

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

#### 3.3.2.10 Molybdenum

The molybdenum concentration exceeded the Site-specific UL18 in natural grasses at Site S4 and soil at Site S2. The concentration of molybdenum in natural grasses at Site S4 exceeded the ULN and the concentration of molybdenum in soil at Site S2 exceeded the soil SCS.

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 soil at concentrations between 0.2 and 6 mg/kg while metal rich soils could contain concentrations between 10 to 100 mg/kg (van Gestel *et al.*, 2012). 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 (McGrath *et al.*, 2010). According to Gupta *et al.* (2008), toxicity levels of molybdenum in crops or reduced crop yield occur from tissue concentrations of 100 to 1,000 mg/kg but are uncommon. While phytotoxic concentrations in leaf tissue were reported as low as 10 mg/kg (Kabata-Pendias, 2001), 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.

The plant tissue concentrations from the 2018 field year were all <100 mg/kg and no phytotoxicity symptoms were observed. Thus, the results of the literature search support that measured concentration of molybdenum in natural grasses are not considered sufficient to result in phytotoxic symptoms. Similarly, the concentrations of molybdenum in soil measured in the 2018 field year were within the natural concentration range (0.2 and 6 mg/kg). Therefore, the concentrations of molybdenum in soil are not considered sufficient to result in phytotoxic concentrations in plants.

On a Site-wide basis, molybdenum concentrations did not exceed the UL18 in the media sampled.

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



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### 3.3.2.11 Phosphorus

The phosphorus concentration exceeded the Site-specific UL18 in natural grasses at Sites E1, E2, E5, N2, N4, S1, S2 and W4. There is no ULN guideline available for comparison for natural grasses. The phosphorus concentration in natural grasses at Sites E2, N2 and N4 did not exceed their Site-specific UL15 values in 2015, 2016 or 2017. The remaining sites with natural grasses exceedances in 2018 had exceedances of the UL15 in one of the past three years (2015: Sites S1 and S2, 2016: W4, and 2017: Sites E1 and E5).

The phosphorus concentration exceeded the Site-specific UL18 in soil at Site S2 but was less than the OTR<sub>98</sub> guideline.

The phosphorus concentration exceeded the Site-specific UL18 in soybeans at Site S1 and S2. There are no guidelines available for comparison for agricultural crops. The phosphorus concentration in soybeans at Sites S1 and S2 did not exceed the Site-specific UL15 in 2015 or 2017 (soybeans were not planted in 2016), suggesting that these are not recurring exceedances.

On a Site-wide basis, phosphorus concentration exceeded the UL18 in natural grasses.

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

### 3.3.2.12 Potassium

The potassium concentration exceeded the Site-specific UL18 in natural grasses at Site E1. There is no ULN guideline available for comparison for natural grasses. The potassium concentration in natural grasses at Site E1 in 2015, 2016 and 2017 did not exceed the Site-specific UL15, suggesting that this is not a recurring exceedance.

The potassium concentration exceeded the Site-specific UL18 in soybeans at Sites S1 and S2. There are no guidelines available for comparison for agricultural crops. The potassium concentration in soybeans at both Sites S1 and S2 in 2015 and 2017 did not exceed the Site-specific UL15, suggesting that these are not recurring exceedances.

On a Site-wide basis, potassium concentrations did not exceed the UL18 in the media sampled.

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

### 3.3.2.13 Silicon

The silicon concentration exceeded the Site-specific UL18 in soil at Site N4. There is no soil SCS or OTR<sub>98</sub> guideline available for comparison. A UL15 was not calculated for silicon, so a comparison of previous years' data is not available.

On a Site-wide basis, silicon concentrations did not exceed the UL18 in the media sampled.

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



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### 3.3.2.14 Strontium

The strontium concentration exceeded the Site-specific UL18 in soybeans at Site S1. There are no guidelines available for comparison for agricultural crops. The concentrations of strontium in soybeans at Site S1 in 2015 and 2017 were less than the UL15, suggesting that this not a recurring exceedance.

On a Site-wide basis, strontium concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.2.15 Sulfur

The sulfur concentration exceeded the Site-specific UL18 and the ULN guideline in natural grasses at Sites E1 and E2.

Sulfur is an essential macronutrient for plants, and it is naturally taken up by plants from the soil or the atmosphere (Linzon *et al.*, 1979). Plants that are acutely exposed to excessive sulfur concentrations may show interveinal lesions and those that are chronically exposed to a threshold concentration of sulfur may have chlorotic injury to the leaf tissue (Linzon *et al.*, 1979). The natural grasses collected at Sites E1 and E2 did not show signs of stress and appeared to be healthy. No further investigation is recommended at this time.

The reported detection limit for sulfur exceeded the Site-specific UL18 in soil at 11 of 13 sites (Sites E1, E2, E5, E6, N2, N4, S1, S2, S4, W2 and W4). There is no soil SCS or OTR<sub>98</sub> guideline available for comparison. The increased RDL was a result of a change in analytical testing facility for chloride from ALS Edmonton (RDL of 200 mg/kg) to ALS Vancouver (RDL of 1000 mg/kg) in the 2018 Field Year. The concentrations of sulfur in soil in previous years were typically measured at concentrations less than the current RDL of 1000 mg/kg. The exceedances identified in the 2018 field year are an artifact of this higher reporting detection limit.

On a Site-wide basis, sulfur concentrations did not exceed the Site-wide UL18 in the media sampled.

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

The RDL for sulfur in the 2018 field year differed from the 2017 field year. The sulfur RDL for soil and sediment was 1000 mg/kg in the 2018 field year and 200 mg/kg in the 2017 field year. The change in RDLs from the 2017 to the 2018 field year do not require additional investigation.

### 3.3.3 Group 2 Analytes

The Group 2 analytes exceeding the UL18 are discussed below.



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### 3.3.3.1 Aluminum

The aluminum concentration exceeded the UL18 in sediment at Site N2. There is no sediment SCS or PSQG available for comparison. The concentration of aluminum in sediment at Site N2 exceeded the Site-specific UL15 in 2015; however, the concentration in 2016 and 2017 did not exceed the Site-specific UL15, suggesting that this is not a recurring exceedance.

On a Site-wide basis, aluminum concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.3.2 Lead

The lead concentration exceeded the UL18 in natural grasses at Site E6 but was less than the ULN.

On a Site-wide basis, lead concentration did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.3.3 Mercury

The mercury concentrations exceeded the Site-specific UL18 in soil at Sites E6 and S2. Mercury concentrations in soil did not exceed the soil SCS at Sites E6 and S2.

On a Site-wide basis, mercury concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.3.4 Vanadium

The vanadium concentration exceeded the Site-specific UL18 in sediment at Site N2. There is no sediment SCS or PSQG available for comparison.

Vanadium in sediment was investigated in the 2010 Annual Landfill Report and given that the sediment concentrations at all Sites were less than the phytotoxic concentration for loamy soil (100 mg/kg), no further investigation was required (Clean Harbors 2010). The 2018 sediment concentration at Site N2 was also less than the phytotoxic concentration.

On a Site-wide basis, vanadium concentrations did not exceed the Site-wide UL18 in the media sampled.

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



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### 3.3.3.5 Zinc

The zinc concentration exceeded the Site-specific UL18 and the ULN in natural grasses at Sites E1 and S1. The concentrations of zinc in natural grasses at Sites E1 and S1 in 2015, 2016 and 2017 were less than their UL15, suggesting that this not a recurring exceedance. Furthermore, the results of a literature search indicated that plant yield is reduced when the concentration of zinc within the plant leaves reaches 300 to 1000 mg of zinc per kg dry weight (Chaney, 1993). The concentrations measured in natural grasses in the 2018 field year were less than this threshold.

On a Site-wide basis, zinc concentrations did not exceed the Site-wide UL18 in the media sampled.

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

### 3.3.4 Fluoride

Fluoride analysis was added to the Biomonitoring Program in the 2018 Field Year. Fluoride is phytotoxic and can reduce growth in plants; fluoride dust is stored at Clean Harbors (MECP, 2019). The MECP conducts an annual silver maple leaf monitoring program which includes analysis of fluoride (MECP, 2019). In 2017, the maximum measured fluoride concentration in unwashed and washed silver maple leaves from trees in the vicinity of the Clean Harbors facility was 4 mg/kg and 2.7 mg/kg. The maple leaf results from 2017 are the most recent maple leaf results reported by the MECP.

Fluoride was measured in soil, natural grasses, sediment and agricultural crops in the 2018 field year. A UL18 is not available for fluoride since it requires six years of data to calculate an upper limit. Fluoride concentrations were compared to available criteria which include an OTR for soil and a ULN for natural grasses.

The laboratory RDL for fluoride in natural grasses ranged from 110 mg/kg to 200 mg/kg and is greater than the ULN (12 mg/kg) and the measured fluoride concentration in silver maple leaves by the MECP in 2017. The fluoride concentrations in agricultural crops (i.e., field corn, soybean and winter wheat) were reported less than the laboratory reporting limits (ranging from 49 mg/kg to 71 mg/kg). There are no guidelines available for comparison for agricultural crops; however, the RDLs were greater than the fluoride concentrations measured in silver maple leaves by the MECP in 2017.

Fluoride was measured at detectable concentrations in soil at all sites but was less than the OTR<sub>98</sub>. Fluoride was measured at detectable concentrations in sediment at all sites where sediment was sampled (i.e., Sites E2, N2, N5, S1, S4, S7) but no guideline is available for comparison.

Monitoring should continue, and a request will be made to the analytical laboratory to lower the RDL in natural grasses and agricultural crops in future years of the Biomonitoring Program such that it allows for comparison to the ULN and/or MECP measured concentrations in maple leaves. No additional investigation is proposed at this time.



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### 3.3.5 Site-Specific Inorganic Trend Lines

Of the 1740 possible analyte / matrix / Site combinations, pre-screening based on the number of collected samples and proportion of detected samples (i.e.,  $n \geq 6$  and  $\geq 50\%$  detected samples based samples collected after the start date recommended in **Appendix E**) identified 964 datasets that were suitable for regression analysis (**Table F-1, Appendix F**). As noted in **Section 2.6**, data up to and including 2018 have been shown to be lognormally distributed; therefore, linear regressions of these datasets were carried out using year of sample collection as the independent variable and log-transformed concentration as the dependent variable. Of the resulting 964 linear regressions, 55 were found to be statistically significant ( $p < 0.003$ ) (**Table F-2, Appendix F**). These 55 statistically significant ( $p < 0.003$ ) linear regressions, representing 17 decreasing and 38 increasing trends, are presented in graphical form in **Appendix F (Section F.2)**. For comparison, 99 significant trends (15 decreasing and 84 increasing) were identified as meaningful in the 2015 Field-Year report and 60 trends (13 decreasing and 47 increasing) were identified as meaningful in the 2012 Field-Year report.

The 17 significantly decreasing trends occurred in natural grass (7), soil (5), sediment (4), and soybean (1) (**Table C-6, Appendix C**). The 38 increasing trends occurred primarily in sediment (18) or soil (12), with a small number of increasing trends also observed in natural grass (5) and soybean (3) (**Table C-6, Appendix C**). In most cases, increasing trends observed in soil at a Site were not reflected in increasing trends in plant tissues at that Site (**Table C-7, Appendix C**). The only exceptions to this were observed at Site S4, where significant increases of calcium, magnesium, and phosphorus were observed in soil as well as soybeans (calcium, phosphorus) or natural grasses (magnesium) (**Table C-7, Appendix C**).

The majority of the increasing trends reported in this 2018 Field-Year report were also identified as increasing in either the 2015 Field-Year or 2012 Field-Year report, indicating long-term stability of many of these trends (**Table C-6, Appendix C**). For example, of the 38 increasing trends shown in **Table C-6, Appendix C**, 30 were previously identified as increasing in either the 2015 Field-Year or 2012 Field-Year report. This includes 13 trends that have been consistently identified as increasing in each Site-specific trend analysis since the 2012 Field-Year report (**Table C-6, Appendix C**). All except one of these consistently increasing trends occurred in sediment at Site N2 (9/13) or in soil at Site S4 (3/13); the remaining consistently increasing trend occurred in sediment at Site E2 (1/13) (**Table C-6, Appendix C**). Sites N2 and S4 are also the locations where the majority (32/38) of significantly increasing trends were observed (**Table C-7, Appendix C**).

Site N2 is located approximately 700 m to the north of the Lambton Facility, while Site S4 is located approximately 2.4 km south of the Facility. Within the two Sites with the highest number of increasing trends in the 2018 Field Year, these increasing trends were found to occur most frequently in sediment (Site N2, including six Group 2 analytes: aluminum, cadmium, copper, lead, vanadium, and zinc) and soil (Site S4, including one Group 2 analyte: aluminum). Based on the discussion of these analytes in **Section 3.3.3**, additional investigation is not recommended at this time.



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The parameters with increasing trends were also evaluated with respect to the applicable guidelines. As shown in **Table C-7, Appendix C**, approximately 8% of the increasing trends (3/38) had measured 2018 Field Year concentrations greater than their applicable guidelines. The two sites with the highest number of upward trends (N2 and S4), also had a high number of exceedances of guidelines. At Site N2, four inorganic analytes (including two Group 2 analytes: aluminum and vanadium) exceeded their applicable guidelines; while at Site S4, two inorganic analytes (Group 1 analytes) exceeded their guidelines.

### 3.4 ORGANIC ANALYTES

The analytical results for the 2018 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**.

#### 3.4.1 Annual Findings

##### 3.4.1.1 OCP

The concentrations of dieldrin, endrin, heptachlor epoxide and mirex were measured in natural grasses greater than their respective RDLs at sites submitted for OCP analysis (Sites E6, N4 and W4). The concentrations of DDD, DDE, DDT, dieldrin, heptachlor epoxide and mirex were measured in soil greater than their respective RDLs at sites submitted for OCP analysis (Sites E6, N4 and S1). The concentrations of chlordane, DDD, DDE, DDT, dieldrin, endrin and mirex were measured in sediment greater than their respective RDLs at sites submitted for OCP analysis (Sites E2 and N2). The concentrations of chlordane, dieldrin, endosulfan sulfate, endrin, heptachlor epoxide and mirex were measured in soybeans at Site E2 greater than their respective RDLs. The concentration of dieldrin was measured in winter wheat at Site N4 greater than its RDL. No OCP analytes were measured at concentrations greater than their respective RDLs in field corn.

Of the analytes that were detected, none exceeded the applicable guidelines for soil for analytes with available guidelines (i.e., DDT, dieldrin and heptachlor epoxide) and for sediment for analytes with available guidelines (i.e., dieldrin and endrin) (**Tables C-2a, C-2b, C-2c and C-2d of Appendix C**). None of the detected concentrations were greater than 50% of their applicable guidelines; thus, analysis of all remaining held samples was not required for OCPs. There are no standards available for comparison of vegetation.

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

##### 3.4.1.2 PCBs

The concentrations of PCBs were measured in natural grasses, soil, sediment and all agricultural crops greater than their respective RDLs.





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The measured concentrations of PCBs in soil did not exceed the applicable guideline. The measured concentrations of PCBs in sediment did not exceed the applicable guideline. None of the detected concentrations were greater than 50% of their applicable guidelines; thus, analysis of all remaining held samples was not required for PCBs. There are no standards available for comparison of vegetation. The measured concentrations of PCBs in agricultural crops were detected less than the 2017 field year RDL.

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

### 3.4.1.3 PCPs

The RDL for pentachlorophenol (PCP) varied from <1.9 ng/g to <2.1 ng/g in agricultural crops. None of the samples analyzed for PCPs had concentrations greater than the RDL in agricultural crops. There are no standards available for comparison of vegetation.

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

### 3.4.1.4 PCDD/DF

The concentrations of polychlorodibenzo-p-dioxin/ polychlorodibenzo-furan (PCDD/DF) analytes were compared to their respective Table 1 SCS or rural parkland OTR<sub>98</sub> for dioxins/furans, where available (**Tables C-2a, C-2b, C-2c and C-2d of Appendix C**). There were no exceedances of the soil Table 1 SCS or OTR<sub>98</sub>, with the exception of the concentration of total hexachlorodibenzo-p-dioxin at Site E6 which marginally exceeded the OTR<sub>98</sub>.

The concentration of hexachlorodibenzo-p-dioxin did not exceed the OTR<sub>98</sub> in soil at Site E6 in the 2017, 2016 or 2015 field year, suggesting this is not a recurring exceedance. The lower and upper bound PCDD/DF TEQ (1.60 and 1.61 pg/g, respectively) at Site E6 are less than the OTR<sub>98</sub> TEQ (i.e., 4.8 pg/g).

Concentrations of PCDD/DF levels measured in soil were less than or within the range of levels in Canada reported in the scientific literature (1.0 - 330 picogram (pg) TEQ/g, from Birmingham *et al.*, 1989).

The concentrations of various PCDD/DF analytes in natural grasses and agricultural crops were reported greater than their respective RDLs. Criteria for comparison of concentrations 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). 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 investigation is proposed at this time.



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### 3.5 FOLLOW UP OF RECOMMENDATIONS FROM PREVIOUS BIOMONITORING REPORTS

Conclusions and recommendations presented previously in the 2017 Biomonitoring Program report which are to be address in the 2018 field year are listed in **Table 5** below.

**Table 5: Status of Conclusions and Recommendations of the 2017 Field Year Biomonitoring Program**

Conclusions and Recommendations	Discussion	Status
Monitoring of changes in the RDLs during the program should continue and impacts on the results should be reported where applicable.	The RDLs for chloride and sulfur are different from the 2017 to the 2018 field year. These are discussed in Section 3.3.2.4 and 3.3.2.15.  In the 2018 field year, total PCBs were detected at concentrations less than the 2017 RDLs. This is presented in Section 3.4.1.2.	Monitoring of changes in the RDLs during the program should continue.
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 Table 1 SCS, Ontario ULN and rural parkland OTR <sub>98</sub> which are representative of aging databases.	Comparisons within and between sites monitored in the program are discussed in Section 3.0 along with comparisons to the Table 1 SCS, ULN and OTR <sub>98</sub> . Since fluoride was added to the Biomonitoring Program in the 2018 Field Year, a UL18 was not available to make comparisons within and between Sites.	Ongoing.
Discussion of recurring findings should continue annually so that previous discussions are compiled and either confirmed or revised based on new results.	This discussion is provided where applicable in Section 3.0.	Discussion of recurring findings should continue annually so that previous discussions are compiled and either confirmed or revised based on new results.



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### 4.0 CONCLUSIONS

Overall, the majority of exceedances of the UL18 in the 2018 Field Year were identified for Group 1 inorganic analytes (i.e., barium, boron, calcium, chloride, chromium, cobalt, iron, magnesium, manganese, molybdenum, phosphorus, potassium, silicon, 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. 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.

Five Group 2 analyte (i.e., aluminum, lead, mercury, vanadium and zinc) exceeded the Site-specific UL18 values. While continued monitoring of this analyte is important, additional investigation is not proposed at this time.

Fluoride analysis was added to the Biomonitoring Program in the 2018 Field Year. The fluoride concentrations measured in soil were less than the OTR<sub>98</sub>. A sediment guideline was not available for comparison and the fluoride RDL in plant tissue was greater than the ULN. Monitoring should continue, and a request will be made to the analytical laboratory to lower the RDL in natural grasses in future years of the Biomonitoring Program such that it allows for comparison to the ULN value. No additional investigation is proposed at this time.

Overall, the Group 3 organic analytes were not detected at concentrations which exceeded the applicable guidelines (i.e., OCPs and PCBs) or the concentrations were less than the RDLs (i.e., PCPs) in each media sampled. The concentrations of PCDD/DF analytes did not exceed the applicable guideline, with the exception of hexachlorodibenzo-p-dioxin in soil at Site E6. However, the lower and upper bound PCDD/DF TEQ was less than the OTR<sub>98</sub> TEQ at Site E6.

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 Table 1 SCS, Ontario ULN and rural parkland OTR<sub>98</sub> 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.



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The concentrations of the identified chemicals were generally within the expected range in comparison with baseline levels, with exceptions/qualifications discussed herein. 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.



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### 5.0 LIMITATIONS

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. 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. The purpose of this report is to identify



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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 Katherine Ketis, P.Eng., statistical analysis was conducted by Melissa Whitfield Aslund, Ph.D., and reviewed by Tereza Dan, Ph.D. and Loretta Hardwick, M.Sc.

All of which is respectfully submitted,

**STANTEC CONSULTING LTD.**

**Katherine Ketis**, P.Eng.  
Environmental Engineer  
Phone: 519 780 8198  
Katherine.Keis@stantec.com

**Tereza Dan**, Ph.D.  
Managing Senior Principal  
Phone: 519 575 4112  
Tereza.Dan@stantec.com

KK/MWA/TD/LH/jt



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# **APPENDICES**

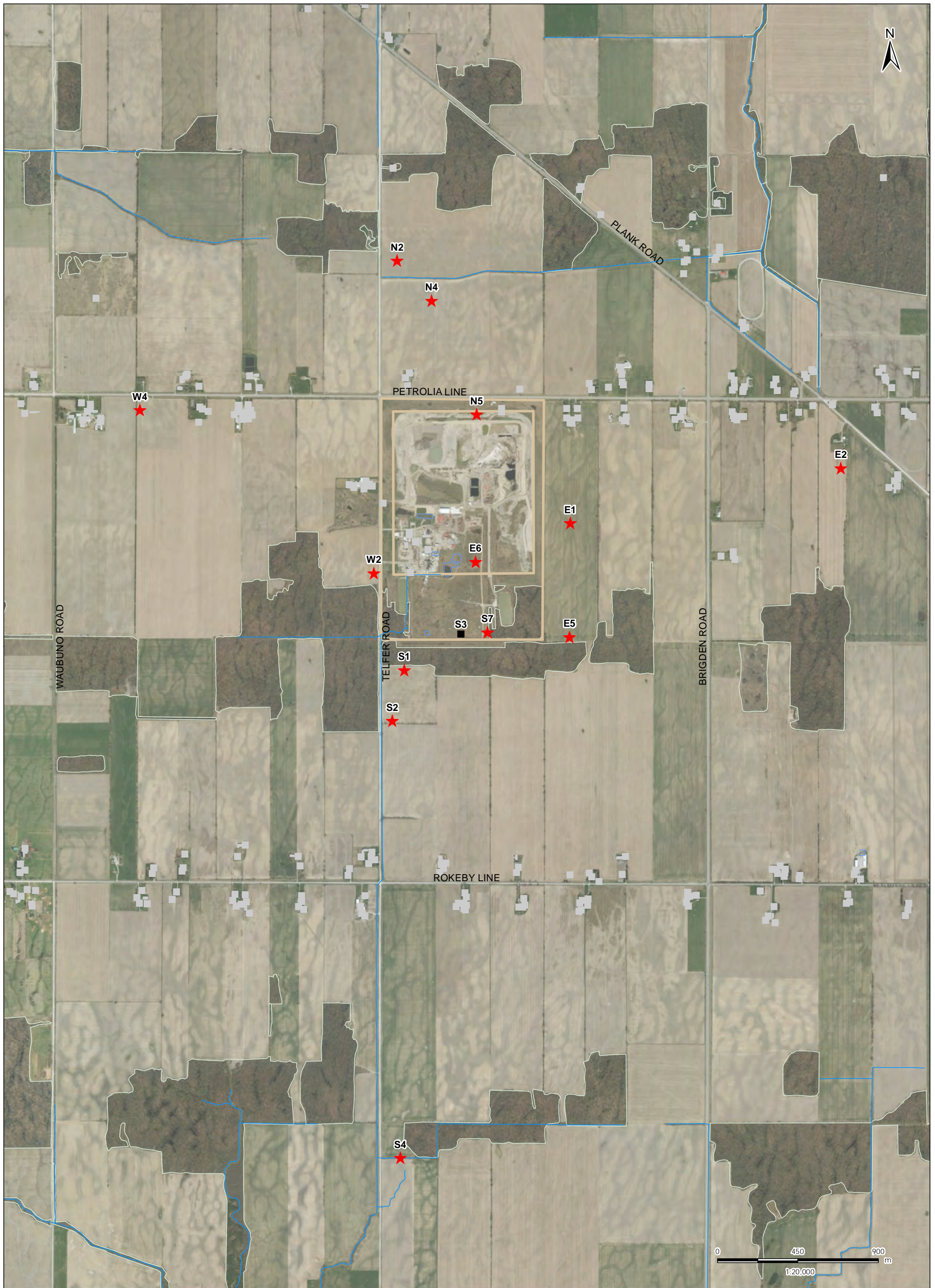
**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
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Appendix A Figures  
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## Appendix A FIGURES







**Legend**

- ★ Existing Sampling Locations (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

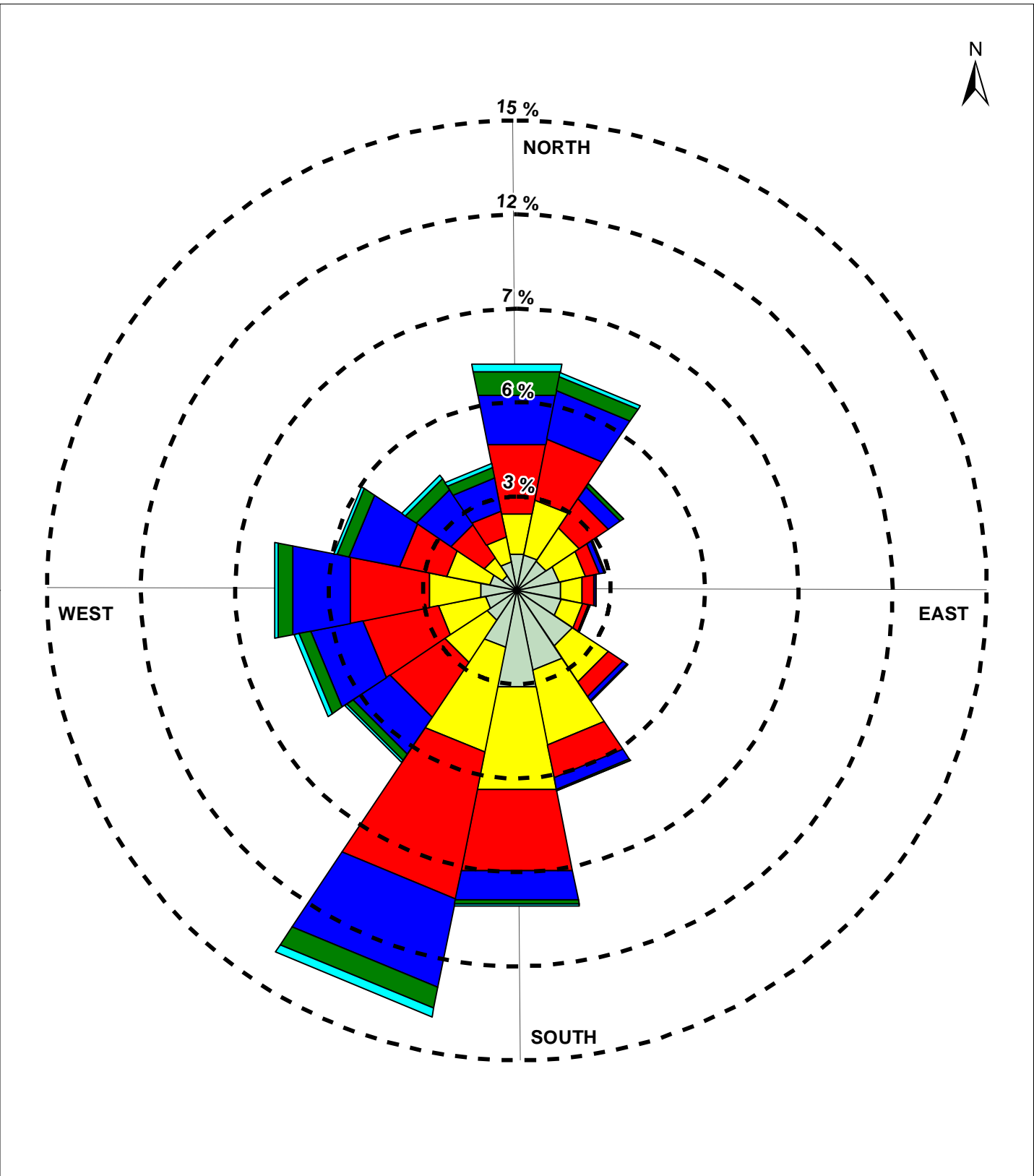
Existing and Proposed  
Sampling Locations

**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.



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 Revised: 2015-12-03 By: sverdamme



Notes  
 1. Note to scale.

Legend

Wind Speed (Knots)

Light Blue	>= 22
Green	17 - 21
Blue	11 - 17
Red	7 - 11
Yellow	4 - 7
Light Green	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), July  
 2014 to June 2015**

January 2019  
 122160003

# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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, OM, 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% OM (Brady & Weil, 2002). Clay in mineral matter and humus in OM 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 ( $\text{pH} \geq 7.0$ ) 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.,  $\text{Al}^{3+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{K}^+$ ,  $\text{NH}_4^+$ ,  $\text{Na}^+$ ) 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 ( $\text{H}^+$ ), 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  $\text{H}^+$  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 absorbed 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 OM and a portion remains in the soil solution. The following general statements apply to discussions on the effect of soil CEC, OM, clay content and pH on the findings arising from the Biomonitoring Program:

- Increase 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  $\text{H}^+$ ), increase CEC (more negative Sites available)
- For cations increase soil adsorption, decrease plant and microbial uptake, decrease leaching



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Appendix B Characterization of Soils at Test Sites  
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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, OM, 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, OM, 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, 2015).

## 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 OM
- 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



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Appendix B Characterization of Soils at Test Sites  
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- 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 with the exception of Site S7. The soil profile at Site S7 is inferred to be comparable to Site S3 given their proximity. 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 13 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.



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Appendix B Characterization of Soils at Test Sites  
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The majority of the Sites (9 of 15) 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, S7) 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 <sup>1 2</sup>	Depth (cm)	Texture <sup>3</sup>	Drainage Class	Slope (%)	Soil Type
N2	Ap	0 - 20	C	Imperfect	0.5	Caistor Clay Loam
	Bmgj	20 - 34	SiCL			
	Btgj	34 - 63	C			
	Ckgj	63 - 100	C			
N4	P	0 - 25	L/CL	Imperfect	1-1.5	Caistor Clay Loam
	MgJ	25 - 46	Si/CL			
	KgJ	46 - 100	Si/CL			
N5	Abk	0 - 30	SiCl	Not Applicable	<1	Disturbed (Landscaped Perimeter)
	Bmgjk	30 - 55	SiCl			
	Ckgj	55 - 70+	SiCl			
E1	Ap	0 - 23	L	Imperfect	1.0	Caistor Clay Loam
	Bmgj	23 - 49	SCL			
	Btgj	49 - 92	SiCL			
	Ckgj	92 - 100	SiCL			
E2	Ap	0 - 20	SCL	Imperfect	0.5	Caistor Clay Loam
	Bmgj	20 - 31	CL			
	Btgj	31 - 46	SiCL			
	Ckgj	46 - 100	SiCL			
E5	Ap	0 - 20	L	Imperfect	1.0	Caistor Clay Loam
	AB	20 - 32	CL			
	Bmgj	32 - 47	CL			
	Btgj	47 - 81	SiC			
	Ckgj	81 - 100	SiCL			





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Site	Horizon <sup>1 2</sup>	Depth (cm)	Texture <sup>3</sup>	Drainage Class	Slope (%)	Soil Type
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 and S7*	Ap Ckgj	Disturbed Site	L <sup>4</sup>	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

**Notes:**

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

\* Soil profile at Site S7 adopted from Site S3 (Site S3 removed from biomonitoring program).



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Appendix B Characterization of Soils at Test Sites  
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**B.5 SOIL AND SEDIMENT RESULTS**

**B.5.1 Soil Class**

Soil characterization samples were collected during the 2017 Field Year (**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).

**Table B5-1: Particle Size Distribution and Textural Class of Soil, 2017 Biomonitoring Program, Lambton Facility**

Site	Soil	Sand	Silt	Clay
	Texture	(%)	(%)	(%)
N2	Clay Loam	30	36	34
N4	Clay Loam	27	41	32
N5	Loam	38	40	22
E1	Clay Loam	35	36	29
E2	Loam	50	36	14
E5	Loam	41	35	24
E6	Loam	47	37	16
S1	Clay Loam	36	36	28
S2	Clay Loam	29	39	32
S4	Clay	15	38	47
S5	Clay Loam	28	37	35
S7	Loam	43	36	21
W2	Clay Loam	27	43	30
W4	Silty Clay Loam	19	42	39

**B.5.2 Soil Nutrients, OM, CEC, pH, Clay Content and Surface Texture, 2017 Field Year**

Soil fertility samples were collected during the 2017 Field Year (**Table B5-2**). The 2017 soil fertility results indicated that the nutrients, OM, 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 2011, taking into consideration natural variation.



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Appendix B Characterization of Soils at Test Sites  
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**Table B5-2: Nutrients (P, K, Mg, Ca), Organic Matter (OM), pH, Cation Exchange Capacity (CEC) of Soil, 2017 Biomonitoring Program, Lambton Facility**

Site	P	K	Mg	Ca	OM	pH	CEC
	(ppm)	(ppm)	(ppm)	(ppm)	(%)		(MEQ/100g)
N2	43	128	479	2856	4.9	6.7	19.8
N4	30	149	263	5031	4.2	7.8	28.9
N5	6	113	420	4367	6.0	7.7	26.8
E1	7	89	391	1993	2.6	7.8	14.7
E2	21	81	261	2593	6.0	7.4	16.5
E5	8	93	429	2917	3.5	7.6	19.6
E6	6	144	260	4015	6.0	7.6	23.8
S1	6	81	401	2845	3.3	7.7	19.0
S2	14	102	407	2674	3.3	7.6	18.2
S4	34	212	467	4633	4.7	7.7	28.8
S5	13	106	523	3744	2.9	7.8	26.4
S7	7	198	385	2898	6.3	7.4	31.4
W2	7	94	458	3434	4.2	7.6	22.4
W4	62	161	508	2951	5.4	6.5	20.6

### 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, 2016 Field Year

The sediment nutrients, OM, CEC, pH, clay content and surface texture are described below. Sediment was sampled under dry conditions for all Sites where drainage ditch sediment was sampled (Sites N2, N5, S1, S4, E2 and S7).

As expected, in 2017 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.



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Appendix B Characterization of Soils at Test Sites  
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**Table B5-3: Particle Size Distribution and Textural Class of Sediment, 2017 Biomonitoring Program, Lambton Facility**

Site	Sediment	Sand	Silt	Clay
	Texture	(%)	(%)	(%)
N2	Silt Clay	18	41	41
N5	Silty Clay Loam	19	45	36
E2	Silty Clay Loam	16	49	35
S1	Clay Loam	34	38	28
S4	Clay	21	38	41
S7	Clay Loam	27	38	35

**Table B5-4: Nutrients (P, K, Mg, Ca), Organic Matter (OM), pH, Cation Exchange Capacity (CEC) of Sediment, 2017 Biomonitoring Program, Lambton Facility**

Site	P	K	Mg	Ca	OM	pH	CEC
	(ppm)	(ppm)	(ppm)	(ppm)	(%)		(MEQ/100g)
N2	21	114	518	4910	7.4	7.5	30.4
N5	10	113	359	4689	2.9	8.0	27.9
E2	8	89	365	4463	1.7	8.0	26.7
S1	10	104	540	3489	6.0	7.2	23.4
S4	17	141	509	5220	4.7	7.9	31.9
S7	4	73	526	5129	2.0	7.9	31.4

## B.6 REFERENCES

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**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2018 FIELD YEAR**

Appendix B Characterization of Soils at Test Sites  
February 14, 2020

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**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2018 FIELD YEAR**

Appendix C Tables  
February 14, 2020

**Appendix C TABLES**



**Table C-1a**  
**Summary of Natural Grass 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location			E1	E2	E5	E6	N2	N4	N5	S1	S2	S4	S7	W2	W4	W4	25-Mar-19			
Sample Date			16-Oct-18	26-Sep-18	16-Oct-18	17-Oct-18	17-Oct-18	26-Sep-18	26-Sep-18	17-Oct-18	25-Sep-18	25-Sep-18	26-Sep-18	17-Oct-18	25-Sep-18	16-Oct-18	16-Oct-18	Duplicate		
Sample ID			18-E1-NG-CH-039	18-E2-NG-CH-049	18-E5-NG-CH-055	18-E6-NG-CH-061	18-N2-NG-CH-019	18-N4-NG-CH-025	18-D3-NG-CH-203	18-N5-NG-CH-035	18-S1-NG-CH-069	18-S2-NG-CH-075	18-S4-NG-CH-093	18-S7-NG-CH-085	18-W2-NG-CH-003	18-W4-NG-CH-009	18-D9-NG-CH-220			
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC			
Laboratory			ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS			
Laboratory Work Order			L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986			
Laboratory Sample ID			L2222986-18	L2222986-22	L2222986-25	L2222986-28	L2222986-9	L2222986-12	L2222986-45	L2222986-16	L2222986-31	L2222986-34	L2222986-38	L2222986-42	L2222986-2	L2222986-5	L2222986-46			
Sample Type								Field Duplicate	RPD (%)								Field Duplicate	RPD (%)	WG3011342-2 Lab Replicate	
<b>General Chemistry</b>																				
Chloride	mg/kg	10,000 <sup>A</sup>	10,300 <sup>A</sup>	6,720	9,950	14,000 <sup>A</sup>	10,200 <sup>A</sup>	11,800 <sup>A</sup>	11,300 <sup>A</sup>	4%	6,680	7,320	6,010	8,090	12,200 <sup>A</sup>	2,520	27,500 <sup>A</sup>	19,600 <sup>A</sup>	34%	-
Fluoride	mg/kg	12 <sup>A</sup>	<160	<160	<160	<150	<160	<190	<200	nc	<110	<200	<200	<140	<140	<190	<200	<200	nc	-
<b>Metals, Group 1</b>																				
Barium	mg/kg	n/v	14.5	23.0	12.6	9.84	17.2	11.7	8.84	28%	13.1	20.5	32.0	19.6	14.0	13.8	14.6	10.2	35%	13.0
Beryllium	mg/kg	n/v	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.011	nc	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	nc	<0.01
Boron	mg/kg	20 <sup>A</sup>	7.5	4.2	6.6	19.5	9.7	6.6	6.8	3%	20.6 <sup>A</sup>	11.8	6.1	5.7	18.0	6.2	5.5	6.8	21%	5.0
Calcium	mg/kg	n/v	6,080	5,740	6,380	8,300	9,040	8,070	7,090	13%	10,400	8,670	5,620	7,930	9,520	4,730	5,240	5,330	2%	4,810
Chromium	mg/kg	5 <sup>A</sup>	0.167	0.220	0.882	0.848	0.800	0.866	0.741	16%	0.344	3.56	0.693	0.308	0.477	0.637	0.413	0.403	2%	0.352
Cobalt	mg/kg	2 <sup>A</sup>	0.036	<0.020	0.097	0.177	0.083	0.139	0.141	1%	0.064	0.148	0.047	0.032	0.061	0.042	0.078	0.086	nc	0.067
Iron	mg/kg	500 <sup>A</sup>	95.5	80.7	198	121	209	357	337	6%	100	308	91.6	89.3	93.0	74.4	132	181	31%	112
Magnesium	mg/kg	n/v	2,860	3,030	3,980	2,800	4,340	3,110	2,670	15%	2,970	2,600	2,200	2,750	3,850	1,700	3,440	3,240	6%	2,960
Manganese	mg/kg	50 <sup>A</sup>	35.1	31.5	52.0 <sup>A</sup>	42.4	155 <sup>A</sup>	116 <sup>A</sup>	109 <sup>A</sup>	6%	33.3	55.3 <sup>A</sup>	23.7	43.3	42.5	32.1	91.7 <sup>A</sup>	66.7 <sup>A</sup>	32%	80.4 <sup>A</sup>
Molybdenum	mg/kg	6 <sup>A</sup>	3.55	4.20	6.80 <sup>A</sup>	13.8 <sup>A</sup>	8.19 <sup>A</sup>	3.79	2.73	33%	2.49	4.06	3.07	15.0 <sup>A</sup>	28.0 <sup>A</sup>	4.05	4.49	4.23	6%	4.09
Nickel	mg/kg	5 <sup>A</sup>	0.55	0.45	0.69	1.55	0.69	0.96	0.86	nc	0.64	1.04	0.77	0.46	1.36	0.62	2.55	2.30	10%	2.29
Phosphorus	mg/kg	n/v	7,060	7,960	3,470	1,690	4,290	4,060	4,170	3%	1,960	4,790	4,500	3,580	2,900	2,530	5,990	6,050	1%	5,330
Potassium	mg/kg	n/v	39,400	36,800	33,400	26,500	28,500	23,700	21,600	9%	19,800	22,900	22,000	24,000	35,600	14,200	45,100	42,500	6%	40,600
Silicon	mg/kg	n/v	7,060	8,660	7,490	7,680	6,860	7,400	11,500	nc	5,710	6,740	9,510	7,380	6,230	7,170	5,880	10,900	nc	-
Silver	mg/kg	n/v	<0.0050	<0.0050	<0.0050	0.0110	<0.0050	<0.0050	<0.0050	nc	0.0052	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nc	<0.005
Sodium	mg/kg	n/v	34	27	60	106	40	73	70	nc	62	50	49	29	49	38	87	83	nc	78
Strontium	mg/kg	n/v	14.2	14.5	8.89	45.0	18.7	16.2	14.6	10%	55.1	15.1	21.0	28.8	24.5	10.6	9.02	7.81	14%	8.34
Sulfur	mg/kg	5,000 <sup>A</sup>	6,700 <sup>A</sup>	8,260 <sup>A</sup>	4,270	3,990	4,830	3,710	3,870	nc	4,750	2,700	2,710	3,720	4,340	1,760	3,430	3,610	nc	-
Titanium	mg/kg	n/v	0.50	0.30	3.30	2.21	2.36	5.87	4.85	19%	1.22	5.02	0.92	1.07	1.13	1.01	1.64	2.52	42%	1.33
Zirconium	mg/kg	n/v	<0.20	<0.20	<0.20	<0.20	<0.20	0.27	<0.20	nc	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	nc	<0.2
<b>Metals, Group 2</b>																				
Aluminum	mg/kg	n/v	16.4	9.8	165	48.5	126	374	323	15%	38.8	275	44.8	47.6	37.7	35.1	67.7	118	54%	53.5
Arsenic	mg/kg	n/v	0.062	0.063	0.111	0.255	0.120	0.161	0.173	7%	0.082	0.094	0.036	0.026	0.058	0.040	0.049	0.053	nc	0.039
Cadmium	mg/kg	0.5 <sup>A</sup>	0.0229	0.0093	0.118	0.297	0.0379	0.0361	0.0198	nc	0.0943	0.145	0.102	0.0372	0.0867	0.0648	0.274	0.220	22%	0.246
Copper	mg/kg	7 <sup>A</sup>	7.14 <sup>A</sup>	7.97 <sup>A</sup>	6.73	7.23 <sup>A</sup>	6.87	4.62	3.61	25%	7.81 <sup>A</sup>	8.75 <sup>A</sup>	9.24 <sup>A</sup>	6.15	7.21 <sup>A</sup>	6.22	7.92 <sup>A</sup>	8.53 <sup>A</sup>	7%	7.21 <sup>A</sup>
Lead	mg/kg	20 <sup>A</sup>	0.125	0.038	0.260	1.93	0.202	0.251	0.246	2%	0.413	0.302	0.103	0.105	0.372	0.275	0.216	0.230	6%	0.188
Mercury	mg/kg	n/v	0.0129	0.0079	0.0195	0.150	0.0182	0.0189	0.0134	nc	0.0336	0.0252	0.0135	0.0145	0.0356	0.0231	0.0165	0.0181	nc	0.0144
Thallium	mg/kg	n/v	<0.0020	<0.0020	0.0032	0.0172	0.0034	0.0047	0.0041	nc	0.0056	0.0049	0.0030	0.0025	0.0045	<0.0020	0.0034	0.0039	nc	0.0033
Vanadium	mg/kg	6 <sup>A</sup>	<0.10	<0.10	0.39	0.25	0.29	0.67	0.57	16%	0.16	0.58	0.11	0.11	0.14	0.13	0.21	0.31	nc	0.17
Zinc	mg/kg	40 <sup>A</sup>	67.2 <sup>A</sup>	33.3	22.7	42.1 <sup>A</sup>	29.2	23.5	28.1	18%	45.7 <sup>A</sup>	45.3 <sup>A</sup>	31.5	17.6	27.7	19.0	27.0	29.0	7%	24.0

**Notes:**  
MOE Ontario Ministry of the Environment  
<sup>A</sup> Ontario Ministry of the Environment Rural "upper limit of normal" contaminant guidelines for phytotoxicology samples (1989)  
6.5<sup>A</sup> 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.  
61% RPD exceeds data quality objective of 60%.  
nc RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

**Table C-1b**  
**Summary of Soil 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location				E1	E2	E5	E6		N2		N4			N5	S1		S2	S4			
Sample Date				16-Oct-18	26-Sep-18	16-Oct-18	17-Oct-18	27-Mar-19	17-Oct-18	28-Mar-19	5-Jul-18	5-Jul-18		21-Mar-19	17-Oct-18	25-Sep-18	25-Sep-18	25-Sep-18	26-Sep-18	28-Mar-19	
Sample ID				18-E1-SS-CH-037	18-E2-SS-CH-043	18-E5-SS-CH-053	18-E6-SS-CH-059	Duplicate	18-N2-SS-CH-013	Duplicate	18-N4-SS-CH-023	18-D1-SS-CH-200		Duplicate	18-N5-SS-CH-029	18-S1-SS-CH-063	18-D2-SS-CH-201	18-S2-SS-CH-073	18-S4-SS-CH-087	Duplicate	
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	15 cm	15 cm	15 cm	15 cm	
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC		STANTEC		STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	
Laboratory				ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	
Laboratory Work Order				L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	
Laboratory Sample ID				L2222986-17	L2222986-20	L2222986-24	L2222986-27	WG3015508-2	L2222986-7	WG3007681-7	L2222986-11	L2222986-43		L2222986-14	L2222986-29	L2222986-44		L2222986-33	L2222986-36	WG3013961-3	
Sample Type								Lab Replicate		Lab Replicate		Field Duplicate		Lab Replicate		Field Duplicate				Lab Replicate	
Units																					
Ontario SCS																					
MOE *																					
<b>General Chemistry</b>																					
Chloride	mg/kg	n/a <sup>A</sup>	35 <sup>B</sup>	<5.0	<5.0	<5.0	30.6	9.1	<5.0	-	23.0	26.6	nc	-	<5.0	8.1	6.9	nc	7.4	<5.0	-
Fluoride	mg/kg	n/v	84	1.89	2.48	2.89	2.87	-	1.44	1.39	4.86	5.40	11%	-	5.96	3.96	4.72	18%	2.13	3.97	3.97
<b>Metals, Group 1</b>																					
Barium	mg/kg	210 <sup>A</sup>	170 <sup>B</sup>	85.9	71.2	58.5	90.4	-	112	-	66.3	70.0	5%	66.1	59.0	118	112	5%	130	139	-
Beryllium	mg/kg	2.5 <sup>A</sup>	1.1 <sup>B</sup>	0.69	0.56	0.53	0.70	-	1.24	-	0.68	0.72	6%	0.67	0.55	1.01	0.99	2%	1.24	1.10	-
Boron	mg/kg	36 <sup>A</sup>	30 <sup>B</sup>	13.1	10.7	8.1	13.1	-	17.0	-	9.0	13.5	nc	9.4	9.9	17.3	18.4	nc	16.3	13.0	-
Calcium	mg/kg	n/v	54,000 <sup>B</sup>	4,090	5,960	4,460	21,900	-	5,780	-	7,860	7,660	3%	5,760 RA	23,000	14,200	17,200	19%	5,160	6,300	-
Chromium	mg/kg	67 <sup>A</sup>	58 <sup>B</sup>	24.3	20.6	20.7	27.8	-	39.7	-	21.7	24.5	12%	21.8	22.5	34.8	31.4	10%	40.1	41.5	-
Cobalt	mg/kg	19 <sup>A</sup>	16 <sup>B</sup>	8.83	7.91	6.48	10.9	-	11.2	-	7.45	7.29	2%	7.69	7.26	12.9	11.5	11%	14.0	18.3	-
Iron	mg/kg	n/v	36,000 <sup>B</sup>	17,700	16,800	16,000	19,400	-	24,700	-	16,800	17,600	5%	17,300	17,100	25,600	23,000	11%	29,600	29,000	-
Magnesium	mg/kg	n/v	19,000 <sup>B</sup>	4,390	4,450	4,310	11,100	-	6,950	-	5,020	5,830	15%	5,050	11,200	10,900	12,000	10%	7,330	8,110	-
Manganese	mg/kg	n/v	1,900 <sup>B</sup>	760	321	244	875	-	324	-	344	284	19%	348	315	753	741	2%	886	888	-
Molybdenum	mg/kg	2 <sup>A</sup>	0.984 <sup>B</sup>	1.19	1.53	1.36	2.88 <sup>A</sup>	-	1.23	-	1.35	1.44	6%	1.40	2.16 <sup>A</sup>	1.38	1.43	4%	2.89 <sup>A</sup>	1.00	-
Nickel	mg/kg	37 <sup>A</sup>	34 <sup>B</sup>	22.6	17.1	16.0	25.7	-	35.4	-	18.9	19.3	2%	19.1	20.8	32.4	30.1	7%	31.4	33.2	-
Phosphorus	mg/kg	n/v	830 <sup>B</sup>	673	677	400	425	-	943 <sup>B</sup>	-	572	551	4%	490	434	633	517	20%	756	718	-
Potassium	mg/kg	n/v	6,500 <sup>B</sup>	2,570	2,460	1,650	2,540	-	4,010	-	1,800	2,710	40%	1,860	1,940	3,620	3,580	1%	4,080	3,880	-
Silicon	mg/kg	n/v	n/v	323,000	306,000	319,000	294,000	-	285,000	-	339,000	318,000	nc	-	288,000	302,000	297,000	nc	298,000	254,000	-
Silver	mg/kg	0.5 <sup>A</sup>	0.27 <sup>B</sup>	<0.10	<0.10	<0.10	<0.10	-	0.10	-	<0.10	<0.10	nc	<0.1	<0.10	<0.10	<0.10	nc	<0.10	<0.10	-
Sodium	mg/kg	n/a <sup>A</sup>	690 <sup>B</sup>	56	55	63	95	-	68	-	56	70	nc	67	121	88	100	nc	81	72	-
Strontium	mg/kg	n/v	63 <sup>B</sup>	14.9	19.1	13.5	39.9	-	22.5	-	16.2	17.9	10%	14.6	57.7	25.5	26.6	4%	25.3	26.6	-
Sulfur	mg/kg	n/v	790 <sup>B</sup>	<1,000	<1,000	<1,000	<1,000	-	<1,000	-	<1,000	<1,000	nc	<1,000	<1,000	<1,000	<1,000	nc	<1,000	<1,000	-
Titanium	mg/kg	n/v	5,500 <sup>B</sup>	131	138	141	162	-	158	-	106	165	44%	123	117	227	213	6%	182	102	-
Zirconium	mg/kg	n/v	n/v	2.4	1.8	1.2	2.1	-	6.0	-	2.2	1.8	nc	2.1	2.0	2.8	2.8	nc	3.3	4.3	-
<b>Metals, Group 2</b>																					
Aluminum	mg/kg	n/v	30,000 <sup>B</sup>	15,400	14,400	13,600	16,000	-	25,600	-	14,500	17,700	20%	14,600	13,300	23,700	21,900	8%	29,100	27,700	-
Arsenic	mg/kg	11 <sup>A</sup>	11 <sup>B</sup>	5.39	5.05	4.81	6.21	-	5.38	-	5.69	5.59	2%	5.66	5.86	7.59	7.05	7%	7.69	5.15	-
Cadmium	mg/kg	1 <sup>A</sup>	0.7 <sup>B</sup>	0.563	0.332	0.291	0.777	-	0.518	-	0.474	0.452	5%	0.455	0.576	0.557	0.502	10%	0.611	0.336	-
Copper	mg/kg	62 <sup>A</sup>	46 <sup>B</sup>	14.6	16.4	9.57	16.9	-	33.5	-	13.6	14.1	4%	13.3	16.2	16.4	15.0	9%	17.8	18.3	-
Lead	mg/kg	45 <sup>A</sup>	34 <sup>B</sup>	13.0	24.6	12.4	16.6	-	16.5	-	12.4	14.5	16%	12.8	16.3	15.7	15.4	2%	21.6	16.7	-
Mercury	mg/kg	0.16 <sup>A</sup>	0.13 <sup>B</sup>	0.0477	0.0701	0.0282	0.0730	-	0.0605	-	0.0409	0.0454	10%	0.0397	0.0701	0.0417	0.0444	6%	0.0604	0.0471	-
Thallium	mg/kg	1 <sup>A</sup>	n/v	0.208	0.203	0.183	0.256	-	0.235	-	0.198	0.244	nc	0.199	0.222	0.267	0.274	3%	0.343	0.230	-
Vanadium	mg/kg	86 <sup>A</sup>	86 <sup>B</sup>	35.7	32.6	33.1	36.7	-	45.2	-	32.8	37.5	13%	35.0	31.0	49.5	46.2	7%	56.0	47.0	-
Zinc	mg/kg	290 <sup>A</sup>	160 <sup>B</sup>	62.1	61.0	51.7	71.5	-	85.1	-	52.0	56.9	9%	52.1	71.5	67.6	62.2	8%	88.4	81.9	-



**Table C-1b**  
**Summary of Soil 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location				S7	W2	W4
Sample Date				17-Oct-18	5-Jul-18	16-Oct-18
Sample ID				18-S7-SS-CH-079	18-W2-SS-CH-001	18-W4-SS-CH-007
Sample Depth				15 cm	15 cm	15 cm
Sampling Company				STANTEC	STANTEC	STANTEC
Laboratory				ALS	ALS	ALS
Laboratory Work Order				L2222986	L2222986	L2222986
Laboratory Sample ID				L2222986-40	L2222986-1	L2222986-4
Sample Type	Units	Ontario SCS	MOE *			
<b>General Chemistry</b>						
Chloride	mg/kg	n/a <sup>A</sup>	35 <sup>B</sup>	12.7	<5.0	<5.0
Fluoride	mg/kg	n/v	84	1.18	3.17	0.90
<b>Metals, Group 1</b>						
Barium	mg/kg	210 <sup>A</sup>	170 <sup>B</sup>	89.6	67.5	115
Beryllium	mg/kg	2.5 <sup>A</sup>	1.1 <sup>B</sup>	0.85	0.77	1.30
Boron	mg/kg	36 <sup>A</sup>	30 <sup>B</sup>	18.5	10.6	22.5
Calcium	mg/kg	n/v	54,000 <sup>B</sup>	9,910	4,850	5,760
Chromium	mg/kg	67 <sup>A</sup>	58 <sup>B</sup>	30.3	24.1	40.6
Cobalt	mg/kg	19 <sup>A</sup>	16 <sup>B</sup>	8.51	7.53	10.9
Iron	mg/kg	n/v	36,000 <sup>B</sup>	21,200	19,400	27,800
Magnesium	mg/kg	n/v	19,000 <sup>B</sup>	8,030	4,420	7,450
Manganese	mg/kg	n/v	1,900 <sup>B</sup>	390	356	321
Molybdenum	mg/kg	2 <sup>A</sup>	0.984 <sup>B</sup>	1.73	<b>2.08<sup>A</sup></b>	1.93
Nickel	mg/kg	37 <sup>A</sup>	34 <sup>B</sup>	26.3	19.1	35.0
Phosphorus	mg/kg	n/v	830 <sup>B</sup>	552	606	<b>1,180<sup>B</sup></b>
Potassium	mg/kg	n/v	6,500 <sup>B</sup>	3,900	1,900	4,900
Silicon	mg/kg	n/v	n/v	286,000	318,000	287,000
Silver	mg/kg	0.5 <sup>A</sup>	0.27 <sup>B</sup>	<0.10	<0.10	<0.10
Sodium	mg/kg	n/a <sup>A</sup>	690 <sup>B</sup>	71	63	87
Strontium	mg/kg	n/v	63 <sup>B</sup>	23.1	13.9	23.0
Sulfur	mg/kg	n/v	790 <sup>B</sup>	<b>&lt;1,000</b>	<b>&lt;1,000</b>	<b>&lt;1,000</b>
Titanium	mg/kg	n/v	5,500 <sup>B</sup>	180	162	181
Zirconium	mg/kg	n/v	n/v	2.8	1.8	3.6
<b>Metals, Group 2</b>						
Aluminum	mg/kg	n/v	30,000 <sup>B</sup>	20,500	16,600	25,800
Arsenic	mg/kg	11 <sup>A</sup>	11 <sup>B</sup>	6.09	7.05	6.42
Cadmium	mg/kg	1 <sup>A</sup>	0.7 <sup>B</sup>	0.484	0.458	0.510
Copper	mg/kg	62 <sup>A</sup>	46 <sup>B</sup>	18.9	14.3	28.1
Lead	mg/kg	45 <sup>A</sup>	34 <sup>B</sup>	15.7	16.9	18.7
Mercury	mg/kg	0.16 <sup>A</sup>	0.13 <sup>B</sup>	0.0543	0.0492	0.0533
Thallium	mg/kg	1 <sup>A</sup>	n/v	0.272	0.253	0.354
Vanadium	mg/kg	86 <sup>A</sup>	86 <sup>B</sup>	41.1	41.3	52.5
Zinc	mg/kg	290 <sup>A</sup>	160 <sup>B</sup>	73.7	58.0	103

**Notes:**

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
	Site Condition Standards (SCS)
<sup>A</sup>	Table 1 - Agricultural or Other Property Use
MOE	Ontario Ministry of the Environment
<sup>B</sup>	Ontario Typical Range (OTR) values for Rural Parks, Ontario Ministry of Environment and Energy (OMEE, 1993)
*	Results are only compared to the MOE OTR value in the absence of an Ontario SCS value
<b>6.5<sup>A</sup></b>	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<b>&lt;0.50</b>	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.
RA	Duplicate results exceeded RPD acceptance criteria. This may be due to sample heterogeneity.sample heterogeneity.
RPD	Relative Percent Difference.
<b>61%</b>	RPD exceeds data quality objective of 40%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

**Table C-1c**  
**Summary of Sediment 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location				E2		N2			N5	S1	S4	S7
Sample Date				26-Sep-18	26-Sep-18	17-Oct-18	17-Oct-18		17-Oct-18	25-Sep-18	26-Sep-18	17-Oct-18
Sample ID				18-E2-SD-CH-045	18-E2-SD-CH-045	18-N2-SD-CH-015	18-D4-SD-CH-204		18-N5-SD-CH-031	18-S1-SD-CH-065	18-S4-SD-CH-089	18-S7-SD-CH-081
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				ALS	ALS	ALS	ALS		ALS	ALS	ALS	ALS
Laboratory Work Order				L2222986	L2222986	L2222986	L2222986		L2222986	L2222986	L2222986	L2222986
Laboratory Sample ID				L2222986-21	L2222986-21	L2222986-8	L2222986-47	RPD	L2222986-15	L2222986-30	L2222986-37	L2222986-41
Sample Type	Units	Ontario SCS	PSQG *		Lab Replicate		Field Duplicate	(%)				
<b>General Chemistry</b>												
Chloride	mg/kg	n/v	n/v	31.0	-	80.0	62.1	25%	33.6	23.1	57.2	69.3
Fluoride	mg/kg	n/v	n/v	6.45	-	2.94	2.84	3%	4.49	3.73	4.25	6.55
<b>Metals, Group 1</b>												
Barium	mg/kg	n/v	n/v	101	-	139	177	24%	79.9	89.4	128	128
Beryllium	mg/kg	n/v	n/v	0.73	-	1.18	1.42	18%	0.72	0.87	1.18	1.14
Boron	mg/kg	n/v	n/v	25.1	-	23.8	31.5	nc	20.0	24.1	28.0	27.5
Calcium	mg/kg	n/v	n/v	93,100	-	39,900	56,300	34%	73,100	36,400	55,400	60,400
Chromium	mg/kg	26 <sup>A</sup>	26 <sup>B</sup>	30.4 <sup>A</sup>	-	42.8 <sup>A</sup>	50.1 <sup>A</sup>	16%	27.2 <sup>A</sup>	38.0 <sup>A</sup>	42.5 <sup>A</sup>	40.6 <sup>A</sup>
Cobalt	mg/kg	50 <sup>A</sup>	n/v	9.97	-	10.8	12.6	15%	9.72	9.91	13.4	11.5
Iron	mg/kg	n/v	20,000 <sup>B</sup>	21,900 <sup>B</sup>	-	28,300 <sup>B</sup>	33,100 <sup>B</sup>	16%	20,600 <sup>B</sup>	21,900 <sup>B</sup>	29,500 <sup>B</sup>	26,900 <sup>B</sup>
Magnesium	mg/kg	n/v	n/v	33,200	-	19,400	24,700	24%	26,000	17,400	23,700	26,000
Manganese	mg/kg	n/v	460 <sup>B</sup>	414	-	289	331	14%	445	175	540 <sup>B</sup>	465 <sup>B</sup>
Molybdenum	mg/kg	n/v	n/v	2.59	-	1.96	2.32	17%	2.50	4.19	1.64	3.25
Nickel	mg/kg	16 <sup>A</sup>	16 <sup>B</sup>	30.0 <sup>A</sup>	-	37.4 <sup>A</sup>	42.7 <sup>A</sup>	13%	28.4 <sup>A</sup>	32.1 <sup>A</sup>	37.6 <sup>A</sup>	35.7 <sup>A</sup>
Phosphorus	mg/kg	n/v	600 <sup>B</sup>	473	-	945 <sup>B</sup>	1,040 <sup>B</sup>	10%	432	697 <sup>B</sup>	699 <sup>B</sup>	501
Potassium	mg/kg	n/v	n/v	4,130	-	5,070	6,370	23%	3,320	4,010	5,440	4,890
Silicon	mg/kg	n/v	n/v	185,000	181,000	201,000	198,000	nc	214,000	232,000	206,000	268,000
Silver	mg/kg	0.5 <sup>A</sup>	n/v	<0.10	-	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10
Sodium	mg/kg	n/v	n/v	271	-	312	195	nc	255	145	194	296
Strontium	mg/kg	n/v	n/v	101	-	52.7	72.8	32%	68.8	39.7	81.1	80.0
Sulfur	mg/kg	n/v	n/v	<1,000	-	<1,000	<1,000	nc	<1,000	<1,000	<1,000	<1,000
Titanium	mg/kg	n/v	n/v	318	-	146	244	50%	247	230	269	272
Zirconium	mg/kg	n/v	n/v	8.3	-	3.9	3.5	nc	4.2	3.0	4.1	4.3
<b>Metals, Group 2</b>												
Aluminum	mg/kg	n/v	n/v	17,000	-	31,800	36,300	13%	16,400	20,100	28,700	26,500
Arsenic	mg/kg	6 <sup>A</sup>	6 <sup>B</sup>	5.89	-	5.48	6.23 <sup>A</sup>	13%	5.90	4.90	6.40 <sup>A</sup>	7.78 <sup>A</sup>
Cadmium	mg/kg	0.6 <sup>A</sup>	0.6 <sup>B</sup>	0.174	-	0.706 <sup>A</sup>	0.781 <sup>A</sup>	10%	0.348	0.443	0.295	0.294
Copper	mg/kg	16 <sup>A</sup>	16 <sup>B</sup>	18.6 <sup>A</sup>	-	28.5 <sup>A</sup>	32.3 <sup>A</sup>	13%	17.8 <sup>A</sup>	23.5 <sup>A</sup>	22.9 <sup>A</sup>	20.7 <sup>A</sup>
Lead	mg/kg	31 <sup>A</sup>	31 <sup>B</sup>	8.83	-	16.9	19.5	14%	12.1	16.0	14.5	14.7
Mercury	mg/kg	0.2 <sup>A</sup>	0.2 <sup>B</sup>	0.0228	-	0.0698	0.0754	8%	0.0381	0.0601	0.0451	0.0448
Thallium	mg/kg	n/v	n/v	0.282	-	0.395	0.486	21%	0.274	0.333	0.292	0.354
Vanadium	mg/kg	n/v	n/v	37.5	-	56.0	66.0	16%	37.6	42.6	53.7	53.8
Zinc	mg/kg	120 <sup>A</sup>	120 <sup>B</sup>	56.2	-	122 <sup>A</sup>	135 <sup>A</sup>	10%	63.9	74.1	75.4	70.1

**Notes:**

- Ontario SCS Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
- Site Condition Standards (SCS)
- Table 1 - All Types of Property Uses
- PSQG Ontario Provincial Sediment Quality Guidelines
- Table 1: PSQG for Metals and Nutrients - Lowest Effect Level
- Results are only compared to the PSQG value in the absence of an Ontario SCS value
- 6.5<sup>A</sup> 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.
- 61% RPD exceeds data quality objective of 40%.
- nc RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

**Table C-1d**  
**Summary of Agricultural Crops 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location		E1				E2				E5			N2		N4						
Sample Date		16-Oct-18	16-Oct-18	16-Oct-18	26-Sep-18	26-Sep-18	26-Sep-18	26-Sep-18	26-Sep-18	16-Oct-18	16-Oct-18	16-Oct-18	17-Oct-18	17-Oct-18	5-Jul-18	5-Jul-18	5-Jul-18	5-Jul-18	5-Jul-18	5-Jul-18	
Sample ID		18-E1-FC-CH-041	18-E1-FC-CH-041	18-E1-FC-CH-041	18-E2-SB-CH-051	18-E2-SB-CH-051	18-D5-SB-CH-205	18-D5-SB-CH-205	18-D5-SB-CH-205	18-E5-FC-CH-057	18-E5-FC-CH-057	18-E5-FC-CH-057	18-N2-FC-CH-021	18-N2-FC-CH-021	18-N4-WW-CH-027	18-N4-WW-CH-027	18-D7-WW-CH-209	18-D7-WW-CH-209	18-D7-WW-CH-209		
Crop		Field Corn	Field Corn	Field Corn	Soybean	Soybean	Soybean	Soybean	Soybean	Field Corn	Field Corn	Field Corn	Field Corn	Field Corn	Winter Wheat	Winter Wheat	Winter Wheat	Winter Wheat	Winter Wheat		
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		
Laboratory		ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS		
Laboratory Work Order		K1902061	L2222986	L2222986	K1902061	L2222986	K1902061	L2222986	K1902061	L2222986	L2222986	K1902061	K1902061	L2222986	K1902061	L2222986	K1902061	L2222986	L2222986		
Laboratory Sample ID		K1902061-011	L2222986-19	L2222986-19	K1902061-013	L2222986-23	K1902061-026	RPD	L2222986-48	RPD	K1902061-015	L2222986-26	K1902061-015DUF	K1902061-006	L2222986-10	K1902061-008	L2222986-13	K1902061-028	RPD	L2222986-50	RPD
Sample Type	Units			Lab Replicate			Field Duplicate	(%)	Field Duplicate	(%)			Lab Replicate				Field Duplicate	(%)	Field Duplicate	(%)	
<b>General Chemistry</b>																					
Chloride	mg/kg	-	568	-	-	32	-	-	35	nc	-	550	-	-	398	-	1,080	-	-	862	22%
Fluoride	mg/kg	<51	-	-	<69	-	<71	nc	-	-	<51	-	<51	<59	-	<59	-	<56	nc	-	-
<b>Metals, Group 1</b>																					
Barium	mg/kg	-	<0.050	-	-	0.996	-	-	1.04	4%	-	<0.050	-	-	<0.050	-	5.30	-	-	3.80	33%
Beryllium	mg/kg	-	<0.010	-	-	<0.010	-	-	<0.010	nc	-	<0.010	-	-	<0.010	-	<0.010	-	-	<0.010	nc
Boron	mg/kg	-	<1.0	-	-	29.8	-	-	32.5	9%	-	1.8	-	-	2.2	-	1.4	-	-	1.5	nc
Calcium	mg/kg	-	23	-	-	2,520	-	-	2,530	0%	-	40	-	-	23	-	665	-	-	621	7%
Chromium	mg/kg	-	<0.050	-	-	<0.050	-	-	<0.050	nc	-	<0.050	-	-	<0.050	-	<0.050	-	-	<0.050	nc
Cobalt	mg/kg	-	<0.020	-	-	0.068	-	-	0.082	nc	-	<0.020	-	-	<0.020	-	<0.020	-	-	<0.020	nc
Iron	mg/kg	-	7.5	-	-	57.9	-	-	55.1	5%	-	9.5	-	-	17.6	-	37.6	-	-	40.2	7%
Magnesium	mg/kg	-	454	-	-	2,670	-	-	2,670	0%	-	592	-	-	1,130	-	1,090	-	-	1,120	3%
Manganese	mg/kg	-	1.47	-	-	20.6	-	-	20.7	0%	-	1.52	-	-	3.29	-	22.4	-	-	24.4	9%
Molybdenum	mg/kg	-	0.281	-	-	20.4	-	-	22.6	10%	-	0.591	-	-	0.400	-	0.995	-	-	0.921	8%
Nickel	mg/kg	-	<0.20	-	-	1.44	-	-	1.24	15%	-	<0.20	-	-	0.23	-	<0.20	-	-	<0.20	nc
Phosphorus	mg/kg	-	1,280	-	-	7,040	-	-	6,840	3%	-	1,850	-	-	3,330	-	3,180	-	-	3,380	6%
Potassium	mg/kg	-	1,550	-	-	20,700	-	-	20,900	1%	-	3,310	-	-	4,010	-	5,660	-	-	5,740	1%
Silicon	mg/kg	-	14.2	25.9	-	8.57	-	-	18.5	nc	-	11.5	-	-	10.1	-	170	-	-	3,260	nc
Silver	mg/kg	-	<0.0050	-	-	<0.0050	-	-	<0.0050	nc	-	<0.0050	-	-	<0.0050	-	<0.0050	-	-	<0.0050	nc
Sodium	mg/kg	-	<20	-	-	<20	-	-	<20	nc	-	<20	-	-	<20	-	<20	-	-	<20	nc
Strontium	mg/kg	-	<0.050	-	-	3.24	-	-	3.68	13%	-	0.053	-	-	<0.050	-	2.29	-	-	1.90	19%
Sulfur	mg/kg	-	400	-	-	3,580	-	-	3,580	nc	-	810	-	-	1,060	-	1,300	-	-	1,280	nc
Titanium	mg/kg	-	<0.10	-	-	<0.10	-	-	<0.10	nc	-	<0.10	-	-	<0.10	-	0.12	-	-	0.15	nc
Zirconium	mg/kg	-	<0.20	-	-	<0.20	-	-	<0.20	nc	-	<0.20	-	-	<0.20	-	<0.20	-	-	<0.20	nc
<b>Metals, Group 2</b>																					
Aluminum	mg/kg	-	<2.0	-	-	<2.0	-	-	<2.0	nc	-	<2.0	-	-	<2.0	-	4.3	-	-	6.6	nc
Arsenic	mg/kg	-	<0.020	-	-	<0.020	-	-	<0.020	nc	-	<0.020	-	-	<0.020	-	<0.020	-	-	<0.020	nc
Cadmium	mg/kg	-	<0.0050	-	-	<0.025 DM	-	-	<0.025 DM	nc	-	<0.0050	-	-	0.0079	-	0.0951	-	-	0.0944	1%
Copper	mg/kg	-	0.51	-	-	11.2	-	-	10.5	6%	-	1.22	-	-	1.30	-	3.95	-	-	3.83	3%
Lead	mg/kg	-	<0.020	-	-	<0.020	-	-	<0.020	nc	-	<0.020	-	-	<0.020	-	<0.020	-	-	<0.020	nc
Mercury	mg/kg	-	<0.0050	-	-	<0.0050	-	-	<0.0050	nc	-	<0.0050	-	-	<0.0050	-	<0.0050	-	-	<0.0050	nc
Thallium	mg/kg	-	<0.0020	-	-	<0.0020	-	-	<0.0020	nc	-	<0.0020	-	-	<0.0020	-	<0.0020	-	-	<0.0020	nc
Vanadium	mg/kg	-	<0.10	-	-	<0.10	-	-	<0.10	nc	-	<0.10	-	-	<0.10	-	<0.10	-	-	<0.10	nc
Zinc	mg/kg	-	7.32	-	-	33.9	-	-	32.8	3%	-	10.1	-	-	16.2	-	16.4	-	-	16.6	1%

See notes on last page

**Table C-1d**  
**Summary of Agricultural Crops 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location		S1		S2		S4			W2		W4		W4		W4		W4		
Sample Date		25-Sep-18	25-Sep-18	25-Sep-18	25-Sep-18	26-Sep-18	26-Sep-18	1-Apr-19	5-Jul-18	5-Jul-18	16-Oct-18	16-Oct-18	16-Oct-18	16-Oct-18	16-Oct-18	16-Oct-18	16-Oct-18	16-Oct-18	
Sample ID		18-S1-SB-CH-071	18-S1-SB-CH-071	18-S2-SB-CH-077	18-S2-SB-CH-077	18-S4-SB-CH-095	18-S4-SB-CH-095	Duplicate	18-W2-WW-CH-005	18-W2-WW-CH-005	18-W4-FC-CH-011	18-W4-FC-CH-011	18-D6-FC-CH-207	18-W4-FC-CH-011	Duplicate	18-D6-FC-CH-207	Duplicate	Duplicate	
Crop		Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Winter Wheat	Winter Wheat	Field Corn	Field Corn	Field Corn	Field Corn	Field Corn	Field Corn	Field Corn	Field Corn	
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	
Laboratory		ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	
Laboratory Work Order		K1902061	L2222986	K1902061	L2222986	K1902061	L2222986	L2222986	K1902061	L2222986	K1902061	K1902061	K1902061	L2222986	L2222986	L2222986	L2222986	L2222986	
Laboratory Sample ID		K1902061-018	L2222986-32	K1902061-020	L2222986-35	K1902061-022	L2222986-39	WG3016565-2	K1902061-002	L2222986-3	K1902061-004	K1902061-004DUF	K1902061-027	RPD	L2222986-6	WG3014541-3, WG3011451-2	L2222986-49	RPD	WG3014663-3
Sample Type	Units							Lab Replicate				Lab Replicate	Field Duplicate	(%)		Lab Replicate	Field Duplicate	(%)	Lab Replicate
<b>General Chemistry</b>																			
Chloride	mg/kg	-	61	-	81	-	59	-	-	668	-	-	-	-	457	457	422	8%	418
Fluoride	mg/kg	<55	-	<69	-	<49	-	-	<60	-	<56	<56	<56	nc	-	-	-	-	-
<b>Metals, Group 1</b>																			
Barium	mg/kg	-	1.27	-	2.05	-	0.765	-	-	4.05	-	-	-	-	<0.050	<0.05	<0.050	nc	-
Beryllium	mg/kg	-	<0.010	-	<0.010	-	<0.010	-	-	<0.010	-	-	-	-	<0.010	<0.01	<0.010	nc	-
Boron	mg/kg	-	39.6	-	35.4	-	28.9	-	-	1.3	-	-	-	-	2.1	1.9	2.1	nc	-
Calcium	mg/kg	-	4,300	-	3,610	-	3,080	-	-	617	-	-	-	-	48	45	43	nc	-
Chromium	mg/kg	-	<0.050	-	<0.050	-	<0.050	-	-	0.050	-	-	-	-	<0.050	<0.05	<0.050	nc	-
Cobalt	mg/kg	-	0.216	-	0.125	-	0.093	-	-	<0.020	-	-	-	-	<0.020	<0.02	<0.020	nc	-
Iron	mg/kg	-	76.8	-	64.1	-	53.7	-	-	37.7	-	-	-	-	16.4	16.8	14.0	nc	-
Magnesium	mg/kg	-	3,320	-	3,030	-	2,300	-	-	1,210	-	-	-	-	1,020	1,070	836	20%	-
Manganese	mg/kg	-	34.2	-	37.5	-	17.5	-	-	19.6	-	-	-	-	3.42	3.28	2.68	24%	-
Molybdenum	mg/kg	-	9.87	-	5.28	-	5.21	-	-	1.02	-	-	-	-	0.297	0.248	0.218	31%	-
Nickel	mg/kg	-	1.45	-	1.84	-	1.27	-	-	<0.20	-	-	-	-	<0.20	<0.2	<0.20	nc	-
Phosphorus	mg/kg	-	8,220	-	8,020	-	6,290	-	-	3,500	-	-	-	-	3,130	3,120	2,720	14%	-
Potassium	mg/kg	-	23,100	-	23,100	-	17,900	-	-	5,850	-	-	-	-	4,070	3,990	3,250	22%	-
Silicon	mg/kg	-	17.7	-	10.6	-	15.7	-	-	2,830	-	-	-	-	20.2	-	15.2	nc	-
Silver	mg/kg	-	<0.0050	-	<0.0050	-	<0.0050	-	-	<0.0050	-	-	-	-	<0.0050	<0.005	<0.0050	nc	-
Sodium	mg/kg	-	<20	-	<20	-	<20	-	-	<20	-	-	-	-	<20	<20	<20	nc	-
Strontium	mg/kg	-	4.15	-	4.96	-	3.45	-	-	1.72	-	-	-	-	0.055	<0.05	<0.050	nc	-
Sulfur	mg/kg	-	3,890	-	3,810	-	2,810	-	-	1,350	-	-	-	-	1,050	-	810	nc	-
Titanium	mg/kg	-	<0.10	-	<0.10	-	0.12	0.12	-	<0.10	-	-	-	-	<0.10	<0.1	<0.10	nc	-
Zirconium	mg/kg	-	<0.20	-	<0.20	-	<0.20	-	-	<0.20	-	-	-	-	<0.20	<0.2	<0.20	nc	-
<b>Metals, Group 2</b>																			
Aluminum	mg/kg	-	<2.0	-	<2.0	-	3.7	-	-	3.0	-	-	-	-	<2.0	<2	<2.0	nc	-
Arsenic	mg/kg	-	<0.020	-	<0.020	-	<0.020	-	-	<0.020	-	-	-	-	<0.020	<0.02	<0.020	nc	-
Cadmium	mg/kg	-	<0.045 DM	-	0.0635	-	<0.020 DM	-	-	0.0780	-	-	-	-	0.0055	<0.005	<0.0050	nc	-
Copper	mg/kg	-	12.4	-	12.4	-	9.03	-	-	4.52	-	-	-	-	1.67	1.61	1.49	11%	-
Lead	mg/kg	-	<0.020	-	<0.020	-	<0.020	-	-	0.026	-	-	-	-	<0.020	<0.02	<0.020	nc	-
Mercury	mg/kg	-	<0.0050	-	<0.0050	-	<0.0050	-	-	0.0062	-	-	-	-	<0.0050	<0.005	<0.0050	nc	-
Thallium	mg/kg	-	0.0035	-	0.0028	-	<0.0020	-	-	<0.0020	-	-	-	-	<0.0020	<0.002	<0.0020	nc	-
Vanadium	mg/kg	-	<0.10	-	<0.10	-	<0.10	-	-	<0.10	-	-	-	-	<0.10	<0.1	<0.10	nc	-
Zinc	mg/kg	-	37.5	-	42.8	-	28.8	-	-	21.0	-	-	-	-	18.4	18.7	15.7	16%	-

**Notes:**

- 15.2 Measured concentration
- <0.03 Analyte was not detected at a concentration greater than the laboratory reporting limit.
- Parameter not analyzed / not available.
- DM Detection limit adjusted due to sample matrix effects.
- RPD Relative Percent Difference.
- 61%** RPD exceeds data quality objective of 60%.
- nc RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

**Table C-1e**  
**Summary of Quality Control 2018 Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location		Field Blank (E1)	Field Blank (N4)	Field Blank (S4)	Rinsate Blank (E1)		Rinsate Blank (N4)	Rinsate Blank (W2)		Trip Blank (E1)	Trip Blank (N4)		Trip Blank (S4)
Sample Date		16-Oct-18	5-Jul-18	26-Sep-18	16-Oct-18	27-Feb-19	5-Jul-18	25-Sep-18	27-Feb-19	15-Jan-19	15-Jan-19	28-Feb-19	15-Jan-19
Sample ID		18-E1-FB-CH-214	18-N4-FB-CH-211	18-S4-FB-CH-213	18-E1-RB-CH-217	Duplicate	18-N4-RB-CH-215	18-W2-RB-CH-216	Duplicate	18-E1-TB-CH-222	18-N4-TB-CH-221	Duplicate	18-S4-TB-CH-220
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC		STANTEC	STANTEC	ALS	STANTEC
Laboratory		ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS
Laboratory Work Order		L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986	L2222986
Laboratory Sample ID		L2222986-53	L2222986-51	L2222986-52	L2222986-56	WG2996298-7	L2222986-54	L2222986-55	WG2995248-3	L2222986-59	L2222986-58	WG2997256-9	L2222986-57
Sample Type	Units	Field Blank	Field Blank	Field Blank	Material Rinse Blank	Lab Replicate	Material Rinse Blank	Material Rinse Blank	Lab Replicate	Trip Blank	Trip Blank	Lab Replicate	Trip Blank
<b>Metals, Group 1</b>													
Barium	mg/L	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.02	<0.020	<0.020	-	<0.020
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	-	<0.00010
Boron	mg/L	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.1	<0.10	<0.10	-	<0.10
Calcium	mg/L	<0.10	<0.10	<0.10	0.12	-	0.12	0.13	0.15	<0.10	<0.10	-	<0.10
Chromium	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	-	<0.0010
Cobalt	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	-	<0.00030	<0.00030	<0.0003	<0.00030	<0.00030	-	<0.00030
Iron	mg/L	<0.030	<0.030	<0.030	<0.030	-	<0.030	<0.030	<0.03	<0.030	<0.030	-	<0.030
Magnesium	mg/L	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.1	<0.10	<0.10	-	<0.10
Manganese	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	-	<0.00030	<0.00030	<0.0003	<0.00030	<0.00030	-	<0.00030
Molybdenum	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	-	<0.0010
Nickel	mg/L	<0.0010	<0.0010	<0.0010	0.0052	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	-	<0.0010
Potassium	mg/L	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2	<2.0	<2.0	-	<2.0
Silicon	mg/L	<0.21	<0.21	<0.21	0.41	-	<0.21	0.38	-	<0.21	<0.21	-	<0.21
Silver	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	-	<0.000020	<0.000020	<0.00002	<0.000020	<0.000020	-	<0.000020
Sodium	mg/L	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2	<2.0	<2.0	-	<2.0
Sulfur	mg/L	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.5	<0.50	<0.50	-	<0.50
Titanium	mg/L	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.01	<0.010	<0.010	-	<0.010
<b>Metals, Group 2</b>													
Aluminum	mg/L	<0.0050	<0.0050	<0.0050	0.0095	-	0.0223	0.0085	0.0094	<0.0050	<0.0050	-	<0.0050
Arsenic	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	-	<0.00050
Cadmium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	0.0000063	<0.0000050	<0.000005	<0.0000050	<0.0000050	-	<0.0000050
Copper	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	0.0017	0.0017	<0.0010	<0.0010	-	<0.0010
Lead	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	-	<0.00050
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	<0.000005	<0.0000050
Thallium	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.00001	<0.000010	<0.000010	-	<0.000010
Vanadium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	-	<0.00050
Zinc	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	-	<0.0050

**Notes:**  
15.2 Measured concentration  
<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.







**Table C-2c**  
**Summary of Sediment 2018 Organic Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location				E2 26-Sep-18 18-E2-SD-CH-045 STANTEC ALS L2222986 L2222986-21	17-Oct-18 18-N2-SD-CH-015 STANTEC ALS L2222986 L2222986-8	N2 17-Oct-18 18-D4-SD-CH-204 STANTEC ALS L2222986 L2222986-47 Field Duplicate	RPD (%)	N5 17-Oct-18 18-N5-SD-CH-031 STANTEC ALS L2222986 L2222986-15	S1 25-Sep-18 18-S1-SD-CH-065 STANTEC ALS L2222986 L2222986-30	S4 26-Sep-18 18-S4-SD-CH-089 STANTEC ALS L2222986 L2222986-37	S7 17-Oct-18 18-S7-SD-CH-081 STANTEC ALS L2222986 L2222986-41
Sample Date	Units	Ontario SCS Table 1 A	PSQG Table 1 - LEL B								
<b>General Chemistry</b>											
Moisture Content	%	n/v	n/v	21.7	63.3	55.0	-	24.9	36.2	42.4	27.5
<b>Organochlorinated pesticides (OCP)</b>											
Aldrin	ng/g	2	n/v	<0.0033	<0.0020	<0.0040	-	-	-	-	-
BHC, alpha-	ng/g	n/v	n/v	<0.045	<0.023	<0.027	-	-	-	-	-
BHC, beta-	ng/g	n/v	n/v	<0.077	<0.039	<0.046	-	-	-	-	-
BHC, delta-	ng/g	n/v	n/v	<0.057	<0.033	<0.037	-	-	-	-	-
Chlordane, alpha-	ng/g	n/v	n/v	<0.012	0.0221 JA XM	<0.012	-	-	-	-	-
Chlordane, trans- (gamma-Chlordane)	ng/g	n/v	n/v	<0.013	<0.0084	<0.013	-	-	-	-	-
DDD (p,p'-DDD)	ng/g	s4	n/v	<0.0090	0.0150 EN JA XM	0.0352 JA XM	-	-	-	-	-
DDE (p,p'-DDE)	ng/g	s4	n/v	<0.0096	0.101 JA XM	0.169 JA XM	-	-	-	-	-
DDT (p,p'-DDT)	ng/g	s4	n/v	<0.010	0.020 EN JA	0.042 JA XM	-	-	-	-	-
Dieldrin	ng/g	2	n/v	<0.0085	0.0139 JA XM	0.022 EN JA XM	-	-	-	-	-
Endosulfan I	ng/g	n/v	n/v	<0.012	<0.011	<0.013	-	-	-	-	-
Endosulfan II	ng/g	n/v	n/v	<0.039	<0.024	<0.027	-	-	-	-	-
Endosulfan Sulfate	ng/g	n/v	n/v	<0.0070	<0.0050	<0.0061	-	-	-	-	-
Endrin	ng/g	3	n/v	<0.010	0.0159 JA XM	<0.014	-	-	-	-	-
Endrin Aldehyde	ng/g	n/v	n/v	<0.0071	<0.0064	<0.0082	-	-	-	-	-
Heptachlor	ng/g	n/v	n/v	<0.0032	<0.0022	<0.0022	-	-	-	-	-
Heptachlor Epoxide	ng/g	5	n/v	<0.0038	<0.0028	<0.0050	-	-	-	-	-
Heptachlor Epoxide (trans)	ng/g	n/v	n/v	<0.026	<0.019	<0.034	-	-	-	-	-
Lindane (Hexachlorocyclohexane, gamma)	ng/g	n/v	n/v	<0.047	<0.027	<0.030	-	-	-	-	-
Methoxychlor (4,4'-Methoxychlor)	ng/g	n/v	n/v	<0.11	<0.15	<0.14	-	-	-	-	-
Mirex	ng/g	n/v	n/v	<0.0022 XM	0.00330 EN JA XM	0.0040 EN JA XM	-	-	-	-	-
<b>Polychlorinated biphenyls (PCB)</b>											
Polychlorinated Biphenyls (PCBs)	ng/g	70 <sub>s14</sub>	n/v	<0.0106	0.520	1.231	nc	-	-	-	-

**Notes:**

- Ontario SCS Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011) Site Condition Standards (SCS)
- 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<sup>A</sup>** 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.
- s4 Standard is applicable to total sum of isomers, individual isomers must be summed for comparison.
- s14 Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
- 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.
- 61%** RPD exceeds data quality objective of 40%.
- nc RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.



**Table C-2b**  
**Summary of Soil 2018 Organic Analytical Results**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Sample Location					W2	W2	W4
Sample Date					5-Jul-18	8-Mar-19	16-Oct-18
Sample ID					18-W2-SS-CH-001	Duplicate	18-W4-SS-CH-007
Sample Depth					15 cm		15 cm
Sampling Company					STANTEC		STANTEC
Laboratory					ALS	ALS	ALS
Laboratory Work Order					L2222986	L2222986	L2222986
Laboratory Sample ID		Ontario SCS Table 1 Agr A	Rural OTR B	Rural ULN C	L2222986-1	WG2991215-3	WG2991214-4
Sample Type	Units				Lab Replicate	Lab Replicate	
<b>General Chemistry</b>							
Moisture Content	%	n/v	n/v	n/v	10.2	9.91	23.1
<b>Dioxins/Furans (PCDD/DF)</b>							
Tetrachlorodibenzofuran, 2,3,7,8-	pg/g	n/v	n/v	n/v	0.364 JA XM	-	0.369 JA XM
Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	pg/g	n/v	0.9	n/v	0.289 JA	-	0.310 JA
Pentachlorodibenzofuran, 1,2,3,7,8- (PeCDF)	pg/g	n/v	n/v	n/v	0.250 EN JA XM	-	0.297 B JA XM
Pentachlorodibenzofuran, 2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.662 JA	-	0.686 JA
Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	pg/g	n/v	n/v	n/v	0.327 B JA	-	0.316 B JA
Octachlorodibenzofuran	pg/g	n/v	n/v	n/v	3.64 B JA	-	4.23 B JA
Octachlorodibenzo-p-dioxin	pg/g	n/v	n/v	n/v	42.7	-	44.1
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	2.23 JA	-	2.43 JA
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	pg/g	n/v	n/v	n/v	0.244 B JA	-	0.230 EN JA
Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	7.20	-	7.56
Hexachlorodibenzofuran, 1,2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.431 B JA	-	0.454 B JA
Hexachlorodibenzofuran, 1,2,3,6,7,8-	pg/g	n/v	n/v	n/v	0.401 B JA	-	0.420 B JA
Hexachlorodibenzofuran, 1,2,3,7,8,9-	pg/g	n/v	n/v	n/v	0.158 B JA	-	0.169 B JA
Hexachlorodibenzofuran, 2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	0.526 B JA	-	0.572 B JA
Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.278 B JA	-	0.270 EN JA
Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	pg/g	n/v	n/v	n/v	0.493 B JA	-	0.568 B JA
Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	pg/g	n/v	n/v	n/v	0.517 JA XM	-	0.663 JA XM
Total Tetrachlorodibenzofuran	pg/g	n/v	12	n/v	7.47	-	8.15
Total Tetrachlorodibenzo-p-dioxin	pg/g	n/v	6.6	n/v	1.41	-	2.03
Total Pentachlorodibenzofuran	pg/g	n/v	19	n/v	8.29	-	8.67
Total Pentachlorodibenzo-p-dioxin	pg/g	n/v	16	n/v	3.55	-	3.75
Total Hexachlorodibenzofuran	pg/g	n/v	28	n/v	5.38	-	5.88
Total Hexachlorodibenzo-p-dioxin	pg/g	n/v	13	n/v	6.80	-	7.37
Total Heptachlorodibenzofuran	pg/g	n/v	32	n/v	3.81	-	3.87
Total Heptachlorodibenzo-p-dioxin	pg/g	n/v	55	n/v	13.4	-	14.2
Total HpCDD # Homologues	none	n/v	n/v	n/v	2	-	2
Total HpCDF # Homologues	none	n/v	n/v	n/v	4	-	4
Total HxCDD # Homologues	none	n/v	n/v	n/v	7	-	8
Total HxCDF # Homologues	none	n/v	n/v	n/v	10	-	10
Total PeCDD # Homologues	none	n/v	n/v	n/v	8	-	7
Total PeCDF # Homologues	none	n/v	n/v	n/v	12	-	15
Total TCDD # Homologues	none	n/v	n/v	n/v	9	-	12
Total TCDF # Homologues	none	n/v	n/v	n/v	17	-	17
Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	1.24	-	1.99
Mid Point PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	1.25	-	2.04
Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	1.25	-	2.04
<b>Organochlorinated pesticides (OCP)</b>							
Aldrin	ng/g	50	1 <sub>p</sub>	n/v	-	-	-
BHC, alpha-	ng/g	n/v	n/v	n/v	-	-	-
BHC, beta-	ng/g	n/v	n/v	n/v	-	-	-
BHC, delta-	ng/g	n/v	n/v	n/v	-	-	-
Chlordane, alpha-	ng/g	n/v	2 <sub>p</sub>	n/v	-	-	-
Chlordane, trans- (gamma-Chlordane)	ng/g	n/v	n/v	n/v	-	-	-
DDD (p,p'-DDD)	ng/g	s4	n/v	n/v	-	-	-
DDE (p,p'-DDE)	ng/g	s4	n/v	n/v	-	-	-
DDT (p,p'-DDT)	ng/g	s4	75	n/v	-	-	-
Dieldrin	ng/g	50	4 <sub>p</sub>	n/v	-	-	-
Endosulfan I	ng/g	n/v	n/v	n/v	-	-	-
Endosulfan II	ng/g	n/v	n/v	n/v	-	-	-
Endosulfan Sulfate	ng/g	n/v	n/v	n/v	-	-	-
Endrin	ng/g	40	4 <sub>p</sub>	n/v	-	-	-
Endrin Aldehyde	ng/g	n/v	n/v	n/v	-	-	-
Heptachlor	ng/g	50	1 <sub>p</sub>	n/v	-	-	-
Heptachlor Epoxide	ng/g	50	1 <sub>p</sub>	n/v	-	-	-
Lindane (Hexachlorocyclohexane, gamma)	ng/g	10	1 <sub>p</sub>	n/v	-	-	-
Methoxychlor (4,4'-Methoxychlor)	ng/g	50	5 <sub>p</sub>	n/v	-	-	-
Mirex	ng/g	n/v	n/v	n/v	-	-	-
<b>Polychlorinated biphenyls (PCB)</b>							
Polychlorinated Biphenyls (PCBs)	ng/g	300 <sub>s14</sub>	15 <sub>p</sub>	n/v	-	-	-

**Notes:**

- Ontario SCS Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act (MOE, 2011) Site Condition Standards (SCS)
- 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<sup>A</sup>** 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
- s4 Standard is applicable to total sum of isomers, individual isomers must be summed for comparison.
- 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.
- 61%** RPD exceeds data quality objective of 40%.
- nc RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.



Appendix C-3: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis  
 Lambton Facility 2019 Annual Landfill Report Biomonitoring Program  
 2018 Field Year

Analyte Group Number	Analyte	Matrix	Site	Sample ID	Detected Conc. (mg/kg)	MDL (mg/kg)	Value Compared to UL18 (mg/kg)	UL18 (mg/kg)	Conc. as % of UL18	LL18 (mg/kg)	Rural OTR98 MOE 2011 (mg/kg)	Rural ULN (mg/kg)	MOE O. Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 - LEL (mg/kg)	MOE O. Reg. 153/04 Table 1 Agricultural/ Other Property Use	Exceedance
Group1	Barium	SD	N2	18-N2-SD-CH-015	139	0.50	139	138	101	55						>UL18
Group1	Boron	SB	S1	18-S1-SB-CH-071	39.6	1.0	39.6	38	104	20						>UL18
Group1	Boron	SB	S2	18-S2-SB-CH-077	35.4	1.0	35.4	35	101	18						>UL18
Group1	Calcium	SS	S4	18-S4-SS-CH-087	6300	50	6300	6026	105	2704	54000					>UL18
Group1	Calcium	SB	S1	18-S1-SB-CH-071	4300	20	4300	3149	137	1251						>UL18
Group1	Calcium	SB	S2	18-S2-SB-CH-077	3610	20	3610	3000	120	1192						>UL18
Group1	Chloride	SD	S4	18-S4-SD-CH-089	57.2	5.0	57.2	30	190	3						>UL18
Group1	Chloride	SS	E2	18-E2-SS-CH-043		5.0	5.0	5	103	1	35					>UL18
Group1	Chloride	SS	E6	18-E6-SS-CH-059	30.6	5.0	30.6	21	148	4	35					>UL18
Group1	Chloride	SS	N4	18-N4-SS-CH-023	23	5.0	23	6	378	1	35					>UL18
Group1	Chloride	SS	W4	18-W4-SS-CH-007		5.0	5.0	5	109	1	35					>UL18
Group1	Chromium	SD	N2	18-N2-SD-CH-015	42.8	0.50	42.8	43	100	18			26	26		>UL18, >SCS, >PSQG
Group1	Chromium	SS	S2	18-S2-SS-CH-073	40.1	0.50	40.1	40	100	19	58	50			67	>UL18
Group1	Cobalt	SB	S1	18-S1-SB-CH-071	0.216	0.020	0.216	0	173	0						>UL18
Group1	Iron	NG	N4	18-N4-NG-CH-025	357	3.0	357	338	106	51		500				>UL18
Group1	Magnesium	NG	N2	18-N2-NG-CH-019	4340	2.0	4340	4318	101	1506						>UL18
Group1	Magnesium	SB	S1	18-S1-SB-CH-071	3320	2.0	3320	2819	118	1602						>UL18
Group1	Magnesium	SB	S2	18-S2-SB-CH-077	3030	2.0	3030	2686	113	1526						>UL18
Group1	Manganese	NG	E1	18-E1-NG-CH-039	35.1	0.050	35.1	35	101	11		50				>UL18
Group1	Manganese	NG	N2	18-N2-NG-CH-019	155	0.050	155	74	210	22		50				>UL18, >ULN
Group1	Manganese	NG	N4	18-N4-NG-CH-025	116	0.050	116	66	175	20		50				>UL18, >ULN
Group1	Manganese	NG	S1	18-S1-NG-CH-069	55.3	0.050	55.3	43	129	13		50				>UL18, >ULN
Group1	Manganese	NG	W4	18-W4-NG-CH-009	91.7	0.050	91.7	72	127	22		50				>UL18, >ULN
Group1	Manganese	SS	E1	18-E1-SS-CH-037	760	1.0	760	550	138	190	1900	700				>UL18, >ULN
Group1	Manganese	SS	E6	18-E6-SS-CH-059	875	1.0	875	615	142	212	1900	700				>UL18, >ULN
Group1	Manganese	SS	S2	18-S2-SS-CH-073	886	1.0	886	665	133	229	1900	700				>UL18, >ULN
Group1	Manganese	SS	S4	18-S4-SS-CH-087	888	1.0	888	425	209	146	1900	700				>UL18, >ULN
Group1	Manganese	SB	S1	18-S1-SB-CH-071	34.2	0.050	34.2	30	116	13						>UL18
Group1	Manganese	SB	S2	18-S2-SB-CH-077	37.5	0.050	37.5	29	131	12						>UL18
Group1	Molybdenum	NG	S4	18-S4-NG-CH-093	15	0.020	15	8	183	1		6				>UL18, >ULN
Group1	Molybdenum	SS	S2	18-S2-SS-CH-073	2.89	0.10	2.89	3	106	1	0.984	2			2	>UL18, >OTR, >ULN, >SCS
Group1	Phosphorus	NG	E1	18-E1-NG-CH-039	7060	10	7060	5171	137	2083						>UL18
Group1	Phosphorus	NG	E2	18-E2-NG-CH-049	7960	10	7960	4936	161	1988						>UL18
Group1	Phosphorus	NG	E5	18-E5-NG-CH-055	3470	10	3470	3259	106	1313						>UL18
Group1	Phosphorus	NG	N2	18-N2-NG-CH-019	4290	10	4290	4060	106	1635						>UL18
Group1	Phosphorus	NG	N4	18-N4-NG-CH-025	4060	10	4060	3947	103	1590						>UL18
Group1	Phosphorus	NG	S1	18-S1-NG-CH-069	4790	10	4790	3493	137	1407						>UL18
Group1	Phosphorus	NG	S2	18-S2-NG-CH-075	4500	10	4500	3598	125	1449						>UL18
Group1	Phosphorus	NG	W4	18-W4-NG-CH-009	5990	10	5990	4707	127	1896						>UL18
Group1	Phosphorus	SS	S2	18-S2-SS-CH-073	756	50	756	733	103	387	830					>UL18
Group1	Phosphorus	SB	S1	18-S1-SB-CH-071	8220	10	8220	7831	105	3126						>UL18
Group1	Phosphorus	SB	S2	18-S2-SB-CH-077	8020	10	8020	7486	107	2988						>UL18
Group1	Potassium	NG	E1	18-E1-NG-CH-039	39400	20	39400	38046	104	8480						>UL18
Group1	Potassium	SB	S1	18-S1-SB-CH-071	23100	20	23100	22150	104	11788						>UL18
Group1	Potassium	SB	S2	18-S2-SB-CH-077	23100	20	23100	22075	105	11748						>UL18
Group1	Silicon	SS	N4	18-N4-SS-CH-023	339000		339000	319941	106	238009						>UL18
Group1	Strontium	SB	S1	18-S1-SB-CH-071	4.15	0.050	4.15	4	102	1						>UL18
Group1	Sulfur	NG	E1	18-E1-NG-CH-039	6700		6700	6580	102	1900		5000				>UL18, >ULN
Group1	Sulfur	NG	E2	18-E2-NG-CH-049	8260		8260	6860	120	1981		5000				>UL18, >ULN
Group1	Sulfur	SS	E1	18-E1-SS-CH-037		1000	1000	610	164	141	790	1000				>UL18, >OTR
Group1	Sulfur	SS	E2	18-E2-SS-CH-043		1000	1000	771	130	178	790	1000				>UL18, >OTR
Group1	Sulfur	SS	E5	18-E5-SS-CH-053		1000	1000	512	195	118	790	1000				>UL18, >OTR
Group1	Sulfur	SS	E6	18-E6-SS-CH-059		1000	1000	763	131	176	790	1000				>UL18, >OTR
Group1	Sulfur	SS	N2	18-N2-SS-CH-013		1000	1000	643	155	148	790	1000				>UL18, >OTR
Group1	Sulfur	SS	N4	18-N4-SS-CH-023		1000	1000	546	183	126	790	1000				>UL18, >OTR
Group1	Sulfur	SS	S1	18-S1-SS-CH-063		1000	1000	546	183	126	790	1000				>UL18, >OTR
Group1	Sulfur	SS	S2	18-S2-SS-CH-073		1000	1000	479	209	110	790	1000				>UL18, >OTR
Group1	Sulfur	SS	S4	18-S4-SS-CH-087		1000	1000	406	246	94	790	1000				>UL18, >OTR
Group1	Sulfur	SS	W2	18-W2-SS-CH-001		1000	1000	536	186	124	790	1000				>UL18, >OTR
Group1	Sulfur	SS	W4	18-W4-SS-CH-007		1000	1000	693	144	160	790	1000				>UL18, >OTR

See notes on last page

**Appendix C-3: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte Group Number	Analyte	Matrix	Site	Sample ID	Detected Conc. (mg/kg)	MDL (mg/kg)	Value Compared to UL18 (mg/kg)	UL18 (mg/kg)	Conc. as % of UL18	LL18 (mg/kg)	Rural OTR98 MOE 2011 (mg/kg)	Rural ULN (mg/kg)	MOE O. Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 - LEL (mg/kg)	MOE O. Reg. 153/04 Table 1 Agricultural/ Other Property Use	Exceedance
Group2	Aluminum	SD	N2	18-N2-SD-CH-015	31800	50	31800	30086	106	9825						>UL18
Group2	Lead	NG	E6	18-E6-NG-CH-061	1.93	0.020	1.93	2	112	0		20				>UL18
Group2	Mercury	SS	E6	18-E6-SS-CH-059	0.073	0.0050	0.073	0	103	0	0.13	0.15			0.16	>UL18
Group2	Mercury	SS	S2	18-S2-SS-CH-073	0.0604	0.0050	0.0604	0	100	0	0.13	0.15			0.16	>UL18
Group2	Vanadium	SD	N2	18-N2-SD-CH-015	56	0.20	56	56	100	20						>UL18
Group2	Zinc	NG	E1	18-E1-NG-CH-039	67.2	0.50	67.2	58	115	19		40				>UL18, >ULN
Group2	Zinc	NG	S1	18-S1-NG-CH-069	45.3	0.50	45.3	39	116	13		40				>UL18, >ULN

Notes:

Rural OTR98 Rural parkland Ontario Typical Range  
Rural ULN Rural Upper Limit of the Normal

MOE O. Reg 153/04 Table 1 Ontario Regulation 153/04 Table 1 site condition standards

PSQG Provincial Sediment Quality Guideline  
MDL Method Detection Limit  
UL18 Upper Limit 2018  
LL18 Lower Limit 2018  
SS Soil  
NG Natural grasses  
SB Soybean  
N/A Not applicable  
N/V No value

**Table C-4: List of Sites and Matrices Where the Concentrations of Analytes in Environmental Media Exceeded Upper Control Limits on a Site-Specific Basis  
Lambton Facility 2019 Annual Landfill Report Biomonitoring Program  
2018 Field Year**

Site	FC	NG	SB	SD	SS	WW	Total Exceedances of UL18
E1	0	Manganese, Phosphorus, Potassium, Sulfur, <b>Zinc</b>	N/A	N/A	Manganese, Sulfur	N/A	7
E2	N/A	Phosphorus, Sulfur	0	0	Chloride, Sulfur	N/A	4
E5	N/A	Phosphorus	N/A	N/A	Sulfur	N/A	2
E6	N/A	<b>Lead</b>	N/A	N/A	Chloride, Manganese, <b>Mercury</b> , Sulfur	N/A	5
N2	0	Magnesium, Manganese, Phosphorus	N/A	<b>Aluminum</b> , Barium, Chromium, <b>Vanadium</b>	Sulfur	N/A	8
N4	N/A	Iron, Manganese, Phosphorus	N/A	N/A	Chloride, Silicon, Sulfur	0	6
N5	N/A	0	N/A	0	0	N/A	0
S1	N/A	Manganese, Phosphorus, <b>Zinc</b>	Boron, Calcium, Cobalt, Magnesium, Manganese, Phosphorus, Potassium, Strontium	0	Sulfur	N/A	12
S2	N/A	Phosphorus	Boron, Calcium, Magnesium, Manganese, Phosphorus, Potassium	N/A	Chromium, Manganese, <b>Mercury</b> , Molybdenum, Phosphorus, Sulfur	N/A	13
S4	N/A	Molybdenum	0	Chloride	Calcium, Manganese, Sulfur	N/A	5
W2	N/A	0	N/A	N/A	Sulfur	0	1
W4	0	Manganese, Phosphorus	N/A	N/A	Chloride, Sulfur	N/A	4
<b>Total</b>	<b>0</b>	<b>22</b>	<b>14</b>	<b>5</b>	<b>26</b>	<b>0</b>	<b>67</b>

Notes:  
 N/A Not Available  
 Chloride Group 1 Analyte  
**Mercury** Group 2 Analyte

**Appendix C-5: Inorganic Analytes Where Concentrations of Analytes in Environmental Media Exceeded Upper Control Limits on a Site-Wide Basis  
Lambton Facility 2019 Annual Landfill Report Biomonitoring Program  
2018 Field Year**

Analyte Group Number	Analyte	Matrix	No. Samples (n)	MDL (mg/kg)	Mean Conc. (mg/kg)	LL18 (mg/kg)	UL18 (mg/kg)	Conc. as % of UL18	Rural ULN (mg/kg)	Exceedances
Group1	Manganese	NG	13	0.050	56.8	16.9	55.5	102	50	>UL18, >ULN
Group1	Phosphorus	NG	13	10	4220.4	1544.8	3835.2	110	n/v	>UL18

Notes:

- Rural ULN Rural Upper Limit of the Normal
- MDL Method Detection Limit
- UL18 Upper Limit 2018
- LL18 Lower Limit 2018
- NG Natural grasses
- n/v No value

LAMBTON FACILITY 2018 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2017 FIELD YEAR

Appendix C Tables

**Table C-6: Site-Specific Trend Lines for Inorganic Analytes (p<0.003), 2018 Biomonitoring Program, Lambton Facility**

Chemical	Matrix	Site	Trend from 2018 Field Year	Trend from 2015 Field Year	Trend from 2012 Field Year
Aluminum	SD	N2	Increasing	Increasing	Increasing
	SS	S4	Increasing	Increasing	No trend
	SS	W2	Increasing	No trend	No trend
Arsenic	SD	S4	Increasing	Increasing	No trend
Barium	NG	E1	Decreasing	Decreasing	Decreasing
	SD	N2	Increasing	Increasing	Increasing
	SS	S4	Increasing	Increasing	Increasing
Beryllium	SD	E2	Increasing	Increasing	Increasing
	SD	N2	Increasing	Increasing	Increasing
	SS	S4	Increasing	Increasing	No trend
Cadmium	SD	N2	Increasing	Increasing	No trend
	SD	S4	Decreasing	No trend	No trend
Calcium	SB	S4	Increasing	No trend	No trend
	SD	N2	Decreasing	Decreasing	Decreasing
	SS	S4	Increasing	Increasing	Increasing
Chromium	SD	N2	Increasing	Increasing	Increasing
	SS	S4	Increasing	Increasing	No trend
Cobalt	SD	N2	Increasing	Increasing	No trend
Copper	SD	N2	Increasing	Increasing	No trend
	SD	S4	Decreasing	Decreasing	No trend
	SS	E1	Decreasing	No trend	No trend
	SS	W2	Decreasing	Decreasing	Decreasing
Iron	SD	N2	Increasing	Increasing	Increasing
Lead	NG	N5	Decreasing	No trend	No trend
	SD	N2	Increasing	Increasing	Increasing
	SS	N5	Decreasing	No trend	No trend
Magnesium	NG	E5	Increasing	No trend	No trend
	NG	S4	Increasing	No trend	No trend
	SD	N2	Decreasing	No trend	No trend
	SS	S4	Increasing	Increasing	No trend
Manganese	NG	W4	Increasing	No trend	Increasing
	SD	S4	Increasing	Increasing	No trend



**LAMBTON FACILITY 2018 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2017 FIELD YEAR**

Appendix C Tables

Chemical	Matrix	Site	Trend from 2018 Field Year	Trend from 2015 Field Year	Trend from 2012 Field Year
Mercury	NG	E1	Decreasing	No trend	No trend
	NG	E2	Decreasing	No trend	No trend
	NG	N4	Decreasing	Decreasing	No trend
	NG	N5	Decreasing	No trend	No trend
	NG	S2	Decreasing	No trend	No trend
Molybdenum	NG	E6	Increasing	Increasing	No trend
	NG	S4	Increasing	No trend	No trend
	SB	S4	Increasing	Increasing	No trend
Nickel	SD	N2	Increasing	Increasing	No trend
Phosphorus	SB	S4	Increasing	No trend	No trend
Phosphorus	SD	N2	Increasing	Increasing	Increasing
	SS	N2	Increasing	Increasing	No trend
	SS	S4	Increasing	Increasing	Increasing
Potassium	SD	N2	Increasing	Increasing	Increasing
	SD	S4	Increasing	No trend	No trend
	SS	S4	Increasing	Increasing	No trend
	SS	W2	Increasing	No trend	No trend
Silicon	SB	S2	Decreasing	No trend	No trend
Sodium	SS	E2	Decreasing	No trend	No trend
	SS	N5	Decreasing	No trend	No trend
Strontium	SS	S4	Increasing	Increasing	No trend
Vanadium	SD	N2	Increasing	Increasing	No trend
Zinc	SD	N2	Increasing	Increasing	Increasing





LAMBTON FACILITY 2018 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2017 FIELD YEAR

Appendix C Tables

**Table C-7: Summary of Sites and Matrices With Site-Specific Upward Trend Lines (p<0.003) for Inorganic Analytes, 2018 Biomonitoring Program, Lambton Facility**

Site	Matrix				Total Upward Trends	Parameters with Upward Trends where 2018 Concentration also Exceeds UL18 and/or Applicable Standards
	Soybeans	Natural Grasses	Soil	Sediment		
E1	0	0	0	N/A	0	
E2	0	0	0	Beryllium	1	
E5	0	Magnesium	0	N/A	1	
E6	N/A	Molybdenum	0	N/A	1	
N2	0	0	Phosphorus	<b>Aluminum</b> , Barium, Beryllium, <b>Cadmium</b> , Chromium, Cobalt, <b>Copper</b> , Iron, <b>Lead</b> , Nickel, Phosphorus, Potassium, <b>Vanadium</b> , <b>Zinc</b>	15	<u>Sediment</u> <b>Aluminum</b> > UL18 Barium > UL18 Chromium > UL18, > Table 1 SCS <b>Vanadium</b> > UL18
N4	0	0	0	N/A	0	
N5	N/A	0	0	0	0	
S1	0	0	0	0	0	
S2	0	0	0	N/A	0	
S4	Calcium, Molybdenum, Phosphorus	Magnesium, Molybdenum	<b>Aluminum</b> , Barium, Beryllium, Calcium, Chromium, Magnesium, Phosphorus, Potassium, Strontium	<b>Arsenic</b> , Manganese, Potassium	17	<u>Soil</u> Calcium > UL18 (< OTR <sub>98</sub> ) <u>Natural Grasses</u> Molybdenum > UL18, > ULN
W2	0	0	<b>Aluminum</b> , Potassium	N/A	2	
W4	0	Manganese	0	N/A	1	<u>Natural Grasses</u> Manganese > UL18, > ULN
<b>Total</b>	<b>3</b>	<b>5</b>	<b>12</b>	<b>18</b>	<b>38</b>	

**Notes:**

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)

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

PSQG - Provincial Sediment Quality Guidelines (MOECC, 2008)



**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2018 FIELD YEAR**

Appendix D Photo Log  
February 14, 2020

## Appendix D PHOTO LOG





Photo 1: Collecting soil samples at Site E6



Photo 2: Collecting soil samples at Site N4

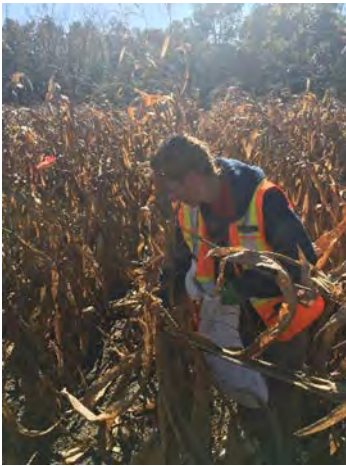


Photo 3: Collecting field corn samples at Site E1



Photo 4: Collecting winter wheat at Site N4



Photo 5: Collecting soybean samples at Site S4



Photo 6: Collecting soil samples at Site E1

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Photo 7: Collecting soil samples at Site S1



Photo 8: Sediment collection area at Site S7



Photo 9: Natural grass collection area at Site E6



Photo 10: Collecting natural grass samples at Site W2



Photo 11: Collecting soil samples at Site N5



Photo 12: Soybean collection area at Site S1

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Photo 133: Traffic set-up at Site N2



Photo 14: Field corn collection area at Site N2



Photo 15: Installing ball-marker at S7



Photo 16: Winter wheat sample collection area at Site N4

## Appendix E ASSESSMENT OF APPROPRIATE START DATE FOR STATISTICAL ANALYSIS

### E.1 RATIONALE AND DISCUSSION

As noted in prior reports, RDLs have shifted since 1991 for certain analyte-matrix pairs due to changes in analytical methods. In most cases, RDLs have decreased because of increased sensitivity of the analytical method. However, in other cases, RDLs have increased, generally as a trade-off for greater sensitivity for other analytes. For analyte-matrix pairs that have large proportions of non-detect data, these changes in RDL can have major impacts on statistical results for analyses that consider all data collected throughout the Biomonitoring Program (e.g., linear regressions and calculations of upper and lower limits).

Therefore, prior to analyses carried out in the present report, analytical data were reviewed for each analyte-matrix pair to determine the appropriate start date for statistical analyses. To facilitate this review, scatterplots of all available analytical data for these analyte-matrix pairs since 1991 were plotted on a Site-wide basis. See **Section E.2** of this appendix for inorganic analytes. Organic analyte start dates have not been updated since the 2016 Field-Year report). As noted elsewhere, values reported as less than the RDL were assigned the full RDL value in these plots. As such, areas of these graphs with points that form a horizontal line are indicative of several years of data points reported as less than the RDL with a stable RDL. Therefore, a visual analysis was applied to identify datasets where results over time appear to be influenced by instability in the analytical method rather than actual meaningful changes in measured analyte concentrations. For example, see the scatterplot for aluminum in soybean in **Section E.2.21** of this appendix. In this dataset, reported values were largely less than the RDL, but the RDL has fluctuated from 30 mg/kg from 1991 to 2001, down to 10 mg/kg in 2001 to 2002, further down to 4 mg/kg in 2003 and 2004, and then back up to 10 mg/kg from 2005 to 2017. For this dataset, truncating the dataset to 2005 onwards will create a dataset with a consistent detection limit and avoid statistical artefacts related to RDL fluctuations.

The assessed appropriate start dates for statistical analysis (control charts and linear regression) for each analyte-matrix pair on a Site-wide basis are indicated by a dashed vertical line on the figures in **Section E.2** of this appendix and are summarized in **Section E.3** of this appendix.

Statistical analyses (e.g., linear regression and calculation of upper and lower limits) that rely on data collected over time in this report and future reports will adopt the analyte-matrix specific start dates described herein unless future analysis identifies a more suitable approach. Historical data will be retained for historical comparison purposes only.



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**E.2 SCATTERPLOTS OF SITE-WIDE ANALYTICAL DATA AVAILABLE FOR  
EACH ANALYTE-MATRIX PAIR SINCE 1991 (INORGANIC)**

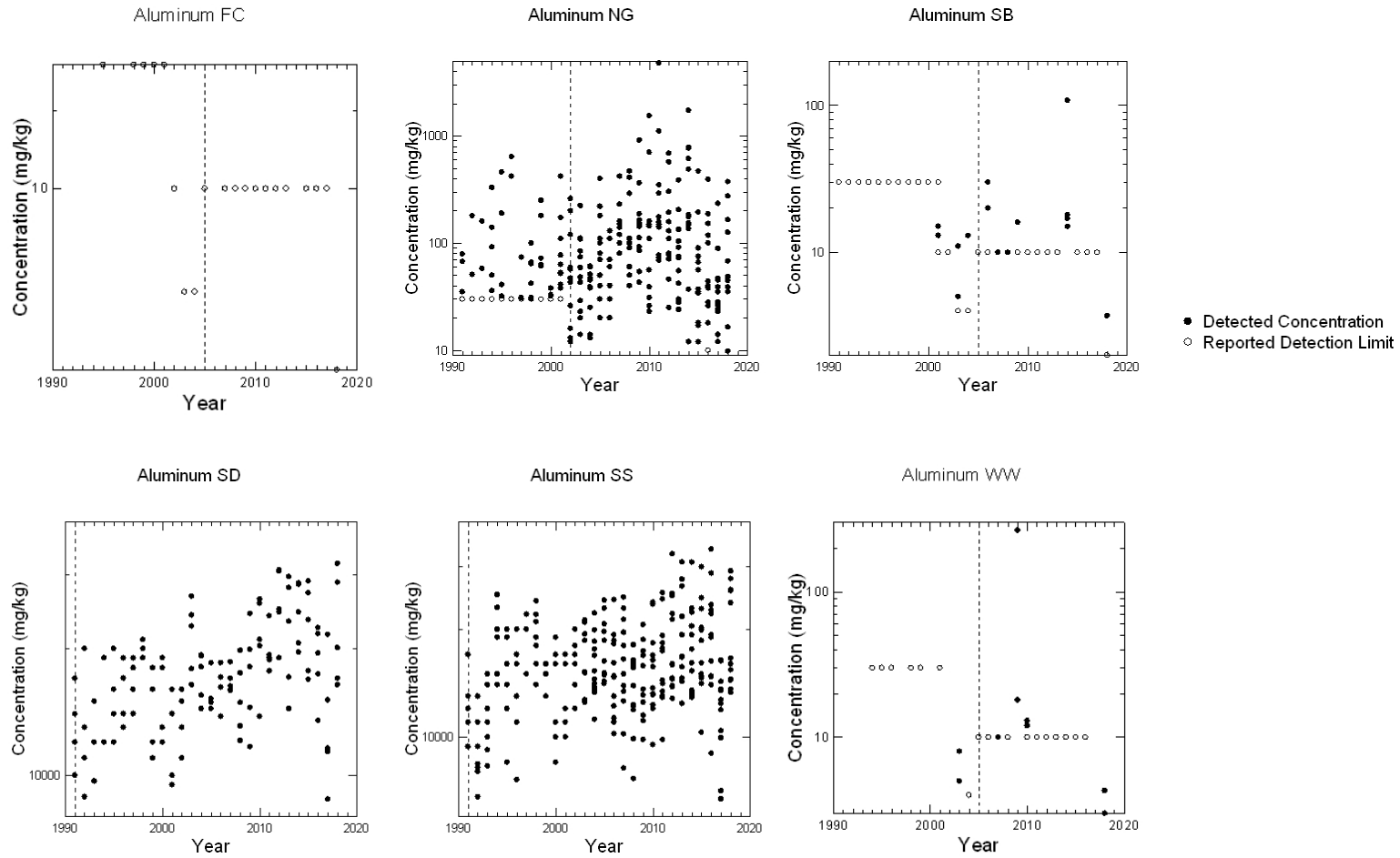
This appendix provides scatterplots of all available analytical data for each analyte-matrix pair for inorganic analytes on a Site-wide basis. The assessed appropriate start dates for statistical analysis (control charts and linear regression) for each analyte-matrix pair on a Site-wide basis are indicated by a dashed vertical line on the figures.



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## E.2.1 Aluminum

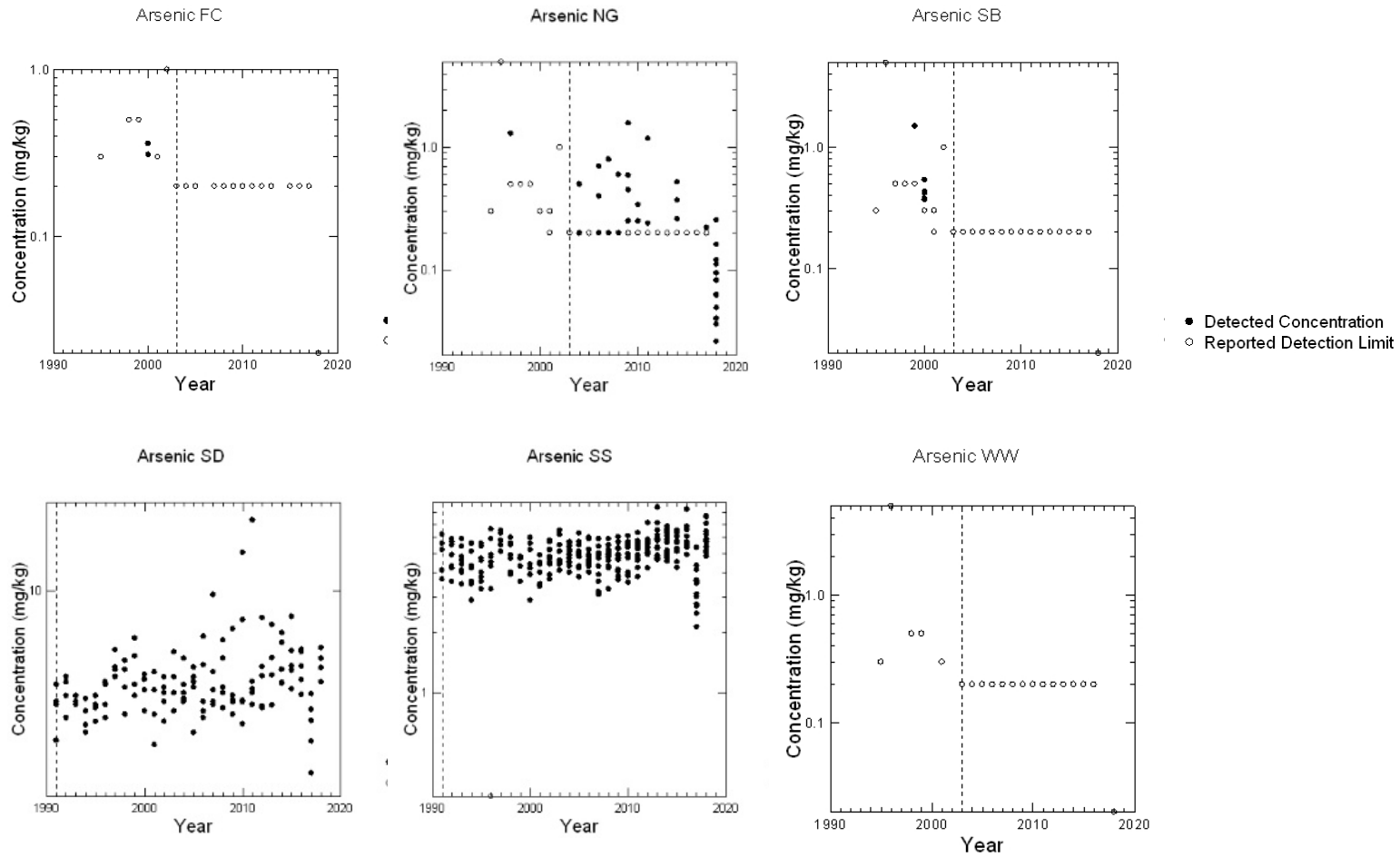




# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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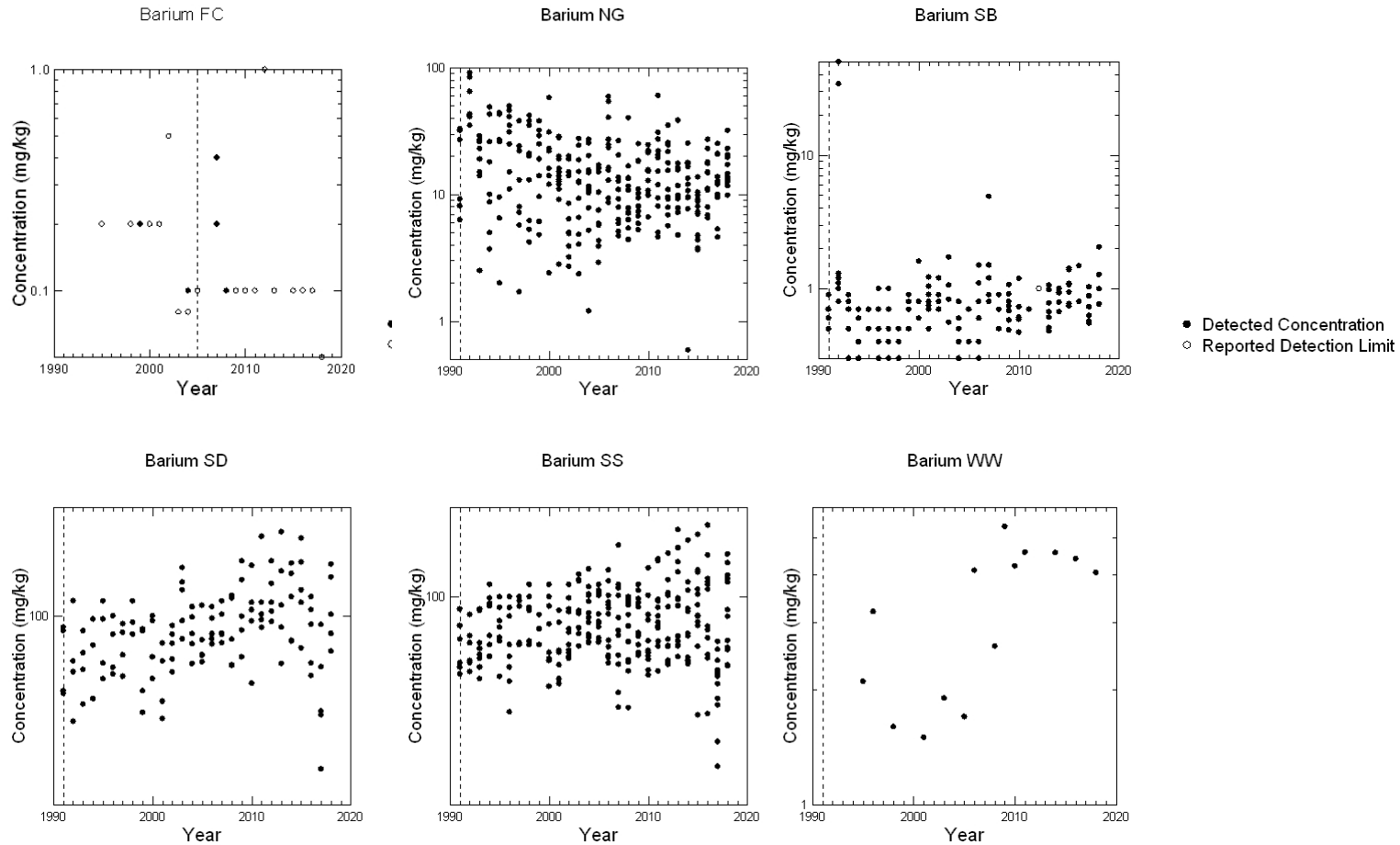
## E.2.2 Arsenic



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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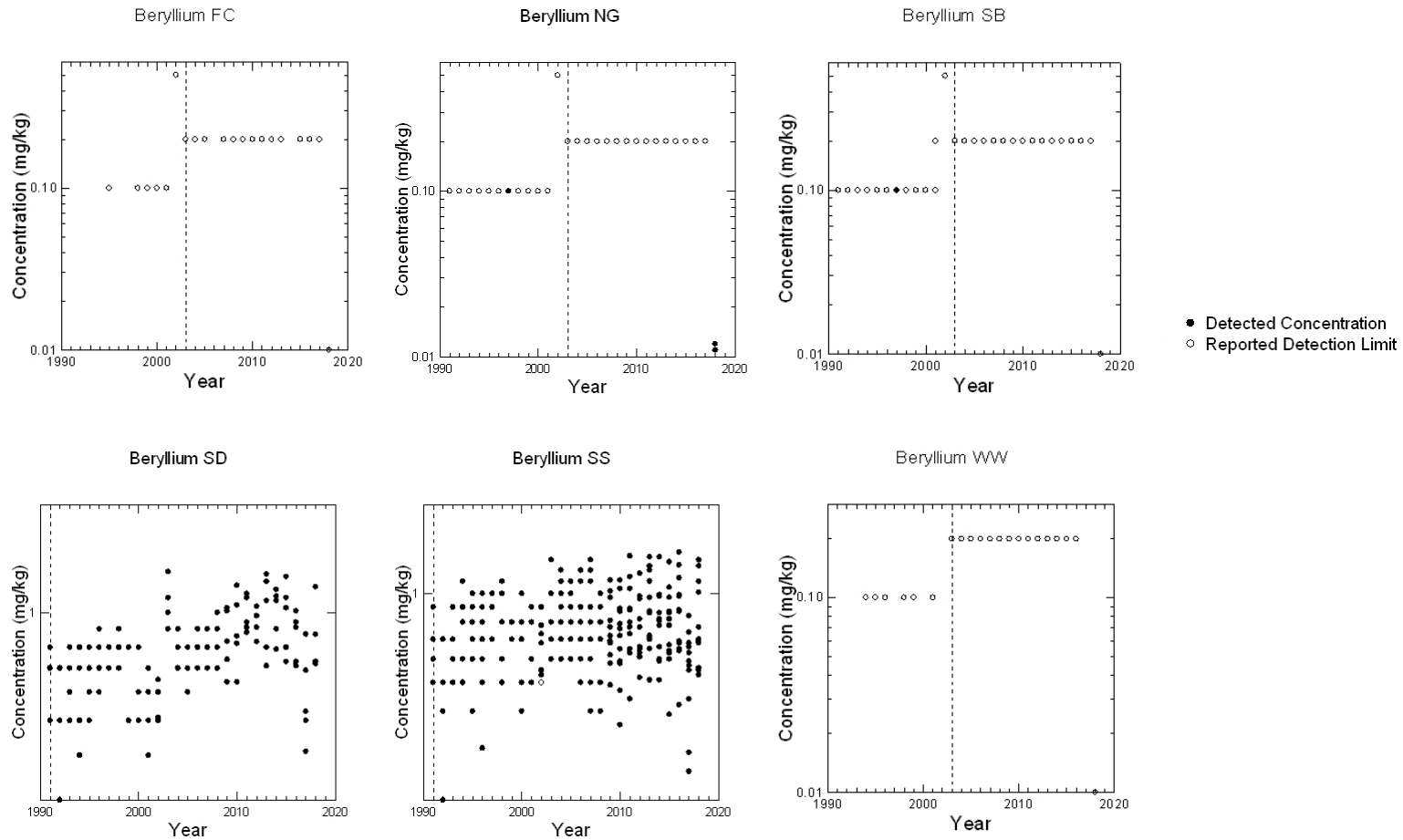
## E.2.3 Barium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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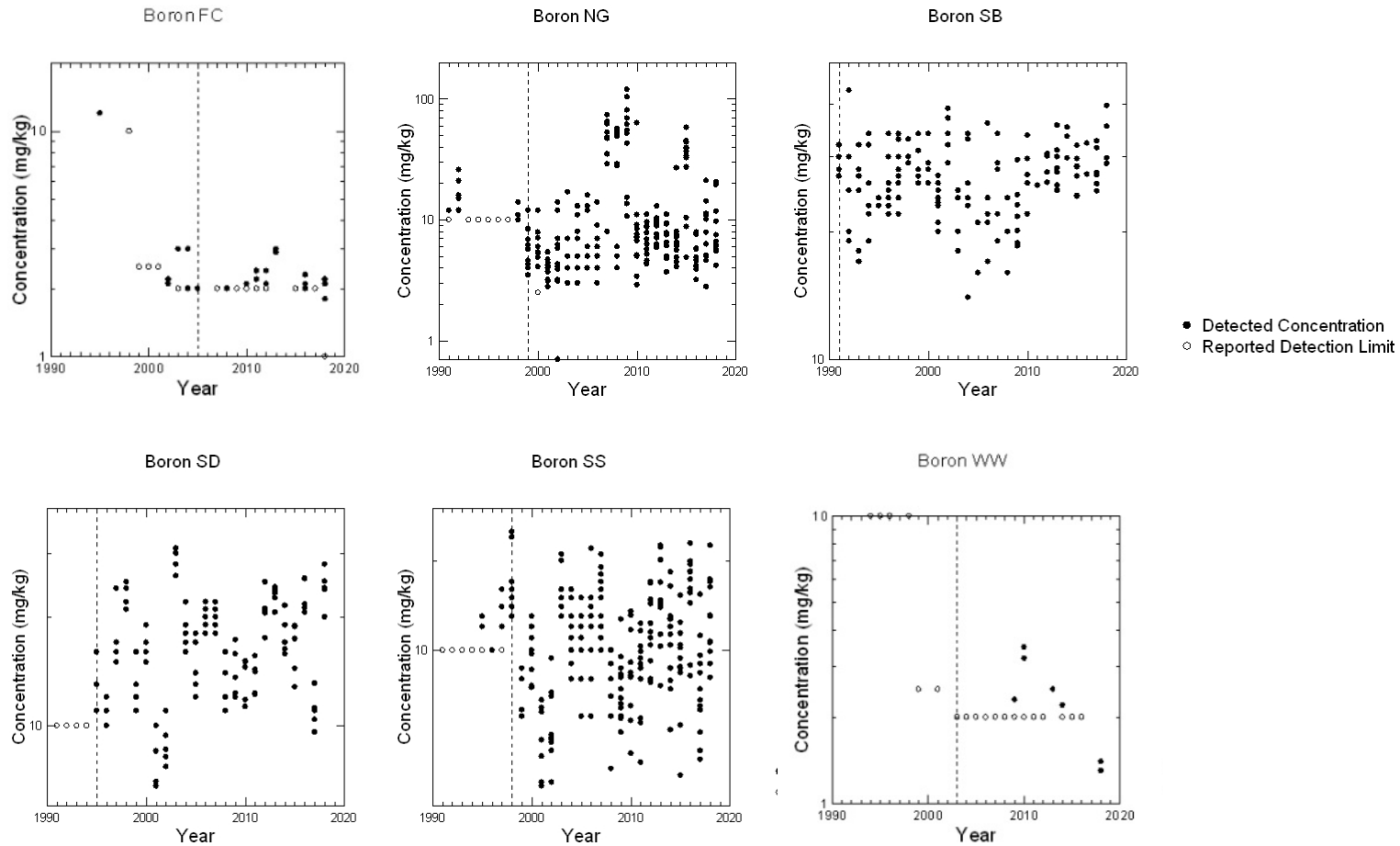
## E.2.4 Beryllium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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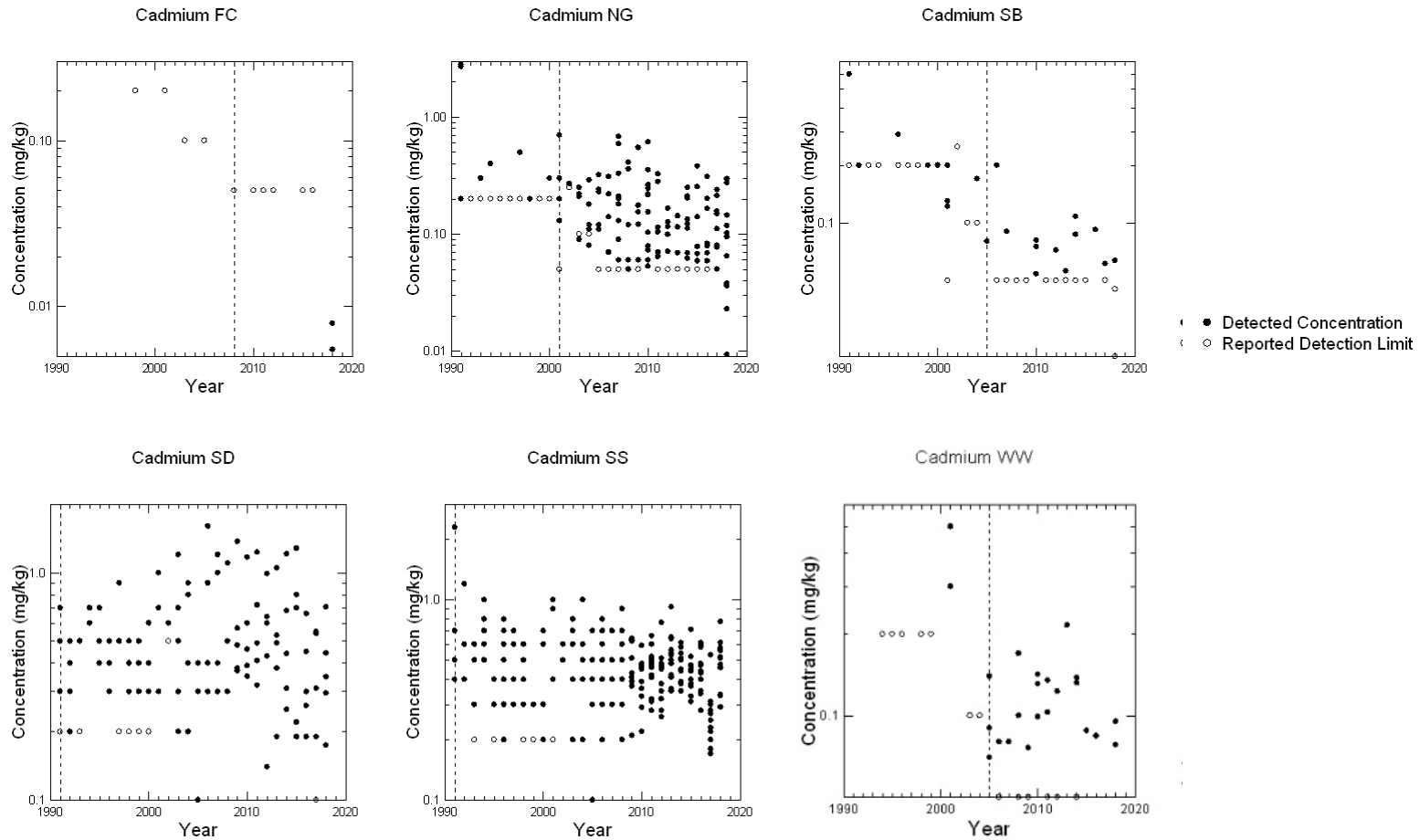
## E.2.5 Boron



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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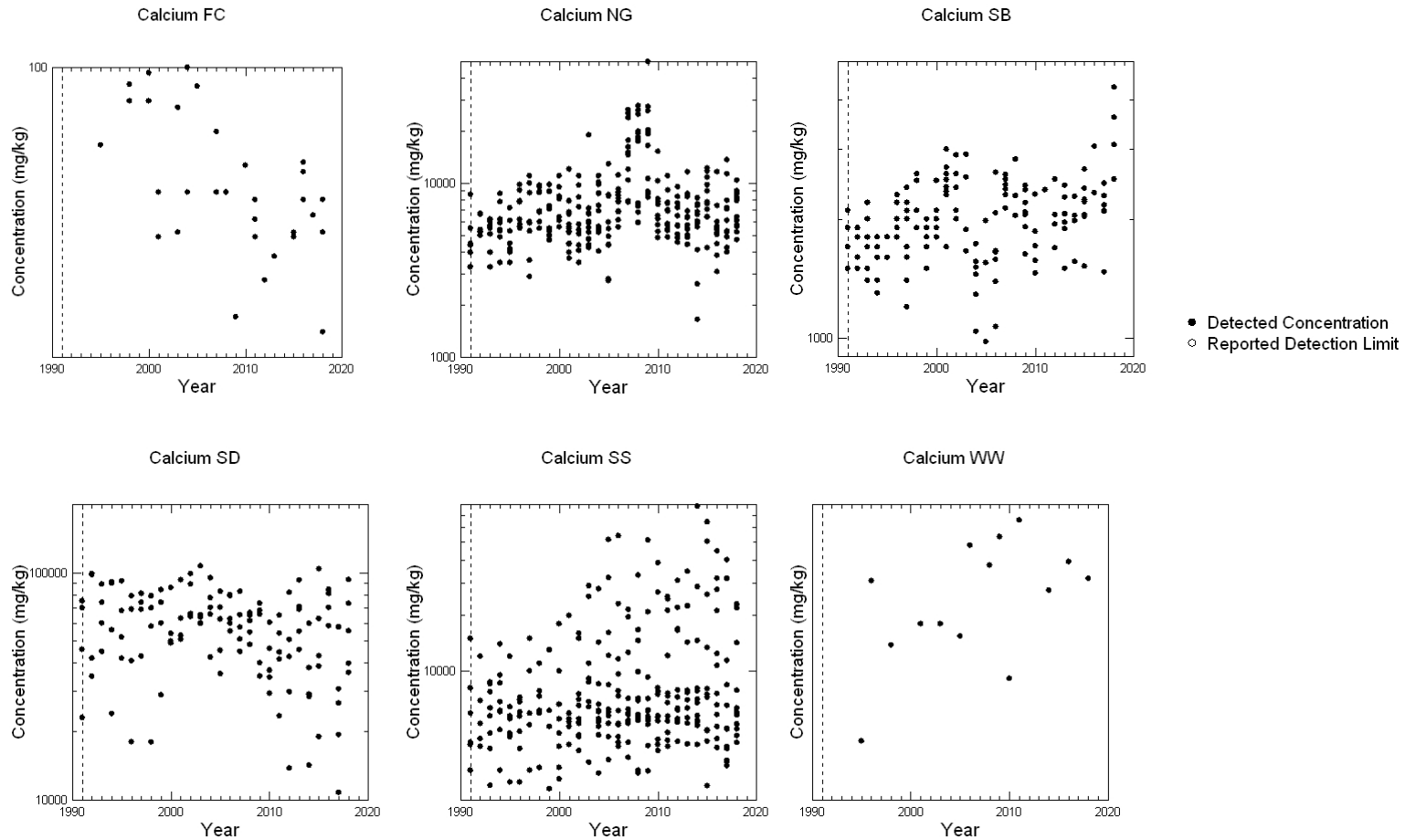
## E.2.6 Cadmium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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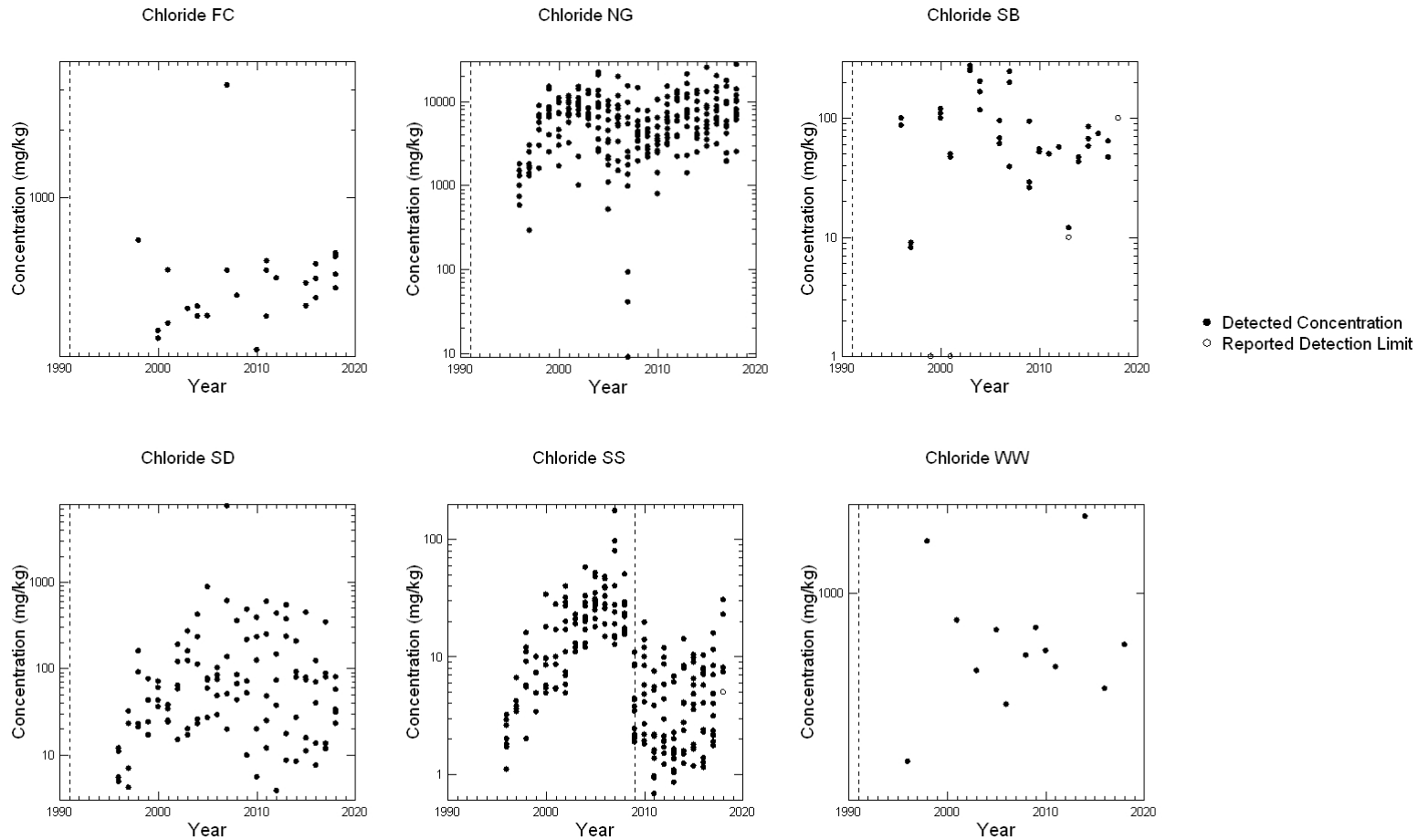
## E.2.7 Calcium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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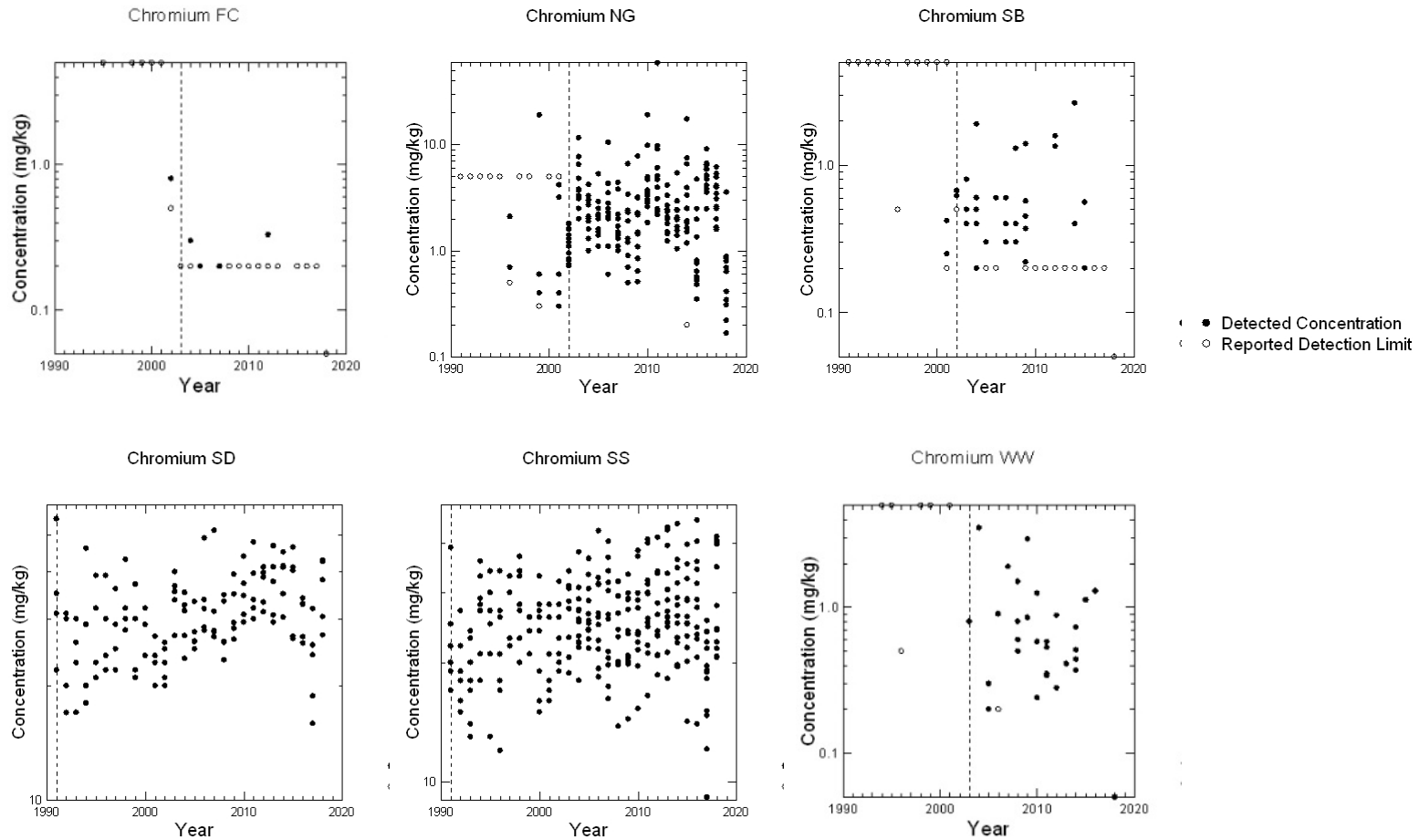
## E.2.8 Chloride



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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## E.2.9 Chromium

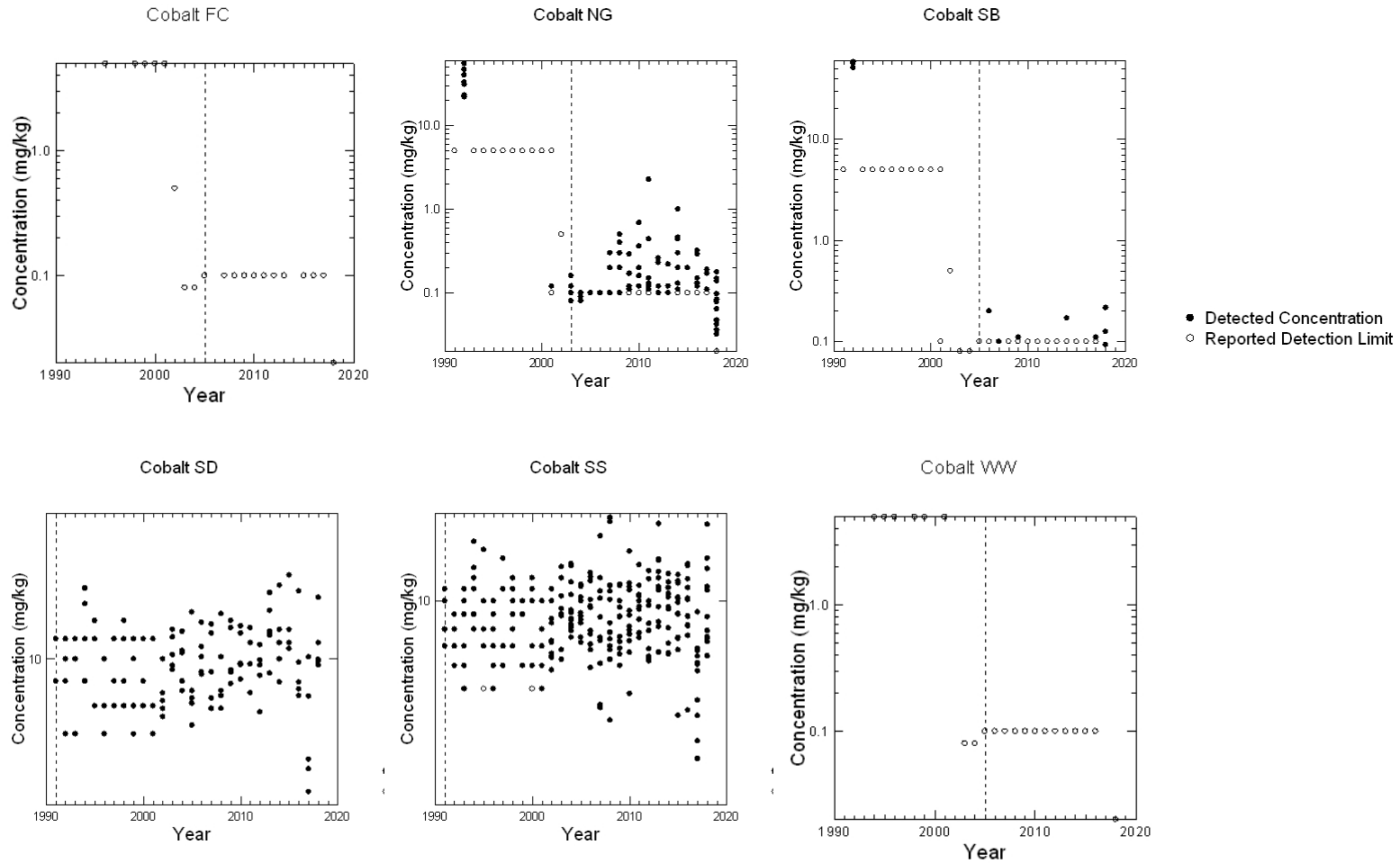




# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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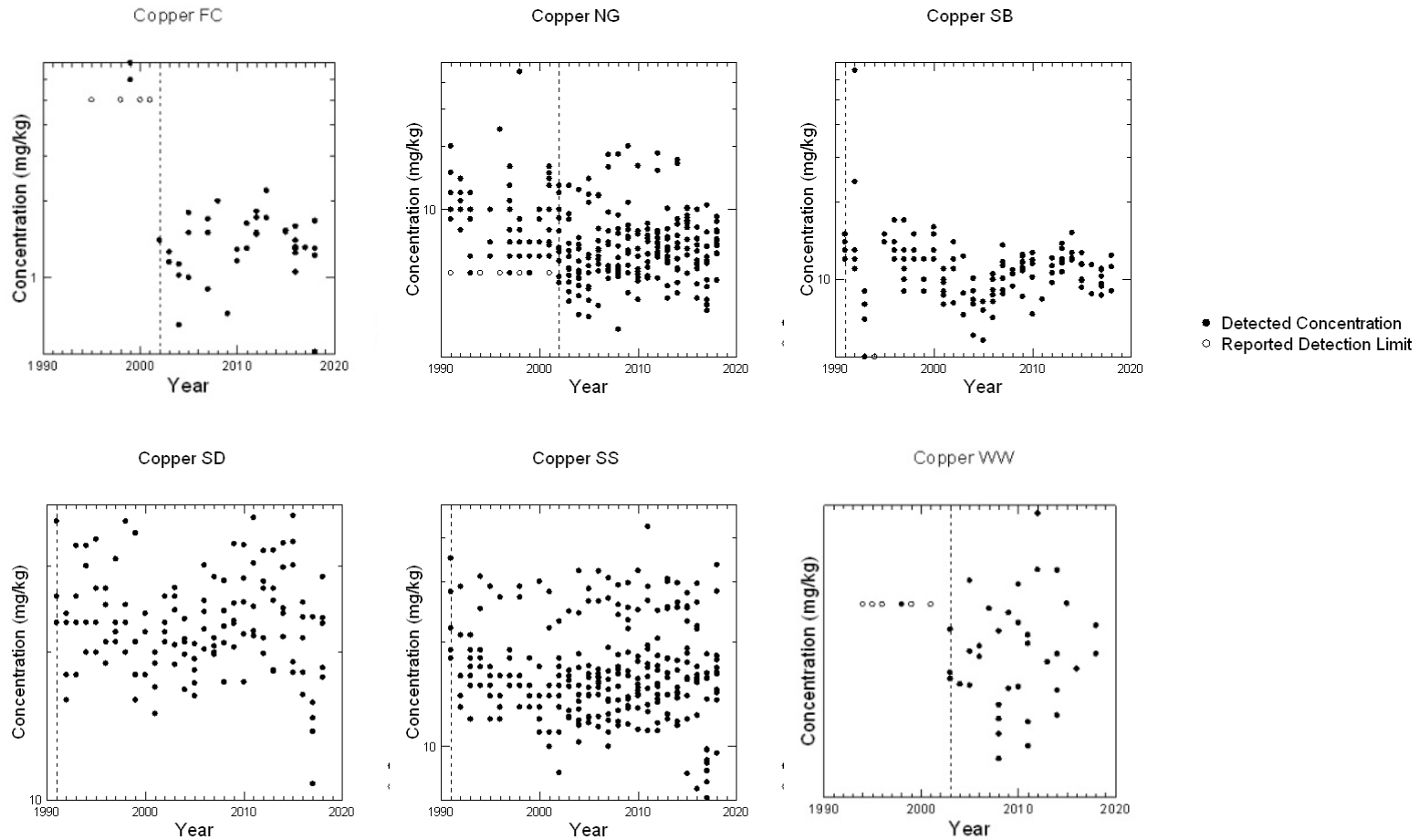
## E.2.10 Cobalt



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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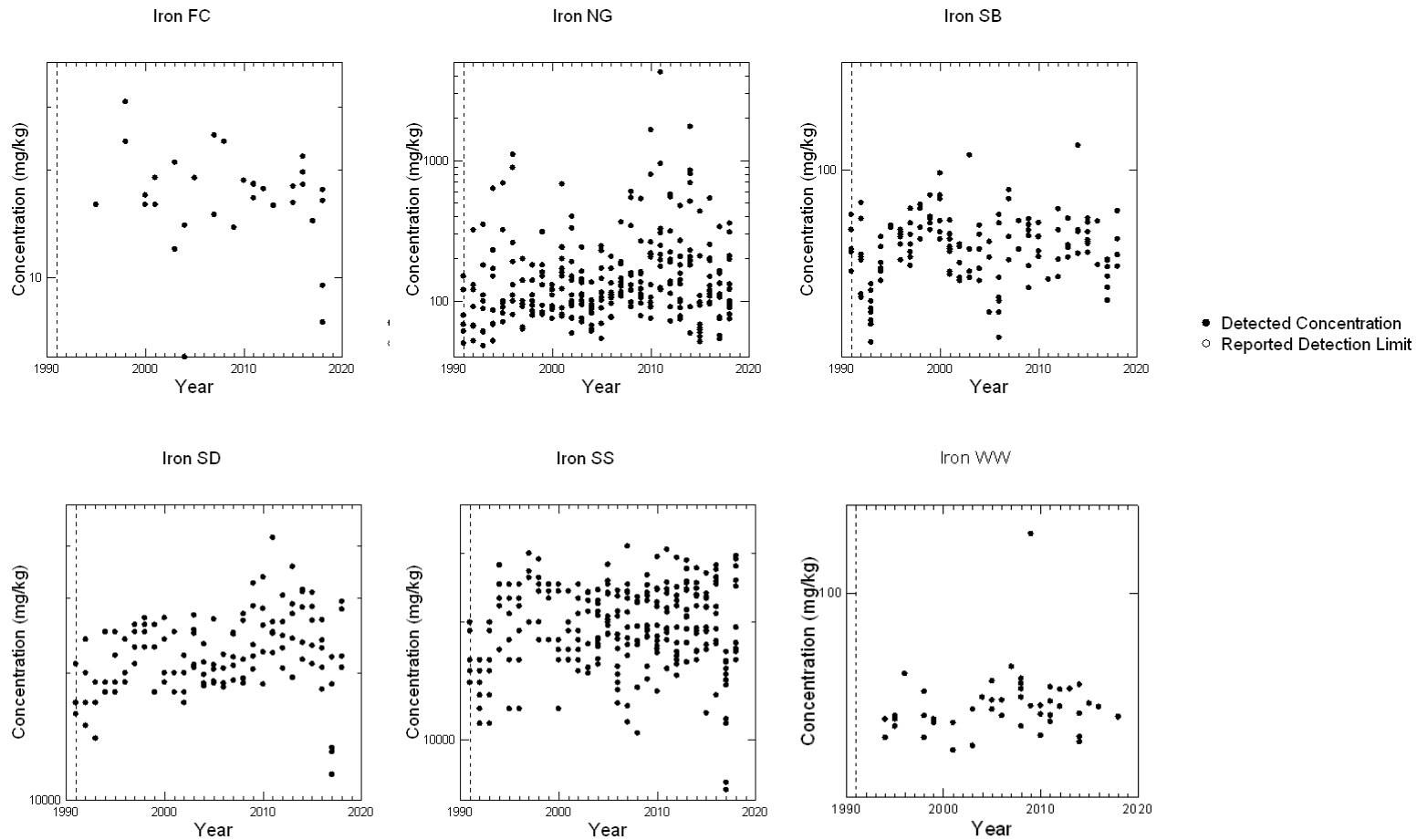
## E.2.11 Copper



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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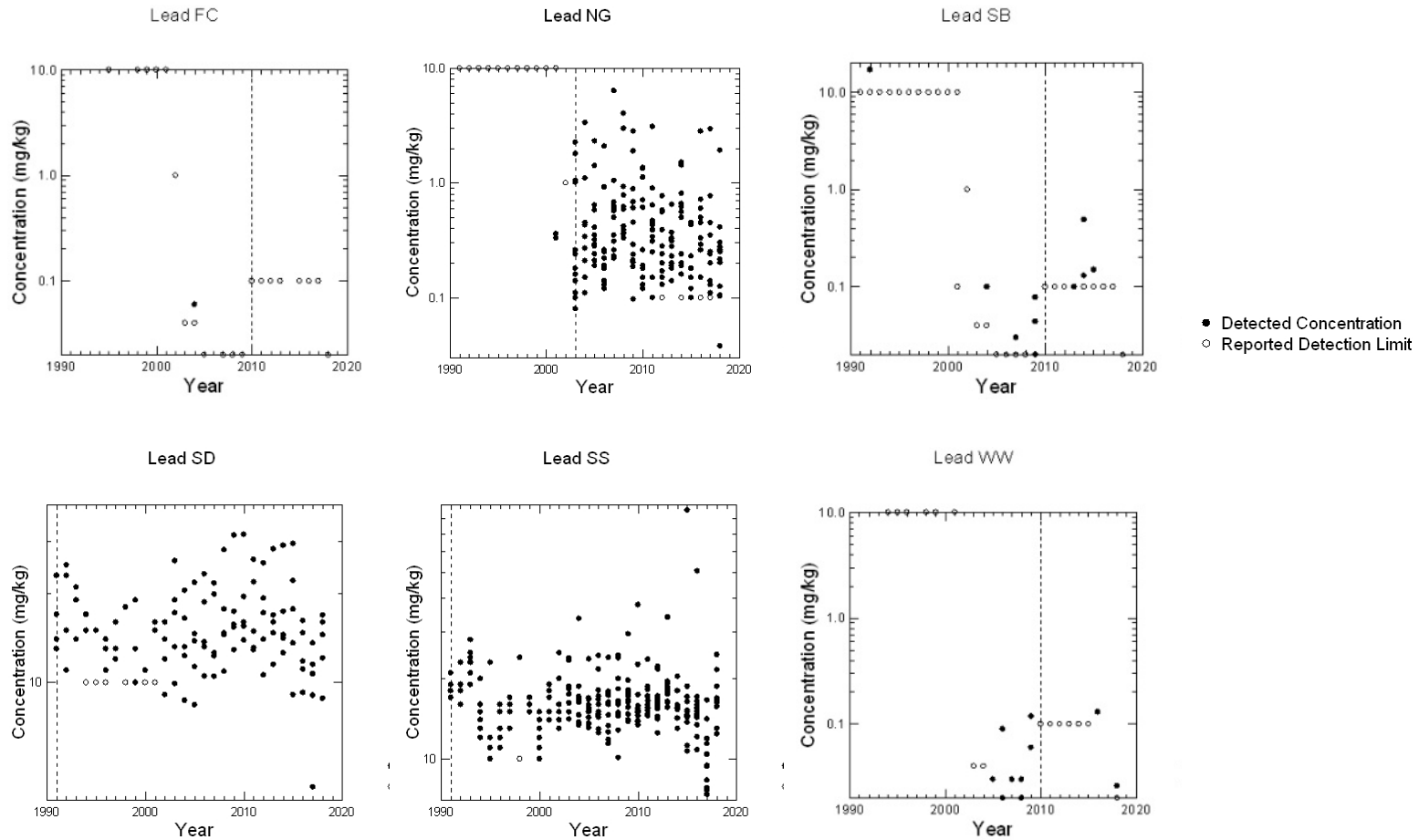
## E.2.12 Iron



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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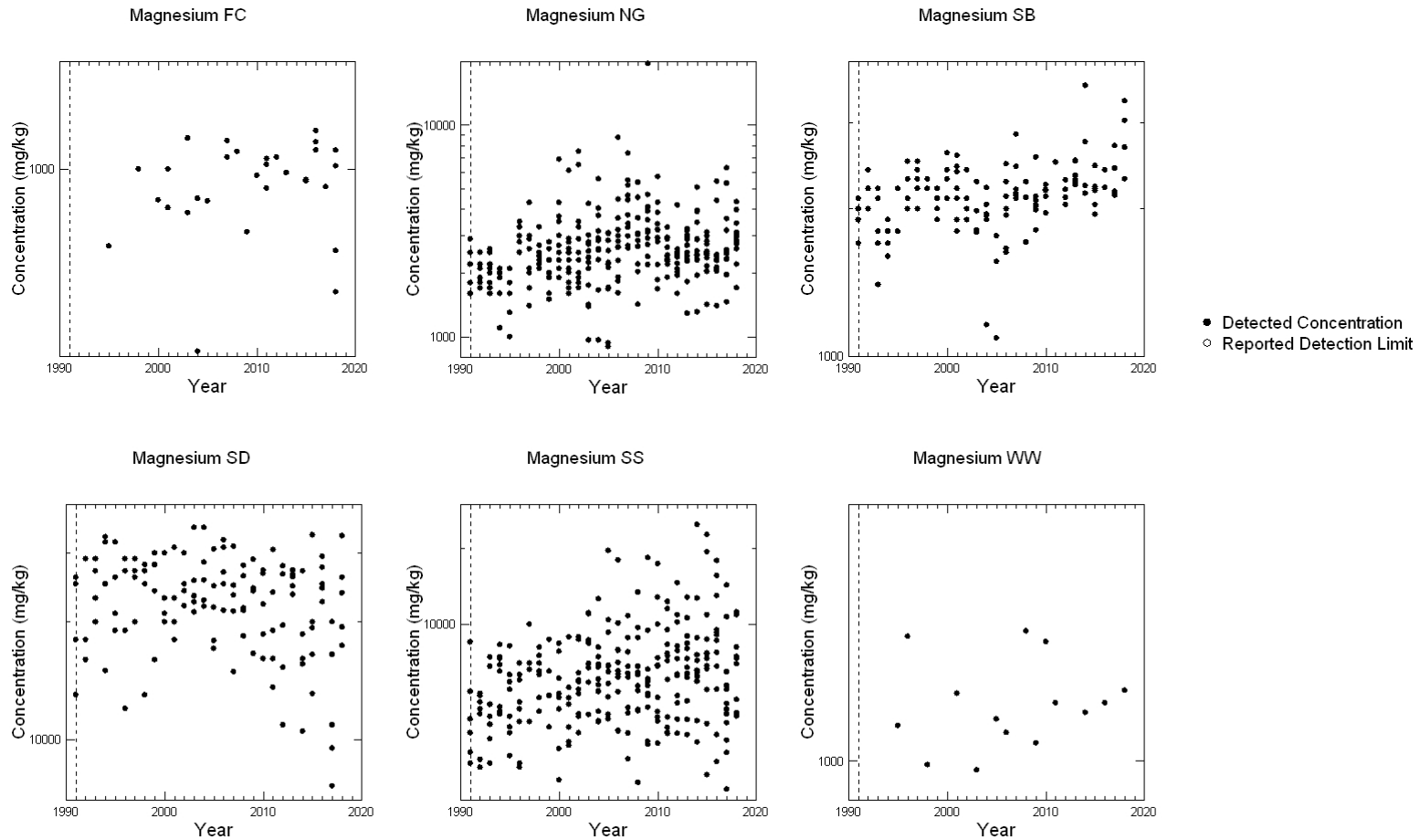
## E.2.13 Lead



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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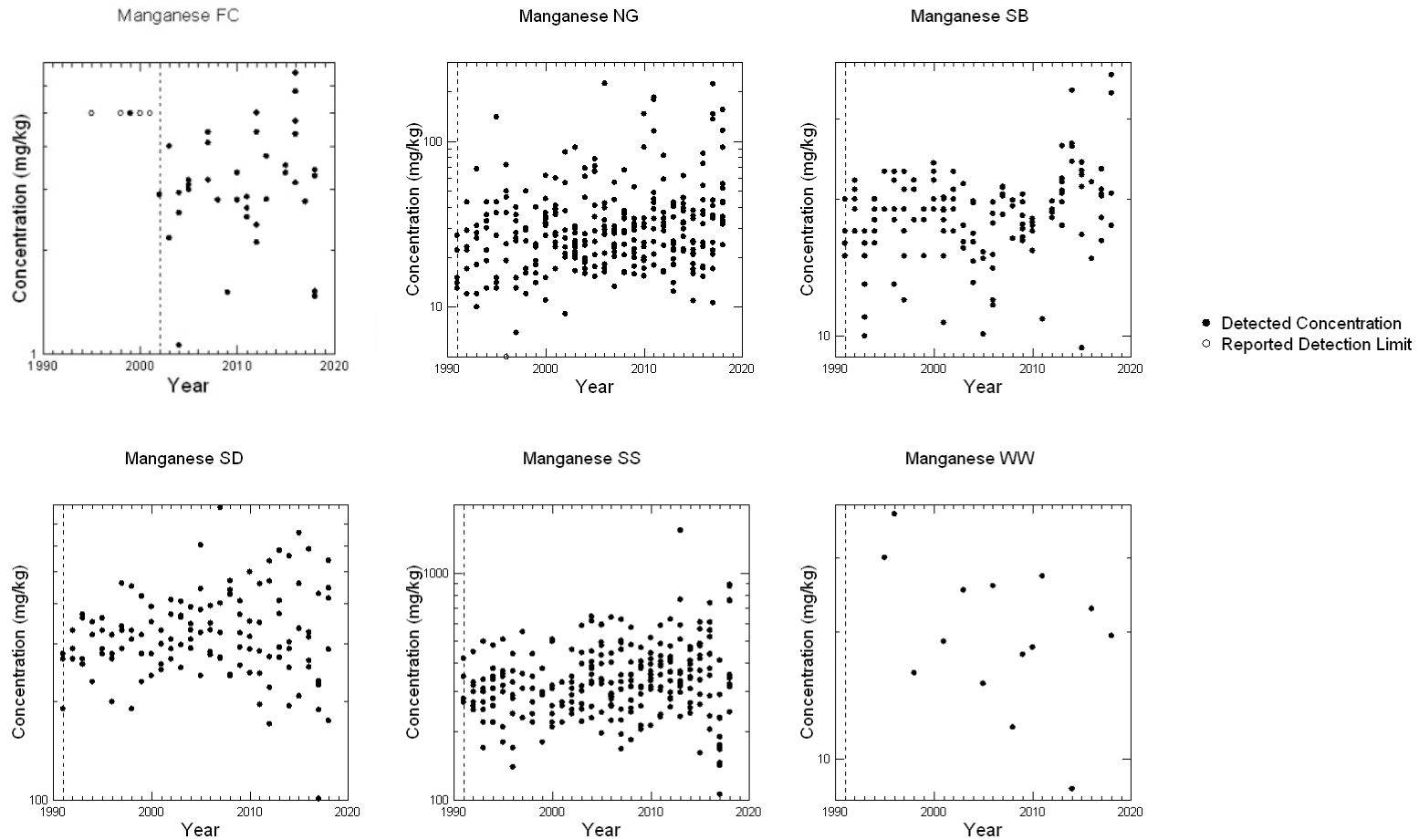
## E.2.14 Magnesium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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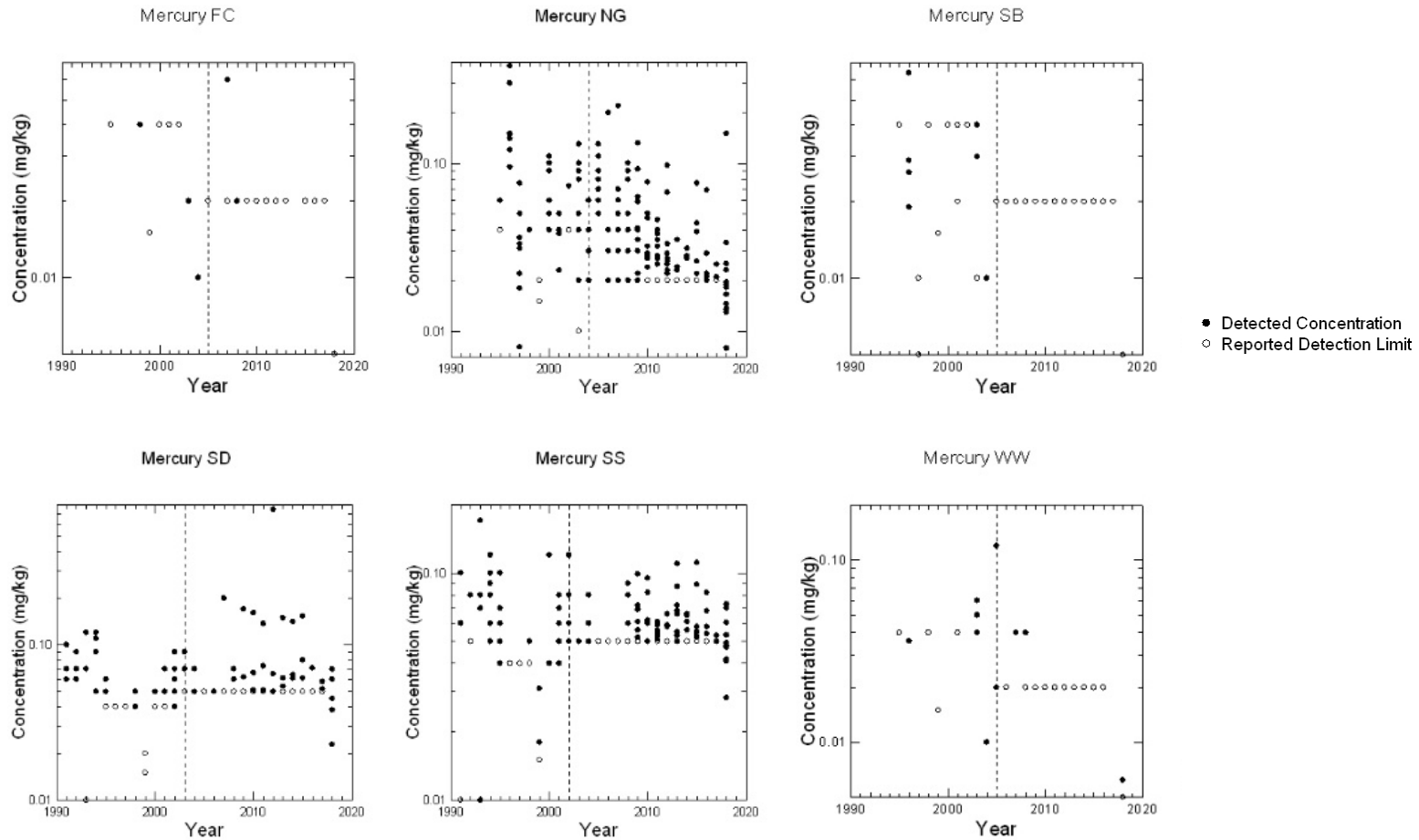
## E.2.15 Manganese



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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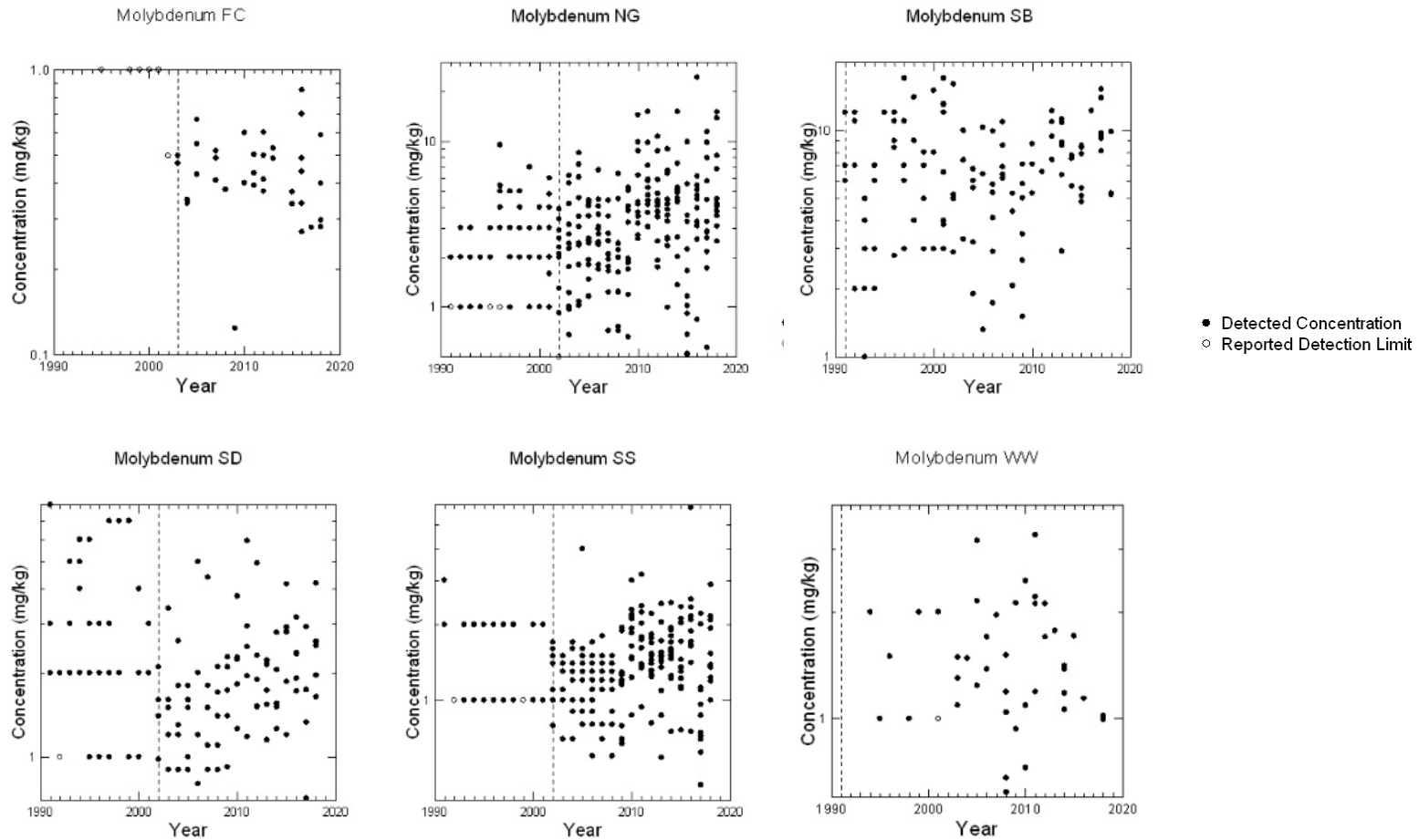
## E.2.16 Mercury



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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## E.2.17 Molybdenum

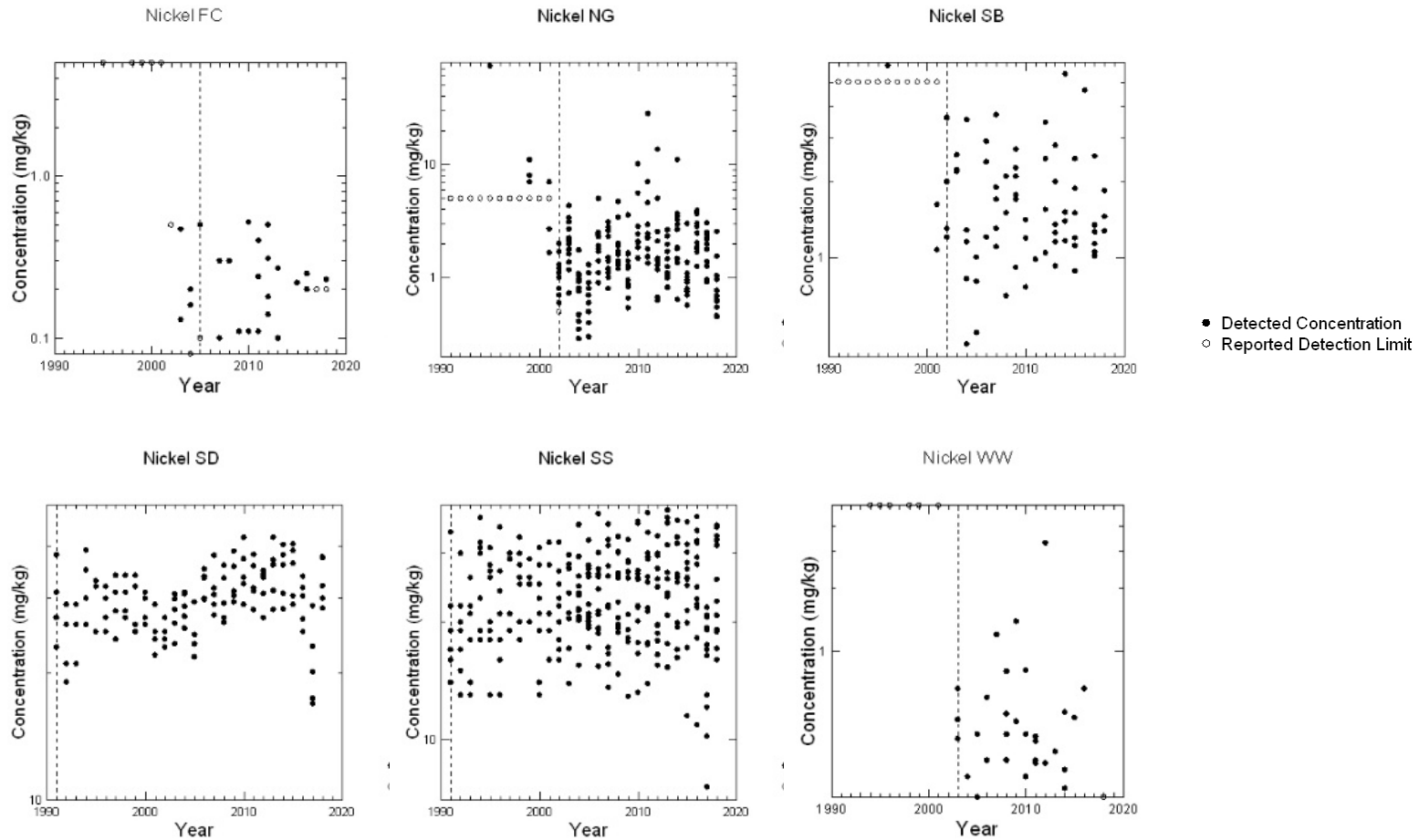




# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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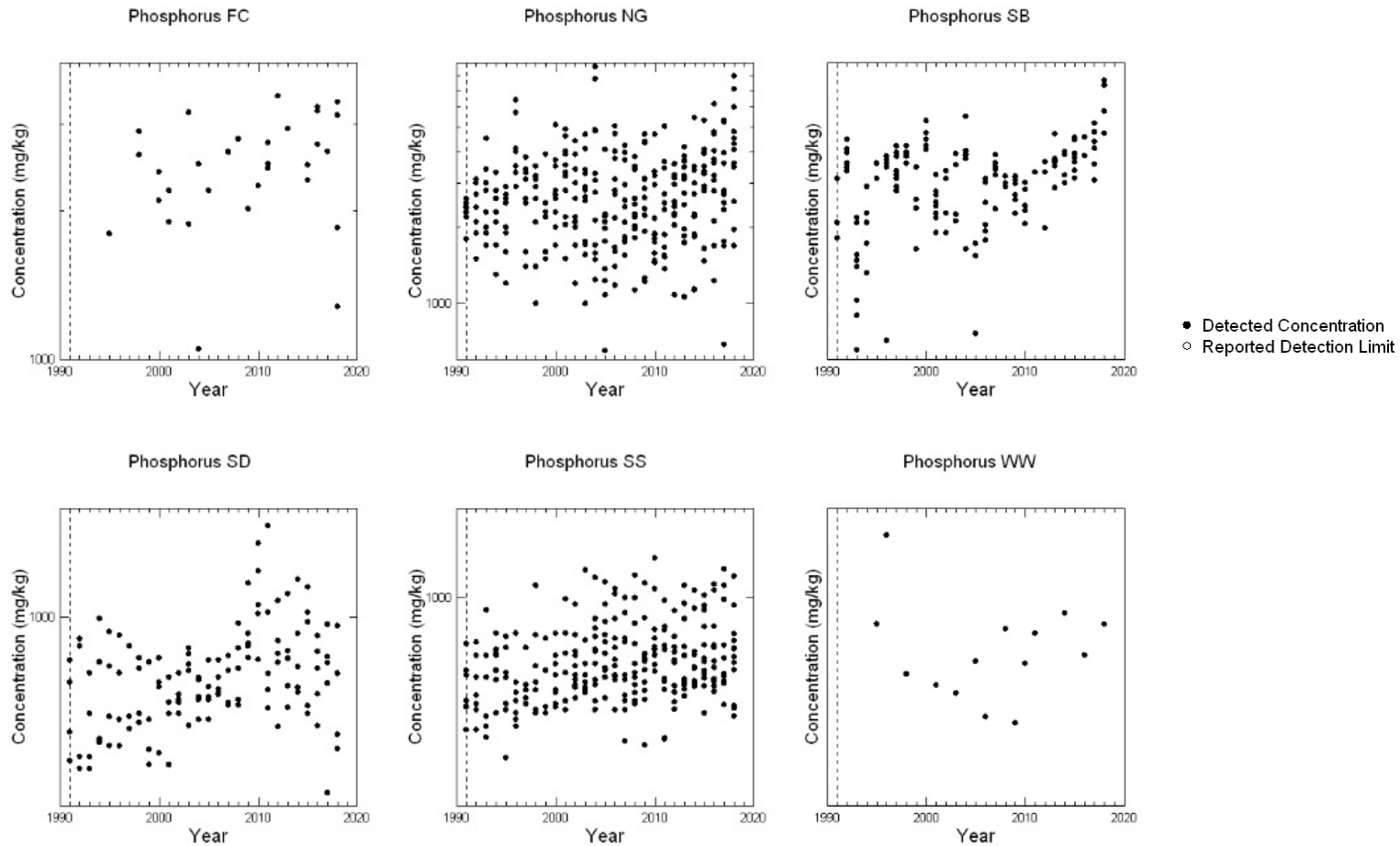
## E.2.18 Nickel



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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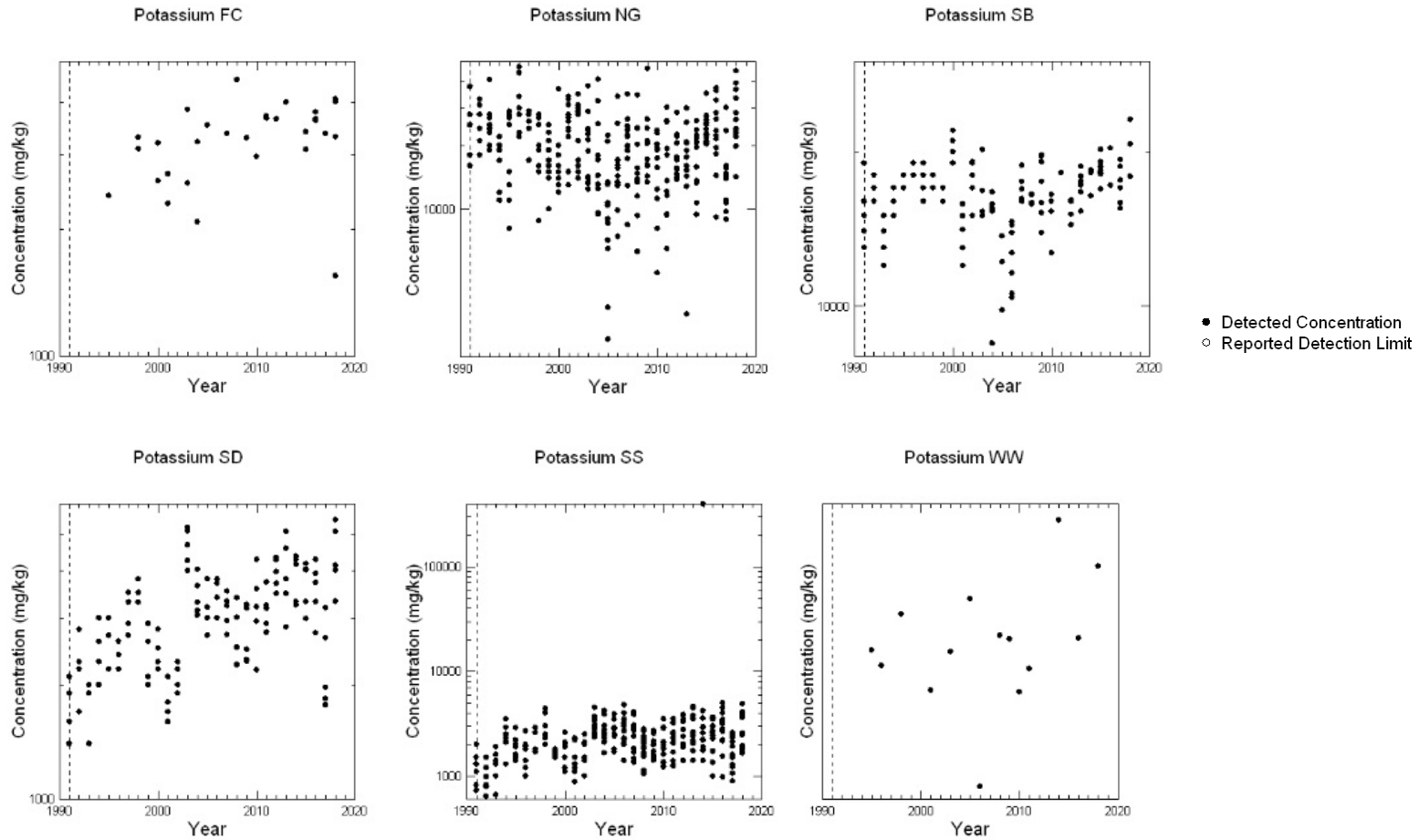
## E.2.19 Phosphorus



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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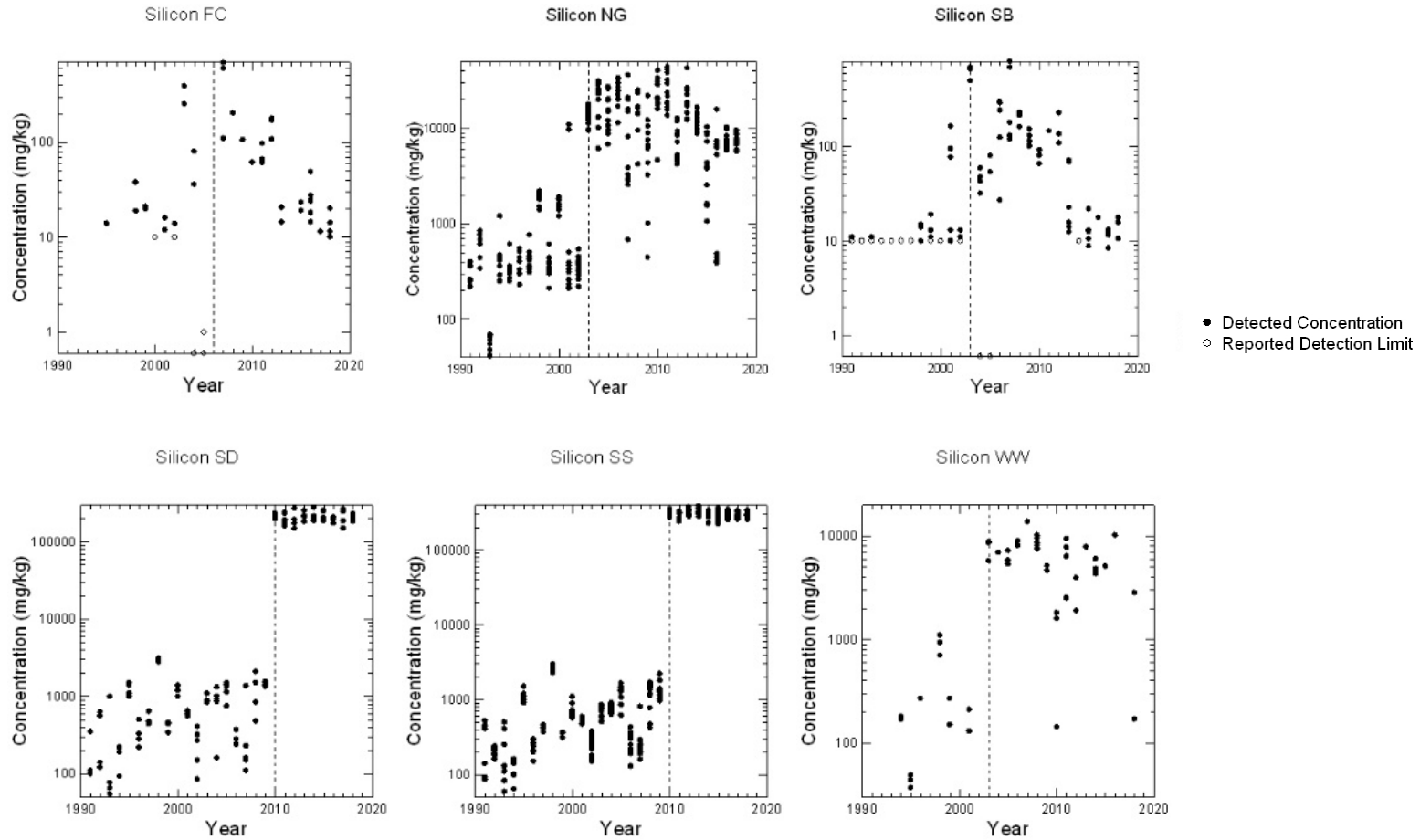
## E.2.20 Potassium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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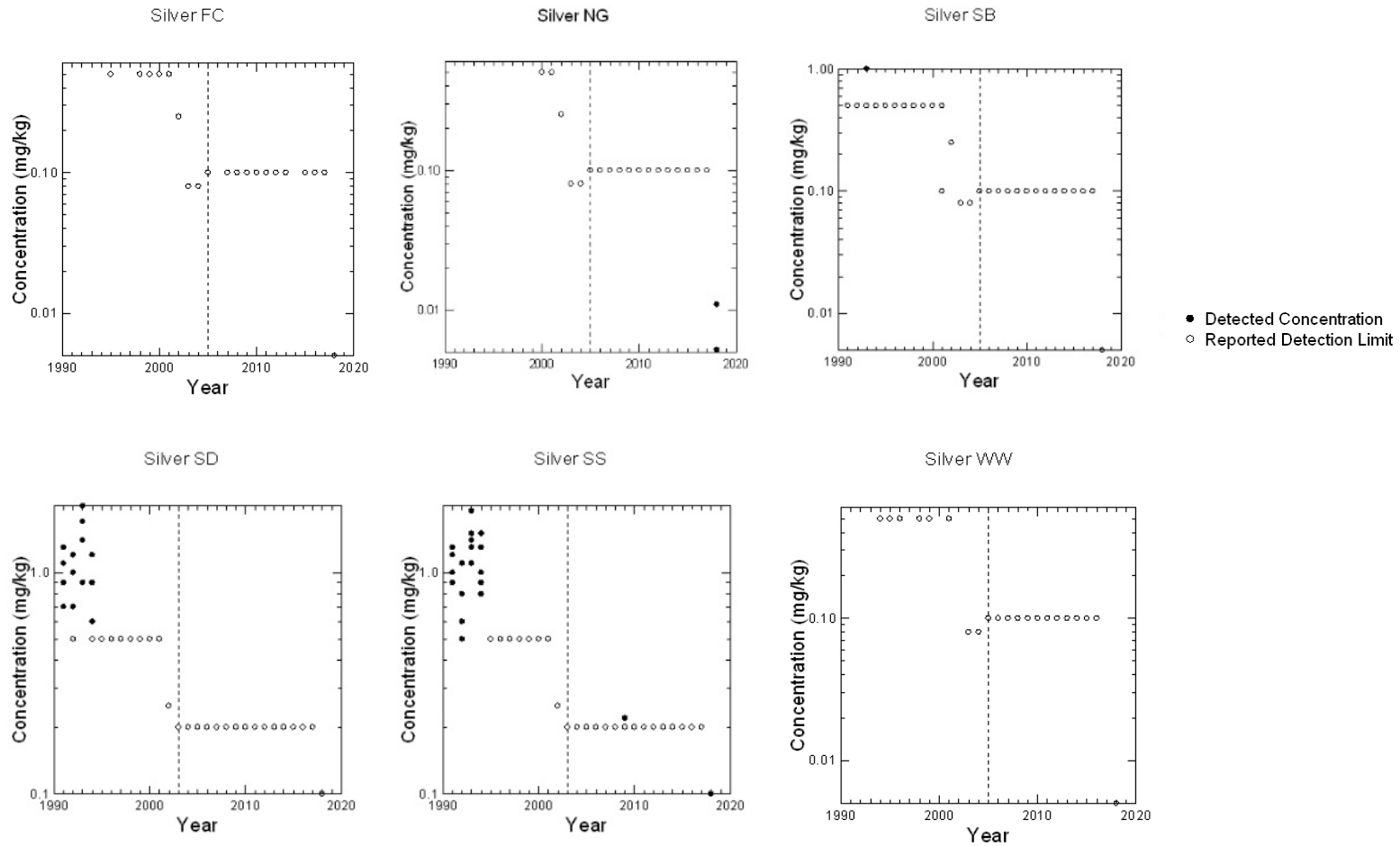
## E.2.21 Silicon



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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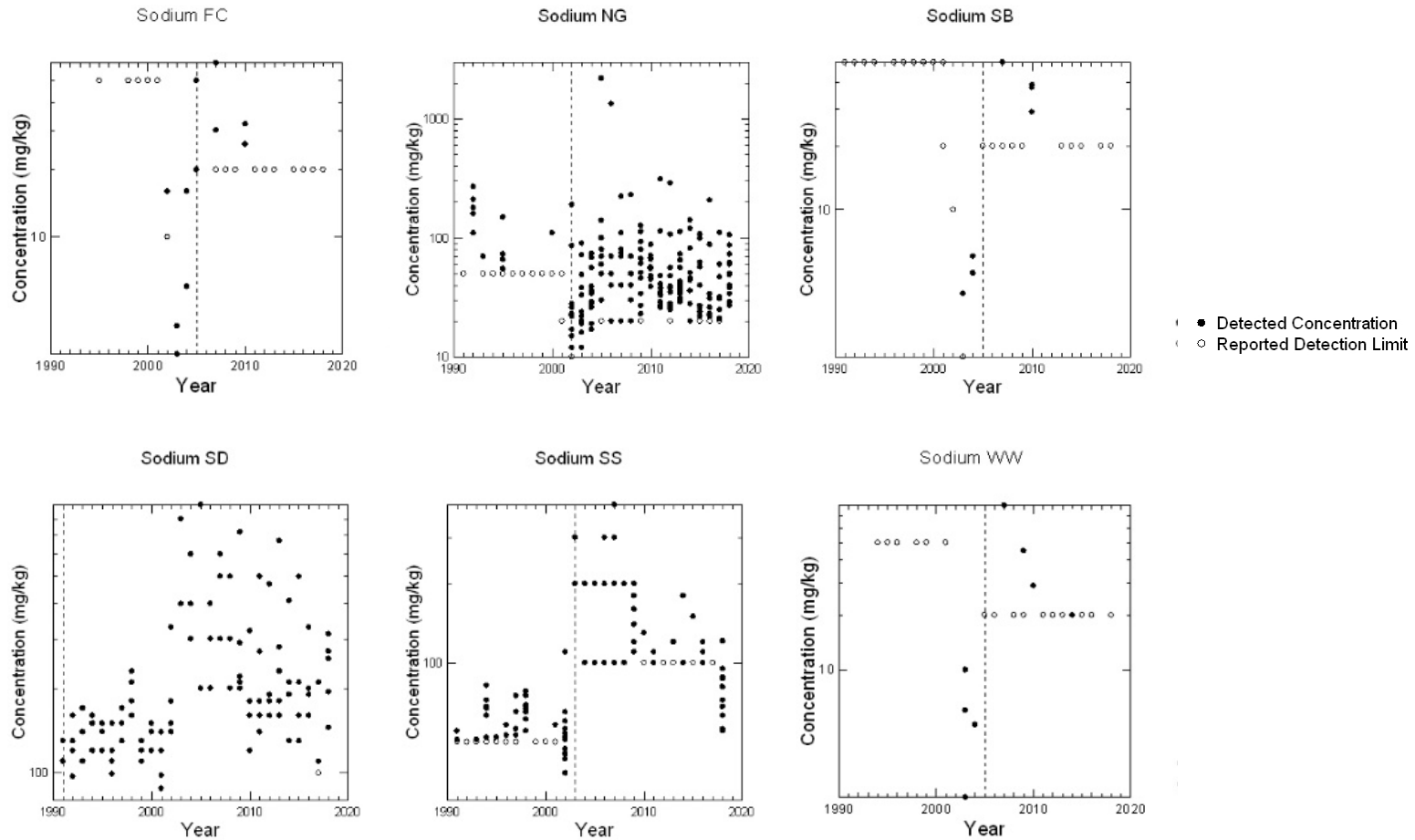
## E.2.22 Silver



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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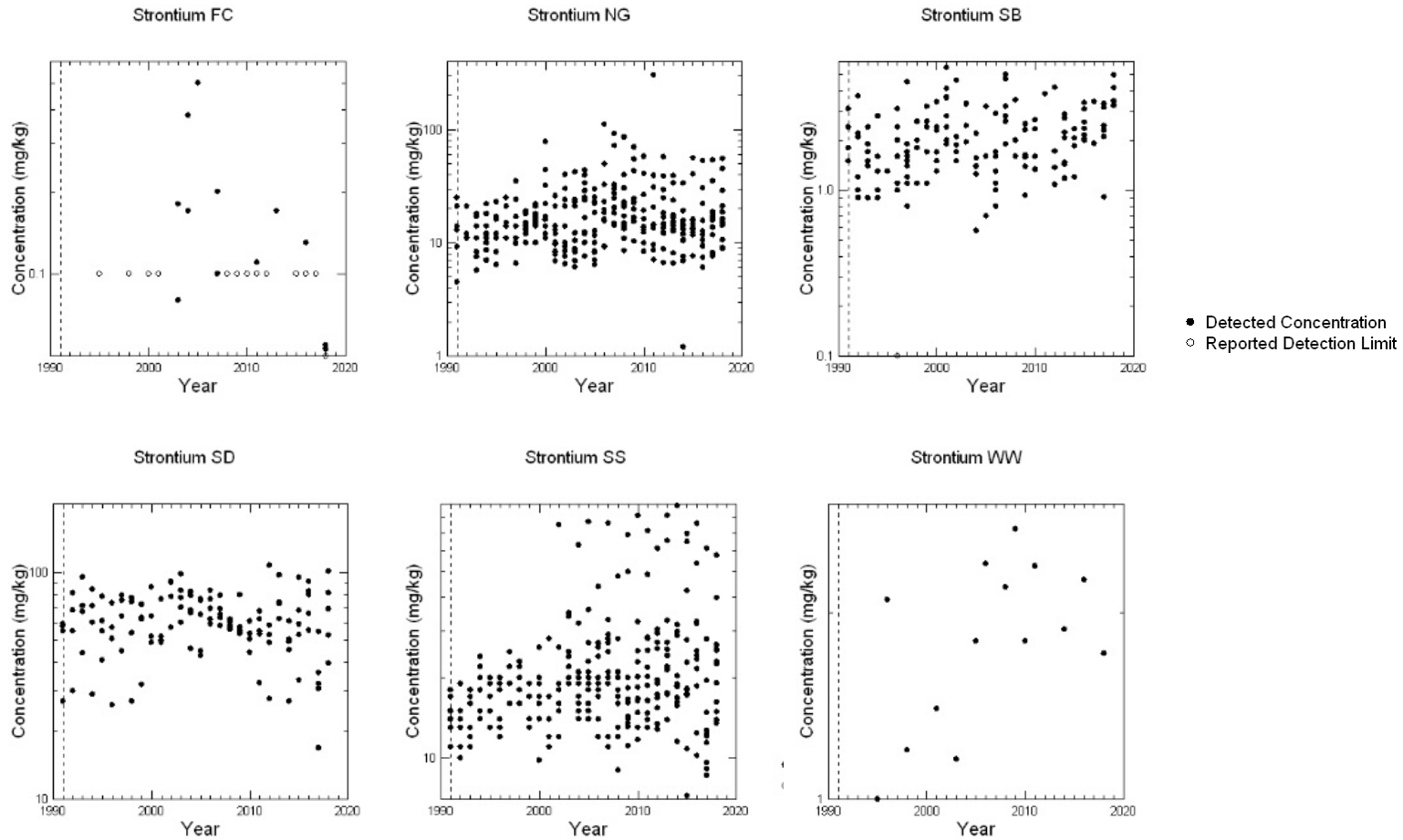
## E.2.23 Sodium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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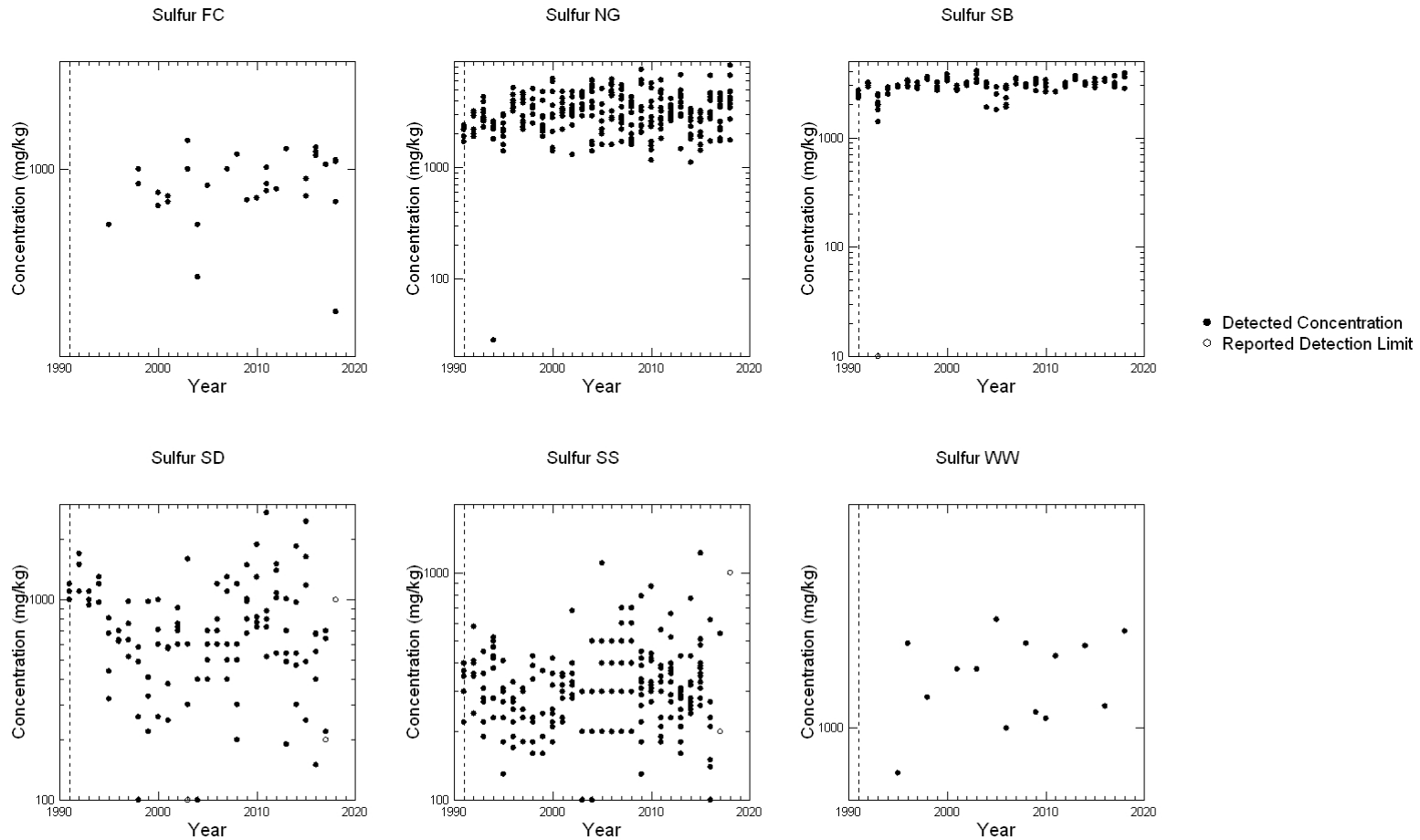
## E.2.24 Strontium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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## E.2.25 Sulfur

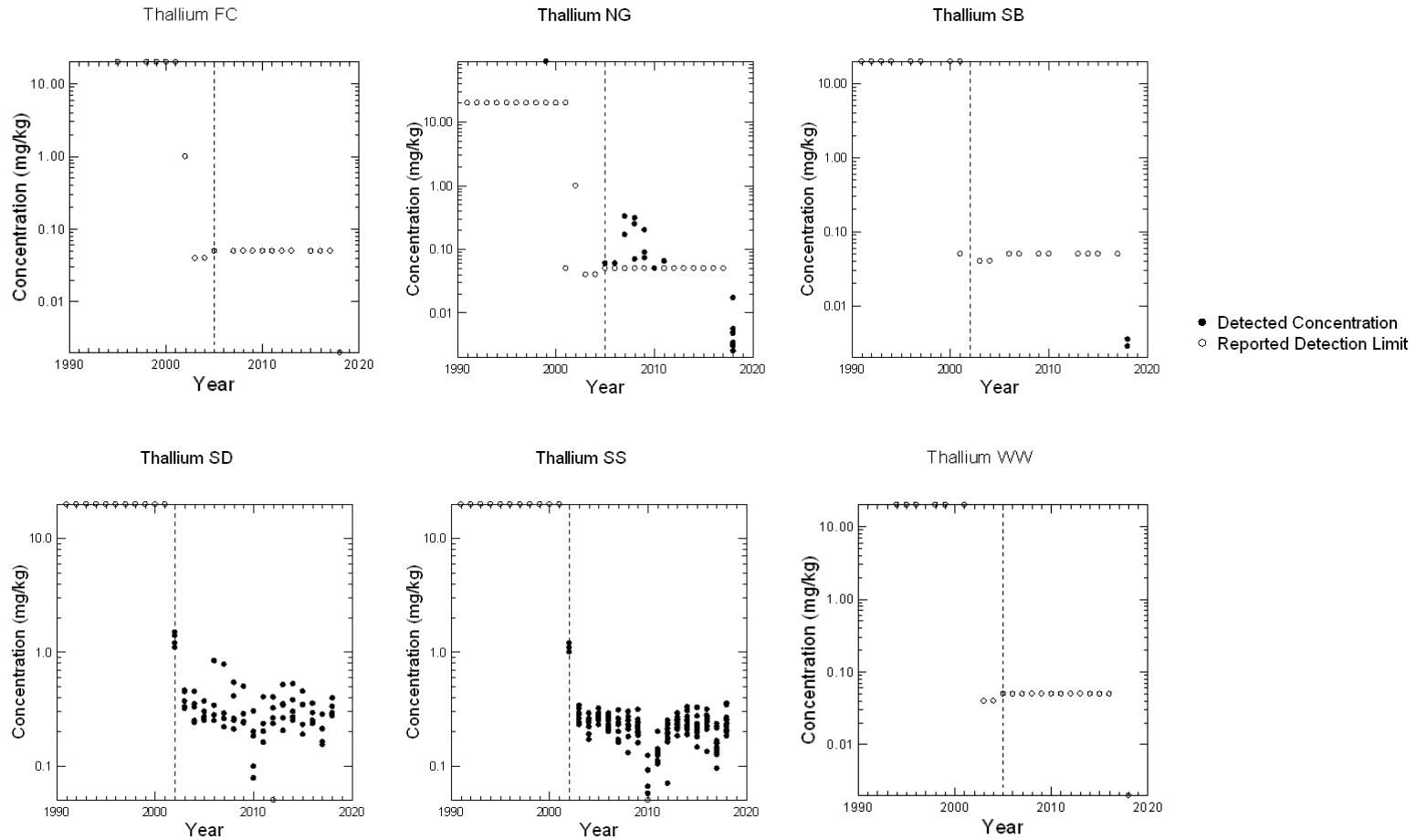




# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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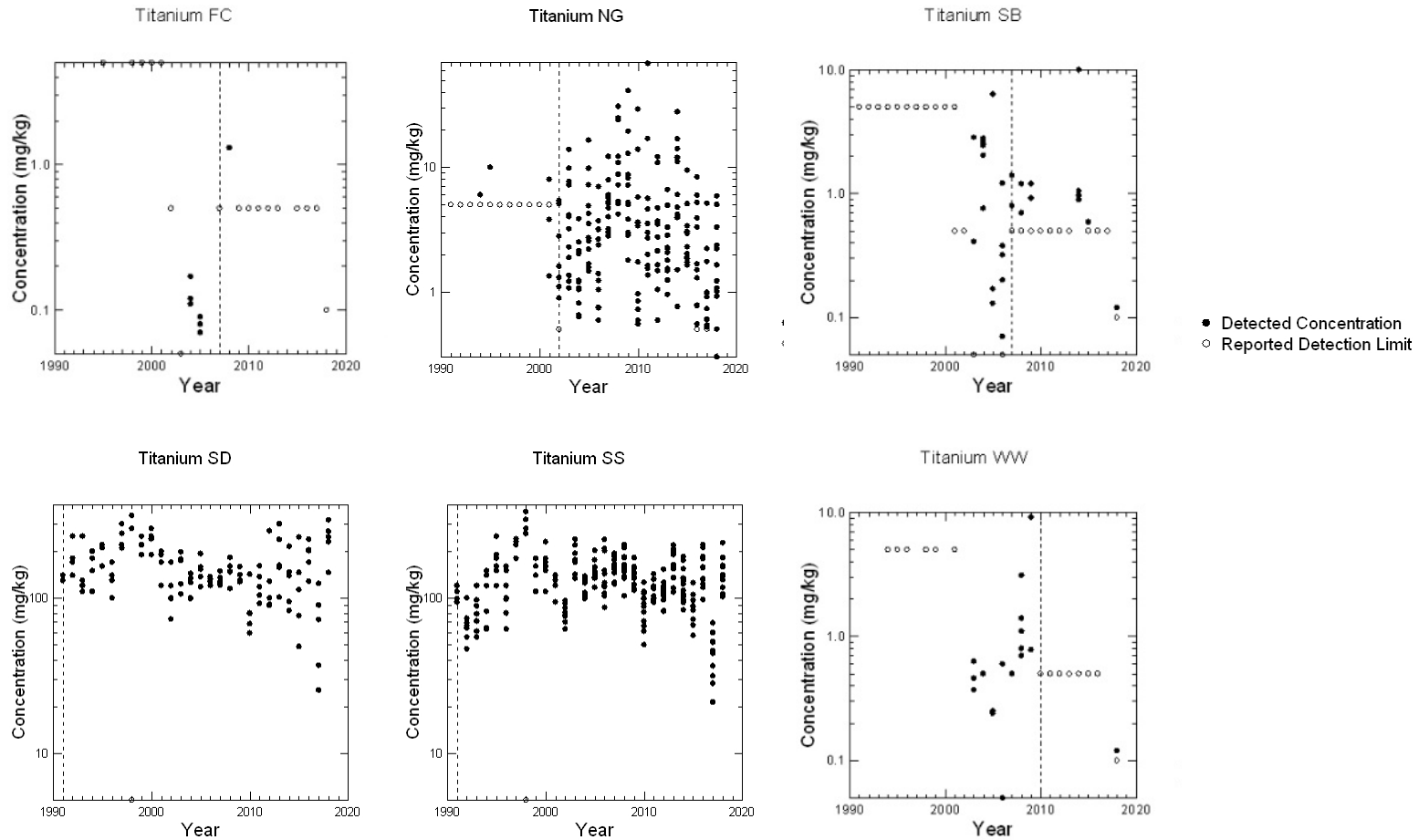
## E.2.26 Thallium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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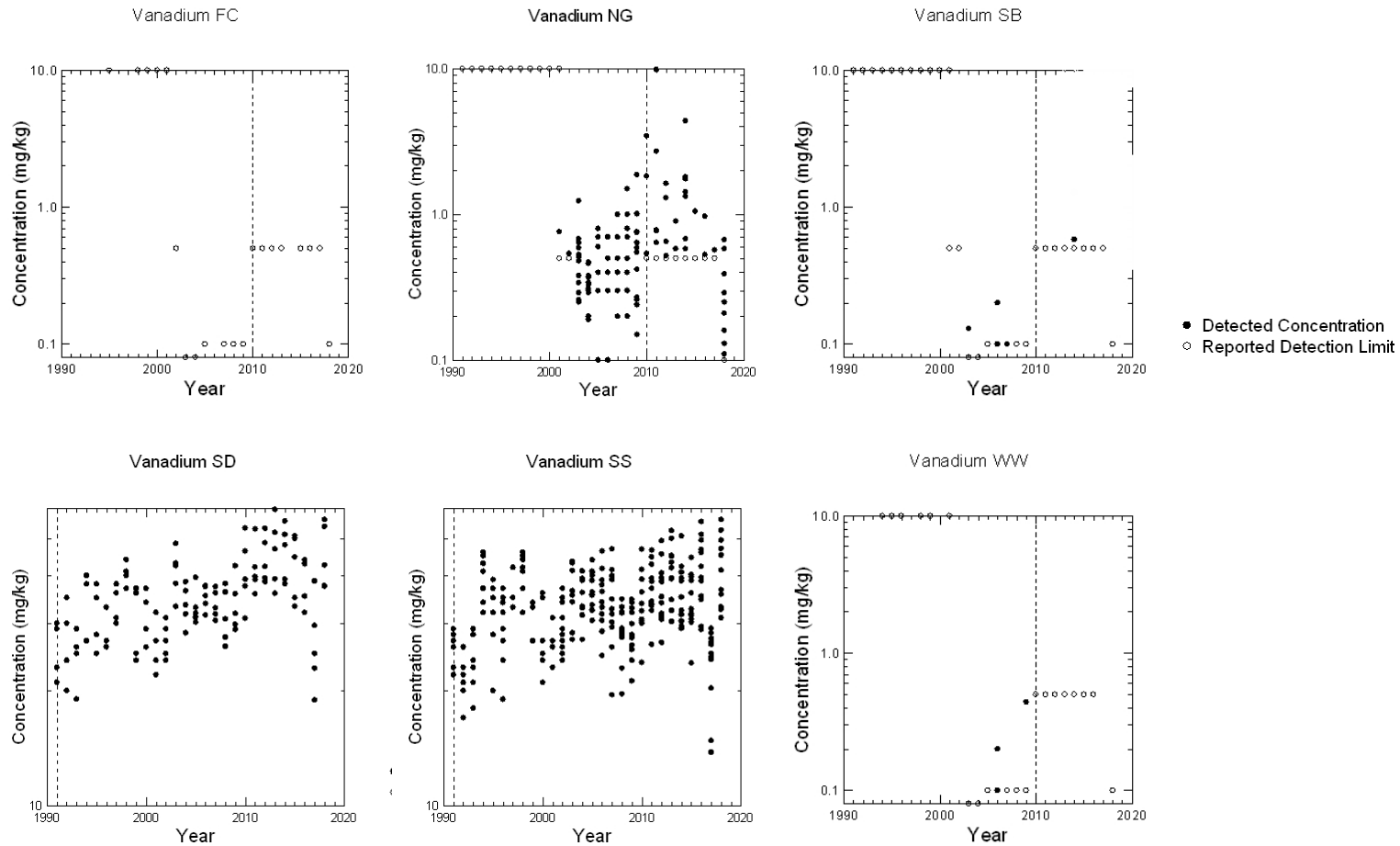
## E.2.27 Titanium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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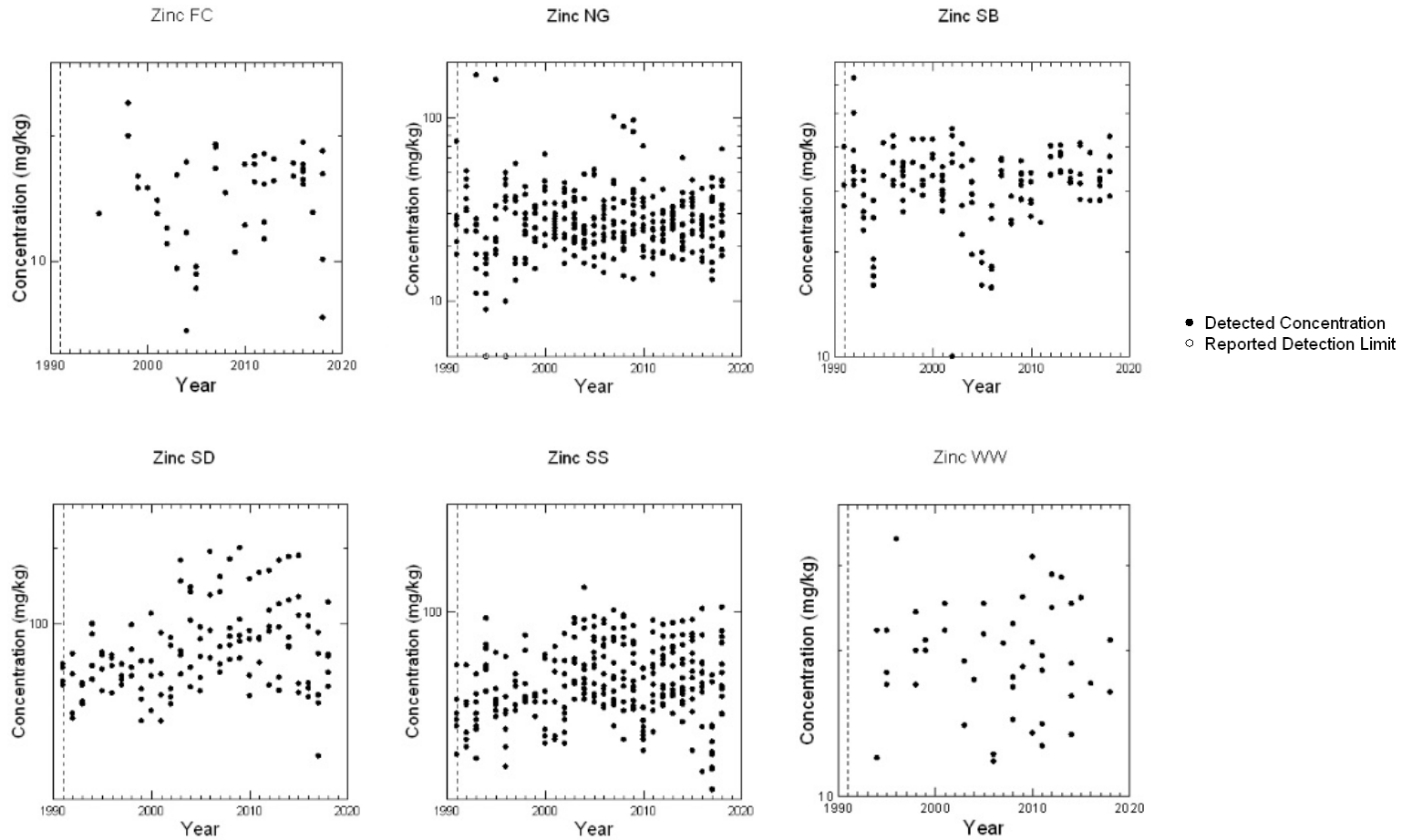
## E.2.28 Vanadium



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

Appendix E Assessment of Appropriate Start Date for Statistical Analysis  
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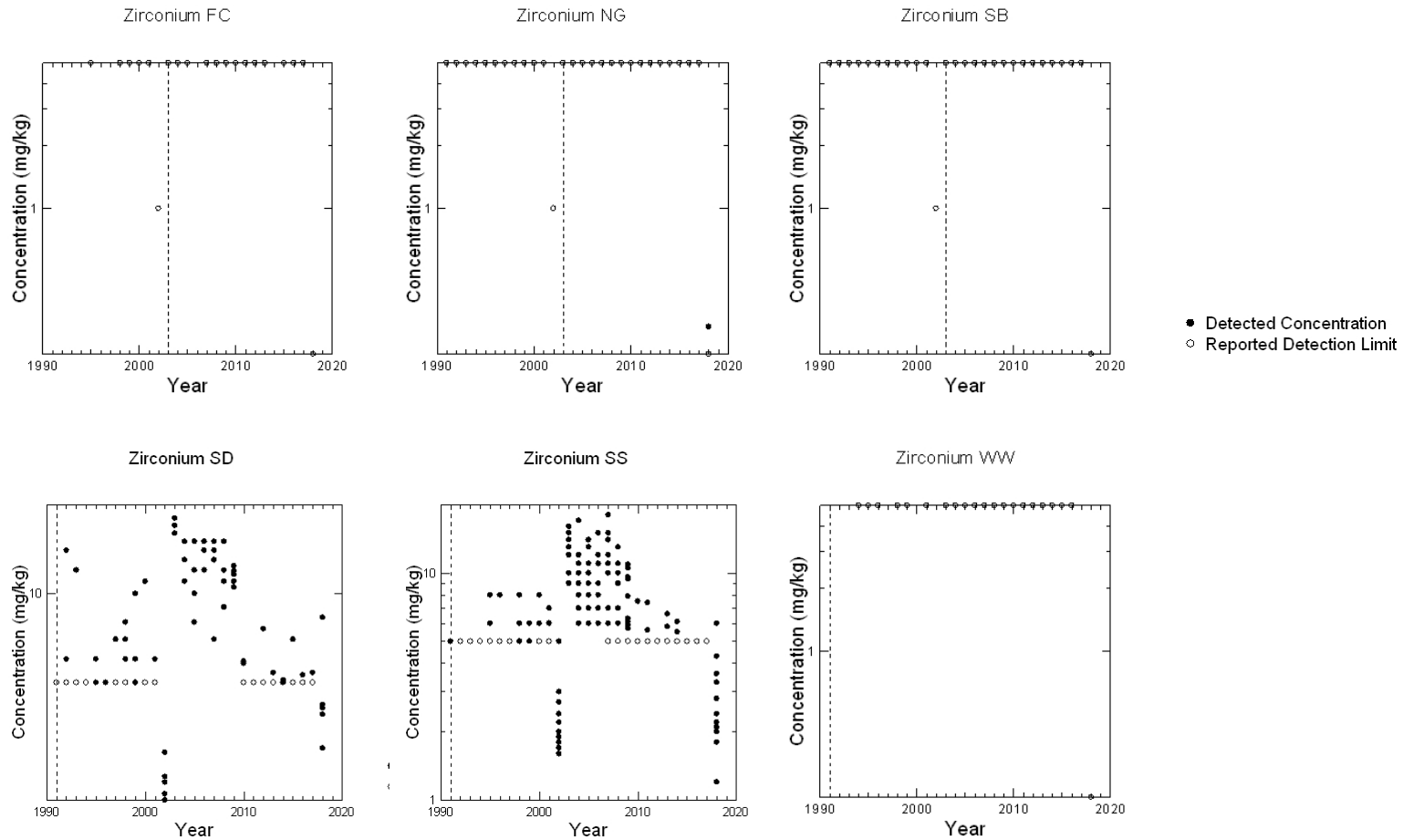
## E.2.29 Zinc



# LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2018 FIELD YEAR

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## E.2.30 Zirconium



**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
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**E.3 FINAL RECOMMENDED START DATES FOR EACH ANALYTE-MATRIX PAIR (INORGANIC)**

Analyte	Matrix	Recommended Statistical Start Date
Aluminum	FC	2005
Aluminum	NG	2002
Aluminum	SB	2005
Aluminum	SD	1991
Aluminum	SS	1991
Aluminum	WW	2005
Arsenic	FC	2003
Arsenic	NG	2003
Arsenic	SB	2003
Arsenic	SD	1991
Arsenic	SS	1991
Arsenic	WW	2003
Barium	FC	2005
Barium	NG	1991
Barium	SB	1991
Barium	SD	1991
Barium	SS	1991
Barium	WW	1991
Beryllium	FC	2003
Beryllium	NG	2003
Beryllium	SB	2003
Beryllium	SD	1991
Beryllium	SS	1991
Beryllium	WW	2003
Boron	FC	2005
Boron	NG	1999
Boron	SB	1991
Boron	SD	1995
Boron	SS	1998
Boron	WW	2003
Cadmium	FC	2007
Cadmium	NG	2001



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Analyte	Matrix	Recommended Statistical Start Date
Cadmium	SB	2005
Cadmium	SD	1991
Cadmium	SS	1991
Cadmium	WW	2005
Calcium	FC	1991
Calcium	NG	1991
Calcium	SB	1991
Calcium	SD	1991
Calcium	SS	1991
Calcium	WW	1991
Chloride	FC	1991
Chloride	NG	1991
Chloride	SB	1991
Chloride	SD	1991
Chloride	SS	2009
Chloride	WW	1991
Chromium	FC	2003
Chromium	NG	2002
Chromium	SB	2002
Chromium	SD	1991
Chromium	SS	1991
Chromium	WW	2003
Cobalt	FC	2005
Cobalt	NG	2003
Cobalt	SB	2005
Cobalt	SD	1991
Cobalt	SS	1991
Cobalt	WW	2005
Copper	FC	2002
Copper	NG	2002
Copper	SB	1991
Copper	SD	1991
Copper	SS	1991
Copper	WW	2003
Iron	FC	1991



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Analyte	Matrix	Recommended Statistical Start Date
Iron	NG	1991
Iron	SB	1991
Iron	SD	1991
Iron	SS	1991
Iron	WW	1991
Lead	FC	2010
Lead	NG	2003
Lead	SB	2010
Lead	SD	1991
Lead	SS	1991
Lead	WW	2010
Magnesium	FC	1991
Magnesium	NG	1991
Magnesium	SB	1991
Magnesium	SD	1991
Magnesium	SS	1991
Magnesium	WW	1991
Manganese	FC	2002
Manganese	NG	1991
Manganese	SB	1991
Manganese	SD	1991
Manganese	SS	1991
Manganese	WW	1991
Mercury	FC	2005
Mercury	NG	2004
Mercury	SB	2005
Mercury	SD	2003
Mercury	SS	2002
Mercury	WW	2005
Molybdenum	FC	2003
Molybdenum	NG	2002
Molybdenum	SB	1991
Molybdenum	SD	2002
Molybdenum	SS	2002
Molybdenum	WW	1991





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Analyte	Matrix	Recommended Statistical Start Date
Nickel	FC	2005
Nickel	NG	2002
Nickel	SB	2002
Nickel	SD	1991
Nickel	SS	1991
Nickel	WW	2003
Phosphorus	FC	1991
Phosphorus	NG	1991
Phosphorus	SB	1991
Phosphorus	SD	1991
Phosphorus	SS	1991
Phosphorus	WW	1991
Potassium	FC	1991
Potassium	NG	1991
Potassium	SB	1991
Potassium	SD	1991
Potassium	SS	1991
Potassium	WW	1991
Silicon	FC	2006
Silicon	NG	2003
Silicon	SB	2003
Silicon	SD	2010
Silicon	SS	2010
Silicon	WW	2003
Silver	FC	2005
Silver	NG	2005
Silver	SB	2005
Silver	SD	2003
Silver	SS	2003
Silver	WW	2005
Sodium	FC	2005
Sodium	NG	2002
Sodium	SB	2005
Sodium	SD	1991
Sodium	SS	2003



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Analyte	Matrix	Recommended Statistical Start Date
Sodium	WW	2005
Strontium	FC	1991
Strontium	NG	1991
Strontium	SB	1991
Strontium	SD	1991
Strontium	SS	1991
Strontium	WW	1991
Sulfur	FC	1991
Sulfur	NG	1991
Sulfur	SB	1991
Sulfur	SD	1991
Sulfur	SS	1991
Sulfur	WW	1991
Thallium	FC	2005
Thallium	NG	2005
Thallium	SB	2005
Thallium	SD	2002
Thallium	SS	2002
Thallium	WW	2005
Titanium	FC	2007
Titanium	NG	2002
Titanium	SB	2007
Titanium	SD	1991
Titanium	SS	1991
Titanium	WW	2010
Vanadium	FC	2010
Vanadium	NG	2010
Vanadium	SB	2010
Vanadium	SD	1991
Vanadium	SS	1991
Vanadium	WW	2010
Zinc	FC	1991
Zinc	NG	1991
Zinc	SB	1991
Zinc	SD	1991



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Analyte	Matrix	Recommended Statistical Start Date
Zinc	SS	1991
Zinc	WW	1991
Zirconium	FC	2003
Zirconium	NG	2003
Zirconium	SB	2003
Zirconium	SD	1991
Zirconium	SS	1991
Zirconium	WW	1991



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Appendix F Inorganic SITE-SPECIFIC Regression  
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## **Appendix F INORGANIC SITE-SPECIFIC REGRESSION**

### **F.1 TABLES**



**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Aluminum	E1	FC	2005	4	0	0.00	YES	YES	NO
Aluminum	E1	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	E1	SB	2005	8	0	0.00	NO	YES	NO
Aluminum	E1	SS	1991	25	25	1.00	NO	NO	YES
Aluminum	E1	WW	2005	2	1	0.50	YES	NO	NO
Aluminum	E2	FC	2005	3	0	0.00	YES	YES	NO
Aluminum	E2	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	E2	SB	2005	4	1	0.25	YES	YES	NO
Aluminum	E2	SD	1991	28	28	1.00	NO	NO	YES
Aluminum	E2	SS	1991	25	25	1.00	NO	NO	YES
Aluminum	E2	WW	2005	3	0	0.00	YES	YES	NO
Aluminum	E5	FC	2005	4	0	0.00	YES	YES	NO
Aluminum	E5	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	E5	SB	2005	8	2	0.25	NO	YES	NO
Aluminum	E5	SS	1991	25	25	1.00	NO	NO	YES
Aluminum	E5	WW	2005	2	1	0.50	YES	NO	NO
Aluminum	E6	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	E6	SS	1991	19	19	1.00	NO	NO	YES
Aluminum	N2	FC	2005	5	0	0.00	YES	YES	NO
Aluminum	N2	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	N2	SB	2005	5	1	0.20	YES	YES	NO
Aluminum	N2	SD	1991	28	28	1.00	NO	NO	YES
Aluminum	N2	SS	1991	25	25	1.00	NO	NO	YES
Aluminum	N2	WW	2005	3	1	0.33	YES	YES	NO
Aluminum	N4	FC	2005	4	0	0.00	YES	YES	NO
Aluminum	N4	NG	2002	17	16	0.94	NO	NO	YES
Aluminum	N4	SB	2005	5	1	0.20	YES	YES	NO
Aluminum	N4	SS	1991	18	18	1.00	NO	NO	YES
Aluminum	N4	WW	2005	5	2	0.40	YES	YES	NO
Aluminum	N5	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	N5	SD	1991	17	17	1.00	NO	NO	YES
Aluminum	N5	SS	1991	17	17	1.00	NO	NO	YES
Aluminum	S1	FC	2005	3	0	0.00	YES	YES	NO
Aluminum	S1	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	S1	SB	2005	9	1	0.11	NO	YES	NO
Aluminum	S1	SD	1991	28	28	1.00	NO	NO	YES
Aluminum	S1	SS	1991	27	27	1.00	NO	NO	YES
Aluminum	S1	WW	2005	2	0	0.00	YES	YES	NO
Aluminum	S2	FC	2005	3	0	0.00	YES	YES	NO
Aluminum	S2	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	S2	SB	2005	9	1	0.11	NO	YES	NO
Aluminum	S2	SS	1991	27	27	1.00	NO	NO	YES
Aluminum	S2	WW	2005	2	0	0.00	YES	YES	NO
Aluminum	S4	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	S4	SB	2005	9	3	0.33	NO	YES	NO
Aluminum	S4	SD	1991	28	28	1.00	NO	NO	YES
Aluminum	S4	SS	1991	24	24	1.00	NO	NO	YES
Aluminum	S4	WW	2005	4	0	0.00	YES	YES	NO
Aluminum	W2	FC	2005	1	0	0.00	YES	YES	NO
Aluminum	W2	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	W2	SB	2005	8	1	0.13	NO	YES	NO
Aluminum	W2	SS	1991	24	24	1.00	NO	NO	YES
Aluminum	W2	WW	2005	5	2	0.40	YES	YES	NO
Aluminum	W4	FC	2005	5	0	0.00	YES	YES	NO
Aluminum	W4	NG	2002	17	17	1.00	NO	NO	YES
Aluminum	W4	SB	2005	6	2	0.33	NO	YES	NO
Aluminum	W4	SS	1991	19	19	1.00	NO	NO	YES
Aluminum	W4	WW	2005	3	0	0.00	YES	YES	NO
Arsenic	E1	FC	2003	5	0	0.00	YES	YES	NO
Arsenic	E1	NG	2003	16	1	0.06	NO	YES	NO
Arsenic	E1	SB	2003	8	0	0.00	NO	YES	NO
Arsenic	E1	SS	1991	25	24	0.96	NO	NO	YES
Arsenic	E1	WW	2003	3	0	0.00	YES	YES	NO
Arsenic	E2	FC	2003	4	0	0.00	YES	YES	NO
Arsenic	E2	NG	2003	16	1	0.06	NO	YES	NO
Arsenic	E2	SB	2003	5	0	0.00	YES	YES	NO
Arsenic	E2	SD	1991	28	28	1.00	NO	NO	YES
Arsenic	E2	SS	1991	25	25	1.00	NO	NO	YES
Arsenic	E2	WW	2003	3	0	0.00	YES	YES	NO
Arsenic	E5	FC	2003	5	0	0.00	YES	YES	NO
Arsenic	E5	NG	2003	16	3	0.19	NO	YES	NO
Arsenic	E5	SB	2003	8	0	0.00	NO	YES	NO
Arsenic	E5	SS	1991	25	25	1.00	NO	NO	YES
Arsenic	E5	WW	2003	3	0	0.00	YES	YES	NO
Arsenic	E6	NG	2003	16	6	0.38	NO	YES	NO
Arsenic	E6	SS	1991	19	19	1.00	NO	NO	YES
Arsenic	N2	FC	2003	5	0	0.00	YES	YES	NO
Arsenic	N2	NG	2003	16	1	0.06	NO	YES	NO
Arsenic	N2	SB	2003	6	0	0.00	NO	YES	NO
Arsenic	N2	SD	1991	28	28	1.00	NO	NO	YES
Arsenic	N2	SS	1991	25	25	1.00	NO	NO	YES
Arsenic	N2	WW	2003	4	0	0.00	YES	YES	NO
Arsenic	N4	FC	2003	5	0	0.00	YES	YES	NO
Arsenic	N4	NG	2003	16	3	0.19	NO	YES	NO
Arsenic	N4	SB	2003	5	0	0.00	YES	YES	NO
Arsenic	N4	SS	1991	18	18	1.00	NO	NO	YES
Arsenic	N4	WW	2003	5	0	0.00	YES	YES	NO
Arsenic	N5	NG	2003	16	7	0.44	NO	YES	NO
Arsenic	N5	SD	1991	17	17	1.00	NO	NO	YES
Arsenic	N5	SS	1991	17	17	1.00	NO	NO	YES
Arsenic	S1	FC	2003	3	0	0.00	YES	YES	NO

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**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Arsenic	S1	NG	2003	16	2	0.13	NO	YES	NO
Arsenic	S1	SB	2003	11	0	0.00	NO	YES	NO
Arsenic	S1	SD	1991	28	28	1.00	NO	NO	YES
Arsenic	S1	SS	1991	27	27	1.00	NO	NO	YES
Arsenic	S1	WW	2003	2	0	0.00	YES	YES	NO
Arsenic	S2	FC	2003	3	0	0.00	YES	YES	NO
Arsenic	S2	NG	2003	16	3	0.19	NO	YES	NO
Arsenic	S2	SB	2003	11	0	0.00	NO	YES	NO
Arsenic	S2	SS	1991	27	27	1.00	NO	NO	YES
Arsenic	S2	WW	2003	2	0	0.00	YES	YES	NO
Arsenic	S4	NG	2003	16	1	0.06	NO	YES	NO
Arsenic	S4	SB	2003	11	0	0.00	NO	YES	NO
Arsenic	S4	SD	1991	28	28	1.00	NO	NO	YES
Arsenic	S4	SS	1991	24	24	1.00	NO	NO	YES
Arsenic	S4	WW	2003	4	0	0.00	YES	YES	NO
Arsenic	W2	FC	2003	1	0	0.00	YES	YES	NO
Arsenic	W2	NG	2003	16	3	0.19	NO	YES	NO
Arsenic	W2	SB	2003	9	0	0.00	NO	YES	NO
Arsenic	W2	SS	1991	24	24	1.00	NO	NO	YES
Arsenic	W2	WW	2003	6	0	0.00	NO	YES	NO
Arsenic	W4	FC	2003	6	0	0.00	NO	YES	NO
Arsenic	W4	NG	2003	16	4	0.25	NO	YES	NO
Arsenic	W4	SB	2003	7	0	0.00	NO	YES	NO
Arsenic	W4	SS	1991	19	19	1.00	NO	NO	YES
Arsenic	W4	WW	2003	3	0	0.00	YES	YES	NO
Barium	E1	FC	2005	4	1	0.25	YES	YES	NO
Barium	E1	NG	1991	28	28	1.00	NO	NO	YES
Barium	E1	SB	1991	17	16	0.94	NO	NO	YES
Barium	E1	SS	1991	25	25	1.00	NO	NO	YES
Barium	E1	WW	1991	4	4	1.00	YES	NO	NO
Barium	E2	FC	2005	3	0	0.00	YES	YES	NO
Barium	E2	NG	1991	28	28	1.00	NO	NO	YES
Barium	E2	SB	1991	12	12	1.00	NO	NO	YES
Barium	E2	SD	1991	28	28	1.00	NO	NO	YES
Barium	E2	SS	1991	25	25	1.00	NO	NO	YES
Barium	E2	WW	1991	5	5	1.00	YES	NO	NO
Barium	E5	FC	2005	4	1	0.25	YES	YES	NO
Barium	E5	NG	1991	27	27	1.00	NO	NO	YES
Barium	E5	SB	1991	17	16	0.94	NO	NO	YES
Barium	E5	SS	1991	25	25	1.00	NO	NO	YES
Barium	E5	WW	1991	4	4	1.00	YES	NO	NO
Barium	E6	NG	1991	19	19	1.00	NO	NO	YES
Barium	E6	SS	1991	19	19	1.00	NO	NO	YES
Barium	N2	FC	2005	5	1	0.20	YES	YES	NO
Barium	N2	NG	1991	28	28	1.00	NO	NO	YES
Barium	N2	SB	1991	16	16	1.00	NO	NO	YES
Barium	N2	SD	1991	28	28	1.00	NO	NO	YES
Barium	N2	SS	1991	25	25	1.00	NO	NO	YES
Barium	N2	WW	1991	5	5	1.00	YES	NO	NO
Barium	N4	FC	2005	4	1	0.25	YES	YES	NO
Barium	N4	NG	1991	18	18	1.00	NO	NO	YES
Barium	N4	SB	1991	5	5	1.00	YES	NO	NO
Barium	N4	SS	1991	18	18	1.00	NO	NO	YES
Barium	N4	WW	1991	5	5	1.00	YES	NO	NO
Barium	N5	NG	1991	17	17	1.00	NO	NO	YES
Barium	N5	SD	1991	17	17	1.00	NO	NO	YES
Barium	N5	SS	1991	17	17	1.00	NO	NO	YES
Barium	S1	FC	2005	3	0	0.00	YES	YES	NO
Barium	S1	NG	1991	28	28	1.00	NO	NO	YES
Barium	S1	SB	1991	19	19	1.00	NO	NO	YES
Barium	S1	SD	1991	28	28	1.00	NO	NO	YES
Barium	S1	SS	1991	27	27	1.00	NO	NO	YES
Barium	S1	WW	1991	4	4	1.00	YES	NO	NO
Barium	S2	FC	2005	3	0	0.00	YES	YES	NO
Barium	S2	NG	1991	28	28	1.00	NO	NO	YES
Barium	S2	SB	1991	19	19	1.00	NO	NO	YES
Barium	S2	SS	1991	27	27	1.00	NO	NO	YES
Barium	S2	WW	1991	4	4	1.00	YES	NO	NO
Barium	S4	NG	1991	26	26	1.00	NO	NO	YES
Barium	S4	SB	1991	17	16	0.94	NO	NO	YES
Barium	S4	SD	1991	28	28	1.00	NO	NO	YES
Barium	S4	SS	1991	24	24	1.00	NO	NO	YES
Barium	S4	WW	1991	7	7	1.00	NO	NO	YES
Barium	W2	FC	2005	1	0	0.00	YES	YES	NO
Barium	W2	NG	1991	28	28	1.00	NO	NO	YES
Barium	W2	SB	1991	18	18	1.00	NO	NO	YES
Barium	W2	SS	1991	24	24	1.00	NO	NO	YES
Barium	W2	WW	1991	7	7	1.00	NO	NO	YES
Barium	W4	FC	2005	5	0	0.00	YES	YES	NO
Barium	W4	NG	1991	22	22	1.00	NO	NO	YES
Barium	W4	SB	1991	10	9	0.90	NO	NO	YES
Barium	W4	SS	1991	19	19	1.00	NO	NO	YES
Barium	W4	WW	1991	3	3	1.00	YES	NO	NO
Beryllium	E1	FC	2003	5	0	0.00	YES	YES	NO
Beryllium	E1	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	E1	SB	2003	8	0	0.00	NO	YES	NO
Beryllium	E1	SS	1991	25	24	0.96	NO	NO	YES
Beryllium	E1	WW	2003	3	0	0.00	YES	YES	NO
Beryllium	E2	FC	2003	4	0	0.00	YES	YES	NO
Beryllium	E2	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	E2	SB	2003	5	0	0.00	YES	YES	NO

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Beryllium	E2	SD	1991	28	28	1.00	NO	NO	YES
Beryllium	E2	SS	1991	25	24	0.96	NO	NO	YES
Beryllium	E2	WW	2003	3	0	0.00	YES	YES	NO
Beryllium	E5	FC	2003	5	0	0.00	YES	YES	NO
Beryllium	E5	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	E5	SB	2003	8	0	0.00	NO	YES	NO
Beryllium	E5	SS	1991	25	25	1.00	NO	NO	YES
Beryllium	E5	WW	2003	3	0	0.00	YES	YES	NO
Beryllium	E6	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	E6	SS	1991	19	18	0.95	NO	NO	YES
Beryllium	N2	FC	2003	5	0	0.00	YES	YES	NO
Beryllium	N2	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	N2	SB	2003	6	0	0.00	NO	YES	NO
Beryllium	N2	SD	1991	28	28	1.00	NO	NO	YES
Beryllium	N2	SS	1991	25	25	1.00	NO	NO	YES
Beryllium	N2	WW	2003	4	0	0.00	YES	YES	NO
Beryllium	N4	FC	2003	5	0	0.00	YES	YES	NO
Beryllium	N4	NG	2003	16	1	0.06	NO	YES	NO
Beryllium	N4	SB	2003	5	0	0.00	YES	YES	NO
Beryllium	N4	SS	1991	18	17	0.94	NO	NO	YES
Beryllium	N4	WW	2003	5	0	0.00	YES	YES	NO
Beryllium	N5	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	N5	SD	1991	17	17	1.00	NO	NO	YES
Beryllium	N5	SS	1991	17	17	1.00	NO	NO	YES
Beryllium	S1	FC	2003	3	0	0.00	YES	YES	NO
Beryllium	S1	NG	2003	16	1	0.06	NO	YES	NO
Beryllium	S1	SB	2003	11	0	0.00	NO	YES	NO
Beryllium	S1	SD	1991	28	27	0.96	NO	NO	YES
Beryllium	S1	SS	1991	27	27	1.00	NO	NO	YES
Beryllium	S1	WW	2003	2	0	0.00	YES	YES	NO
Beryllium	S2	FC	2003	3	0	0.00	YES	YES	NO
Beryllium	S2	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	S2	SB	2003	11	0	0.00	NO	YES	NO
Beryllium	S2	SS	1991	27	27	1.00	NO	NO	YES
Beryllium	S2	WW	2003	2	0	0.00	YES	YES	NO
Beryllium	S4	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	S4	SB	2003	11	0	0.00	NO	YES	NO
Beryllium	S4	SD	1991	28	28	1.00	NO	NO	YES
Beryllium	S4	SS	1991	24	24	1.00	NO	NO	YES
Beryllium	S4	WW	2003	4	0	0.00	YES	YES	NO
Beryllium	W2	FC	2003	1	0	0.00	YES	YES	NO
Beryllium	W2	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	W2	SB	2003	9	0	0.00	NO	YES	NO
Beryllium	W2	SS	1991	24	23	0.96	NO	NO	YES
Beryllium	W2	WW	2003	6	0	0.00	NO	YES	NO
Beryllium	W4	FC	2003	6	0	0.00	NO	YES	NO
Beryllium	W4	NG	2003	16	0	0.00	NO	YES	NO
Beryllium	W4	SB	2003	7	0	0.00	NO	YES	NO
Beryllium	W4	SS	1991	19	19	1.00	NO	NO	YES
Beryllium	W4	WW	2003	3	0	0.00	YES	YES	NO
Boron	E1	FC	2005	4	2	0.50	YES	NO	NO
Boron	E1	NG	1999	20	20	1.00	NO	NO	YES
Boron	E1	SB	1991	17	17	1.00	NO	NO	YES
Boron	E1	SS	1998	19	19	1.00	NO	NO	YES
Boron	E1	WW	2003	3	1	0.33	YES	YES	NO
Boron	E2	FC	2005	3	1	0.33	YES	YES	NO
Boron	E2	NG	1999	20	20	1.00	NO	NO	YES
Boron	E2	SB	1991	12	12	1.00	NO	NO	YES
Boron	E2	SD	1995	24	24	1.00	NO	NO	YES
Boron	E2	SS	1998	19	19	1.00	NO	NO	YES
Boron	E2	WW	2003	3	0	0.00	YES	YES	NO
Boron	E5	FC	2005	4	2	0.50	YES	NO	NO
Boron	E5	NG	1999	20	20	1.00	NO	NO	YES
Boron	E5	SB	1991	17	17	1.00	NO	NO	YES
Boron	E5	SS	1998	19	19	1.00	NO	NO	YES
Boron	E5	WW	2003	3	1	0.33	YES	YES	NO
Boron	E6	NG	1999	19	19	1.00	NO	NO	YES
Boron	E6	SS	1998	19	19	1.00	NO	NO	YES
Boron	N2	FC	2005	5	4	0.80	YES	NO	NO
Boron	N2	NG	1999	20	20	1.00	NO	NO	YES
Boron	N2	SB	1991	16	16	1.00	NO	NO	YES
Boron	N2	SD	1995	24	23	0.96	NO	NO	YES
Boron	N2	SS	1998	19	19	1.00	NO	NO	YES
Boron	N2	WW	2003	4	1	0.25	YES	YES	NO
Boron	N4	FC	2005	4	2	0.50	YES	NO	NO
Boron	N4	NG	1999	18	18	1.00	NO	NO	YES
Boron	N4	SB	1991	5	5	1.00	YES	NO	NO
Boron	N4	SS	1998	18	18	1.00	NO	NO	YES
Boron	N4	WW	2003	5	2	0.40	YES	YES	NO
Boron	N5	NG	1999	17	17	1.00	NO	NO	YES
Boron	N5	SD	1995	17	17	1.00	NO	NO	YES
Boron	N5	SS	1998	17	17	1.00	NO	NO	YES
Boron	S1	FC	2005	3	1	0.33	YES	YES	NO
Boron	S1	NG	1999	20	20	1.00	NO	NO	YES
Boron	S1	SB	1991	19	19	1.00	NO	NO	YES
Boron	S1	SD	1995	24	24	1.00	NO	NO	YES
Boron	S1	SS	1998	20	20	1.00	NO	NO	YES
Boron	S1	WW	2003	2	0	0.00	YES	YES	NO
Boron	S2	FC	2005	3	1	0.33	YES	YES	NO
Boron	S2	NG	1999	20	20	1.00	NO	NO	YES
Boron	S2	SB	1991	19	19	1.00	NO	NO	YES

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Boron	S2	SS	1998	20	20	1.00	NO	NO	YES
Boron	S2	WW	2003	2	0	0.00	YES	YES	NO
Boron	S4	NG	1999	20	20	1.00	NO	NO	YES
Boron	S4	SB	1991	17	17	1.00	NO	NO	YES
Boron	S4	SD	1995	24	24	1.00	NO	NO	YES
Boron	S4	SS	1998	19	19	1.00	NO	NO	YES
Boron	S4	WW	2003	4	0	0.00	YES	YES	NO
Boron	W2	FC	2005	1	0	0.00	YES	YES	NO
Boron	W2	NG	1999	20	20	1.00	NO	NO	YES
Boron	W2	SB	1991	18	18	1.00	NO	NO	YES
Boron	W2	SS	1998	17	17	1.00	NO	NO	YES
Boron	W2	WW	2003	6	1	0.17	NO	YES	NO
Boron	W4	FC	2005	5	3	0.60	YES	NO	NO
Boron	W4	NG	1999	20	19	0.95	NO	NO	YES
Boron	W4	SB	1991	10	10	1.00	NO	NO	YES
Boron	W4	SS	1998	19	19	1.00	NO	NO	YES
Boron	W4	WW	2003	2	1	0.50	YES	NO	NO
Cadmium	E1	FC	2007	4	0	0.00	YES	YES	NO
Cadmium	E1	NG	2001	18	5	0.28	NO	YES	NO
Cadmium	E1	SB	2005	8	0	0.00	NO	YES	NO
Cadmium	E1	SS	1991	25	21	0.84	NO	NO	YES
Cadmium	E1	WW	2005	2	1	0.50	YES	NO	NO
Cadmium	E2	FC	2007	3	0	0.00	YES	YES	NO
Cadmium	E2	NG	2001	18	5	0.28	NO	YES	NO
Cadmium	E2	SB	2005	4	1	0.25	YES	YES	NO
Cadmium	E2	SD	1991	28	21	0.75	NO	NO	YES
Cadmium	E2	SS	1991	25	24	0.96	NO	NO	YES
Cadmium	E2	WW	2005	3	1	0.33	YES	YES	NO
Cadmium	E5	FC	2007	4	0	0.00	YES	YES	NO
Cadmium	E5	NG	2001	18	13	0.72	NO	NO	YES
Cadmium	E5	SB	2005	8	0	0.00	NO	YES	NO
Cadmium	E5	SS	1991	25	22	0.88	NO	NO	YES
Cadmium	E5	WW	2005	2	1	0.50	YES	NO	NO
Cadmium	E6	NG	2001	18	15	0.83	NO	NO	YES
Cadmium	E6	SS	1991	19	19	1.00	NO	NO	YES
Cadmium	N2	FC	2007	4	1	0.25	YES	YES	NO
Cadmium	N2	NG	2001	18	5	0.28	NO	YES	NO
Cadmium	N2	SB	2005	5	2	0.40	YES	YES	NO
Cadmium	N2	SD	1991	28	26	0.93	NO	NO	YES
Cadmium	N2	SS	1991	25	23	0.92	NO	NO	YES
Cadmium	N2	WW	2005	3	3	1.00	YES	NO	NO
Cadmium	N4	FC	2007	4	0	0.00	YES	YES	NO
Cadmium	N4	NG	2001	18	4	0.22	NO	YES	NO
Cadmium	N4	SB	2005	5	2	0.40	YES	YES	NO
Cadmium	N4	SS	1991	18	16	0.89	NO	NO	YES
Cadmium	N4	WW	2005	5	4	0.80	YES	NO	NO
Cadmium	N5	NG	2001	17	14	0.82	NO	NO	YES
Cadmium	N5	SD	1991	17	17	1.00	NO	NO	YES
Cadmium	N5	SS	1991	17	17	1.00	NO	NO	YES
Cadmium	S1	FC	2007	2	0	0.00	YES	YES	NO
Cadmium	S1	NG	2001	18	12	0.67	NO	NO	YES
Cadmium	S1	SB	2005	9	1	0.11	NO	YES	NO
Cadmium	S1	SD	1991	28	26	0.93	NO	NO	YES
Cadmium	S1	SS	1991	27	25	0.93	NO	NO	YES
Cadmium	S1	WW	2005	2	0	0.00	YES	YES	NO
Cadmium	S2	FC	2007	2	0	0.00	YES	YES	NO
Cadmium	S2	NG	2001	18	11	0.61	NO	NO	YES
Cadmium	S2	SB	2005	9	2	0.22	NO	YES	NO
Cadmium	S2	SS	1991	27	25	0.93	NO	NO	YES
Cadmium	S2	WW	2005	2	0	0.00	YES	YES	NO
Cadmium	S4	NG	2001	18	7	0.39	NO	YES	NO
Cadmium	S4	SB	2005	9	2	0.22	NO	YES	NO
Cadmium	S4	SD	1991	28	26	0.93	NO	NO	YES
Cadmium	S4	SS	1991	24	20	0.83	NO	NO	YES
Cadmium	S4	WW	2005	4	4	1.00	YES	NO	NO
Cadmium	W2	FC	2007	1	0	0.00	YES	YES	NO
Cadmium	W2	NG	2001	18	5	0.28	NO	YES	NO
Cadmium	W2	SB	2005	8	3	0.38	NO	YES	NO
Cadmium	W2	SS	1991	24	23	0.96	NO	NO	YES
Cadmium	W2	WW	2005	5	4	0.80	YES	NO	NO
Cadmium	W4	FC	2007	5	1	0.20	YES	YES	NO
Cadmium	W4	NG	2001	18	17	0.94	NO	NO	YES
Cadmium	W4	SB	2005	6	5	0.83	NO	NO	YES
Cadmium	W4	SS	1991	19	18	0.95	NO	NO	YES
Cadmium	W4	WW	2005	3	3	1.00	YES	NO	NO
Calcium	E1	FC	1991	6	6	1.00	NO	NO	YES
Calcium	E1	NG	1991	28	28	1.00	NO	NO	YES
Calcium	E1	SB	1991	17	17	1.00	NO	NO	YES
Calcium	E1	SS	1991	25	25	1.00	NO	NO	YES
Calcium	E1	WW	1991	4	4	1.00	YES	NO	NO
Calcium	E2	FC	1991	6	6	1.00	NO	NO	YES
Calcium	E2	NG	1991	28	28	1.00	NO	NO	YES
Calcium	E2	SB	1991	12	12	1.00	NO	NO	YES
Calcium	E2	SD	1991	28	28	1.00	NO	NO	YES
Calcium	E2	SS	1991	25	25	1.00	NO	NO	YES
Calcium	E2	WW	1991	5	5	1.00	YES	NO	NO
Calcium	E5	FC	1991	6	6	1.00	NO	NO	YES
Calcium	E5	NG	1991	27	27	1.00	NO	NO	YES
Calcium	E5	SB	1991	17	17	1.00	NO	NO	YES
Calcium	E5	SS	1991	25	25	1.00	NO	NO	YES
Calcium	E5	WW	1991	4	4	1.00	YES	NO	NO



**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Calcium	E6	NG	1991	19	19	1.00	NO	NO	YES
Calcium	E6	SS	1991	19	19	1.00	NO	NO	YES
Calcium	N2	FC	1991	6	6	1.00	NO	NO	YES
Calcium	N2	NG	1991	28	28	1.00	NO	NO	YES
Calcium	N2	SB	1991	16	16	1.00	NO	NO	YES
Calcium	N2	SD	1991	28	28	1.00	NO	NO	YES
Calcium	N2	SS	1991	25	25	1.00	NO	NO	YES
Calcium	N2	WW	1991	5	5	1.00	YES	NO	NO
Calcium	N4	FC	1991	5	5	1.00	YES	NO	NO
Calcium	N4	NG	1991	18	18	1.00	NO	NO	YES
Calcium	N4	SB	1991	5	5	1.00	YES	NO	NO
Calcium	N4	SS	1991	18	18	1.00	NO	NO	YES
Calcium	N4	WW	1991	5	5	1.00	YES	NO	NO
Calcium	N5	NG	1991	17	17	1.00	NO	NO	YES
Calcium	N5	SD	1991	17	17	1.00	NO	NO	YES
Calcium	N5	SS	1991	17	17	1.00	NO	NO	YES
Calcium	S1	FC	1991	5	5	1.00	YES	NO	NO
Calcium	S1	NG	1991	28	28	1.00	NO	NO	YES
Calcium	S1	SB	1991	19	19	1.00	NO	NO	YES
Calcium	S1	SD	1991	28	28	1.00	NO	NO	YES
Calcium	S1	SS	1991	27	27	1.00	NO	NO	YES
Calcium	S1	WW	1991	4	4	1.00	YES	NO	NO
Calcium	S2	FC	1991	5	5	1.00	YES	NO	NO
Calcium	S2	NG	1991	28	28	1.00	NO	NO	YES
Calcium	S2	SB	1991	19	19	1.00	NO	NO	YES
Calcium	S2	SS	1991	27	27	1.00	NO	NO	YES
Calcium	S2	WW	1991	4	4	1.00	YES	NO	NO
Calcium	S4	NG	1991	26	26	1.00	NO	NO	YES
Calcium	S4	SB	1991	17	17	1.00	NO	NO	YES
Calcium	S4	SD	1991	28	28	1.00	NO	NO	YES
Calcium	S4	SS	1991	24	24	1.00	NO	NO	YES
Calcium	S4	WW	1991	7	7	1.00	NO	NO	YES
Calcium	W2	FC	1991	1	1	1.00	YES	NO	NO
Calcium	W2	NG	1991	28	28	1.00	NO	NO	YES
Calcium	W2	SB	1991	18	18	1.00	NO	NO	YES
Calcium	W2	SS	1991	24	24	1.00	NO	NO	YES
Calcium	W2	WW	1991	7	7	1.00	NO	NO	YES
Calcium	W4	FC	1991	8	8	1.00	NO	NO	YES
Calcium	W4	NG	1991	22	22	1.00	NO	NO	YES
Calcium	W4	SB	1991	10	10	1.00	NO	NO	YES
Calcium	W4	SS	1991	19	19	1.00	NO	NO	YES
Calcium	W4	WW	1991	3	3	1.00	YES	NO	NO
Chloride	E1	FC	1991	6	6	1	NO	NO	YES
Chloride	E1	NG	1991	23	23	1	NO	NO	YES
Chloride	E1	SB	1991	13	10	0.77	NO	NO	YES
Chloride	E1	SS	2009	10	9	0.90	NO	NO	YES
Chloride	E1	WW	1991	4	4	1.00	YES	NO	NO
Chloride	E2	FC	1991	5	5	1.00	YES	NO	NO
Chloride	E2	NG	1991	23	23	1.00	NO	NO	YES
Chloride	E2	SB	1991	9	8	0.89	NO	NO	YES
Chloride	E2	SD	1991	23	23	1.00	NO	NO	YES
Chloride	E2	SS	2009	10	9	0.90	NO	NO	YES
Chloride	E2	WW	1991	4	4	1.00	YES	NO	NO
Chloride	E5	FC	1991	6	6	1.00	NO	NO	YES
Chloride	E5	NG	1991	23	23	1.00	NO	NO	YES
Chloride	E5	SB	1991	14	10	0.71	NO	NO	YES
Chloride	E5	SS	2009	10	9	0.90	NO	NO	YES
Chloride	E5	WW	1991	3	3	1.00	YES	NO	NO
Chloride	E6	NG	1991	19	19	1.00	NO	NO	YES
Chloride	E6	SS	2009	10	10	1.00	NO	NO	YES
Chloride	N2	FC	1991	6	6	1.00	NO	NO	YES
Chloride	N2	NG	1991	24	24	1.00	NO	NO	YES
Chloride	N2	SB	1991	11	8	0.73	NO	NO	YES
Chloride	N2	SD	1991	23	23	1.00	NO	NO	YES
Chloride	N2	SS	2009	10	9	0.90	NO	NO	YES
Chloride	N2	WW	1991	5	5	1.00	YES	NO	NO
Chloride	N4	FC	1991	5	5	1.00	YES	NO	NO
Chloride	N4	NG	1991	18	18	1.00	NO	NO	YES
Chloride	N4	SB	1991	5	5	1.00	YES	NO	NO
Chloride	N4	SS	2009	10	10	1.00	NO	NO	YES
Chloride	N4	WW	1991	5	5	1.00	YES	NO	NO
Chloride	N5	NG	1991	17	17	1.00	NO	NO	YES
Chloride	N5	SD	1991	17	17	1.00	NO	NO	YES
Chloride	N5	SS	2009	10	9	0.90	NO	NO	YES
Chloride	S1	FC	1991	5	5	1.00	YES	NO	NO
Chloride	S1	NG	1991	23	23	1.00	NO	NO	YES
Chloride	S1	SB	1991	16	14	0.88	NO	NO	YES
Chloride	S1	SD	1991	23	23	1.00	NO	NO	YES
Chloride	S1	SS	2009	10	10	1.00	NO	NO	YES
Chloride	S1	WW	1991	3	3	1.00	YES	NO	NO
Chloride	S2	FC	1991	5	5	1.00	YES	NO	NO
Chloride	S2	NG	1991	24	24	1.00	NO	NO	YES
Chloride	S2	SB	1991	16	14	0.88	NO	NO	YES
Chloride	S2	SS	2009	10	10	1.00	NO	NO	YES
Chloride	S2	WW	1991	3	3	1.00	YES	NO	NO
Chloride	S4	NG	1991	23	23	1.00	NO	NO	YES
Chloride	S4	SB	1991	15	14	0.93	NO	NO	YES
Chloride	S4	SD	1991	23	23	1.00	NO	NO	YES
Chloride	S4	SS	2009	10	9	0.90	NO	NO	YES
Chloride	S4	WW	1991	6	6	1.00	NO	NO	YES
Chloride	W2	FC	1991	1	1	1.00	YES	NO	NO

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**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Chloride	W2	NG	1991	23	23	1.00	NO	NO	YES
Chloride	W2	SB	1991	16	13	0.81	NO	NO	YES
Chloride	W2	SS	2009	10	9	0.90	NO	NO	YES
Chloride	W2	WW	1991	7	7	1.00	NO	NO	YES
Chloride	W4	FC	1991	8	8	1.00	NO	NO	YES
Chloride	W4	NG	1991	22	22	1.00	NO	NO	YES
Chloride	W4	SB	1991	10	9	0.90	NO	NO	YES
Chloride	W4	SS	2009	10	9	0.90	NO	NO	YES
Chloride	W4	WW	1991	3	3	1.00	YES	NO	NO
Chromium	E1	FC	2003	5	1	0.20	YES	YES	NO
Chromium	E1	NG	2002	17	17	1.00	NO	NO	YES
Chromium	E1	SB	2002	9	2	0.22	NO	YES	NO
Chromium	E1	SS	1991	25	25	1.00	NO	NO	YES
Chromium	E1	WW	2003	3	3	1.00	YES	NO	NO
Chromium	E2	FC	2003	4	0	0.00	YES	YES	NO
Chromium	E2	NG	2002	17	17	1.00	NO	NO	YES
Chromium	E2	SB	2002	5	3	0.60	YES	NO	NO
Chromium	E2	SD	1991	28	28	1.00	NO	NO	YES
Chromium	E2	SS	1991	25	25	1.00	NO	NO	YES
Chromium	E2	WW	2003	3	3	1.00	YES	NO	NO
Chromium	E5	FC	2003	5	1	0.20	YES	YES	NO
Chromium	E5	NG	2002	17	17	1.00	NO	NO	YES
Chromium	E5	SB	2002	9	4	0.44	NO	YES	NO
Chromium	E5	SS	1991	25	25	1.00	NO	NO	YES
Chromium	E5	WW	2003	3	3	1.00	YES	NO	NO
Chromium	E6	NG	2002	17	17	1.00	NO	NO	YES
Chromium	E6	SS	1991	19	19	1.00	NO	NO	YES
Chromium	N2	FC	2003	5	1	0.20	YES	YES	NO
Chromium	N2	NG	2002	17	16	0.94	NO	NO	YES
Chromium	N2	SB	2002	7	2	0.29	NO	YES	NO
Chromium	N2	SD	1991	28	28	1.00	NO	NO	YES
Chromium	N2	SS	1991	25	25	1.00	NO	NO	YES
Chromium	N2	WW	2003	4	4	1.00	YES	NO	NO
Chromium	N4	FC	2003	5	0	0.00	YES	YES	NO
Chromium	N4	NG	2002	17	17	1.00	NO	NO	YES
Chromium	N4	SB	2002	5	3	0.60	YES	NO	NO
Chromium	N4	SS	1991	18	18	1.00	NO	NO	YES
Chromium	N4	WW	2003	5	4	0.80	YES	NO	NO
Chromium	N5	NG	2002	17	17	1.00	NO	NO	YES
Chromium	N5	SD	1991	17	17	1.00	NO	NO	YES
Chromium	N5	SS	1991	17	17	1.00	NO	NO	YES
Chromium	S1	FC	2003	3	1	0.33	YES	YES	NO
Chromium	S1	NG	2002	17	17	1.00	NO	NO	YES
Chromium	S1	SB	2002	11	4	0.36	NO	YES	NO
Chromium	S1	SD	1991	28	28	1.00	NO	NO	YES
Chromium	S1	SS	1991	27	27	1.00	NO	NO	YES
Chromium	S1	WW	2003	2	2	1.00	YES	NO	NO
Chromium	S2	FC	2003	3	2	0.67	YES	NO	NO
Chromium	S2	NG	2002	17	17	1.00	NO	NO	YES
Chromium	S2	SB	2002	11	5	0.45	NO	YES	NO
Chromium	S2	SS	1991	27	27	1.00	NO	NO	YES
Chromium	S2	WW	2003	2	2	1.00	YES	NO	NO
Chromium	S4	NG	2002	17	17	1.00	NO	NO	YES
Chromium	S4	SB	2002	11	5	0.45	NO	YES	NO
Chromium	S4	SD	1991	28	28	1.00	NO	NO	YES
Chromium	S4	SS	1991	24	24	1.00	NO	NO	YES
Chromium	S4	WW	2003	4	4	1.00	YES	NO	NO
Chromium	W2	FC	2003	1	0	0.00	YES	YES	NO
Chromium	W2	NG	2002	17	17	1.00	NO	NO	YES
Chromium	W2	SB	2002	10	6	0.60	NO	NO	YES
Chromium	W2	SS	1991	24	24	1.00	NO	NO	YES
Chromium	W2	WW	2003	6	5	0.83	NO	NO	YES
Chromium	W4	FC	2003	6	0	0.00	NO	YES	NO
Chromium	W4	NG	2002	17	17	1.00	NO	NO	YES
Chromium	W4	SB	2002	8	6	0.75	NO	NO	YES
Chromium	W4	SS	1991	19	19	1.00	NO	NO	YES
Chromium	W4	WW	2003	3	3	1.00	YES	NO	NO
Cobalt	E1	FC	2005	4	0	0.00	YES	YES	NO
Cobalt	E1	NG	2003	16	4	0.25	NO	YES	NO
Cobalt	E1	SB	2005	8	0	0.00	NO	YES	NO
Cobalt	E1	SS	1991	25	24	0.96	NO	NO	YES
Cobalt	E1	WW	2005	2	0	0.00	YES	YES	NO
Cobalt	E2	FC	2005	3	0	0.00	YES	YES	NO
Cobalt	E2	NG	2003	16	4	0.25	NO	YES	NO
Cobalt	E2	SB	2005	4	2	0.50	YES	NO	NO
Cobalt	E2	SD	1991	28	28	1.00	NO	NO	YES
Cobalt	E2	SS	1991	25	23	0.92	NO	NO	YES
Cobalt	E2	WW	2005	3	0	0.00	YES	YES	NO
Cobalt	E5	FC	2005	4	0	0.00	YES	YES	NO
Cobalt	E5	NG	2003	16	8	0.50	NO	NO	YES
Cobalt	E5	SB	2005	8	1	0.13	NO	YES	NO
Cobalt	E5	SS	1991	25	25	1.00	NO	NO	YES
Cobalt	E5	WW	2005	2	0	0.00	YES	YES	NO
Cobalt	E6	NG	2003	16	9	0.56	NO	NO	YES
Cobalt	E6	SS	1991	19	19	1.00	NO	NO	YES
Cobalt	N2	FC	2005	5	0	0.00	YES	YES	NO
Cobalt	N2	NG	2003	16	7	0.44	NO	YES	NO
Cobalt	N2	SB	2005	5	0	0.00	YES	YES	NO
Cobalt	N2	SD	1991	28	28	1.00	NO	NO	YES
Cobalt	N2	SS	1991	25	25	1.00	NO	NO	YES
Cobalt	N2	WW	2005	3	0	0.00	YES	YES	NO

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Cobalt	N4	FC	2005	4	0	0.00	YES	YES	NO
Cobalt	N4	NG	2003	16	9	0.56	NO	NO	YES
Cobalt	N4	SB	2005	5	1	0.20	YES	YES	NO
Cobalt	N4	SS	1991	18	18	1.00	NO	NO	YES
Cobalt	N4	WW	2005	5	0	0.00	YES	YES	NO
Cobalt	N5	NG	2003	16	10	0.63	NO	NO	YES
Cobalt	N5	SD	1991	17	17	1.00	NO	NO	YES
Cobalt	N5	SS	1991	17	17	1.00	NO	NO	YES
Cobalt	S1	FC	2005	3	0	0.00	YES	YES	NO
Cobalt	S1	NG	2003	16	11	0.69	NO	NO	YES
Cobalt	S1	SB	2005	9	1	0.11	NO	YES	NO
Cobalt	S1	SD	1991	28	28	1.00	NO	NO	YES
Cobalt	S1	SS	1991	27	27	1.00	NO	NO	YES
Cobalt	S1	WW	2005	2	0	0.00	YES	YES	NO
Cobalt	S2	FC	2005	3	0	0.00	YES	YES	NO
Cobalt	S2	NG	2003	16	9	0.56	NO	NO	YES
Cobalt	S2	SB	2005	9	3	0.33	NO	YES	NO
Cobalt	S2	SS	1991	27	27	1.00	NO	NO	YES
Cobalt	S2	WW	2005	2	0	0.00	YES	YES	NO
Cobalt	S4	NG	2003	16	6	0.38	NO	YES	NO
Cobalt	S4	SB	2005	9	2	0.22	NO	YES	NO
Cobalt	S4	SD	1991	28	28	1.00	NO	NO	YES
Cobalt	S4	SS	1991	24	24	1.00	NO	NO	YES
Cobalt	S4	WW	2005	4	0	0.00	YES	YES	NO
Cobalt	W2	FC	2005	1	0	0.00	YES	YES	NO
Cobalt	W2	NG	2003	16	8	0.50	NO	NO	YES
Cobalt	W2	SB	2005	8	0	0.00	NO	YES	NO
Cobalt	W2	SS	1991	24	24	1.00	NO	NO	YES
Cobalt	W2	WW	2005	5	0	0.00	YES	YES	NO
Cobalt	W4	FC	2005	5	0	0.00	YES	YES	NO
Cobalt	W4	NG	2003	16	9	0.56	NO	NO	YES
Cobalt	W4	SB	2005	6	1	0.17	NO	YES	NO
Cobalt	W4	SS	1991	19	19	1.00	NO	NO	YES
Cobalt	W4	WW	2005	3	0	0.00	YES	YES	NO
Copper	E1	FC	2002	5	5	1.00	YES	NO	NO
Copper	E1	NG	2002	17	17	1.00	NO	NO	YES
Copper	E1	SB	1991	17	16	0.94	NO	NO	YES
Copper	E1	SS	1991	25	25	1.00	NO	NO	YES
Copper	E1	WW	2003	3	3	1.00	YES	NO	NO
Copper	E2	FC	2002	4	4	1.00	YES	NO	NO
Copper	E2	NG	2002	17	17	1.00	NO	NO	YES
Copper	E2	SB	1991	12	12	1.00	NO	NO	YES
Copper	E2	SD	1991	28	28	1.00	NO	NO	YES
Copper	E2	SS	1991	25	25	1.00	NO	NO	YES
Copper	E2	WW	2003	3	3	1.00	YES	NO	NO
Copper	E5	FC	2002	5	5	1.00	YES	NO	NO
Copper	E5	NG	2002	17	17	1.00	NO	NO	YES
Copper	E5	SB	1991	17	17	1.00	NO	NO	YES
Copper	E5	SS	1991	25	25	1.00	NO	NO	YES
Copper	E5	WW	2003	3	3	1.00	YES	NO	NO
Copper	E6	NG	2002	17	17	1.00	NO	NO	YES
Copper	E6	SS	1991	19	19	1.00	NO	NO	YES
Copper	N2	FC	2002	5	5	1.00	YES	NO	NO
Copper	N2	NG	2002	17	17	1.00	NO	NO	YES
Copper	N2	SB	1991	16	15	0.94	NO	NO	YES
Copper	N2	SD	1991	28	28	1.00	NO	NO	YES
Copper	N2	SS	1991	25	25	1.00	NO	NO	YES
Copper	N2	WW	2003	4	4	1.00	YES	NO	NO
Copper	N4	FC	2002	5	5	1.00	YES	NO	NO
Copper	N4	NG	2002	17	17	1.00	NO	NO	YES
Copper	N4	SB	1991	5	5	1.00	YES	NO	NO
Copper	N4	SS	1991	18	18	1.00	NO	NO	YES
Copper	N4	WW	2003	5	5	1.00	YES	NO	NO
Copper	N5	NG	2002	17	17	1.00	NO	NO	YES
Copper	N5	SD	1991	17	17	1.00	NO	NO	YES
Copper	N5	SS	1991	17	17	1.00	NO	NO	YES
Copper	S1	FC	2002	4	4	1.00	YES	NO	NO
Copper	S1	NG	2002	17	17	1.00	NO	NO	YES
Copper	S1	SB	1991	19	18	0.95	NO	NO	YES
Copper	S1	SD	1991	28	28	1.00	NO	NO	YES
Copper	S1	SS	1991	27	27	1.00	NO	NO	YES
Copper	S1	WW	2003	2	2	1.00	YES	NO	NO
Copper	S2	FC	2002	4	4	1.00	YES	NO	NO
Copper	S2	NG	2002	17	17	1.00	NO	NO	YES
Copper	S2	SB	1991	19	17	0.89	NO	NO	YES
Copper	S2	SS	1991	27	27	1.00	NO	NO	YES
Copper	S2	WW	2003	2	2	1.00	YES	NO	NO
Copper	S4	NG	2002	17	17	1.00	NO	NO	YES
Copper	S4	SB	1991	17	16	0.94	NO	NO	YES
Copper	S4	SD	1991	28	28	1.00	NO	NO	YES
Copper	S4	SS	1991	24	24	1.00	NO	NO	YES
Copper	S4	WW	2003	4	4	1.00	YES	NO	NO
Copper	W2	FC	2002	1	1	1.00	YES	NO	NO
Copper	W2	NG	2002	17	17	1.00	NO	NO	YES
Copper	W2	SB	1991	18	17	0.94	NO	NO	YES
Copper	W2	SS	1991	24	24	1.00	NO	NO	YES
Copper	W2	WW	2003	6	6	1.00	NO	NO	YES
Copper	W4	FC	2002	6	6	1.00	NO	NO	YES
Copper	W4	NG	2002	17	17	1.00	NO	NO	YES
Copper	W4	SB	1991	10	10	1.00	NO	NO	YES
Copper	W4	SS	1991	19	19	1.00	NO	NO	YES

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**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Copper	W4	WW	2003	3	3	1.00	YES	NO	NO
Iron	E1	FC	1991	6	6	1.00	NO	NO	YES
Iron	E1	NG	1991	28	28	1.00	NO	NO	YES
Iron	E1	SB	1991	17	17	1.00	NO	NO	YES
Iron	E1	SS	1991	25	25	1.00	NO	NO	YES
Iron	E1	WW	1991	4	4	1.00	YES	NO	NO
Iron	E2	FC	1991	6	6	1.00	NO	NO	YES
Iron	E2	NG	1991	28	28	1.00	NO	NO	YES
Iron	E2	SB	1991	12	12	1.00	NO	NO	YES
Iron	E2	SD	1991	28	28	1.00	NO	NO	YES
Iron	E2	SS	1991	25	25	1.00	NO	NO	YES
Iron	E2	WW	1991	5	5	1.00	YES	NO	NO
Iron	E5	FC	1991	6	6	1.00	NO	NO	YES
Iron	E5	NG	1991	27	27	1.00	NO	NO	YES
Iron	E5	SB	1991	17	17	1.00	NO	NO	YES
Iron	E5	SS	1991	25	25	1.00	NO	NO	YES
Iron	E5	WW	1991	4	4	1.00	YES	NO	NO
Iron	E6	NG	1991	19	19	1.00	NO	NO	YES
Iron	E6	SS	1991	19	19	1.00	NO	NO	YES
Iron	N2	FC	1991	6	6	1.00	NO	NO	YES
Iron	N2	NG	1991	28	28	1.00	NO	NO	YES
Iron	N2	SB	1991	16	16	1.00	NO	NO	YES
Iron	N2	SD	1991	28	28	1.00	NO	NO	YES
Iron	N2	SS	1991	25	25	1.00	NO	NO	YES
Iron	N2	WW	1991	5	5	1.00	YES	NO	NO
Iron	N4	FC	1991	5	5	1.00	YES	NO	NO
Iron	N4	NG	1991	18	18	1.00	NO	NO	YES
Iron	N4	SB	1991	5	5	1.00	YES	NO	NO
Iron	N4	SS	1991	18	18	1.00	NO	NO	YES
Iron	N4	WW	1991	5	5	1.00	YES	NO	NO
Iron	N5	NG	1991	17	17	1.00	NO	NO	YES
Iron	N5	SD	1991	17	17	1.00	NO	NO	YES
Iron	N5	SS	1991	17	17	1.00	NO	NO	YES
Iron	S1	FC	1991	5	4	0.80	YES	NO	NO
Iron	S1	NG	1991	28	28	1.00	NO	NO	YES
Iron	S1	SB	1991	19	19	1.00	NO	NO	YES
Iron	S1	SD	1991	28	28	1.00	NO	NO	YES
Iron	S1	SS	1991	27	27	1.00	NO	NO	YES
Iron	S1	WW	1991	4	4	1.00	YES	NO	NO
Iron	S2	FC	1991	5	5	1.00	YES	NO	NO
Iron	S2	NG	1991	28	28	1.00	NO	NO	YES
Iron	S2	SB	1991	19	19	1.00	NO	NO	YES
Iron	S2	SS	1991	27	27	1.00	NO	NO	YES
Iron	S2	WW	1991	4	4	1.00	YES	NO	NO
Iron	S4	NG	1991	26	26	1.00	NO	NO	YES
Iron	S4	SB	1991	17	17	1.00	NO	NO	YES
Iron	S4	SD	1991	28	28	1.00	NO	NO	YES
Iron	S4	SS	1991	24	24	1.00	NO	NO	YES
Iron	S4	WW	1991	7	7	1.00	NO	NO	YES
Iron	W2	FC	1991	1	1	1.00	YES	NO	NO
Iron	W2	NG	1991	28	28	1.00	NO	NO	YES
Iron	W2	SB	1991	18	18	1.00	NO	NO	YES
Iron	W2	SS	1991	24	24	1.00	NO	NO	YES
Iron	W2	WW	1991	7	7	1.00	NO	NO	YES
Iron	W4	FC	1991	8	8	1.00	NO	NO	YES
Iron	W4	NG	1991	22	22	1.00	NO	NO	YES
Iron	W4	SB	1991	10	10	1.00	NO	NO	YES
Iron	W4	SS	1991	19	19	1.00	NO	NO	YES
Iron	W4	WW	1991	3	3	1.00	YES	NO	NO
Lead	E1	FC	2010	3	0	0.00	YES	YES	NO
Lead	E1	NG	2003	16	15	0.94	NO	NO	YES
Lead	E1	SB	2010	4	2	0.50	YES	NO	NO
Lead	E1	SS	1991	25	23	0.92	NO	NO	YES
Lead	E1	WW	2010	2	0	0.00	YES	YES	NO
Lead	E2	FC	2010	2	0	0.00	YES	YES	NO
Lead	E2	NG	2003	16	15	0.94	NO	NO	YES
Lead	E2	SB	2010	3	0	0.00	YES	YES	NO
Lead	E2	SD	1991	28	21	0.75	NO	NO	YES
Lead	E2	SS	1991	25	25	1.00	NO	NO	YES
Lead	E2	WW	2010	1	0	0.00	YES	YES	NO
Lead	E5	FC	2010	3	0	0.00	YES	YES	NO
Lead	E5	NG	2003	16	16	1.00	NO	NO	YES
Lead	E5	SB	2010	4	0	0.00	YES	YES	NO
Lead	E5	SS	1991	25	24	0.96	NO	NO	YES
Lead	E5	WW	2010	2	0	0.00	YES	YES	NO
Lead	E6	NG	2003	16	16	1.00	NO	NO	YES
Lead	E6	SS	1991	19	19	1.00	NO	NO	YES
Lead	N2	FC	2010	3	0	0.00	YES	YES	NO
Lead	N2	NG	2003	16	14	0.88	NO	NO	YES
Lead	N2	SB	2010	3	0	0.00	YES	YES	NO
Lead	N2	SD	1991	28	24	0.86	NO	NO	YES
Lead	N2	SS	1991	25	24	0.96	NO	NO	YES
Lead	N2	WW	2010	2	0	0.00	YES	YES	NO
Lead	N4	FC	2010	3	0	0.00	YES	YES	NO
Lead	N4	NG	2003	16	13	0.81	NO	NO	YES
Lead	N4	SB	2010	3	1	0.33	YES	YES	NO
Lead	N4	SS	1991	18	18	1.00	NO	NO	YES
Lead	N4	WW	2010	3	0	0.00	YES	YES	NO
Lead	N5	NG	2003	16	16	1.00	NO	NO	YES
Lead	N5	SD	1991	17	17	1.00	NO	NO	YES
Lead	N5	SS	1991	17	17	1.00	NO	NO	YES

**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Lead	S1	FC	2010	2	0	0.00	YES	YES	NO
Lead	S1	NG	2003	16	15	0.94	NO	NO	YES
Lead	S1	SB	2010	6	0	0.00	NO	YES	NO
Lead	S1	SD	1991	28	28	1.00	NO	NO	YES
Lead	S1	SS	1991	27	25	0.93	NO	NO	YES
Lead	S1	WW	2010	1	0	0.00	YES	YES	NO
Lead	S2	FC	2010	2	0	0.00	YES	YES	NO
Lead	S2	NG	2003	16	15	0.94	NO	NO	YES
Lead	S2	SB	2010	6	0	0.00	NO	YES	NO
Lead	S2	SS	1991	27	26	0.96	NO	NO	YES
Lead	S2	WW	2010	1	0	0.00	YES	YES	NO
Lead	S4	NG	2003	16	14	0.88	NO	NO	YES
Lead	S4	SB	2010	6	0	0.00	NO	YES	NO
Lead	S4	SD	1991	28	25	0.89	NO	NO	YES
Lead	S4	SS	1991	24	22	0.92	NO	NO	YES
Lead	S4	WW	2010	2	0	0.00	YES	YES	NO
Lead	W2	FC	2010	1	0	0.00	YES	YES	NO
Lead	W2	NG	2003	16	16	1.00	NO	NO	YES
Lead	W2	SB	2010	5	2	0.40	YES	YES	NO
Lead	W2	SS	1991	24	24	1.00	NO	NO	YES
Lead	W2	WW	2010	3	2	0.67	YES	NO	NO
Lead	W4	FC	2010	5	0	0.00	YES	YES	NO
Lead	W4	NG	2003	16	16	1.00	NO	NO	YES
Lead	W4	SB	2010	3	0	0.00	YES	YES	NO
Lead	W4	SS	1991	19	18	0.95	NO	NO	YES
Lead	W4	WW	2010	1	0	0.00	YES	YES	NO
Magnesium	E1	FC	1991	6	6	1.00	NO	NO	YES
Magnesium	E1	NG	1991	28	28	1.00	NO	NO	YES
Magnesium	E1	SB	1991	17	17	1.00	NO	NO	YES
Magnesium	E1	SS	1991	25	25	1.00	NO	NO	YES
Magnesium	E1	WW	1991	4	4	1.00	YES	NO	NO
Magnesium	E2	FC	1991	6	6	1.00	NO	NO	YES
Magnesium	E2	NG	1991	28	28	1.00	NO	NO	YES
Magnesium	E2	SB	1991	12	12	1.00	NO	NO	YES
Magnesium	E2	SD	1991	28	28	1.00	NO	NO	YES
Magnesium	E2	SS	1991	25	25	1.00	NO	NO	YES
Magnesium	E2	WW	1991	5	5	1.00	YES	NO	NO
Magnesium	E5	FC	1991	6	6	1.00	NO	NO	YES
Magnesium	E5	NG	1991	27	27	1.00	NO	NO	YES
Magnesium	E5	SB	1991	17	17	1.00	NO	NO	YES
Magnesium	E5	SS	1991	25	25	1.00	NO	NO	YES
Magnesium	E5	WW	1991	4	4	1.00	YES	NO	NO
Magnesium	E6	NG	1991	19	19	1.00	NO	NO	YES
Magnesium	E6	SS	1991	19	19	1.00	NO	NO	YES
Magnesium	N2	FC	1991	6	6	1.00	NO	NO	YES
Magnesium	N2	NG	1991	28	28	1.00	NO	NO	YES
Magnesium	N2	SB	1991	16	16	1.00	NO	NO	YES
Magnesium	N2	SD	1991	28	28	1.00	NO	NO	YES
Magnesium	N2	SS	1991	25	25	1.00	NO	NO	YES
Magnesium	N2	WW	1991	5	5	1.00	YES	NO	NO
Magnesium	N4	FC	1991	5	5	1.00	YES	NO	NO
Magnesium	N4	NG	1991	18	18	1.00	NO	NO	YES
Magnesium	N4	SB	1991	5	5	1.00	YES	NO	NO
Magnesium	N4	SS	1991	18	18	1.00	NO	NO	YES
Magnesium	N4	WW	1991	5	5	1.00	YES	NO	NO
Magnesium	N5	NG	1991	17	17	1.00	NO	NO	YES
Magnesium	N5	SD	1991	17	17	1.00	NO	NO	YES
Magnesium	N5	SS	1991	17	17	1.00	NO	NO	YES
Magnesium	S1	FC	1991	5	5	1.00	YES	NO	NO
Magnesium	S1	NG	1991	28	28	1.00	NO	NO	YES
Magnesium	S1	SB	1991	19	19	1.00	NO	NO	YES
Magnesium	S1	SD	1991	28	28	1.00	NO	NO	YES
Magnesium	S1	SS	1991	27	27	1.00	NO	NO	YES
Magnesium	S1	WW	1991	4	4	1.00	YES	NO	NO
Magnesium	S2	FC	1991	5	5	1.00	YES	NO	NO
Magnesium	S2	NG	1991	28	28	1.00	NO	NO	YES
Magnesium	S2	SB	1991	19	19	1.00	NO	NO	YES
Magnesium	S2	SS	1991	27	27	1.00	NO	NO	YES
Magnesium	S2	WW	1991	4	4	1.00	YES	NO	NO
Magnesium	S4	NG	1991	26	26	1.00	NO	NO	YES
Magnesium	S4	SB	1991	17	17	1.00	NO	NO	YES
Magnesium	S4	SD	1991	28	28	1.00	NO	NO	YES
Magnesium	S4	SS	1991	24	24	1.00	NO	NO	YES
Magnesium	S4	WW	1991	7	7	1.00	NO	NO	YES
Magnesium	W2	FC	1991	1	1	1.00	YES	NO	NO
Magnesium	W2	NG	1991	28	28	1.00	NO	NO	YES
Magnesium	W2	SB	1991	18	18	1.00	NO	NO	YES
Magnesium	W2	SS	1991	24	24	1.00	NO	NO	YES
Magnesium	W2	WW	1991	7	7	1.00	NO	NO	YES
Magnesium	W4	FC	1991	8	8	1.00	NO	NO	YES
Magnesium	W4	NG	1991	22	22	1.00	NO	NO	YES
Magnesium	W4	SB	1991	10	10	1.00	NO	NO	YES
Magnesium	W4	SS	1991	19	19	1.00	NO	NO	YES
Magnesium	W4	WW	1991	3	3	1.00	YES	NO	NO
Manganese	E1	FC	2002	5	5	1.00	YES	NO	NO
Manganese	E1	NG	1991	28	28	1.00	NO	NO	YES
Manganese	E1	SB	1991	17	17	1.00	NO	NO	YES
Manganese	E1	SS	1991	25	25	1.00	NO	NO	YES
Manganese	E1	WW	1991	4	4	1.00	YES	NO	NO
Manganese	E2	FC	2002	4	4	1.00	YES	NO	NO
Manganese	E2	NG	1991	28	27	0.96	NO	NO	YES

**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Manganese	E2	SB	1991	12	12	1.00	NO	NO	YES
Manganese	E2	SD	1991	28	28	1.00	NO	NO	YES
Manganese	E2	SS	1991	25	25	1.00	NO	NO	YES
Manganese	E2	WW	1991	5	5	1.00	YES	NO	NO
Manganese	E5	FC	2002	5	5	1.00	YES	NO	NO
Manganese	E5	NG	1991	27	27	1.00	NO	NO	YES
Manganese	E5	SB	1991	17	17	1.00	NO	NO	YES
Manganese	E5	SS	1991	25	25	1.00	NO	NO	YES
Manganese	E5	WW	1991	4	4	1.00	YES	NO	NO
Manganese	E6	NG	1991	19	19	1.00	NO	NO	YES
Manganese	E6	SS	1991	19	19	1.00	NO	NO	YES
Manganese	N2	FC	2002	5	5	1.00	YES	NO	NO
Manganese	N2	NG	1991	28	28	1.00	NO	NO	YES
Manganese	N2	SB	1991	16	16	1.00	NO	NO	YES
Manganese	N2	SD	1991	28	28	1.00	NO	NO	YES
Manganese	N2	SS	1991	25	25	1.00	NO	NO	YES
Manganese	N2	WW	1991	5	5	1.00	YES	NO	NO
Manganese	N4	FC	2002	5	5	1.00	YES	NO	NO
Manganese	N4	NG	1991	18	18	1.00	NO	NO	YES
Manganese	N4	SB	1991	5	5	1.00	YES	NO	NO
Manganese	N4	SS	1991	18	18	1.00	NO	NO	YES
Manganese	N4	WW	1991	5	5	1.00	YES	NO	NO
Manganese	N5	NG	1991	17	17	1.00	NO	NO	YES
Manganese	N5	SD	1991	17	17	1.00	NO	NO	YES
Manganese	N5	SS	1991	17	17	1.00	NO	NO	YES
Manganese	S1	FC	2002	4	4	1.00	YES	NO	NO
Manganese	S1	NG	1991	28	28	1.00	NO	NO	YES
Manganese	S1	SB	1991	19	19	1.00	NO	NO	YES
Manganese	S1	SD	1991	28	28	1.00	NO	NO	YES
Manganese	S1	SS	1991	27	27	1.00	NO	NO	YES
Manganese	S1	WW	1991	4	4	1.00	YES	NO	NO
Manganese	S2	FC	2002	4	4	1.00	YES	NO	NO
Manganese	S2	NG	1991	28	28	1.00	NO	NO	YES
Manganese	S2	SB	1991	19	19	1.00	NO	NO	YES
Manganese	S2	SS	1991	27	27	1.00	NO	NO	YES
Manganese	S2	WW	1991	4	4	1.00	YES	NO	NO
Manganese	S4	NG	1991	26	26	1.00	NO	NO	YES
Manganese	S4	SB	1991	17	17	1.00	NO	NO	YES
Manganese	S4	SD	1991	28	28	1.00	NO	NO	YES
Manganese	S4	SS	1991	24	24	1.00	NO	NO	YES
Manganese	S4	WW	1991	7	7	1.00	NO	NO	YES
Manganese	W2	FC	2002	1	1	1.00	YES	NO	NO
Manganese	W2	NG	1991	28	27	0.96	NO	NO	YES
Manganese	W2	SB	1991	18	18	1.00	NO	NO	YES
Manganese	W2	SS	1991	24	24	1.00	NO	NO	YES
Manganese	W2	WW	1991	7	7	1.00	NO	NO	YES
Manganese	W4	FC	2002	6	6	1.00	NO	NO	YES
Manganese	W4	NG	1991	22	22	1.00	NO	NO	YES
Manganese	W4	SB	1991	10	10	1.00	NO	NO	YES
Manganese	W4	SS	1991	19	19	1.00	NO	NO	YES
Manganese	W4	WW	1991	3	3	1.00	YES	NO	NO
Mercury	E1	FC	2005	4	0	0.00	YES	YES	NO
Mercury	E1	NG	2004	15	11	0.73	NO	NO	YES
Mercury	E1	SB	2005	8	0	0.00	NO	YES	NO
Mercury	E1	SS	2002	16	3	0.19	NO	YES	NO
Mercury	E1	WW	2005	2	0	0.00	YES	YES	NO
Mercury	E2	FC	2005	3	0	0.00	YES	YES	NO
Mercury	E2	NG	2004	15	10	0.67	NO	NO	YES
Mercury	E2	SB	2005	4	0	0.00	YES	YES	NO
Mercury	E2	SD	2003	16	3	0.19	NO	YES	NO
Mercury	E2	SS	2002	17	11	0.65	NO	NO	YES
Mercury	E2	WW	2005	3	1	0.33	YES	YES	NO
Mercury	E5	FC	2005	4	1	0.25	YES	YES	NO
Mercury	E5	NG	2004	15	9	0.60	NO	NO	YES
Mercury	E5	SB	2005	8	0	0.00	NO	YES	NO
Mercury	E5	SS	2002	16	2	0.13	NO	YES	NO
Mercury	E5	WW	2005	2	0	0.00	YES	YES	NO
Mercury	E6	NG	2004	15	14	0.93	NO	NO	YES
Mercury	E6	SS	2002	17	13	0.76	NO	NO	YES
Mercury	N2	FC	2005	5	1	0.20	YES	YES	NO
Mercury	N2	NG	2004	15	9	0.60	NO	NO	YES
Mercury	N2	SB	2005	5	0	0.00	YES	YES	NO
Mercury	N2	SD	2003	16	10	0.63	NO	NO	YES
Mercury	N2	SS	2002	16	9	0.56	NO	NO	YES
Mercury	N2	WW	2005	3	1	0.33	YES	YES	NO
Mercury	N4	FC	2005	4	0	0.00	YES	YES	NO
Mercury	N4	NG	2004	15	9	0.60	NO	NO	YES
Mercury	N4	SB	2005	5	0	0.00	YES	YES	NO
Mercury	N4	SS	2002	17	4	0.24	NO	YES	NO
Mercury	N4	WW	2005	5	0	0.00	YES	YES	NO
Mercury	N5	NG	2004	15	15	1.00	NO	NO	YES
Mercury	N5	SD	2003	16	13	0.81	NO	NO	YES
Mercury	N5	SS	2002	17	14	0.82	NO	NO	YES
Mercury	S1	FC	2005	3	0	0.00	YES	YES	NO
Mercury	S1	NG	2004	15	12	0.80	NO	NO	YES
Mercury	S1	SB	2005	9	0	0.00	NO	YES	NO
Mercury	S1	SD	2003	16	9	0.56	NO	NO	YES
Mercury	S1	SS	2002	17	4	0.24	NO	YES	NO
Mercury	S1	WW	2005	2	0	0.00	YES	YES	NO
Mercury	S2	FC	2005	3	0	0.00	YES	YES	NO
Mercury	S2	NG	2004	15	9	0.60	NO	NO	YES

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**Suitability of Data for Site Specific Inorganic Regression Analysis**  
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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Mercury	S2	SB	2005	9	0	0.00	NO	YES	NO
Mercury	S2	SS	2002	17	2	0.12	NO	YES	NO
Mercury	S2	WW	2005	2	0	0.00	YES	YES	NO
Mercury	S4	NG	2004	15	6	0.40	NO	YES	NO
Mercury	S4	SB	2005	9	0	0.00	NO	YES	NO
Mercury	S4	SD	2003	16	1	0.06	NO	YES	NO
Mercury	S4	SS	2002	16	5	0.31	NO	YES	NO
Mercury	S4	WW	2005	4	2	0.50	YES	NO	NO
Mercury	W2	FC	2005	1	0	0.00	YES	YES	NO
Mercury	W2	NG	2004	15	11	0.73	NO	NO	YES
Mercury	W2	SB	2005	8	0	0.00	NO	YES	NO
Mercury	W2	SS	2002	16	4	0.25	NO	YES	NO
Mercury	W2	WW	2005	5	1	0.20	YES	YES	NO
Mercury	W4	FC	2005	5	0	0.00	YES	YES	NO
Mercury	W4	NG	2004	15	12	0.80	NO	NO	YES
Mercury	W4	SB	2005	6	0	0.00	NO	YES	NO
Mercury	W4	SS	2002	17	8	0.47	NO	YES	NO
Mercury	W4	WW	2005	3	0	0.00	YES	YES	NO
Molybdenum	E1	FC	2003	5	5	1.00	YES	NO	NO
Molybdenum	E1	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	E1	SB	1991	17	17	1.00	NO	NO	YES
Molybdenum	E1	SS	2002	16	16	1.00	NO	NO	YES
Molybdenum	E1	WW	1991	4	4	1.00	YES	NO	NO
Molybdenum	E2	FC	2003	4	4	1.00	YES	NO	NO
Molybdenum	E2	NG	2002	17	16	0.94	NO	NO	YES
Molybdenum	E2	SB	1991	12	12	1.00	NO	NO	YES
Molybdenum	E2	SD	2002	17	17	1.00	NO	NO	YES
Molybdenum	E2	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	E2	WW	1991	5	5	1.00	YES	NO	NO
Molybdenum	E5	FC	2003	5	5	1.00	YES	NO	NO
Molybdenum	E5	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	E5	SB	1991	17	17	1.00	NO	NO	YES
Molybdenum	E5	SS	2002	16	16	1.00	NO	NO	YES
Molybdenum	E5	WW	1991	4	4	1.00	YES	NO	NO
Molybdenum	E6	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	E6	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	N2	FC	2003	5	5	1.00	YES	NO	NO
Molybdenum	N2	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	N2	SB	1991	16	16	1.00	NO	NO	YES
Molybdenum	N2	SD	2002	17	17	1.00	NO	NO	YES
Molybdenum	N2	SS	2002	16	16	1.00	NO	NO	YES
Molybdenum	N2	WW	1991	5	5	1.00	YES	NO	NO
Molybdenum	N4	FC	2003	5	5	1.00	YES	NO	NO
Molybdenum	N4	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	N4	SB	1991	5	5	1.00	YES	NO	NO
Molybdenum	N4	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	N4	WW	1991	5	5	1.00	YES	NO	NO
Molybdenum	N5	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	N5	SD	2002	17	17	1.00	NO	NO	YES
Molybdenum	N5	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	S1	FC	2003	3	3	1.00	YES	NO	NO
Molybdenum	S1	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	S1	SB	1991	19	19	1.00	NO	NO	YES
Molybdenum	S1	SD	2002	17	17	1.00	NO	NO	YES
Molybdenum	S1	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	S1	WW	1991	4	3	0.75	YES	NO	NO
Molybdenum	S2	FC	2003	3	3	1.00	YES	NO	NO
Molybdenum	S2	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	S2	SB	1991	19	19	1.00	NO	NO	YES
Molybdenum	S2	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	S2	WW	1991	4	4	1.00	YES	NO	NO
Molybdenum	S4	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	S4	SB	1991	17	17	1.00	NO	NO	YES
Molybdenum	S4	SD	2002	17	17	1.00	NO	NO	YES
Molybdenum	S4	SS	2002	16	16	1.00	NO	NO	YES
Molybdenum	S4	WW	1991	7	5	0.71	NO	NO	YES
Molybdenum	W2	FC	2003	1	1	1.00	YES	NO	NO
Molybdenum	W2	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	W2	SB	1991	18	18	1.00	NO	NO	YES
Molybdenum	W2	SS	2002	16	16	1.00	NO	NO	YES
Molybdenum	W2	WW	1991	7	7	1.00	NO	NO	YES
Molybdenum	W4	FC	2003	6	6	1.00	NO	NO	YES
Molybdenum	W4	NG	2002	17	17	1.00	NO	NO	YES
Molybdenum	W4	SB	1991	10	10	1.00	NO	NO	YES
Molybdenum	W4	SS	2002	17	17	1.00	NO	NO	YES
Molybdenum	W4	WW	1991	3	3	1.00	YES	NO	NO
Nickel	E1	FC	2005	4	2	0.50	YES	NO	NO
Nickel	E1	NG	2002	17	17	1.00	NO	NO	YES
Nickel	E1	SB	2002	9	9	1.00	NO	NO	YES
Nickel	E1	SS	1991	25	25	1.00	NO	NO	YES
Nickel	E1	WW	2003	3	3	1.00	YES	NO	NO
Nickel	E2	FC	2005	3	2	0.67	YES	NO	NO
Nickel	E2	NG	2002	17	17	1.00	NO	NO	YES
Nickel	E2	SB	2002	5	5	1.00	YES	NO	NO
Nickel	E2	SD	1991	28	28	1.00	NO	NO	YES
Nickel	E2	SS	1991	25	25	1.00	NO	NO	YES
Nickel	E2	WW	2003	3	3	1.00	YES	NO	NO
Nickel	E5	FC	2005	4	2	0.50	YES	NO	NO
Nickel	E5	NG	2002	17	17	1.00	NO	NO	YES
Nickel	E5	SB	2002	9	9	1.00	NO	NO	YES
Nickel	E5	SS	1991	25	25	1.00	NO	NO	YES

**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Nickel	E5	WW	2003	3	3	1.00	YES	NO	NO
Nickel	E6	NG	2002	17	17	1.00	NO	NO	YES
Nickel	E6	SS	1991	19	19	1.00	NO	NO	YES
Nickel	N2	FC	2005	5	5	1.00	YES	NO	NO
Nickel	N2	NG	2002	17	17	1.00	NO	NO	YES
Nickel	N2	SB	2002	7	7	1.00	NO	NO	YES
Nickel	N2	SD	1991	28	28	1.00	NO	NO	YES
Nickel	N2	SS	1991	25	25	1.00	NO	NO	YES
Nickel	N2	WW	2003	4	4	1.00	YES	NO	NO
Nickel	N4	FC	2005	4	4	1.00	YES	NO	NO
Nickel	N4	NG	2002	17	17	1.00	NO	NO	YES
Nickel	N4	SB	2002	5	5	1.00	YES	NO	NO
Nickel	N4	SS	1991	18	18	1.00	NO	NO	YES
Nickel	N4	WW	2003	5	4	0.80	YES	NO	NO
Nickel	N5	NG	2002	17	17	1.00	NO	NO	YES
Nickel	N5	SD	1991	17	17	1.00	NO	NO	YES
Nickel	N5	SS	1991	17	17	1.00	NO	NO	YES
Nickel	S1	FC	2005	3	1	0.33	YES	YES	NO
Nickel	S1	NG	2002	17	17	1.00	NO	NO	YES
Nickel	S1	SB	2002	11	11	1.00	NO	NO	YES
Nickel	S1	SD	1991	28	28	1.00	NO	NO	YES
Nickel	S1	SS	1991	27	27	1.00	NO	NO	YES
Nickel	S1	WW	2003	2	2	1.00	YES	NO	NO
Nickel	S2	FC	2005	3	1	0.33	YES	YES	NO
Nickel	S2	NG	2002	17	17	1.00	NO	NO	YES
Nickel	S2	SB	2002	11	11	1.00	NO	NO	YES
Nickel	S2	SS	1991	27	27	1.00	NO	NO	YES
Nickel	S2	WW	2003	2	2	1.00	YES	NO	NO
Nickel	S4	NG	2002	17	16	0.94	NO	NO	YES
Nickel	S4	SB	2002	11	11	1.00	NO	NO	YES
Nickel	S4	SD	1991	28	28	1.00	NO	NO	YES
Nickel	S4	SS	1991	24	24	1.00	NO	NO	YES
Nickel	S4	WW	2003	4	4	1.00	YES	NO	NO
Nickel	W2	FC	2005	1	1	1.00	YES	NO	NO
Nickel	W2	NG	2002	17	17	1.00	NO	NO	YES
Nickel	W2	SB	2002	10	10	1.00	NO	NO	YES
Nickel	W2	SS	1991	24	24	1.00	NO	NO	YES
Nickel	W2	WW	2003	6	5	0.83	NO	NO	YES
Nickel	W4	FC	2005	5	4	0.80	YES	NO	NO
Nickel	W4	NG	2002	17	17	1.00	NO	NO	YES
Nickel	W4	SB	2002	8	8	1.00	NO	NO	YES
Nickel	W4	SS	1991	19	19	1.00	NO	NO	YES
Nickel	W4	WW	2003	3	3	1.00	YES	NO	NO
Phosphorus	E1	FC	1991	6	6	1.00	NO	NO	YES
Phosphorus	E1	NG	1991	28	28	1.00	NO	NO	YES
Phosphorus	E1	SB	1991	16	16	1.00	NO	NO	YES
Phosphorus	E1	SS	1991	25	25	1.00	NO	NO	YES
Phosphorus	E1	WW	1991	4	4	1.00	YES	NO	NO
Phosphorus	E2	FC	1991	6	6	1.00	NO	NO	YES
Phosphorus	E2	NG	1991	28	28	1.00	NO	NO	YES
Phosphorus	E2	SB	1991	12	12	1.00	NO	NO	YES
Phosphorus	E2	SD	1991	28	28	1.00	NO	NO	YES
Phosphorus	E2	SS	1991	25	25	1.00	NO	NO	YES
Phosphorus	E2	WW	1991	5	5	1.00	YES	NO	NO
Phosphorus	E5	FC	1991	6	6	1.00	NO	NO	YES
Phosphorus	E5	NG	1991	27	27	1.00	NO	NO	YES
Phosphorus	E5	SB	1991	17	17	1.00	NO	NO	YES
Phosphorus	E5	SS	1991	25	25	1.00	NO	NO	YES
Phosphorus	E5	WW	1991	4	4	1.00	YES	NO	NO
Phosphorus	E6	NG	1991	19	19	1.00	NO	NO	YES
Phosphorus	E6	SS	1991	19	19	1.00	NO	NO	YES
Phosphorus	N2	FC	1991	6	6	1.00	NO	NO	YES
Phosphorus	N2	NG	1991	28	28	1.00	NO	NO	YES
Phosphorus	N2	SB	1991	16	16	1.00	NO	NO	YES
Phosphorus	N2	SD	1991	28	28	1.00	NO	NO	YES
Phosphorus	N2	SS	1991	25	25	1.00	NO	NO	YES
Phosphorus	N2	WW	1991	5	5	1.00	YES	NO	NO
Phosphorus	N4	FC	1991	5	5	1.00	YES	NO	NO
Phosphorus	N4	NG	1991	18	18	1.00	NO	NO	YES
Phosphorus	N4	SB	1991	5	5	1.00	YES	NO	NO
Phosphorus	N4	SS	1991	18	18	1.00	NO	NO	YES
Phosphorus	N4	WW	1991	5	5	1.00	YES	NO	NO
Phosphorus	N5	NG	1991	17	17	1.00	NO	NO	YES
Phosphorus	N5	SD	1991	17	17	1.00	NO	NO	YES
Phosphorus	N5	SS	1991	17	17	1.00	NO	NO	YES
Phosphorus	S1	FC	1991	5	5	1.00	YES	NO	NO
Phosphorus	S1	NG	1991	28	28	1.00	NO	NO	YES
Phosphorus	S1	SB	1991	19	19	1.00	NO	NO	YES
Phosphorus	S1	SD	1991	28	28	1.00	NO	NO	YES
Phosphorus	S1	SS	1991	27	27	1.00	NO	NO	YES
Phosphorus	S1	WW	1991	4	4	1.00	YES	NO	NO
Phosphorus	S2	FC	1991	5	5	1.00	YES	NO	NO
Phosphorus	S2	NG	1991	28	28	1.00	NO	NO	YES
Phosphorus	S2	SB	1991	19	19	1.00	NO	NO	YES
Phosphorus	S2	SS	1991	27	27	1.00	NO	NO	YES
Phosphorus	S2	WW	1991	4	4	1.00	YES	NO	NO
Phosphorus	S4	NG	1991	26	26	1.00	NO	NO	YES
Phosphorus	S4	SB	1991	17	17	1.00	NO	NO	YES
Phosphorus	S4	SD	1991	28	28	1.00	NO	NO	YES
Phosphorus	S4	SS	1991	24	24	1.00	NO	NO	YES
Phosphorus	S4	WW	1991	7	7	1.00	NO	NO	YES



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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Phosphorus	W2	FC	1991	1	1	1.00	YES	NO	NO
Phosphorus	W2	NG	1991	28	28	1.00	NO	NO	YES
Phosphorus	W2	SB	1991	18	18	1.00	NO	NO	YES
Phosphorus	W2	SS	1991	24	24	1.00	NO	NO	YES
Phosphorus	W2	WW	1991	7	7	1.00	NO	NO	YES
Phosphorus	W4	FC	1991	8	8	1.00	NO	NO	YES
Phosphorus	W4	NG	1991	22	22	1.00	NO	NO	YES
Phosphorus	W4	SB	1991	10	10	1.00	NO	NO	YES
Phosphorus	W4	SS	1991	19	19	1.00	NO	NO	YES
Phosphorus	W4	WW	1991	3	3	1.00	YES	NO	NO
Potassium	E1	FC	1991	6	6	1.00	NO	NO	YES
Potassium	E1	NG	1991	28	28	1.00	NO	NO	YES
Potassium	E1	SB	1991	17	17	1.00	NO	NO	YES
Potassium	E1	SS	1991	25	25	1.00	NO	NO	YES
Potassium	E1	WW	1991	4	4	1.00	YES	NO	NO
Potassium	E2	FC	1991	6	6	1.00	NO	NO	YES
Potassium	E2	NG	1991	28	28	1.00	NO	NO	YES
Potassium	E2	SB	1991	12	12	1.00	NO	NO	YES
Potassium	E2	SD	1991	28	28	1.00	NO	NO	YES
Potassium	E2	SS	1991	25	25	1.00	NO	NO	YES
Potassium	E2	WW	1991	5	5	1.00	YES	NO	NO
Potassium	E5	FC	1991	6	6	1.00	NO	NO	YES
Potassium	E5	NG	1991	27	27	1.00	NO	NO	YES
Potassium	E5	SB	1991	17	17	1.00	NO	NO	YES
Potassium	E5	SS	1991	25	25	1.00	NO	NO	YES
Potassium	E5	WW	1991	4	4	1.00	YES	NO	NO
Potassium	E6	NG	1991	19	19	1.00	NO	NO	YES
Potassium	E6	SS	1991	19	19	1.00	NO	NO	YES
Potassium	N2	FC	1991	6	6	1.00	NO	NO	YES
Potassium	N2	NG	1991	28	28	1.00	NO	NO	YES
Potassium	N2	SB	1991	16	16	1.00	NO	NO	YES
Potassium	N2	SD	1991	28	28	1.00	NO	NO	YES
Potassium	N2	SS	1991	25	25	1.00	NO	NO	YES
Potassium	N2	WW	1991	5	5	1.00	YES	NO	NO
Potassium	N4	FC	1991	5	5	1.00	YES	NO	NO
Potassium	N4	NG	1991	18	18	1.00	NO	NO	YES
Potassium	N4	SB	1991	5	5	1.00	YES	NO	NO
Potassium	N4	SS	1991	18	18	1.00	NO	NO	YES
Potassium	N4	WW	1991	5	5	1.00	YES	NO	NO
Potassium	N5	NG	1991	17	17	1.00	NO	NO	YES
Potassium	N5	SD	1991	17	17	1.00	NO	NO	YES
Potassium	N5	SS	1991	17	17	1.00	NO	NO	YES
Potassium	S1	FC	1991	5	5	1.00	YES	NO	NO
Potassium	S1	NG	1991	28	28	1.00	NO	NO	YES
Potassium	S1	SB	1991	19	19	1.00	NO	NO	YES
Potassium	S1	SD	1991	28	28	1.00	NO	NO	YES
Potassium	S1	SS	1991	27	27	1.00	NO	NO	YES
Potassium	S1	WW	1991	4	4	1.00	YES	NO	NO
Potassium	S2	FC	1991	5	5	1.00	YES	NO	NO
Potassium	S2	NG	1991	28	28	1.00	NO	NO	YES
Potassium	S2	SB	1991	19	19	1.00	NO	NO	YES
Potassium	S2	SS	1991	27	27	1.00	NO	NO	YES
Potassium	S2	WW	1991	4	4	1.00	YES	NO	NO
Potassium	S4	NG	1991	26	26	1.00	NO	NO	YES
Potassium	S4	SB	1991	17	17	1.00	NO	NO	YES
Potassium	S4	SD	1991	28	28	1.00	NO	NO	YES
Potassium	S4	SS	1991	24	24	1.00	NO	NO	YES
Potassium	S4	WW	1991	7	7	1.00	NO	NO	YES
Potassium	W2	FC	1991	1	1	1.00	YES	NO	NO
Potassium	W2	NG	1991	28	28	1.00	NO	NO	YES
Potassium	W2	SB	1991	18	18	1.00	NO	NO	YES
Potassium	W2	SS	1991	24	24	1.00	NO	NO	YES
Potassium	W2	WW	1991	7	7	1.00	NO	NO	YES
Potassium	W4	FC	1991	8	8	1.00	NO	NO	YES
Potassium	W4	NG	1991	22	22	1.00	NO	NO	YES
Potassium	W4	SB	1991	10	10	1.00	NO	NO	YES
Potassium	W4	SS	1991	19	19	1.00	NO	NO	YES
Potassium	W4	WW	1991	3	3	1.00	YES	NO	NO
Silicon	E1	FC	2006	4	4	1.00	YES	NO	NO
Silicon	E1	NG	2003	16	16	1.00	NO	NO	YES
Silicon	E1	SB	2003	8	8	1.00	NO	NO	YES
Silicon	E1	SS	2010	9	9	1.00	NO	NO	YES
Silicon	E1	WW	2003	3	3	1.00	YES	NO	NO
Silicon	E2	FC	2006	3	3	1.00	YES	NO	NO
Silicon	E2	NG	2003	16	16	1.00	NO	NO	YES
Silicon	E2	SB	2003	5	4	0.80	YES	NO	NO
Silicon	E2	SD	2010	9	9	1.00	NO	NO	YES
Silicon	E2	SS	2010	9	9	1.00	NO	NO	YES
Silicon	E2	WW	2003	3	3	1.00	YES	NO	NO
Silicon	E5	FC	2006	4	4	1.00	YES	NO	NO
Silicon	E5	NG	2003	16	16	1.00	NO	NO	YES
Silicon	E5	SB	2003	8	8	1.00	NO	NO	YES
Silicon	E5	SS	2010	9	9	1.00	NO	NO	YES
Silicon	E5	WW	2003	3	3	1.00	YES	NO	NO
Silicon	E6	NG	2003	15	15	1.00	NO	NO	YES
Silicon	E6	SS	2010	9	9	1.00	NO	NO	YES
Silicon	N2	FC	2006	4	4	1.00	YES	NO	NO
Silicon	N2	NG	2003	15	15	1.00	NO	NO	YES
Silicon	N2	SB	2003	5	5	1.00	YES	NO	NO
Silicon	N2	SD	2010	9	9	1.00	NO	NO	YES
Silicon	N2	SS	2010	9	9	1.00	NO	NO	YES

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Silicon	N2	WW	2003	4	4	1.00	YES	NO	NO
Silicon	N4	FC	2006	4	4	1.00	YES	NO	NO
Silicon	N4	NG	2003	16	16	1.00	NO	NO	YES
Silicon	N4	SB	2003	5	4	0.80	YES	NO	NO
Silicon	N4	SS	2010	9	9	1.00	NO	NO	YES
Silicon	N4	WW	2003	5	5	1.00	YES	NO	NO
Silicon	N5	NG	2003	16	16	1.00	NO	NO	YES
Silicon	N5	SD	2010	9	9	1.00	NO	NO	YES
Silicon	N5	SS	2010	9	9	1.00	NO	NO	YES
Silicon	S1	FC	2006	2	2	1.00	YES	NO	NO
Silicon	S1	NG	2003	16	16	1.00	NO	NO	YES
Silicon	S1	SB	2003	11	9	0.82	NO	NO	YES
Silicon	S1	SD	2010	9	9	1.00	NO	NO	YES
Silicon	S1	SS	2010	9	9	1.00	NO	NO	YES
Silicon	S1	WW	2003	2	2	1.00	YES	NO	NO
Silicon	S2	FC	2006	2	2	1.00	YES	NO	NO
Silicon	S2	NG	2003	16	16	1.00	NO	NO	YES
Silicon	S2	SB	2003	11	10	0.91	NO	NO	YES
Silicon	S2	SS	2010	9	9	1.00	NO	NO	YES
Silicon	S2	WW	2003	2	2	1.00	YES	NO	NO
Silicon	S4	NG	2003	16	16	1.00	NO	NO	YES
Silicon	S4	SB	2003	10	10	1.00	NO	NO	YES
Silicon	S4	SD	2010	9	9	1.00	NO	NO	YES
Silicon	S4	SS	2010	9	9	1.00	NO	NO	YES
Silicon	S4	WW	2003	4	4	1.00	YES	NO	NO
Silicon	W2	FC	2006	1	1	1.00	YES	NO	NO
Silicon	W2	NG	2003	16	16	1.00	NO	NO	YES
Silicon	W2	SB	2003	9	7	0.78	NO	NO	YES
Silicon	W2	SS	2010	9	9	1.00	NO	NO	YES
Silicon	W2	WW	2003	6	6	1.00	NO	NO	YES
Silicon	W4	FC	2006	5	5	1.00	YES	NO	NO
Silicon	W4	NG	2003	16	16	1.00	NO	NO	YES
Silicon	W4	SB	2003	7	6	0.86	NO	NO	YES
Silicon	W4	SS	2010	9	9	1.00	NO	NO	YES
Silicon	W4	WW	2003	3	3	1.00	YES	NO	NO
Silver	E1	FC	2005	4	0	0.00	YES	YES	NO
Silver	E1	NG	2005	14	0	0.00	NO	YES	NO
Silver	E1	SB	2005	8	0	0.00	NO	YES	NO
Silver	E1	SS	2003	15	0	0.00	NO	YES	NO
Silver	E1	WW	2005	3	0	0.00	YES	YES	NO
Silver	E2	FC	2005	3	0	0.00	YES	YES	NO
Silver	E2	NG	2005	14	0	0.00	NO	YES	NO
Silver	E2	SB	2005	4	0	0.00	YES	YES	NO
Silver	E2	SD	2003	16	0	0.00	NO	YES	NO
Silver	E2	SS	2003	16	0	0.00	NO	YES	NO
Silver	E2	WW	2005	3	0	0.00	YES	YES	NO
Silver	E5	FC	2005	4	0	0.00	YES	YES	NO
Silver	E5	NG	2005	14	0	0.00	NO	YES	NO
Silver	E5	SB	2005	8	0	0.00	NO	YES	NO
Silver	E5	SS	2003	15	0	0.00	NO	YES	NO
Silver	E5	WW	2005	2	0	0.00	YES	YES	NO
Silver	E6	NG	2005	14	1	0.07	NO	YES	NO
Silver	E6	SS	2003	16	0	0.00	NO	YES	NO
Silver	N2	FC	2005	5	0	0.00	YES	YES	NO
Silver	N2	NG	2005	14	0	0.00	NO	YES	NO
Silver	N2	SB	2005	5	0	0.00	YES	YES	NO
Silver	N2	SD	2003	16	0	0.00	NO	YES	NO
Silver	N2	SS	2003	15	1	0.07	NO	YES	NO
Silver	N2	WW	2005	3	0	0.00	YES	YES	NO
Silver	N4	FC	2005	4	0	0.00	YES	YES	NO
Silver	N4	NG	2005	14	0	0.00	NO	YES	NO
Silver	N4	SB	2005	5	0	0.00	YES	YES	NO
Silver	N4	SS	2003	16	0	0.00	NO	YES	NO
Silver	N4	WW	2005	5	0	0.00	YES	YES	NO
Silver	N5	NG	2005	14	1	0.07	NO	YES	NO
Silver	N5	SD	2003	16	0	0.00	NO	YES	NO
Silver	N5	SS	2003	16	0	0.00	NO	YES	NO
Silver	S1	FC	2005	3	0	0.00	YES	YES	NO
Silver	S1	NG	2005	14	0	0.00	NO	YES	NO
Silver	S1	SB	2005	9	0	0.00	NO	YES	NO
Silver	S1	SD	2003	16	0	0.00	NO	YES	NO
Silver	S1	SS	2003	16	0	0.00	NO	YES	NO
Silver	S1	WW	2005	2	0	0.00	YES	YES	NO
Silver	S2	FC	2005	3	0	0.00	YES	YES	NO
Silver	S2	NG	2005	14	0	0.00	NO	YES	NO
Silver	S2	SB	2005	9	0	0.00	NO	YES	NO
Silver	S2	SS	2003	16	1	0.06	NO	YES	NO
Silver	S2	WW	2005	2	0	0.00	YES	YES	NO
Silver	S4	NG	2005	14	0	0.00	NO	YES	NO
Silver	S4	SB	2005	9	0	0.00	NO	YES	NO
Silver	S4	SD	2003	16	0	0.00	NO	YES	NO
Silver	S4	SS	2003	16	0	0.00	NO	YES	NO
Silver	S4	WW	2005	4	0	0.00	YES	YES	NO
Silver	W2	FC	2005	1	0	0.00	YES	YES	NO
Silver	W2	NG	2005	14	0	0.00	NO	YES	NO
Silver	W2	SB	2005	8	0	0.00	NO	YES	NO
Silver	W2	SS	2003	15	0	0.00	NO	YES	NO
Silver	W2	WW	2005	5	0	0.00	YES	YES	NO
Silver	W4	FC	2005	5	0	0.00	YES	YES	NO
Silver	W4	NG	2005	14	0	0.00	NO	YES	NO
Silver	W4	SB	2005	6	0	0.00	NO	YES	NO

**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Silver	W4	SS	2003	16	0	0.00	NO	YES	NO
Silver	W4	WW	2005	3	0	0.00	YES	YES	NO
Sodium	E1	FC	2005	4	1	0.25	YES	YES	NO
Sodium	E1	NG	2002	17	13	0.76	NO	NO	YES
Sodium	E1	SB	2005	8	0	0.00	NO	YES	NO
Sodium	E1	SS	2003	15	7	0.47	NO	YES	NO
Sodium	E1	WW	2005	2	1	0.50	YES	NO	NO
Sodium	E2	FC	2005	3	0	0.00	YES	YES	NO
Sodium	E2	NG	2002	17	13	0.76	NO	NO	YES
Sodium	E2	SB	2005	4	2	0.50	YES	NO	NO
Sodium	E2	SD	1991	28	28	1.00	NO	NO	YES
Sodium	E2	SS	2003	16	9	0.56	NO	NO	YES
Sodium	E2	WW	2005	3	0	0.00	YES	YES	NO
Sodium	E5	FC	2005	4	0	0.00	YES	YES	NO
Sodium	E5	NG	2002	17	15	0.88	NO	NO	YES
Sodium	E5	SB	2005	8	0	0.00	NO	YES	NO
Sodium	E5	SS	2003	15	7	0.47	NO	YES	NO
Sodium	E5	WW	2005	2	1	0.50	YES	NO	NO
Sodium	E6	NG	2002	17	16	0.94	NO	NO	YES
Sodium	E6	SS	2003	16	9	0.56	NO	NO	YES
Sodium	N2	FC	2005	5	1	0.20	YES	YES	NO
Sodium	N2	NG	2002	17	13	0.76	NO	NO	YES
Sodium	N2	SB	2005	5	1	0.20	YES	YES	NO
Sodium	N2	SD	1991	28	28	1.00	NO	NO	YES
Sodium	N2	SS	2003	15	7	0.47	NO	YES	NO
Sodium	N2	WW	2005	3	1	0.33	YES	YES	NO
Sodium	N4	FC	2005	4	2	0.50	YES	NO	NO
Sodium	N4	NG	2002	17	15	0.88	NO	NO	YES
Sodium	N4	SB	2005	5	2	0.40	YES	YES	NO
Sodium	N4	SS	2003	16	8	0.50	NO	NO	YES
Sodium	N4	WW	2005	5	1	0.20	YES	YES	NO
Sodium	N5	NG	2002	17	17	1.00	NO	NO	YES
Sodium	N5	SD	1991	17	17	1.00	NO	NO	YES
Sodium	N5	SS	2003	16	14	0.88	NO	NO	YES
Sodium	S1	FC	2005	3	1	0.33	YES	YES	NO
Sodium	S1	NG	2002	17	15	0.88	NO	NO	YES
Sodium	S1	SB	2005	9	2	0.22	NO	YES	NO
Sodium	S1	SD	1991	28	27	0.96	NO	NO	YES
Sodium	S1	SS	2003	16	8	0.50	NO	NO	YES
Sodium	S1	WW	2005	2	0	0.00	YES	YES	NO
Sodium	S2	FC	2005	3	0	0.00	YES	YES	NO
Sodium	S2	NG	2002	17	14	0.82	NO	NO	YES
Sodium	S2	SB	2005	9	1	0.11	NO	YES	NO
Sodium	S2	SS	2003	16	8	0.50	NO	NO	YES
Sodium	S2	WW	2005	2	0	0.00	YES	YES	NO
Sodium	S4	NG	2002	17	14	0.82	NO	NO	YES
Sodium	S4	SB	2005	9	0	0.00	NO	YES	NO
Sodium	S4	SD	1991	28	27	0.96	NO	NO	YES
Sodium	S4	SS	2003	16	10	0.63	NO	NO	YES
Sodium	S4	WW	2005	3	1	0.33	YES	YES	NO
Sodium	W2	FC	2005	1	0	0.00	YES	YES	NO
Sodium	W2	NG	2002	17	14	0.82	NO	NO	YES
Sodium	W2	SB	2005	8	1	0.13	NO	YES	NO
Sodium	W2	SS	2003	15	7	0.47	NO	YES	NO
Sodium	W2	WW	2005	5	0	0.00	YES	YES	NO
Sodium	W4	FC	2005	5	1	0.20	YES	YES	NO
Sodium	W4	NG	2002	17	15	0.88	NO	NO	YES
Sodium	W4	SB	2005	6	0	0.00	NO	YES	NO
Sodium	W4	SS	2003	16	9	0.56	NO	NO	YES
Sodium	W4	WW	2005	3	0	0.00	YES	YES	NO
Strontium	E1	FC	1991	6	3	0.50	NO	NO	YES
Strontium	E1	NG	1991	28	28	1.00	NO	NO	YES
Strontium	E1	SB	1991	17	17	1.00	NO	NO	YES
Strontium	E1	SS	1991	25	25	1.00	NO	NO	YES
Strontium	E1	WW	1991	4	4	1.00	YES	NO	NO
Strontium	E2	FC	1991	6	2	0.33	NO	YES	NO
Strontium	E2	NG	1991	28	28	1.00	NO	NO	YES
Strontium	E2	SB	1991	12	11	0.92	NO	NO	YES
Strontium	E2	SD	1991	28	28	1.00	NO	NO	YES
Strontium	E2	SS	1991	25	25	1.00	NO	NO	YES
Strontium	E2	WW	1991	5	5	1.00	YES	NO	NO
Strontium	E5	FC	1991	6	4	0.67	NO	NO	YES
Strontium	E5	NG	1991	27	27	1.00	NO	NO	YES
Strontium	E5	SB	1991	17	17	1.00	NO	NO	YES
Strontium	E5	SS	1991	25	25	1.00	NO	NO	YES
Strontium	E5	WW	1991	4	4	1.00	YES	NO	NO
Strontium	E6	NG	1991	19	19	1.00	NO	NO	YES
Strontium	E6	SS	1991	19	19	1.00	NO	NO	YES
Strontium	N2	FC	1991	6	1	0.17	NO	YES	NO
Strontium	N2	NG	1991	28	28	1.00	NO	NO	YES
Strontium	N2	SB	1991	16	16	1.00	NO	NO	YES
Strontium	N2	SD	1991	28	28	1.00	NO	NO	YES
Strontium	N2	SS	1991	25	25	1.00	NO	NO	YES
Strontium	N2	WW	1991	5	5	1.00	YES	NO	NO
Strontium	N4	FC	1991	5	4	0.80	YES	NO	NO
Strontium	N4	NG	1991	18	18	1.00	NO	NO	YES
Strontium	N4	SB	1991	5	5	1.00	YES	NO	NO
Strontium	N4	SS	1991	18	18	1.00	NO	NO	YES
Strontium	N4	WW	1991	5	5	1.00	YES	NO	NO
Strontium	N5	NG	1991	17	17	1.00	NO	NO	YES
Strontium	N5	SD	1991	17	17	1.00	NO	NO	YES

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**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Strontium	N5	SS	1991	17	17	1.00	NO	NO	YES
Strontium	S1	FC	1991	5	2	0.40	YES	YES	NO
Strontium	S1	NG	1991	28	28	1.00	NO	NO	YES
Strontium	S1	SB	1991	19	19	1.00	NO	NO	YES
Strontium	S1	SD	1991	28	28	1.00	NO	NO	YES
Strontium	S1	SS	1991	27	27	1.00	NO	NO	YES
Strontium	S1	WW	1991	4	4	1.00	YES	NO	NO
Strontium	S2	FC	1991	5	1	0.20	YES	YES	NO
Strontium	S2	NG	1991	28	28	1.00	NO	NO	YES
Strontium	S2	SB	1991	19	19	1.00	NO	NO	YES
Strontium	S2	SS	1991	27	27	1.00	NO	NO	YES
Strontium	S2	WW	1991	4	4	1.00	YES	NO	NO
Strontium	S4	NG	1991	26	26	1.00	NO	NO	YES
Strontium	S4	SB	1991	17	17	1.00	NO	NO	YES
Strontium	S4	SD	1991	28	28	1.00	NO	NO	YES
Strontium	S4	SS	1991	24	24	1.00	NO	NO	YES
Strontium	S4	WW	1991	7	7	1.00	NO	NO	YES
Strontium	W2	FC	1991	1	0	0.00	YES	YES	NO
Strontium	W2	NG	1991	28	28	1.00	NO	NO	YES
Strontium	W2	SB	1991	18	18	1.00	NO	NO	YES
Strontium	W2	SS	1991	24	24	1.00	NO	NO	YES
Strontium	W2	WW	1991	7	7	1.00	NO	NO	YES
Strontium	W4	FC	1991	8	2	0.25	NO	YES	NO
Strontium	W4	NG	1991	22	22	1.00	NO	NO	YES
Strontium	W4	SB	1991	10	10	1.00	NO	NO	YES
Strontium	W4	SS	1991	19	19	1.00	NO	NO	YES
Strontium	W4	WW	1991	3	3	1.00	YES	NO	NO
Sulfur	E1	FC	1991	6	6	1.00	NO	NO	YES
Sulfur	E1	NG	1991	28	28	1.00	NO	NO	YES
Sulfur	E1	SB	1991	17	16	0.94	NO	NO	YES
Sulfur	E1	SS	1991	25	22	0.88	NO	NO	YES
Sulfur	E1	WW	1991	4	4	1.00	YES	NO	NO
Sulfur	E2	FC	1991	6	6	1.00	NO	NO	YES
Sulfur	E2	NG	1991	28	28	1.00	NO	NO	YES
Sulfur	E2	SB	1991	12	12	1.00	NO	NO	YES
Sulfur	E2	SD	1991	28	25	0.89	NO	NO	YES
Sulfur	E2	SS	1991	25	23	0.92	NO	NO	YES
Sulfur	E2	WW	1991	5	5	1.00	YES	NO	NO
Sulfur	E5	FC	1991	6	6	1.00	NO	NO	YES
Sulfur	E5	NG	1991	27	27	1.00	NO	NO	YES
Sulfur	E5	SB	1991	17	17	1.00	NO	NO	YES
Sulfur	E5	SS	1991	25	23	0.92	NO	NO	YES
Sulfur	E5	WW	1991	4	4	1.00	YES	NO	NO
Sulfur	E6	NG	1991	19	19	1.00	NO	NO	YES
Sulfur	E6	SS	1991	19	17	0.89	NO	NO	YES
Sulfur	N2	FC	1991	6	6	1.00	NO	NO	YES
Sulfur	N2	NG	1991	28	28	1.00	NO	NO	YES
Sulfur	N2	SB	1991	16	16	1.00	NO	NO	YES
Sulfur	N2	SD	1991	28	27	0.96	NO	NO	YES
Sulfur	N2	SS	1991	25	22	0.88	NO	NO	YES
Sulfur	N2	WW	1991	5	5	1.00	YES	NO	NO
Sulfur	N4	FC	1991	5	5	1.00	YES	NO	NO
Sulfur	N4	NG	1991	18	18	1.00	NO	NO	YES
Sulfur	N4	SB	1991	5	5	1.00	YES	NO	NO
Sulfur	N4	SS	1991	18	16	0.89	NO	NO	YES
Sulfur	N4	WW	1991	5	5	1.00	YES	NO	NO
Sulfur	N5	NG	1991	17	17	1.00	NO	NO	YES
Sulfur	N5	SD	1991	17	16	0.94	NO	NO	YES
Sulfur	N5	SS	1991	17	16	0.94	NO	NO	YES
Sulfur	S1	FC	1991	5	5	1.00	YES	NO	NO
Sulfur	S1	NG	1991	28	28	1.00	NO	NO	YES
Sulfur	S1	SB	1991	19	19	1.00	NO	NO	YES
Sulfur	S1	SD	1991	28	27	0.96	NO	NO	YES
Sulfur	S1	SS	1991	27	24	0.89	NO	NO	YES
Sulfur	S1	WW	1991	4	4	1.00	YES	NO	NO
Sulfur	S2	FC	1991	5	5	1.00	YES	NO	NO
Sulfur	S2	NG	1991	28	28	1.00	NO	NO	YES
Sulfur	S2	SB	1991	19	19	1.00	NO	NO	YES
Sulfur	S2	SS	1991	27	24	0.89	NO	NO	YES
Sulfur	S2	WW	1991	4	4	1.00	YES	NO	NO
Sulfur	S4	NG	1991	26	26	1.00	NO	NO	YES
Sulfur	S4	SB	1991	17	17	1.00	NO	NO	YES
Sulfur	S4	SD	1991	28	25	0.89	NO	NO	YES
Sulfur	S4	SS	1991	24	21	0.88	NO	NO	YES
Sulfur	S4	WW	1991	7	7	1.00	NO	NO	YES
Sulfur	W2	FC	1991	1	1	1.00	YES	NO	NO
Sulfur	W2	NG	1991	28	28	1.00	NO	NO	YES
Sulfur	W2	SB	1991	18	18	1.00	NO	NO	YES
Sulfur	W2	SS	1991	24	22	0.92	NO	NO	YES
Sulfur	W2	WW	1991	7	7	1.00	NO	NO	YES
Sulfur	W4	FC	1991	8	8	1.00	NO	NO	YES
Sulfur	W4	NG	1991	22	22	1.00	NO	NO	YES
Sulfur	W4	SB	1991	10	10	1.00	NO	NO	YES
Sulfur	W4	SS	1991	19	17	0.89	NO	NO	YES
Sulfur	W4	WW	1991	3	3	1.00	YES	NO	NO
Thallium	E1	FC	2005	4	0	0.00	YES	YES	NO
Thallium	E1	NG	2005	14	0	0.00	NO	YES	NO
Thallium	E1	SB	2005	8	0	0.00	NO	YES	NO
Thallium	E1	SS	2002	16	14	0.88	NO	NO	YES
Thallium	E1	WW	2005	2	0	0.00	YES	YES	NO
Thallium	E2	FC	2005	3	0	0.00	YES	YES	NO

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Thallium	E2	NG	2005	14	0	0.00	NO	YES	NO
Thallium	E2	SB	2005	4	0	0.00	YES	YES	NO
Thallium	E2	SD	2002	17	17	1.00	NO	NO	YES
Thallium	E2	SS	2002	17	16	0.94	NO	NO	YES
Thallium	E2	WW	2005	3	0	0.00	YES	YES	NO
Thallium	E5	FC	2005	4	0	0.00	YES	YES	NO
Thallium	E5	NG	2005	14	3	0.21	NO	YES	NO
Thallium	E5	SB	2005	8	0	0.00	NO	YES	NO
Thallium	E5	SS	2002	16	16	1.00	NO	NO	YES
Thallium	E5	WW	2005	2	0	0.00	YES	YES	NO
Thallium	E6	NG	2005	14	5	0.36	NO	YES	NO
Thallium	E6	SS	2002	17	16	0.94	NO	NO	YES
Thallium	N2	FC	2005	5	0	0.00	YES	YES	NO
Thallium	N2	NG	2005	14	1	0.07	NO	YES	NO
Thallium	N2	SB	2005	5	0	0.00	YES	YES	NO
Thallium	N2	SD	2002	17	17	1.00	NO	NO	YES
Thallium	N2	SS	2002	16	15	0.94	NO	NO	YES
Thallium	N2	WW	2005	3	0	0.00	YES	YES	NO
Thallium	N4	FC	2005	4	0	0.00	YES	YES	NO
Thallium	N4	NG	2005	14	1	0.07	NO	YES	NO
Thallium	N4	SB	2005	5	0	0.00	YES	YES	NO
Thallium	N4	SS	2002	17	15	0.88	NO	NO	YES
Thallium	N4	WW	2005	5	0	0.00	YES	YES	NO
Thallium	N5	NG	2005	14	6	0.43	NO	YES	NO
Thallium	N5	SD	2002	17	17	1.00	NO	NO	YES
Thallium	N5	SS	2002	17	16	0.94	NO	NO	YES
Thallium	S1	FC	2005	3	0	0.00	YES	YES	NO
Thallium	S1	NG	2005	14	2	0.14	NO	YES	NO
Thallium	S1	SB	2005	9	1	0.11	NO	YES	NO
Thallium	S1	SD	2002	17	17	1.00	NO	NO	YES
Thallium	S1	SS	2002	17	16	0.94	NO	NO	YES
Thallium	S1	WW	2005	2	0	0.00	YES	YES	NO
Thallium	S2	FC	2005	3	0	0.00	YES	YES	NO
Thallium	S2	NG	2005	14	1	0.07	NO	YES	NO
Thallium	S2	SB	2005	9	1	0.11	NO	YES	NO
Thallium	S2	SS	2002	17	16	0.94	NO	NO	YES
Thallium	S2	WW	2005	2	0	0.00	YES	YES	NO
Thallium	S4	NG	2005	14	1	0.07	NO	YES	NO
Thallium	S4	SB	2005	9	0	0.00	NO	YES	NO
Thallium	S4	SD	2002	17	16	0.94	NO	NO	YES
Thallium	S4	SS	2002	16	15	0.94	NO	NO	YES
Thallium	S4	WW	2005	4	0	0.00	YES	YES	NO
Thallium	W2	FC	2005	1	0	0.00	YES	YES	NO
Thallium	W2	NG	2005	14	0	0.00	NO	YES	NO
Thallium	W2	SB	2005	8	0	0.00	NO	YES	NO
Thallium	W2	SS	2002	16	15	0.94	NO	NO	YES
Thallium	W2	WW	2005	5	0	0.00	YES	YES	NO
Thallium	W4	FC	2005	5	0	0.00	YES	YES	NO
Thallium	W4	NG	2005	14	2	0.14	NO	YES	NO
Thallium	W4	SB	2005	6	0	0.00	NO	YES	NO
Thallium	W4	SS	2002	17	17	1.00	NO	NO	YES
Thallium	W4	WW	2005	3	0	0.00	YES	YES	NO
Titanium	E1	FC	2007	4	0	0.00	YES	YES	NO
Titanium	E1	NG	2002	17	16	0.94	NO	NO	YES
Titanium	E1	SB	2007	6	0	0.00	NO	YES	NO
Titanium	E1	SS	1991	25	25	1.00	NO	NO	YES
Titanium	E1	WW	2010	2	0	0.00	YES	YES	NO
Titanium	E2	FC	2007	3	0	0.00	YES	YES	NO
Titanium	E2	NG	2002	17	16	0.94	NO	NO	YES
Titanium	E2	SB	2007	4	1	0.25	YES	YES	NO
Titanium	E2	SD	1991	28	28	1.00	NO	NO	YES
Titanium	E2	SS	1991	25	25	1.00	NO	NO	YES
Titanium	E2	WW	2010	1	0	0.00	YES	YES	NO
Titanium	E5	FC	2007	4	0	0.00	YES	YES	NO
Titanium	E5	NG	2002	17	16	0.94	NO	NO	YES
Titanium	E5	SB	2007	6	2	0.33	NO	YES	NO
Titanium	E5	SS	1991	25	25	1.00	NO	NO	YES
Titanium	E5	WW	2010	2	0	0.00	YES	YES	NO
Titanium	E6	NG	2002	17	17	1.00	NO	NO	YES
Titanium	E6	SS	1991	19	19	1.00	NO	NO	YES
Titanium	N2	FC	2007	4	1	0.25	YES	YES	NO
Titanium	N2	NG	2002	17	16	0.94	NO	NO	YES
Titanium	N2	SB	2007	4	1	0.25	YES	YES	NO
Titanium	N2	SD	1991	28	28	1.00	NO	NO	YES
Titanium	N2	SS	1991	25	25	1.00	NO	NO	YES
Titanium	N2	WW	2010	2	0	0.00	YES	YES	NO
Titanium	N4	FC	2007	4	0	0.00	YES	YES	NO
Titanium	N4	NG	2002	17	15	0.88	NO	NO	YES
Titanium	N4	SB	2007	4	2	0.50	YES	NO	NO
Titanium	N4	SS	1991	18	18	1.00	NO	NO	YES
Titanium	N4	WW	2010	3	1	0.33	YES	YES	NO
Titanium	N5	NG	2002	17	17	1.00	NO	NO	YES
Titanium	N5	SD	1991	17	17	1.00	NO	NO	YES
Titanium	N5	SS	1991	17	17	1.00	NO	NO	YES
Titanium	S1	FC	2007	2	0	0.00	YES	YES	NO
Titanium	S1	NG	2002	17	17	1.00	NO	NO	YES
Titanium	S1	SB	2007	8	1	0.13	NO	YES	NO
Titanium	S1	SD	1991	28	27	0.96	NO	NO	YES
Titanium	S1	SS	1991	27	26	0.96	NO	NO	YES
Titanium	S1	WW	2010	1	0	0.00	YES	YES	NO
Titanium	S2	FC	2007	2	0	0.00	YES	YES	NO

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Titanium	S2	NG	2002	17	17	1.00	NO	NO	YES
Titanium	S2	SB	2007	8	1	0.13	NO	YES	NO
Titanium	S2	SS	1991	27	26	0.96	NO	NO	YES
Titanium	S2	WW	2010	1	0	0.00	YES	YES	NO
Titanium	S4	NG	2002	17	16	0.94	NO	NO	YES
Titanium	S4	SB	2007	8	3	0.38	NO	YES	NO
Titanium	S4	SD	1991	28	27	0.96	NO	NO	YES
Titanium	S4	SS	1991	24	23	0.96	NO	NO	YES
Titanium	S4	WW	2010	2	0	0.00	YES	YES	NO
Titanium	W2	FC	2007	1	0	0.00	YES	YES	NO
Titanium	W2	NG	2002	17	17	1.00	NO	NO	YES
Titanium	W2	SB	2007	7	1	0.14	NO	YES	NO
Titanium	W2	SS	1991	24	24	1.00	NO	NO	YES
Titanium	W2	WW	2010	3	0	0.00	YES	YES	NO
Titanium	W4	FC	2007	5	0	0.00	YES	YES	NO
Titanium	W4	NG	2002	17	17	1.00	NO	NO	YES
Titanium	W4	SB	2007	5	1	0.20	YES	YES	NO
Titanium	W4	SS	1991	19	19	1.00	NO	NO	YES
Titanium	W4	WW	2010	1	0	0.00	YES	YES	NO
Vanadium	E1	FC	2010	3	0	0.00	YES	YES	NO
Vanadium	E1	NG	2010	9	1	0.11	NO	YES	NO
Vanadium	E1	SB	2010	4	0	0.00	YES	YES	NO
Vanadium	E1	SS	1991	25	25	1.00	NO	NO	YES
Vanadium	E1	WW	2010	2	0	0.00	YES	YES	NO
Vanadium	E2	FC	2010	2	0	0.00	YES	YES	NO
Vanadium	E2	NG	2010	9	1	0.11	NO	YES	NO
Vanadium	E2	SB	2010	3	0	0.00	YES	YES	NO
Vanadium	E2	SD	1991	28	28	1.00	NO	NO	YES
Vanadium	E2	SS	1991	25	25	1.00	NO	NO	YES
Vanadium	E2	WW	2010	1	0	0.00	YES	YES	NO
Vanadium	E5	FC	2010	3	0	0.00	YES	YES	NO
Vanadium	E5	NG	2010	9	5	0.56	NO	NO	YES
Vanadium	E5	SB	2010	4	0	0.00	YES	YES	NO
Vanadium	E5	SS	1991	25	25	1.00	NO	NO	YES
Vanadium	E5	WW	2010	2	0	0.00	YES	YES	NO
Vanadium	E6	NG	2010	9	3	0.33	NO	YES	NO
Vanadium	E6	SS	1991	19	19	1.00	NO	NO	YES
Vanadium	N2	FC	2010	3	0	0.00	YES	YES	NO
Vanadium	N2	NG	2010	9	3	0.33	NO	YES	NO
Vanadium	N2	SB	2010	3	0	0.00	YES	YES	NO
Vanadium	N2	SD	1991	28	28	1.00	NO	NO	YES
Vanadium	N2	SS	1991	25	25	1.00	NO	NO	YES
Vanadium	N2	WW	2010	2	0	0.00	YES	YES	NO
Vanadium	N4	FC	2010	3	0	0.00	YES	YES	NO
Vanadium	N4	NG	2010	9	2	0.22	NO	YES	NO
Vanadium	N4	SB	2010	3	1	0.33	YES	YES	NO
Vanadium	N4	SS	1991	18	18	1.00	NO	NO	YES
Vanadium	N4	WW	2010	3	0	0.00	YES	YES	NO
Vanadium	N5	NG	2010	9	2	0.22	NO	YES	NO
Vanadium	N5	SD	1991	17	17	1.00	NO	NO	YES
Vanadium	N5	SS	1991	17	17	1.00	NO	NO	YES
Vanadium	S1	FC	2010	2	0	0.00	YES	YES	NO
Vanadium	S1	NG	2010	9	4	0.44	NO	YES	NO
Vanadium	S1	SB	2010	6	0	0.00	NO	YES	NO
Vanadium	S1	SD	1991	28	28	1.00	NO	NO	YES
Vanadium	S1	SS	1991	27	27	1.00	NO	NO	YES
Vanadium	S1	WW	2010	1	0	0.00	YES	YES	NO
Vanadium	S2	FC	2010	2	0	0.00	YES	YES	NO
Vanadium	S2	NG	2010	9	3	0.33	NO	YES	NO
Vanadium	S2	SB	2010	6	0	0.00	NO	YES	NO
Vanadium	S2	SS	1991	27	27	1.00	NO	NO	YES
Vanadium	S2	WW	2010	1	0	0.00	YES	YES	NO
Vanadium	S4	NG	2010	9	1	0.11	NO	YES	NO
Vanadium	S4	SB	2010	6	0	0.00	NO	YES	NO
Vanadium	S4	SD	1991	28	28	1.00	NO	NO	YES
Vanadium	S4	SS	1991	24	24	1.00	NO	NO	YES
Vanadium	S4	WW	2010	2	0	0.00	YES	YES	NO
Vanadium	W2	FC	2010	1	0	0.00	YES	YES	NO
Vanadium	W2	NG	2010	9	4	0.44	NO	YES	NO
Vanadium	W2	SB	2010	5	0	0.00	YES	YES	NO
Vanadium	W2	SS	1991	24	24	1.00	NO	NO	YES
Vanadium	W2	WW	2010	3	0	0.00	YES	YES	NO
Vanadium	W4	FC	2010	5	0	0.00	YES	YES	NO
Vanadium	W4	NG	2010	9	6	0.67	NO	NO	YES
Vanadium	W4	SB	2010	3	1	0.33	YES	YES	NO
Vanadium	W4	SS	1991	19	19	1.00	NO	NO	YES
Vanadium	W4	WW	2010	1	0	0.00	YES	YES	NO
Zinc	E1	FC	1991	6	6	1.00	NO	NO	YES
Zinc	E1	NG	1991	28	28	1.00	NO	NO	YES
Zinc	E1	SB	1991	17	17	1.00	NO	NO	YES
Zinc	E1	SS	1991	25	25	1.00	NO	NO	YES
Zinc	E1	WW	1991	4	4	1.00	YES	NO	NO
Zinc	E2	FC	1991	6	6	1.00	NO	NO	YES
Zinc	E2	NG	1991	28	28	1.00	NO	NO	YES
Zinc	E2	SB	1991	12	12	1.00	NO	NO	YES
Zinc	E2	SD	1991	28	28	1.00	NO	NO	YES
Zinc	E2	SS	1991	25	25	1.00	NO	NO	YES
Zinc	E2	WW	1991	5	5	1.00	YES	NO	NO
Zinc	E5	FC	1991	6	6	1.00	NO	NO	YES
Zinc	E5	NG	1991	27	26	0.96	NO	NO	YES
Zinc	E5	SB	1991	17	17	1.00	NO	NO	YES

**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Zinc	E5	SS	1991	25	25	1.00	NO	NO	YES
Zinc	E5	WW	1991	4	4	1.00	YES	NO	NO
Zinc	E6	NG	1991	19	19	1.00	NO	NO	YES
Zinc	E6	SS	1991	19	19	1.00	NO	NO	YES
Zinc	N2	FC	1991	6	6	1.00	NO	NO	YES
Zinc	N2	NG	1991	28	28	1.00	NO	NO	YES
Zinc	N2	SB	1991	16	16	1.00	NO	NO	YES
Zinc	N2	SD	1991	28	28	1.00	NO	NO	YES
Zinc	N2	SS	1991	25	25	1.00	NO	NO	YES
Zinc	N2	WW	1991	5	5	1.00	YES	NO	NO
Zinc	N4	FC	1991	5	5	1.00	YES	NO	NO
Zinc	N4	NG	1991	18	18	1.00	NO	NO	YES
Zinc	N4	SB	1991	5	5	1.00	YES	NO	NO
Zinc	N4	SS	1991	18	18	1.00	NO	NO	YES
Zinc	N4	WW	1991	5	5	1.00	YES	NO	NO
Zinc	N5	NG	1991	17	17	1.00	NO	NO	YES
Zinc	N5	SD	1991	17	17	1.00	NO	NO	YES
Zinc	N5	SS	1991	17	17	1.00	NO	NO	YES
Zinc	S1	FC	1991	5	5	1.00	YES	NO	NO
Zinc	S1	NG	1991	28	28	1.00	NO	NO	YES
Zinc	S1	SB	1991	19	19	1.00	NO	NO	YES
Zinc	S1	SD	1991	28	28	1.00	NO	NO	YES
Zinc	S1	SS	1991	27	27	1.00	NO	NO	YES
Zinc	S1	WW	1991	4	4	1.00	YES	NO	NO
Zinc	S2	FC	1991	5	5	1.00	YES	NO	NO
Zinc	S2	NG	1991	28	28	1.00	NO	NO	YES
Zinc	S2	SB	1991	19	19	1.00	NO	NO	YES
Zinc	S2	SS	1991	27	27	1.00	NO	NO	YES
Zinc	S2	WW	1991	4	4	1.00	YES	NO	NO
Zinc	S4	NG	1991	26	25	0.96	NO	NO	YES
Zinc	S4	SB	1991	17	17	1.00	NO	NO	YES
Zinc	S4	SD	1991	28	28	1.00	NO	NO	YES
Zinc	S4	SS	1991	24	24	1.00	NO	NO	YES
Zinc	S4	WW	1991	7	7	1.00	NO	NO	YES
Zinc	W2	FC	1991	1	1	1.00	YES	NO	NO
Zinc	W2	NG	1991	28	28	1.00	NO	NO	YES
Zinc	W2	SB	1991	18	18	1.00	NO	NO	YES
Zinc	W2	SS	1991	24	24	1.00	NO	NO	YES
Zinc	W2	WW	1991	7	7	1.00	NO	NO	YES
Zinc	W4	FC	1991	8	8	1.00	NO	NO	YES
Zinc	W4	NG	1991	22	22	1.00	NO	NO	YES
Zinc	W4	SB	1991	10	10	1.00	NO	NO	YES
Zinc	W4	SS	1991	19	19	1.00	NO	NO	YES
Zinc	W4	WW	1991	3	3	1.00	YES	NO	NO
Zirconium	E1	FC	2003	5	0	0.00	YES	YES	NO
Zirconium	E1	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	E1	SB	2003	8	0	0.00	NO	YES	NO
Zirconium	E1	SS	1991	25	7	0.28	NO	YES	NO
Zirconium	E1	WW	1991	4	0	0.00	YES	YES	NO
Zirconium	E2	FC	2003	4	0	0.00	YES	YES	NO
Zirconium	E2	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	E2	SB	2003	5	0	0.00	YES	YES	NO
Zirconium	E2	SD	1991	28	18	0.64	NO	NO	YES
Zirconium	E2	SS	1991	25	8	0.32	NO	YES	NO
Zirconium	E2	WW	1991	5	0	0.00	YES	YES	NO
Zirconium	E5	FC	2003	5	0	0.00	YES	YES	NO
Zirconium	E5	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	E5	SB	2003	8	0	0.00	NO	YES	NO
Zirconium	E5	SS	1991	25	8	0.32	NO	YES	NO
Zirconium	E5	WW	1991	4	0	0.00	YES	YES	NO
Zirconium	E6	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	E6	SS	1991	19	8	0.42	NO	YES	NO
Zirconium	N2	FC	2003	5	0	0.00	YES	YES	NO
Zirconium	N2	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	N2	SB	2003	6	0	0.00	NO	YES	NO
Zirconium	N2	SD	1991	28	12	0.43	NO	YES	NO
Zirconium	N2	SS	1991	25	18	0.72	NO	NO	YES
Zirconium	N2	WW	1991	5	0	0.00	YES	YES	NO
Zirconium	N4	FC	2003	5	0	0.00	YES	YES	NO
Zirconium	N4	NG	2003	16	1	0.06	NO	YES	NO
Zirconium	N4	SB	2003	5	0	0.00	YES	YES	NO
Zirconium	N4	SS	1991	18	10	0.56	NO	NO	YES
Zirconium	N4	WW	1991	5	0	0.00	YES	YES	NO
Zirconium	N5	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	N5	SD	1991	17	12	0.71	NO	NO	YES
Zirconium	N5	SS	1991	17	9	0.53	NO	NO	YES
Zirconium	S1	FC	2003	3	0	0.00	YES	YES	NO
Zirconium	S1	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	S1	SB	2003	11	0	0.00	NO	YES	NO
Zirconium	S1	SD	1991	28	13	0.46	NO	YES	NO
Zirconium	S1	SS	1991	27	13	0.48	NO	YES	NO
Zirconium	S1	WW	1991	4	0	0.00	YES	YES	NO
Zirconium	S2	FC	2003	3	0	0.00	YES	YES	NO
Zirconium	S2	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	S2	SB	2003	11	0	0.00	NO	YES	NO
Zirconium	S2	SS	1991	27	9	0.33	NO	YES	NO
Zirconium	S2	WW	1991	4	0	0.00	YES	YES	NO
Zirconium	S4	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	S4	SB	2003	11	0	0.00	NO	YES	NO
Zirconium	S4	SD	1991	28	15	0.54	NO	NO	YES
Zirconium	S4	SS	1991	24	11	0.46	NO	YES	NO

**Table F-1**  
**Suitability of Data for Site Specific Inorganic Regression Analysis**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	Number of Detected Samples	Proportion Detected	n<6 ?	<50% Detected	Suitable for Regression
Zirconium	S4	WW	1991	7	0	0.00	NO	YES	NO
Zirconium	W2	FC	2003	1	0	0.00	YES	YES	NO
Zirconium	W2	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	W2	SB	2003	9	0	0.00	NO	YES	NO
Zirconium	W2	SS	1991	24	8	0.33	NO	YES	NO
Zirconium	W2	WW	1991	7	0	0.00	NO	YES	NO
Zirconium	W4	FC	2003	6	0	0.00	NO	YES	NO
Zirconium	W4	NG	2003	16	0	0.00	NO	YES	NO
Zirconium	W4	SB	2003	7	0	0.00	NO	YES	NO
Zirconium	W4	SS	1991	19	11	0.58	NO	NO	YES
Zirconium	W4	WW	1991	3	0	0.00	YES	YES	NO



Table F-2  
Site Specific Inorganic Regression Analysis Results Summary  
Lambton Facility 2019 Annual Landfill Report Biomonitoring Program  
2018 Field Year

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Aluminum	E1	NG	2002	17	0.045	-0.013	28.401	0.413		
Aluminum	E1	SS	1991	25	0.039	0.002	-0.227	0.346		
Aluminum	E2	NG	2002	17	0.017	0.012	-22.025	0.615		
Aluminum	E2	SD	1991	28	0.247	0.007	-9.903	0.007		
Aluminum	E2	SS	1991	25	0.155	0.005	-6.637	0.051		
Aluminum	E5	NG	2002	17	0.331	0.068	-135.242	0.016		
Aluminum	E5	SS	1991	25	0.11	0.004	-3.903	0.105		
Aluminum	E6	NG	2002	17	0.017	-0.008	17.476	0.617		
Aluminum	E6	SS	1991	19	0.009	0.002	0.952	0.694		
Aluminum	N2	NG	2002	17	0.158	-0.035	72.911	0.114		
Aluminum	N2	SD	1991	28	0.701	0.016	-27.102	<0.001	*	Increasing
Aluminum	N2	SS	1991	25	0.273	0.007	-8.913	0.007		
Aluminum	N4	NG	2002	17	0.005	0.007	-12.386	0.79		
Aluminum	N4	SS	1991	18	0.125	0.005	-6.577	0.151		
Aluminum	N5	NG	2002	17	0	0	2.514	0.99		
Aluminum	N5	SD	1991	17	0.045	0.005	-6.654	0.413		
Aluminum	N5	SS	1991	17	0.037	0.002	0.161	0.458		
Aluminum	S1	NG	2002	16	0.003	0.005	-7.155	0.845		
Aluminum	S1	SD	1991	28	0.038	0.002	-0.625	0.321		
Aluminum	S1	SS	1991	27	0.259	0.005	-5.98	0.007		
Aluminum	S2	NG	2002	17	0.028	-0.014	29.436	0.523		
Aluminum	S2	SS	1991	27	0.22	0.005	-5.535	0.014		
Aluminum	S4	NG	2002	17	0.04	0.015	-28.614	0.439		
Aluminum	S4	SD	1991	28	0.088	0.002	-0.136	0.125		
Aluminum	S4	SS	1991	24	0.354	0.008	-12.497	0.002	*	Increasing
Aluminum	W2	NG	2002	17	0.097	0.025	-48.437	0.225		
Aluminum	W2	SS	1991	24	0.376	0.006	-6.956	0.001	*	Increasing
Aluminum	W4	NG	2002	17	0.036	0.018	-33.642	0.468		
Aluminum	W4	SS	1991	19	0.139	0.004	-3.865	0.116		
Arsenic	E1	SS	1991	25	0.11	0.01	-19.148	0.106		
Arsenic	E2	SD	1991	28	0.008	0.001	-0.651	0.646		
Arsenic	E2	SS	1991	25	0.105	0.004	-7.403	0.114		
Arsenic	E5	SS	1991	25	0.021	0.001	-1.835	0.49		
Arsenic	E6	SS	1991	19	0.006	0.001	-1.979	0.751		
Arsenic	N2	SD	1991	28	0.048	0.003	-5.377	0.263		
Arsenic	N2	SS	1991	25	0.211	0.004	-6.869	0.021		
Arsenic	N4	SS	1991	18	0.027	0.001	-2.292	0.512		
Arsenic	N5	SD	1991	16	0.023	0.003	-6.158	0.573		
Arsenic	N5	SS	1991	17	0.393	0.006	-12.088	0.007		
Arsenic	S1	SD	1991	28	0.004	0.001	-1.128	0.745		
Arsenic	S1	SS	1991	27	0.07	0.002	-3.554	0.183		
Arsenic	S2	SS	1991	27	0.07	0.002	-3.353	0.183		
Arsenic	S4	SD	1991	28	0.316	0.006	-11.62	0.002	*	Increasing
Arsenic	S4	SS	1991	24	0.005	-0.001	1.888	0.753		
Arsenic	W2	SS	1991	24	0.322	0.004	-6.429	0.004		
Arsenic	W4	SS	1991	19	0.141	0.004	-7.472	0.113		
Barium	E1	NG	1991	28	0.345	-0.019	40.084	0.001	*	Decreasing
Barium	E1	SB	1991	17	0.298	0.012	-25.211	0.023		
Barium	E1	SS	1991	25	0.03	-0.002	6.394	0.41		
Barium	E2	NG	1991	28	0.034	-0.006	13.786	0.35		
Barium	E2	SB	1991	12	0.033	-0.012	23.404	0.573		
Barium	E2	SD	1991	28	0.087	0.004	-5.693	0.129		
Barium	E2	SS	1991	25	0.017	0.002	-1.36	0.532		
Barium	E5	NG	1991	27	0.061	-0.009	19.346	0.212		
Barium	E5	SB	1991	17	0.038	0.004	-7.662	0.453		
Barium	E5	SS	1991	25	0.03	0.002	-2.238	0.404		
Barium	E6	NG	1991	19	0.036	-0.011	23.319	0.439		
Barium	E6	SS	1991	19	0.025	-0.003	8.353	0.522		
Barium	N2	NG	1991	29	0.115	-0.015	31.051	0.072		
Barium	N2	SB	1991	16	0.063	-0.015	29.375	0.348		
Barium	N2	SD	1991	28	0.648	0.012	-21.884	<0.001	*	Increasing
Barium	N2	SS	1991	25	0.079	0.003	-4.016	0.173		
Barium	N4	NG	1991	18	0.182	0.015	-28.657	0.078		
Barium	N4	SS	1991	18	0.008	-0.001	4.488	0.728		
Barium	N5	NG	1991	17	0.018	-0.005	10.268	0.606		
Barium	N5	SD	1991	17	0.004	0.002	-1.556	0.799		
Barium	N5	SS	1991	17	0.235	-0.006	13.274	0.049		
Barium	S1	NG	1991	28	0.026	0.007	-13.27	0.413		
Barium	S1	SB	1991	20	0.116	0.007	-14.567	0.142		
Barium	S1	SD	1991	28	0.024	-0.002	5.117	0.435		
Barium	S1	SS	1991	27	0.091	0.003	-3.569	0.127		
Barium	S2	NG	1991	29	0.192	-0.016	33.608	0.018		
Barium	S2	SB	1991	20	0.159	0.009	-17.985	0.082		
Barium	S2	SS	1991	27	0.037	0.002	-1.349	0.335		
Barium	S4	NG	1991	25	0.156	-0.015	30.456	0.051		
Barium	S4	SB	1991	17	0.092	0.007	-14.009	0.236		
Barium	S4	SD	1991	28	0.046	0.001	-0.831	0.272		
Barium	S4	SS	1991	24	0.455	0.011	-20.618	<0.001	*	Increasing
Barium	S4	WW	1991	7	0.632	0.023	-46.142	0.033		
Barium	W2	NG	1991	28	0.004	0.002	-3.412	0.746		
Barium	W2	SB	1991	19	0.177	0.01	-20.153	0.073		
Barium	W2	SS	1991	24	0.065	0.001	-0.943	0.229		
Barium	W2	WW	1991	7	0.275	0.01	-19.867	0.227		
Barium	W4	NG	1991	22	0.025	0.008	-14.209	0.478		
Barium	W4	SB	1991	10	0.01	-0.002	4.944	0.781		
Barium	W4	SS	1991	19	0.001	0	1.54	0.924		
Beryllium	E1	SS	1991	25	0	0	0.07	0.954		
Beryllium	E2	SD	1991	28	0.321	0.009	-18.622	0.002	*	Increasing
Beryllium	E2	SS	1991	25	0.066	0.004	-9.053	0.216		
Beryllium	E5	SS	1991	25	0.053	0.003	-5.347	0.269		
Beryllium	E6	SS	1991	19	0	0	0.163	0.965		

**Table F-2**  
**Site Specific Inorganic Regression Analysis Results Summary**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Beryllium	N2	SD	1991	28	0.645	0.015	-29.484	<0.001	*	Increasing
Beryllium	N2	SS	1991	25	0.148	0.004	-7.157	0.057		
Beryllium	N4	SS	1991	18	0.268	0.008	-15.863	0.028		
Beryllium	N5	SD	1991	17	0.046	0.005	-10.919	0.407		
Beryllium	N5	SS	1991	17	0.001	0	-1.034	0.9		
Beryllium	S1	SD	1991	28	0.041	0.002	-4.886	0.301		
Beryllium	S1	SS	1991	27	0.082	0.003	-5.425	0.147		
Beryllium	S2	SS	1991	27	0.139	0.004	-8.382	0.056		
Beryllium	S4	SD	1991	28	0.205	0.004	-7.268	0.016		
Beryllium	S4	SS	1991	24	0.388	0.009	-17.58	0.001	*	Increasing
Beryllium	W2	SS	1991	24	0.214	0.004	-8.506	0.023		
Beryllium	W4	SS	1991	19	0.01	0.001	-2.677	0.681		
Boron	E1	NG	1999	20	0.032	0.006	-11.6	0.453		
Boron	E1	SB	1991	17	0.009	-0.001	3.958	0.711		
Boron	E1	SS	1998	19	0.002	0.001	-1.423	0.875		
Boron	E2	NG	1999	20	0.021	0.008	-15.617	0.546		
Boron	E2	SB	1991	12	0.004	0	0.594	0.847		
Boron	E2	SD	1995	24	0.115	0.007	-12.585	0.105		
Boron	E2	SS	1998	19	0.038	-0.005	11.95	0.425		
Boron	E5	NG	1999	20	0.01	0.008	-15.008	0.669		
Boron	E5	SB	1991	17	0.011	-0.001	3.605	0.689		
Boron	E5	SS	1998	19	0.034	0.006	-10.373	0.448		
Boron	E6	NG	1999	19	0.141	0.034	-67.01	0.113		
Boron	E6	SS	1998	19	0.058	0.006	-10.257	0.321		
Boron	N2	NG	1999	21	0.152	0.018	-35.16	0.08		
Boron	N2	SB	1991	16	0.083	-0.004	8.805	0.28		
Boron	N2	SD	1995	24	0.141	0.008	-15.465	0.071		
Boron	N2	SS	1998	19	0.014	0.003	-5.594	0.627		
Boron	N4	NG	1999	18	0.035	0.013	-25.505	0.458		
Boron	N4	SS	1998	18	0.25	0.02	-38.617	0.034		
Boron	N5	NG	1999	17	0.1	0.025	-48.922	0.217		
Boron	N5	SD	1995	17	0.01	0.003	-4.406	0.709		
Boron	N5	SS	1998	17	0	0	0.86	0.978		
Boron	S1	NG	1999	20	0.12	0.025	-49.84	0.135		
Boron	S1	SB	1991	20	0.119	0.003	-5.343	0.136		
Boron	S1	SD	1995	24	0.009	0.002	-2.216	0.665		
Boron	S1	SS	1998	20	0.019	0.004	-6.074	0.566		
Boron	S2	NG	1999	21	0.108	0.022	-43.788	0.146		
Boron	S2	SB	1991	20	0.233	0.005	-8.773	0.031		
Boron	S2	SS	1998	20	0.008	0.003	-4.126	0.702		
Boron	S4	NG	1999	20	0.027	-0.011	22.2	0.493		
Boron	S4	SB	1991	17	0.142	0.004	-7.364	0.135		
Boron	S4	SD	1995	24	0.105	0.008	-13.918	0.122		
Boron	S4	SS	1998	19	0.048	0.006	-11.733	0.369		
Boron	W2	NG	1999	20	0.013	-0.007	14.571	0.631		
Boron	W2	SB	1991	19	0.003	0.001	-0.206	0.82		
Boron	W2	SS	1998	17	0.127	0.01	-20.261	0.16		
Boron	W4	NG	1999	20	0.027	0.011	-21.899	0.488		
Boron	W4	SB	1991	10	0.027	0.002	-1.856	0.653		
Boron	W4	SS	1998	19	0.003	0.002	-2.119	0.832		
Cadmium	E1	SS	1991	25	0.002	-0.001	1.41	0.824		
Cadmium	E2	SD	1991	28	0.015	-0.003	6.302	0.53		
Cadmium	E2	SS	1991	25	0.034	-0.003	4.635	0.381		
Cadmium	E5	NG	2001	18	0.006	-0.004	7.758	0.754		
Cadmium	E5	SS	1991	25	0.041	-0.004	8.08	0.333		
Cadmium	E6	NG	2001	18	0	0.001	-2.335	0.947		
Cadmium	E6	SS	1991	19	0.248	-0.011	21.189	0.03		
Cadmium	N2	SD	1991	28	0.379	0.011	-22.017	<0.001	*	Increasing
Cadmium	N2	SS	1991	25	0.022	-0.002	4.554	0.482		
Cadmium	N4	SS	1991	18	0.025	0.003	-6.744	0.533		
Cadmium	N5	NG	2001	17	0.371	-0.036	71.495	0.009		
Cadmium	N5	SD	1991	17	0.015	-0.004	8.809	0.638		
Cadmium	N5	SS	1991	17	0.164	-0.007	12.952	0.107		
Cadmium	S1	NG	2001	18	0.062	-0.015	29.511	0.318		
Cadmium	S1	SD	1991	28	0.014	-0.003	5.38	0.544		
Cadmium	S1	SS	1991	27	0.001	0.001	-1.487	0.87		
Cadmium	S2	NG	2001	19	0.224	-0.026	50.589	0.041		
Cadmium	S2	SS	1991	27	0.126	-0.01	19.375	0.07		
Cadmium	S4	SD	1991	28	0.308	-0.014	28.148	0.002	*	Decreasing
Cadmium	S4	SS	1991	24	0	0	0.216	0.942		
Cadmium	W2	SS	1991	24	0.247	-0.006	11.389	0.013		
Cadmium	W4	NG	2001	18	0.003	0.002	-5.064	0.832		
Cadmium	W4	SB	2005	6	0.215	-0.023	45.695	0.354		
Cadmium	W4	SS	1991	19	0.007	-0.001	2.664	0.735		
Calcium	E1	FC	1991	6	0.621	-0.025	52.382	0.063		
Calcium	E1	NG	1991	28	0.005	0.001	1.19	0.71		
Calcium	E1	SB	1991	17	0.062	0.003	-3.239	0.334		
Calcium	E1	SS	1991	25	0.061	-0.004	11.306	0.235		
Calcium	E2	FC	1991	6	0.436	-0.015	32.22	0.154		
Calcium	E2	NG	1991	28	0	0	3.194	0.924		
Calcium	E2	SB	1991	12	0.043	0.002	-0.211	0.517		
Calcium	E2	SD	1991	28	0.175	-0.005	15.175	0.027		
Calcium	E2	SS	1991	25	0.048	0.005	-5.697	0.292		
Calcium	E5	FC	1991	6	0.641	-0.017	35.551	0.056		
Calcium	E5	NG	1991	27	0.149	0.011	-18.157	0.047		
Calcium	E5	SB	1991	17	0.041	0.002	-0.599	0.435		
Calcium	E5	SS	1991	25	0.236	-0.009	20.941	0.014		
Calcium	E6	NG	1991	19	0.062	0.009	-14.807	0.302		
Calcium	E6	SS	1991	19	0.04	-0.004	12.119	0.413		
Calcium	N2	FC	1991	6	0.592	-0.025	51.22	0.074		
Calcium	N2	NG	1991	29	0	0	3.416	0.962		

**Table F-2**  
**Site Specific Inorganic Regression Analysis Results Summary**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Calcium	N2	SB	1991	16	0.023	-0.002	6.925	0.577		
Calcium	N2	SD	1991	28	0.515	-0.011	26.639	<0.001	*	Decreasing
Calcium	N2	SS	1991	25	0.104	-0.003	9.187	0.117		
Calcium	N4	NG	1991	18	0	0.001	2.221	0.937		
Calcium	N4	SS	1991	18	0.434	0.042	-79.528	0.003		
Calcium	N5	NG	1991	17	0.076	0.009	-14.59	0.283		
Calcium	N5	SD	1991	17	0.206	-0.015	34.994	0.067		
Calcium	N5	SS	1991	17	0.138	0.015	-26.495	0.142		
Calcium	S1	NG	1991	28	0.126	0.01	-16.794	0.064		
Calcium	S1	SB	1991	20	0.22	0.006	-7.901	0.037		
Calcium	S1	SD	1991	28	0.002	-0.001	7.025	0.838		
Calcium	S1	SS	1991	27	0.002	-0.001	5.702	0.807		
Calcium	S2	NG	1991	29	0.018	0.004	-3.363	0.484		
Calcium	S2	SB	1991	20	0.363	0.007	-10.684	0.005		
Calcium	S2	SS	1991	27	0.09	0.005	-5.45	0.129		
Calcium	S4	NG	1991	26	0.068	0.007	-9.898	0.2		
Calcium	S4	SB	1991	17	0.496	0.01	-16.146	0.002	*	Increasing
Calcium	S4	SD	1991	28	0.011	-0.002	8.474	0.592		
Calcium	S4	SS	1991	24	0.753	0.023	-41.684	<0.001	*	Increasing
Calcium	S4	WW	1991	7	0.382	0.012	-20.602	0.139		
Calcium	W2	NG	1991	28	0.034	0.004	-3.52	0.351		
Calcium	W2	SB	1991	19	0.269	0.007	-9.767	0.023		
Calcium	W2	SS	1991	24	0.006	-0.001	4.875	0.715		
Calcium	W2	WW	1991	7	0.1	0.003	-3.523	0.49		
Calcium	W4	FC	1991	8	0.228	-0.008	18.794	0.232		
Calcium	W4	NG	1991	22	0.038	-0.008	19.86	0.387		
Calcium	W4	SB	1991	10	0.006	-0.001	6.116	0.826		
Calcium	W4	SS	1991	19	0.049	-0.002	7.4	0.364		
Chloride	E1	FC	1991	6	0.824	0.019	-36.246	0.012		
Chloride	E1	NG	1991	23	0.11	0.012	-20.225	0.123		
Chloride	E1	SB	1991	13	0.137	0.038	-75.753	0.214		
Chloride	E1	SS	2009	10	0.059	0.017	-32.955	0.5		
Chloride	E2	NG	1991	23	0.002	-0.002	7.331	0.852		
Chloride	E2	SB	1991	9	0.058	0.022	-43.101	0.533		
Chloride	E2	SD	1991	22	0.182	0.022	-41.527	0.048		
Chloride	E2	SS	2009	10	0.141	0.041	-81.436	0.285		
Chloride	E5	FC	1991	6	0.017	0.007	-11.805	0.803		
Chloride	E5	NG	1991	23	0.054	0.015	-27.19	0.285		
Chloride	E5	SB	1991	14	0.178	0.051	-101.386	0.133		
Chloride	E5	SS	2009	10	0.004	-0.006	12.28	0.867		
Chloride	E6	NG	1991	19	0.021	0.015	-26.604	0.557		
Chloride	E6	SS	2009	10	0.375	0.044	-87.094	0.06		
Chloride	N2	FC	1991	6	0.744	0.011	-19.35	0.027		
Chloride	N2	NG	1991	24	0.122	0.018	-32.809	0.095		
Chloride	N2	SB	1991	11	0.003	0.005	-9.545	0.867		
Chloride	N2	SD	1991	23	0.148	0.019	-37.323	0.069		
Chloride	N2	SS	2009	10	0.152	0.045	-90.752	0.266		
Chloride	N4	NG	1991	18	0.015	0.006	-8.236	0.631		
Chloride	N4	SS	2009	10	0.261	0.073	-146.352	0.131		
Chloride	N5	NG	1991	17	0.073	-0.01	24.578	0.296		
Chloride	N5	SD	1991	17	0.095	-0.021	45.234	0.229		
Chloride	N5	SS	2009	10	0.321	-0.034	69.855	0.087		
Chloride	S1	NG	1991	23	0.017	0.012	-21.203	0.55		
Chloride	S1	SB	1991	16	0.01	0.008	-14.832	0.716		
Chloride	S1	SD	1991	23	0	0	1.747	0.995		
Chloride	S1	SS	2009	10	0.026	0.015	-30.38	0.659		
Chloride	S2	NG	1991	24	0.039	0.008	-11.588	0.356		
Chloride	S2	SB	1991	16	0.012	0.009	-16.636	0.689		
Chloride	S2	SS	2009	10	0.009	0.008	-15.042	0.797		
Chloride	S4	NG	1991	23	0.158	0.022	-39.474	0.06		
Chloride	S4	SB	1991	15	0.03	0.015	-28.873	0.536		
Chloride	S4	SD	1991	23	0.04	-0.01	20.753	0.36		
Chloride	S4	SS	2009	10	0.004	0.007	-13.115	0.863		
Chloride	S4	WW	1991	6	0	0	2.272	0.985		
Chloride	W2	NG	1991	23	0.035	0.008	-13.245	0.393		
Chloride	W2	SB	1991	16	0.143	0.044	-87.599	0.149		
Chloride	W2	SS	2009	10	0.006	-0.011	21.981	0.825		
Chloride	W2	WW	1991	7	0.459	0.013	-23.866	0.094		
Chloride	W4	FC	1991	8	0.171	-0.008	18.897	0.308		
Chloride	W4	NG	1991	22	0.257	0.039	-75.353	0.016		
Chloride	W4	SB	1991	10	0.158	0.039	-75.9	0.255		
Chloride	W4	SS	2009	10	0.245	0.053	-107.15	0.146		
Chromium	E1	NG	2002	17	0.156	-0.028	56.936	0.117		
Chromium	E1	SS	1991	25	0	0	1.652	0.929		
Chromium	E2	NG	2002	17	0.037	-0.014	29.145	0.459		
Chromium	E2	SD	1991	28	0.147	0.004	-6.587	0.044		
Chromium	E2	SS	1991	25	0.067	0.003	-5.102	0.211		
Chromium	E5	NG	2002	17	0	-0.001	2.483	0.963		
Chromium	E5	SS	1991	25	0.047	0.002	-2.685	0.3		
Chromium	E6	NG	2002	17	0.03	-0.008	16.719	0.507		
Chromium	E6	SS	1991	19	0.018	-0.002	5.403	0.587		
Chromium	N2	NG	2002	17	0.006	-0.006	12.446	0.769		
Chromium	N2	SD	1991	28	0.7	0.012	-22.373	<0.001	*	Increasing
Chromium	N2	SS	1991	25	0.091	0.003	-4.836	0.143		
Chromium	N4	NG	2002	17	0.001	0.002	-3.164	0.919		
Chromium	N4	SS	1991	18	0.116	0.005	-9.088	0.166		
Chromium	N5	NG	2002	17	0.056	-0.017	33.751	0.36		
Chromium	N5	SD	1991	17	0.019	0.003	-4.751	0.593		
Chromium	N5	SS	1991	17	0.018	0.001	-0.744	0.607		
Chromium	S1	NG	2002	16	0.038	0.011	-22.404	0.469		
Chromium	S1	SD	1991	28	0.035	-0.002	6.405	0.338		

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Chromium	S1	SS	1991	27	0.171	0.003	-4.321	0.032		
Chromium	S2	NG	2002	17	0.005	-0.004	9.115	0.784		
Chromium	S2	SS	1991	27	0.102	0.002	-3.434	0.105		
Chromium	S4	NG	2002	17	0.054	-0.019	39.329	0.369		
Chromium	S4	SD	1991	28	0.098	0.002	-2.716	0.105		
Chromium	S4	SS	1991	24	0.38	0.007	-12.608	0.001	*	Increasing
Chromium	W2	NG	2002	17	0.094	0.021	-42.484	0.23		
Chromium	W2	SB	2002	10	0.553	-0.032	63.413	0.014		
Chromium	W2	SS	1991	24	0.264	0.003	-4.976	0.01		
Chromium	W2	WW	2003	6	0.122	-0.032	63.877	0.498		
Chromium	W4	NG	2002	17	0.002	0.004	-6.803	0.868		
Chromium	W4	SB	2002	8	0.059	0.018	-36.716	0.562		
Chromium	W4	SS	1991	19	0.077	0.003	-3.742	0.249		
Cobalt	E1	SS	1991	25	0.011	-0.002	4.067	0.61		
Cobalt	E2	SD	1991	28	0.002	0	1.554	0.828		
Cobalt	E2	SS	1991	25	0.002	-0.001	1.937	0.843		
Cobalt	E5	NG	2003	16	0.046	0.013	-26.966	0.424		
Cobalt	E5	SS	1991	25	0.002	0.001	-0.244	0.823		
Cobalt	E6	NG	2003	16	0.148	0.018	-37.026	0.142		
Cobalt	E6	SS	1991	19	0.006	0.002	-2.582	0.743		
Cobalt	N2	SD	1991	28	0.445	0.005	-9.351	<0.001	*	Increasing
Cobalt	N2	SS	1991	25	0.009	0.001	-0.627	0.644		
Cobalt	N4	NG	2003	16	0.007	0.003	-6.91	0.755		
Cobalt	N4	SS	1991	18	0.014	0.001	-1.676	0.638		
Cobalt	N5	NG	2003	16	0.011	-0.005	8.539	0.698		
Cobalt	N5	SD	1991	17	0.002	-0.001	2.719	0.853		
Cobalt	N5	SS	1991	17	0.173	0.005	-8.688	0.097		
Cobalt	S1	NG	2003	16	0.014	0.009	-18.966	0.667		
Cobalt	S1	SD	1991	28	0.11	-0.003	6.433	0.084		
Cobalt	S1	SS	1991	27	0.061	0.002	-3.927	0.213		
Cobalt	S2	NG	2003	16	0.003	-0.003	4.757	0.829		
Cobalt	S2	SS	1991	27	0.033	0.002	-3.081	0.362		
Cobalt	S4	SD	1991	28	0.163	0.002	-3.597	0.033		
Cobalt	S4	SS	1991	24	0.004	0.001	-0.65	0.765		
Cobalt	W2	NG	2003	16	0.014	-0.006	10.883	0.665		
Cobalt	W2	SS	1991	24	0.108	0.002	-3.807	0.117		
Cobalt	W4	NG	2003	16	0	0.001	-3.253	0.941		
Cobalt	W4	SS	1991	19	0.001	0	0.325	0.892		
Copper	E1	NG	2002	17	0.309	0.008	-15.311	0.021		
Copper	E1	SB	1991	17	0.01	0.001	-1.84	0.7		
Copper	E1	SS	1991	25	0.412	-0.01	20.71	0.001	*	Decreasing
Copper	E2	NG	2002	17	0.213	0.012	-23.666	0.062		
Copper	E2	SB	1991	12	0.123	-0.009	19.35	0.264		
Copper	E2	SD	1991	28	0.032	-0.002	5.171	0.361		
Copper	E2	SS	1991	25	0.023	-0.001	4.109	0.466		
Copper	E5	NG	2002	17	0.15	0.01	-19.559	0.125		
Copper	E5	SB	1991	17	0	0	1.369	0.949		
Copper	E5	SS	1991	25	0.087	-0.004	8.256	0.152		
Copper	E6	NG	2002	17	0.03	-0.008	16.634	0.504		
Copper	E6	SS	1991	19	0.142	-0.005	11.732	0.112		
Copper	N2	NG	2002	17	0.002	-0.002	4.156	0.855		
Copper	N2	SB	1991	16	0.012	-0.002	5.203	0.692		
Copper	N2	SD	1991	28	0.444	0.006	-10.259	<0.001	*	Increasing
Copper	N2	SS	1991	25	0.015	-0.002	5.08	0.554		
Copper	N4	NG	2002	17	0.007	-0.002	5.138	0.743		
Copper	N4	SS	1991	18	0.353	0.016	-31.11	0.009		
Copper	N5	NG	2002	17	0.003	0.002	-2.53	0.837		
Copper	N5	SD	1991	17	0.005	-0.001	4.356	0.786		
Copper	N5	SS	1991	17	0.124	-0.004	8.368	0.165		
Copper	S1	NG	2002	17	0.021	-0.005	9.876	0.575		
Copper	S1	SB	1991	20	0.037	0.002	-3.353	0.415		
Copper	S1	SD	1991	28	0.148	-0.006	13.215	0.043		
Copper	S1	SS	1991	27	0.179	-0.003	8.072	0.028		
Copper	S2	NG	2002	17	0.039	-0.006	11.889	0.447		
Copper	S2	SB	1991	20	0.074	0.004	-6.977	0.245		
Copper	S2	SS	1991	27	0.093	-0.003	7.274	0.121		
Copper	S4	NG	2002	17	0.036	-0.008	16.87	0.463		
Copper	S4	SB	1991	17	0.084	0.005	-8.363	0.26		
Copper	S4	SD	1991	28	0.377	-0.005	10.617	0.001	*	Decreasing
Copper	S4	SS	1991	24	0.284	0.008	-14.947	0.007		
Copper	W2	NG	2002	17	0.028	-0.006	12.345	0.521		
Copper	W2	SB	1991	19	0.03	0.003	-4.75	0.475		
Copper	W2	SS	1991	24	0.445	-0.005	10.347	<0.001	*	Decreasing
Copper	W2	WW	2003	6	0.332	0.005	-9.105	0.231		
Copper	W4	FC	2002	6	0.575	0.008	-15.947	0.081		
Copper	W4	NG	2002	17	0.11	0.008	-15.647	0.194		
Copper	W4	SB	1991	10	0	0	1.299	0.964		
Copper	W4	SS	1991	19	0.089	0.006	-11.57	0.216		
Iron	E1	FC	1991	6	0.17	-0.01	22.07	0.416		
Iron	E1	NG	1991	28	0.062	-0.007	15.136	0.202		
Iron	E1	SB	1991	17	0.011	-0.001	3.56	0.692		
Iron	E1	SS	1991	25	0	0	4.479	0.941		
Iron	E2	FC	1991	6	0.178	-0.007	15.362	0.404		
Iron	E2	NG	1991	28	0.061	0.007	-11.245	0.204		
Iron	E2	SB	1991	12	0.006	0.001	0.151	0.807		
Iron	E2	SD	1991	28	0.041	0.002	0.893	0.299		
Iron	E2	SS	1991	25	0.051	0.003	-1.489	0.279		
Iron	E5	FC	1991	6	0.012	0.003	-5.185	0.834		
Iron	E5	NG	1991	27	0	-0.001	3.816	0.929		
Iron	E5	SB	1991	17	0.033	-0.002	5.379	0.484		
Iron	E5	SS	1991	25	0.003	0	3.3	0.799		

**Table F-2**  
**Site Specific Inorganic Regression Analysis Results Summary**  
**Lambton Facility 2019 Annual Landfill Report Biomonitoring Program**  
**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Iron	E6	NG	1991	19	0.001	0.001	-0.72	0.887		
Iron	E6	SS	1991	19	0.019	-0.002	9.06	0.575		
Iron	N2	FC	1991	6	0.16	-0.003	7.677	0.433		
Iron	N2	NG	1991	29	0.068	0.007	-12.622	0.171		
Iron	N2	SB	1991	16	0.037	0.003	-3.827	0.474		
Iron	N2	SD	1991	28	0.565	0.008	-11.563	<0.001	*	Increasing
Iron	N2	SS	1991	25	0.085	0.003	-0.972	0.158		
Iron	N4	NG	1991	18	0.117	0.018	-33.033	0.165		
Iron	N4	SS	1991	18	0.008	-0.001	6.1	0.724		
Iron	N5	NG	1991	17	0	0.001	0.998	0.963		
Iron	N5	SD	1991	17	0.017	0.003	-2.358	0.617		
Iron	N5	SS	1991	17	0.024	0.002	0.338	0.552		
Iron	S1	NG	1991	27	0.243	0.018	-34.655	0.009		
Iron	S1	SB	1991	20	0.032	0.002	-2.34	0.449		
Iron	S1	SD	1991	28	0.016	-0.001	6.475	0.523		
Iron	S1	SS	1991	27	0.084	0.002	-0.281	0.143		
Iron	S2	NG	1991	29	0.022	0.005	-7.431	0.445		
Iron	S2	SB	1991	20	0.07	0.003	-3.503	0.258		
Iron	S2	SS	1991	27	0.026	0.001	1.852	0.422		
Iron	S4	NG	1991	26	0.097	-0.011	23.537	0.122		
Iron	S4	SB	1991	17	0.008	-0.001	3.727	0.735		
Iron	S4	SD	1991	28	0.068	0.002	1.169	0.179		
Iron	S4	SS	1991	24	0.015	0.001	2.133	0.569		
Iron	S4	WW	1991	7	0.459	0.008	-15.328	0.094		
Iron	W2	NG	1991	28	0.252	0.016	-29.088	0.006		
Iron	W2	SB	1991	19	0.091	0.003	-4.609	0.209		
Iron	W2	SS	1991	24	0.169	0.002	-0.639	0.046		
Iron	W2	WW	1991	7	0.092	-0.003	7.541	0.509		
Iron	W4	FC	1991	8	0.162	-0.004	8.409	0.322		
Iron	W4	NG	1991	22	0.093	0.017	-32.596	0.168		
Iron	W4	SB	1991	10	0.08	0.004	-6.365	0.429		
Iron	W4	SS	1991	19	0.005	-0.001	5.51	0.771		
Lead	E1	NG	2003	16	0.272	-0.034	68.209	0.038		
Lead	E1	SS	1991	25	0.113	-0.004	9.639	0.101		
Lead	E2	NG	2003	16	0.03	-0.01	19.805	0.523		
Lead	E2	SD	1991	28	0.074	-0.004	9.056	0.161		
Lead	E2	SS	1991	25	0.187	0.008	-15.389	0.031		
Lead	E5	NG	2003	16	0.004	0.005	-9.677	0.809		
Lead	E5	SS	1991	25	0.058	-0.003	6.394	0.246		
Lead	E6	NG	2003	16	0.011	-0.008	16.319	0.7		
Lead	E6	SS	1991	19	0.153	-0.006	13.792	0.098		
Lead	N2	NG	2003	16	0.385	-0.037	73.611	0.01		
Lead	N2	SD	1991	28	0.461	0.007	-13.493	<0.001	*	Increasing
Lead	N2	SS	1991	25	0.01	-0.001	3.585	0.639		
Lead	N4	NG	2003	16	0.337	-0.036	72.086	0.018		
Lead	N4	SS	1991	18	0.11	-0.003	7.815	0.18		
Lead	N5	NG	2003	16	0.605	-0.061	122.213	<0.001	*	Decreasing
Lead	N5	SD	1991	17	0.043	-0.006	12.803	0.425		
Lead	N5	SS	1991	17	0.515	-0.014	29.343	0.001	*	Decreasing
Lead	S1	NG	2003	16	0.019	0.01	-20.944	0.614		
Lead	S1	SD	1991	28	0.076	-0.003	7.476	0.155		
Lead	S1	SS	1991	27	0.012	-0.001	3.573	0.579		
Lead	S2	NG	2003	16	0.134	-0.019	37.844	0.163		
Lead	S2	SS	1991	27	0.011	-0.001	3.714	0.609		
Lead	S4	NG	2003	16	0.057	-0.011	21.267	0.373		
Lead	S4	SD	1991	28	0.145	-0.004	9.918	0.046		
Lead	S4	SS	1991	24	0.029	0.002	-2.791	0.428		
Lead	W2	NG	2003	16	0.013	0.006	-11.753	0.674		
Lead	W2	SS	1991	24	0.03	-0.001	3.885	0.42		
Lead	W4	NG	2003	16	0.014	0.006	-13.147	0.667		
Lead	W4	SS	1991	19	0.037	0.002	-3.493	0.429		
Magnesium	E1	FC	1991	6	0.077	-0.006	15.432	0.593		
Magnesium	E1	NG	1991	28	0.006	-0.001	5.897	0.692		
Magnesium	E1	SB	1991	17	0.027	0.002	0.11	0.525		
Magnesium	E1	SS	1991	25	0.003	0.001	2.205	0.789		
Magnesium	E2	FC	1991	6	0.149	0.004	-5.102	0.449		
Magnesium	E2	NG	1991	28	0.055	0.003	-3.345	0.23		
Magnesium	E2	SB	1991	12	0.132	0.002	-0.516	0.247		
Magnesium	E2	SD	1991	28	0.03	-0.001	6.501	0.376		
Magnesium	E2	SS	1991	25	0.085	0.005	-6.907	0.157		
Magnesium	E5	FC	1991	6	0.078	0.009	-15.295	0.592		
Magnesium	E5	NG	1991	27	0.329	0.016	-28.079	0.002	*	Increasing
Magnesium	E5	SB	1991	17	0.077	0.002	-0.207	0.282		
Magnesium	E5	SS	1991	25	0.009	-0.001	5.88	0.648		
Magnesium	E6	NG	1991	19	0.187	0.008	-11.749	0.065		
Magnesium	E6	SS	1991	19	0.017	-0.002	8.156	0.6		
Magnesium	N2	FC	1991	6	0.156	0.003	-3.853	0.438		
Magnesium	N2	NG	1991	29	0.189	0.005	-7.5	0.019		
Magnesium	N2	SB	1991	16	0.009	0.001	2.108	0.724		
Magnesium	N2	SD	1991	28	0.385	-0.006	15.69	<0.001	*	Decreasing
Magnesium	N2	SS	1991	25	0.082	0.002	-1.083	0.164		
Magnesium	N4	NG	1991	18	0	0	3.318	0.991		
Magnesium	N4	SS	1991	18	0.356	0.022	-40.831	0.009		
Magnesium	N5	NG	1991	17	0.022	0.003	-3.386	0.566		
Magnesium	N5	SD	1991	17	0.074	-0.006	15.723	0.29		
Magnesium	N5	SS	1991	17	0.137	0.011	-17.025	0.143		
Magnesium	S1	NG	1991	28	0.032	0.004	-3.97	0.365		
Magnesium	S1	SB	1991	20	0.148	0.003	-1.786	0.094		
Magnesium	S1	SD	1991	28	0.003	-0.001	6.248	0.786		
Magnesium	S1	SS	1991	27	0.057	0.003	-1.627	0.232		
Magnesium	S2	NG	1991	29	0.013	0.003	-2.147	0.557		

**Table F-2**  
**Site Specific Inorganic Regression Analysis Results Summary**  
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**2018 Field Year**

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Magnesium	S2	SB	1991	20	0.376	0.005	-6.604	0.004		
Magnesium	S2	SS	1991	27	0.104	0.003	-2.755	0.101		
Magnesium	S4	NG	1991	26	0.328	0.015	-27.317	0.002	*	Increasing
Magnesium	S4	SB	1991	17	0.196	0.003	-2.791	0.075		
Magnesium	S4	SD	1991	28	0.037	-0.002	8.81	0.328		
Magnesium	S4	SS	1991	24	0.484	0.008	-12.6	<0.001	*	Increasing
Magnesium	S4	WW	1991	7	0.308	0.005	-6.037	0.196		
Magnesium	W2	NG	1991	28	0.047	0.003	-2.388	0.27		
Magnesium	W2	SB	1991	19	0.098	0.004	-5	0.192		
Magnesium	W2	SS	1991	24	0.197	0.004	-4.05	0.03		
Magnesium	W2	WW	1991	7	0.022	-0.001	5.057	0.748		
Magnesium	W4	FC	1991	8	0.035	0.002	-0.219	0.659		
Magnesium	W4	NG	1991	22	0	0.001	1.903	0.925		
Magnesium	W4	SB	1991	10	0.149	0.003	-2.225	0.27		
Magnesium	W4	SS	1991	19	0.01	0.001	2.053	0.689		
Manganese	E1	NG	1991	28	0.059	-0.005	11.035	0.212		
Manganese	E1	SB	1991	17	0.011	0.001	-0.767	0.684		
Manganese	E1	SS	1991	25	0.004	-0.002	5.566	0.754		
Manganese	E2	NG	1991	28	0.172	0.012	-22.986	0.028		
Manganese	E2	SB	1991	12	0.126	0.003	-4.909	0.258		
Manganese	E2	SD	1991	28	0.044	-0.002	6.202	0.284		
Manganese	E2	SS	1991	25	0.038	0.003	-4.536	0.348		
Manganese	E5	NG	1991	27	0.084	-0.008	17.343	0.143		
Manganese	E5	SB	1991	17	0.001	0	0.715	0.907		
Manganese	E5	SS	1991	25	0.085	0.005	-7.225	0.158		
Manganese	E6	NG	1991	19	0	0.001	0.483	0.959		
Manganese	E6	SS	1991	19	0.089	0.009	-15.08	0.216		
Manganese	N2	NG	1991	29	0.223	0.013	-24.923	0.01		
Manganese	N2	SB	1991	16	0.102	0.003	-4.415	0.228		
Manganese	N2	SD	1991	28	0.011	-0.001	3.888	0.598		
Manganese	N2	SS	1991	25	0.038	0.002	-1.851	0.352		
Manganese	N4	NG	1991	18	0.264	0.025	-48.903	0.029		
Manganese	N4	SS	1991	18	0.018	0.002	-1.509	0.6		
Manganese	N5	NG	1991	17	0.06	0.004	-6.434	0.345		
Manganese	N5	SD	1991	17	0.036	-0.004	9.916	0.468		
Manganese	N5	SS	1991	17	0.211	0.007	-11.843	0.064		
Manganese	S1	NG	1991	27	0.297	0.016	-30.171	0.003		
Manganese	S1	SB	1991	20	0.151	0.004	-6.701	0.09		
Manganese	S1	SD	1991	28	0.02	-0.003	8.263	0.469		
Manganese	S1	SS	1991	27	0.08	0.005	-7.232	0.153		
Manganese	S2	NG	1991	29	0.015	0.002	-3.257	0.522		
Manganese	S2	SB	1991	20	0.303	0.007	-12.732	0.012		
Manganese	S2	SS	1991	27	0.085	0.005	-7.96	0.139		
Manganese	S4	NG	1991	25	0.031	-0.004	8.523	0.4		
Manganese	S4	SB	1991	17	0.014	-0.002	4.222	0.649		
Manganese	S4	SD	1991	28	0.4	0.008	-13.35	<0.001	*	Increasing
Manganese	S4	SS	1991	24	0.28	0.012	-21.74	0.008		
Manganese	S4	WW	1991	7	0.639	-0.02	41.545	0.031		
Manganese	W2	NG	1991	28	0.122	0.01	-19.249	0.069		
Manganese	W2	SB	1991	19	0.091	0.004	-7.642	0.209		
Manganese	W2	SS	1991	24	0.183	0.005	-6.763	0.037		
Manganese	W2	WW	1991	7	0.549	-0.01	22.437	0.057		
Manganese	W4	FC	2002	6	0.019	0.003	-5.257	0.792		
Manganese	W4	NG	1991	22	0.409	0.035	-67.928	0.001	*	Increasing
Manganese	W4	SB	1991	10	0.025	0.001	-1.497	0.664		
Manganese	W4	SS	1991	19	0.004	0.001	-0.172	0.798		
Mercury	E1	NG	2004	15	0.624	-0.044	87.194	<0.001	*	Decreasing
Mercury	E2	NG	2004	15	0.556	-0.029	55.909	0.001	*	Decreasing
Mercury	E2	SS	2002	17	0.326	0.013	-26.338	0.017		
Mercury	E5	NG	2004	15	0.187	-0.022	43.478	0.107		
Mercury	E6	NG	2004	15	0.017	-0.007	13.476	0.648		
Mercury	E6	SS	2002	17	0	0	-1.662	0.957		
Mercury	N2	NG	2004	15	0.262	-0.023	44.426	0.051		
Mercury	N2	SD	2003	16	0.076	0.003	-7.873	0.301		
Mercury	N2	SS	2002	16	0.017	-0.002	2.066	0.627		
Mercury	N4	NG	2004	15	0.644	-0.029	56.885	<0.001	*	Decreasing
Mercury	N5	NG	2004	15	0.576	-0.056	110.814	0.001	*	Decreasing
Mercury	N5	SD	2003	16	0.024	0.011	-22.638	0.565		
Mercury	N5	SS	2002	17	0	0	-0.882	0.983		
Mercury	S1	NG	2004	15	0.244	-0.021	41.145	0.061		
Mercury	S1	SD	2003	16	0.01	-0.003	5.349	0.708		
Mercury	S2	NG	2004	15	0.557	-0.031	61.1	0.001	*	Decreasing
Mercury	W2	NG	2004	15	0.405	-0.028	55.297	0.011		
Mercury	W4	NG	2004	15	0.196	-0.015	28.136	0.099		
Molybdenum	E1	NG	2002	17	0	-0.001	2.197	0.95		
Molybdenum	E1	SB	1991	17	0.066	0.009	-16.779	0.32		
Molybdenum	E1	SS	2002	16	0.219	0.014	-28.514	0.068		
Molybdenum	E2	NG	2002	17	0.348	0.026	-52.751	0.013		
Molybdenum	E2	SB	1991	12	0.066	0.005	-9.385	0.42		
Molybdenum	E2	SD	2002	17	0.36	0.011	-22.696	0.011		
Molybdenum	E2	SS	2002	17	0.042	0.007	-14.107	0.431		
Molybdenum	E5	NG	2002	17	0.016	0.006	-12.466	0.628		
Molybdenum	E5	SB	1991	17	0.067	0.006	-11.782	0.314		
Molybdenum	E5	SS	2002	16	0.065	0.006	-11.594	0.342		
Molybdenum	E6	NG	2002	17	0.606	0.054	-107.828	<0.001	*	Increasing
Molybdenum	E6	SS	2002	17	0.067	0.008	-15.244	0.314		
Molybdenum	N2	NG	2002	17	0.068	-0.02	40.374	0.311		
Molybdenum	N2	SB	1991	16	0.004	0.001	-1.419	0.809		
Molybdenum	N2	SD	2002	17	0.399	0.016	-31.878	0.007		
Molybdenum	N2	SS	2002	16	0.09	0.007	-14.335	0.259		
Molybdenum	N4	NG	2002	17	0.001	0.001	-1.866	0.917		

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Molybdenum	N4	SS	2002	17	0.1	0.007	-14.077	0.215		
Molybdenum	N5	NG	2002	17	0	0	1.023	0.977		
Molybdenum	N5	SD	2002	17	0.407	0.017	-33.237	0.006		
Molybdenum	N5	SS	2002	17	0.414	0.016	-31.763	0.005		
Molybdenum	S1	NG	2002	17	0.238	0.026	-52.083	0.047		
Molybdenum	S1	SB	1991	20	0.046	-0.004	9.519	0.361		
Molybdenum	S1	SD	2002	17	0.02	0.005	-9.82	0.591		
Molybdenum	S1	SS	2002	17	0.147	0.008	-16.006	0.128		
Molybdenum	S2	NG	2002	17	0.182	0.022	-44.804	0.088		
Molybdenum	S2	SB	1991	20	0.012	-0.002	5.201	0.645		
Molybdenum	S2	SS	2002	17	0.024	0.003	-6.425	0.556		
Molybdenum	S4	NG	2002	17	0.609	0.061	-121.203	<0.001	*	Increasing
Molybdenum	S4	SB	1991	17	0.561	0.031	-60.75	0.001	*	Increasing
Molybdenum	S4	SD	2002	17	0.297	0.012	-23.701	0.024		
Molybdenum	S4	SS	2002	16	0.007	0.002	-3.167	0.753		
Molybdenum	S4	WW	1991	7	0.064	0.004	-7.221	0.583		
Molybdenum	W2	NG	2002	16	0.376	0.025	-48.633	0.011		
Molybdenum	W2	SB	1991	19	0	0	1.662	0.952		
Molybdenum	W2	SS	2002	16	0.059	0.004	-8.697	0.366		
Molybdenum	W2	WW	1991	7	0.033	-0.004	8.539	0.696		
Molybdenum	W4	FC	2003	6	0.787	-0.017	32.823	0.018		
Molybdenum	W4	NG	2002	17	0.01	0.003	-5.718	0.706		
Molybdenum	W4	SB	1991	10	0.148	0.006	-10.672	0.272		
Molybdenum	W4	SS	2002	17	0.206	0.01	-19.386	0.067		
Nickel	E1	NG	2002	17	0.004	0.003	-6.615	0.807		
Nickel	E1	SB	2002	9	0.196	-0.014	28.695	0.233		
Nickel	E1	SS	1991	25	0.065	-0.003	7.014	0.22		
Nickel	E2	NG	2002	17	0.009	-0.005	10.311	0.715		
Nickel	E2	SD	1991	28	0.042	0.002	-1.823	0.293		
Nickel	E2	SS	1991	25	0.015	0.001	-1.731	0.556		
Nickel	E5	NG	2002	17	0.012	0.009	-17.997	0.673		
Nickel	E5	SB	2002	9	0.065	0.005	-10.453	0.507		
Nickel	E5	SS	1991	25	0.016	-0.001	3.903	0.543		
Nickel	E6	NG	2002	17	0.003	0.002	-3.394	0.841		
Nickel	E6	SS	1991	19	0.029	-0.003	6.788	0.489		
Nickel	N2	NG	2002	17	0.031	0.008	-16.417	0.5		
Nickel	N2	SB	2002	7	0.013	0.002	-4.136	0.806		
Nickel	N2	SD	1991	28	0.641	0.008	-14.058	<0.001	*	Increasing
Nickel	N2	SS	1991	25	0.007	0.001	-0.079	0.688		
Nickel	N4	NG	2002	17	0.002	0.002	-4.374	0.856		
Nickel	N4	SS	1991	18	0.167	0.007	-11.779	0.093		
Nickel	N5	NG	2002	17	0.007	0.004	-7.688	0.742		
Nickel	N5	SD	1991	17	0.011	0.002	-2.688	0.689		
Nickel	N5	SS	1991	17	0.098	0.003	-5.482	0.222		
Nickel	S1	NG	2002	16	0.15	0.019	-37.383	0.138		
Nickel	S1	SB	2002	11	0.037	-0.004	8.391	0.573		
Nickel	S1	SD	1991	28	0.027	-0.002	4.538	0.406		
Nickel	S1	SS	1991	27	0.049	0.002	-1.847	0.267		
Nickel	S2	NG	2002	17	0.027	0.007	-13.553	0.528		
Nickel	S2	SB	2002	11	0.003	0.001	-2.464	0.869		
Nickel	S2	SS	1991	27	0.016	0.001	-0.432	0.532		
Nickel	S4	NG	2002	17	0.001	-0.002	3.895	0.922		
Nickel	S4	SB	2002	11	0.117	0.014	-27.027	0.303		
Nickel	S4	SD	1991	28	0.028	0.001	-0.283	0.393		
Nickel	S4	SS	1991	24	0.245	0.005	-8.855	0.014		
Nickel	W2	NG	2002	17	0.109	0.023	-46.465	0.197		
Nickel	W2	SB	2002	10	0.124	0.011	-21.445	0.317		
Nickel	W2	SS	1991	24	0.09	0.001	-1.414	0.155		
Nickel	W2	WW	2003	6	0.147	-0.014	26.801	0.452		
Nickel	W4	NG	2002	17	0.19	0.025	-50.452	0.08		
Nickel	W4	SB	2002	8	0.001	-0.001	1.994	0.932		
Nickel	W4	SS	1991	19	0.039	0.001	-1.493	0.42		
Phosphorus	E1	FC	1991	6	0.218	-0.009	20.509	0.351		
Phosphorus	E1	NG	1991	28	0.252	0.011	-18.303	0.006		
Phosphorus	E1	SB	1991	16	0.011	0.001	1.037	0.695		
Phosphorus	E1	SS	1991	25	0.037	-0.002	6.327	0.356		
Phosphorus	E2	FC	1991	6	0.338	0.006	-8.686	0.227		
Phosphorus	E2	NG	1991	28	0.152	0.01	-17.014	0.041		
Phosphorus	E2	SB	1991	12	0.278	0.004	-4.313	0.078		
Phosphorus	E2	SD	1991	28	0.228	0.007	-10.552	0.01		
Phosphorus	E2	SS	1991	25	0.054	0.003	-2.719	0.264		
Phosphorus	E5	FC	1991	6	0.149	0.009	-15.571	0.45		
Phosphorus	E5	NG	1991	27	0.025	0.004	-3.93	0.428		
Phosphorus	E5	SB	1991	17	0.03	0.002	0.413	0.505		
Phosphorus	E5	SS	1991	25	0.037	0.002	-0.718	0.356		
Phosphorus	E6	NG	1991	19	0.204	-0.01	22.497	0.052		
Phosphorus	E6	SS	1991	19	0.011	0.001	-0.026	0.668		
Phosphorus	N2	FC	1991	6	0.408	0.009	-14.438	0.172		
Phosphorus	N2	NG	1991	29	0.006	0.001	0.922	0.682		
Phosphorus	N2	SB	1991	16	0.108	0.004	-5.041	0.213		
Phosphorus	N2	SD	1991	28	0.628	0.013	-23.831	<0.001	*	Increasing
Phosphorus	N2	SS	1991	25	0.388	0.004	-5.508	0.001	*	Increasing
Phosphorus	N4	NG	1991	18	0.002	0.001	1.573	0.87		
Phosphorus	N4	SS	1991	18	0.43	0.011	-18.564	0.003		
Phosphorus	N5	NG	1991	17	0	0	2.939	0.985		
Phosphorus	N5	SD	1991	17	0.033	0.006	-9.394	0.485		
Phosphorus	N5	SS	1991	17	0.119	-0.005	12.085	0.175		
Phosphorus	S1	NG	1991	28	0.083	0.006	-8.443	0.138		
Phosphorus	S1	SB	1991	20	0.21	0.004	-4.913	0.042		
Phosphorus	S1	SD	1991	28	0.045	-0.002	7.028	0.278		
Phosphorus	S1	SS	1991	27	0.307	0.004	-4.814	0.003		

**Table F-2**  
**Site Specific Inorganic Regression Analysis Results Summary**  
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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Phosphorus	S2	NG	1991	29	0.048	0.004	-4.173	0.254		
Phosphorus	S2	SB	1991	20	0.311	0.007	-11.302	0.011		
Phosphorus	S2	SS	1991	27	0.28	0.007	-11.621	0.004		
Phosphorus	S4	NG	1991	26	0.05	0.005	-6.657	0.274		
Phosphorus	S4	SB	1991	17	0.473	0.012	-20.508	0.002	*	Increasing
Phosphorus	S4	SD	1991	28	0.013	0.001	0.454	0.556		
Phosphorus	S4	SS	1991	24	0.708	0.018	-33.01	<0.001	*	Increasing
Phosphorus	S4	WW	1991	7	0.112	0.002	-0.143	0.464		
Phosphorus	W2	NG	1991	28	0.001	-0.001	4.505	0.856		
Phosphorus	W2	SB	1991	19	0.085	0.003	-2.796	0.227		
Phosphorus	W2	SS	1991	24	0.226	0.003	-4.168	0.019		
Phosphorus	W2	WW	1991	7	0.076	-0.003	9.871	0.55		
Phosphorus	W4	FC	1991	8	0.072	0.003	-2.509	0.52		
Phosphorus	W4	NG	1991	22	0.211	0.01	-16.836	0.032		
Phosphorus	W4	SB	1991	10	0.031	0.002	0.34	0.625		
Phosphorus	W4	SS	1991	19	0.024	0.002	-0.567	0.523		
Potassium	E1	FC	1991	6	0.224	-0.01	22.807	0.343		
Potassium	E1	NG	1991	28	0.033	-0.004	12.693	0.353		
Potassium	E1	SB	1991	17	0.02	0.001	1.799	0.588		
Potassium	E1	SS	1991	25	0.106	0.006	-8.659	0.111		
Potassium	E2	FC	1991	6	0.596	0.007	-11.118	0.072		
Potassium	E2	NG	1991	28	0.069	-0.006	16.471	0.178		
Potassium	E2	SB	1991	12	0.091	0.002	0.887	0.34		
Potassium	E2	SD	1991	28	0.289	0.008	-13.272	0.003		
Potassium	E2	SS	1991	25	0.028	0.003	-2.817	0.424		
Potassium	E5	FC	1991	6	0.506	0.01	-17.184	0.113		
Potassium	E5	NG	1991	27	0	0	3.566	0.936		
Potassium	E5	SB	1991	17	0.002	0	3.653	0.873		
Potassium	E5	SS	1991	25	0.185	0.008	-12.129	0.032		
Potassium	E6	NG	1991	19	0.037	0.005	-6.455	0.432		
Potassium	E6	SS	1991	19	0.003	-0.001	5.417	0.821		
Potassium	N2	FC	1991	6	0.252	0.008	-12.63	0.31		
Potassium	N2	NG	1991	29	0.196	-0.009	22.462	0.016		
Potassium	N2	SB	1991	16	0	0	4.099	0.976		
Potassium	N2	SD	1991	28	0.586	0.014	-25.148	<0.001	*	Increasing
Potassium	N2	SS	1991	24	0.298	0.008	-13.452	0.006		
Potassium	N4	NG	1991	18	0.013	0.005	-5.455	0.649		
Potassium	N4	SS	1991	18	0.179	0.01	-17.336	0.08		
Potassium	N5	NG	1991	17	0	-0.001	5.251	0.964		
Potassium	N5	SD	1991	17	0.019	0.003	-3.258	0.594		
Potassium	N5	SS	1991	17	0.068	-0.003	9.861	0.312		
Potassium	S1	NG	1991	28	0.016	-0.003	9.668	0.526		
Potassium	S1	SB	1991	20	0.047	0.002	0.946	0.359		
Potassium	S1	SD	1991	28	0.118	0.005	-5.725	0.074		
Potassium	S1	SS	1991	27	0.273	0.009	-15.204	0.005		
Potassium	S2	NG	1991	29	0	0	3.395	0.912		
Potassium	S2	SB	1991	20	0.253	0.004	-3.624	0.024		
Potassium	S2	SS	1991	27	0.279	0.009	-15.441	0.005		
Potassium	S4	NG	1991	26	0.016	-0.003	9.415	0.543		
Potassium	S4	SB	1991	17	0.031	0.002	1.189	0.497		
Potassium	S4	SD	1991	28	0.31	0.008	-11.599	0.002	*	Increasing
Potassium	S4	SS	1991	24	0.417	0.012	-19.718	0.001	*	Increasing
Potassium	S4	WW	1991	7	0.17	0.004	-5.306	0.358		
Potassium	W2	NG	1991	28	0.182	-0.008	20.169	0.023		
Potassium	W2	SB	1991	19	0.001	0	3.502	0.903		
Potassium	W2	SS	1991	24	0.391	0.009	-15.598	0.001	*	Increasing
Potassium	W2	WW	1991	7	0.214	0.005	-6.358	0.296		
Potassium	W4	FC	1991	8	0.251	0.004	-4.471	0.206		
Potassium	W4	NG	1991	22	0.037	0.008	-11.636	0.393		
Potassium	W4	SB	1991	10	0.039	0.001	1.609	0.586		
Potassium	W4	SS	1991	19	0.027	0.003	-2.146	0.5		
Silicon	E1	NG	2003	16	0.431	-0.047	98.156	0.006		
Silicon	E1	SB	2003	8	0.301	-0.061	123.636	0.159		
Silicon	E1	SS	2010	9	0.032	-0.002	8.593	0.644		
Silicon	E2	NG	2003	16	0.287	-0.04	83.858	0.033		
Silicon	E2	SD	2010	9	0.278	-0.01	26.38	0.145		
Silicon	E2	SS	2010	9	0.38	-0.011	28.541	0.077		
Silicon	E5	NG	2003	16	0.199	-0.046	95.796	0.083		
Silicon	E5	SB	2003	8	0.661	-0.114	231.85	0.014		
Silicon	E5	SS	2010	9	0.347	-0.007	19.766	0.095		
Silicon	E6	NG	2003	15	0.009	-0.01	23.095	0.74		
Silicon	E6	SS	2010	9	0.432	-0.006	17.622	0.054		
Silicon	N2	NG	2003	15	0.319	-0.03	64.264	0.028		
Silicon	N2	SD	2010	9	0.012	0.001	3.336	0.777		
Silicon	N2	SS	2010	9	0.025	-0.001	7.44	0.685		
Silicon	N4	NG	2003	16	0.278	-0.034	72.781	0.036		
Silicon	N4	SS	2010	9	0	0	6.327	0.956		
Silicon	N5	NG	2003	16	0.162	-0.033	71.264	0.122		
Silicon	N5	SD	2010	9	0.323	0.01	-14.357	0.11		
Silicon	N5	SS	2010	9	0.005	-0.001	7.663	0.857		
Silicon	S1	NG	2003	16	0.212	-0.049	102.998	0.073		
Silicon	S1	SB	2003	11	0.116	-0.055	112.688	0.305		
Silicon	S1	SD	2010	9	0.01	-0.002	8.439	0.794		
Silicon	S1	SS	2010	9	0.305	-0.006	18.081	0.123		
Silicon	S2	NG	2003	16	0.12	-0.034	73.154	0.188		
Silicon	S2	SB	2003	11	0.752	-0.1	202.718	0.001	*	Decreasing
Silicon	S2	SS	2010	9	0.464	-0.005	16.343	0.043		
Silicon	S4	NG	2003	16	0.104	-0.019	42.604	0.224		
Silicon	S4	SB	2003	10	0.454	-0.077	157.282	0.033		
Silicon	S4	SD	2010	9	0.001	-0.001	6.494	0.922		
Silicon	S4	SS	2010	9	0.724	-0.008	21.198	0.004		



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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Silicon	W2	NG	2003	16	0.071	-0.013	30.248	0.317		
Silicon	W2	SB	2003	9	0.02	-0.027	56.415	0.717		
Silicon	W2	SS	2010	9	0.277	-0.007	18.883	0.145		
Silicon	W2	WW	2003	6	0.233	-0.017	38.492	0.332		
Silicon	W4	NG	2003	16	0.059	-0.022	49.103	0.366		
Silicon	W4	SB	2003	7	0.438	-0.095	192.871	0.105		
Silicon	W4	SS	2010	9	0.019	-0.001	7.762	0.725		
Sodium	E1	NG	2002	17	0.048	-0.009	19.615	0.4		
Sodium	E2	NG	2002	17	0.001	0.001	-0.947	0.93		
Sodium	E2	SD	1991	28	0.128	0.006	-10.061	0.061		
Sodium	E2	SS	2003	16	0.558	-0.025	51.662	0.001	*	Decreasing
Sodium	E5	NG	2002	17	0.326	0.026	-51.353	0.017		
Sodium	E6	NG	2002	17	0.087	0.031	-60.342	0.25		
Sodium	E6	SS	2003	16	0.376	-0.026	53.44	0.012		
Sodium	N2	NG	2002	17	0.088	0.015	-27.643	0.246		
Sodium	N2	SD	1991	28	0.182	0.009	-15.04	0.023		
Sodium	N4	NG	2002	17	0	0	1.61	0.997		
Sodium	N4	SS	2003	16	0.316	-0.023	47.418	0.023		
Sodium	N5	NG	2002	17	0.001	-0.002	6.686	0.885		
Sodium	N5	SD	1991	17	0.305	-0.019	41.2	0.022		
Sodium	N5	SS	2003	16	0.598	-0.026	53.786	<0.001	*	Decreasing
Sodium	S1	NG	2002	17	0.009	-0.005	11.08	0.717		
Sodium	S1	SD	1991	28	0.038	0.005	-6.88	0.317		
Sodium	S1	SS	2003	16	0.341	-0.024	50.105	0.018		
Sodium	S2	NG	2002	17	0.026	-0.007	15.377	0.539		
Sodium	S2	SS	2003	16	0.413	-0.027	56.943	0.007		
Sodium	S4	NG	2002	17	0.127	-0.016	33.187	0.161		
Sodium	S4	SD	1991	28	0.051	0.004	-6.263	0.249		
Sodium	S4	SS	2003	16	0.247	-0.013	27.19	0.05		
Sodium	W2	NG	2002	17	0.162	0.015	-27.708	0.109		
Sodium	W4	NG	2002	17	0.025	-0.016	34.715	0.546		
Sodium	W4	SS	2003	16	0.433	-0.017	36.136	0.006		
Strontium	E1	FC	1991	6	0.291	-0.023	45.72	0.27		
Strontium	E1	NG	1991	28	0.008	0.002	-2.562	0.645		
Strontium	E1	SB	1991	17	0.258	0.011	-21.446	0.037		
Strontium	E1	SS	1991	25	0.008	-0.001	3.086	0.665		
Strontium	E2	NG	1991	28	0.024	-0.003	6.883	0.43		
Strontium	E2	SB	1991	12	0.046	0.011	-20.761	0.503		
Strontium	E2	SD	1991	28	0.031	-0.002	5.015	0.367		
Strontium	E2	SS	1991	25	0.016	0.002	-1.855	0.548		
Strontium	E5	FC	1991	6	0.396	-0.015	28.311	0.181		
Strontium	E5	NG	1991	27	0.052	0.007	-12.018	0.253		
Strontium	E5	SB	1991	17	0.006	0.002	-3.332	0.766		
Strontium	E5	SS	1991	25	0.017	-0.001	3.934	0.535		
Strontium	E6	NG	1991	19	0.024	0.005	-9.102	0.527		
Strontium	E6	SS	1991	19	0.085	0.008	-14.903	0.225		
Strontium	N2	NG	1991	29	0	-0.001	2.197	0.924		
Strontium	N2	SB	1991	16	0.097	-0.005	10.569	0.24		
Strontium	N2	SD	1991	28	0.21	-0.004	9.409	0.014		
Strontium	N2	SS	1991	25	0.056	0.002	-3.266	0.256		
Strontium	N4	NG	1991	18	0.021	0.005	-8.769	0.57		
Strontium	N4	SS	1991	18	0.418	0.017	-33.128	0.004		
Strontium	N5	NG	1991	17	0.14	0.018	-35.327	0.139		
Strontium	N5	SD	1991	17	0.229	-0.01	22.09	0.052		
Strontium	N5	SS	1991	17	0.093	0.007	-11.299	0.235		
Strontium	S1	NG	1991	28	0.036	0.005	-8.311	0.334		
Strontium	S1	SB	1991	20	0.097	0.007	-13.889	0.18		
Strontium	S1	SD	1991	28	0.013	0.002	-2.822	0.557		
Strontium	S1	SS	1991	27	0.021	0.002	-1.728	0.473		
Strontium	S2	NG	1991	29	0.001	-0.001	2.418	0.878		
Strontium	S2	SB	1991	20	0.23	0.007	-13.817	0.033		
Strontium	S2	SS	1991	27	0.079	0.003	-4.702	0.156		
Strontium	S4	NG	1991	25	0.017	0.004	-5.948	0.537		
Strontium	S4	SB	1991	17	0.233	0.01	-20.066	0.05		
Strontium	S4	SD	1991	28	0.004	0.001	0.206	0.765		
Strontium	S4	SS	1991	24	0.521	0.013	-25.106	<0.001	*	Increasing
Strontium	S4	WW	1991	7	0.784	0.016	-31.601	0.008		
Strontium	W2	NG	1991	28	0.022	0.002	-2.995	0.447		
Strontium	W2	SB	1991	19	0.303	0.011	-22.325	0.015		
Strontium	W2	SS	1991	24	0.003	0	0.498	0.8		
Strontium	W2	WW	1991	7	0.024	0.003	-4.774	0.741		
Strontium	W4	NG	1991	22	0.055	-0.008	16.369	0.292		
Strontium	W4	SB	1991	10	0.024	-0.004	8.495	0.669		
Strontium	W4	SS	1991	19	0	0	0.719	0.931		
Sulfur	E1	FC	1991	6	0.075	-0.007	16.115	0.598		
Sulfur	E1	NG	1991	28	0.089	0.007	-9.746	0.124		
Sulfur	E1	SB	1991	17	0.102	0.023	-41.958	0.212		
Sulfur	E1	SS	1991	25	0.023	-0.003	8.497	0.468		
Sulfur	E2	FC	1991	6	0.343	0.005	-7.554	0.222		
Sulfur	E2	NG	1991	28	0.097	0.007	-10.774	0.107		
Sulfur	E2	SB	1991	12	0.467	0.004	-4.4	0.014		
Sulfur	E2	SD	1991	28	0.041	-0.007	17.629	0.302		
Sulfur	E2	SS	1991	25	0.027	-0.003	8.237	0.433		
Sulfur	E5	FC	1991	6	0.216	0.008	-12.912	0.353		
Sulfur	E5	NG	1991	27	0.007	-0.002	6.962	0.683		
Sulfur	E5	SB	1991	17	0.214	0.003	-2.816	0.061		
Sulfur	E5	SS	1991	25	0	0	1.742	0.949		
Sulfur	E6	NG	1991	19	0.048	0.004	-4.04	0.368		
Sulfur	E6	SS	1991	19	0.045	0.008	-14.074	0.381		
Sulfur	N2	FC	1991	6	0.14	0.003	-3.463	0.465		
Sulfur	N2	NG	1991	29	0.088	0.015	-26.891	0.118		

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Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Sulfur	N2	SB	1991	16	0.05	0.002	-1.516	0.403		
Sulfur	N2	SD	1991	28	0	-0.001	3.974	0.919		
Sulfur	N2	SS	1991	25	0.03	-0.003	9.192	0.406		
Sulfur	N4	NG	1991	18	0.016	-0.003	10.032	0.612		
Sulfur	N4	SS	1991	18	0.167	0.016	-30.474	0.092		
Sulfur	N5	NG	1991	17	0.017	-0.004	11.555	0.619		
Sulfur	N5	SD	1991	17	0.216	0.024	-45.872	0.06		
Sulfur	N5	SS	1991	17	0.123	0.011	-18.863	0.168		
Sulfur	S1	NG	1991	28	0.013	-0.002	7.197	0.564		
Sulfur	S1	SB	1991	20	0.228	0.003	-3.381	0.033		
Sulfur	S1	SD	1991	28	0	-0.001	4.061	0.923		
Sulfur	S1	SS	1991	27	0.002	-0.001	4.384	0.84		
Sulfur	S2	NG	1991	29	0.025	-0.003	8.668	0.412		
Sulfur	S2	SB	1991	20	0.299	0.006	-8.442	0.013		
Sulfur	S2	SS	1991	27	0.024	0.004	-5.168	0.445		
Sulfur	S4	NG	1991	26	0.025	0.004	-4.074	0.444		
Sulfur	S4	SB	1991	17	0.079	0.003	-2.615	0.274		
Sulfur	S4	SD	1991	28	0.132	-0.013	29.323	0.057		
Sulfur	S4	SS	1991	24	0.197	0.012	-20.82	0.03		
Sulfur	S4	WW	1991	7	0.325	0.006	-8.868	0.181		
Sulfur	W2	NG	1991	28	0.001	0	2.648	0.878		
Sulfur	W2	SB	1991	19	0.015	0.001	1.055	0.616		
Sulfur	W2	SS	1991	24	0.007	-0.002	5.734	0.691		
Sulfur	W2	WW	1991	7	0.002	0	3.734	0.915		
Sulfur	W4	FC	1991	8	0.067	0.002	-1.075	0.535		
Sulfur	W4	NG	1991	22	0.015	-0.002	7.559	0.591		
Sulfur	W4	SB	1991	10	0.556	0.004	-4.286	0.013		
Sulfur	W4	SS	1991	19	0	0	3.213	0.961		
Thallium	E1	SS	2002	16	0.185	-0.023	44.911	0.096		
Thallium	E2	SD	2002	17	0.231	-0.02	39.253	0.051		
Thallium	E2	SS	2002	17	0.226	-0.023	45.351	0.054		
Thallium	E5	SS	2002	16	0.198	-0.021	42.085	0.084		
Thallium	E6	SS	2002	17	0.251	-0.02	39.542	0.04		
Thallium	N2	SD	2002	17	0.085	-0.01	20.061	0.258		
Thallium	N2	SS	2002	16	0.189	-0.023	46.027	0.092		
Thallium	N4	SS	2002	17	0.133	-0.017	34.281	0.15		
Thallium	N5	SD	2002	17	0.15	-0.014	27.081	0.125		
Thallium	N5	SS	2002	17	0.097	-0.013	24.918	0.224		
Thallium	S1	SD	2002	17	0.326	-0.028	56.763	0.017		
Thallium	S1	SS	2002	17	0.116	-0.019	37.219	0.18		
Thallium	S2	SS	2002	17	0.135	-0.018	36.125	0.147		
Thallium	S4	SD	2002	17	0.168	-0.023	45.37	0.102		
Thallium	S4	SS	2002	16	0.001	0.001	-2.961	0.913		
Thallium	W2	SS	2002	16	0.159	-0.021	41.525	0.126		
Thallium	W4	SS	2002	17	0.081	-0.014	26.83	0.269		
Titanium	E1	NG	2002	17	0.144	-0.025	51.127	0.132		
Titanium	E1	SS	1991	25	0.081	0.005	-7.862	0.169		
Titanium	E2	NG	2002	17	0.017	-0.01	21.284	0.619		
Titanium	E2	SD	1991	28	0.095	-0.006	14.62	0.111		
Titanium	E2	SS	1991	25	0.032	-0.004	10.749	0.391		
Titanium	E5	NG	2002	17	0.182	0.042	-83.624	0.087		
Titanium	E5	SS	1991	25	0.004	0.002	-1.405	0.756		
Titanium	E6	NG	2002	17	0.045	-0.014	29.348	0.413		
Titanium	E6	SS	1991	19	0.046	-0.006	13.657	0.376		
Titanium	N2	NG	2002	17	0.266	-0.041	82.191	0.034		
Titanium	N2	SD	1991	28	0.221	-0.011	24.13	0.012		
Titanium	N2	SS	1991	25	0.005	0.002	-0.999	0.74		
Titanium	N4	NG	2002	17	0.006	-0.008	15.712	0.777		
Titanium	N4	SS	1991	18	0.185	-0.011	24.226	0.075		
Titanium	N5	NG	2002	17	0.032	-0.016	33.321	0.492		
Titanium	N5	SD	1991	17	0.032	-0.007	15.965	0.493		
Titanium	N5	SS	1991	17	0	0	2.301	0.985		
Titanium	S1	NG	2002	16	0.002	-0.003	7.031	0.868		
Titanium	S1	SD	1991	28	0.008	0.003	-4.613	0.653		
Titanium	S1	SS	1991	27	0.036	0.007	-12.684	0.345		
Titanium	S2	NG	2002	17	0.129	-0.027	54.824	0.156		
Titanium	S2	SS	1991	27	0.02	0.005	-8.788	0.485		
Titanium	S4	NG	2002	17	0.002	-0.004	7.899	0.853		
Titanium	S4	SD	1991	28	0.03	0.007	-11.444	0.378		
Titanium	S4	SS	1991	24	0.003	-0.002	6.996	0.802		
Titanium	W2	NG	2002	17	0.019	0.01	-18.943	0.599		
Titanium	W2	SS	1991	24	0.04	-0.004	9.971	0.351		
Titanium	W4	NG	2002	17	0	-0.002	3.823	0.947		
Titanium	W4	SS	1991	19	0.193	-0.018	37.552	0.06		
Vanadium	E1	SS	1991	25	0.104	0.003	-5.433	0.117		
Vanadium	E2	SD	1991	28	0.275	0.006	-10.869	0.004		
Vanadium	E2	SS	1991	25	0.122	0.005	-7.759	0.086		
Vanadium	E5	NG	2010	9	0.004	-0.008	15.605	0.864		
Vanadium	E5	SS	1991	25	0.113	0.003	-5.281	0.101		
Vanadium	E6	SS	1991	19	0.005	0.001	-0.944	0.784		
Vanadium	N2	SD	1991	28	0.694	0.013	-24.606	<0.001	*	Increasing
Vanadium	N2	SS	1991	25	0.193	0.005	-8.271	0.028		
Vanadium	N4	SS	1991	18	0.045	0.003	-3.826	0.397		
Vanadium	N5	SD	1991	17	0.084	0.007	-12.376	0.258		
Vanadium	N5	SS	1991	17	0.092	0.003	-4.083	0.236		
Vanadium	S1	SD	1991	28	0.039	0.002	-2.282	0.312		
Vanadium	S1	SS	1991	27	0.22	0.005	-7.774	0.014		
Vanadium	S2	SS	1991	27	0.152	0.004	-5.743	0.044		
Vanadium	S4	SD	1991	28	0.236	0.004	-5.56	0.009		
Vanadium	S4	SS	1991	24	0.159	0.004	-7.19	0.053		
Vanadium	W2	SS	1991	24	0.295	0.005	-7.824	0.006		

Table F-2  
 Site Specific Inorganic Regression Analysis Results Summary  
 Lambton Facility 2019 Annual Landfill Report Biomonitoring Program  
 2018 Field Year

Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	P<0.003	Direction of Significant Trend
Vanadium	W4	NG	2010	9	0.625	-0.112	224.668	0.011		
Vanadium	W4	SS	1991	19	0.06	0.003	-4.344	0.311		
Zinc	E1	FC	1991	6	0.288	-0.012	24.897	0.272		
Zinc	E1	NG	1991	28	0.059	-0.008	17.038	0.212		
Zinc	E1	SB	1991	17	0.021	0.002	-1.911	0.577		
Zinc	E1	SS	1991	25	0.049	-0.002	6.671	0.286		
Zinc	E2	FC	1991	6	0.026	-0.003	6.665	0.761		
Zinc	E2	NG	1991	28	0.181	0.007	-12.24	0.024		
Zinc	E2	SB	1991	12	0.144	-0.004	9.661	0.224		
Zinc	E2	SD	1991	28	0.097	0.005	-8.39	0.108		
Zinc	E2	SS	1991	25	0.014	0.001	-0.996	0.58		
Zinc	E5	FC	1991	6	0.013	0.003	-4.159	0.828		
Zinc	E5	NG	1991	27	0.011	0.003	-4.012	0.605		
Zinc	E5	SB	1991	17	0.006	0.001	-0.182	0.771		
Zinc	E5	SS	1991	25	0.028	0.002	-1.406	0.427		
Zinc	E6	NG	1991	19	0.001	-0.001	3.501	0.92		
Zinc	E6	SS	1991	19	0.256	-0.008	18.578	0.027		
Zinc	N2	FC	1991	6	0.344	0.009	-17.512	0.221		
Zinc	N2	NG	1991	29	0.006	0.001	-0.956	0.694		
Zinc	N2	SB	1991	16	0.096	-0.005	10.694	0.242		
Zinc	N2	SD	1991	28	0.54	0.012	-22.182	<0.001	*	Increasing
Zinc	N2	SS	1991	25	0.001	0	1.504	0.901		
Zinc	N4	NG	1991	18	0.015	0.003	-4.12	0.625		
Zinc	N4	SS	1991	18	0.064	0.004	-5.79	0.312		
Zinc	N5	NG	1991	17	0	0	0.504	0.943		
Zinc	N5	SD	1991	17	0.032	-0.005	12.807	0.494		
Zinc	N5	SS	1991	17	0.444	-0.009	19.671	0.003		
Zinc	S1	NG	1991	28	0.014	0.002	-3.438	0.551		
Zinc	S1	SB	1991	20	0.069	0.003	-4.23	0.263		
Zinc	S1	SD	1991	28	0.006	0.001	-0.696	0.705		
Zinc	S1	SS	1991	27	0.049	0.002	-1.933	0.267		
Zinc	S2	NG	1991	29	0.001	0.001	0.194	0.884		
Zinc	S2	SB	1991	20	0.074	0.003	-4.63	0.246		
Zinc	S2	SS	1991	27	0.019	0.001	-1.105	0.492		
Zinc	S4	NG	1991	26	0.001	0.001	-0.617	0.858		
Zinc	S4	SB	1991	17	0.029	0.002	-3.224	0.51		
Zinc	S4	SD	1991	28	0.045	-0.002	5.66	0.276		
Zinc	S4	SS	1991	24	0.201	0.004	-7.045	0.028		
Zinc	S4	WW	1991	7	0.014	-0.001	3.284	0.799		
Zinc	W2	NG	1991	28	0.064	-0.003	7.903	0.196		
Zinc	W2	SB	1991	19	0.021	0.003	-3.951	0.556		
Zinc	W2	SS	1991	24	0.065	0.002	-2.04	0.231		
Zinc	W2	WW	1991	7	0.082	-0.005	12.084	0.533		
Zinc	W4	FC	1991	8	0.117	0.003	-4.048	0.408		
Zinc	W4	NG	1991	22	0	0	1.912	0.967		
Zinc	W4	SB	1991	10	0.06	-0.003	6.693	0.497		
Zinc	W4	SS	1991	19	0.046	0.002	-2.427	0.38		
Zirconium	E2	SD	1991	28	0.009	-0.002	5.721	0.634		
Zirconium	N2	SS	1991	25	0.001	0.001	-0.366	0.893		
Zirconium	N4	SS	1991	18	0.125	-0.014	28.735	0.151		
Zirconium	N5	SD	1991	17	0.18	-0.02	41.14	0.089		
Zirconium	N5	SS	1991	17	0.153	-0.016	31.958	0.121		
Zirconium	S4	SD	1991	28	0.002	0.001	-1.394	0.831		
Zirconium	W4	SS	1991	19	0.187	-0.015	31.616	0.064		

**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2018 FIELD YEAR**

Appendix F Inorganic SITE-SPECIFIC Regression  
February 14, 2020

**F.2 SITE-SPECIFIC INORGANIC TREND LINE GRAPHS (P<0.003)**



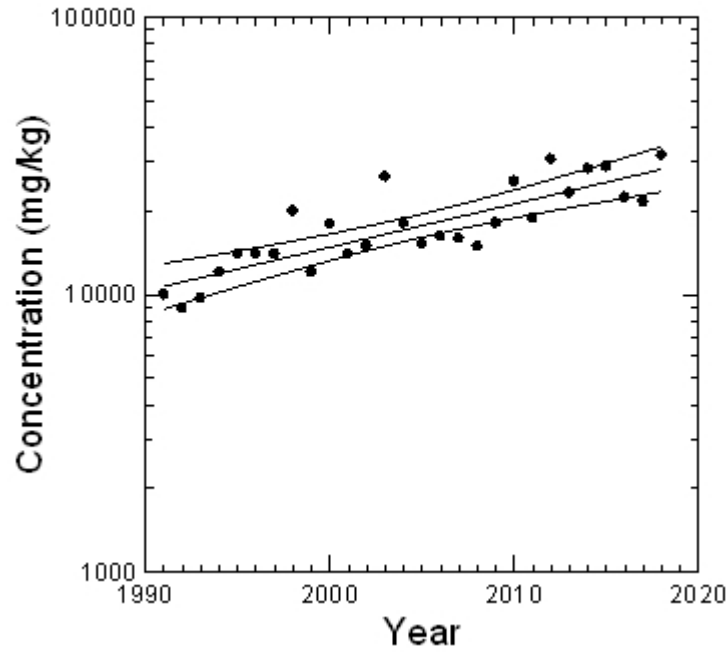
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Aluminum SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Aluminum	N2	SD	1991	28	0.701	0.016	-27.102	<0.001	Increasing



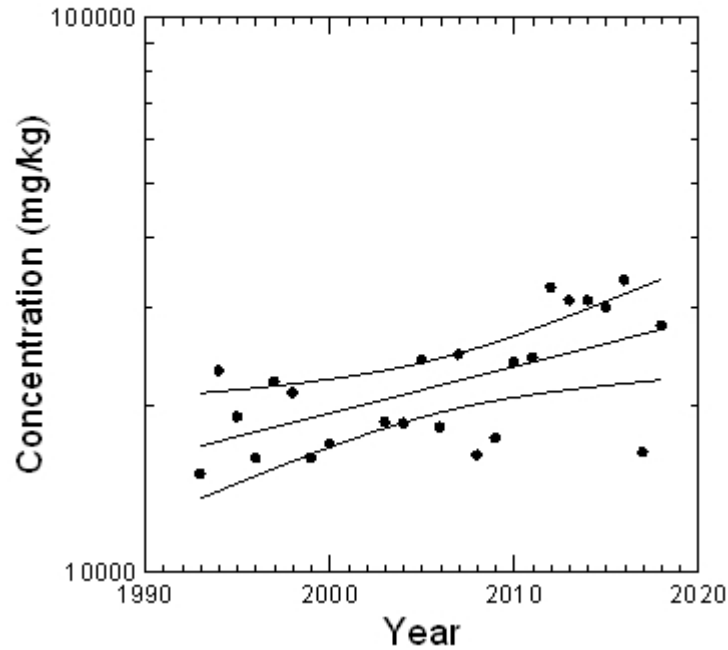
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Aluminum SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Aluminum	S4	SS	1991	24	0.354	0.008	-12.497	0.002	Increasing



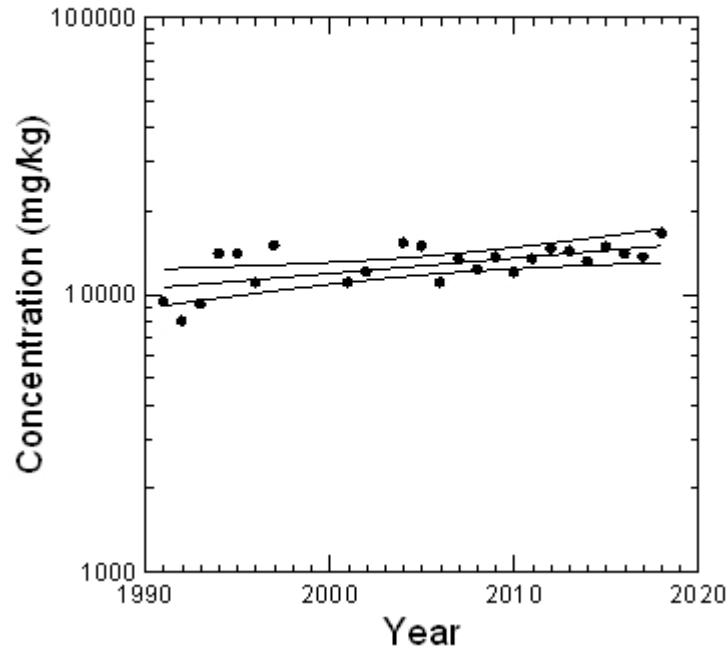
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Aluminum SS, Site = W2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Aluminum	W2	SS	1991	24	0.376	0.006	-6.956	0.001	Increasing



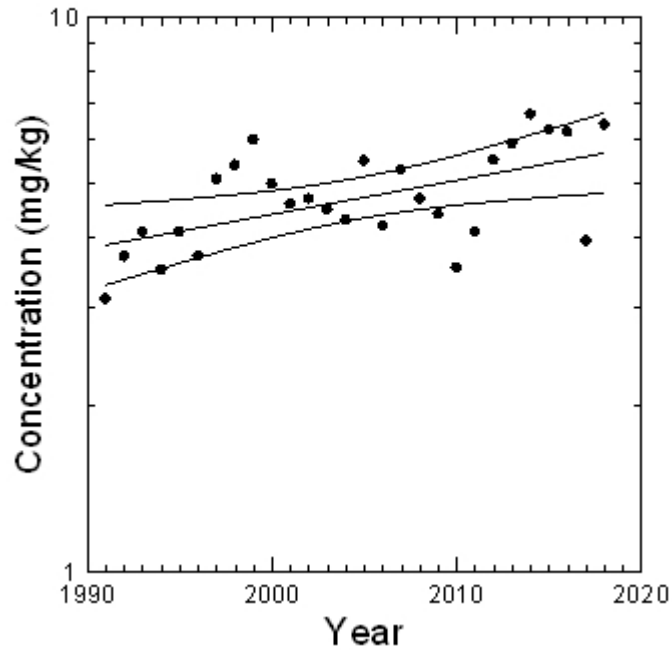
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Arsenic SD, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Arsenic	S4	SD	1991	28	0.316	0.006	-11.62	0.002	Increasing





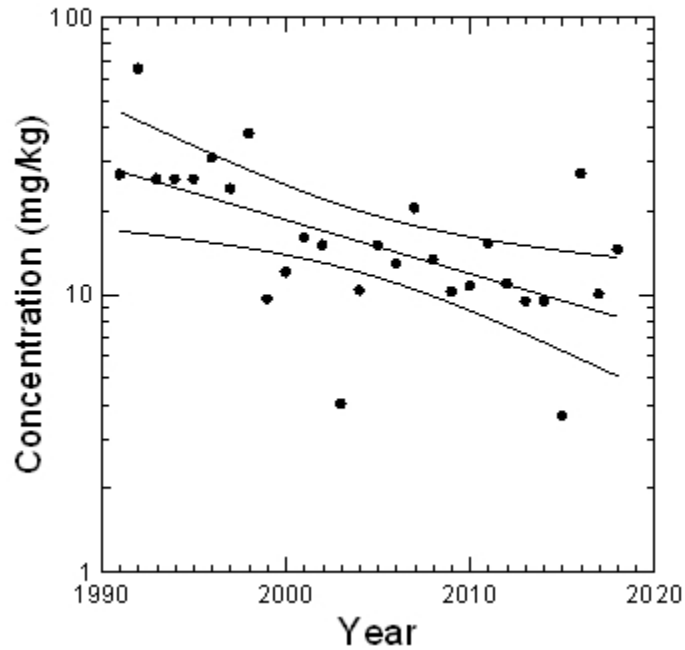
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Barium NG, Site = E1



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Barium	E1	NG	1991	28	0.345	-0.019	40.084	0.001	Decreasing



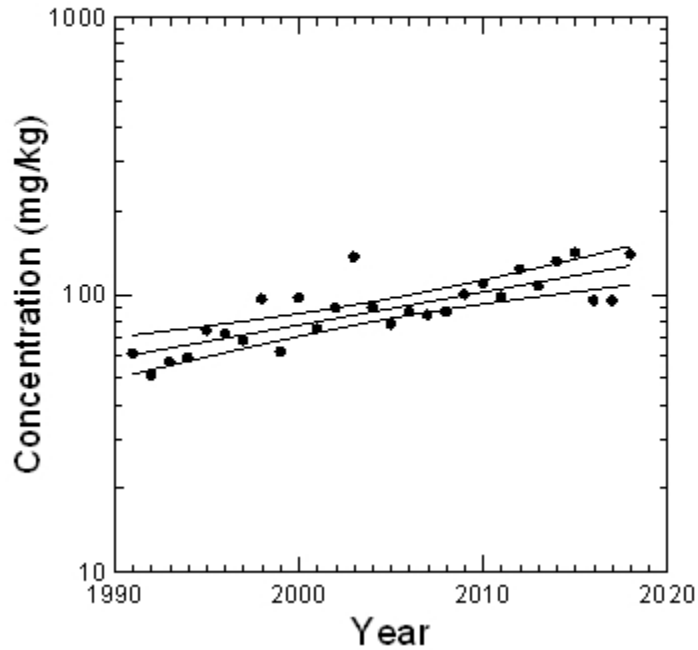
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Barium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Barium	N2	SD	1991	28	0.648	0.012	-21.884	<0.001	Increasing



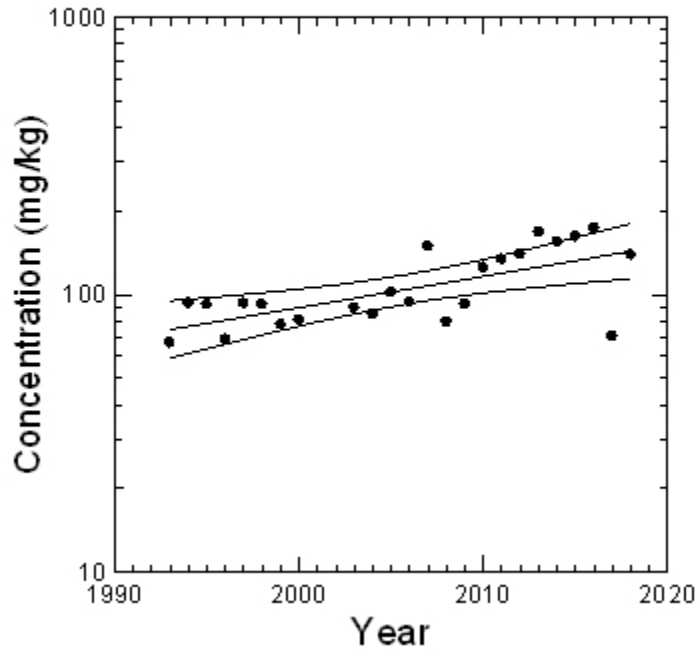
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Barium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Barium	S4	SS	1991	24	0.455	0.011	-20.618	<0.001	Increasing



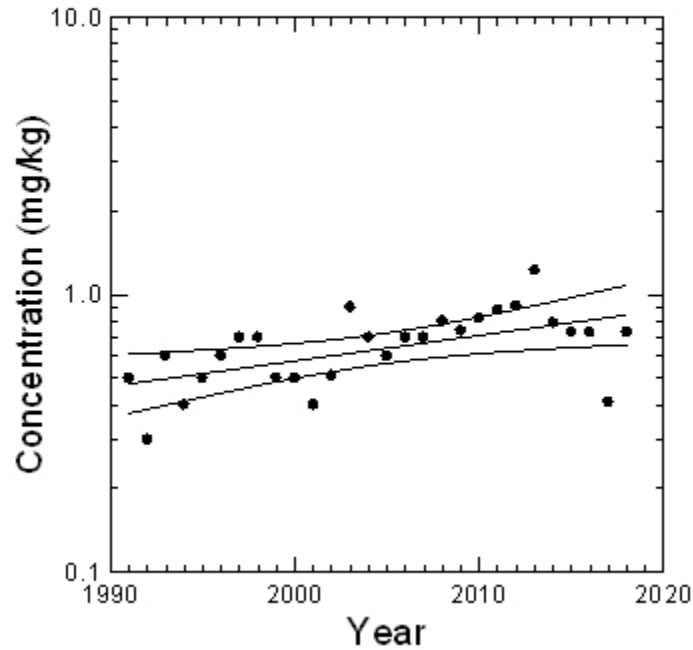
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Beryllium SD, Site = E2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Beryllium	E2	SD	1991	28	0.321	0.009	-18.622	0.002	Increasing



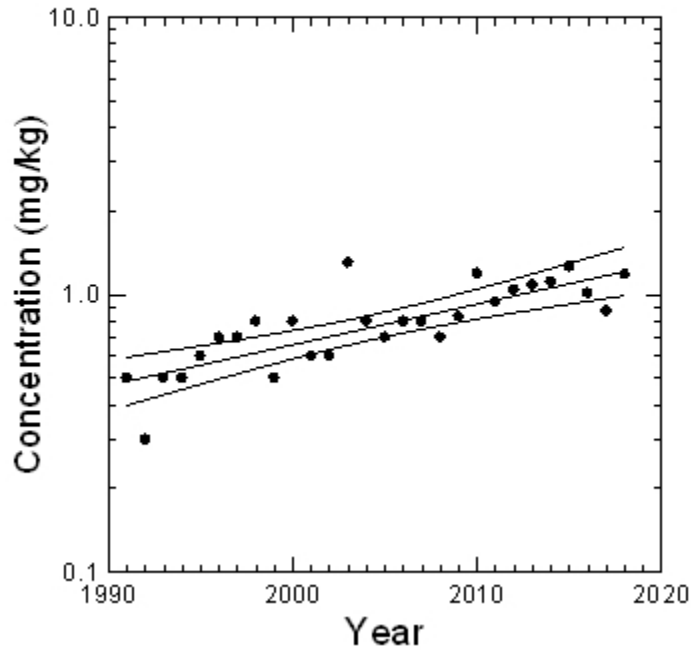
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Beryllium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Beryllium	N2	SD	1991	28	0.645	0.015	-29.484	<0.001	Increasing



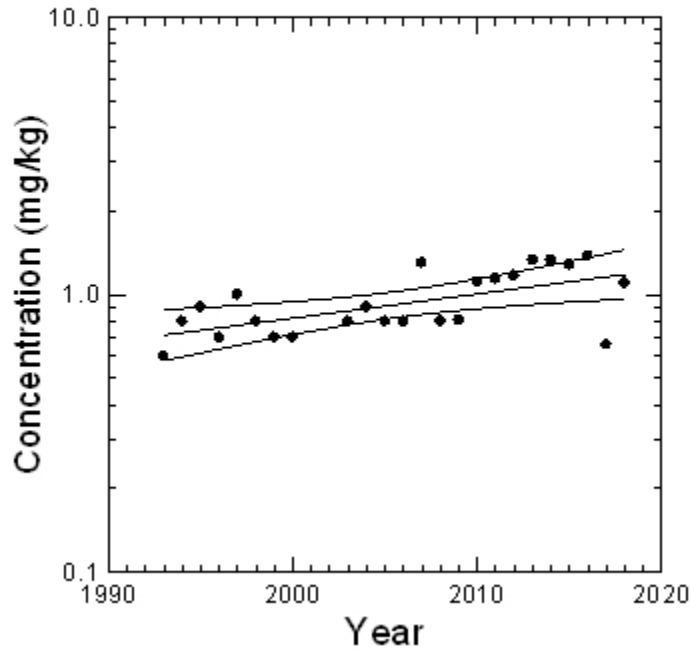
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Beryllium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Beryllium	S4	SS	1991	24	0.388	0.009	-17.58	0.001	Increasing



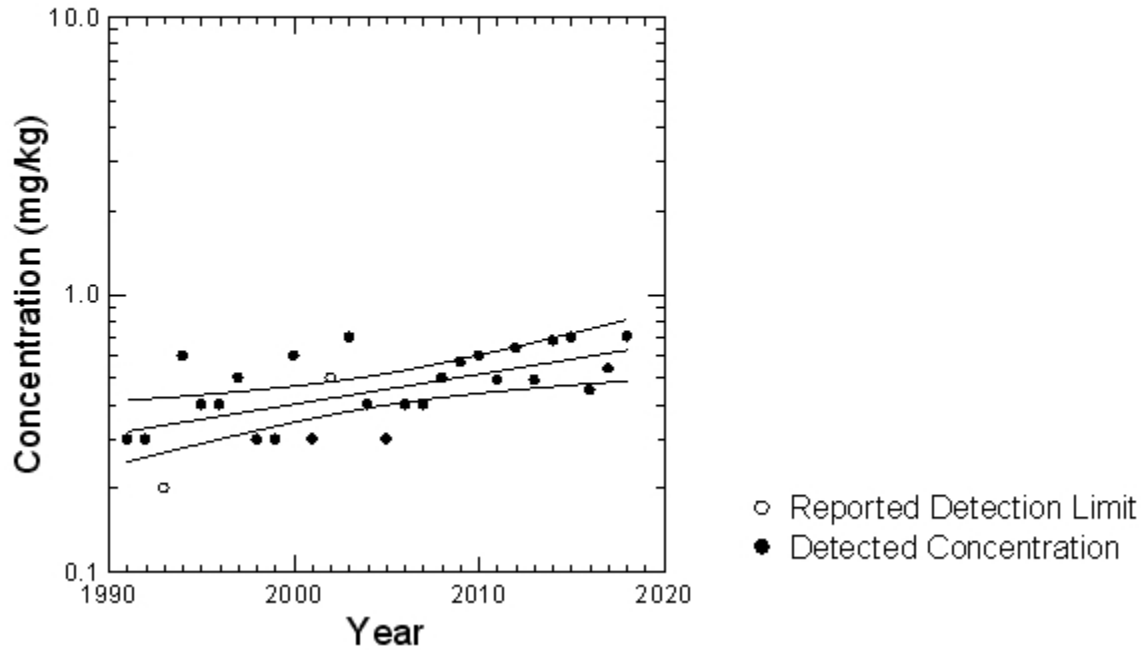
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Cadmium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend



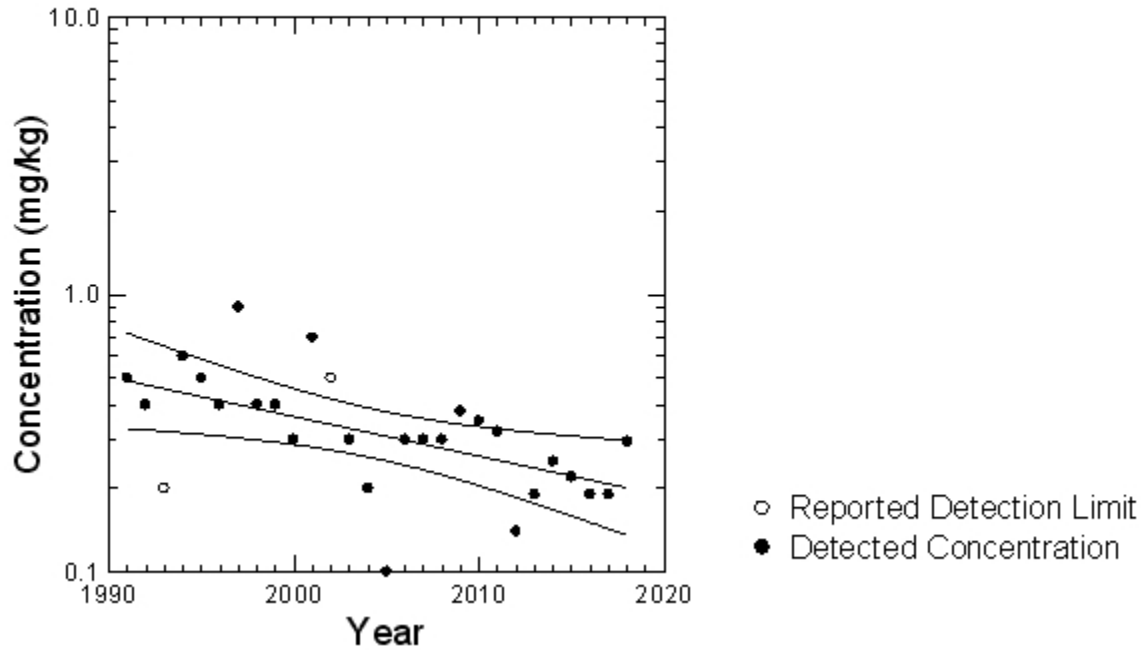
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Cadmium SD, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Cadmium	S4	SD	1991	28	0.308	-0.014	28.148	0.002	Decreasing





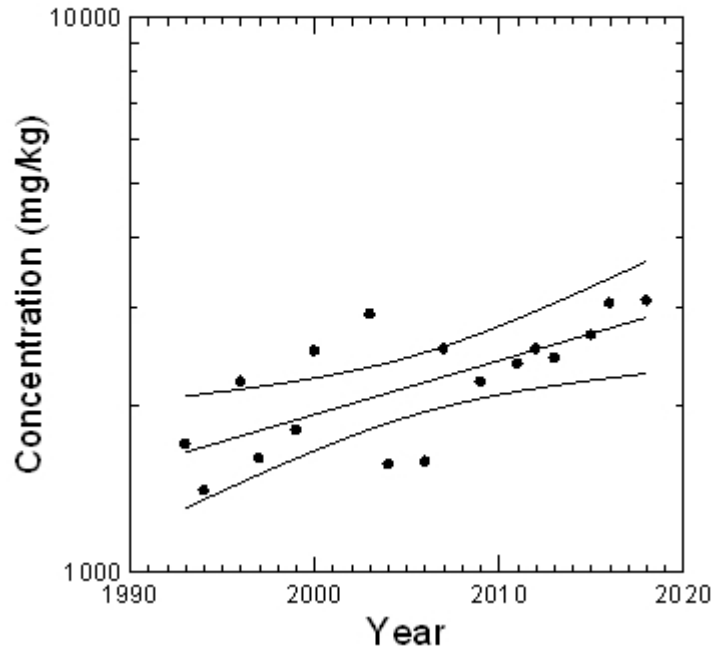
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Calcium SB, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Calcium	S4	SB	1991	17	0.496	0.01	-16.146	0.002	Increasing



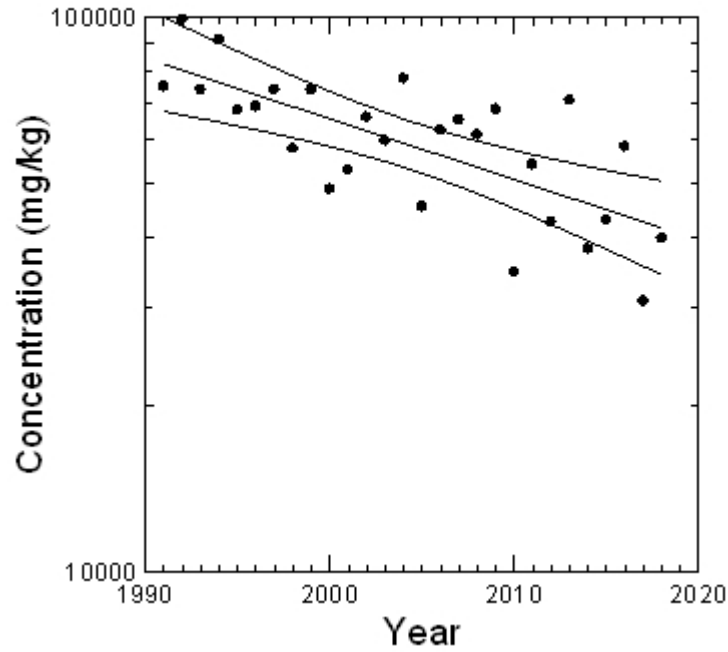
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Calcium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Calcium	N2	SD	1991	28	0.515	-0.011	26.639	<0.001	Decreasing



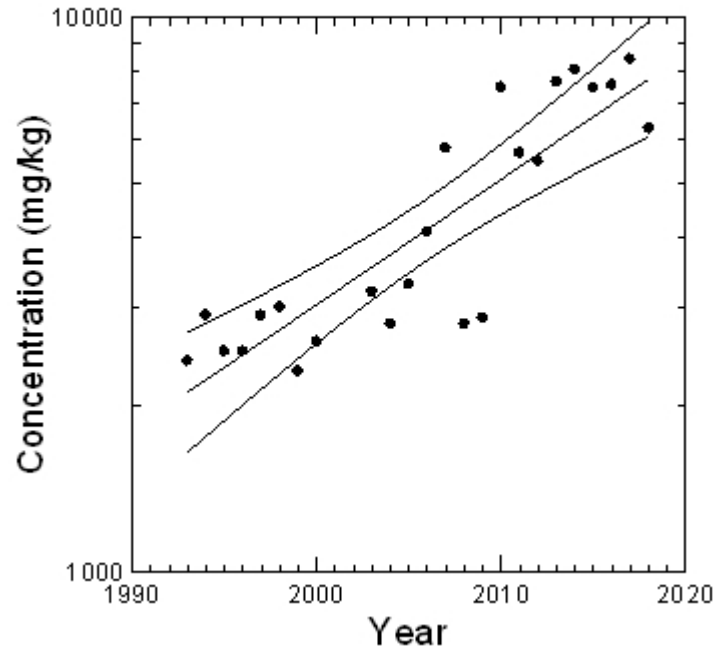
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Calcium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Calcium	S4	SS	1991	24	0.753	0.023	-41.684	<0.001	Increasing



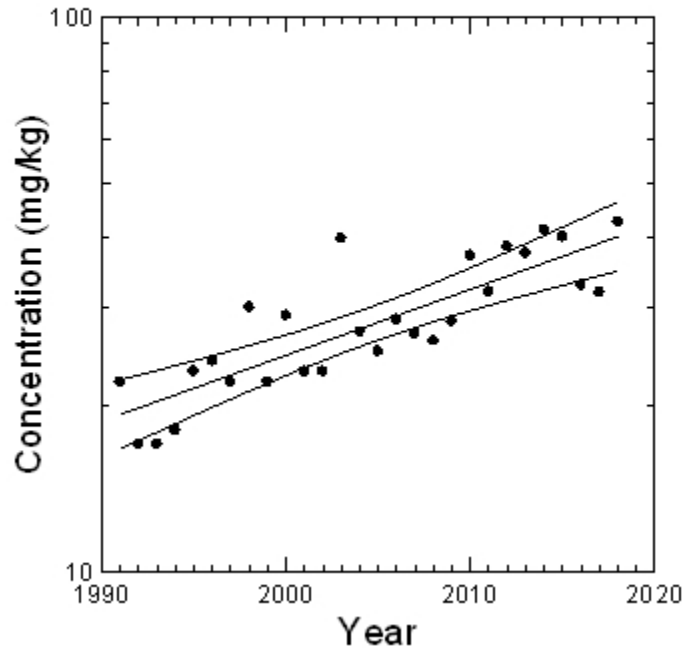
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Chromium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Chromium	N2	SD	1991	28	0.7	0.012	-22.373	<0.001	Increasing



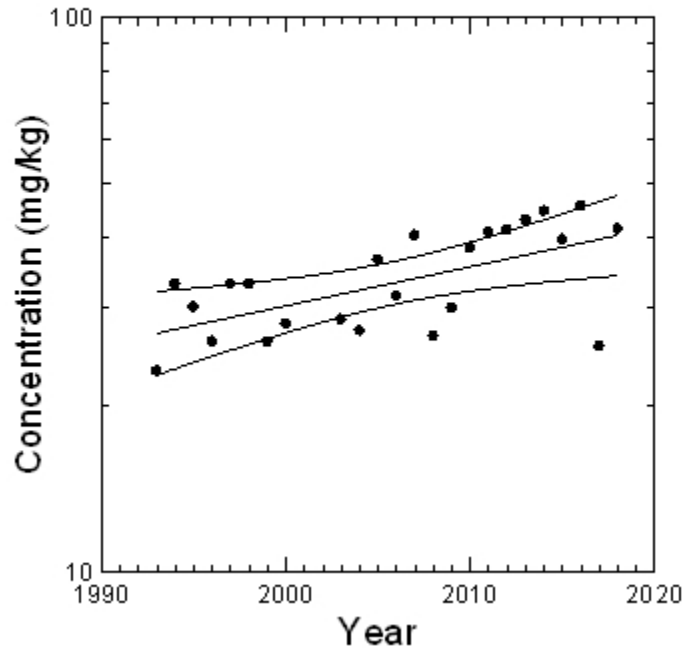
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Chromium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Chromium	S4	SS	1991	24	0.38	0.007	-12.608	0.001	Increasing



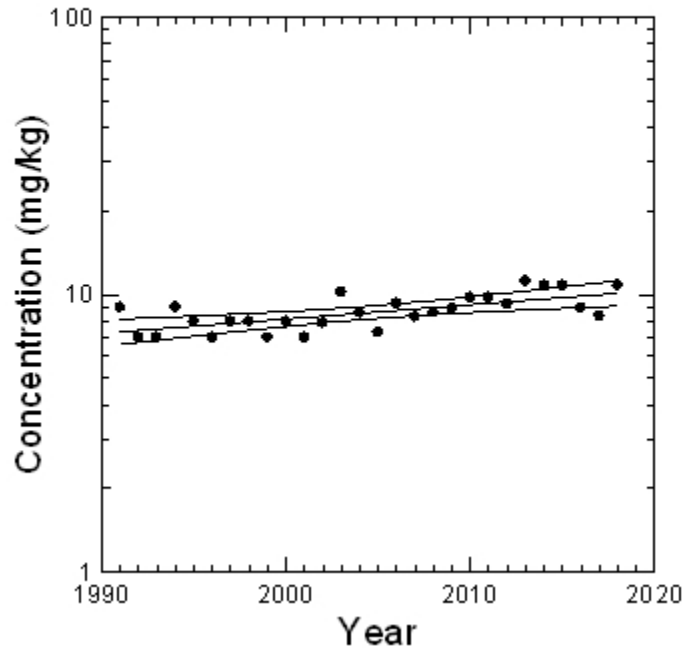
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Cobalt SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Cobalt	N2	SD	1991	28	0.445	0.005	-9.351	<0.001	Increasing



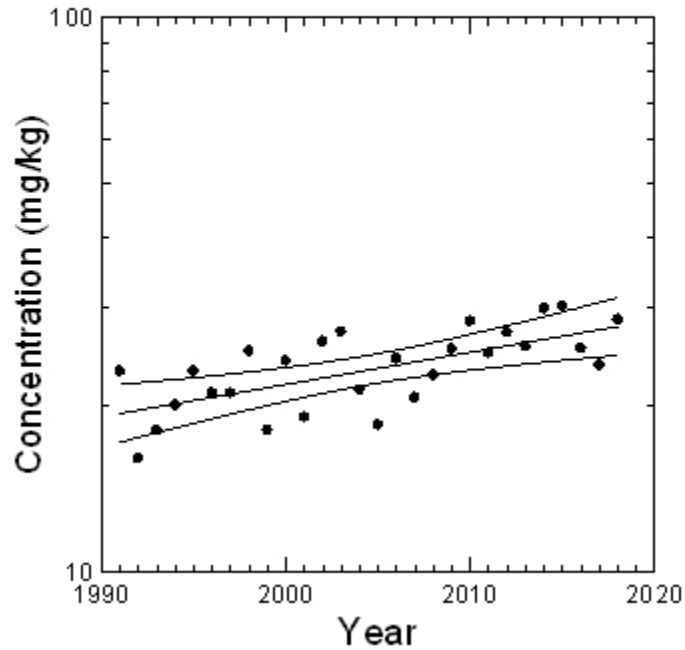
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Copper SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Copper	N2	SD	1991	28	0.444	0.006	-10.259	<0.001	Increasing



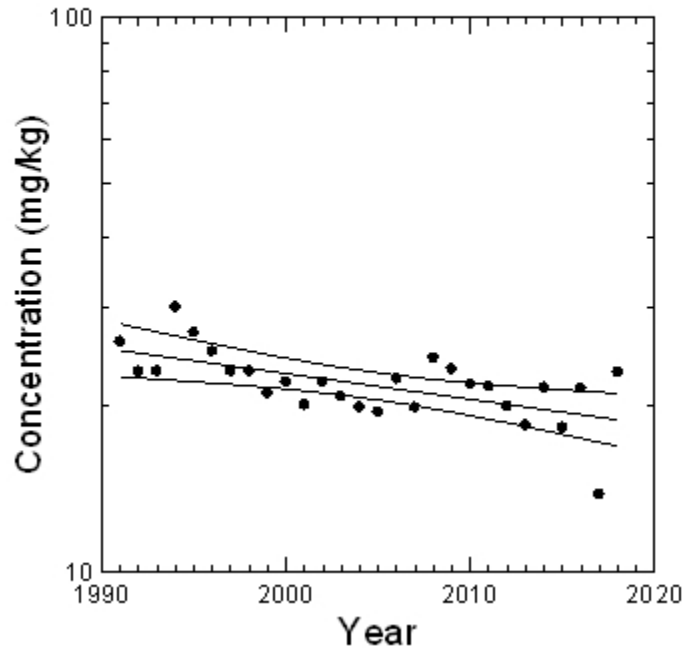
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Copper SD, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Copper	S4	SD	1991	28	0.377	-0.005	10.617	0.001	Decreasing





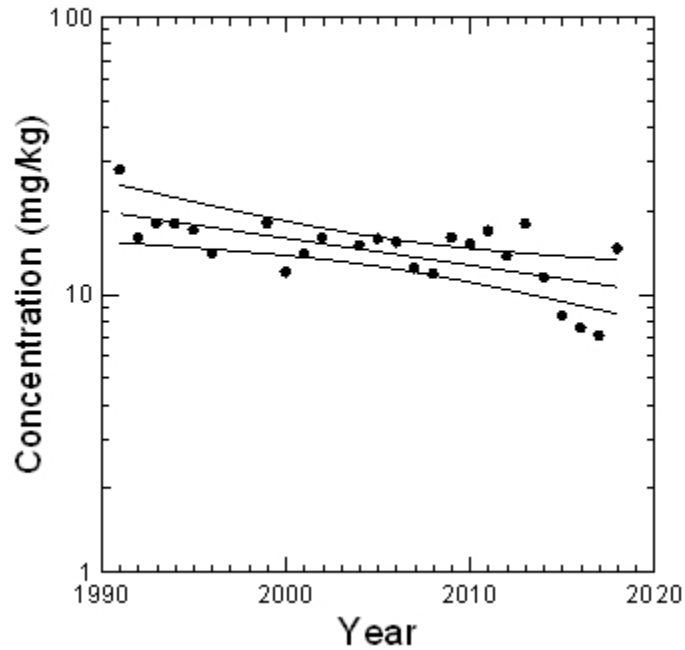
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Copper SS, Site = E1



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Copper	E1	SS	1991	25	0.412	-0.01	20.71	0.001	Decreasing



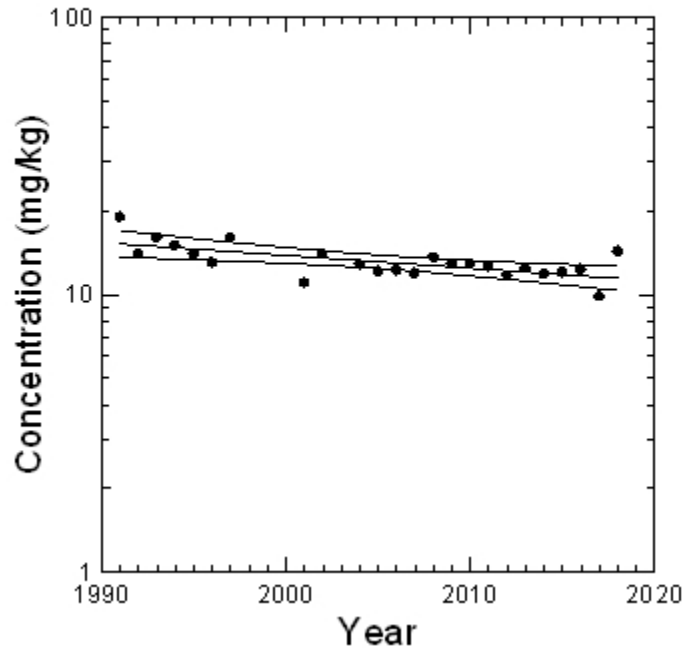
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Copper SS, Site = W2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Copper	W2	SS	1991	24	0.445	-0.005	10.347	<0.001	Decreasing



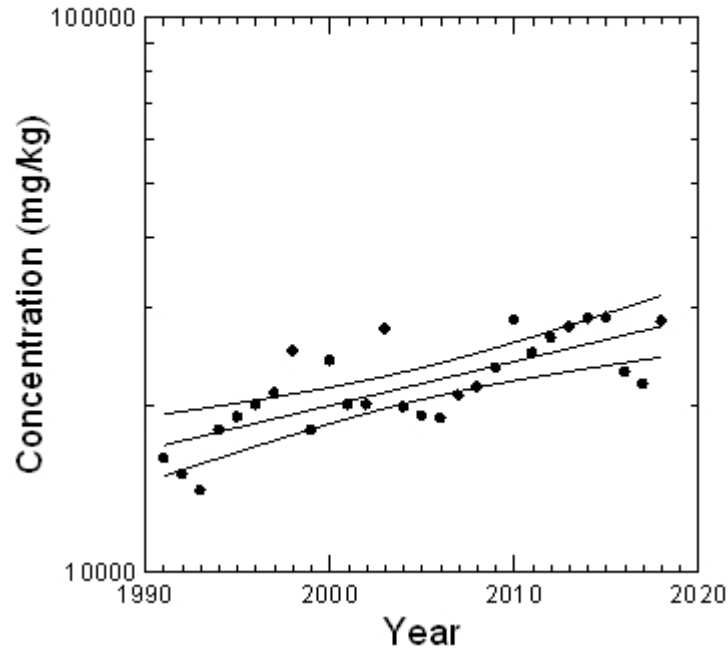
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Iron SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Iron	N2	SD	1991	28	0.565	0.008	-11.563	<0.001	Increasing



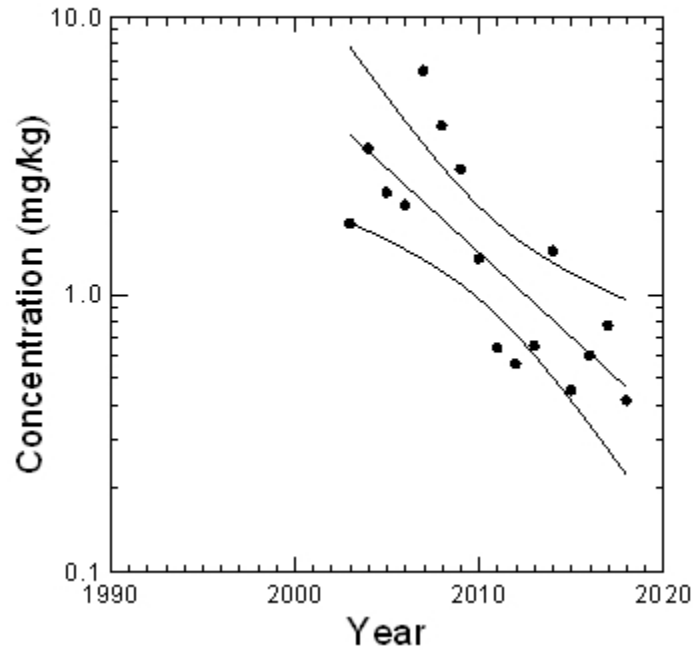
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Lead NG, Site = N5



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Lead	N5	NG	2003	16	0.605	-0.061	122.213	<0.001	Decreasing



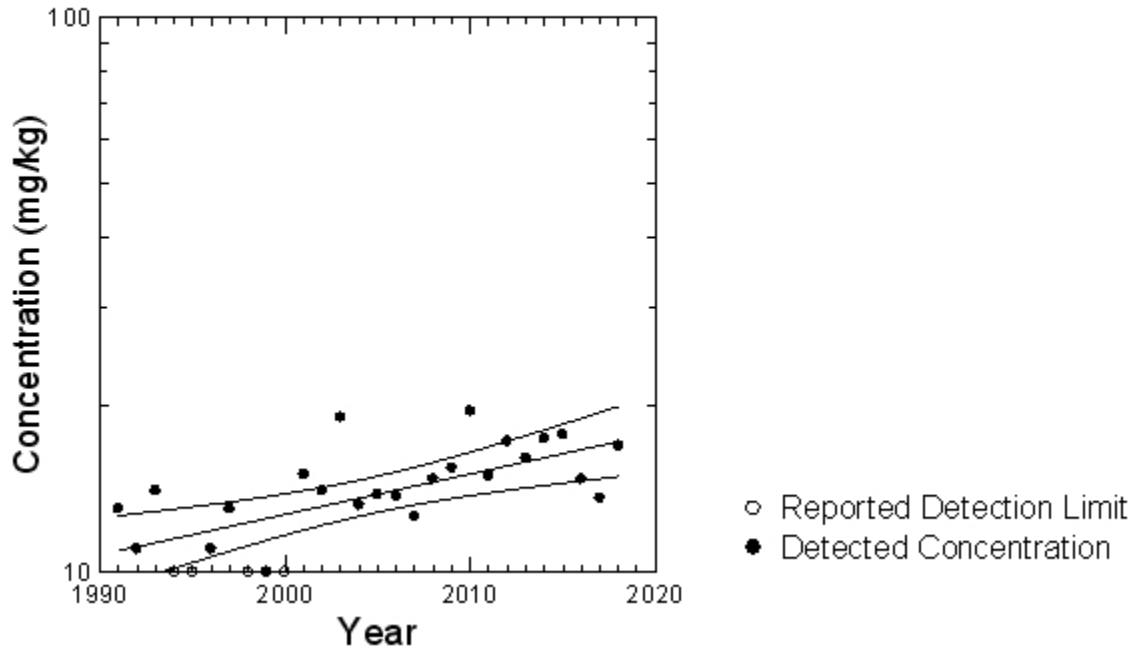
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Lead SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Lead	N2	SD	1991	28	0.461	0.007	-13.493	<0.001	Increasing



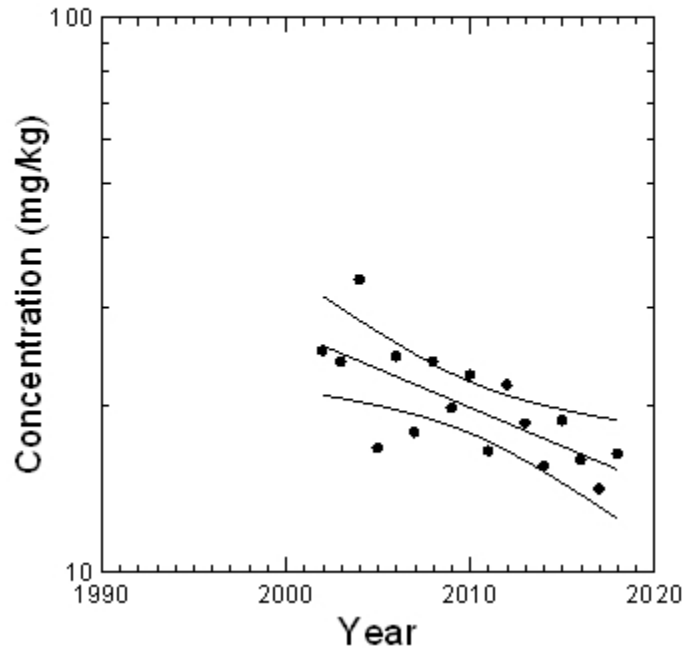
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Lead SS, Site = N5



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Lead	N5	SS	1991	17	0.515	-0.014	29.343	0.001	Decreasing

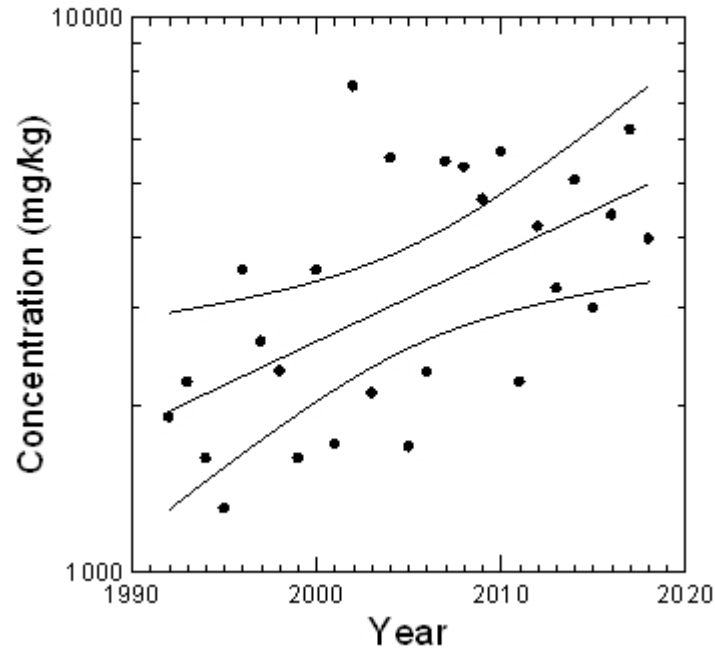
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Magnesium NG, Site = E5



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Magnesium	E5	NG	1991	27	0.329	0.016	-28.079	0.002	Increasing



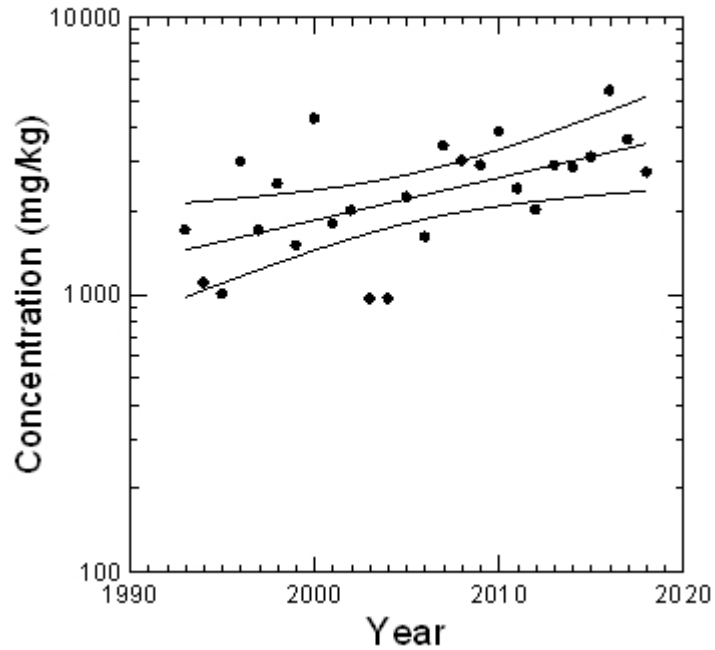
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Magnesium NG, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Magnesium	S4	NG	1991	26	0.328	0.015	-27.317	0.002	Increasing





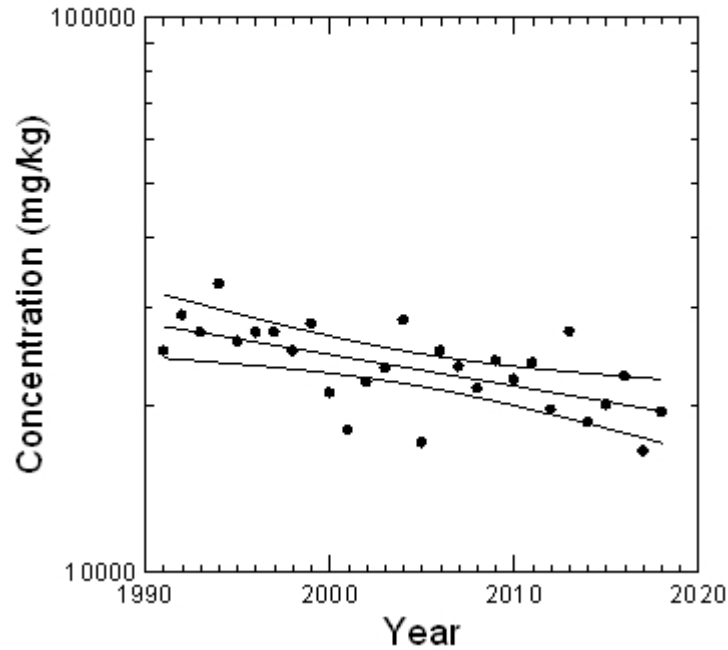
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Magnesium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Magnesium	N2	SD	1991	28	0.385	-0.006	15.69	<0.001	Decreasing

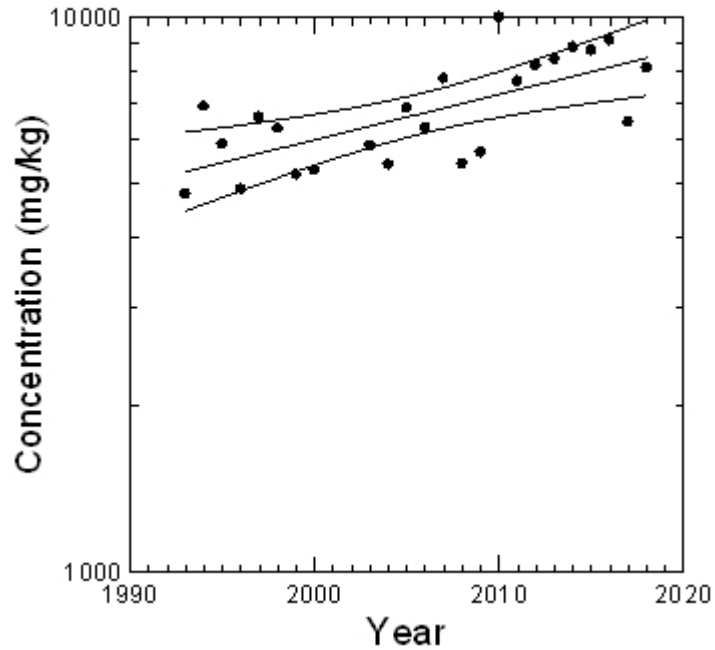
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Magnesium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Magnesium	S4	SS	1991	24	0.484	0.008	-12.6	<0.001	Increasing



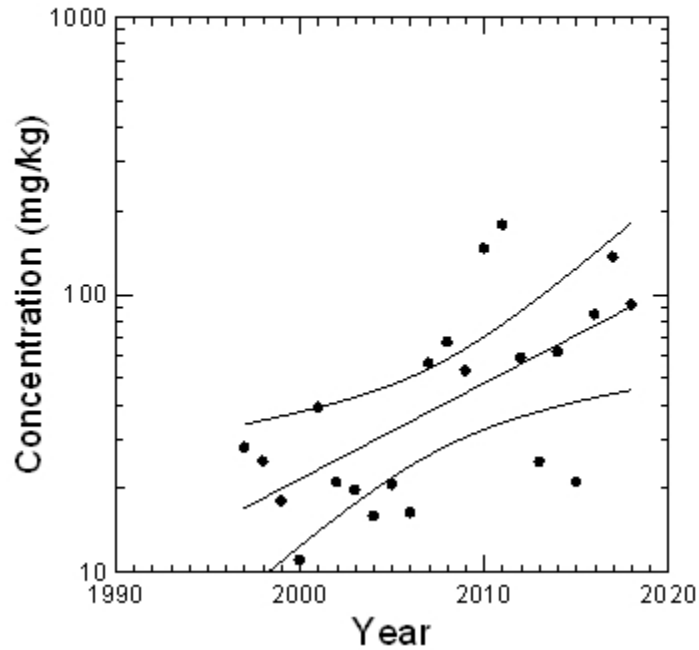
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Manganese NG, Site = W4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Manganese	W4	NG	1991	22	0.409	0.035	-67.928	0.001	Increasing



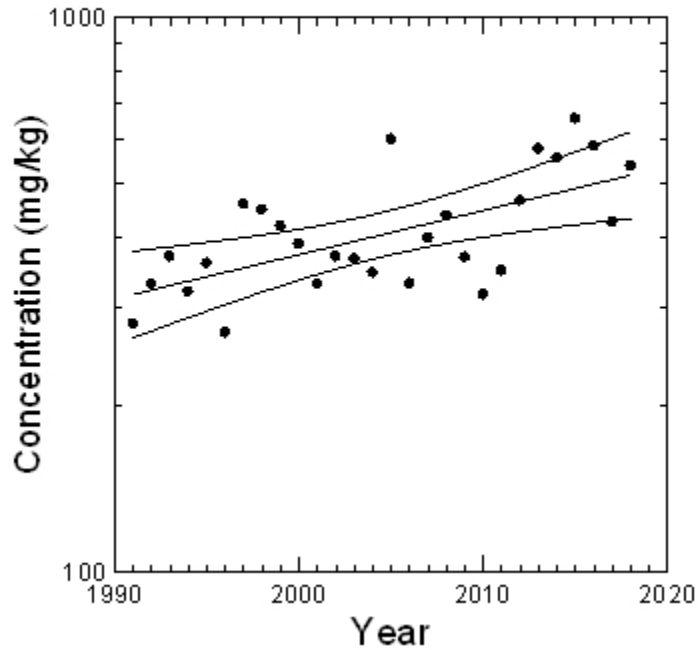
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Manganese SD, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Manganese	S4	SD	1991	28	0.4	0.008	-13.35	<0.001	Increasing



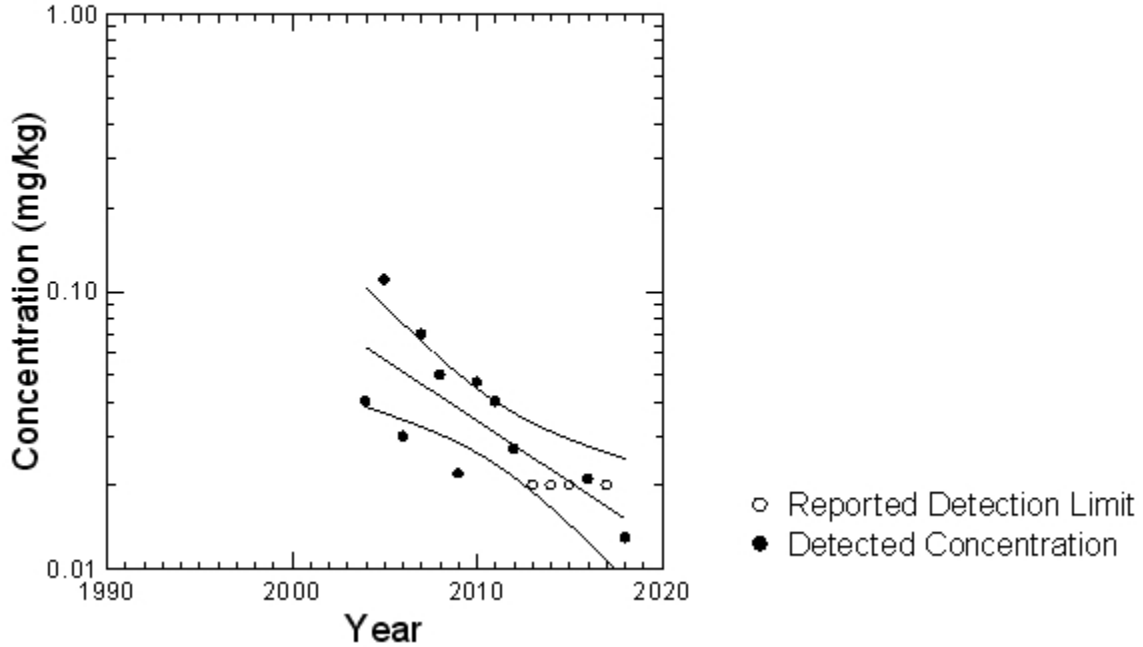
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Mercury NG, Site = E1



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Mercury	E1	NG	2004	15	0.624	-0.044	87.194	<0.001	Decreasing



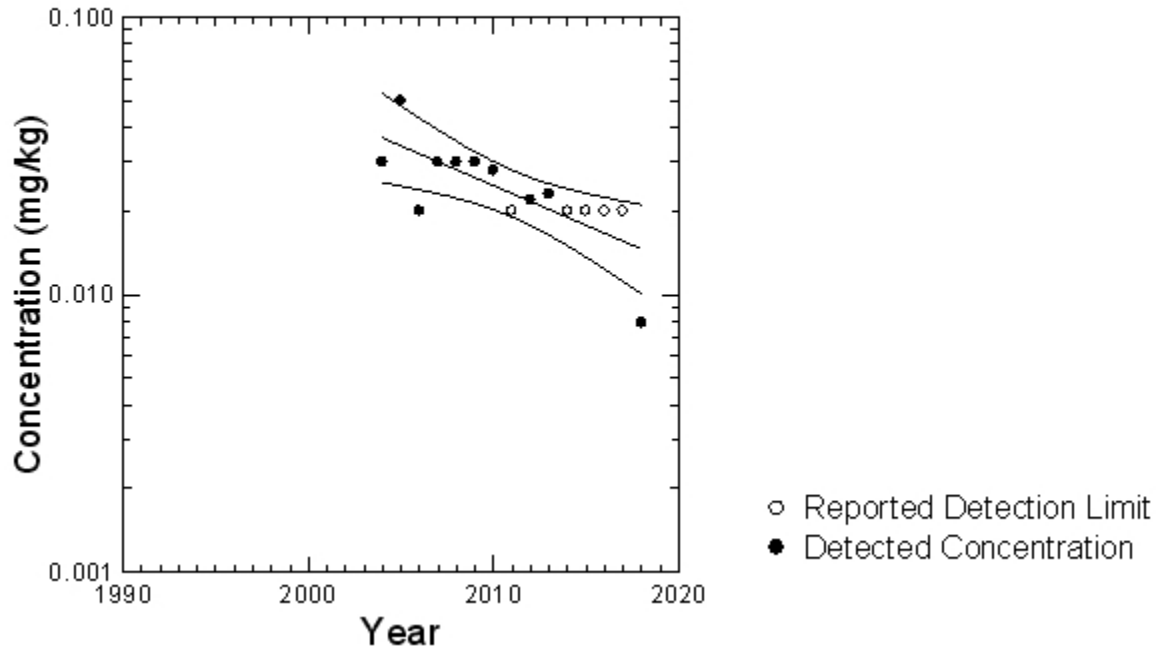
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Mercury NG, Site = E2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Mercury	E2	NG	2004	15	0.556	-0.029	55.909	0.001	Decreasing



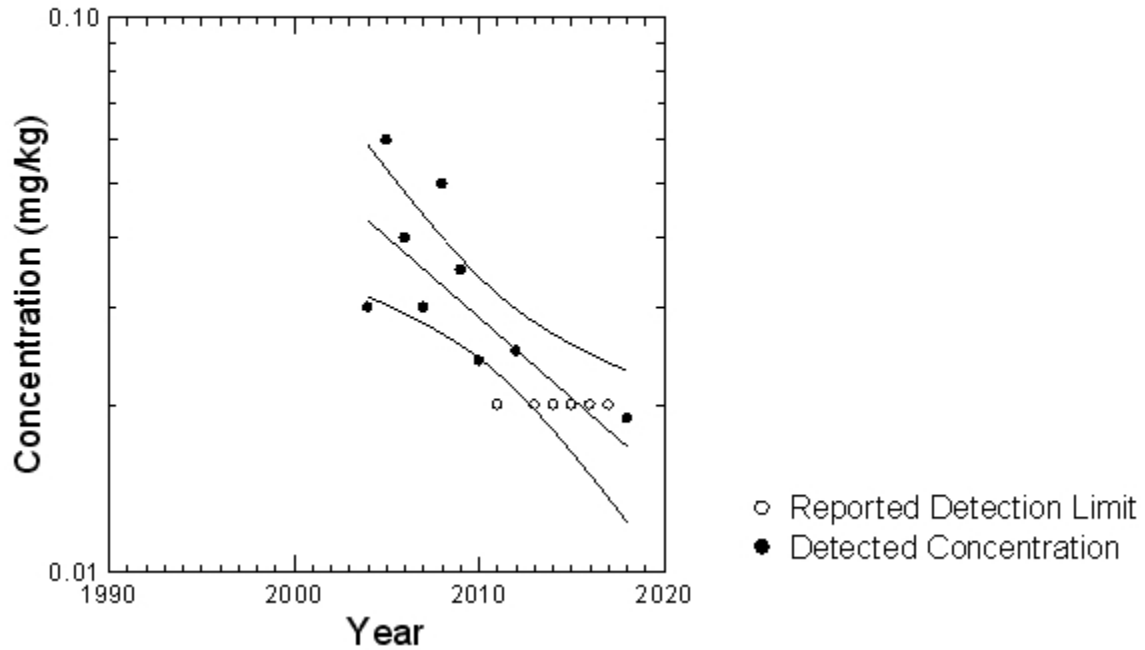
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Mercury NG, Site = N4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Mercury	N4	NG	2004	15	0.644	-0.029	56.885	<0.001	Decreasing



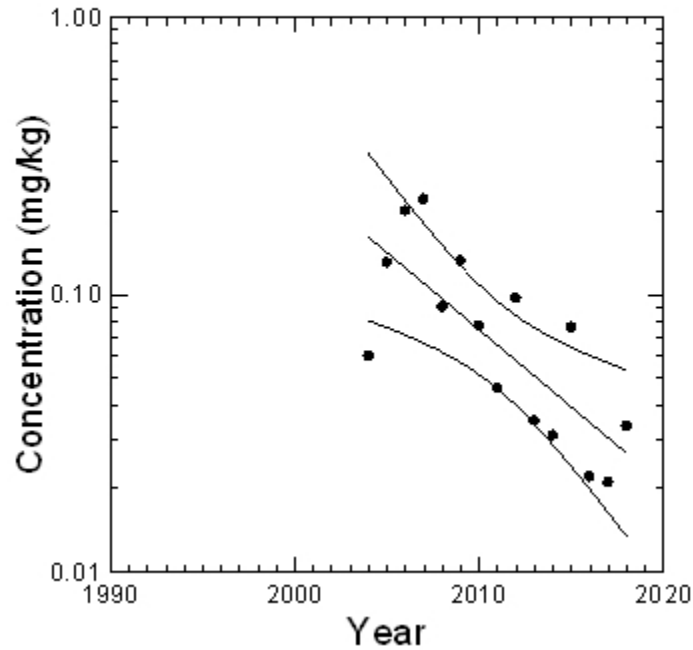
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Mercury NG, Site = N5



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Mercury	N5	NG	2004	15	0.576	-0.056	110.814	0.001	Decreasing



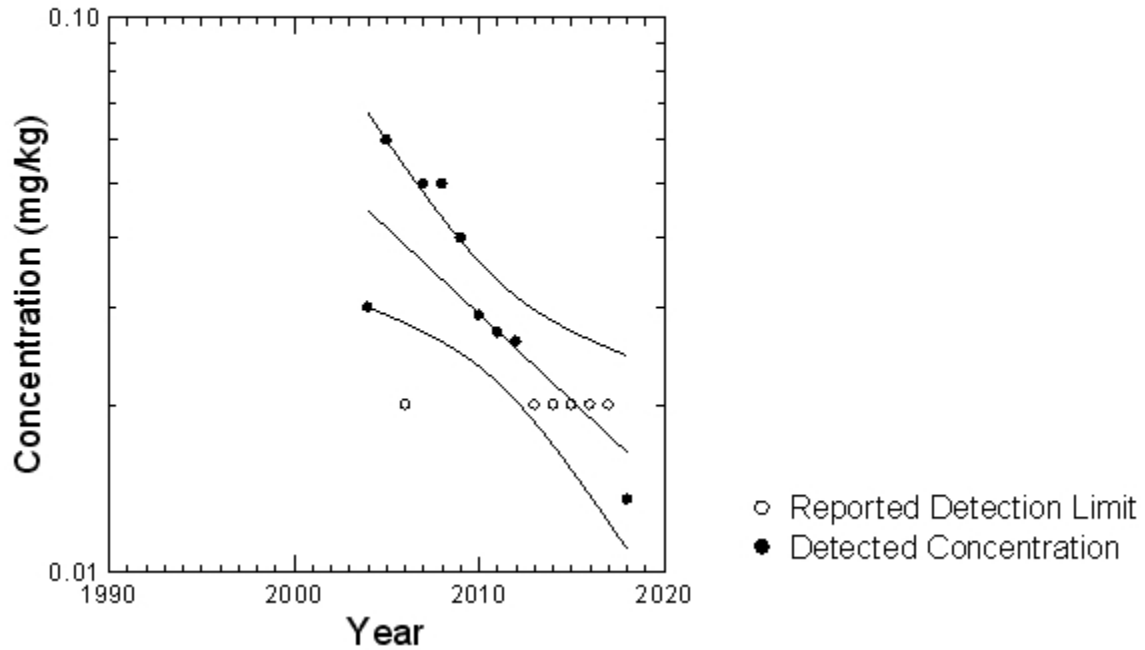
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Mercury NG, Site = S2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Mercury	S2	NG	2004	15	0.557	-0.031	61.1	0.001	Decreasing



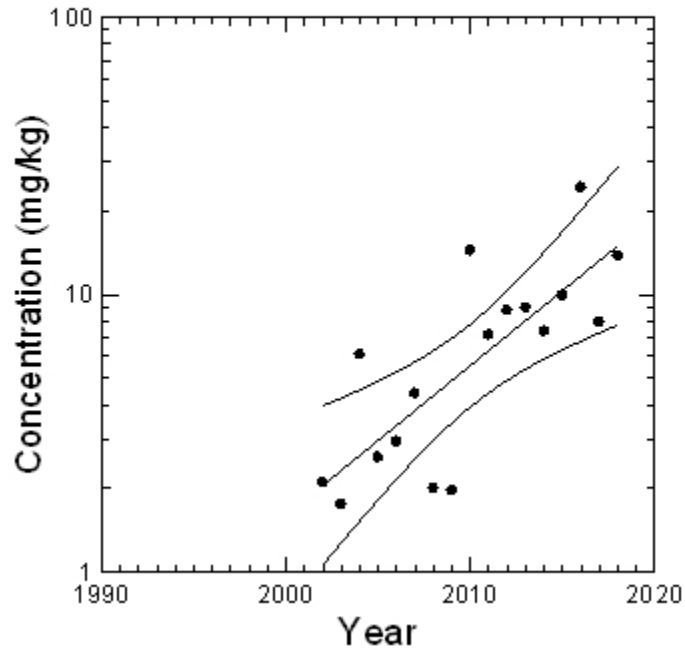
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Molybdenum NG, Site = E6



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Molybdenum	E6	NG	2002	17	0.606	0.054	-107.828	<0.001	Increasing

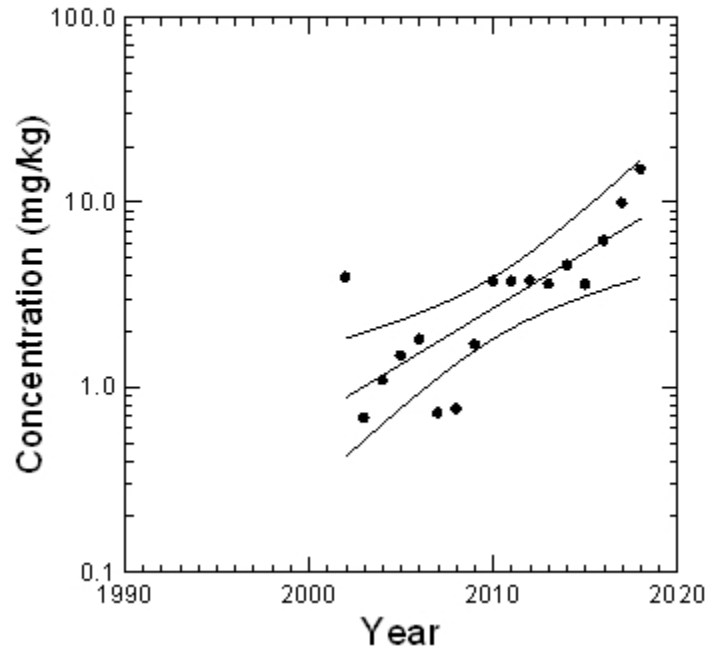
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Molybdenum NG, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Molybdenum	S4	NG	2002	17	0.609	0.061	-121.203	<0.001	Increasing



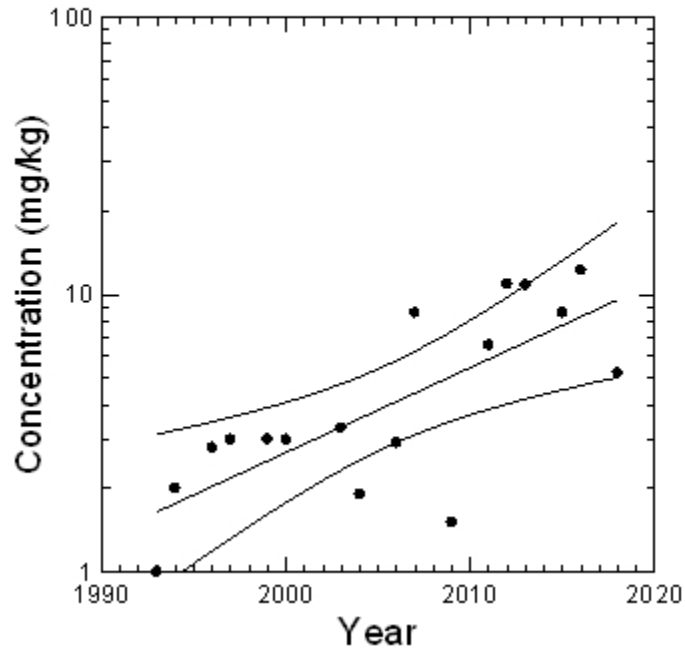
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Molybdenum SB, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Molybdenum	S4	SB	1991	17	0.561	0.031	-60.75	0.001	Increasing



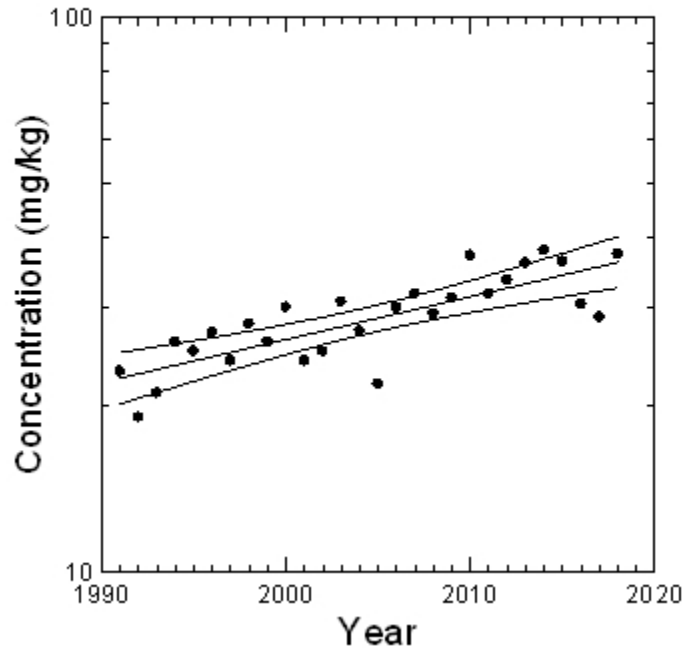
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Nickel SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Nickel	N2	SD	1991	28	0.641	0.008	-14.058	<0.001	Increasing



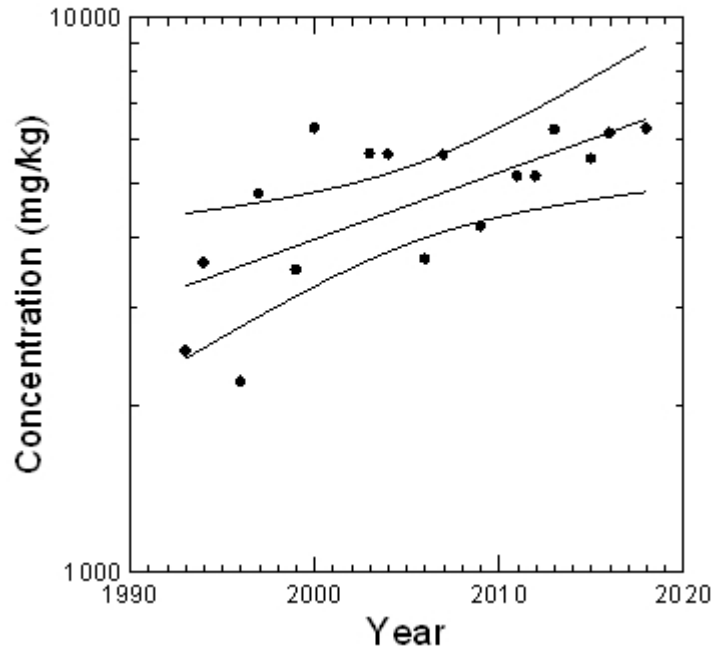
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Phosphorus SB, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Phosphorus	S4	SB	1991	17	0.473	0.012	-20.508	0.002	Increasing



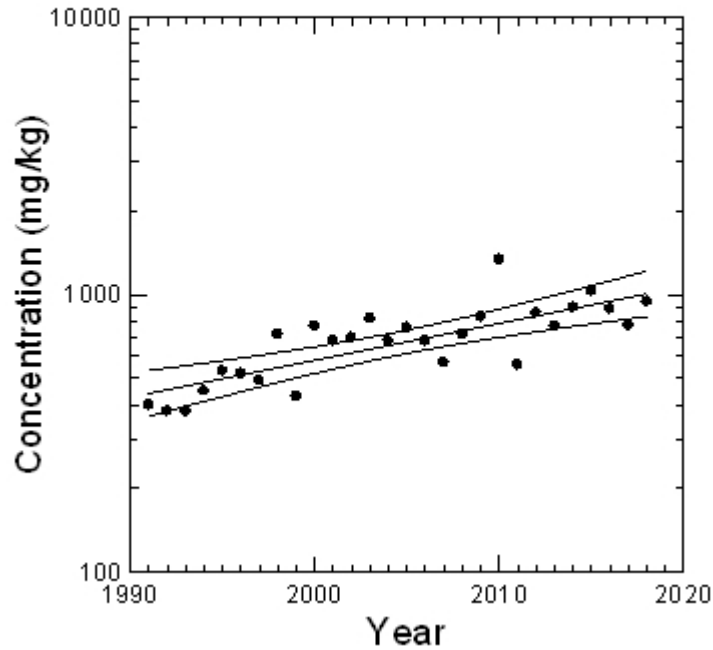
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Phosphorus SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Phosphorus	N2	SD	1991	28	0.628	0.013	-23.831	<0.001	Increasing



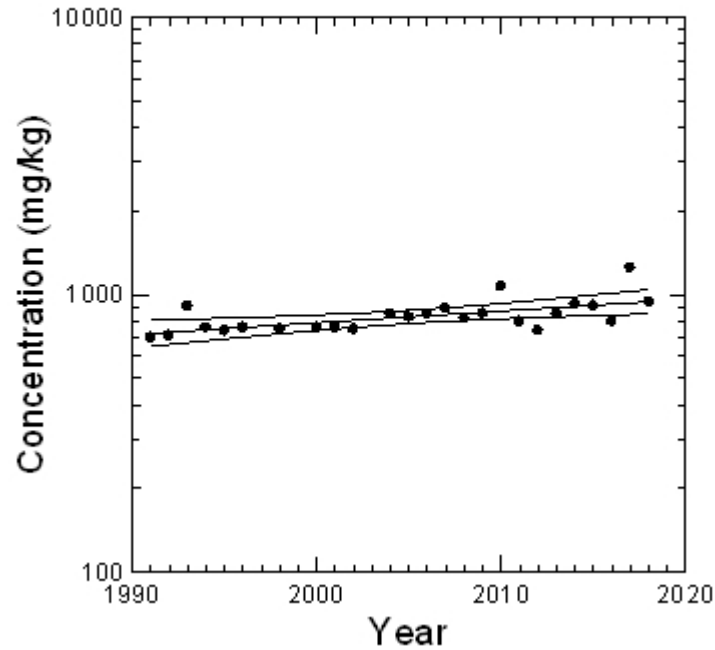
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Phosphorus SS, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Phosphorus	N2	SS	1991	25	0.388	0.004	-5.508	0.001	Increasing





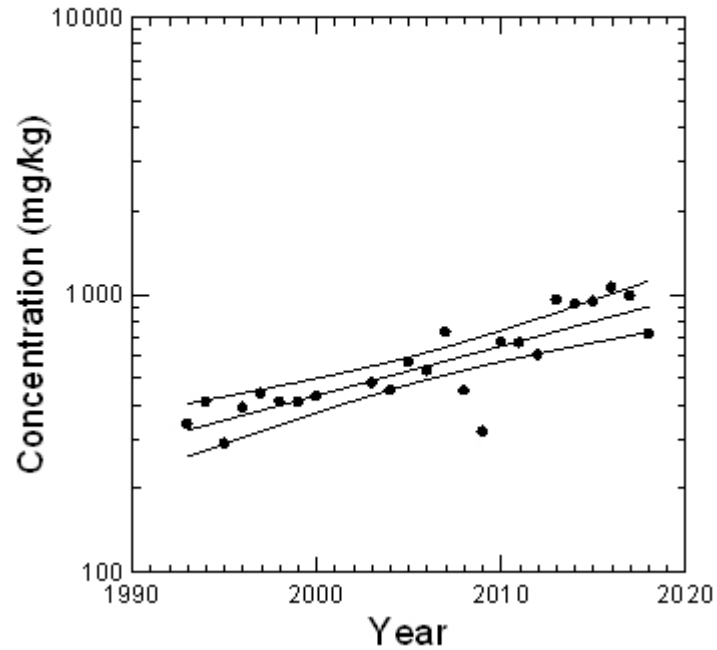
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Phosphorus SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Phosphorus	S4	SS	1991	24	0.708	0.018	-33.01	<0.001	Increasing



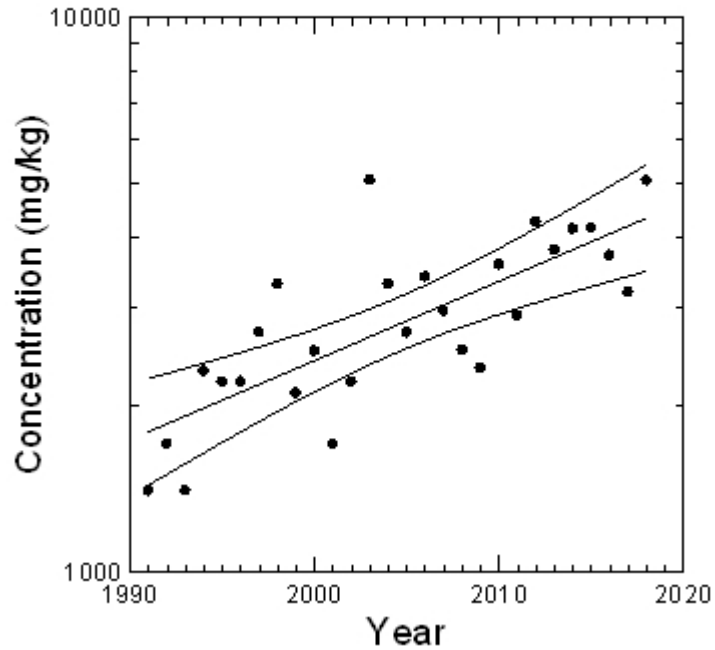
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Potassium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Potassium	N2	SD	1991	28	0.586	0.014	-25.148	<0.001	Increasing



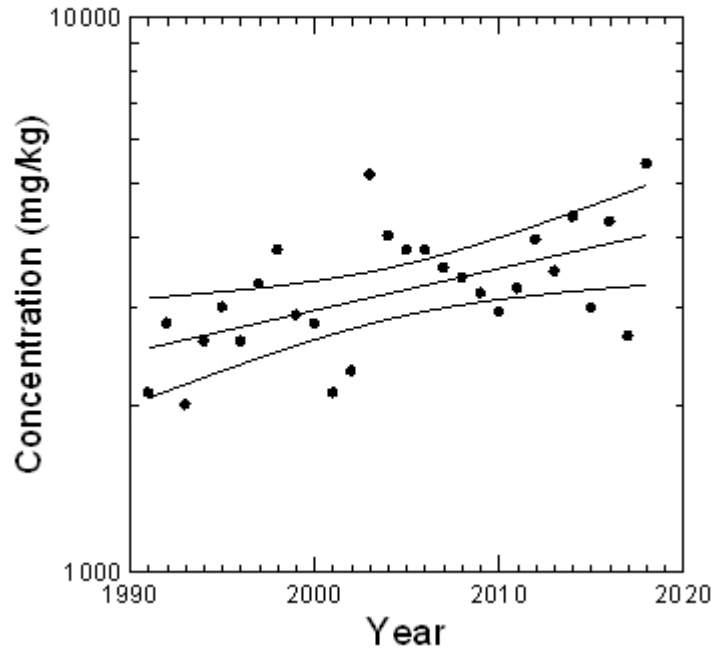
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Potassium SD, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Potassium	S4	SD	1991	28	0.31	0.008	-11.599	0.002	Increasing



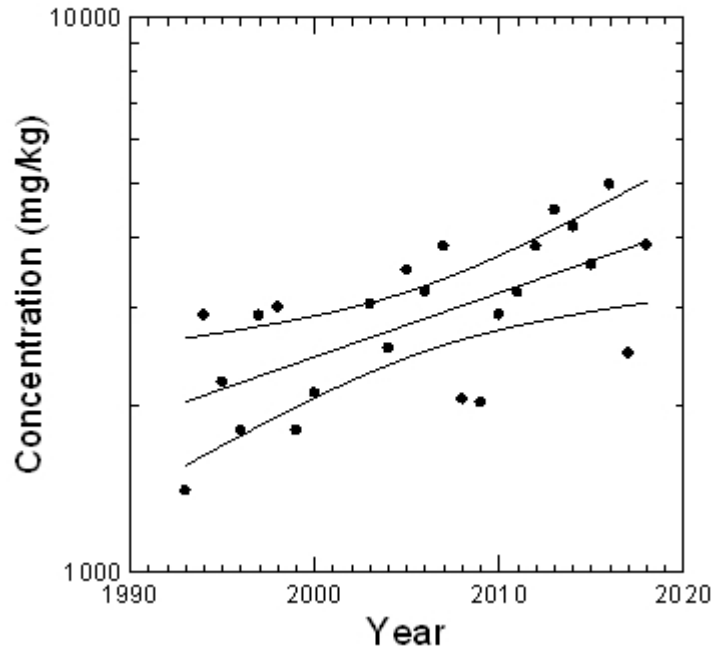
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Potassium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Potassium	S4	SS	1991	24	0.417	0.012	-19.718	0.001	Increasing



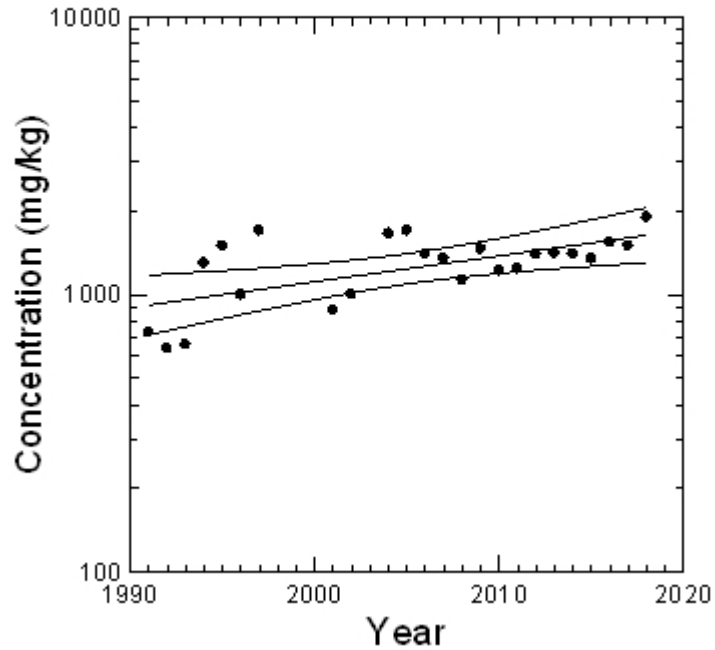
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Potassium SS, Site = W2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Potassium	W2	SS	1991	24	0.391	0.009	-15.598	0.001	Increasing



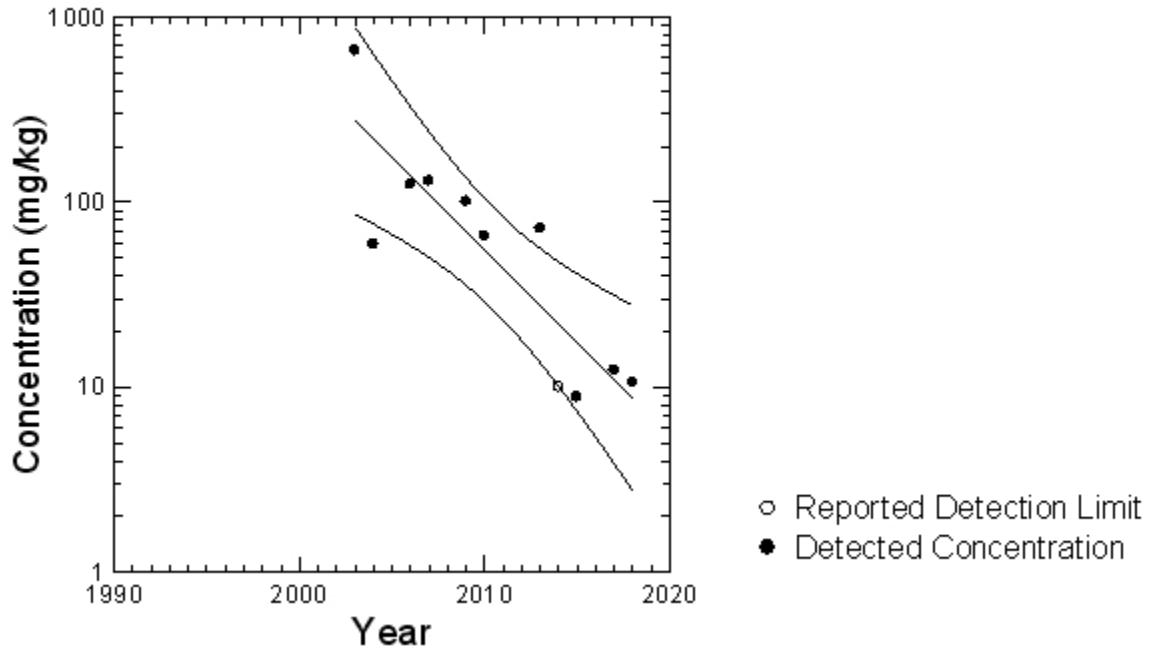
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Silicon SB, Site = S2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Silicon	S2	SB	2003	11	0.752	-0.1	202.718	0.001	Decreasing



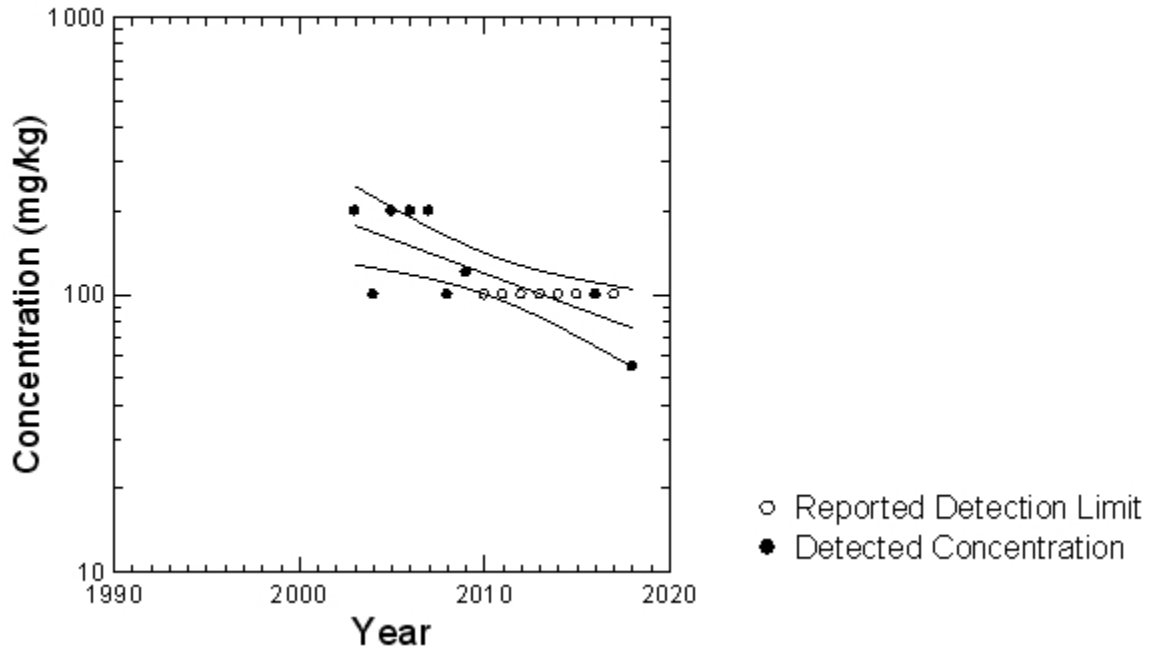
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Sodium SS, Site = E2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Sodium	E2	SS	2003	16	0.558	-0.025	51.662	0.001	Decreasing



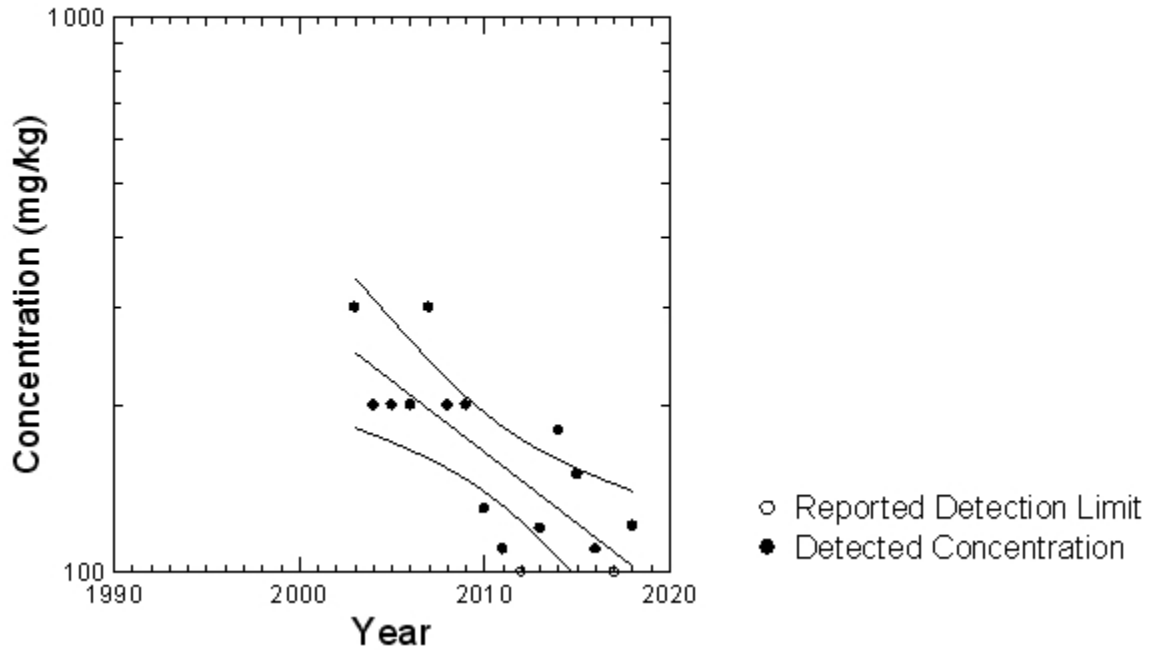
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Sodium SS, Site = N5



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Sodium	N5	SS	2003	16	0.598	-0.026	53.786	<0.001	Decreasing





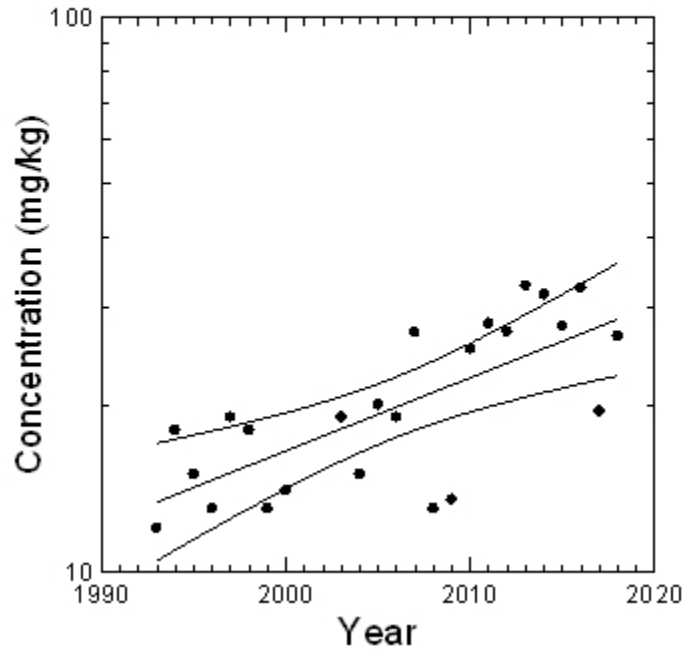
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Strontium SS, Site = S4



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Strontium	S4	SS	1991	24	0.521	0.013	-25.106	<0.001	Increasing



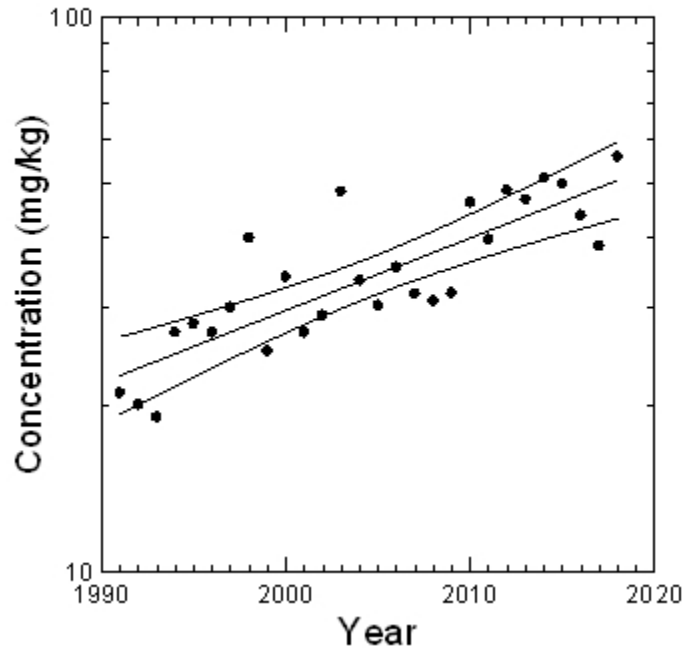
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Vanadium SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Vanadium	N2	SD	1991	28	0.694	0.013	-24.606	<0.001	Increasing



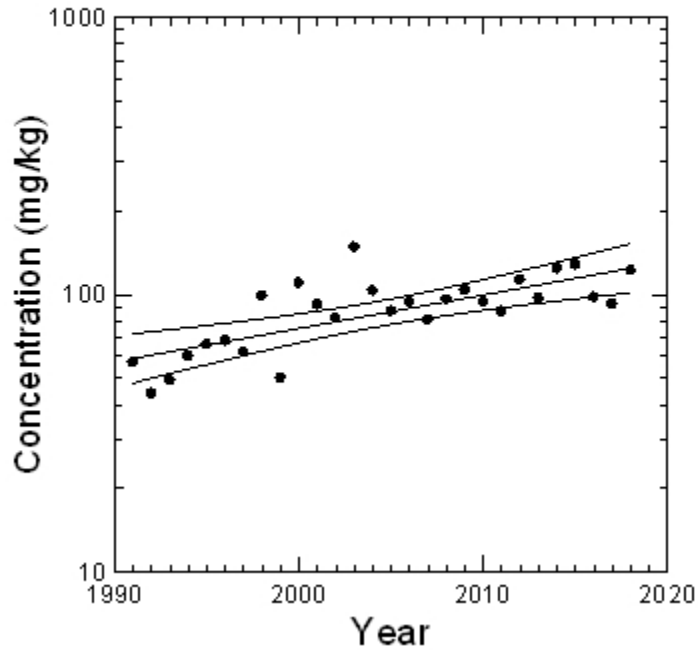
Appendix F-2

Site-Specific Inorganic Trend Line Graphs  $p < 0.003$

Lambton Facility 2019 Annual Landfill Report Biomonitoring Program

2018 Field Year

Zinc SD, Site = N2



Analyte	Site	Matrix	Regression Start Year	Number of Samples (n)	R <sup>2</sup>	Slope	Intercept	p-value	Direction of Significant Trend
Zinc	N2	SD	1991	28	0.54	0.012	-22.182	<0.001	Increasing



**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2018 FIELD YEAR**

Appendix G Approved Changes to the Biomonitoring Program  
February 14, 2020

**Appendix G APPROVED CHANGES TO THE BIOMONITORING  
PROGRAM**



Ministry of the Environment  
and Climate Change

Ministère de l'Environnement  
et de l'Action en matière de  
changement climatique



733 Exeter Road  
London ON N6E 1L3  
Tel: 519 873-5000  
Fax: 519 873-5020

733, rue Exeter  
London ON N6E 1L3  
Tél.: 519 873-5000  
Fax: 519 873-5020

February 12, 2018

Mr. Michael E. Parker  
Vice President, Canadian Environmental Compliance  
Clean Harbors Canada, Inc.  
4090 Telfer Road, R.R. No. 1  
Corunna ON N0N 1G0

**Re: Clean Harbors Hazardous Waste Landfill  
Approval of the Bio-Monitoring Plan  
Environmental Compliance Approval No. A031806**

This letter is being provided pursuant to Condition 9 (a) (i) of Notice No. 9 of Environmental Compliance Approval No. A031806, issued to Clean Harbors Canada Inc. (the "Company") for the hazardous waste landfill.

This is to confirm that the ministry has completed its review of the Company's bio-monitoring plan, and the Company has satisfactorily addressed the ministry's review comments. Therefore, I approve the final Bio-Monitoring Plan outlined in the report titled "Bio-Monitoring Program Lambton Facility, Corunna, Ontario", prepared by Stantec Consulting Limited dated November 26, 2015, and amendments dated September 6, 2016, and April 20, 2017.

The Company shall not make changes to the Bio-Monitoring Program unless such changes have been authorized by or requested by the Regional Director, in writing.

Sincerely,

A handwritten signature in cursive script that reads "Angela McGonigal".

Angela McGonigal  
Director (A)  
Southwest Region

- c. Mike Moroney, MOECC Sarnia District Office
- Sean Morrison, MOECC Sarnia District Office
- Don Hayes, MOECC Sarnia District Office
- Andrew McDonough, MOECC Environmental Sciences and Standards Division



Clean Harbors Canada, Inc.  
4090 Telfer Road, R.R. #1  
Corunna, ON N0N 1G0  
Tel: 519.864.1021  
Fax: 519.864.1437  
www.cleanharbors.com

April 20, 2017

Mr. Aaron Todd  
Supervisor  
Terrestrial Assessment and Field Services Unit  
Ministry of the Environment and Climate Change  
Environmental Monitoring and Reporting Branch  
125 Resources Road  
Etobicoke ON M9P 3V6

**Re: Memorandum – Review of Summary of Proposed Changes to Clean Harbors Biomonitoring Program**

Dear Mr. Todd,

This letter is in response to the memorandum titled “Review of Summary of Proposed Changes to Clean Harbors Biomonitoring Program”, issued by the Ministry of Environment and Climate Change (MOECC) to Clean Harbors on March 29, 2017.

*Environmental Media (Maple Leaves) and Addition of Fluoride as a Chemical Analyte*

In September 2002, the MOECC provided the preliminary report titled Phytotoxicology 1999, 2000, and 2001 Investigations: Safety-Kleen Limited – Moore Township (Gizyn, 2002). In response to a request from MOECC, Clean Harbors Canada Inc. (formerly Safety-Kleen Limited) volunteered and initiated its own maple leaf sampling program. As such, the maple leaf sampling program is not part of the core mandatory Clean Harbors biomonitoring program as outlined in the ECA no. A031806, and instead is a voluntary program that Clean Harbors is engaged in.

Fluoride testing in the Clean Harbors maple leaf sampling program has not been conducted, and as such Clean Harbors cannot comment on the fluoride concentration differences between the control site and the rest of the onsite locations tested. On the other hand, the MOECC sampling program did include fluoride testing and it is on the basis of the MOECC’s fluoride





results in maple leaves that Stantec Consulting Ltd. recommended adding fluoride as an analyte to the biomonitoring program.

As required in Condition no. 9 (a) (i) of ECA no. A031806, and in response to concerns from the District office, an updated biomonitoring program was submitted to MOECC which proposed adding fluoride testing to the core program. At the same time it is the company's opinion that the maple leaf program provides no benefit to the core program. Thus, the company is withdrawing its support from the maple leaf program. The addition of the fluoride testing within the biomonitoring program would fulfill the purpose to determine if fluoride is higher closer to the facility.

Clean Harbors feels that this approach would accomplish the study of fluoride on and off the facility. The maple leaf study results obtained by the company thus far have shown no significant difference between the control sites and the rest of the locations, and as such the company would require suitable justification from the District to continue with this study.

#### *Change in Test Sites Surrounding the Lambton Facility*

We appreciate the MOECC support for the rationale establishing a new test site to the northeast of the Facility, and removing Site S5 to the south. We are also in agreement that the data should inform decisions regarding the discontinuation of a site, and that quantitative evidence of the similarities between Sites S2 and S5 would provide additional support. In order to support the removal of Site S5 from the Biomonitoring Program, an evaluation of all data collected was conducted in all media (soil, natural grasses and agricultural crops) and all chemical of concern, CoC.

Specifically in the case of the inorganic contaminants, statistical comparison was conducted between the inorganic upper and lower limits (UL15 and LL15) at Sites S2 and S5 from all available media to determine if the means of the limits were equal for the two sites. Two analysis of variances (ANOVA) were conducted to determine if there were significant differences in the means of the upper and lower limits. The results of the ANOVA support the hypothesis that there are no statistically significant differences between the two sites for both the upper and lower limits ( $p > 0.05$ ).

Given that the upper and lower limits can be used to define the "normal" or "expected" variability of the annual mean concentrations of the analytes in a sampling media, and represent the typical ranges of concentrations expected at a specific site, the finding of the ANOVA comparison of the mean upper and lower limits indicates a similarity in inorganic parameters between S2 and S5.



Upper limits are not available for organic parameters due to the large number of non-detect (ND) concentrations. Therefore, for organic parameters, two lines of evidence were reviewed: 1) a comparison to available standards and 2) the number of detected concentrations measured at each site. The results of each review are below:

- 1) Since the inception of the program (1991) most of the data shows ND. From the detected data none of it was identified at concentrations which exceeded applicable criteria (where available, such as the Ontario Typical Range (MOECC, 2011), the Upper Limit of Normal (MOECC, 1989), or the Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act (MOECC, 2011).
- 2) The number of detected concentrations is provided in the enclosed tables. Fewer detected concentrations were measured at Site S5 compared to Sites S2, suggesting that the organic concentrations at Site S5 are generally lower than at Site S2.

Therefore, based on the review of both the inorganic and organic data at Sites S2 and S5, it is recommended that Site S5 be removed from the Biomonitoring Program.

Clean Harbors proposes a meeting between the company, the company's consulting firm (Stantec Consulting Ltd.), the District and yourself. During this meeting the parties involved can discuss the elements of the core biomonitoring program, and thus work towards the final acceptance of a new program, and how acceptance of this program will be communicated to the company. We are available at any time for this meeting.

Please feel free to reach out to the undersigned should you require any further information, and to discuss the prospect of a meeting.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Erica Carabott'.

Erica Carabott  
Senior Compliance Manager  
Clean Harbors Canada, Inc.

519-864-3890  
carabott.eric@cleanharbors.com



Parameters	Number of Detected Concentrations (1991-2015)	
	52	55
<b>Dioxins/Furans</b>		
C14-Tetrachlorodibenzofuran, 2,3,7,8-	6	9
C14-Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	5	4
C15-Pentachlorodibenzofuran, 1,2,3,7,8-	5	7
C15-Pentachlorodibenzofuran, 2,3,4,7,8-	5	9
C15-Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	4	4
C16-Hexachlorodibenzofuran, 1,2,3,4,7,8-	10	9
C16-Hexachlorodibenzofuran, 1,2,3,6,7,8-	10	9
C16-Hexachlorodibenzofuran, 1,2,3,7,8,9-	3	3
C16-Hexachlorodibenzofuran, 2,3,4,6,7,8-	5	7
C16-Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	4	4
C16-Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	6	6
C16-Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	9	8
C17-Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	9	7
C17-Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	6	5
C17-Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	20	17
C18-Octachlorodibenzofuran	14	13
C18-Octachlorodibenzo-p-dioxin	24	20
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	23	25
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	7	7
Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	32	31
Hexachlorodibenzofuran, 1,2,3,4,7,8-	18	17
Hexachlorodibenzofuran, 1,2,3,6,7,8-	15	13
Hexachlorodibenzofuran, 1,2,3,7,8,9-	11	9
Hexachlorodibenzofuran, 2,3,4,6,7,8-	16	15
Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	9	6
Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	13	12
Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	10	13
Octachlorodibenzofuran	34	35
Octachlorodibenzo-p-dioxin	60	55
Pentachlorodibenzofuran, 1,2,3,7,8-	11	11
Pentachlorodibenzofuran, 2,3,4,7,8-	13	10
Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	7	7
Tetrachlorodibenzofuran, 2,3,7,8-	6	5
Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	7	6
Total Heptachlorodibenzofuran	18	17
Total Heptachlorodibenzo-p-dioxin	30	28
Total Hexachlorodibenzofuran	18	22
Total Hexachlorodibenzo-p-dioxin	24	29
Total Pentachlorodibenzofuran	14	13
Total Pentachlorodibenzo-p-dioxin	13	13
Total polychlorinated dibenzofurans (PCDFs)	23	22
Total polychlorinated dibenzo-p-dioxins (PCDDs)	28	27
Total TEQ (ND=0) (WHO Calc)	47	42
Total TEQ (ND=0.5DL) (WHO Calc)	33	33
Total TEQ (ND=DL) (WHO Calc)	33	33
Total Tetrachlorodibenzofuran	12	9
Total Tetrachlorodibenzo-p-dioxin	18	16
<b>OCPs</b>		
Aldrin	1	0
BHC, alpha-	5	3
Chlordane, alpha-	7	2
Chlordane, trans- (gamma-Chlordane)	4	3
DDD (p,p'-DDD)	1	1
DDE (p,p'-DDE)	14	10
DDT (p,p'-DDT)	5	6
Dieldrin	11	10
Endosulfan I	7	4
Endosulfan II	1	3
Endosulfan Sulfate	6	7
Endrin	1	4
Endrin Aldehyde	5	3
Heptachlor	3	3
Heptachlor Epoxide	7	8
Lindane (Hexachlorocyclohexane, gamma)	1	0
Methoxychlor (4,4'-Methoxychlor)	2	1
Mirex	8	7
PARLAR 50	0	1
<b>PCBs</b>		
Polychlorinated Biphenyls (PCBs)	0	0
<b>PCPs</b>		

The Mixed Procedure

Model Information	
Data Set	WORK.S2S5
Dependent Variable	UL15_log_normal
Covariance Structure	Diagonal
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Residual

Class Level Information		
Class	Levels	Values
Site	2	S2 S5
Analyte	31	Aluminum Arsenic Barium Beryllium Boron Cadmium Calcium Chloride Chromium (Total Cobalt Copper Iron Lead Magnesium Manganese Mercury Molybdenum Nickel Phosphorus Potassium Silico. Silicon Silver Sodium Strontium Sulfur Thallium Titanium Vanadium Zirconium

Dimensions	
Covariance Parameters	1
Columns in X	3
Columns in Z	0
Subjects	1
Max Obs per Subject	256

Number of Observations	
Number of Observations Read	258
Number of Observations Used	256
Number of Observations Not Used	2

Covariance Parameter Estimates	
Cov Parm	Estimate
Residual	3.7326E9

Fit Statistics	
-2 Res Log Likelihood	6328.8
AIC (Smaller is Better)	6330.8
AICC (Smaller is Better)	6330.8
BIC (Smaller is Better)	6334.3

The Mixed Procedure

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
Site	1	254	0.31	0.5756

Least Squares Means						
Effect	Site	Estimate	Standard Error	DF	t Value	Pr >  t
Site	S2	7045.98	5400.05	254	1.30	0.1931
Site	S5	11327	5400.05	254	2.10	0.0369

Differences of Least Squares Means							
Effect	Site	_Site	Estimate	Standard Error	DF	t Value	Pr >  t
Site	S2	S5	-4280.79	7636.83	254	-0.56	0.5756

The Mixed Procedure

Model Information	
Data Set	WORK.S2S5
Dependent Variable	LL15_log_normal
Covariance Structure	Diagonal
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Residual

Class Level Information		
Class	Levels	Values
Site	2	S2 S5
Analyte	31	Aluminum Arsenic Barium Beryllium Boron Cadmium Calcium Chloride Chromium (Total Cobalt Copper Iron Lead Magnesium Manganese Mercury Molybdenum Nickel Phosphorus Potassium Silico. Silicon Silver Sodium Strontium Sulfur Thallium Titanium Vanadium Zirconium

Dimensions	
Covariance Parameters	1
Columns in X	3
Columns in Z	0
Subjects	1
Max Obs per Subject	256

Number of Observations	
Number of Observations Read	258
Number of Observations Used	256
Number of Observations Not Used	2

Covariance Parameter Estimates	
Cov Parm	Estimate
Residual	5253740

Fit Statistics	
-2 Res Log Likelihood	4661.0
AIC (Smaller is Better)	4663.0
AICC (Smaller is Better)	4663.1
BIC (Smaller is Better)	4666.6

The Mixed Procedure

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
Site	1	254	0.02	0.9007

Least Squares Means						
Effect	Site	Estimate	Standard Error	DF	t Value	Pr >  t
Site	S2	659.88	202.60	254	3.26	0.0013
Site	S5	695.68	202.60	254	3.43	0.0007

Differences of Least Squares Means							
Effect	Site	_Site	Estimate	Standard Error	DF	t Value	Pr >  t
Site	S2	S5	-35.8036	286.51	254	-0.12	0.9007



**Stantec**

**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.



**Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program**

**Table 1 – Summary of Proposed Changes to the Biomonitoring Program**

Type of Change	Proposed Changes
Test Sites	<p><b>Sites within Lambton Facility affected by Landfill Expansion</b></p> <ul style="list-style-type: none"> <li>• Site E6 – No change at this time.</li> <li>• Site S3 – Remove from Biomonitoring Program. Site has been replaced by an access road.</li> <li>• New Site S7 – Proposed new site to replace Site S3.</li> </ul> <p><b>Sites in Surrounding Area of Lambton Facility</b></p> <ul style="list-style-type: none"> <li>• New Site E7 - Proposed new site to increase coverage to northeast of Facility based on predominant wind direction.</li> <li>• Site S5 – Remove from Biomonitoring Program. Sufficient coverage to the south of Facility is provided by remaining sites.</li> </ul>
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).



September 6, 2016  
Erica Carabott  
Page 3 of 7

**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.





September 6, 2016  
Erica Carabott  
Page 4 of 7

**Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program**

**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.



September 6, 2016  
Erica Carabott  
Page 5 of 7

**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.

Design with community in mind



September 6, 2016  
Erica Carabott  
Page 6 of 7

**Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program**

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

Regards,

**STANTEC CONSULTING LTD.**

Katherine Ketis  
Environmental Engineer  
Phone: (519) 780-8198  
Fax: (519) 836-2943  
Katherine.Ketis@stantec.com

Tereza Dan  
Principal, Environmental Services  
Phone: (519) 575-4112  
Fax: (519) 579-6733  
Tereza.Dan@stantec.com

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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year\correspondence\proposed\_changes\_biom\_sept\_2016\let\_biom\_changes\_20160906.docx



September 6, 2016  
Erica Carabott  
Page 7 of 7

**Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program**

## **REFERENCES**

Clean Harbors Canada Inc., 2014a. Lambton Landfill Expansion Environmental Assessment: Final Environmental Assessment Report.

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DeBrou, Gary. 2010. Phytotoxicology 2008 & 2009 Investigations: Clean Harbors Environmental Services Inc. Moore Township. Technical Memorandum. Report No.: Phyto S1688 2009. Ontario Ministry of the Environment and Climate Change. Environmental Monitoring and Reporting Branch. Biomonitoring Section, Air Monitoring and Reporting Section. Toronto, ON.

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Stantec Consulting Ltd., 2012. 2012 Maple Leaf Sampling Program, 2011 Field Year.

Stantec Consulting Ltd., 2010. 2010 Maple Leaf Sampling Program, 2009 Field Year.

Stantec Consulting Ltd., 2009. 2009 Maple Leaf Sampling Program, 2008 Field Year.

# ATTACHMENT FIGURES





**Legend**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li><span style="color: red;">★</span> Existing Sampling Locations (Approximate)</li> <li><span style="color: yellow;">▲</span> Proposed Sampling Location (Approximate)</li> <li>■ Existing Sampling Station to be Removed (Approximate)</li> <li>— Watercourse</li> </ul> | <ul style="list-style-type: none"> <li><span style="border: 1px solid gray; display: inline-block; width: 15px; height: 10px;"></span> Building</li> <li><span style="border: 2px solid orange; display: inline-block; width: 15px; height: 10px;"></span> Lambton Facility</li> <li><span style="border: 1px solid blue; display: inline-block; width: 15px; height: 10px;"></span> Waterbody</li> <li><span style="border: 1px solid green; display: inline-block; width: 15px; height: 10px;"></span> Wooded Area</li> </ul> |
|--|---|

- 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 Harbors Canada Inc.  
Lambton Landfill Expansion

Figure No.  
**1**  
Title  
**Existing and Proposed Sampling Locations**



\\cd1220402\work\_group\01221\active\122160003\_drawing\MXD\_2016\_Q3\_SamplingLocations\_20160003\_2016\_Q3\_Fig02\_Existing\_ProposedSamplingLocations\_20160003.mxd  
 Revised: 2016-09-05 by vandamme



**Stantec**

**Notes**

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

Legend	
<span style="color: red;">★</span>	Existing Sampling Locations (Approximate)
<span style="color: yellow;">▲</span>	Proposed Sampling Location (Approximate)
■	Existing Sampling Station to be Removed (Approximate)
—	Watercourse
■	Building
□	Lambton Facility
□	Waterbody
□	Wooded Area

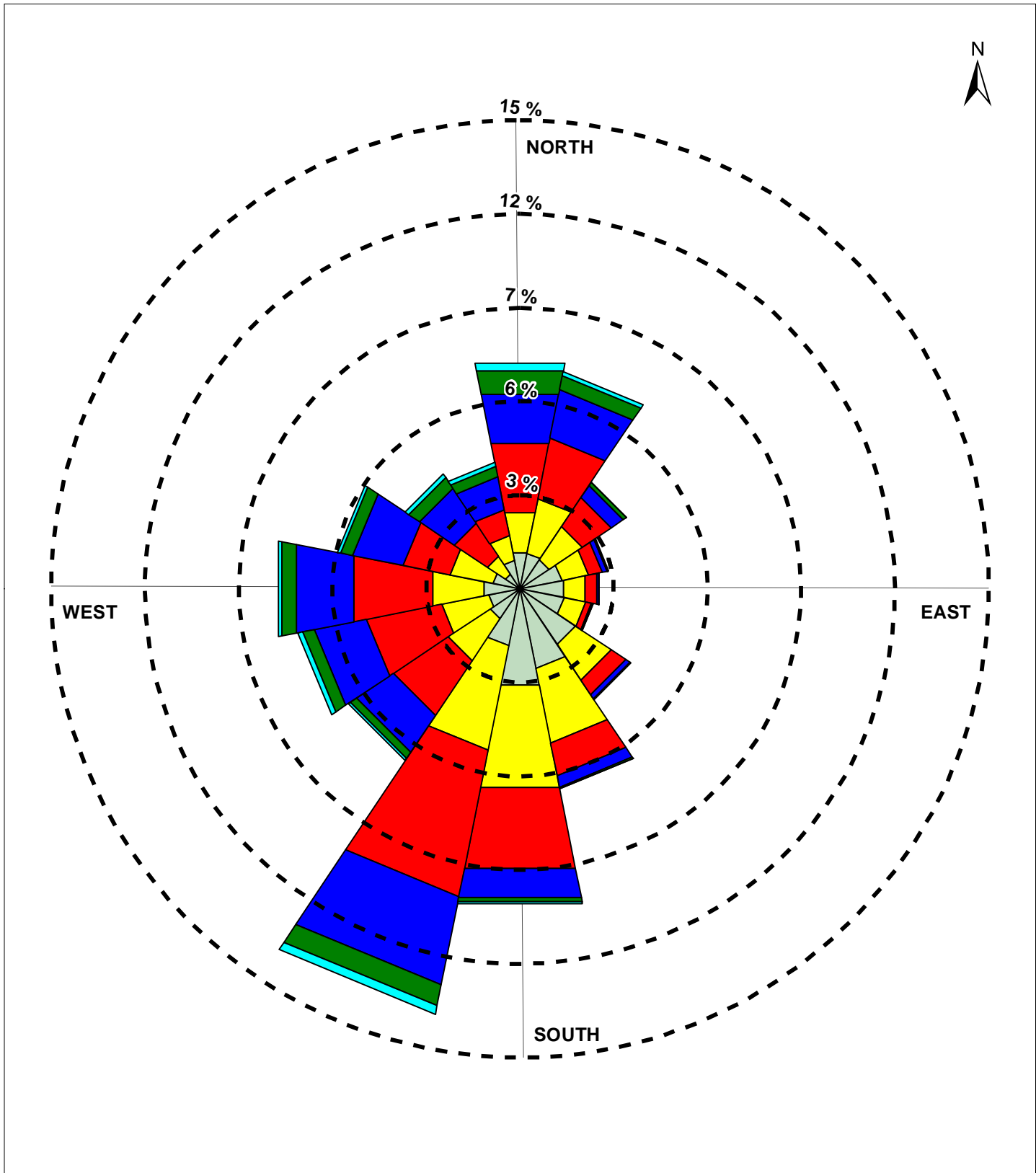
Client/Project  
 Clean Harbors Canada Inc.  
 Lambton Landfill Expansion

Figure No.  
 2

Title  
 Existing and Proposed Sampling Locations



\\cd1220-102\Work\_group\01221\active\122160003\drawing\MXD\2016\_Q3\_SamplingStations\122160003\_2016\_Q3\_Fig03\_WindRose.mxd  
 Revised: 2016-09-05 By: sverdamme



Notes  
 1. Not to scale.

Legend

Wind Speed (Knots)
>= 22
17 - 21
11 - 17
7 - 11
4 - 7
1 - 4

Calms: 3.06%

September 2016  
 122160003

Client/Project  
 Clean Harbors Canada Inc.  
 Lambton Landfill Expansion

Figure No.  
 3

Title  
 Wind Speed Direction  
 (blowing from)



## LAMBTON FACILITY 2015 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM 2014 FIELD YEAR

Follow-Up of Recommendations from Previous Biomonitoring Reports  
November 26, 2015

### 4.0 FOLLOW-UP OF RECOMMENDATIONS FROM PREVIOUS BIOMONITORING REPORTS

**Table 4-1** presents the status of conclusions and recommendations presented previously in the 2013 and 2014 Biomonitoring Program reports which are to be addressed in 2015.

Discussion of recommended changes to the Biomonitoring Program is also provided.

**LAMBTON FACILITY 2015 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2014 FIELD YEAR**

Follow-Up of Recommendations from Previous Biomonitoring Reports  
November 26, 2015

**Table 4-1: Status of Historical Conclusions and Recommendations**

Item No.	Report	Conclusions and Recommendations Requiring Follow-up	Discussion	Status
1.	2014 Annual Landfill Report, 2013 Field Year	Molybdenum investigation	Molybdenum in Soil (Discussed in Section 3.2.6.1) A literature review based on the phytotoxicity of molybdenum in soil was completed due to the high soil concentrations observed at Site S3. Plant tissue concentrations from the 2013 and 2014 Field Year were below the phytotoxic limit of 100 mg/kg, suggesting that current concentrations of molybdenum in soil are not resulting in phytotoxic concentrations in plants.	Based on results of the literature review, no further investigation is required; however, monitoring will continue.
2.	Clean Harbors Biomonitoring Program – Recommended Changes Letter (July, 2015)	It is recommended that PCB analysis continue on a 3-year from an annual sample collection schedule in all media.	PCBs have rarely been detected at concentrations above the reporting limit. Where no observations of PCBs have occurred in the last fourteen years of the program. Decreasing the frequency of analysis will help streamline the program.	A letter summarizing recommended changes to the Biomonitoring Program was submitted to Clean Harbors Environmental Services in July 2015. Comments on the recommended changes were received from Neegan Burnside and the MOECC in September 2015. Neegan Burnside proposed a PCB sample collection schedule of 2 years. The MOECC proposed an annual collection cycle, with only samples from the site with highest historical PCB concentrations and also the control site being submitted for analysis. In the event that PCB/PCP/OCP concentrations are detected above the RDL, the remaining samples can be sent in for analysis. It was also proposed by the MOECC that, on a three year schedule, all samples collected from all



**LAMBTON FACILITY 2015 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2014 FIELD YEAR**

Follow-Up of Recommendations from Previous Biomonitoring Reports  
November 26, 2015

**Table 4-1: Status of Historical Conclusions and Recommendations**

Item No.	Report	Conclusions and Recommendations Requiring Follow-up	Discussion	Status
				sites should be analyzed. Stantec is currently in the process of investigating these options and responding to stakeholder comments.
3.	Clean Harbors Biomonitoring Program – Recommended Changes Letter (July, 2015)	It is recommended that PCP analysis continue on a 3-year from an annual sample collection schedule in all media.	PCP has been detected above the reporting limits in only 4/24 years of the Biomonitoring Program (1998, 1999, 2002 and 2009). Decreasing the frequency of analysis will help streamline the program.	A letter summarizing recommended changes to the Biomonitoring Program was submitted to Clean Harbors Environmental Services in July 2015. Comments on the recommended changes were received from Neegan Burnside and the MOECC in September 2015. Neegan Burnside proposed a PCB sample collection schedule of 2 years. The MOECC proposed an annual collection cycle, with only samples from the site with highest historical PCB concentrations and also the control site being submitted for analysis. In the event that PCB/PCP/OCP concentrations are detected above the RDL, the remaining samples can be sent in for analysis. It was also proposed by the MOECC that, on a three year schedule, all samples collected from all sites should be analyzed. Stantec is currently in the process of investigating these options and responding to stakeholder comments.

**LAMBTON FACILITY 2015 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2014 FIELD YEAR**

Follow-Up of Recommendations from Previous Biomonitoring Reports  
November 26, 2015

**Table 4-1: Status of Historical Conclusions and Recommendations**

Item No.	Report	Conclusions and Recommendations Requiring Follow-up	Discussion	Status
4.	Clean Harbors Biomonitoring Program – Recommended Changes Letter (July, 2015)	It is recommended that OCP analysis continue on a 3-year from an annual sample collection schedule in all media.	As indicated in <b>Table C-2f</b> , OCP are rarely detected at concentrations above the reporting limit. Dieldrin, endosulfan, sulphate, p,p'-DDE, and p,p'-DDT, are the few chemicals which have been reported at detected concentrations in at least 10% of samples. However, there have been no detected concentrations of OCPs which have exceeded the applicable guidelines for these chemicals. Decreasing the frequency of analysis will help streamline the program.	A letter summarizing recommended changes to the Biomonitoring Program was submitted to Clean Harbors Environmental Services in July 2015. Comments on the recommended changes were received from Neegan Burnside and the MOECC in September 2015. Neegan Burnside proposed a PCB sample collection schedule of 2 years. The MOECC proposed an annual collection cycle, with only samples from the site with highest historical PCB concentrations and also the control site being submitted for analysis. In the event that PCB/PCP/OCP concentrations are detected above the RDL, the remaining samples can be sent in for analysis. It was also proposed by the MOECC that, on a three year schedule, all samples collected from all sites should be analyzed.  Stantec is currently in the process of investigating these options and responding to stakeholder comments.



**LAMBTON FACILITY 2015 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2014 FIELD YEAR**

Follow-Up of Recommendations from Previous Biomonitoring Reports  
November 26, 2015

**Table 4-1: Status of Historical Conclusions and Recommendations**

Item No.	Report	Conclusions and Recommendations Requiring Follow-up	Discussion	Status
5.	Clean Harbors Biomonitoring Program – Recommended Changes Letter (July, 2015)	It is recommended that sites be added to, or removed from, the Biomonitoring program.	Based on a review of scientific literature, it is recommended that a new site be added to the northeast of the incinerator 2-2.5 km away within the maximum deposition area. Additionally, a control site may be added to monitor regional background concentrations unaffected by facility operations. Due to the sufficient coverage offered by currently established sites south of the facility, it is recommended that Site S5 can be removed to streamline the Biomonitoring Program.	<p>A letter summarizing recommended changes to the Biomonitoring Program was submitted to Clean Harbors Environmental Services in July 2015. Comments on the recommended changes were received from Neegan Burnside and the MOECC in September 2015. Neegan Burnside indicated that they concur with the addition of new sites, and are comfortable with the removal of one test site. The MOECC suggested a revision of the proposed locations of the new sites, but agree with the proposed removal of Site S5 on the condition that a data comparison between S2 and S5 is completed to demonstrate that the two sites are similar.</p> <p>Stantec is currently in the process of reviewing the comments and responding to stakeholders.</p>
6.	Clean Harbors Biomonitoring Program – Recommended Changes Letter (July, 2015)	It is recommended that sediment particle size distribution (texture) analysis continue on a 3-year schedule.	Sediment particle size distribution (texture) has shown little variation annually so the frequency of analysis for sediment fertility and characterization is recommended to be changed to every three years.	<p>A letter summarizing recommended changes to the Biomonitoring Program was submitted to Clean Harbors Environmental Services in July 2015. Comments on the recommended changes were received from Neegan Burnside and the MOECC in September 2015. Neegan Burnside did not comment on the proposed revision of the sediment characterization/fertility</p>



**LAMBTON FACILITY 2015 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2014 FIELD YEAR**

Follow-Up of Recommendations from Previous Biomonitoring Reports  
November 26, 2015

**Table 4-1: Status of Historical Conclusions and Recommendations**

Item No.	Report	Conclusions and Recommendations Requiring Follow-up	Discussion	Status
				<p>analysis schedule, while the MOECC is in agreement.</p> <p>Following acceptance of these proposed changes by Clean Harbors, sediment fertility and characterization (texture) analysis will continue on a 3-year sample collection schedule.</p>
7.	Clean Harbors Biomonitoring Program – Recommended Changes Letter (July, 2015)	It is recommended that fluoride be added as an analyte sampled in the Biomonitoring Program.	Based on a review of the two most recent Clean Harbors Maple Leaf Monitoring reports and the Annual Landfill Report, high fluoride concentrations have been identified in silver maple foliage and groundwater.	<p>A letter summarizing recommended changes to the Biomonitoring Program was submitted to Clean Harbors Environmental Services in July 2015. Comments on the recommended changes were received from Neegan Burnside and the MOECC in September 2015. Both stakeholders are in agreement that fluoride should be added as an analyte to the Biomonitoring Program.</p> <p>Following acceptance of these proposed changes by Clean Harbors, fluoride will be added as an analyte sampled in the Biomonitoring Program.</p>
8.	2014 Annual Landfill Report, 2013 Field Year	Entering the remaining analytes into a database	Two sets of parameters (PCDD and PCDF) were entered into the EQUIS database this year to improve data management efficiency. The remaining parameters should be entered into the EQUIS database.	Historic PCP and PCB data should be imported into the EQUIS database next year.

**LAMBTON FACILITY 2019 ANNUAL LANDFILL REPORT BIOMONITORING PROGRAM  
2018 FIELD YEAR**

Appendix H Laboratory Certificates  
February 14, 2020

## Appendix H LABORATORY CERTIFICATES



# Report

Page 1 (3)



## L1907921

1GYHZXQ2ZSH



Date received **2019-03-19**  
Issued **2019-03-28**

**ALS Life Sciences Division**  
**Lynne Wrona**

**1435 Norjohn Court, Unit 1**  
**L7L 0E6 Burlington**  
**Canada**

Project **L2222986**

### Analysis: TC-2

Your ID	<b>L2222986-8</b> <b>18-N2-SD-CH-015</b>					
LabID	U11579516					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	43.6		%	2	W	TV
Si	201000	36500	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-15</b> <b>18-N5-SD-CH-031</b>					
LabID	U11579517					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	75.5		%	2	W	TV
Si	214000	38800	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-21</b> <b>18-E2-SD-CH-045</b>					
LabID	U11579518					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	78.0		%	2	W	TV
Si	185000	33700	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-30</b> <b>18-S1-SD-CH-065</b>					
LabID	U11579519					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	72.2		%	2	W	TV
Si	232000	42100	mg/kg TS	3	H	SVS



# Report

Page 2 (3)



## L1907921

1GYHZXQ2ZSH



Your ID	<b>L2222986-37</b> <b>18-S4-SD-CH-089</b>					
LabID	U11579520					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	63.8		%	2	W	TV
Si	206000	37500	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-41</b> <b>18-S7-SD-CH-081</b>					
LabID	U11579521					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	72.2		%	2	W	TV
Si	268000	48600	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-47</b> <b>18-D4-SD-CH-204</b>					
LabID	U11579522					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	52.0		%	2	W	TV
Si	198000	35900	mg/kg TS	3	H	SVS

Your ID	<b>Blank</b>					
LabID	U11579523					
Analysis	Results	Unit	Method	Issuer	Sign	
Si	<400	mg/kg TS	3	H	SVS	

Your ID	<b>L2222986-21 - Duplicate</b> <b>18-E2-SD-CH-045</b>					
LabID	U11579524					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
TS 105°C *	74.2		%	2	W	TV
Si	181000	33000	mg/kg TS	3	H	SVS

Your ID	<b>QC</b>					
LabID	U11579525					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Si	183000	33300	mg/kg TS	3	H	SVS

Method specification	
1	Analysed according to provberedning, malning stålfat.
2	Analysed according to SS 028113.
3	<p>The sample was dried at 105°C according to Swedish Standard SS 28113:1981.</p> <p>Dried sample was fused LiBO<sub>2</sub> and dissolved in HNO<sub>3</sub> according to ASTM D3682:2013 and ASTM D4503:2008. LOI (loss on ignition) is done at 1000°C.</p> <p>The ICP-SFMS analyses were carried out according to SS EN ISO 17294- 2: 2016 and US EPA Method 200.8: 1994</p> <p>Note that limits of reporting may be affected if, e.g. additional dilution was required because of matrix effects, or the sample quantity was limited.</p>

	Approver
PECA	Peter Carlsson
SVS	Svetlana Senioukh
TV	Tiina Vikeväinen

	Issuer <sup>1</sup>
H	ICP-SFMS
I	Man.Inm.
W	Våtkemi

\* indicates unaccredited analysis.

The uncertainty is given as extended uncertainty (according to the definition in "Guide to the Expression of Uncertainty in Measurement", JCGM 100:2008 Corrected version 2010) calculated with a coverage factor of 2, which gives a confidence level of approximately 95%.

Measurement of uncertainty is reported only for detected substances with levels above the reporting limits.

The uncertainty from subcontractors is often given as extended uncertainty calculated with a coverage factor of 2. Contact the laboratory for further information.

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<sup>1</sup> The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.



Date received **2019-03-19**  
 Issued **2019-03-28**

**ALS Life Sciences Division**  
**Lynne Wrona**

**1435 Norjohn Court, Unit 1**  
**L7L 0E6 Burlington**  
**Canada**

Project **L2222986**

## Analysis: M4-CM

Your ID	<b>L2222986-2</b> <b>18-W2-NG-CH-003</b>				
LabID	U11579526				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	<b>21.8</b>	%	1	W	TV
Si <sup>+</sup>	<b>7170</b>	mg/kg TS	2	S	IR

Your ID	<b>L2222986-3</b> <b>18-W2-WW-CH-005</b>				
LabID	U11579527				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	<b>74.0</b>	%	1	W	TV
Si <sup>+</sup>	<b>2830</b>	mg/kg TS	2	S	IR

Your ID	<b>L2222986-5</b> <b>18-W4-NG-CH-009</b>				
LabID	U11579528				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	<b>22.0</b>	%	1	W	TV
Si <sup>+</sup>	<b>5880</b>	mg/kg TS	2	S	IR

Your ID	<b>L2222986-6</b> <b>18-W4-FC-CH-011</b>				
LabID	U11579529				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	<b>75.8</b>	%	1	W	TV
Si <sup>+</sup>	<b>20.2</b>	mg/kg TS	2	S	IR

Your ID	<b>L2222986-9</b> <b>18-N2-NG-CH-019</b>				
LabID	U11579530				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	<b>27.7</b>	%	1	W	TV
Si <sup>+</sup>	<b>6860</b>	mg/kg TS	2	S	IR



Your ID	<b>L2222986-10</b> <b>18-N2-FC-CH-021</b>				
LabID	U11579531				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	69.7	%	1	W	TV
Si <sup>+</sup>	10.1	mg/kg TS	2	S	IR

Your ID	<b>L2222986-12</b> <b>18-N4-NG-CH-025</b>				
LabID	U11579532				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	13.5	%	1	W	TV
Si <sup>+</sup>	7400	mg/kg TS	2	S	IR

Your ID	<b>L2222986-13</b> <b>18-N4-WW-CH-027</b>				
LabID	U11579533				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	56.8	%	1	W	TV
Si <sup>+</sup>	170	mg/kg TS	2	S	IR

Your ID	<b>L2222986-16</b> <b>18-N5-NG-CH-035</b>				
LabID	U11579534				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	26.6	%	1	W	TV
Si <sup>+</sup>	5710	mg/kg TS	2	S	IR

Your ID	<b>L2222986-18</b> <b>18-E1-NG-CH-039</b>				
LabID	U11579535				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	21.9	%	1	W	TV
Si <sup>+</sup>	7060	mg/kg TS	2	S	IR

Your ID	<b>L2222986-19</b> <b>18-E1-FC-CH-041</b>				
LabID	U11579536				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	81.2	%	1	W	TV
Si <sup>+</sup>	14.2	mg/kg TS	2	S	IR



Your ID	<b>L2222986-22</b> <b>18-E2-NG-CH-049</b>				
LabID	U11579537				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	26.9	%	1	W	TV
Si <sup>+</sup>	8660	mg/kg TS	2	S	IR

Your ID	<b>L2222986-23</b> <b>18-E2-SB-CH-051</b>				
LabID	U11579538				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	58.7	%	1	W	TV
Si <sup>+</sup>	8.57	mg/kg TS	2	S	IR

Your ID	<b>L2222986-25</b> <b>18-E5-NG-CH-055</b>				
LabID	U11579539				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	25.2	%	1	W	TV
Si <sup>+</sup>	7490	mg/kg TS	2	S	IR

Your ID	<b>L2222986-26</b> <b>18-E5-FC-CH-057</b>				
LabID	U11579540				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	83.1	%	1	W	TV
Si <sup>+</sup>	11.5	mg/kg TS	2	S	IR

Your ID	<b>L2222986-28</b> <b>18-E6-NG-CH-061</b>				
LabID	U11579541				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	25.2	%	1	W	TV
Si <sup>+</sup>	7680	mg/kg TS	2	S	IR

Your ID	<b>L2222986-31</b> <b>18-S1-NG-CH-069</b>				
LabID	U11579542				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	17.0	%	1	W	TV
Si <sup>+</sup>	6740	mg/kg TS	2	S	IR



Your ID	<b>L2222986-32</b> <b>18-S1-SB-CH-071</b>				
LabID	U11579543				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	74.3	%	1	W	TV
Si <sup>+</sup>	17.7	mg/kg TS	2	S	IR

Your ID	<b>L2222986-34</b> <b>18-S2-NG-CH-075</b>				
LabID	U11579544				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	17.8	%	1	W	TV
Si <sup>+</sup>	9510	mg/kg TS	2	S	IR

Your ID	<b>L2222986-35</b> <b>18-S2-SB-CH-077</b>				
LabID	U11579545				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	55.7	%	1	W	TV
Si <sup>+</sup>	10.6	mg/kg TS	2	S	IR

Your ID	<b>L2222986-38</b> <b>18-S4-NG-CH-093</b>				
LabID	U11579546				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	29.0	%	1	W	TV
Si <sup>+</sup>	7380	mg/kg TS	2	S	IR

Your ID	<b>L2222986-39</b> <b>18-S4-SB-CH-095</b>				
LabID	U11579547				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	85.2	%	1	W	TV
Si <sup>+</sup>	15.7	mg/kg TS	2	S	IR

Your ID	<b>L2222986-42</b> <b>18-S7-NG-CH-085</b>				
LabID	U11579548				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	23.1	%	1	W	TV
Si <sup>+</sup>	6230	mg/kg TS	2	S	IR



Your ID	<b>L2222986-45</b> <b>18-D3-NG-CH-203</b>				
LabID	U11579549				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	22.7	%	1	W	TV
Si <sup>+</sup>	11500	mg/kg TS	2	S	IR

Your ID	<b>L2222986-46</b> <b>18-D9-NG-CH-220</b>				
LabID	U11579550				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	17.8	%	1	W	TV
Si <sup>+</sup>	10900	mg/kg TS	2	S	IR

Your ID	<b>L2222986-48</b> <b>18-D5-SB-CH-205</b>				
LabID	U11579551				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	56.0	%	1	W	TV
Si <sup>+</sup>	18.5	mg/kg TS	2	S	IR

Your ID	<b>L2222986-49</b> <b>18-D6-FC-CH-207</b>				
LabID	U11579552				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	74.5	%	1	W	TV
Si <sup>+</sup>	15.2	mg/kg TS	2	S	IR

Your ID	<b>L2222986-50</b> <b>18-D7-WW-CH-209</b>				
LabID	U11579553				
Analysis	Results	Unit	Method	Issuer	Sign
TS <sup>+</sup>	65.6	%	1	W	TV
Si <sup>+</sup>	3260	mg/kg TS	2	S	IR

Your ID	<b>Blank</b>				
LabID	U11579554				
Analysis	Results	Unit	Method	Issuer	Sign
Si <sup>+</sup>	<3	mg/kg TS	2	S	IR



Your ID	<b>L2222986-19 - Duplicate</b> <b>18-E1-FC-CH-041</b>				
LabID	U11579555				
Analysis	Results	Unit	Method	Issuer	Sign
TS*	81.6	%	1	W	TV
Si*	25.9	mg/kg TS	2	S	IR

Your ID	<b>QC</b>				
LabID	U11579556				
Analysis	Results	Unit	Method	Issuer	Sign
Si*	817	mg/kg TS	2	S	IR





Method specification	
1	Analysed according to SS 02 81 13-1 Torrsubstansbestämning.
2	<p>An aliquot of the sample was dried at 105°C according to Swedish Standard SS028113 for determination of dry matter. The analytical sample was dried at 50°C and the elemental concentrations were corrected to dry weight (TS) from dry matter content. For description of the digestion method used, please contact the laboratory.</p> <p>The ICP-SFMS analyses were carried out according to SS EN ISO 17294-1, 2 (modified) and US EPA Method 200.8 (modified). The ICP-AES analyses were carried out according to SS EN ISO 11885 (modified) and US EPA Method 200.7 (modified).</p> <p>Note that limits of reporting may be affected if, e.g. additional dilution was required because of matrix effects, or the sample quantity was limited.</p>

Approver	
IR	Iliia Rodioushkine
TV	Tiina Vikeväinen

Issuer <sup>1</sup>	
S	ICP-SFMS
W	Våtkemi

\* indicates unaccredited analysis.

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<sup>1</sup> The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

# Report

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## L1907920

1H0TZPMHEFL



Date received **2019-03-19**  
Issued **2019-03-29**

**ALS Life Sciences Division**  
**Lynne Wrona**

**1435 Norjohn Court, Unit 1**  
**L7L 0E6 Burlington**  
**Canada**

Project **L2222986**

### Analysis: TC-2

Your ID	<b>L2222986-1</b> <b>18-W2-SS-CH-001</b>					
LabID	U11579498					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	91.2		%	2	W	TV
Si	318000	58000	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-4</b> <b>18-W4-SS-CH-007</b>					
LabID	U11579499					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	79.0		%	2	W	TV
Si	287000	52200	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-7</b> <b>18-N2-SS-CH-013</b>					
LabID	U11579500					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	75.2		%	2	W	TV
Si	285000	51700	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-11</b> <b>18-N4-SS-CH-023</b>					
LabID	U11579501					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	90.8		%	2	W	TV
Si	339000	61900	mg/kg TS	3	H	SVS

# Report

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## L1907920

1H0TZPMHEFL



Your ID	<b>L2222986-14</b> <b>18-N5-SS-CH-029</b>					
LabID	U11579502					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	79.1		%	2	W	TV
Si	288000	52300	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-17</b> <b>18-E1-SS-CH-037</b>					
LabID	U11579503					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	83.7		%	2	W	TV
Si	323000	58700	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-20</b> <b>18-E2-SS-CH-043</b>					
LabID	U11579504					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	79.3		%	2	W	TV
Si	306000	55700	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-24</b> <b>18-E5-SS-CH-053</b>					
LabID	U11579505					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	82.9		%	2	W	TV
Si	319000	58000	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-27</b> <b>18-E6-SS-CH-059</b>					
LabID	U11579506					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	79.6		%	2	W	TV
Si	294000	53400	mg/kg TS	3	H	SVS

# Report

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## L1907920

1H0TZPMHEFL



Your ID	<b>L2222986-29</b> <b>18-S1-SS-CH-063</b>					
LabID	U11579507					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	81.1		%	2	W	TV
Si	302000	55000	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-33</b> <b>18-S2-SS-CH-073</b>					
LabID	U11579508					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	79.0		%	2	W	TV
Si	298000	54100	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-36</b> <b>18-S4-SS-CH-087</b>					
LabID	U11579509					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	76.9		%	2	W	TV
Si	254000	46000	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-40</b> <b>18-S7-SS-CH-079</b>					
LabID	U11579510					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	75.9		%	2	W	TV
Si	286000	52000	mg/kg TS	3	H	SVS

Your ID	<b>L2222986-43</b> <b>18-D1-SS-CH-200</b>					
LabID	U11579511					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Malning stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	91.9		%	2	W	TV
Si	318000	57900	mg/kg TS	3	H	SVS

# Report

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## L1907920

1H0TZPMHEFL



Your ID	<b>L2222986-44</b> <b>18-D2-SS-CH-201</b>					
LabID	U11579512					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Maining stålfat *	ja		ArbMom	1	I	PECA
TS 105°C *	82.9		%	2	W	TV
Si	297000	54000	mg/kg TS	3	H	SVS

Your ID	<b>Blank</b>					
LabID	U11579513					
Analysis	Results	Unit	Method	Issuer	Sign	
Si	<400	mg/kg TS	3	H	SVS	

Your ID	<b>L2222986-14 - Duplicate</b> <b>18-N5-SS-CH-029</b>					
LabID	U11579514					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
TS 105°C	-----	2.0	%	2	I	MASB
Si *	-----		mg/kg TS	3	I	MASB

Your ID	<b>QC</b>					
LabID	U11579515					
Analysis	Results	Uncertainty ( $\pm$ )	Unit	Method	Issuer	Sign
Si	177000	32300	mg/kg TS	3	H	SVS

Method specification	
1	Analysed according to provberedning, malning stålfat.
2	Analysed according to SS 028113.
3	<p>The sample was dried at 105°C according to Swedish Standard SS 28113:1981.</p> <p>Dried sample was fused LiBO<sub>2</sub> and dissolved in HNO<sub>3</sub> according to ASTM D3682:2013 and ASTM D4503:2008. LOI (loss on ignition) is done at 1000°C.</p> <p>The ICP-SFMS analyses were carried out according to SS EN ISO 17294- 2: 2016 and US EPA Method 200.8: 1994</p> <p>Note that limits of reporting may be affected if, e.g. additional dilution was required because of matrix effects, or the sample quantity was limited.</p>

	Approver
MASB	Marlene Sundberg
PECA	Peter Carlsson
SVS	Svetlana Senioukh
TV	Tiina Vikeväinen

	Issuer <sup>1</sup>
H	ICP-SFMS
I	Man.Inm.
W	Våtkemi

\* indicates unaccredited analysis.

The uncertainty is given as extended uncertainty (according to the definition in "Guide to the Expression of Uncertainty in Measurement", JCGM 100:2008 Corrected version 2010) calculated with a coverage factor of 2, which gives a confidence level of approximately 95%.

Measurement of uncertainty is reported only for detected substances with levels above the reporting limits.

The uncertainty from subcontractors is often given as extended uncertainty calculated with a coverage factor of 2. Contact the laboratory for further information.

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<sup>1</sup> The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.



---

ALS Environmental  
ALS Group USA, Corp  
1317 South 13th Avenue  
Kelso, WA 98626  
T : +1 360 577 7222  
F : +1 360 636 1068  
[www.alsglobal.com](http://www.alsglobal.com)

March 25, 2019

**Analytical Report for Service Request No: K1902061**

Lynne Wrona  
ALS Environmental - Canada  
1435 Norjohn Court #1  
Burlington, ON L7L 0E6

**RE: Burlington, ON / L2222986**

Dear Lynne,

Enclosed are the results of the sample(s) submitted to our laboratory March 08, 2019  
For your reference, these analyses have been assigned our service request number **K1902061**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Elizabeth Harris  
Project Manager



---

ALS Environmental  
ALS Group USA, Corp  
1317 South 13th Avenue  
Kelso, WA 98626  
T : +1 360 577 7222  
F : +1 360 636 1068  
[www.alsglobal.com](http://www.alsglobal.com)

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON  
**Sample Matrix:** Plant Tissue

**Service Request:** K1902061  
**Date Received:** 03/08/2019

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

#### Sample Receipt:

Twenty-eight plant tissue samples were received for analysis at ALS Environmental on 03/08/2019. The samples were received in good condition, other than what is noted on the Cooler Receipt and Preservation Form, and consistent with the accompanying chain of custody form. The samples were stored frozen at -20°C upon receipt at the laboratory.

#### Metals:

No significant anomalies were noted with this analysis.

#### General Chemistry:

Method SM 4500-F-C Modified, 03/19/2019: The matrix spike recoveries of Fluoride for samples 18-W4-FC-CH-011 and 18-E5-FC-CH-057 were outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential low bias in this matrix. No further corrective action was appropriate.

Approved by



Date

03/25/2019



# Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



ADDRESS 1317 South 13th Ave., Kelso, WA 98626  
 PHONE 1 360 577 7222 FAX 1 360 636 1068

# Chain of Custody

Work Order No.:

*201801  
K1902061*

Part of the ALS Group A Campbell Brothers Limited Company

Project Manager: Lynne Wrona		Bill to: Same as Previous				
Client Name: ALS Environmental		Company:				
Address: 1435 Norjohn Court, Unit 1		Address:				
City, State ZIP: Burlington, ON, Canada		City, State ZIP:				
Email: lynne.wrona@alsglobal.com		Email:				
Phone: 905-331-3111						
Project Name:	REQUESTED ANALYSIS			TAT		
Project Number:	No. of Containers Fluoride via SM4500F-C including Bellack Distillation			<input checked="" type="checkbox"/> Routine <input type="checkbox"/> Same Day *** <input type="checkbox"/> Next Day *** <input type="checkbox"/> 3 Day <input type="checkbox"/> 5 Day		
P.O. Number: L2222986				*** Please call for availability		
Sampler's Name: Client				Comments		
<b>SAMPLE RECEIPT</b>						
Temperature (C):		Temp Blank Present				
Received Intact:	Yes No N/A	Wet Ice / Blue Ice				
Cooler Custody Seals:	Yes No N/A	Total Containers:				
Sample Custody Seals:	Yes No N/A					
Sample Identification	Matrix	Date Sampled	Time Sampled	Lab ID		
18-W2-NG-CH-003	Plant Tissue	9/25/2018	12:20 PM	1 X		
18-W2-WW-CH-005	Plant Tissue	7/5/2018	2:15 PM	1 X		
18-W4-NG-CH-009	Plant Tissue	10/16/2018	4:00 PM	1 X		
18-W4-FC-CH-011	Plant Tissue	10/16/2018	4:30 PM	1 X		
18-N2-NG-CH-019	Plant Tissue	10/17/2018	9:05 AM	1 X		
18-N2-FC-CH-021	Plant Tissue	10/17/2018	8:55 AM	1 X		
18-N4-NG-CH-025	Plant Tissue	9/26/2018	1:00 PM	1 X		
18-N4-WW-CH-027	Plant Tissue	7/5/2018	12:45 PM	1 X		
18-N5-NG-CH-035	Plant Tissue	10/17/2018	11:40 AM	1 X		
18-E1-NG-CH-039	Plant Tissue	10/16/2018	2:10 PM	1 X		
18-E1-FC-CH-041	Plant Tissue	10/16/2018	2:20 PM	1 X		
				Additional Methods Available Upon Request		
<b>RELINQUISHED BY</b>			<b>RECEIVED BY</b>			
Print Name	Signature	Date/Time	Print Name	Signature		
Aaron Burton			<i>Snorf</i>	<i>[Signature]</i>		
				3/8/19 0940		



ADDRESS 1317 South 13th Ave., Kelso, WA 98626  
 PHONE 1 360 577 7222 FAX 1 360 636 1068

# Chain of Custody

Work Order No.: **K1902061**

Part of the ALS Group A Campbell Brothers Limited Company

<b>Project Manager:</b> Lynne Wrona		<b>Bill to:</b> Same as Previous	
<b>Client Name:</b> ALS Environmental		<b>Company:</b>	
<b>Address:</b> 1435 Norjohn Court, Unit 1		<b>Address:</b>	
<b>City, State ZIP:</b> Burlington, ON, Canada		<b>City, State ZIP:</b>	
<b>Email:</b> lynne.wrona@alsglobal.com		<b>Email:</b>	
<b>Phone:</b> 905-331-3111			

SAMPLE RECEIPT						REQUESTED ANALYSIS													TAT	
Project Name:		No. of Containers Fluoride via SM4500F-C including Bellack Distillation													<input checked="" type="checkbox"/> Routine <input type="checkbox"/> Same Day *** <input type="checkbox"/> Next Day *** <input type="checkbox"/> 3 Day <input type="checkbox"/> 5 Day					
Project Number:																				
P.O. Number: L2222986																				
Sampler's Name: Client																				
Temperature (°C):	Temp Blank Present														*** Please call for availability  Comments					
Received Intact: Yes No N/A	Wet Ice / Blue Ice																			
Cooler Custody Seals: Yes No N/A	Total Containers:																			
Sample Custody Seals: Yes No N/A																				
Sample Identification	Matrix	Date Sampled	Time Sampled	Lab ID	No. of Containers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
18-E2-NG-CH-049	Plant Tissue	9/26/2018	11:05 AM		1	X														
18-E2-SB-CH-051	Plant Tissue	9/26/2018	11:10 AM		1	X														
18-E5-NG-CH-055	Plant Tissue	10/16/2018	12:40 PM		1	X														
18-E5-FC-CH-057	Plant Tissue	10/16/2018	12:50 PM		1	X														
18-E6-NG-CH-061	Plant Tissue	10/17/2018	10:40 AM		1	X														
18-S1-NG-CH-069	Plant Tissue	9/25/2018	2:10 PM		1	X														
18-S1-SB-CH-071	Plant Tissue	9/25/2018	2:00 PM		1	X														
18-S2-NG-CH-075	Plant Tissue	9/25/2018	3:35 PM		1	X														
18-S2-SB-CH-077	Plant Tissue	9/25/2018	3:50 PM		1	X														
18-S4-NG-CH-093	Plant Tissue	9/26/2018	9:00 AM		1	X														
18-S4-SB-CH-095	Plant Tissue	9/26/2018	9:00 AM		1	X														

RELINQUISHED BY		RECEIVED BY	
Print Name <b>Aaron Burton</b>	Signature	Date/Time	Print Name <i>SWALE</i>
			Signature <i>[Signature]</i>
			Date/Time <b>3/8/19 0946</b>





ADDRESS 1317 South 13th Ave., Kelso, WA 98626  
 PHONE 1 360 577 7222 FAX 1 360 636 1068

# Chain of Custody

W182  
 K1902061

Work Order No.:

Part of the ALS Group A Campbell Brothers Limited Company

<b>Project Manager:</b> Lynne Wrona	<b>Bill to:</b> Same as Previous
<b>Client Name:</b> ALS Environmental	<b>Company:</b>
<b>Address:</b> 1435 Norjohn Court, Unit 1	<b>Address:</b>
<b>City, State ZIP:</b> Burlington, ON, Canada	<b>City, State ZIP:</b>
<b>Email:</b> lynne.wrona@alsglobal.com	<b>Email:</b>
<b>Phone:</b> 905-331-3111	

SAMPLE RECEIPT					REQUESTED ANALYSIS															TAT						
Project Name:					No. of Containers Fluoride via SM4500F-C including Bellack Distillation																<input checked="" type="checkbox"/> Routine <input type="checkbox"/> Same Day *** <input type="checkbox"/> Next Day *** <input type="checkbox"/> 3 Day <input type="checkbox"/> 5 Day					
Project Number:																					*** Please call for availability					
P.O. Number: L2222986																										
Sampler's Name: Client																										
Temperature (°C):					Temp Blank Present					Received Intact:					Cooler Custody Seals:					Sample Custody Seals:						
					Yes No N/A					Yes No N/A					Yes No N/A					Yes No N/A						
Sample Identification	Matrix	Date Sampled	Time Sampled	Lab ID																						
18-S7-NG-CH-085	Plant Tissue	10/17/2018	11:10 AM		1	X																				
18-D3-NG-CH-203	Plant Tissue	9/25/2018	12:30 PM		1	X																				
18-D9-NG-CH-220	Plant Tissue	10/16/2018	4:00 PM		1	X																				
18-D5-SB-CH-205	Plant Tissue	9/26/2018	11:20 AM		1	X																				
18-D6-FC-CH-207	Plant Tissue	10/16/2018	4:40 PM		1	X																				
18-D7-WW-CH-209	Plant Tissue	7/5/2018	12:55 PM		1	X																				

**Additional Methods Available Upon Request**

RELINQUISHED BY			RECEIVED BY		
Print Name	Signature	Date/Time	Print Name	Signature	Date/Time
Aaron Burton			JWOLF		3/8/19 094



Cooler Receipt and Preservation Form

02061 PC Libby  
02061

Client ALS-Burlington Service Request K19  
Received: 3/8/19 Opened: 3/8/19 By: JM Unloaded: 3/8/19 By: JM

- 1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- 2. Samples were received in: (circle) Cooler Box Envelope Other NA
- 3. Were custody seals on coolers? NA Y N If yes, how many and where? \_\_\_\_\_  
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
<u>0.3</u>	<u>0.3</u>	<u>N/A</u>	<u>N/A</u>	<u>0</u>	<u>362</u>		<u>7746 4801 8243</u>		

- 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves Box
- 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA Y N  
If applicable, tissue samples were received: Frozen Partially Thawed Thawed
- 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
- 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- 11. Were VOA vials received without headspace? Indicate in the table below. NA Y N
- 12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: There isn't a date or time for when samples were taken on the COC.  
No Date + time on samples either.



# Total Solids

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue  
**Analysis Method:** Freeze Dry  
**Prep Method:** None

**Service Request:** K1902061  
**Date Collected:** 07/05/18 - 10/17/18  
**Date Received:** 03/8/19  
**Units:** Percent  
**Basis:** Wet

**Total Solids**

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
18-W2-NG-CH-003	K1902061-001	21.1	-	1	03/15/19 12:04	
18-W2-WW-CH-005	K1902061-002	67.0	-	1	03/15/19 12:04	
18-W4-NG-CH-009	K1902061-003	19.6	-	1	03/15/19 12:04	
18-W4-FC-CH-011	K1902061-004	71.5	-	1	03/15/19 12:04	
18-N2-NG-CH-019	K1902061-005	24.5	-	1	03/15/19 12:04	
18-N2-FC-CH-021	K1902061-006	67.6	-	1	03/15/19 12:04	
18-N4-NG-CH-025	K1902061-007	21.3	-	1	03/15/19 12:04	
18-N4-WW-CH-027	K1902061-008	67.8	-	1	03/15/19 12:04	
18-N5-NG-CH-035	K1902061-009	34.9	-	1	03/15/19 12:04	
18-E1-NG-CH-039	K1902061-010	24.5	-	1	03/15/19 12:04	
18-E1-FC-CH-041	K1902061-011	78.6	-	1	03/15/19 12:04	
18-E2-NG-CH-049	K1902061-012	24.8	-	1	03/15/19 12:04	
18-E2-SB-CH-051	K1902061-013	58.0	-	1	03/15/19 12:04	
18-E5-NG-CH-055	K1902061-014	24.9	-	1	03/15/19 12:04	
18-E5-FC-CH-057	K1902061-015	78.0	-	1	03/15/19 12:04	
18-E6-NG-CH-061	K1902061-016	27.4	-	1	03/15/19 12:04	
18-S1-NG-CH-069	K1902061-017	20.2	-	1	03/15/19 12:04	
18-S1-SB-CH-071	K1902061-018	72.2	-	1	03/15/19 12:04	
18-S2-NG-CH-075	K1902061-019	19.8	-	1	03/15/19 12:04	
18-S2-SB-CH-077	K1902061-020	57.6	-	1	03/15/19 12:04	
18-S4-NG-CH-093	K1902061-021	29.2	-	1	03/15/19 12:04	
18-S4-SB-CH-095	K1902061-022	82.4	-	1	03/15/19 12:04	
18-S7-NG-CH-085	K1902061-023	27.8	-	1	03/15/19 12:04	
18-D3-NG-CH-203	K1902061-024	20.2	-	1	03/15/19 12:04	
18-D9-NG-CH-220	K1902061-025	20.5	-	1	03/15/19 12:04	
18-D5-SB-CH-205	K1902061-026	56.4	-	1	03/15/19 12:04	
18-D6-FC-CH-207	K1902061-027	71.5	-	1	03/15/19 12:04	
18-D7-WW-CH-209	K1902061-028	71.2	-	1	03/15/19 12:04	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue  
**Analysis Method:** Freeze Dry  
**Prep Method:** None

**Service Request:** K1902061  
**Date Collected:** 10/16/18  
**Date Received:** 03/08/19

**Units:** Percent  
**Basis:** Wet

**Replicate Sample Summary**  
**Inorganic Parameters**

<b>Sample Name:</b>	<b>Lab Code:</b>	<b>MRL</b>	<b>Sample Result</b>	<b>Duplicate Result</b>	<b>Average</b>	<b>RPD</b>	<b>RPD Limit</b>	<b>Date Analyzed</b>
18-W4-FC-CH-011	K1902061-004DUP	-	71.5	71.1	71.3	<1	20	03/15/19
18-D6-FC-CH-207	K1902061-027DUP	-	71.5	72.8	72.2	2	20	03/15/19

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue  
**Analysis Method:** SM 4500-F- C Modified  
**Prep Method:** ALS SOP

**Service Request:** K1902061  
**Date Collected:** 07/05/18 - 10/17/18  
**Date Received:** 03/8/19  
**Units:** mg/Kg  
**Basis:** Dry

**Fluoride**

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
18-W2-NG-CH-003	K1902061-001	ND U	190	1	03/15/19 16:20	3/14/19	
18-W2-WW-CH-005	K1902061-002	ND U	60	1	03/15/19 16:20	3/14/19	
18-W4-NG-CH-009	K1902061-003	ND U	200	1	03/15/19 16:20	3/14/19	
18-W4-FC-CH-011	K1902061-004	ND U	56	1	03/15/19 16:20	3/14/19	
18-N2-NG-CH-019	K1902061-005	ND U	160	1	03/15/19 16:20	3/14/19	
18-N2-FC-CH-021	K1902061-006	ND U	59	1	03/15/19 16:20	3/14/19	
18-N4-NG-CH-025	K1902061-007	ND U	190	1	03/15/19 16:20	3/14/19	
18-N4-WW-CH-027	K1902061-008	ND U	59	1	03/15/19 16:20	3/14/19	
18-N5-NG-CH-035	K1902061-009	ND U	110	1	03/15/19 16:20	3/14/19	
18-E1-NG-CH-039	K1902061-010	ND U	160	1	03/15/19 16:20	3/14/19	
18-E1-FC-CH-041	K1902061-011	ND U	51	1	03/15/19 16:20	3/14/19	
18-E2-NG-CH-049	K1902061-012	ND U	160	1	03/15/19 16:20	3/14/19	
18-E2-SB-CH-051	K1902061-013	ND U	69	1	03/19/19 10:00	3/18/19	
18-E5-NG-CH-055	K1902061-014	ND U	160	1	03/19/19 10:00	3/18/19	
18-E5-FC-CH-057	K1902061-015	ND U	51	1	03/19/19 10:00	3/18/19	
18-E6-NG-CH-061	K1902061-016	ND U	150	1	03/19/19 10:00	3/18/19	
18-S1-NG-CH-069	K1902061-017	ND U	200	1	03/19/19 10:00	3/18/19	
18-S1-SB-CH-071	K1902061-018	ND U	55	1	03/19/19 10:00	3/18/19	
18-S2-NG-CH-075	K1902061-019	ND U	200	1	03/19/19 10:00	3/18/19	
18-S2-SB-CH-077	K1902061-020	ND U	69	1	03/19/19 10:00	3/18/19	
18-S4-NG-CH-093	K1902061-021	ND U	140	1	03/19/19 10:00	3/18/19	
18-S4-SB-CH-095	K1902061-022	ND U	49	1	03/19/19 10:00	3/18/19	
18-S7-NG-CH-085	K1902061-023	ND U	140	1	03/19/19 10:00	3/18/19	
18-D3-NG-CH-203	K1902061-024	ND U	200	1	03/19/19 10:00	3/18/19	
18-D9-NG-CH-220	K1902061-025	ND U	200	1	03/19/19 10:00	3/18/19	
18-D5-SB-CH-205	K1902061-026	ND U	71	1	03/19/19 10:00	3/18/19	
18-D6-FC-CH-207	K1902061-027	ND U	56	1	03/19/19 10:00	3/18/19	
18-D7-WW-CH-209	K1902061-028	ND U	56	1	03/19/19 10:00	3/18/19	
Method Blank	K1902061-MB1	ND U	40	1	03/15/19 16:20	3/14/19	
Method Blank	K1902061-MB2	ND U	40	1	03/19/19 10:00	3/18/19	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue  
**Analysis Method:** SM 4500-F- C Modified  
**Prep Method:** ALS SOP

**Service Request:** K1902061  
**Date Collected:** 10/16/18  
**Date Received:** 03/08/19

**Units:** mg/Kg  
**Basis:** Dry

Replicate Sample Summary  
Fluoride

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
18-W4-FC-CH-011	K1902061-004DUP	56	ND U	ND U	NC	NC	20	03/15/19
18-E5-FC-CH-057	K1902061-015DUP	51	ND U	ND U	NC	NC	20	03/19/19

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue

**Service Request:** K1902061  
**Date Collected:** 10/16/18  
**Date Received:** 03/08/19  
**Date Analyzed:** 03/15/19  
**Date Extracted:** 03/14/19

**Duplicate Matrix Spike Summary  
Fluoride**

**Sample Name:** 18-W4-FC-CH-011  
**Lab Code:** K1902061-004  
**Analysis Method:** SM 4500-F- C Modified  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry

Analyte Name	Sample Result	Result	Matrix Spike K1902061-004MS		Duplicate Matrix Spike K1902061-004DMS		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Fluoride	ND U	734	1400	52 *	727	1390	53 *	56-130	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue

**Service Request:** K1902061  
**Date Collected:** 10/16/18  
**Date Received:** 03/08/19  
**Date Analyzed:** 03/19/19  
**Date Extracted:** 03/18/19

**Duplicate Matrix Spike Summary**  
**Fluoride**

**Sample Name:** 18-E5-FC-CH-057  
**Lab Code:** K1902061-015  
**Analysis Method:** SM 4500-F- C Modified  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry

Analyte Name	Sample Result	Result	Matrix Spike K1902061-015MS		Result	Duplicate Matrix Spike K1902061-015DMS		% Rec Limits	RPD	RPD Limit
			Spike Amount	% Rec		Spike Amount	% Rec			
Fluoride	ND U	471	1260	37 *	568	1280	44 *	56-130	19	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue

**Service Request:** K1902061  
**Date Analyzed:** 03/15/19  
**Date Extracted:** 03/14/19

**Lab Control Sample Summary**  
**Fluoride**

**Analysis Method:** SM 4500-F- C Modified  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 628508

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1902061-LCS1	851	915	93	85-115

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986  
**Sample Matrix:** Plant Tissue

**Service Request:** K1902061  
**Date Analyzed:** 03/19/19  
**Date Extracted:** 03/18/19

**Lab Control Sample Summary**  
**Fluoride**

**Analysis Method:** SM 4500-F- C Modified  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 628748

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K1902061-LCS2	806	824	98	85-115

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986

**Service Request:** K1902061

### Continuing Calibration Verification (CCV) Summary

#### Fluoride

**Analysis Method:** SM 4500-F- C Modified

**Units:** mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCV1	628508	KQ1903404-04	03/15/19 16:20	5.00	5.03	101	90-110
CCV2	628508	KQ1903404-05	03/15/19 16:20	5.00	4.99	100	90-110
CCV3	628508	KQ1903404-06	03/15/19 16:20	5.00	4.76	95	90-110
CCV4	628748	KQ1903511-05	03/19/19 10:00	5.00	5.09	102	90-110
CCV5	628748	KQ1903511-06	03/19/19 10:00	5.00	4.79	96	90-110
CCV6	628748	KQ1903511-07	03/19/19 10:00	5.00	4.81	96	90-110
CCV7	628748	KQ1903511-08	03/19/19 10:00	5.00	4.94	99	90-110

**Client:** ALS Environmental - Canada  
**Project:** Burlington, ON/L2222986

**Service Request:**K1902061

**Continuing Calibration Blank (CCB) Summary**  
**Fluoride**

**Analysis Method:** SM 4500-F- C Modified

**Units:**mg/Kg

	<b>Analysis Lot</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>MRL</b>	<b>Result</b>	<b>Q</b>
CCB1	628508	KQ1903404-01	03/15/19 16:20	40	ND	U
CCB2	628508	KQ1903404-02	03/15/19 16:20	40	ND	U
CCB3	628508	KQ1903404-03	03/15/19 16:20	40	ND	U
CCB4	628748	KQ1903511-01	03/19/19 10:00	40	ND	U
CCB5	628748	KQ1903511-02	03/19/19 10:00	40	ND	U
CCB6	628748	KQ1903511-03	03/19/19 10:00	40	ND	U
CCB7	628748	KQ1903511-04	03/19/19 10:00	40	ND	U



## Raw Data

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
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# Total Solids

**ALS Environmental—Kelso Laboratory**  
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# Benchsheet

Service Request #: K1902061, KQ1903300, K1902223

Run #: 628310

Test: Frz Dry

Balance ID: K-Balance-53

Method: Frz Dry

Matrix	Lab Code	Tare (g)	Wet Wt. (g)	Tare + Dry Wt. (g)	Dry Weight (g)	% Total Solids	RPD
Plant Tissue	K1902061-001	13.231	1.308	13.507	0.276	21.1	
Plant Tissue	K1902061-002	13.238	1.190	14.035	0.797	67.0	
Plant Tissue	K1902061-003	13.248	1.031	13.450	0.202	19.6	
Plant Tissue	K1902061-004	13.288	1.128	14.095	0.807	71.5	
Plant Tissue	K1902061-004DUP	13.266	1.055	14.016	0.750	71.1	<1
Plant Tissue	K1902061-005	13.265	1.060	13.525	0.260	24.5	
Plant Tissue	K1902061-006	13.229	1.039	13.931	0.702	67.6	
Plant Tissue	K1902061-007	13.190	1.048	13.413	0.223	21.3	
Plant Tissue	K1902061-008	13.266	1.078	13.997	0.731	67.8	
Plant Tissue	K1902061-009	13.265	1.093	13.647	0.382	34.9	
Plant Tissue	K1902061-010	13.316	1.141	13.595	0.279	24.5	
Plant Tissue	K1902061-011	13.271	1.159	14.182	0.911	78.6	
Plant Tissue	K1902061-012	13.273	1.089	13.543	0.270	24.8	
Plant Tissue	K1902061-013	13.251	1.115	13.898	0.647	58.0	
Plant Tissue	K1902061-014	13.229	1.027	13.485	0.256	24.9	
Plant Tissue	K1902061-015	13.180	1.020	13.976	0.796	78.0	
Plant Tissue	K1902061-016	13.308	1.042	13.593	0.285	27.4	
Plant Tissue	K1902061-017	13.263	1.005	13.466	0.203	20.2	
Plant Tissue	K1902061-018	13.252	1.088	14.037	0.785	72.2	
Plant Tissue	K1902061-019	13.217	1.079	13.431	0.214	19.8	
Plant Tissue	K1902061-020	13.231	1.048	13.835	0.604	57.6	
Plant Tissue	K1902061-021	13.285	1.027	13.585	0.300	29.2	
Plant Tissue	K1902061-022	13.252	1.118	14.173	0.921	82.4	
Plant Tissue	K1902061-023	13.264	1.022	13.548	0.284	27.8	
Plant Tissue	K1902061-024	13.257	1.187	13.497	0.240	20.2	
Plant Tissue	K1902061-025	13.266	1.062	13.484	0.218	20.5	
Plant Tissue	K1902061-026	13.225	1.079	13.834	0.609	56.4	
Plant Tissue	K1902061-027	13.147	1.207	14.010	0.863	71.5	
Plant Tissue	K1902061-027DUP	13.273	1.518	14.378	1.11	72.8	2
Plant Tissue	K1902061-028	13.276	1.128	14.079	0.803	71.2	
Animal Tissue	K1902223-001	81.185	10.120	83.317	2.13	21.1	

FreezeDryer ID	Date In	Time In	Date Out	Time Out	Thermometer ID
FreezeDry	03/15/19	12:04	03/18/19	09:19	

Cal EQID	Cal Start Value	Cal End Value	Start Date	Start Time	End Date	End Time
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Comments: CCL

Service Request Number(s): K1902061

TISSUE HOMOGENIZATION

Laboratory ID	Weight of Sample* (g)	Tare of Jar (g)				
K1902061-1	6.74	119.57				
2	8.46	119.69				
3	6.96	119.54				
4	158.25	203.24				
5	8.72	119.39				
6	136.47	202.94				
7	7.51	119.65				
8	7.39	119.35				
9	6.33	119.68				
10	6.67	119.45				
11	111.34	203.41				
12	6.01	119.49				
13	32.82	119.70				
14	7.27	119.69				
15	130.95	203.53				
16	6.05	119.79				
17	6.52	119.61				
18	36.14	119.52				
19	6.04	119.43				
20	40.33	119.82				
21	6.74	119.42				
22	43.44	119.48				
23	5.85	119.63				
24	7.19	119.50				
25	5.56	119.66				

Comments:

\* The weight of sample is after homogenization.

Balance ID: 52

Date Balance Checked: 3/13/19 3/14/19

Analyst: Cody Hill with 20

Date: 3/13/19 3/14/19

Reviewed: 30

Date: 3/19/19

Service Request Number(s): K1902061

TISSUE HOMOGENIZATION

Laboratory ID	Weight of Sample* (g)	Tare of Jar (g)				
K1902061-26	43.41	119.65				
↓ 27	146.37	203.96				
↓ 28	8.02	119.54				

CCL 3/14

Comments:

\* The weight of sample is after homogenization.

Balance ID: 5-2 Date Balance Checked: 3/14/19

Analyst: <i>Colby Holt</i>	Date: 3/14/19
Reviewed: <i>SC</i>	Date: 3/14/19

Service Request Number(s): K1902061

Rinsate and Homogenization Blank Data

Laboratory ID	Amount (mL)	Date	Time	Preservative
Rinsate Blank	500	3/14/19	10:42	None
Homogenization Blank	↓	↓	10:50	↓

Comments: One Rinsate Blank per Batch of Samples. One Homgenization Blank Per 8 hour shift.

Analyst: <i>Cathy Hlh</i>	Date: 3/14/19
Reviewed: <i>3c</i>	Date: 3/19/19

Service Request Number(s): K1902061

**Rinsate and Homogenization Blank Data**

Laboratory ID	Amount (mL)	Date	Time	Preservative
Rinsate Blank	<u>500</u>	<u>3/13/19</u>	<u>13:51</u>	<u>None</u>
Homogenization Blank	<u>↓</u>	<u>↓</u>	<u>14:12</u>	<u>↓</u>

Comments: One Rinsate Blank per Batch of Samples. One Homgenization Blank Per 8 hour shift.

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Analyst: <u>Cathy Zilk</u>	Date: <u>3/13/19</u>
Reviewed: <u>ZL</u>	Date: <u>3/19/19</u>



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
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Work Request # 1902061

Tier: IV

Date Analyzed: 3-14-19 + 3-15-19

Analyst: A. Chatterjee

Run # 628508

Analysis: Fluoride SM 4500-F-C Mid Bellack Dist.

### DATA QUALITY REPORT INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

- |     |   |                  |
|-----|---|------------------|
| 1.  | Is the method name and number correct and appropriate?  | <u>yes/no/NA</u> |
| 2.  | Holding times met for all analyses and for all samples?   | <u>yes/no/NA</u> |
| 3.  | Are calculations correct?   | <u>yes/no/NA</u> |
| 4.  | Is the reporting basis correct? (Dry Weight)  | <u>yes/no/NA</u> |
| 5.  | All quality control criteria met?   | <u>yes/no</u>    |
| 6.  | Is the calibration curve correlation coefficient $\geq 0.995$ ?   | <u>yes/no/NA</u> |
| 7.  | MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?  | <u>yes/no/NA</u> |
| 8.  | Are ICVs, CCVs, and CCBs all within acceptance limits?  | <u>yes/no/NA</u> |
| 9.  | Are results for methods blanks all ND?  | <u>yes/no/NA</u> |
| 10. | Are all QC samples within acceptance criteria?<br>(LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)               | <u>yes/no/NA</u> |
| 11. | Are all exceptions explained?   | <u>yes/no/NA</u> |
| 12. | Have all applicable service requests been reviewed?   | <u>yes/no/NA</u> |
| 13. | Are all samples labeled correctly?  | <u>yes/no/NA</u> |
| 14. | Have all instructions on the service request been followed?<br>(e.g. Special MRLs, QC on a specific sample, Form V) | <u>yes/no/NA</u> |
| 15. | Are detection limits and units reported correctly?  | <u>yes/no/NA</u> |
| 16. | Is the unused space on the benchsheet crossed out?  | <u>yes/no/NA</u> |
| 17. | Was analysis turned in by the due date? (n-2) (If not record SR#)   | <u>yes/no/NA</u> |

**COMMENTS:**

*Samples rec'd past hold.  
Both SAKs failed. Suspect matrix interference.*

Final Approved by: Freeripi

Date: 03/18/19

DQREPORT

# Analytical Results Summary

Instrument Name: K-ISE-01

Analyst: ACHEATLEY

Analysis Lot: 628508 Method/Testcode: SM 4500-F- C Modified/F

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1902061-001	Fluoride	N/A		Plant Tissue	0.39 mg/L	1.0027 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-002	Fluoride	N/A		Plant Tissue	0.11 mg/L	1.0221 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-003	Fluoride	N/A		Plant Tissue	0.10 mg/L	1.0401 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-004	Fluoride	N/A		Plant Tissue	0.11 mg/L	1.0039 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-005	Fluoride	N/A		Plant Tissue	0.13 mg/L	1.0230 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-006	Fluoride	N/A		Plant Tissue	0.05 mg/L	1.0054 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-007	Fluoride	N/A		Plant Tissue	0.05 mg/L	1.0075 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-008	Fluoride	N/A		Plant Tissue	0.05 mg/L	1.0616 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-009	Fluoride	N/A		Plant Tissue	0.09 mg/L	1.0050 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-010	Fluoride	N/A		Plant Tissue	0.05 mg/L	1.0088 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-011	Fluoride	N/A		Plant Tissue	0.06 mg/L	1.0042 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
K1902061-012	Fluoride	N/A		Plant Tissue	0.07 mg/L	1.0042 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
KQ1903345-01	Fluoride	DUP	K1902061-004	Plant Tissue	0.10 mg/L	1.0031 g	40 mg/Kg U	1		40		NC	3/15/19 16:20:00	N	IV
KQ1903345-02	Fluoride	MS	K1902061-004	Plant Tissue	10.50 mg/L	1.0003 g	525 mg/Kg	1		40	53*		3/15/19 16:20:00	N	IV
KQ1903345-03	Fluoride	DMS	K1902061-004	Plant Tissue	10.50 mg/L	1.0093 g	520 mg/Kg	1		40	52*	<1	3/15/19 16:20:00	N	IV
KQ1903345-04	Fluoride	LCS		Plant Tissue	18.90 mg/L	1.0000 g	851 mg/Kg	1		40	93		3/15/19 16:20:00	N	IV
KQ1903345-05	Fluoride	MB		Plant Tissue	0.22 mg/L	1.0000 g	40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
KQ1903404-01	Fluoride	CCB		Plant Tissue	0.03 mg/L		40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
KQ1903404-02	Fluoride	CCB		Plant Tissue	0.06 mg/L		40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
KQ1903404-03	Fluoride	CCB		Plant Tissue	0.04 mg/L		40 mg/Kg U	1		40			3/15/19 16:20:00	N	IV
KQ1903404-04	Fluoride	CCV		Plant Tissue	5.03 mg/L		5.03 mg/L	1					3/15/19 16:20:00	N	IV
KQ1903404-05	Fluoride	CCV		Plant Tissue	4.99 mg/L		4.99 mg/L	1					3/15/19 16:20:00	N	IV
KQ1903404-06	Fluoride	CCV		Plant Tissue	4.76 mg/L		4.76 mg/L	1					3/15/19 16:20:00	N	IV

03/18/19  
 Humpy

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.



ALS ENVIRONMENTAL

Work Order #.:

Fluoride

Analysis Method 340.2/SM 4500-F C

Prep. Method : ALS SOP

Sample Number	Sample Aliquot, mL	Final Vol. mL	Reading mg/L	Dilution	mg/L Sample Reported
0.2 STD	20	20	0.199	1.00	0.199
CCV1	20	20	5.03	1.00	5.030
CCB1	20	20	0.0253	1.00	0.025
MB	20	20	0.216	1.00	0.216
LCS	20	20	18.9	1.00	18.900
K1902061-001	20	20	0.391	1.00	0.391
K1902061-002	20	20	0.114	1.00	0.114
K1902061-003	20	20	0.104	1.00	0.104
K1902061-004	20	20	0.105	1.00	0.105
K1902061-004d	20	20	0.0991	1.00	0.099
K1902061-004ms	20	20	10.5	1.00	10.500
K1902061-004msd	20	20	10.5	1.00	10.500
K1902061-005	20	20	0.125	1.00	0.125
CCV2	20	20	4.99	1.00	4.990
CCB2	20	20	0.0588	1.00	0.059
K1902061-006	20	20	0.0474	1.00	0.047
K1902061-007	20	20	0.0515	1.00	0.052
K1902061-008	20	20	0.0508	1.00	0.051
K1902061-009	20	20	0.086	1.00	0.086
K1902061-010	20	20	0.0487	1.00	0.049
K1902061-011	20	20	0.0600	1.00	0.060
K1902061-012	20	20	0.0665	1.00	0.067
0.2 STD	20	20	0.216	1.00	0.216
CCV3	20	20	4.76	1.00	4.760
CCB3	20	20	0.0413	1.00	0.041

%REC

100

101

100

108

95

*E.D.D*

Calibration info. 1 STD 1.0 mg/L 2 STD 10.0 mg/L 3 STD 100 mg/L

1-100ppm Slope: -59.1

1ppm F/2-73-K 10ppm F/2-39-C 100ppm F/2-21-C 1000ppm F/2-3-M

CCV=5ppm F/2-55-A LCS TV=18.3mg/L F/2-85-H

Analyzed By:	DATE	TIME
AC	3/15/2019	4:20:00 PM
<i>[Signature]</i>		<i>03/18/19</i>

Revision 1-R:/WET/ANALYSES/FLUOR/FIN SOLUTION\_LIMS

# Preparation Information Benchsheet

Prep Run#: 333036  
 Team: GenChem/ACHEATLEY  
 Number of Copies to make: 1

Prep WorkFlow: GenExt28Day  
 Prep Method: ALS SOP

Status: Prepped  
 Prep Date/Time: 3/14/19 11:25 AM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Final Vol	Sample Description
1	K1902061-001	18-W2-NG-CH-003	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0027g	41.00mL	
2	K1902061-002	18-W2-WW-CH-005	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0221g	42.00mL	
3	K1902061-003	18-W4-NG-CH-009	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0401g	45.00mL	
4	K1902061-004	18-W4-FC-CH-011	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0039g	43.00mL	
5	KQ1903345-05	MB		SM 4500-F- C Modified/F		Tissue	1.0000g	45.00mL	
6	KQ1903345-04	LCS		SM 4500-F- C Modified/F		Tissue	1.0000g	45.00mL	
7	KQ1903345-02	K1902061-004 MS	.01	SM 4500-F- C Modified/F		Tissue	1.0003g	50.00mL	
8	KQ1903345-03	K1902061-004 DMS	.01	SM 4500-F- C Modified/F		Tissue	1.0093g	50.00mL	
9	KQ1903345-01	K1902061-004 DUP	.01	SM 4500-F- C Modified/F		Tissue	1.0031g	45.00mL	
10	K1902061-005	18-N2-NG-CH-019	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0230g	37.00mL	
11	K1902061-006	18-N2-FC-CH-021	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0054g	45.00mL	
12	K1902061-007	18-N4-NG-CH-025	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0075g	44.00mL	
13	K1902061-008	18-N4-WW-CH-027	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0616g	46.00mL	
14	K1902061-009	18-N5-NG-CH-035	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0050g	50.00mL	
15	K1902061-010	18-E1-NG-CH-039	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0088g	43.00mL	
16	K1902061-011	18-E1-FC-CH-041	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0055g 1.0042g	50.00mL	
17	K1902061-012	18-E2-NG-CH-049	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0042g	47.00mL	

Spiking Solutions *TISAB F/2-90-I*

Name: Fluoride 1000 ppm F      Inventory ID 61469      Logbook Ref: ~~F/2-2-k~~ *F/2-3-M*      Expires On: ~~02/28/2014~~ *6-1-19*

KQ1903345-02 1.00mL      KQ1903345-03 1.00mL

Name: Fluoride ERA LCS      Inventory ID 194604      Logbook Ref: F/2-85-H      Expires On: ~~11/01/2019~~ *6-1-19*

KQ1903345-04 1.00g

*OTH 03/18/19*

**Preparation Steps**

Step: Extraction  
 Started: 3/14/19 11:25  
 Finished: 3/15/19 11:05  
 By: ACHEATLEY  
 Comments

# Preparation Information Benchsheet

Prep Run#: 333036  
Team: GenChem/ACHEATLEY

Prep WorkFlow: GenExt28Day  
Prep Method: ALS SOP

Status: Prepped  
Prep Date/Time: 3/14/19 11:25 AM

Comments: \_\_\_\_\_

Reviewed By: Hawryu Date: 03/18/19

Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u> Yes      No
Received By: _____	Date: _____	



# ALS Environmental - Laboratory Note Sheet

Service Request Number(s):

Sample Number	Sample wt. (g)	final Vol (ml)				
MB	1.0000	45				
LCS	1.0000	45				
2061-1	1.0027	41				
-2	1.0221	42				
-3	1.0401	45				
-4	1.0039	43				
-4a	1.0031	45				
-4ms	1.0003	50				
-4msd	1.0093	50				
-5	1.0230	37				
-6	1.0054	45				
-7	1.0075	44				
-8	1.0616	46				
-9	1.0050	50				
-10	1.0088	43				
-11	1.0055	50				
-12	1.0042	47				

Comments/Notes:

Analyst: <i>A. Cheater</i>	1125	0855
Reviewed: <i>Henry</i>	Date: 3-14-19	3-15-19
	Date: 03/18/19	

Work Request # 2061 2331 2202 2114 2124  
 Tier: IV II I I I  
 Date Analyzed: 3-18-19 3-19-19  
 Analyst: A. Chatterjee  
 Analysis: Fluoride SM 4500-F-C Mod + Dist. Run # 628748  
628798  
628898

**DATA QUALITY REPORT  
INORGANICS**

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1. Is the method name and number correct and appropriate? yes/no/NA
2. Holding times met for all analyses and for all samples? yes/no/NA
3. Are calculations correct? yes/no/NA
4. Is the reporting basis correct? (Dry Weight) yes/no/NA
5. All quality control criteria met? yes/no
6. Is the calibration curve correlation coefficient  $\geq 0.995$ ? yes/no/NA
7. MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency? yes/no/NA
8. Are ICVs, CCVs, and CCBs all within acceptance limits? yes/no/NA
9. Are results for methods blanks all ND? yes/no/NA
10. Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.) yes/no/NA
11. Are all exceptions explained? yes/no/NA
12. Have all applicable service requests been reviewed? yes/no/NA
13. Are all samples labeled correctly? yes/no/NA
14. Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V) yes/no/NA
15. Are detection limits and units reported correctly? yes/no/NA
16. Is the unused space on the benchsheet crossed out? yes/no/NA
17. Was analysis turned in by the due date? (n-2) (If not record SR#) yes/no/NA

**COMMENTS:**

2) 2061. Rec'd past hold

10) 2061. 15ms/15msd failed. Suspect matrix interference.  
 2202. 1ms/1msd failed. Sample concentration > spk concentration.

Final Approved by: [Signature] Date: 03/20/19 DOREPORT

# Analytical Results Summary

Instrument Name: K-ISE-01

Analyst: ACHEATLEY

Analysis Lot: 628748 Method/Testcode: SM 4500-F- C Modified/F

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	As Received*	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1902061-013	Fluoride	N/A		Plant Tissue	0.15 mg/L	6.26	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-014	Fluoride	N/A		Plant Tissue	0.10 mg/L	3.62	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-015	Fluoride	N/A		Plant Tissue	0.07 mg/L	3.48	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-016	Fluoride	N/A		Plant Tissue	0.15 mg/L	6.60	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-017	Fluoride	N/A		Plant Tissue	0.09 mg/L	4.01	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-018	Fluoride	N/A		Plant Tissue	0.07 mg/L	2.89	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-019	Fluoride	N/A		Plant Tissue	0.06 mg/L	2.24	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-020	Fluoride	N/A		Plant Tissue	0.05 mg/L	2.24	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-021	Fluoride	N/A		Plant Tissue	0.09 mg/L	3.96	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-022	Fluoride	N/A		Plant Tissue	0.05 mg/L	2.19	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-023	Fluoride	N/A		Plant Tissue	0.05 mg/L	2.25	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-024	Fluoride	N/A		Plant Tissue	0.03 mg/L	1.33	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-025	Fluoride	N/A		Plant Tissue	0.01 mg/L	0.62	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-026	Fluoride	N/A		Plant Tissue	0.02 mg/L	0.75	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-027	Fluoride	N/A		Plant Tissue	0.00 mg/L	0.17	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
K1902061-028	Fluoride	N/A		Plant Tissue	0.03 mg/L	1.10	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903470-01	Fluoride	DUP	K1902061-015	Plant Tissue	0.06 mg/L	2.43	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903470-02	Fluoride	MS	K1902061-015	Plant Tissue	10.10 mg/L	367.60	368 mg/Kg	1		40	37*		3/19/19 10:00:00	N	IV
KQ1903470-03	Fluoride	DMS	K1902061-015	Plant Tissue	9.88 mg/L	442.92	443 mg/Kg	1		40	44*	19	3/19/19 10:00:00	N	IV
KQ1903470-04	Fluoride	LCS		Plant Tissue	17.90 mg/L	805.50	806 mg/Kg	1		40	98		3/19/19 10:00:00	N	IV
KQ1903470-05	Fluoride	MB		Plant Tissue	0.06 mg/L	2.79	40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903511-01	Fluoride	CCB		Plant Tissue	0.02 mg/L		40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903511-02	Fluoride	CCB		Plant Tissue	0.01 mg/L		40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903511-03	Fluoride	CCB		Plant Tissue	0.07 mg/L		40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903511-04	Fluoride	CCB		Plant Tissue	0.04 mg/L		40 mg/Kg U	1		40			3/19/19 10:00:00	N	IV
KQ1903511-05	Fluoride	CCV		Plant Tissue	5.09 mg/L		5.09 mg/L	1					3/19/19 10:00:00	N	IV
KQ1903511-06	Fluoride	CCV		Plant Tissue	4.79 mg/L		4.79 mg/L	1					3/19/19 10:00:00	N	IV
KQ1903511-07	Fluoride	CCV		Plant Tissue	4.81 mg/L		4.81 mg/L	1					3/19/19 10:00:00	N	IV
KQ1903511-08	Fluoride	CCV		Plant Tissue	4.94 mg/L		4.94 mg/L	1					3/19/19 10:00:00	N	IV

03/20/19  
*[Handwritten Signature]*

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\* Not adjusted for changes in units  
# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

# Analytical Results Summary

Instrument Name: K-ISE-01

Analyst: ACHEATLEY

Analysis Lot: 628798

Method/Testcode: SM 4500-F- C Modified/F

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1902114-001	Fluoride	N/A		Drinking Water	0.63 mg/L	20 mL	0.63 mg/L	1	0.007	0.20			3/19/19 10:00:00	N	1
K1902124-001	Fluoride	N/A		Drinking Water	0.61 mg/L	20 mL	0.61 mg/L	1	0.007	0.20			3/19/19 10:00:00	N	1
KQ1903528-01	Fluoride	DUP	K1902114-001	Drinking Water	0.63 mg/L	20 mL	0.63 mg/L	1	0.007	0.20		<1	3/19/19 10:00:00	N	1
KQ1903528-02	Fluoride	MS	K1902114-001	Drinking Water	25.80 mg/L	20 mL	25.8 mg/L	1	0.007	0.20	101		3/19/19 10:00:00	N	1
KQ1903528-03	Fluoride	DMS	K1902114-001	Drinking Water	25.70 mg/L	20 mL	25.7 mg/L	1	0.007	0.20	100	<1	3/19/19 10:00:00	N	1
KQ1903528-04	Fluoride	LCS		Drinking Water	18.20 mg/L	20 mL	18.2 mg/L	1	0.007	0.20	99		3/19/19 10:00:00	N	1
KQ1903528-05	Fluoride	MB		Drinking Water	0.12 mg/L	20 mL	0.12 mg/L	J 1	0.007	0.20			3/19/19 10:00:00	N	1
KQ1903528-06	Fluoride	CCB		Drinking Water	0.07 mg/L	20 mL	0.07 mg/L	J 1	0.007	0.20			3/19/19 10:00:00	N	1
KQ1903528-07	Fluoride	CCB		Drinking Water	0.04 mg/L	20 mL	0.04 mg/L	J 1	0.007	0.20			3/19/19 10:00:00	N	1
KQ1903528-08	Fluoride	CCB		Drinking Water	0.00 mg/L	20 mL	0.20 mg/L	U 1	0.007	0.20			3/19/19 10:00:00	N	1
KQ1903528-09	Fluoride	CCV		Drinking Water	4.81 mg/L	20 mL	4.81 mg/L	1					3/19/19 10:00:00	N	1
KQ1903528-10	Fluoride	CCV		Drinking Water	4.94 mg/L	20 mL	4.94 mg/L	1					3/19/19 10:00:00	N	1
KQ1903528-11	Fluoride	CCV		Drinking Water	4.77 mg/L	20 mL	4.77 mg/L	1					3/19/19 10:00:00	N	1

03/20/19  
*[Signature]*

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

# Analytical Results Summary

Instrument Name: K-ISE-01

Analyst: ACHEATLEY

Analysis Lot: 628898 Method/Testcode: SM 4500-F- C Modified/F Dist

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	As Received*	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1902202-001	Fluoride	N/A		Sludge, Solid	81.00 mg/L	3554.76	3750 mg/Kg	1	19	46			3/19/19 10:00:00	N	II
K1902331-001	Fluoride	N/A		Misc. Solid	1.83 mg/L	84.93	85 mg/Kg	1	19	46			3/19/19 10:00:00	N	II
KQ1903248-01	Fluoride	DUP	K1902202-001	Sludge, Solid	76.90 mg/L	3442.60	3630 mg/Kg	1	19	47		3	3/19/19 10:00:00	N	II
KQ1903248-02	Fluoride	MS	K1902202-001	Sludge, Solid	84.90 mg/L	3411.16	3600 mg/Kg	1	17	42	-16*		3/19/19 10:00:00	N	II
KQ1903248-03	Fluoride	DMS	K1902202-001	Sludge, Solid	60.50 mg/L	2253.17	2380 mg/Kg	1	16	39	-164*	NC	3/19/19 10:00:00	N	II
KQ1903248-04	Fluoride	MB		Sludge, Solid	0.04 mg/L	1.66	46 mg/Kg U	1	19	46			3/19/19 10:00:00	N	II
KQ1903248-05	Fluoride	LCS		Sludge, Solid	17.60 mg/L	862.40	862 mg/Kg	1	20	49	96		3/19/19 10:00:00	N	II
KQ1903602-01	Fluoride	CCB		Sludge, Solid	0.07 mg/L	2.88	40 mg/Kg U	1	16	40			3/19/19 10:00:00	N	II
KQ1903602-02	Fluoride	CCB		Sludge, Solid	0.04 mg/L	1.68	40 mg/Kg U	1	16	40			3/19/19 10:00:00	N	II
KQ1903602-03	Fluoride	CCV		Sludge, Solid	4.81 mg/L	192.40	4.81 mg/L	1					3/19/19 10:00:00	N	II
KQ1903602-04	Fluoride	CCV		Sludge, Solid	4.94 mg/L	197.60	4.94 mg/L	1					3/19/19 10:00:00	N	II
KQ1903602-05	Fluoride	CCB		Sludge, Solid	0.00 mg/L	0.12	40 mg/Kg U	1	16	40			3/19/19 10:00:00	N	II
KQ1903602-06	Fluoride	CCV		Sludge, Solid	4.77 mg/L	190.80	4.77 mg/L	1					3/19/19 10:00:00	N	II
KQ1903602-07	Fluoride	CCB		Sludge, Solid	0.03 mg/L	1.00	40 mg/Kg U	1	16	40			3/19/19 10:00:00	N	II
KQ1903602-08	Fluoride	CCV		Sludge, Solid	4.65 mg/L	186.00	4.65 mg/L	1					3/19/19 10:00:00	N	II

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\* Not adjusted for changes in units

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.



ALS ENVIRONMENTAL

Work Order #.:

Fluoride

Analysis Method 340.2/SM 4500-F C

Prep. Method : CAS SOP

Sample Number	Sample Aliquot, mL	Final Vol. mL	Reading mg/L	Dilution	mg/L Sample Reported
0.2 STD	20	20	0.201	1.00	0.201
CCV1	20	20	5.09	1.00	5.090
CCB1	20	20	0.0165	1.00	0.017
MB	20	20	0.057	1.00	0.057
LCS	20	20	17.9	1.00	17.900
K1902061-013	20	20	0.150	1.00	0.150
K1902061-014	20	20	0.101	1.00	0.101
K1902061-015	20	20	0.0726	1.00	0.073
K1902061-015d	20	20	0.0578	1.00	0.058
K1902061-015ms	20	20	10.1	1.00	10.100
K1902061-015msd	20	20	9.88	1.00	9.880
K1902061-016	20	20	0.148	1.00	0.148
K1902061-017	20	20	0.0881	1.00	0.088
CCV2	20	20	4.79	1.00	4.790
CCB2	20	20	0.0133	1.00	0.013
K1902061-018	20	20	0.0665	1.00	0.067
K1902061-019	20	20	0.061	1.00	0.061
K1902061-020	20	20	0.0521	1.00	0.052
K1902061-021	20	20	0.0897	1.00	0.090
K1902061-022	20	20	0.0504	1.00	0.050
K1902061-023	20	20	0.0496	1.00	0.050
K1902061-024	20	20	0.0291	1.00	0.029
K1902061-025	20	20	0.0137	1.00	0.014
K1902061-026	20	20	0.0176	1.00	0.018
K1902061-027	20	20	0.0036	1.00	0.004

%REC

1

102

96

Calibration info. 1 STD 1.0 mg/L 2 STD 10.0 mg/L 3 STD 100 mg/L

1-100ppm Slope: -58.7

1ppm F/2-73-K 10ppm F/2-39-C 100ppm F/2-21-C 1000ppm F/2-3-M

CCV= 5ppm F/2-55-A LCS TV= 18.3 mg/L F/2-85-H

Probe F/2-99-K Instrument K-ISE-02

	DATE	TIME
Analyzed By:	AC 3/19/2019 3-20-19	10:00AM 9:50 AM
Reviewed By:	<i>[Signature]</i>	03/20/19

Revision 1-R:/WET/ANALYSES/FLUOR/FIN SOLUTION\_LIMS

COLUMBIA ANALYTICAL SERVICES, INC.

Work Order #.:

Fluoride

Analysis Method 340.2/SM 4500-F C

Prep. Method : CAS SOP

Sample Number	Sample Aliquot, mL	Final Vol. mL	Reading mg/L	Dilution	mg/L Sample Reported
CCV3	20	20	4.81	1.00	4.810
CCB3	20	20	0.0724	1.00	0.072
K1902061-028	20	20	0.0311	1.00	0.031
MB	20	20	0.0364	1.00	0.036
LCS	20	20	17.6	1.00	17.600
<del>K1902202-001</del>	<del>5</del>	<del>20</del>	<del>46.5</del>	<del>4.00</del>	<del>186.000</del>
<del>K1902202-001d</del>	<del>20</del>	<del>20</del>	<del>9.84</del>	<del>1.00</del>	<del>9.840</del>
K1902202-001ms	20	20	84.9	1.00	84.900
K1902202-001msd	20	20	60.5	1.00	60.500
K1902331-001	20	20	1.83	1.00	1.830
MB	20	20	0.123	1.00	0.123
LCS	20	20	18.2	1.00	18.200
CCV4	20	20	4.94	1.00	4.940
CCB4	20	20	0.0423	1.00	0.042
K1902114-001	20	20	0.625	1.00	0.625
K1902114-001d	20	20	0.629	1.00	0.629
K1902114-001ms	20	20	25.8	1.00	25.800
K1902114-001msd	20	20	25.7	1.00	25.700
K1902124-001	20	20	0.612	1.00	0.612
0.2 STD	20	20	0.196	1.00	0.196
CCV5	20	20	4.77	1.00	4.770
CCB5	20	20	0.0029	1.00	0.003
K1902202-1t	20	20	81.0	1.00	81.000
K1902202-1q	20	20	76.9	1.00	76.900

%REC

96

NR

NR

99

98

95

2114-1ms/1msd=0.5mlx1000ppm/20ml=25

		DATE	TIME
Analyzed By:	AC	3/19/2019 3-20-19	10:00:00 AM 9:50 AM
Reviewed By:	<i>[Signature]</i>		03/20/19

COLUMBIA ANALYTICAL SERVICES, INC.

Work Order #: \_\_\_\_\_

Fluoride

Analysis Method 340.2/SM 4500-F C

Prep. Method : CAS SOP

Sample Number	Sample Aliquot, mL	Final Vol. mL	Reading mg/L	Dilution	mg/L Sample Reported
0.2 std	20	20	0.191	1.00	0.191
CCV6	20	20	4.65	1.00	4.650
CCB6	20	20	0.025	1.00	0.025

%REC  
96  
95

		DATE	TIME
Analyzed By:	ac	3-19-19 3-20-19	10:00am 09:50 am
Reviewed By:			03/20/19

# Preparation Information Benchsheet

Prep Run#: 333128

Team: GenChem/ACHEATLEY

Prep Workflow: GenExt28Day

Prep Method: ALS SOP

Status: Prepped

Prep Date/Time: 3/18/19 10:30 AM

Number of Copies to make: 1

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Final Vol	Sample Description
1	K1902061-013	18-E2-SB-CH-051	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0064g	42.00mL	
2	K1902061-028	18-D7-WW-CH-209	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0402g	37.00mL	
3	K1902061-014	18-E5-NG-CH-055	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0053g	36.00mL	
4	K1902061-015	18-E5-FC-CH-057	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0072g	48.00mL	
5	KQ1903470-05	MB		SM 4500-F- C Modified/F		Tissue	1.0000g	49.00mL	
6	KQ1903470-04	LCS		SM 4500-F- C Modified/F		Tissue	1.0000g	45.00mL	
7	KQ1903470-02	K1902061-015 MS	.01	SM 4500-F- C Modified/F		Tissue	1.0166g	37.00mL	
8	KQ1903470-03	K1902061-015 DMS	.01	SM 4500-F- C Modified/F		Tissue	1.0038g	45.00mL	
9	KQ1903470-01	K1902061-015 DUP	.01	SM 4500-F- C Modified/F		Tissue	1.0026g	42.00mL	
10	K1902061-016	18-E6-NG-CH-061	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0093g	45.00mL	
11	K1902061-017	18-S1-NG-CH-069	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0096g	46.00mL	
12	K1902061-018	18-S1-SB-CH-071	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0197g	44.00mL	
13	K1902061-019	18-S2-NG-CH-075	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0055g	37.00mL	
14	K1902061-020	18-S2-SB-CH-077	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0424g	45.00mL	
15	K1902061-021	18-S4-NG-CH-093	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0006g	44.00mL	
16	K1902061-022	18-S4-SB-CH-095	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0047g	44.00mL	
17	K1902061-023	18-S7-NG-CH-085	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0214g	46.00mL	
18	K1902061-024	18-D3-NG-CH-203	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0219g	47.00mL	
19	K1902061-025	18-D9-NG-CH-220	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0006g	44.00mL	
20	K1902061-026	18-D5-SB-CH-205	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0106g	42.00mL	
21	K1902061-027	18-D6-FC-CH-207	.01	SM 4500-F- C Modified/F		Plant Tissue	1.0209g	43.00mL	

**Spiking Solutions**

*TISAB F/2-96-I*

Name: Fluoride 1000 ppm F	Inventory ID: 61469	Logbook Ref: <i>F/2-k F/2-3-M</i>	Expires On: <i>02/28/2014</i> <i>9-13-19</i>
KQ1903470-02 1.00mL	KQ1903470-03 1.00mL		

Name: Fluoride ERA LCS	Inventory ID: 194604	Logbook Ref: F/2-85-H	Expires On: <i>11/01/2019</i> <i>6-1-19</i>
KQ1903470-04 1.00g			

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# Preparation Information Benchsheet

Prep Run#: 333128

Team: GenChem/ACHEATLEY

Prep WorkFlow: GenExt28Day

Prep Method: ALS SOP

Status: Prepped

Prep Date/Time: 3/18/19 10:30 AM

## Preparation Steps

Step: Extraction  
Started: 3/18/19 10:30  
Finished: 3/19/19 10:15  
By: ACHEATLEY  
Comments

Comments: \_\_\_\_\_

Reviewed By:     *Fluery*     Date:     03/20/19    

### Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u> Yes      No
Received By: _____	Date: _____	

# Preparation Information Benchsheet

Prep Run#: 332902

Team: GenChem/ACHEATLEY

Number of Copies to make: 2

Prep Workflow: Gen Dist SFluor

Prep Method: SM 4500-F-B Modified

Status: Prepped

Prep Date/Time: 3/19/19 10:00 AM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Final Vol	Sample Description
1	K1902202-001	Biosolids	.02	SM 4500-F- C Modified/F Dist		Sludge, Solid	1.0026g	44.00mL	SSPAIN K-Balance-49
2	KQ1903248-05	LCS		SM 4500-F- C Modified/F Dist		Solid	1.0000g	49.00mL	
3	KQ1903248-04	MB		SM 4500-F- C Modified/F Dist		Solid	1.0000g	46.00mL	
4	K1902331-001	1908097-01	.01	SM 4500-F- C Modified/F Dist		Misc. Solid	1.0127g	47.00mL	
5	KQ1903248-01	K1902202-001 DUP	.02	SM 4500-F- C Modified/F Dist		Solid	1.0052g	45.00mL	SSPAIN K-Balance-49
6	KQ1903248-02	K1902202-001 MS	.02	SM 4500-F- C Modified/F Dist		Solid	1.120g	45.00mL	SSPAIN K-Balance-49
7	KQ1903248-03	K1902202-001 DMS	.02	SM 4500-F- C Modified/F Dist		Solid	1.262g	47.00mL	SSPAIN K-Balance-49

**Spiking Solutions**

*TISAB*

Name: Fluoride 1000 ppm F      Inventory ID: 61469      Logbook Ref: ~~F/2-2-k~~ *F/2-3 M*      Expires On: ~~02/28/2014~~ *9-13-19*  
 KQ1903248-02 1.00mL      KQ1903248-03 1.00mL

Name: Fluoride ERA LCS      Inventory ID: 194604      Logbook Ref: F/2-85-H      Expires On: ~~11/01/2019~~ *6-1-9*  
 KQ1903248-05 1.00g

**Preparation Steps**

Step: Distillation  
 Started: 3/19/19 10:00  
 Finished: 3/20/19 09:50  
 By: ACHEATLEY  
 Comments:

Comments: \_\_\_\_\_

Reviewed By: *Prepped*      Date: *03/20/19*

Chain of Custody

Relinquished By: _____	Date: _____	Extracts Examined Yes      No
Received By: _____	Date: _____	

# ALS Environmental - Laboratory Note Sheet

Service Request Number(s):

Sample Number	Sample wt (g)	Total Vol mls.		Sample wt (g)	Total Vol (mls)
NLB	1.000	49	2061-28	1.04850	
LCS	1.000	45		1.0402	
2041-13	1.0064	42			
-14	1.0053	36			
-15	1.0072	48			
-15d	1.0026	42			
-15ms	1.0164	37			
-15msd	1.0038	45			
-14	1.0073	45			
-17	1.0096	46			
-18	1.0197	44			
-19	1.0055	37			
-20	1.0424	45			
-21	1.0006	44			
-22	1.0047	44			
-23	1.0214	46			
-24	1.0219	47			
-25	1.0006	44			
-24	1.0106	42			
✓ -27	1.0209	43			

Comments/Notes:

Spilled at 3/18/19

Analyst:

*A. Clayton*

Date:

3/18/19 1030

Reviewed:

*Frederick*

Date:

03/20/19

# ALS Environmental - Laboratory Note Sheet

Service Request Number(s):

Sample Number	total wt (g)	total Vol ml.				
MB	1.000	46				
LCS	1.000	49				
2202-1	1.398	47	NR			
↓ -1d	7.414	47	NR			
↓ -1ms	1.120	45				
↓ -1msd	1.202	47				
2331-1	1.0127	47				
2202-14	1.0026	44	(1)			
↓ -1g	1.0052	45	(1d)			

Comments/Notes:

Analyst:	A. Chatterjee	Date:	3-19-19
Reviewed:	[Signature]	Date:	03/20/19

On 3-19-19





STANTEC CONSULTING LTD.  
ATTN: Katherine Ketis  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Date Received: 15-JAN-19  
Report Date: 04-NOV-19 10:18 (MT)  
Version: FINAL REV. 5

Client Phone: 519-836-6050

## Certificate of Analysis

**Lab Work Order #:** L2222986  
**Project P.O. #:** NOT SUBMITTED  
**Job Reference:** 122160003  
**C of C Numbers:**  
**Legal Site Desc:**

**Comments:** ADDITIONAL 05-JUN-19 14:02  
4-NOV-2019 Revised

Lynne Wrona, M.Sc.  
Account Manager

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ADDRESS: 1435 Norjohn Court, Unit 1, Burlington, ON, L7L 0E6 Canada | Phone: +1 905 331 3111 | Fax: +1 905 331 4567  
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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-1 18-W2-SS-CH-001							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 14:30							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	10.2		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	3.17		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0492		0.0050	mg/kg	15-MAR-19	19-MAR-19	R4570191
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	16600		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Arsenic (As)	7.05		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Barium (Ba)	67.5		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Beryllium (Be)	0.77		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Boron (B)	10.6		5.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Cadmium (Cd)	0.458		0.020	mg/kg	15-MAR-19	18-MAR-19	R4570390
Calcium (Ca)	4850		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Chromium (Cr)	24.1		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Cobalt (Co)	7.53		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Copper (Cu)	14.3		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Iron (Fe)	19400		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Lead (Pb)	16.9		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Magnesium (Mg)	4420		20	mg/kg	15-MAR-19	18-MAR-19	R4570390
Manganese (Mn)	356		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Molybdenum (Mo)	2.08		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Nickel (Ni)	19.1		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Phosphorus (P)	606		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Potassium (K)	1900		100	mg/kg	15-MAR-19	18-MAR-19	R4570390
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Sodium (Na)	63		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Strontium (Sr)	13.9		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	18-MAR-19	R4570390
Thallium (Tl)	0.253		0.050	mg/kg	15-MAR-19	18-MAR-19	R4570390
Titanium (Ti)	162		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Vanadium (V)	41.3		0.20	mg/kg	15-MAR-19	18-MAR-19	R4570390
Zinc (Zn)	58.0		2.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Zirconium (Zr)	1.8		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.289	[J]	0.014	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.327	J,B	0.0094	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.278	J,B	0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.493	J,B	0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.517	M,J	0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	7.20		0.015	pg/g	07-MAR-19	17-MAR-19	R4579287
OCDD	42.7		0.028	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,7,8-TCDF	0.364	M,J	0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.250	M,J,R	0.013	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.662	[J]	0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.431	J,B	0.0080	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.401	J,B	0.0076	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.526	J,B	0.0074	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.158	J,B	0.0084	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	2.23	[J]	0.010	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.244	J,B	0.012	pg/g	07-MAR-19	17-MAR-19	R4579287
OCDF	3.64	J,B	0.012	pg/g	07-MAR-19	17-MAR-19	R4579287
Total-TCDD	1.41		0.014	pg/g	07-MAR-19	17-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-1 18-W2-SS-CH-001							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 14:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total TCDD # Homologues	9				07-MAR-19	17-MAR-19	R4579287
Total-PeCDD	3.55		0.0094	pg/g	07-MAR-19	17-MAR-19	R4579287
Total PeCDD # Homologues	8				07-MAR-19	17-MAR-19	R4579287
Total-HxCDD	6.80		0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	17-MAR-19	R4579287
Total-HpCDD	13.4		0.015	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	17-MAR-19	R4579287
Total-TCDF	7.47		0.011	pg/g	07-MAR-19	17-MAR-19	R4579287
Total TCDF # Homologues	17				07-MAR-19	17-MAR-19	R4579287
Total-PeCDF	8.29		0.013	pg/g	07-MAR-19	17-MAR-19	R4579287
Total PeCDF # Homologues	12				07-MAR-19	17-MAR-19	R4579287
Total-HxCDF	5.38		0.0084	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HxCDF # Homologues	10				07-MAR-19	17-MAR-19	R4579287
Total-HpCDF	3.81		0.012	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HpCDF # Homologues	4				07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	90.0		25-164	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	80.0		25-181	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	86.0		32-141	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	87.0		28-130	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	94.0		23-140	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-OCDD	80.0		17-157	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	91.0		24-169	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	86.0		24-185	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	85.0		21-178	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	96.0		26-152	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	90.0		26-123	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	95.0		29-147	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	111.0		28-136	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	98.0		28-143	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	108.0		26-138	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	88.0		35-197	%	07-MAR-19	17-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.24			pg/g	07-MAR-19	17-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.25			pg/g	07-MAR-19	17-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.25			pg/g	07-MAR-19	17-MAR-19	R4579287
L2222986-2 18-W2-NG-CH-003							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:20							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	77.4		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	2520		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0231		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	1760		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	1.01		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	35.1		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.040		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	13.8		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	6.2		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-2 18-W2-NG-CH-003							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:20							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Cadmium (Cd)-Total	0.0648		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	4730		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.637		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.042		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	6.22		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	74.4		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.275		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	1700		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	32.1		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	4.05		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.62		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	2530		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	14200		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	38		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	10.6		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.13		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	19.0		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.056	[U]	0.056	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.082	M,J,R	0.020	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.090	M,J,B	0.027	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.130	M,J,R	0.025	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.130	M,J,R	0.025	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.39	[J]	0.044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	7.86	[J]	0.040	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	0.120	M,J,R	0.032	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.108	M,J,B	0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.084	J,B	0.020	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.121	M,J,B	0.025	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.104	M,J	0.026	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.063	M,J,R	0.025	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.056	M,J,R	0.034	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.590	[J]	0.017	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	<0.024	[U]	0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDF	1.57	[J]	0.027	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	0.308		0.056	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	0.901		0.020	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	4				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	2.97		0.027	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	4				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	3.83		0.044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-TCDF	1.82		0.032	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	9				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	1.28		0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	6				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	0.841		0.034	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	4				11-MAR-19	27-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-2 18-W2-NG-CH-003							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:20							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total-HpCDF	0.590		0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	84.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	99.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	82.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	86.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	83.0		23-140	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-OCDD	66.0		17-157	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	85.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	89.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	93.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	79.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	81.0		26-123	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	80.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	80.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	82.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	81.0		26-138	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	85.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0825			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.243			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.271			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-3 18-W2-WW-CH-005							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 14:15							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	30.7		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	668		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0062		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	1350		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	3.0		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	4.05		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	1.3		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0780		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	617		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.050		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	4.52		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	37.7		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.026		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	1210		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	19.6		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	1.02		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	3500		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	5850		20	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-3 18-W2-WW-CH-005							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 14:15							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	1.72		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	21.0		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.013	[U]	0.013	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0072	M,J	0.0055	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.0065	M,J,R	0.0047	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.0072	M,J,B	0.0044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0091	M,J,R	0.0044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0496	M,J,B	0.0078	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	0.460	J,B	0.0055	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	0.0180	M,J	0.0090	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0180	M,J,B	0.0058	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.0072	M,J,B	0.0047	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0165	M,J,B	0.0044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0089	M,J,R	0.0043	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0075	M,J,R	0.0044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0170	M,J,R	0.0057	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0524	M,J,B	0.0045	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0129	M,J,B	0.0057	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDF	0.205	J,B	0.0063	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	<0.013	[U]	0.013	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	0.0596		0.0055	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	3				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	0.0259		0.0047	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	0.0496		0.0078	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-TCDF	0.0474		0.0090	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	3				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	0.0503		0.0058	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	3				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	0.0165		0.0057	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-HpCDF	0.0805		0.0057	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	3				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	86.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	92.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	82.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	82.0		23-140	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-OCDD	68.0		17-157	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	83.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	90.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	88.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	80.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	83.0		26-123	%	11-MAR-19	27-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-3 18-W2-WW-CH-005 Sampled By: Pascal Tuarze on 05-JUL-18 @ 14:15 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	79.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	80.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	79.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	79.0		26-138	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	83.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0154			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0268			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0333			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-4 18-W4-SS-CH-007 Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:15 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	23.1		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	0.90		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0533		0.0050	mg/kg	15-MAR-19	19-MAR-19	R4570191
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	25800		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Arsenic (As)	6.42		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Barium (Ba)	115		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Beryllium (Be)	1.30		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Boron (B)	22.5		5.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Cadmium (Cd)	0.510		0.020	mg/kg	15-MAR-19	18-MAR-19	R4570390
Calcium (Ca)	5760		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Chromium (Cr)	40.6		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Cobalt (Co)	10.9		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Copper (Cu)	28.1		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Iron (Fe)	27800		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Lead (Pb)	18.7		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Magnesium (Mg)	7450		20	mg/kg	15-MAR-19	18-MAR-19	R4570390
Manganese (Mn)	321		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Molybdenum (Mo)	1.93		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Nickel (Ni)	35.0		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Phosphorus (P)	1180		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Potassium (K)	4900		100	mg/kg	15-MAR-19	18-MAR-19	R4570390
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Sodium (Na)	87		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Strontium (Sr)	23.0		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	18-MAR-19	R4570390
Thallium (Tl)	0.354		0.050	mg/kg	15-MAR-19	18-MAR-19	R4570390
Titanium (Ti)	181		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Vanadium (V)	52.5		0.20	mg/kg	15-MAR-19	18-MAR-19	R4570390
Zinc (Zn)	103		2.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Zirconium (Zr)	3.6		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.560	[J]	0.019	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.361	J,B	0.012	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.368	J,B	0.026	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	1.41	[J]	0.028	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.979	M,J	0.027	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	24.5		0.026	pg/g	07-MAR-19	17-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-4 18-W4-SS-CH-007 Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:15 Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
OCDD	116		0.037	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,7,8-TCDF	0.510	M,J,R	0.025	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.373	M,J,B	0.029	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.686	M,J	0.024	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.593	J,B	0.016	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.543	J,B	0.014	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.736	[J]	0.015	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.204	J,B	0.017	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	7.62		0.017	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.497	J,B	0.021	pg/g	07-MAR-19	17-MAR-19	R4579287
OCDF	16.6		0.017	pg/g	07-MAR-19	17-MAR-19	R4579287
Total-TCDD	3.35		0.019	pg/g	07-MAR-19	17-MAR-19	R4579287
Total TCDD # Homologues	12				07-MAR-19	17-MAR-19	R4579287
Total-PeCDD	3.93		0.012	pg/g	07-MAR-19	17-MAR-19	R4579287
Total PeCDD # Homologues	7				07-MAR-19	17-MAR-19	R4579287
Total-HxCDD	11.2		0.028	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HxCDD # Homologues	8				07-MAR-19	17-MAR-19	R4579287
Total-HpCDD	39.4		0.026	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	17-MAR-19	R4579287
Total-TCDF	10.3		0.025	pg/g	07-MAR-19	17-MAR-19	R4579287
Total TCDF # Homologues	17				07-MAR-19	17-MAR-19	R4579287
Total-PeCDF	8.80		0.029	pg/g	07-MAR-19	17-MAR-19	R4579287
Total PeCDF # Homologues	15				07-MAR-19	17-MAR-19	R4579287
Total-HxCDF	9.55		0.017	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HxCDF # Homologues	10				07-MAR-19	17-MAR-19	R4579287
Total-HpCDF	17.3		0.021	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HpCDF # Homologues	4				07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	72.0		25-164	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	69.0		25-181	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	77.0		32-141	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	73.0		28-130	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	83.0		23-140	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-OCDD	70.0		17-157	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	72.0		24-169	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	71.0		24-185	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	73.0		21-178	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	81.0		26-152	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	79.0		26-123	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	83.0		29-147	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	93.0		28-136	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	84.0		28-143	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	75.0		35-197	%	07-MAR-19	17-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.99			pg/g	07-MAR-19	17-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	2.04			pg/g	07-MAR-19	17-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	2.04			pg/g	07-MAR-19	17-MAR-19	R4579287
L2222986-5 18-W4-NG-CH-009 Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	80.9		0.10	%	11-MAR-19	12-MAR-19	R4558429

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-5 18-W4-NG-CH-009							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00							
Matrix: Plant Tissue							
Chloride (Cl)	27500		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0165		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	3430		100	mg/kg	21-MAR-19	26-MAR-19	R4585028
Titanium (Ti)-Total	1.64		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	67.7		2.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Arsenic (As)-Total	0.049		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Barium (Ba)-Total	14.6		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	26-MAR-19	R4585028
Boron (B)-Total	5.5		1.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Cadmium (Cd)-Total	0.274		0.0050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Calcium (Ca)-Total	5240		20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Chromium (Cr)-Total	0.413		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Cobalt (Co)-Total	0.078		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Copper (Cu)-Total	7.92		0.10	mg/kg	21-MAR-19	26-MAR-19	R4585028
Iron (Fe)-Total	132		3.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Lead (Pb)-Total	0.216		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Magnesium (Mg)-Total	3440		2.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Manganese (Mn)-Total	91.7		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Molybdenum (Mo)-Total	4.49		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Nickel (Ni)-Total	2.55		0.20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Phosphorus (P)-Total	5990		10	mg/kg	21-MAR-19	26-MAR-19	R4585028
Potassium (K)-Total	45100		20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Sodium (Na)-Total	87		20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Strontium (Sr)-Total	9.02		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Thallium (Tl)-Total	0.0034		0.0020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Vanadium (V)-Total	0.21		0.10	mg/kg	21-MAR-19	26-MAR-19	R4585028
Zinc (Zn)-Total	27.0		0.50	mg/kg	21-MAR-19	26-MAR-19	R4585028
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	26-MAR-19	R4585028
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.59	[U]	0.59	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<1.0	[U]	1.0	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.84	[U]	0.84	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.67	[U]	0.67	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.079	[U]	0.079	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.072	[U]	0.072	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	<0.070	[U]	0.070	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.31	[U]	0.31	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.27	[U]	0.27	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	0.67	M,J	0.17	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.24	[U]	0.24	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.48	[U]	0.48	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.52	[U]	0.52	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.47	[U]	0.47	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.33	[U]	0.33	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.23	[U]	0.23	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.25	[U]	0.25	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.64	[U]	0.64	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<1.8	U,1	1.8	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	0.215	M,J	0.063	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	71.0		16-129	%	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-5 18-W4-NG-CH-009							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Surrogate: gamma-BHC-D6	74.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	39.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	61.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	56.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	60.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	68.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	61.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	107.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	95.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	61.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.47	[U]	0.47	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.18	[U]	0.18	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.081	M,J	0.050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.069	M,J,R	0.048	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.083	M,J,B	0.044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.110	M,J,R	0.044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.27	[J]	0.047	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	5.50	[J]	0.054	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	<0.13	[U]	0.13	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.110	M,J,R	0.054	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.055	M,J,R	0.040	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.095	M,J,R	0.034	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.117	M,J	0.033	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.053	M,J,R	0.031	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.100	M,J,R	0.040	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.445	M,J,B	0.030	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.046	M,J,R	0.037	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDF	0.846	J,B	0.050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	<0.18	[U]	0.18	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	0.773		0.050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	5				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	0.792		0.048	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	3.13		0.047	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-TCDF	<0.13	[U]	0.13	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	0.089		0.054	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	0.685		0.040	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	4				11-MAR-19	27-MAR-19	R4586945
Total-HpCDF	0.682		0.037	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	87.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	146.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	80.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	82.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	94.0		23-140	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-OCDD	89.0		17-157	%	11-MAR-19	27-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-5 18-W4-NG-CH-009							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-2,3,7,8-TCDF	83.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	123.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	136.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	71.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	74.0		26-123	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	74.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	77.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	86.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	100.0		26-138	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	86.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.120			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.279			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.376			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-6 18-W4-FC-CH-011							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:30							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	28.8		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	457		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	1050		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	2.1		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	0.0055		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	48		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	1.67		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	16.4		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	1020		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	3.42		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	0.297		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	3130		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	4070		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	0.055		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	18.4		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Chlorophenols as acetate derivatives</b>							
Pentachlorophenol	<1.9	[U]	1.9	ng/g	21-MAR-19	28-MAR-19	R4681338
Surrogate: 13C6-Pentachlorophenol	45.6	G	50-150	%	21-MAR-19	28-MAR-19	R4681338

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-6 18-W4-FC-CH-011							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:30							
Matrix: Plant Tissue							
Note: The recovery of 13C6-Pentachlorophenol is below the method control limit. PCP has not been detected							
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.019	[U]	0.019	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.034	[U]	0.034	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.027	[U]	0.027	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.022	[U]	0.022	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.0023	[U]	0.0023	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.0027	[U]	0.0027	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	<0.0022	[U]	0.0022	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.014	[U]	0.014	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.012	[U]	0.012	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	<0.0063	[U]	0.0063	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.0099	[U]	0.0099	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.031	[U]	0.031	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.014	[U]	0.014	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.049	[U]	0.049	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.019	[U]	0.019	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.0085	[U]	0.0085	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.020	[U]	0.020	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.047	[U]	0.047	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<0.23	U,1.	0.23	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.0053	[U]	0.0053	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	79.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	83.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	42.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	71.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	61.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	51.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	72.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	37.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	70.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	54.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	39.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.015	[U]	0.015	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.015	[U]	0.015	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	<0.0050	[U]	0.0050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	<0.0057	[U]	0.0057	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.0084	M,J,B	0.0053	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0088	M,J,R	0.0053	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0240	M,J,R	0.0077	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	0.207	J,B	0.0084	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	<0.0091	[U]	0.0091	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0098	M,J,B	0.0045	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	<0.0036	[U]	0.0036	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0084	M,J,B	0.0038	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0045	M,J,R	0.0036	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0077	M,J,R	0.0038	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0130	M,J,R	0.0050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0320	M,J,R	0.0046	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	<0.0062	[U]	0.0062	pg/g wwt	11-MAR-19	27-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-6 18-W4-FC-CH-011							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:30							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
OCDF	0.152	M,J,B	0.0072	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	<0.015	[U]	0.015	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	<0.0050	[U]	0.0050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	0.0084		0.0057	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	<0.0077	[U]	0.0077	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-TCDF	<0.0091	[U]	0.0091	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	0.0098		0.0045	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	0.0161		0.0050	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-HpCDF	0.0105		0.0062	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	81.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	85.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	82.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	79.0		23-140	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-OCDD	62.0		17-157	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	79.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	79.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	82.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	76.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	78.0		26-123	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	77.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	72.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	76.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	77.0		26-138	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	81.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.00208			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0174			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0287			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-7 18-N2-SS-CH-013							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:30							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	24.0		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	1.44		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0605		0.0050	mg/kg	15-MAR-19	19-MAR-19	R4570191
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	25600		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Arsenic (As)	5.38		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Barium (Ba)	112		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Beryllium (Be)	1.24		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Boron (B)	17.0		5.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Cadmium (Cd)	0.518		0.020	mg/kg	15-MAR-19	18-MAR-19	R4570390

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-7 18-N2-SS-CH-013							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:30							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Calcium (Ca)	5780		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Chromium (Cr)	39.7		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Cobalt (Co)	11.2		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Copper (Cu)	33.5		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Iron (Fe)	24700		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Lead (Pb)	16.5		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Magnesium (Mg)	6950		20	mg/kg	15-MAR-19	18-MAR-19	R4570390
Manganese (Mn)	324		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Molybdenum (Mo)	1.23		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Nickel (Ni)	35.4		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Phosphorus (P)	943		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Potassium (K)	4010		100	mg/kg	15-MAR-19	18-MAR-19	R4570390
Silver (Ag)	0.10		0.10	mg/kg	15-MAR-19	18-MAR-19	R4570390
Sodium (Na)	68		50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Strontium (Sr)	22.5		0.50	mg/kg	15-MAR-19	18-MAR-19	R4570390
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	18-MAR-19	R4570390
Thallium (Tl)	0.235		0.050	mg/kg	15-MAR-19	18-MAR-19	R4570390
Titanium (Ti)	158		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Vanadium (V)	45.2		0.20	mg/kg	15-MAR-19	18-MAR-19	R4570390
Zinc (Zn)	85.1		2.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
Zirconium (Zr)	6.0		1.0	mg/kg	15-MAR-19	18-MAR-19	R4570390
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.322	[J]	0.015	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.251	J,B	0.013	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.245	J,B	0.023	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.485	J,B	0.024	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.499	M,J	0.023	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	5.76		0.022	pg/g	07-MAR-19	17-MAR-19	R4579287
OCDD	32.7		0.025	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,7,8-TCDF	0.340	M,J,R	0.017	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.314	M,J,B	0.027	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.582	[J]	0.022	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.437	J,B	0.0069	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.360	J,B	0.0065	pg/g	07-MAR-19	17-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.390	J,R	0.0064	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.152	J,B	0.0077	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.91	[J]	0.012	pg/g	07-MAR-19	17-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.164	J,B	0.014	pg/g	07-MAR-19	17-MAR-19	R4579287
OCDF	2.80	J,B	0.016	pg/g	07-MAR-19	17-MAR-19	R4579287
Total-TCDD	2.72		0.015	pg/g	07-MAR-19	17-MAR-19	R4579287
Total TCDD # Homologues	11				07-MAR-19	17-MAR-19	R4579287
Total-PeCDD	3.98		0.013	pg/g	07-MAR-19	17-MAR-19	R4579287
Total PeCDD # Homologues	9				07-MAR-19	17-MAR-19	R4579287
Total-HxCDD	7.55		0.024	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	17-MAR-19	R4579287
Total-HpCDD	11.5		0.022	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	17-MAR-19	R4579287
Total-TCDF	9.00		0.017	pg/g	07-MAR-19	17-MAR-19	R4579287
Total TCDF # Homologues	17				07-MAR-19	17-MAR-19	R4579287
Total-PeCDF	7.35		0.027	pg/g	07-MAR-19	17-MAR-19	R4579287
Total PeCDF # Homologues	15				07-MAR-19	17-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-7 18-N2-SS-CH-013							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total-HxCDF	4.35		0.0077	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HxCDF # Homologues	9				07-MAR-19	17-MAR-19	R4579287
Total-HpCDF	3.18		0.014	pg/g	07-MAR-19	17-MAR-19	R4579287
Total HpCDF # Homologues	4				07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	84.0		25-164	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	79.0		25-181	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	87.0		32-141	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	89.0		23-140	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-OCDD	71.0		17-157	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	86.0		24-169	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	83.0		24-185	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	85.0		21-178	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	96.0		26-152	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	90.0		26-123	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	95.0		29-147	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	104.0		28-136	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	94.0		28-143	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	102.0		26-138	%	07-MAR-19	17-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	80.0		35-197	%	07-MAR-19	17-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.06			pg/g	07-MAR-19	17-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.14			pg/g	07-MAR-19	17-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.14			pg/g	07-MAR-19	17-MAR-19	R4579287
L2222986-8 18-N2-SD-CH-015							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:40							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
% Moisture	63.3		0.10	%	12-MAR-19	13-MAR-19	R4560298
Chloride (Cl)	80.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	2.94		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0698		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	31800		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.48		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	139		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	1.18		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	23.8		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.706		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	39900		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	42.8		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	10.8		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	28.5		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	28300		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	16.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	19400		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	289		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	1.96		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	37.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	945		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	5070		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-8 18-N2-SD-CH-015							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:40							
Matrix: Sediment							
<b>Metals in Soil by CRC ICPMS</b>							
Sodium (Na)	312		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	52.7		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.395		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	146		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	56.0		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	122		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	3.9		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.023	[U]	0.023	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.039	[U]	0.039	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.033	[U]	0.033	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.027	[U]	0.027	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0022	[U]	0.0022	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0020	[U]	0.0020	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	<0.0028	[U]	0.0028	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.0084	[U]	0.0084	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	0.0221	M,J	0.0077	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	0.0139	M,J	0.0065	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	0.0159	M,J	0.0089	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.0064	[U]	0.0064	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.024	[U]	0.024	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0050	[U]	0.0050	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.101	M,J	0.0050	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	0.0150	M,J,R	0.0034	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.020	J,R	0.010	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.15	U,1.	0.15	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.00330	M,J,R	0.00064	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	99.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	101.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	57.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	87.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	83.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	79.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	92.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	106.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	72.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	70.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	97.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.019	[U]	0.019	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	97.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
L2222986-9 18-N2-NG-CH-019							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 09:05							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	75.8		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	10200		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0182		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	4830		100	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-9 18-N2-NG-CH-019							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 09:05							
Matrix: Plant Tissue							
Titanium (Ti)-Total	2.36		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	126		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.120		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	17.2		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	9.7		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0379		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	9040		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.800		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.083		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	6.87		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	209		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.202		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	4340		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	155		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	8.19		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.69		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	4290		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	28500		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	40		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	18.7		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0034		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.29		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	29.2		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.082	[U]	0.082	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.071	M,J,R	0.029	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.113	M,J,B	0.029	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.123	M,J,B	0.027	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.100	M,J,R	0.027	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.16	[J]	0.036	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	4.43	[J]	0.059	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	0.176	M,J	0.049	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.123	M,J,B	0.032	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.094	M,J,B	0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.101	M,J,B	0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.104	M,J	0.024	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.101	M,J,B	0.026	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.091	J,B	0.031	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.462	J,B	0.034	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	<0.044	[U]	0.044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDF	0.732	J,B	0.049	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	0.726		0.082	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	1.19		0.029	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	4				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	2.18		0.029	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	4				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	3.13		0.036	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-9 18-N2-NG-CH-019 Sampled By: Pascal Tuarze on 17-OCT-18 @ 09:05 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total-TCDF	2.00		0.049	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	9				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	1.33		0.032	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	6				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	1.04		0.031	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	7				11-MAR-19	27-MAR-19	R4586945
Total-HpCDF	0.462		0.044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	74.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	87.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	76.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	77.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	75.0		23-140	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-OCDD	41.0		17-157	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	80.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	85.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	75.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	74.0		26-123	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	71.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	73.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	69.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	71.0		26-138	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	78.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.131			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.253			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.294			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-10 18-N2-FC-CH-021 Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:55 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	35.7		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	398		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	1060		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	2.2		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	0.0079		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	23		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	1.30		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	17.6		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-10 18-N2-FC-CH-021							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:55							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Magnesium (Mg)-Total	1130		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	3.29		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	0.400		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	0.23		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	3330		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	4010		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	16.2		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.017	[U]	0.017	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0123	M,J	0.0063	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.0084	M,J,R	0.0068	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	<0.0066	M,J,R	0.0066	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0120	M,J,R	0.0065	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0506	J,B	0.0077	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	0.424	J,B	0.0095	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	<0.0099	[U]	0.0099	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0130	M,J,B	0.0053	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.0076	M,J,R	0.0042	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0097	M,J,R	0.0042	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0089	M,J,R	0.0043	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0107	M,J,B	0.0044	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0130	M,J,B	0.0055	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0399	M,J,B	0.0047	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0100	M,J,B	0.0060	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDF	0.146	M,J,B	0.0082	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	<0.017	[U]	0.017	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	0.0123		0.0063	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	<0.0068	[U]	0.0068	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	0.0752		0.0077	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-TCDF	<0.0099	[U]	0.0099	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	0.0130		0.0053	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	0.0238		0.0055	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-HpCDF	0.0499		0.0060	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	78.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	86.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	84.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	79.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	85.0		23-140	%	11-MAR-19	27-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-10 18-N2-FC-CH-021 Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:55 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-OCDD	66.0		17-157	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	79.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	81.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	80.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	80.0		26-123	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	79.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	77.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	78.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	80.0		26-138	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	78.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0162			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0321			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0411			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-11 18-N4-SS-CH-023 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:30 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	11.0		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	23.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	4.86		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0409		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	14500		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.69		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	66.3		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.68		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	9.0		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.474		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	7860		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	21.7		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	7.45		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	13.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	16800		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	12.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	5020		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	344		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	1.35		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	18.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	572		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	1800		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	56		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	16.2		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.198		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	106		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	32.8		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	52.0		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	2.2		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>OC Pesticides by Method 1699</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-11 18-N4-SS-CH-023							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:30							
Matrix: Soil							
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.043	[U]	0.043	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.074	[U]	0.074	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.053	[U]	0.053	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.043	[U]	0.043	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0037	[U]	0.0037	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0031	[U]	0.0031	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	0.0213	M,J	0.0033	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.018	[U]	0.018	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.017	[U]	0.017	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	0.033	M,J	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.016	M,U	0.016	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.016	[U]	0.016	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.034	[U]	0.034	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0022	[U]	0.0022	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.331	M	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.304		0.015	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.17	U,1.	0.17	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.0082	J,B	0.0010	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	80.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	89.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	56.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	84.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	89.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	80.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	91.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	98.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	84.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	81.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	95.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.023	[U]	0.023	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	103.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.197	[J]	0.026	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.224	J,B	0.0096	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.190	M,J,R	0.014	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.456	J,B	0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.422	M,J	0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	5.46		0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDD	31.9		0.018	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,7,8-TCDF	0.345	M,J	0.021	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.256	M,J,B	0.012	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.488	[J]	0.010	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.372	J,B	0.0084	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.319	J,B	0.0083	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.396	J,B	0.0083	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.131	J,B	0.0096	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.70	[J]	0.0079	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.140	J,R	0.0098	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDF	2.46	J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-11 18-N4-SS-CH-023							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total-TCDD	1.46		0.026	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287
Total-PeCDD	2.74		0.0096	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287
Total-HxCDD	6.73		0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDD # Homologues	6				07-MAR-19	19-MAR-19	R4579287
Total-HpCDD	10.7		0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Total-TCDF	8.71		0.021	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDF # Homologues	22				07-MAR-19	19-MAR-19	R4579287
Total-PeCDF	6.86		0.012	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDF # Homologues	18				07-MAR-19	19-MAR-19	R4579287
Total-HxCDF	4.23		0.0096	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDF # Homologues	12				07-MAR-19	19-MAR-19	R4579287
Total-HpCDF	2.46		0.0098	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDF # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	85.0		25-164	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	78.0		25-181	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	88.0		32-141	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	84.0		28-130	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	94.0		23-140	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-OCDD	84.0		17-157	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	80.0		24-185	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	81.0		21-178	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	90.0		26-152	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	90.0		26-123	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	93.0		29-147	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	101.0		28-136	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	94.0		28-143	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	103.0		26-138	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	80.0		35-197	%	07-MAR-19	19-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.901			pg/g	07-MAR-19	19-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	0.921			pg/g	07-MAR-19	19-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	0.921			pg/g	07-MAR-19	19-MAR-19	R4579287
L2222986-12 18-N4-NG-CH-025							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 13:00							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	81.8		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	11800		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0189		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	3710		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	5.87		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	374		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.161		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	11.7		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	0.012		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-12 18-N4-NG-CH-025							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 13:00							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Boron (B)-Total	6.6		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0361		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	8070		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.866		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.139		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	4.62		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	357		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.251		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	3110		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	116		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	3.79		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.96		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	4060		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	23700		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	73		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	16.2		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0047		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.67		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	23.5		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	0.27		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.18	[U]	0.18	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.32	[U]	0.32	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.26	[U]	0.26	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.21	[U]	0.21	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.021	[U]	0.021	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.027	[U]	0.027	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	0.027	M,J,R	0.024	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.13	[U]	0.13	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	<0.22	[U]	0.22	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.34	[U]	0.34	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.26	[U]	0.26	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.25	[U]	0.25	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.64	[U]	0.64	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.54	[U]	0.54	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.15	[U]	0.15	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.48	[U]	0.48	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.55	[U]	0.55	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<2.3	U,1.	2.3	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.087	[U]	0.087	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	67.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	69.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	39.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	60.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	47.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	38.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	52.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	27.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	71.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	40.0		5-120	%	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-12 18-N4-NG-CH-025							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 13:00							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Surrogate: 4,4'-DDD, 13C12-Heptachlor Epoxide A	27.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
	<0.16	[U]	0.16	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.053	[U]	0.053	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.062	M,J	0.020	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.077	M,J,R	0.017	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.064	M,J,R	0.016	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.111	[J]	0.016	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.770	[J]	0.022	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDD	4.61	[J]	0.028	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,7,8-TCDF	0.090	M,J	0.037	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.098	M,J,B	0.021	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.052	J,B	0.016	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.076	M,J,B	0.013	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.076	M,J	0.014	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.062	M,J,B	0.014	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.090	M,J,B	0.018	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.353	J,B	0.012	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.055	M,J,R	0.015	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
OCDF	0.724	J,B	0.027	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total-TCDD	0.279		0.053	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDD # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Total-PeCDD	1.01		0.020	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDD # Homologues	5				11-MAR-19	27-MAR-19	R4586945
Total-HxCDD	1.54		0.017	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDD # Homologues	3				11-MAR-19	27-MAR-19	R4586945
Total-HpCDD	2.05		0.022	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	27-MAR-19	R4586945
Total-TCDF	0.998		0.037	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total TCDF # Homologues	8				11-MAR-19	27-MAR-19	R4586945
Total-PeCDF	1.09		0.021	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total PeCDF # Homologues	8				11-MAR-19	27-MAR-19	R4586945
Total-HxCDF	0.450		0.018	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HxCDF # Homologues	6				11-MAR-19	27-MAR-19	R4586945
Total-HpCDF	0.353		0.015	pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	80.0		25-164	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	93.0		25-181	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	89.0		32-141	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	87.0		28-130	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	91.0		23-140	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-OCDD	69.0		17-157	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	81.0		24-169	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	85.0		21-192	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	90.0		21-178	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	85.0		26-152	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	84.0		26-123	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	84.0		29-147	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	81.0		28-136	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	84.0		28-143	%	11-MAR-19	27-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	85.0		26-138	%	11-MAR-19	27-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-12 18-N4-NG-CH-025 Sampled By: Pascal Tuarze on 26-SEP-18 @ 13:00 Matrix: Plant Tissue <b>Dioxins and Furans HR 1613B</b> Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	83.0		31-197	%	11-MAR-19	27-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.144			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.185			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.212			pg/g wwt	11-MAR-19	27-MAR-19	R4586945
L2222986-13 18-N4-WW-CH-027 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:45 Matrix: Plant Tissue <b>Miscellaneous Parameters</b>							
% Moisture	33.7		0.10	%	11-MAR-19	12-MAR-19	R4557951
% Moisture	34.6		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	1080		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	1300		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	0.12		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	4.3		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	5.30		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	1.4		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0951		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	665		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	3.95		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	37.6		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	1090		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	22.4		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	0.995		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	3180		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	5660		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	2.29		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	16.4		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Chlorophenols as acetate derivatives</b>							
Pentachlorophenol	<2.0	[U]	2.0	ng/g	21-MAR-19	28-MAR-19	R4681338
Surrogate: 13C6-Pentachlorophenol	50.9		50-150	%	21-MAR-19	28-MAR-19	R4681338
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.041	[U]	0.041	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.073	[U]	0.073	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.055	[U]	0.055	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.044	[U]	0.044	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.0041	[U]	0.0041	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.0043	[U]	0.0043	ng/g	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-13 18-N4-WW-CH-027							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:45							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Heptachlor Epoxide	<0.0073	[U]	0.0073	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.032	[U]	0.032	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.028	[U]	0.028	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	<0.016	[U]	0.016	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.021	[U]	0.021	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.039	[U]	0.039	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.032	[U]	0.032	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.051	[U]	0.051	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.016	[U]	0.016	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.016	[U]	0.016	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.019	[U]	0.019	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.039	[U]	0.039	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<0.29	U,1.	0.29	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.0055	[U]	0.0055	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	59.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	63.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	36.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	52.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	50.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	46.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	59.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	51.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	102.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	67.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	48.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.049	[U]	0.049	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.089	[U]	0.089	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDD	<0.041	[U]	0.041	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	<0.039	[U]	0.039	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	0.040	M,J,R	0.035	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	<0.036	[U]	0.036	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	0.157	J,B	0.031	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDD	0.668	M,J	0.043	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,7,8-TCDF	<0.070	[U]	0.070	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDF	<0.046	[U]	0.046	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,7,8-PeCDF	<0.035	[U]	0.035	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	<0.028	[U]	0.028	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	<0.028	[U]	0.028	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	0.033	M,J,R	0.028	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	<0.040	M,U	0.040	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.090	M,J,R	0.025	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	<0.028	[U]	0.028	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDF	0.130	M,J,R	0.061	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total-TCDD	<0.089	[U]	0.089	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDD	<0.041	[U]	0.041	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HxCDD	<0.039	[U]	0.039	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HpCDD	0.157		0.031	pg/g wwt	20-MAR-19	28-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-13 18-N4-WW-CH-027 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:45 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total HpCDD # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-TCDF	<0.070	[U]	0.070	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDF	<0.046	[U]	0.046	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HxCDF	<0.040	[U]	0.040	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HpCDF	<0.028	[U]	0.028	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	100.0		25-164	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	98.0		25-181	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	77.0		32-141	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	86.0		28-130	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	89.0		23-140	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-OCDD	76.0		17-157	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	84.0		24-169	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	95.0		21-192	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	92.0		21-178	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	74.0		26-152	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	85.0		26-123	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	81.0		29-147	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	76.0		28-136	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	85.0		28-143	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	97.0		26-138	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	82.0		31-197	%	20-MAR-19	28-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.00177			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.0931			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.176			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
L2222986-14 18-N5-SS-CH-029 Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:30 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	20.8		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	5.96		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0701		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	13300		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.86		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	59.0		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.55		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	9.9		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.576		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	23000		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	22.5		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	7.26		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	16.2		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	17100		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	16.3		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	11200		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	315		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-14 18-N5-SS-CH-029							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:30							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Molybdenum (Mo)	2.16		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	20.8		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	434		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	1940		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	121		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	57.7		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.222		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	117		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	31.0		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	71.5		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	2.0		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.204	[J]	0.074	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.233	M,J,B	0.037	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.353	J,B	0.046	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.836	[J]	0.047	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.672	[J]	0.047	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	15.8		0.061	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDD	151		0.086	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,7,8-TCDF	<0.062	[U]	0.062	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.300	J,B	0.049	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.430	J,R	0.040	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	1.01	[J]	0.029	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.632	[J]	0.027	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.693	J,B	0.028	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.180	J,R	0.035	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	8.92		0.050	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.544	J,B	0.062	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDF	21.8		0.065	pg/g	07-MAR-19	19-MAR-19	R4579287
Total-TCDD	1.18		0.074	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDD # Homologues	3				07-MAR-19	19-MAR-19	R4579287
Total-PeCDD	4.14		0.037	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDD # Homologues	8				07-MAR-19	19-MAR-19	R4579287
Total-HxCDD	9.51		0.047	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287
Total-HpCDD	32.4		0.061	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Total-TCDF	5.14		0.062	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDF # Homologues	13				07-MAR-19	19-MAR-19	R4579287
Total-PeCDF	6.13		0.049	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDF # Homologues	10				07-MAR-19	19-MAR-19	R4579287
Total-HxCDF	8.19		0.035	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDF # Homologues	10				07-MAR-19	19-MAR-19	R4579287
Total-HpCDF	14.8		0.062	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	85.0		25-164	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	78.0		25-181	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	87.0		32-141	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	90.0		28-130	%	07-MAR-19	19-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-14 18-N5-SS-CH-029							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	100.0		23-140	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-OCDD	92.0		17-157	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	79.0		24-169	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	81.0		24-185	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	82.0		21-178	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	94.0		26-152	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	94.0		26-123	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	95.0		29-147	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	104.0		28-136	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	99.0		28-143	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	107.0		26-138	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	73.0		35-197	%	07-MAR-19	19-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.17			pg/g	07-MAR-19	19-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.32			pg/g	07-MAR-19	19-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.32			pg/g	07-MAR-19	19-MAR-19	R4579287
L2222986-15 18-N5-SD-CH-031							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:50							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
Chloride (Cl)	33.6		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	4.49		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0381		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
Moisture	24.9		0.25	%		16-MAR-19	R4568024
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	16400		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.90		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	79.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.72		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	20.0		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.348		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	73100		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	27.2		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	9.72		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	17.8		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	20600		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	12.1		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	26000		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	445		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	2.50		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	28.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	432		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	3320		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	255		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	68.8		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.274		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	247		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	37.6		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	63.9		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	4.2		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-15 18-N5-SD-CH-031 Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:50 Matrix: Sediment							
L2222986-16 18-N5-NG-CH-035 Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:40 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	67.3		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	6680		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0336		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	0.0052		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	4750		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	1.22		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	38.8		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.082		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	13.1		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	20.6		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0943		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	10400		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.344		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.064		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	7.81		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	100		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.413		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2970		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	33.3		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	2.49		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.64		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	1960		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	19800		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	62		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	55.1		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0056		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.16		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	45.7		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.53	[U]	0.53	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	<0.22	[U]	0.22	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.28	M,J	0.21	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.24	M,J,R	0.20	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.32	M,J,R	0.20	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.95	[J]	0.13	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	11.3	[J]	0.18	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.38	[U]	0.38	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.30	M,J	0.19	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	<0.15	[U]	0.15	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	<0.21	M,J,R	0.21	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.29	M,J,R	0.20	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	<0.20	M,J,R	0.20	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.37	M,J,R	0.27	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.97	[J]	0.14	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	<0.18	[U]	0.18	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-16 18-N5-NG-CH-035 Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:40 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
OCDF	1.61	M,J	0.18	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.53	[U]	0.53	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	<0.22	[U]	0.22	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	2.33		0.21	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	4.67		0.13	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	<0.38	[U]	0.38	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.30		0.19	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.47		0.27	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.97		0.18	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	75.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	92.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	84.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	83.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	101.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	103.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	74.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	90.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	88.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	81.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	86.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	87.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	86.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	101.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	103.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	73.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0703			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.651			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	1.07			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-17 18-E1-SS-CH-037 Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:00 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	20.4		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	1.89		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0477		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	15400		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.39		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	85.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.69		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	13.1		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.563		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-17 18-E1-SS-CH-037							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:00							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Calcium (Ca)	4090		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	24.3		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	8.83		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	14.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	17700		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	13.0		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	4390		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	760		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	1.19		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	22.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	673		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	2570		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	56		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	14.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.208		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	131		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	35.7		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	62.1		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	2.4		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.260	[J]	0.043	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.230	J,B	0.024	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.253	J,B	0.030	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.381	J,B	0.031	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.411	M,J	0.030	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	6.04		0.039	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDD	43.6		0.028	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,7,8-TCDF	0.310	M,J,R	0.048	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.309	J,B	0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.425	[J]	0.017	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.574	J,B	0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.363	J,B	0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.367	J,B	0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.130	J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	3.17		0.012	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.150	J,R	0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDF	4.51	J,B	0.029	pg/g	07-MAR-19	19-MAR-19	R4579287
Total-TCDD	1.55		0.043	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDD # Homologues	6				07-MAR-19	19-MAR-19	R4579287
Total-PeCDD	2.16		0.024	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDD # Homologues	4				07-MAR-19	19-MAR-19	R4579287
Total-HxCDD	6.79		0.031	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287
Total-HpCDD	12.1		0.039	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Total-TCDF	5.99		0.048	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDF # Homologues	14				07-MAR-19	19-MAR-19	R4579287
Total-PeCDF	5.36		0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDF # Homologues	12				07-MAR-19	19-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-17 18-E1-SS-CH-037							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:00							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total-HxCDF	4.04		0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDF # Homologues	9				07-MAR-19	19-MAR-19	R4579287
Total-HpCDF	4.21		0.015	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDF # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	78.0		25-164	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	74.0		25-181	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	80.0		32-141	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	84.0		28-130	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	92.0		23-140	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-OCDD	81.0		17-157	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	69.0		24-169	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	79.0		24-185	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	77.0		21-178	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	85.0		26-152	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	89.0		26-123	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	86.0		29-147	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	94.0		28-136	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	91.0		28-143	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	97.0		26-138	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	70.0		35-197	%	07-MAR-19	19-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.981			pg/g	07-MAR-19	19-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.01			pg/g	07-MAR-19	19-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.01			pg/g	07-MAR-19	19-MAR-19	R4579287
L2222986-18 18-E1-NG-CH-039							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:10							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	81.4		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	10300		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0129		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	6700		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	0.50		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	16.4		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.062		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	14.5		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	7.5		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0229		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	6080		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.167		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.036		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	7.14		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	95.5		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.125		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2860		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	35.1		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	3.55		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.55		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-18 18-E1-NG-CH-039							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:10							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Phosphorus (P)-Total	7060		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	39400		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	34		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	14.2		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	67.2		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.053	[U]	0.053	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.065	M,J	0.024	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.086	M,J,B	0.033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.081	M,J,R	0.032	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.068	M,J,R	0.032	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.34	[J]	0.027	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	6.17	[J]	0.048	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	0.131	M,J	0.037	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.101	M,J,B	0.021	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.080	M,J,B	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.081	M,J,R	0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.098	M,J	0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.068	J,R	0.019	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.092	M,J,B	0.025	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.377	M,J,B	0.018	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.065	M,J,B	0.022	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.561	M,J,B	0.042	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.053	[U]	0.053	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	1.22		0.024	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	1.68		0.033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	3.53		0.027	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	1.57		0.037	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	9				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	1.25		0.021	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	9				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.636		0.025	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.692		0.022	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	73.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	81.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	85.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	76.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	48.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	75.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	81.0		21-178	%	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-18 18-E1-NG-CH-039							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:10							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	81.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	83.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	73.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	72.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	71.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	74.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	71.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.153			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.209			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.236			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-19 18-E1-FC-CH-041							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:20							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	25.1		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	568		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	400		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	<1.0		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	23		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	0.51		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	7.5		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	454		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	1.47		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	0.281		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	1280		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	1550		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	7.32		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.0099	[U]	0.0099	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0098	M,J	0.0050	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.0098	M,J,B	0.0044	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.0125	M,J,B	0.0041	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0190	M,J	0.0041	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-19 18-E1-FC-CH-041							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 14:20							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,4,6,7,8-HpCDD	0.0544	J,B	0.0051	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	0.477	J,B	0.0088	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.0061	[U]	0.0061	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0170	M,J,R	0.0041	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.0086	M,J,R	0.0031	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0171	J,B	0.0037	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0130	J,R	0.0038	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0112	J,B	0.0039	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0210	M,J,B	0.0051	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0538	J,B	0.0040	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0223	M,J,B	0.0050	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.154	J,B	0.0089	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.0099	[U]	0.0099	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.0098		0.0050	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	0.0413		0.0044	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	0.0945		0.0051	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	<0.0061	[U]	0.0061	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	<0.0041	[U]	0.0041	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.0584		0.0051	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.0754		0.0050	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	70.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	74.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	80.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	81.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	78.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	45.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	72.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	68.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	72.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	76.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	79.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	74.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	72.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	74.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	73.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	71.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0204			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0300			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0353			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-20 18-E2-SS-CH-043							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:25							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-20 18-E2-SS-CH-043							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:25							
Matrix: Soil							
% Moisture	22.7		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	2.48		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0701		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	14400		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.05		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	71.2		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.56		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	10.7		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.332		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	5960		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	20.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	7.91		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	16.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	16800		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	24.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	4450		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	321		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	1.53		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	17.1		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	677		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	2460		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	55		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	19.1		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.203		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	138		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	32.6		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	61.0		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	1.8		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.188	[J]	0.044	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.200	J,B	0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.190	M,J,B	0.024	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.392	J,B	0.021	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.449	M,J	0.022	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	6.03		0.038	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDD	38.4		0.057	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,7,8-TCDF	0.330	M,J,R	0.046	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.198	J,B	0.031	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.370	J,R	0.028	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.336	J,B	0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.220	J,R	0.018	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.342	J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.079	J,R	0.025	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.59	[J]	0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.130	J,R	0.026	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDF	2.02	J,B	0.031	pg/g	07-MAR-19	19-MAR-19	R4579287
Total-TCDD	1.57		0.044	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-20 18-E2-SS-CH-043							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:25							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total-PeCDD	3.28		0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDD # Homologues	10				07-MAR-19	19-MAR-19	R4579287
Total-HxCDD	4.45		0.024	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDD # Homologues	6				07-MAR-19	19-MAR-19	R4579287
Total-HpCDD	11.5		0.038	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Total-TCDF	3.60		0.046	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDF # Homologues	9				07-MAR-19	19-MAR-19	R4579287
Total-PeCDF	4.92		0.031	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDF # Homologues	15				07-MAR-19	19-MAR-19	R4579287
Total-HxCDF	2.84		0.025	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDF # Homologues	6				07-MAR-19	19-MAR-19	R4579287
Total-HpCDF	2.18		0.026	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDF # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	74.0		25-164	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	68.0		25-181	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	76.0		32-141	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	75.0		28-130	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	82.0		23-140	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-OCDD	71.0		17-157	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	68.0		24-169	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	71.0		24-185	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	69.0		21-178	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	80.0		26-152	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	79.0		26-123	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	78.0		29-147	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	86.0		28-136	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	81.0		28-143	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	86.0		26-138	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	67.0		35-197	%	07-MAR-19	19-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.653			pg/g	07-MAR-19	19-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	0.828			pg/g	07-MAR-19	19-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	0.828			pg/g	07-MAR-19	19-MAR-19	R4579287
L2222986-21 18-E2-SD-CH-045							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:35							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
% Moisture	21.7		0.10	%	12-MAR-19	13-MAR-19	R4560298
Chloride (Cl)	31.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	6.45		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0228		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	17000		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	5.89		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	101		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.73		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	25.1		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.174		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	93100		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	30.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	9.97		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-21 18-E2-SD-CH-045							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:35							
Matrix: Sediment							
<b>Metals in Soil by CRC ICPMS</b>							
Copper (Cu)	18.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	21900		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	8.83		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	33200		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	414		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	2.59		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	30.0		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	473		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	4130		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	271		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	101		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.282		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	318		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	37.5		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	56.2		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	8.3		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.045	[U]	0.045	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.077	[U]	0.077	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.057	[U]	0.057	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.047	[U]	0.047	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0032	[U]	0.0032	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0033	[U]	0.0033	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	<0.0038	[U]	0.0038	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.013	[U]	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	<0.0085	[U]	0.0085	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.010	[U]	0.010	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.0071	[U]	0.0071	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.039	[U]	0.039	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0070	[U]	0.0070	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	<0.0096	[U]	0.0096	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	<0.0090	[U]	0.0090	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	<0.010	[U]	0.010	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.11	U,1.	0.11	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	<0.0022	M,U	0.0022	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	80.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	86.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	65.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	81.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	85.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	85.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	91.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	102.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	91.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	98.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	101.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.026	[U]	0.026	ng/g	14-MAR-19	26-MAR-19	R4689169

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-21 18-E2-SD-CH-045 Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:35 Matrix: Sediment <b>OC Pesticides by Method 1699</b> Surrogate: 4,4'-DDD, 13C12-	114.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
L2222986-22 18-E2-NG-CH-049 Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:05 Matrix: Plant Tissue <b>Miscellaneous Parameters</b>							
% Moisture	78.6		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	6720		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0079		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	8260		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	0.30		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	9.8		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.063		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	23.0		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	4.2		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0093		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	5740		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.220		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	7.97		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	80.7		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.038		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	3030		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	31.5		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	4.20		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.45		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	7960		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	36800		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	27		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	14.5		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	33.3		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.040	[U]	0.040	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.079	M,J	0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.077	M,J,B	0.027	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.089	M,J,B	0.026	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.119	M,J	0.025	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.829	[J]	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	3.23	J,B	0.031	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	0.075	M,J	0.031	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.095	M,J,B	0.023	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.063	M,J,B	0.019	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.100	J,B	0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.080	M,J,R	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.100	M,J,B	0.018	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.091	M,J,B	0.023	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-22 18-E2-NG-CH-049							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:05							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,4,6,7,8-HpCDF	0.370	J,R	0.013	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.077	M,J,B	0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.931	J,B	0.036	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	1.15		0.040	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	5				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	1.27		0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	5				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	1.82		0.027	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	6				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	2.07		0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	1.96		0.031	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	13				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	1.14		0.023	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	6				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.768		0.023	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	5				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.179		0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	68.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	77.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	76.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	73.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	66.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	40.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	69.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	71.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	74.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	73.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	73.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	67.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	68.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	62.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	64.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	74.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.176			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.208			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.228			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-23 18-E2-SB-CH-051							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:10							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	40.4		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	32		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	3580		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-23 18-E2-SB-CH-051							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:10							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	0.996		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	29.8		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.025	DLM	0.025	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	2520		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	0.068		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	11.2		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	57.9		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	2670		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	20.6		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	20.4		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	1.44		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	7040		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	20700		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	3.24		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	33.9		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Chlorophenols as acetate derivatives</b>							
Pentachlorophenol	<2.0	[U]	2.0	ng/g	21-MAR-19	28-MAR-19	R4681338
Surrogate: 13C6-Pentachlorophenol	43.5	G	50-150	%	21-MAR-19	28-MAR-19	R4681338
Note: The recovery of 13C6-Pentachlorophenol is below the method control limit. PCP has not been detected							
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.0071	[U]	0.0071	ng/g	25-MAR-19	30-MAR-19	R4690215
beta-BHC	<0.011	[U]	0.011	ng/g	25-MAR-19	30-MAR-19	R4690215
delta-BHC	<0.010	[U]	0.010	ng/g	25-MAR-19	30-MAR-19	R4690215
gamma-BHC	<0.0090	[U]	0.0090	ng/g	25-MAR-19	30-MAR-19	R4690215
Heptachlor	<0.00085	[U]	0.00085	ng/g	25-MAR-19	30-MAR-19	R4690215
Aldrin	<0.00087	[U]	0.00087	ng/g	25-MAR-19	30-MAR-19	R4690215
Heptachlor Epoxide	0.0170	M,J,B	0.0016	ng/g	25-MAR-19	30-MAR-19	R4690215
trans-Chlordane	<0.010	M,U	0.010	ng/g	25-MAR-19	30-MAR-19	R4690215
cis-Chlordane	0.0192	M,J	0.0093	ng/g	25-MAR-19	30-MAR-19	R4690215
Dieldrin	0.0555	[J]	0.0040	ng/g	25-MAR-19	30-MAR-19	R4690215
Endrin	0.0130	M,J,R	0.0073	ng/g	25-MAR-19	30-MAR-19	R4690215
Endrin Aldehyde	<0.0051	[U]	0.0051	ng/g	25-MAR-19	30-MAR-19	R4690215
Endosulfan I	<0.013	[U]	0.013	ng/g	25-MAR-19	30-MAR-19	R4690215
Endosulfan II	<0.018	[U]	0.018	ng/g	25-MAR-19	30-MAR-19	R4690215
Endosulfan Sulfate	0.0167	M,J	0.0078	ng/g	25-MAR-19	30-MAR-19	R4690215
4,4-DDE	<0.0050	[U]	0.0050	ng/g	25-MAR-19	30-MAR-19	R4690215
4,4-DDD	<0.0056	[U]	0.0056	ng/g	25-MAR-19	30-MAR-19	R4690215
4,4-DDT	<0.0093	[U]	0.0093	ng/g	25-MAR-19	30-MAR-19	R4690215
Methoxychlor	<0.21	U,1	0.21	ng/g	25-MAR-19	30-MAR-19	R4690215
Mirex	0.00390	M,J,R	0.00038	ng/g	25-MAR-19	30-MAR-19	R4690215
Surrogate: alpha-BHC, 13C6-	47.0		16-129	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: gamma-BHC-D6	49.0		11-120	%	25-MAR-19	30-MAR-19	R4690215

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-23 18-E2-SB-CH-051							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:10							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Surrogate: Heptachlor, 13C10-	65.0		5-120	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: Dieldrin, 13C12-	65.0		40-151	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: Endrin, 13C12-	94.0		35-155	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: Endosulfan II, 13C9-	57.0		5-122	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: 4,4'-DDE, 13C12-	68.0		21-125	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: 4,4'-DDT, 13C12-	71.0		5-120	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: Methoxychlor-D6	92.0		5-120	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: Mirex, 13C10-	64.0		5-120	%	25-MAR-19	30-MAR-19	R4690215
Surrogate: 4,4'-DDD, 13C12-	66.0		5-150	%	25-MAR-19	30-MAR-19	R4690215
Heptachlor Epoxide A	<0.010	[U]	0.010	ng/g	25-MAR-19	30-MAR-19	R4690215
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.030	[U]	0.030	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDD	<0.014	[U]	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	<0.015	M,U	0.015	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	<0.014	[U]	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.021	M,J	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	0.032	M,J,R	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDD	0.221	M,J	0.012	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,7,8-TCDF	<0.024	[U]	0.024	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDF	<0.013	[U]	0.013	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,7,8-PeCDF	<0.011	[U]	0.011	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.016	M,J,R	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	<0.014	[U]	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	<0.015	[U]	0.015	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	<0.020	M,U	0.020	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.034	M,J	0.012	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	0.019	M,J,R	0.012	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDF	0.115	M,J,B	0.020	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total-TCDD	<0.030	[U]	0.030	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDD	<0.014	[U]	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HxCDD	0.021		0.015	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDD # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-HpCDD	<0.014	[U]	0.014	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-TCDF	<0.024	[U]	0.024	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDF	<0.013	[U]	0.013	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HxCDF	<0.020	[U]	0.020	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HpCDF	0.034		0.012	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDF # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	97.0		25-164	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	85.0		25-181	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	66.0		32-141	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	72.0		28-130	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	76.0		23-140	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-OCDD	66.0		17-157	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	80.0		24-169	%	20-MAR-19	28-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-23 18-E2-SB-CH-051 Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:10 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,7,8-PeCDF	80.0		21-192	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	81.0		21-178	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	64.0		26-152	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	73.0		26-123	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	65.0		29-147	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	64.0		28-136	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	69.0		28-143	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	85.0		26-138	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	80.0		31-197	%	20-MAR-19	28-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.00258			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.0336			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.0626			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
L2222986-24 18-E5-SS-CH-053 Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:30 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	18.6		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	2.89		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0282		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	13600		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	4.81		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	58.5		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.53		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	8.1		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.291		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	4460		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	20.7		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	6.48		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	9.57		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	16000		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	12.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	4310		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	244		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	1.36		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	16.0		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	400		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	1650		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	63		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	13.5		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627
Thallium (Tl)	0.183		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	141		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	33.1		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	51.7		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	1.2		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.120	J,R	0.029	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.169	J,B	0.036	pg/g	07-MAR-19	19-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-24 18-E5-SS-CH-053							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,4,7,8-HxCDD	0.180	J,B	0.016	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.380	J,B	0.016	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.372	M,J	0.016	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	5.14		0.034	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDD	30.6		0.030	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,7,8-TCDF	0.210	M,J,R	0.037	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.193	M,J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.313	J,B	0.016	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.373	J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.269	J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.311	J,B	0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.107	J,B	0.024	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.71	[J]	0.014	pg/g	07-MAR-19	19-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.109	J,B	0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
OCDF	2.33	J,B	0.020	pg/g	07-MAR-19	19-MAR-19	R4579287
Total-TCDD	1.20		0.029	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287
Total-PeCDD	2.30		0.036	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDD # Homologues	7				07-MAR-19	19-MAR-19	R4579287
Total-HxCDD	3.93		0.016	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDD # Homologues	6				07-MAR-19	19-MAR-19	R4579287
Total-HpCDD	9.91		0.034	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	19-MAR-19	R4579287
Total-TCDF	4.51		0.037	pg/g	07-MAR-19	19-MAR-19	R4579287
Total TCDF # Homologues	13				07-MAR-19	19-MAR-19	R4579287
Total-PeCDF	3.84		0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
Total PeCDF # Homologues	9				07-MAR-19	19-MAR-19	R4579287
Total-HxCDF	3.11		0.024	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HxCDF # Homologues	8				07-MAR-19	19-MAR-19	R4579287
Total-HpCDF	2.54		0.019	pg/g	07-MAR-19	19-MAR-19	R4579287
Total HpCDF # Homologues	4				07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	85.0		25-164	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	79.0		25-181	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	100.0		32-141	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	89.0		28-130	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	98.0		23-140	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-OCDD	84.0		17-157	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	76.0		24-169	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	80.0		24-185	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	81.0		21-178	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	104.0		26-152	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	101.0		26-123	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	100.0		29-147	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	109.0		28-136	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	101.0		28-143	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	104.0		26-138	%	07-MAR-19	19-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	78.0		35-197	%	07-MAR-19	19-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.547			pg/g	07-MAR-19	19-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	0.688			pg/g	07-MAR-19	19-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	0.688			pg/g	07-MAR-19	19-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-25 18-E5-NG-CH-055							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:40							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	78.7		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	9950		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0195		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	4270		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	3.30		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	165		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.111		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	12.6		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	6.6		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.118		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	6380		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.882		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.097		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	6.73		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	198		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.260		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	3980		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	52.0		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	6.80		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.69		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	3470		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	33400		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	60		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	8.89		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0032		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.39		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	22.7		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.12	[U]	0.12	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.087	M,J,R	0.046	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.130	M,J,R	0.090	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.235	M,J	0.084	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.324	M,J	0.084	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.70	[J]	0.079	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	7.32	[J]	0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	0.14	M,J	0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.153	M,J,B	0.058	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.110	M,J,R	0.046	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.168	M,J,B	0.056	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.100	M,J,R	0.053	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.170	M,J,R	0.053	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.140	M,J,R	0.074	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.550	J,R	0.043	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.150	M,J,R	0.058	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	1.03	M,J,B	0.10	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	0.68		0.12	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-25 18-E5-NG-CH-055							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:40							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total-PeCDD	1.39		0.046	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	2.05		0.090	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	1.70		0.079	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	1.55		0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	7				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.921		0.058	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.572		0.074	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.156		0.058	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	72.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	81.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	71.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	77.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	73.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	51.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	79.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	81.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	67.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	75.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	72.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	69.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	72.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	70.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	73.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.110			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.351			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.411			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-26 18-E5-FC-CH-057							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:50							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	21.4		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	554		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	810		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	1.8		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-26 18-E5-FC-CH-057							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:50							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Calcium (Ca)-Total	40		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	1.22		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	9.5		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	592		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	1.52		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	0.591		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	1850		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	3310		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	0.053		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	10.1		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.021	[U]	0.021	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0212	M,J	0.0085	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.021	M,J,R	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.020	M,J,R	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.043	M,J	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0730	M,J,R	0.0096	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	0.466	M,J,B	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.016	[U]	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.024	M,J,R	0.012	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	<0.0091	[U]	0.0091	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0250	M,J,R	0.0077	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0237	M,J	0.0077	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0200	M,J,R	0.0082	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.031	M,J,R	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0762	J,B	0.0056	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0360	M,J,R	0.0073	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.240	J,B	0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.021	[U]	0.021	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.0362		0.0085	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	0.066		0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	0.0594		0.0096	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	<0.016	[U]	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.014		0.012	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.024		0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.0762		0.0073	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-26 18-E5-FC-CH-057 Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:50 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total HpCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	77.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	83.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	69.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	80.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	76.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	62.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	81.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	78.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	83.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	68.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	79.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	71.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	70.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	75.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	74.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	72.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0288			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0550			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0676			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-27 18-E6-SS-CH-059 Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:30 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	22.0		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	30.6		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	2.87		0.20	mg/kg	15-MAR-19	28-MAR-19	R4586022
Mercury (Hg)	0.0730		0.0050	mg/kg	15-MAR-19	22-MAR-19	R4578310
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	16000		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Arsenic (As)	6.21		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Barium (Ba)	90.4		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Beryllium (Be)	0.70		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Boron (B)	13.1		5.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cadmium (Cd)	0.777		0.020	mg/kg	15-MAR-19	21-MAR-19	R4577627
Calcium (Ca)	21900		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Chromium (Cr)	27.8		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Cobalt (Co)	10.9		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Copper (Cu)	16.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Iron (Fe)	19400		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Lead (Pb)	16.6		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Magnesium (Mg)	11100		20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Manganese (Mn)	875		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Molybdenum (Mo)	2.88		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Nickel (Ni)	25.7		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Phosphorus (P)	425		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Potassium (K)	2540		100	mg/kg	15-MAR-19	21-MAR-19	R4577627
Silver (Ag)	<0.10		0.10	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sodium (Na)	95		50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Strontium (Sr)	39.9		0.50	mg/kg	15-MAR-19	21-MAR-19	R4577627
Sulfur (S)	<1000		1000	mg/kg	15-MAR-19	21-MAR-19	R4577627

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-27 18-E6-SS-CH-059							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:30							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Thallium (Tl)	0.256		0.050	mg/kg	15-MAR-19	21-MAR-19	R4577627
Titanium (Ti)	162		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Vanadium (V)	36.7		0.20	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zinc (Zn)	71.5		2.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
Zirconium (Zr)	2.1		1.0	mg/kg	15-MAR-19	21-MAR-19	R4577627
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.041	[U]	0.041	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.071	[U]	0.071	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.053	[U]	0.053	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.043	[U]	0.043	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0024	[U]	0.0024	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0035	[U]	0.0035	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	0.0111	M,J	0.0037	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.019	[U]	0.019	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.018	[U]	0.018	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	0.019	M,J	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.013	[U]	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.018	[U]	0.018	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.029	[U]	0.029	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.207	M	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	0.017	M,J,R	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.165	[J]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.15	U,1	0.15	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.00570	M,J,R	0.00096	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	77.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	85.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	59.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	79.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	82.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	82.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	85.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	95.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	85.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	92.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	96.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.026	[U]	0.026	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	99.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.296	[J]	0.033	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.362	J,B	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.459	J,B	0.035	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.821	[J]	0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.879	M,J	0.036	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	14.6		0.041	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	125		0.046	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	0.390	M,J	0.038	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.431	M,J,B	0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.564	[J]	0.022	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	1.01	[J]	0.018	pg/g	07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-27 18-E6-SS-CH-059							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,6,7,8-HxCDF	0.723	[J]	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.689	J,B	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.221	J,B	0.022	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	5.72		0.026	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.400	J,R	0.033	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	12.4		0.038	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	2.97		0.033	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDD # Homologues	9				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	6.11		0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	13.5		0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287
Total-HpCDD	30.1		0.041	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	7.54		0.038	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	18				07-MAR-19	20-MAR-19	R4579287
Total-PeCDF	7.42		0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	13				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	7.78		0.022	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	12				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	8.89		0.033	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	84.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	77.0		25-181	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	80.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	86.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	87.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	73.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	79.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	79.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	91.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	85.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	88.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	95.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	88.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	75.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.60			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.61			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.61			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-28 18-E6-NG-CH-061							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:40							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	70.6		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	14000		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.150		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	0.0110		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	3990		100	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-28 18-E6-NG-CH-061							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:40							
Matrix: Plant Tissue							
Titanium (Ti)-Total	2.21		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	48.5		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.255		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	9.84		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	19.5		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.297		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	8300		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.848		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.177		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	7.23		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	121		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	1.93		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2800		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	42.4		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	13.8		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	1.55		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	1690		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	26500		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	106		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	45.0		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0172		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.25		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	42.1		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.22	[U]	0.22	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.38	[U]	0.38	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.28	[U]	0.28	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.22	[U]	0.22	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.033	[U]	0.033	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.032	[U]	0.032	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	0.077	M,J	0.025	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.12	[U]	0.12	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.10	[U]	0.10	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	0.31	M,J,R	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	0.23	M,J	0.19	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.27	[U]	0.27	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.29	[U]	0.29	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.55	[U]	0.55	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.25	[U]	0.25	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.26	[U]	0.26	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.32	[U]	0.32	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<2.7	U,1.	2.7	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.058	[U]	0.058	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	67.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	74.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	43.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	60.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	56.0		35-155	%	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-28 18-E6-NG-CH-061							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:40							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Surrogate: Endosulfan II, 13C9-	46.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	63.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	41.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	87.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	60.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	39.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.17	[U]	0.17	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.40	[U]	0.40	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDD	<0.23	M,U	0.23	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	0.30	M,J	0.20	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	0.25	M,J	0.18	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.37	M,J	0.18	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	3.32	M,J	0.22	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDD	20.2	[J]	0.25	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,7,8-TCDF	<0.34	[U]	0.34	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDF	<0.20	[U]	0.20	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,7,8-PeCDF	<0.15	[U]	0.15	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.21	M,J,R	0.18	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	0.23	M,J	0.18	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	<0.18	M,U	0.18	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	0.31	M,J	0.24	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	1.11	M,J	0.18	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	<0.20	[U]	0.20	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDF	3.15	M,J	0.23	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total-TCDD	<0.40	[U]	0.40	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDD	0.39		0.23	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDD # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-HxCDD	2.61		0.20	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDD # Homologues	4				20-MAR-19	28-MAR-19	R4587121
Total-HpCDD	3.32		0.22	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDD # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-TCDF	<0.34	[U]	0.34	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDF	<0.20	[U]	0.20	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDF # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-HxCDF	1.33		0.24	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDF # Homologues	4				20-MAR-19	28-MAR-19	R4587121
Total-HpCDF	1.11		0.20	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDF # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	86.0		25-164	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	89.0		25-181	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	67.0		32-141	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	78.0		28-130	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	81.0		23-140	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-OCDD	73.0		17-157	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	73.0		24-169	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	81.0		21-192	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	83.0		21-178	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	65.0		26-152	%	20-MAR-19	28-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-28 18-E6-NG-CH-061 Sampled By: Pascal Tuarze on 17-OCT-18 @ 10:40 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	77.0		26-123	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	72.0		29-147	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	69.0		28-136	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	77.0		28-143	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	88.0		26-138	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	77.0		31-197	%	20-MAR-19	28-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.197			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.586			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.953			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
L2222986-29 18-S1-SS-CH-063 Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:30 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	19.6		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	8.1		5.0	mg/kg	27-MAR-19	28-MAR-19	R4587202
Fluoride (F)	3.96		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0417		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	23700		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	7.59		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	118		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	1.01		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	17.3		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.557		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	14200		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	34.8		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	12.9		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	16.4		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	25600		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	15.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	10900		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	753		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	1.38		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	32.4		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	633		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	3620		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	88		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	25.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.267		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	227		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	49.5		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	67.6		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	2.8		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.054	[U]	0.054	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.093	[U]	0.093	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.073	[U]	0.073	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.059	[U]	0.059	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0039	[U]	0.0039	ng/g	14-MAR-19	26-MAR-19	R4689169

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-29 18-S1-SS-CH-063							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:30							
Matrix: Soil							
<b>OC Pesticides by Method 1699</b>							
Aldrin	<0.0046	[U]	0.0046	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	<0.0039	[U]	0.0039	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.023	[U]	0.023	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.021	[U]	0.021	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.015	[U]	0.015	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.017	[U]	0.017	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.022	[U]	0.022	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.035	[U]	0.035	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0054	[U]	0.0054	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.166	M,J	0.017	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.098	[J]	0.021	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.12	U,1.	0.12	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.0019	M,J,R	0.0010	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	72.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	73.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	55.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	78.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	77.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	80.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	87.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	84.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	87.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	106.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	108.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.027	[U]	0.027	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	95.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.388	[J]	0.031	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.245	M,J,B	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.192	J,B	0.018	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.393	J,B	0.019	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.410	M,J	0.018	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	6.92		0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	44.5		0.032	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	0.250	M,J,R	0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.190	M,J,R	0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.399	[J]	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.346	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.250	J,R	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.359	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.099	M,J,B	0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.57	[J]	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.130	J,R	0.016	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	2.67	J,B	0.021	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	2.35		0.031	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDD # Homologues	9				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	4.29		0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	8				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	6.53		0.019	pg/g	07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-29 18-S1-SS-CH-063							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total HxCDD # Homologues	8				07-MAR-19	20-MAR-19	R4579287
Total-HpCDD	12.6		0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	5.94		0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	14				07-MAR-19	20-MAR-19	R4579287
Total-PeCDF	4.65		0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	11				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	3.38		0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	10				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	2.80		0.016	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	85.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	77.0		25-181	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	86.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	84.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	89.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	74.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	78.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	76.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	78.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	90.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	91.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	89.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	96.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	87.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	77.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.03			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.09			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.09			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-30 18-S1-SD-CH-065							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:25							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
Chloride (Cl)	23.1		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	3.73		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0601		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
Moisture	36.2		0.25	%		16-MAR-19	R4568024
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	20100		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	4.90		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	89.4		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	0.87		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	24.1		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.443		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	36400		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	38.0		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	9.91		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	23.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	21900		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	16.0		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-30 18-S1-SD-CH-065 Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:25 Matrix: Sediment							
<b>Metals in Soil by CRC ICPMS</b>							
Magnesium (Mg)	17400		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	175		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	4.19		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	32.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	697		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	4010		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	145		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	39.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.333		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	230		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	42.6		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	74.1		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	3.0		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
L2222986-31 18-S1-NG-CH-069 Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:10 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	83.2		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	7320		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0252		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	2700		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	5.02		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	275		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.094		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	20.5		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	0.011		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	11.8		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.145		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	8670		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	3.56		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.148		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	8.75		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	308		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.302		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2600		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	55.3		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	4.06		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	1.04		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	4790		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	22900		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	50		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	15.1		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0049		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.58		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	45.3		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-31 18-S1-NG-CH-069							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:10							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.17	[U]	0.17	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.130	M,J,R	0.080	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.17	M,J,R	0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.271	M,J	0.098	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.290	M,J,R	0.099	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.30	M,J,R	0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	6.62	[J]	0.098	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.12	[U]	0.12	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.20	M,J,B	0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	<0.087	M,U	0.087	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.16	M,J,R	0.12	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.12	M,J,R	0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.13	M,J,R	0.12	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	<0.16	M,U	0.16	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.586	M,J	0.040	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.170	M,J,R	0.045	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	1.16	M,J,B	0.072	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.17	[U]	0.17	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	1.14		0.080	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	1.68		0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	2.18		0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	0.36		0.12	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	1.76		0.11	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	6				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	<0.16	[U]	0.16	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.586		0.045	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	80.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	96.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	74.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	86.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	91.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	74.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	80.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	90.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	92.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	72.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	82.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	78.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	74.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	79.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	90.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	80.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0411			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.385			pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-31 18-S1-NG-CH-069 Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:10 Matrix: Plant Tissue <b>Dioxins and Furans HR 1613B</b> Upper Bound PCDD/F TEQ (WHO 2005)	0.497			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-32 18-S1-SB-CH-071 Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:00 Matrix: Plant Tissue <b>Miscellaneous Parameters</b>							
% Moisture	32.6		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	61		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	3890		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	1.27		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	39.6		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.045	DLM	0.045	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	4300		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	0.216		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	12.4		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	76.8		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	3320		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	34.2		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	9.87		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	1.45		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	8220		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	23100		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	4.15		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	0.0035		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	37.5		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.0091	[U]	0.0091	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0095	M,J,R	0.0036	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.0120	M,J,R	0.0052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.0120	M,J,R	0.0048	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0130	M,J,R	0.0048	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0472	M,J,B	0.0055	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	0.284	J,B	0.0051	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.0064	[U]	0.0064	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0218	M,J,B	0.0048	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.0094	M,J,B	0.0039	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0232	M,J,B	0.0048	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0160	M,J,R	0.0050	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0140	M,J,R	0.0049	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0230	M,J,R	0.0069	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-32 18-S1-SB-CH-071							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:00							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,4,6,7,8-HpCDF	0.0647	J,B	0.0052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0276	M,J,B	0.0067	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.204	M,J,B	0.0062	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.0091	[U]	0.0091	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	<0.0036	[U]	0.0036	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	<0.0052	[U]	0.0052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	0.0472		0.0055	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	<0.0064	[U]	0.0064	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.0407		0.0048	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.0450		0.0069	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.0923		0.0067	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	83.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	88.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	78.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	84.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	71.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	81.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	83.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	85.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	78.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	84.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	80.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	77.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	79.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	80.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	89.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.00735			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0307			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0356			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-33 18-S2-SS-CH-073							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:45							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	22.1		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	7.4		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	2.13		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0604		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	29100		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	7.69		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	130		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	1.24		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-33 18-S2-SS-CH-073							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:45							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Boron (B)	16.3		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.611		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	5160		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	40.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	14.0		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	17.8		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	29600		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	21.6		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	7330		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	886		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	2.89		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	31.4		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	756		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	4080		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	81		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	25.3		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.343		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	182		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	56.0		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	88.4		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	3.3		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.550	[J]	0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.240	M,J,R	0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.217	J,B	0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.449	J,B	0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.401	M,J	0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	5.02		0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	32.8		0.032	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	<0.021	[U]	0.021	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.242	M,J,B	0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.456	M,J	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.362	J,B	0.024	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.307	J,B	0.024	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.370	J,B	0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.110	J,R	0.031	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.70	[J]	0.011	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.142	J,B	0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	2.25	J,B	0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	3.12		0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDD # Homologues	8				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	3.81		0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	6				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	6.49		0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDD # Homologues	6				07-MAR-19	20-MAR-19	R4579287
Total-HpCDD	10.3		0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	7.19		0.021	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	13				07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-33 18-S2-SS-CH-073							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:45							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total-PeCDF	5.49		0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	10				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	3.88		0.031	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	9				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	2.60		0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	81.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	71.0		25-181	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	92.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	82.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	88.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	76.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	73.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	74.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	73.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	95.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	91.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	91.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	97.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	92.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	94.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	75.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.984			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.24			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.24			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-34 18-S2-NG-CH-075							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:35							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	84.2		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	6010		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0135		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	2710		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	0.92		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	44.8		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.036		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	32.0		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	6.1		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.102		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	5620		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.693		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.047		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	9.24		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	91.6		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.103		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2200		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	23.7		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-34 18-S2-NG-CH-075							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:35							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Molybdenum (Mo)-Total	3.07		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.77		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	4500		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	22000		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	49		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	21.0		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0030		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.11		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	31.5		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.13	[U]	0.13	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	<0.055	[U]	0.055	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.079	M,J,R	0.068	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.082	M,J,R	0.063	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.094	M,J,R	0.063	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.667	M,J,B	0.082	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	2.49	M,J,B	0.094	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	0.145	M,J	0.096	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.099	M,J,R	0.065	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.094	M,J,R	0.052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.100	M,J,R	0.052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.070	M,J,R	0.052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.094	M,J,R	0.055	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.093	M,J,B	0.074	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.368	M,J,B	0.068	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	<0.089	[U]	0.089	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.936	J,B	0.097	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.13	[U]	0.13	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.708		0.055	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	1.31		0.068	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	1.53		0.082	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	0.967		0.096	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	6				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.074		0.065	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.198		0.074	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.368		0.089	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	82.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	86.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	78.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	86.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	86.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	65.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	85.0		24-169	%	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-34 18-S2-NG-CH-075 Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:35 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,7,8-PeCDF	84.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	84.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	78.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	85.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	79.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	76.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	82.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	82.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	82.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0351			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.211			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.304			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-35 18-S2-SB-CH-077 Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:50 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	45.4		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	81		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	3810		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	2.05		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	35.4		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	0.0635		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	3610		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	0.125		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	12.4		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	64.1		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	3030		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	37.5		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	5.28		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	1.84		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	8020		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	23100		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	4.96		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	0.0028		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	42.8		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.016	[U]	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0181	M,J	0.0087	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.0240	M,J,R	0.0091	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-35 18-S2-SB-CH-077							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 15:50							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,6,7,8-HxCDD	0.0270	M,J,R	0.0084	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0410	M,J,R	0.0084	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0607	M,J,B	0.0074	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	0.389	J,B	0.010	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.011	[U]	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0200	J,R	0.0065	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.0130	M,J,R	0.0056	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0230	M,J,R	0.0060	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0254	M,J	0.0060	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0220	J,R	0.0058	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0410	M,J,R	0.0076	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0653	M,J,B	0.0055	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0363	M,J,B	0.0070	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.227	J,B	0.010	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.016	[U]	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.0308		0.0087	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	<0.0091	[U]	0.0091	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	0.109		0.0074	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	<0.011	[U]	0.011	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	<0.0065	[U]	0.0065	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.0335		0.0076	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.102		0.0070	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	54.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	57.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	49.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	54.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	52.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	45.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	53.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	53.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	55.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	48.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	51.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	50.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	50.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	50.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	49.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	59.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0224			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0533			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0618			pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-36 18-S4-SS-CH-087							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:30							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	25.4		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	<5.0		5.0	mg/kg	27-MAR-19	28-MAR-19	R4587202
Fluoride (F)	3.97		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0471		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	27700		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	5.15		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	139		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	1.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	13.0		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.336		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	6300		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	41.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	18.3		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	18.3		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	29000		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	16.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	8110		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	888		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	1.00		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	33.2		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	718		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	3880		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	72		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	26.6		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.230		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	102		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	47.0		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	81.9		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	4.3		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.250	J,R	0.038	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.417	J,B	0.024	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.258	J,B	0.026	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.711	J,B	0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.678	M,J	0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	11.8		0.059	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	65.2		0.052	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	0.511	[J]	0.073	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.330	J,B	0.024	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.643	[J]	0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.474	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.381	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.538	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.130	J,B	0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	2.71	[J]	0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.220	J,R	0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	6.18	[J]	0.031	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	1.36		0.038	pg/g	07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-36 18-S4-SS-CH-087							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:30							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total TCDD # Homologues	5				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	4.45		0.024	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	9.92		0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287
Total-HpCDD	20.0		0.059	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	11.7		0.073	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	15				07-MAR-19	20-MAR-19	R4579287
Total-PeCDF	7.42		0.024	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	11				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	5.60		0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	10				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	5.26		0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	64.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	69.0		25-181	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	89.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	81.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	90.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	77.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	54.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	70.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	70.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	89.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	88.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	89.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	101.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	91.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	96.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	57.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	1.15			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.41			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.41			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-37 18-S4-SD-CH-089							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:30							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
Chloride (Cl)	57.2		5.0	mg/kg	27-MAR-19	28-MAR-19	R4587202
Fluoride (F)	4.25		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0451		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
Moisture	42.4		0.25	%		16-MAR-19	R4568024
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	28700		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	6.40		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	128		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	1.18		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	28.0		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.295		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	55400		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	42.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-37 18-S4-SD-CH-089 Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:30 Matrix: Sediment							
<b>Metals in Soil by CRC ICPMS</b>							
Cobalt (Co)	13.4		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	22.9		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	29500		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	14.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	23700		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	540		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	1.64		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	37.6		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	699		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	5440		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	194		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	81.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.292		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	269		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	53.7		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	75.4		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	4.1		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
L2222986-38 18-S4-NG-CH-093 Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:00 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	76.3		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	8090		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0145		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	3720		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	1.07		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	47.6		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.026		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	19.6		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	5.7		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0372		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	7930		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.308		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.032		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	6.15		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	89.3		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.105		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2750		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	43.3		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	15.0		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.46		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	3580		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	24000		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	29		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	28.8		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-38 18-S4-NG-CH-093							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:00							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Thallium (Tl)-Total	0.0025		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.11		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	17.6		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.071	[U]	0.071	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.095	M,J,R	0.049	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.101	J,B	0.042	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.124	M,J,B	0.038	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.110	M,J,R	0.039	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.750	[J]	0.043	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	2.75	J,B	0.052	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	0.116	M,J	0.056	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.090	M,J,B	0.032	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.074	M,J,R	0.026	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.099	M,J,B	0.033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.099	M,J	0.033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.101	M,J,B	0.035	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.092	M,J,R	0.045	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.363	M,J,B	0.022	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.089	M,J,R	0.026	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.529	M,J,B	0.044	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	0.595		0.071	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.727		0.049	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	1.64		0.042	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	1.79		0.043	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	1.27		0.056	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	7				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.739		0.032	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	5				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.300		0.045	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.363		0.026	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	77.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	80.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	74.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	80.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	82.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	66.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	80.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	78.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	80.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	73.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	79.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	72.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	72.0		28-136	%	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-38 18-S4-NG-CH-093 Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:00 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	73.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	77.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	66.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0788			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.253			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.288			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-39 18-S4-SB-CH-095 Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:00 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	21.4		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	59		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	2810		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	0.12		0.10	mg/kg	29-MAR-19	01-APR-19	R4588513
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	3.7		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	0.765		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	28.9		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.020	DLM	0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	3080		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	0.093		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	9.03		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	53.7		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	2300		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	17.5		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	5.21		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	1.27		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	6290		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	17900		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	3.45		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	28.8		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.0094	[U]	0.0094	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDD	0.0067	M,J,R	0.0038	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.019	M,J,B	0.010	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.0120	M,J,R	0.0097	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.0175	M,J	0.0097	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	0.0513	M,J,B	0.0059	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	0.218	M,J,B	0.0062	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	<0.0065	[U]	0.0065	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.0156	M,J,B	0.0033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-39 18-S4-SB-CH-095							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:00							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
2,3,4,7,8-PeCDF	0.0106	M,J,B	0.0027	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.0181	M,J,B	0.0046	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.0156	M,J	0.0045	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.0120	M,J,R	0.0046	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.0250	M,J,B	0.0066	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.0419	M,J,B	0.0072	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.0213	M,J,B	0.0088	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	0.124	M,J,B	0.0064	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	<0.0094	[U]	0.0094	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.0069		0.0038	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	1				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	0.036		0.010	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	0.0807		0.0059	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	<0.0065	[U]	0.0065	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	0				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.0263		0.0033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.0588		0.0066	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.0632		0.0088	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	80.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	83.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	73.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	82.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	76.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	70.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	80.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	80.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	73.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	79.0		26-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	77.0		29-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	70.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	69.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	73.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	84.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.0144			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.0285			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.0335			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
L2222986-40 18-S7-SS-CH-079							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:00							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	26.3		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	12.7		5.0	mg/kg	27-MAR-19	28-MAR-19	R4587202
Fluoride (F)	1.18		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0543		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-40 18-S7-SS-CH-079							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:00							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	20500		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	6.09		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	89.6		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	0.85		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	18.5		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.484		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	9910		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	30.3		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	8.51		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	18.9		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	21200		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	15.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	8030		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	390		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	1.73		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	26.3		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	552		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	3900		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	71		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	23.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.272		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	180		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	41.1		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	73.7		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	2.8		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.263	[J]	0.036	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.210	J,R	0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.228	J,B	0.023	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.492	J,B	0.023	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.512	[J]	0.023	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	7.02		0.036	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	49.6		0.037	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	0.392	M,J	0.039	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.268	M,J,B	0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.445	[J]	0.023	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.453	J,B	0.010	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.362	J,B	0.0099	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.400	J,R	0.010	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.120	J,R	0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	2.43	[J]	0.013	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.210	J,R	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	4.71	J,B	0.023	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	1.09		0.036	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDD # Homologues	4				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	3.33		0.020	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	7.57		0.023	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-40 18-S7-SS-CH-079							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:00							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Total-HpCDD	14.6		0.036	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	5.38		0.039	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	13				07-MAR-19	20-MAR-19	R4579287
Total-PeCDF	5.41		0.029	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	15				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	3.64		0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	8				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	3.82		0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	73.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	76.0		25-181	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	93.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	78.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	87.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	71.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	65.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	75.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	77.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	99.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	92.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	90.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	97.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	86.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	69.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.759			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	1.02			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	1.02			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-41 18-S7-SD-CH-081							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:20							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
Chloride (Cl)	69.3		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	6.55		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0448		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
Moisture	27.5		0.25	%		16-MAR-19	R4568024
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	26500		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	7.78		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	128		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	1.14		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	27.5		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.294		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	60400		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	40.6		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	11.5		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	20.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	26900		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	14.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	26000		20	mg/kg	16-MAR-19	20-MAR-19	R4574887

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-41 18-S7-SD-CH-081 Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:20 Matrix: Sediment							
<b>Metals in Soil by CRC ICPMS</b>							
Manganese (Mn)	465		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	3.25		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	35.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	501		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	4890		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	296		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	80.0		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.354		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	272		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	53.8		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	70.1		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	4.3		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
L2222986-42 18-S7-NG-CH-085 Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:10 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	78.4		0.10	%	11-MAR-19	12-MAR-19	R4558429
Chloride (Cl)	12200		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0356		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	4340		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	1.13		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	37.7		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	0.058		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	14.0		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	18.0		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0867		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	9520		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.477		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.061		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	7.21		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	93.0		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.372		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	3850		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	42.5		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	28.0		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	1.36		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	2900		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	35600		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	49		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	24.5		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0045		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.14		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	27.7		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.033	[U]	0.033	pg/g ww	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-42 18-S7-NG-CH-085							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 11:10							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,7,8-PeCDD	0.067	M,J	0.014	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDD	0.090	J,R	0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDD	0.136	J,B	0.014	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDD	0.153	[J]	0.014	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDD	1.57	[J]	0.024	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDD	9.17	[J]	0.035	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,7,8-TCDF	0.099	[J]	0.024	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8-PeCDF	0.076	M,J,B	0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,7,8-PeCDF	0.081	M,J,B	0.013	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8-HxCDF	0.093	M,J,R	0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,6,7,8-HxCDF	0.090	[J]	0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
2,3,4,6,7,8-HxCDF	0.098	M,J,R	0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,7,8,9-HxCDF	0.110	J,R	0.019	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,6,7,8-HpCDF	0.458	J,B	0.013	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
1,2,3,4,7,8,9-HpCDF	0.079	J,B	0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
OCDF	1.24	[J]	0.025	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total-TCDD	0.254		0.033	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-PeCDD	0.689		0.014	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDD # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HxCDD	1.86		0.015	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDD # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HpCDD	4.03		0.024	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDD # Homologues	2				11-MAR-19	28-MAR-19	R4586945
Total-TCDF	1.59		0.024	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total TCDF # Homologues	13				11-MAR-19	28-MAR-19	R4586945
Total-PeCDF	0.887		0.017	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total PeCDF # Homologues	6				11-MAR-19	28-MAR-19	R4586945
Total-HxCDF	0.573		0.019	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HxCDF # Homologues	4				11-MAR-19	28-MAR-19	R4586945
Total-HpCDF	0.862		0.016	pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Total HpCDF # Homologues	3				11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDD	82.0		25-164	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDD	96.0		25-181	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	88.0		32-141	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	88.0		28-130	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	86.0		23-140	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-OCDD	56.0		17-157	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,7,8-TCDF	84.0		24-169	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8-PeCDF	91.0		21-192	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,7,8-PeCDF	93.0		21-178	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	85.0		26-152	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	87.0		29-123	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	85.0		26-147	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	85.0		28-136	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	81.0		28-143	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	82.0		26-138	%	11-MAR-19	28-MAR-19	R4586945
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	81.0		31-197	%	11-MAR-19	28-MAR-19	R4586945
Lower Bound PCDD/F TEQ (WHO 2005)	0.166			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Mid Point PCDD/F TEQ (WHO 2005)	0.221			pg/g wwt	11-MAR-19	28-MAR-19	R4586945
Upper Bound PCDD/F TEQ (WHO 2005)	0.238			pg/g wwt	11-MAR-19	28-MAR-19	R4586945

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-43 18-D1-SS-CH-200							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:40							
Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	10.0		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	26.6		5.0	mg/kg	27-MAR-19	28-MAR-19	R4587202
Fluoride (F)	5.40		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0454		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	17700		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	5.59		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	70.0		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	0.72		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	13.5		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.452		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	7660		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	24.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	7.29		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	14.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	17600		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	14.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	5830		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	284		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	1.44		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	19.3		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	551		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	2710		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	70		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	17.9		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.244		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	165		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	37.5		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	56.9		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	1.8		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.032	[U]	0.032	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.056	[U]	0.056	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.042	[U]	0.042	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.034	[U]	0.034	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0031	[U]	0.0031	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0025	[U]	0.0025	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	0.0218	M,J	0.0051	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	0.0250	M,J,R	0.0079	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.010	M,J,R	0.010	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.015	[U]	0.015	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.019	[U]	0.019	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0049	[U]	0.0049	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.298	M	0.010	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	0.0106	[J]	0.0079	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.290		0.0052	ng/g	14-MAR-19	26-MAR-19	R4689169

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-43 18-D1-SS-CH-200							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:40							
Matrix: Soil							
<b>OC Pesticides by Method 1699</b>							
Methoxychlor	<0.11	U,1	0.11	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.00678	M,J,B	0.00079	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	91.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	99.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	68.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	94.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	95.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	99.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	102.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	106.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	93.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	92.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	105.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.035	[U]	0.035	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	110.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.198	[J]	0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.212	J,B	0.011	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.210	J,B	0.011	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.388	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.411	M,J	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	5.15		0.018	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	31.9		0.021	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	0.377	M,J	0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.230	M,J,R	0.019	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.538	[J]	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.387	J,B	0.010	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.311	J,B	0.010	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.385	J,B	0.0098	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.106	J,B	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDF	1.79	[J]	0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.140	J,R	0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	2.52	J,B	0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	0.955		0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDD # Homologues	4				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	2.71		0.011	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	10				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	5.07		0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDD # Homologues	6				07-MAR-19	20-MAR-19	R4579287
Total-HpCDD	9.92		0.018	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	9.52		0.025	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	18				07-MAR-19	20-MAR-19	R4579287
Total-PeCDF	6.63		0.019	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	14				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	4.04		0.012	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	10				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	2.77		0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	76.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	77.0		25-181	%	07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-43 18-D1-SS-CH-200 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:40 Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	80.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	84.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	88.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	72.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	67.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	78.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	78.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	88.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	81.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	85.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	97.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	84.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	72.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.909			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	0.917			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	0.917			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-44 18-D2-SS-CH-201 Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:35 Matrix: Soil							
<b>Miscellaneous Parameters</b>							
% Moisture	18.2		0.10	%	07-MAR-19	08-MAR-19	R4551577
Chloride (Cl)	6.9		5.0	mg/kg	27-MAR-19	28-MAR-19	R4587202
Fluoride (F)	4.72		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0444		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	21900		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	7.05		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	112		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	0.99		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	18.4		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.502		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	17200		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	31.4		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	11.5		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	15.0		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	23000		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	15.4		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	12000		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	741		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	1.43		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	30.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Phosphorus (P)	517		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	3580		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	100		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	26.6		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.274		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	213		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	46.2		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-44 18-D2-SS-CH-201							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:35							
Matrix: Soil							
<b>Metals in Soil by CRC ICPMS</b>							
Zinc (Zn)	62.2		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	2.8		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.049	[U]	0.049	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.086	[U]	0.086	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.066	[U]	0.066	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.054	[U]	0.054	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0051	[U]	0.0051	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0040	[U]	0.0040	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	<0.0036	[U]	0.0036	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.018	[U]	0.018	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.017	[U]	0.017	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	<0.013	[U]	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.016	[U]	0.016	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.011	[U]	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.025	[U]	0.025	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.029	[U]	0.029	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0076	[U]	0.0076	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.237	M	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	<0.0086	[U]	0.0086	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.132	[J]	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.11	U,1.	0.11	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.0038	M,J,B	0.0013	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	84.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	87.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	55.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	80.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	77.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	80.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	90.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	93.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	90.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	101.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	111.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.025	[U]	0.025	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	101.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	0.305	[J]	0.032	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDD	0.179	J,B	0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDD	0.121	J,B	0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDD	0.361	J,B	0.016	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDD	0.341	M,J	0.015	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,6,7,8-HpCDD	5.64		0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDD	35.0		0.043	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,7,8-TCDF	0.261	M,J	0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8-PeCDF	0.230	J,B	0.016	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,7,8-PeCDF	0.332	J,B	0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8-HxCDF	0.301	J,B	0.0074	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,6,7,8-HxCDF	0.235	J,B	0.0074	pg/g	07-MAR-19	20-MAR-19	R4579287
2,3,4,6,7,8-HxCDF	0.320	J,B	0.0076	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,7,8,9-HxCDF	0.0710	J,R	0.0092	pg/g	07-MAR-19	20-MAR-19	R4579287

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-44 18-D2-SS-CH-201							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 14:35							
Matrix: Soil							
<b>Dioxins and Furans HR 1613B</b>							
1,2,3,4,6,7,8-HpCDF	1.38	[J]	0.011	pg/g	07-MAR-19	20-MAR-19	R4579287
1,2,3,4,7,8,9-HpCDF	0.138	J,B	0.013	pg/g	07-MAR-19	20-MAR-19	R4579287
OCDF	2.11	J,B	0.021	pg/g	07-MAR-19	20-MAR-19	R4579287
Total-TCDD	1.69		0.032	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDD # Homologues	8				07-MAR-19	20-MAR-19	R4579287
Total-PeCDD	3.54		0.014	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDD # Homologues	8				07-MAR-19	20-MAR-19	R4579287
Total-HxCDD	5.08		0.016	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDD # Homologues	7				07-MAR-19	20-MAR-19	R4579287
Total-HpCDD	10.1		0.027	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDD # Homologues	2				07-MAR-19	20-MAR-19	R4579287
Total-TCDF	5.97		0.017	pg/g	07-MAR-19	20-MAR-19	R4579287
Total TCDF # Homologues	16				07-MAR-19	20-MAR-19	R4579287
Total-PeCDF	4.75		0.016	pg/g	07-MAR-19	20-MAR-19	R4579287
Total PeCDF # Homologues	12				07-MAR-19	20-MAR-19	R4579287
Total-HxCDF	2.43		0.0092	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HxCDF # Homologues	6				07-MAR-19	20-MAR-19	R4579287
Total-HpCDF	2.44		0.013	pg/g	07-MAR-19	20-MAR-19	R4579287
Total HpCDF # Homologues	3				07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDD	80.0		25-164	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDD	69.0		25-181	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	88.0		32-141	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	78.0		28-130	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	85.0		23-140	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-OCDD	69.0		17-157	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,7,8-TCDF	73.0		24-169	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8-PeCDF	70.0		24-185	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,7,8-PeCDF	70.0		21-178	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	88.0		26-152	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	87.0		26-123	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	85.0		29-147	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	95.0		28-136	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	84.0		28-143	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	90.0		26-138	%	07-MAR-19	20-MAR-19	R4579287
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	76.0		35-197	%	07-MAR-19	20-MAR-19	R4579287
Lower Bound PCDD/F TEQ (WHO 2005)	0.867			pg/g	07-MAR-19	20-MAR-19	R4579287
Mid Point PCDD/F TEQ (WHO 2005)	0.874			pg/g	07-MAR-19	20-MAR-19	R4579287
Upper Bound PCDD/F TEQ (WHO 2005)	0.874			pg/g	07-MAR-19	20-MAR-19	R4579287
L2222986-45 18-D3-NG-CH-203							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:30							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	79.7		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	11300		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0134		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	3870		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	4.85		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	323		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-45 18-D3-NG-CH-203							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:30							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Arsenic (As)-Total	0.173		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	8.84		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	0.011		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	6.8		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0198		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	7090		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	0.741		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	0.141		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	3.61		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	337		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	0.246		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	2670		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	109		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	2.73		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	0.86		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	4170		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	21600		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	70		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	14.6		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	0.0041		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	0.57		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	28.1		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.12	[U]	0.12	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.22	[U]	0.22	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.18	[U]	0.18	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.011	[U]	0.011	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.015	[U]	0.015	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	<0.016	[U]	0.016	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.10	[U]	0.10	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.091	[U]	0.091	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	<0.041	[U]	0.041	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.068	[U]	0.068	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.19	[U]	0.19	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.13	[U]	0.13	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.42	[U]	0.42	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.21	[U]	0.21	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.087	[U]	0.087	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.29	[U]	0.29	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.25	[U]	0.25	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<1.0	U.1.	1.0	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.053	[U]	0.053	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	78.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	80.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	57.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	69.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	52.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	37.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	60.0		21-125	%	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-45 18-D3-NG-CH-203							
Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:30							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Surrogate: 4,4'-DDT, 13C12-	34.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	94.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	46.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	39.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.11	[U]	0.11	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.098	[U]	0.098	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDD	<0.046	M,U	0.046	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	0.090	M,J	0.045	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	0.090	M,J	0.041	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.120	M,J,R	0.041	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	0.718	M,J	0.051	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDD	3.05	[J]	0.058	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,7,8-TCDF	<0.074	[U]	0.074	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDF	0.073	M,J,R	0.033	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,7,8-PeCDF	0.063	M,J,R	0.027	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.090	M,J	0.051	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	<0.051	M,U	0.051	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	<0.053	M,U	0.053	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	<0.072	M,U	0.072	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.256	[J]	0.027	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	0.062	M,J,R	0.034	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDF	0.327	M,J,B	0.061	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total-TCDD	0.135		0.098	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDD # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-PeCDD	0.105		0.046	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDD # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-HxCDD	0.606		0.045	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDD # Homologues	3				20-MAR-19	28-MAR-19	R4587121
Total-HpCDD	1.65		0.051	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDD # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Total-TCDF	0.188		0.074	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDF # Homologues	1				20-MAR-19	28-MAR-19	R4587121
Total-PeCDF	0.369		0.033	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDF # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Total-HxCDF	0.376		0.072	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDF # Homologues	3				20-MAR-19	28-MAR-19	R4587121
Total-HpCDF	0.331		0.034	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDF # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	98.0		25-164	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	97.0		25-181	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	72.0		32-141	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	81.0		23-140	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-OCDD	74.0		17-157	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	81.0		24-169	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	90.0		21-192	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	93.0		21-178	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	75.0		26-152	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	82.0		26-123	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	81.0		29-147	%	20-MAR-19	28-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-45 18-D3-NG-CH-203 Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:30 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	77.0		28-136	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	82.0		28-143	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	78.0		31-197	%	20-MAR-19	28-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.0378			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.156			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.241			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
L2222986-46 18-D9-NG-CH-220 Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	75.6		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	19600		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	0.0181		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	3610		100	mg/kg	21-MAR-19	26-MAR-19	R4585028
Titanium (Ti)-Total	2.52		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	118		2.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Arsenic (As)-Total	0.053		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Barium (Ba)-Total	10.2		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	26-MAR-19	R4585028
Boron (B)-Total	6.8		1.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Cadmium (Cd)-Total	0.220		0.0050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Calcium (Ca)-Total	5330		20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Chromium (Cr)-Total	0.403		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Cobalt (Co)-Total	0.086		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Copper (Cu)-Total	8.53		0.10	mg/kg	21-MAR-19	26-MAR-19	R4585028
Iron (Fe)-Total	181		3.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Lead (Pb)-Total	0.230		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Magnesium (Mg)-Total	3240		2.0	mg/kg	21-MAR-19	26-MAR-19	R4585028
Manganese (Mn)-Total	66.7		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Molybdenum (Mo)-Total	4.23		0.020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Nickel (Ni)-Total	2.30		0.20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Phosphorus (P)-Total	6050		10	mg/kg	21-MAR-19	26-MAR-19	R4585028
Potassium (K)-Total	42500		20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Sodium (Na)-Total	83		20	mg/kg	21-MAR-19	26-MAR-19	R4585028
Strontium (Sr)-Total	7.81		0.050	mg/kg	21-MAR-19	26-MAR-19	R4585028
Thallium (Tl)-Total	0.0039		0.0020	mg/kg	21-MAR-19	26-MAR-19	R4585028
Vanadium (V)-Total	0.31		0.10	mg/kg	21-MAR-19	26-MAR-19	R4585028
Zinc (Zn)-Total	29.0		0.50	mg/kg	21-MAR-19	26-MAR-19	R4585028
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	26-MAR-19	R4585028
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.17	[U]	0.17	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.31	[U]	0.31	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.24	[U]	0.24	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.19	[U]	0.19	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.015	[U]	0.015	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.018	[U]	0.018	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	0.033	M,J	0.030	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-46 18-D9-NG-CH-220							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
cis-Chlordane	<0.12	[U]	0.12	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	0.160	M,J,R	0.056	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.086	[U]	0.086	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.15	[U]	0.15	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.36	[U]	0.36	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.18	[U]	0.18	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.12	[U]	0.12	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.23	[U]	0.23	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.54	[U]	0.54	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<0.85	U,1.	0.85	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.046	[U]	0.046	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	69.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	74.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	36.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	56.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	47.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	41.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	54.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	33.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	65.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	57.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	35.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.20	[U]	0.20	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.17	[U]	0.17	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDD	0.16	M,J	0.12	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	0.154	M,J	0.098	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	0.259	M,J	0.091	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.190	M,J,R	0.091	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	1.23	M,J	0.10	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDD	5.73	M,J	0.11	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,7,8-TCDF	<0.16	[U]	0.16	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8-PeCDF	0.164	M,J,B	0.094	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,7,8-PeCDF	<0.073	[U]	0.073	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.194	M,J	0.063	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	0.224	M,J	0.063	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	0.180	M,J,R	0.064	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	0.200	M,J,R	0.087	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.613	M,J	0.051	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	0.214	M,J	0.064	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
OCDF	1.00	M,J,R	0.12	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total-TCDD	<0.17	[U]	0.17	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	28-MAR-19	R4587121
Total-PeCDD	0.65		0.12	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDD # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Total-HxCDD	1.28		0.098	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDD # Homologues	3				20-MAR-19	28-MAR-19	R4587121
Total-HpCDD	2.90		0.10	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDD # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Total-TCDF	0.55		0.16	pg/g wwt	20-MAR-19	28-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-46 18-D9-NG-CH-220							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:00							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total TCDF # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Total-PeCDF	0.413		0.094	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total PeCDF # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Total-HxCDF	0.667		0.087	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HxCDF # Homologues	3				20-MAR-19	28-MAR-19	R4587121
Total-HpCDF	0.827		0.064	pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Total HpCDF # Homologues	2				20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	103.0		25-164	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	95.0		25-181	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	78.0		32-141	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	85.0		28-130	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	91.0		23-140	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-OCDD	77.0		17-157	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	89.0		24-169	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	90.0		21-192	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	89.0		21-178	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	75.0		26-152	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	84.0		26-123	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	81.0		29-147	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	78.0		28-136	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	87.0		28-143	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	93.0		26-138	%	20-MAR-19	28-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	85.0		31-197	%	20-MAR-19	28-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.269			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.431			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.535			pg/g wwt	20-MAR-19	28-MAR-19	R4587121
L2222986-47 18-D4-SD-CH-204							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:50							
Matrix: Sediment							
<b>Miscellaneous Parameters</b>							
% Moisture	55.0		0.10	%	12-MAR-19	13-MAR-19	R4560298
Chloride (Cl)	62.1		5.0	mg/kg	27-MAR-19	27-MAR-19	R4586535
Fluoride (F)	2.84		0.20	mg/kg	25-MAR-19	28-MAR-19	R4586702
Mercury (Hg)	0.0754		0.0050	mg/kg	16-MAR-19	21-MAR-19	R4575467
<b>Metals in Soil by CRC ICPMS</b>							
Aluminum (Al)	36300		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Arsenic (As)	6.23		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Barium (Ba)	177		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Beryllium (Be)	1.42		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Boron (B)	31.5		5.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cadmium (Cd)	0.781		0.020	mg/kg	16-MAR-19	20-MAR-19	R4574887
Calcium (Ca)	56300		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Chromium (Cr)	50.1		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Cobalt (Co)	12.6		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Copper (Cu)	32.3		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Iron (Fe)	33100		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Lead (Pb)	19.5		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Magnesium (Mg)	24700		20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Manganese (Mn)	331		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Molybdenum (Mo)	2.32		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Nickel (Ni)	42.7		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-47 18-D4-SD-CH-204							
Sampled By: Pascal Tuarze on 17-OCT-18 @ 08:50							
Matrix: Sediment							
<b>Metals in Soil by CRC ICPMS</b>							
Phosphorus (P)	1040		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Potassium (K)	6370		100	mg/kg	16-MAR-19	20-MAR-19	R4574887
Silver (Ag)	<0.10		0.10	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sodium (Na)	195		50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Strontium (Sr)	72.8		0.50	mg/kg	16-MAR-19	20-MAR-19	R4574887
Sulfur (S)	<1000		1000	mg/kg	16-MAR-19	20-MAR-19	R4574887
Thallium (Tl)	0.486		0.050	mg/kg	16-MAR-19	20-MAR-19	R4574887
Titanium (Ti)	244		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Vanadium (V)	66.0		0.20	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zinc (Zn)	135		2.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
Zirconium (Zr)	3.5		1.0	mg/kg	16-MAR-19	20-MAR-19	R4574887
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.027	[U]	0.027	ng/g	14-MAR-19	26-MAR-19	R4689169
beta-BHC	<0.046	[U]	0.046	ng/g	14-MAR-19	26-MAR-19	R4689169
delta-BHC	<0.037	[U]	0.037	ng/g	14-MAR-19	26-MAR-19	R4689169
gamma-BHC	<0.030	[U]	0.030	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor	<0.0022	[U]	0.0022	ng/g	14-MAR-19	26-MAR-19	R4689169
Aldrin	<0.0040	[U]	0.0040	ng/g	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide	<0.0050	[U]	0.0050	ng/g	14-MAR-19	26-MAR-19	R4689169
trans-Chlordane	<0.013	[U]	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
cis-Chlordane	<0.012	[U]	0.012	ng/g	14-MAR-19	26-MAR-19	R4689169
Dieldrin	0.022	M,J,R	0.010	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin	<0.014	[U]	0.014	ng/g	14-MAR-19	26-MAR-19	R4689169
Endrin Aldehyde	<0.0082	[U]	0.0082	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan I	<0.013	[U]	0.013	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan II	<0.027	[U]	0.027	ng/g	14-MAR-19	26-MAR-19	R4689169
Endosulfan Sulfate	<0.0061	[U]	0.0061	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDE	0.169	M,J	0.0085	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDD	0.0352	M,J	0.0058	ng/g	14-MAR-19	26-MAR-19	R4689169
4,4-DDT	0.042	M,J	0.011	ng/g	14-MAR-19	26-MAR-19	R4689169
Methoxychlor	<0.14	U,1.	0.14	ng/g	14-MAR-19	26-MAR-19	R4689169
Mirex	0.0040	M,J,R	0.0010	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: alpha-BHC, 13C6-	84.0		16-129	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: gamma-BHC-D6	91.0		11-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Heptachlor, 13C10-	66.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: trans-Nonachlor, 13C10-	86.0		14-136	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Dieldrin, 13C12-	88.0		40-151	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endrin, 13C12-	91.0		35-155	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Endosulfan II, 13C9-	89.0		5-122	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDE, 13C12-	109.0		21-125	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDT, 13C12-	71.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Methoxychlor-D6	53.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Surrogate: Mirex, 13C10-	72.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
Heptachlor Epoxide A	<0.034	[U]	0.034	ng/g	14-MAR-19	26-MAR-19	R4689169
Surrogate: 4,4'-DDD, 13C12-	106.0		5-120	%	14-MAR-19	26-MAR-19	R4689169
L2222986-48 18-D5-SB-CH-205							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:20							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	37.8		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	35		20	mg/kg	26-MAR-19	27-MAR-19	R4586235

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-48 18-D5-SB-CH-205							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:20							
Matrix: Plant Tissue							
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	3580		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	1.04		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	32.5		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.025	DLM	0.025	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	2530		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	0.082		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	10.5		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	55.1		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	2670		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	20.7		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	22.6		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	1.24		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	6840		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	20900		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	3.68		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	32.8		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Chlorophenols as acetate derivatives</b>							
Pentachlorophenol	<2.0	[U]	2.0	ng/g	21-MAR-19	28-MAR-19	R4681338
Surrogate: 13C6-Pentachlorophenol	39.8	G	50-150	%	21-MAR-19	28-MAR-19	R4681338
Note: The recovery of 13C6-Pentachlorophenol is below the method control limit. PCP has not been detected							
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.049	[U]	0.049	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.088	[U]	0.088	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.067	[U]	0.067	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.053	[U]	0.053	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.0038	[U]	0.0038	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.0036	[U]	0.0036	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	<0.0051	[U]	0.0051	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.021	[U]	0.021	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.019	[U]	0.019	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	0.0547	M,J	0.0063	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.0098	[U]	0.0098	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.034	[U]	0.034	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.018	[U]	0.018	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.056	[U]	0.056	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.026	[U]	0.026	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.016	[U]	0.016	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.027	[U]	0.027	ng/g	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-48 18-D5-SB-CH-205							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:20							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
4,4-DDT	<0.069	[U]	0.069	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<0.24	U,1.	0.24	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.0048	[U]	0.0048	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	66.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	72.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	36.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	62.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	55.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	54.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	72.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	63.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	127.0	G	5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	97.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	61.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.035	[U]	0.035	ng/g	13-MAR-19	27-MAR-19	R4690188
Note: Methoxychlor-D6 % recovery is outside the method limits.							
Isotope dilution calculation for native target is recovery corrected							
so impact to data quality is minimal.							
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.020	[U]	0.020	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8-PeCDD	0.0162	M,J	0.0078	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	0.014	M,J,R	0.010	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	0.0124	M,J	0.0089	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.0220	M,J,R	0.0091	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	0.030	M,J,R	0.014	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
OCDD	0.186	M,J	0.014	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,7,8-TCDF	<0.015	[U]	0.015	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8-PeCDF	0.0258	M,J,B	0.0094	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,4,7,8-PeCDF	0.0130	M,J,R	0.0078	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.0119	M,J	0.0080	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	0.0172	M,J	0.0081	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	0.0115	M,J	0.0087	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	0.026	M,J,R	0.012	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.0282	M,J	0.0086	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	0.0170	M,J,R	0.0097	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
OCDF	0.105	M,J,B	0.014	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total-TCDD	<0.020	[U]	0.020	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-PeCDD	0.0162		0.0078	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total PeCDD # Homologues	1				20-MAR-19	29-MAR-19	R4587121
Total-HxCDD	0.012		0.010	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HxCDD # Homologues	1				20-MAR-19	29-MAR-19	R4587121
Total-HpCDD	<0.014	[U]	0.014	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HpCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-TCDF	<0.015	[U]	0.015	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-PeCDF	0.0258		0.0094	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total PeCDF # Homologues	1				20-MAR-19	29-MAR-19	R4587121
Total-HxCDF	0.041		0.012	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HxCDF # Homologues	3				20-MAR-19	29-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-48 18-D5-SB-CH-205							
Sampled By: Pascal Tuarze on 26-SEP-18 @ 11:20							
Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Total-HpCDF	0.0282		0.0097	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HpCDF # Homologues	1				20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	91.0		25-164	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	80.0		25-181	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	63.0		32-141	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	68.0		28-130	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	68.0		23-140	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-OCDD	58.0		17-157	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	73.0		24-169	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	77.0		21-192	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	74.0		21-178	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	60.0		26-152	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	67.0		26-123	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	62.0		29-147	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	62.0		28-136	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	61.0		28-143	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	75.0		26-138	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	75.0		31-197	%	20-MAR-19	29-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.0226			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.0440			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.0547			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
L2222986-49 18-D6-FC-CH-207							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:40							
Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	27.2		0.10	%	12-MAR-19	13-MAR-19	R4560301
Chloride (Cl)	422		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Sulfur (S)-Total	810		100	mg/kg	21-MAR-19	23-MAR-19	R4581418
Titanium (Ti)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Barium (Ba)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	23-MAR-19	R4581418
Boron (B)-Total	2.1		1.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Calcium (Ca)-Total	43		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Copper (Cu)-Total	1.49		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Iron (Fe)-Total	14.0		3.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Magnesium (Mg)-Total	836		2.0	mg/kg	21-MAR-19	23-MAR-19	R4581418
Manganese (Mn)-Total	2.68		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Molybdenum (Mo)-Total	0.218		0.020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Phosphorus (P)-Total	2720		10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Potassium (K)-Total	3250		20	mg/kg	21-MAR-19	23-MAR-19	R4581418

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-49 18-D6-FC-CH-207							
Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:40							
Matrix: Plant Tissue							
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	23-MAR-19	R4581418
Strontium (Sr)-Total	<0.050		0.050	mg/kg	21-MAR-19	23-MAR-19	R4581418
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	23-MAR-19	R4581418
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zinc (Zn)-Total	15.7		0.50	mg/kg	21-MAR-19	23-MAR-19	R4581418
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	23-MAR-19	R4581418
<b>Chlorophenols as acetate derivatives</b>							
Pentachlorophenol	<2.0	[U]	2.0	ng/g	21-MAR-19	28-MAR-19	R4681338
Surrogate: 13C6-Pentachlorophenol	42.3	G	50-150	%	21-MAR-19	28-MAR-19	R4681338
Note: The recovery of 13C6-Pentachlorophenol is below the method control limit. PCP has not been detected							
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.042	[U]	0.042	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.075	[U]	0.075	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.056	[U]	0.056	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.044	[U]	0.044	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.0041	[U]	0.0041	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.0038	[U]	0.0038	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	<0.0036	[U]	0.0036	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.017	[U]	0.017	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.015	[U]	0.015	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	<0.017	[U]	0.017	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.025	[U]	0.025	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.036	[U]	0.036	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.029	[U]	0.029	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.063	[U]	0.063	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.042	[U]	0.042	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.021	[U]	0.021	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.045	[U]	0.045	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188
Methoxychlor	<0.19	U,1.	0.19	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.013	[U]	0.013	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	65.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	74.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	40.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	62.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	56.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	45.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	62.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	41.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	79.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	56.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	40.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.024	[U]	0.024	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.017	[U]	0.017	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8-PeCDD	<0.0078	[U]	0.0078	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	<0.0093	[U]	0.0093	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	<0.0087	[U]	0.0087	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.0140	M,J,R	0.0087	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	0.030	M,J,R	0.011	pg/g wwt	20-MAR-19	29-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-49 18-D6-FC-CH-207 Sampled By: Pascal Tuarze on 16-OCT-18 @ 16:40 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
OCDD	0.195	M,J	0.016	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,7,8-TCDF	<0.013	[U]	0.013	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8-PeCDF	<0.0077	[U]	0.0077	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,4,7,8-PeCDF	<0.0063	[U]	0.0063	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.0140	M,J,R	0.0060	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	0.0099	M,J	0.0059	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	0.0138	M,J	0.0062	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	0.0163	M,J	0.0087	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.0180	M,J,R	0.0069	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	0.0120	M,J,R	0.0079	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
OCDF	0.095	M,J,B	0.013	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDD	<0.017	[U]	0.017	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total PeCDD	<0.0078	[U]	0.0078	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total PeCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total HxCDD	<0.0093	[U]	0.0093	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HxCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total HpCDD	<0.011	[U]	0.011	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HpCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total TCDF	<0.013	[U]	0.013	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total PeCDF	<0.0077	[U]	0.0077	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total PeCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total HxCDF	0.0400		0.0087	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HxCDF # Homologues	3				20-MAR-19	29-MAR-19	R4587121
Total HpCDF	<0.0079	[U]	0.0079	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HpCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	93.0		25-164	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	82.0		25-181	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	70.0		32-141	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	75.0		28-130	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	73.0		23-140	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-OCDD	59.0		17-157	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	78.0		24-169	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	82.0		21-192	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	78.0		21-178	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	67.0		26-152	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	76.0		26-123	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	71.0		29-147	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	67.0		28-136	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	69.0		28-143	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	80.0		26-138	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	75.0		31-197	%	20-MAR-19	29-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.00409			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.0225			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.0375			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
L2222986-50 18-D7-WW-CH-209 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:55 Matrix: Plant Tissue							
<b>Miscellaneous Parameters</b>							
% Moisture	37.0		0.10	%	12-MAR-19	13-MAR-19	R4560301

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-50 18-D7-WW-CH-209							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:55							
Matrix: Plant Tissue							
Chloride (Cl)	862		20	mg/kg	26-MAR-19	27-MAR-19	R4586235
Mercury (Hg)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582669
Silver (Ag)-Total	<0.0050		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sulfur (S)-Total	1280		100	mg/kg	21-MAR-19	25-MAR-19	R4582634
Titanium (Ti)-Total	0.15		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Metals in Tissue by CRC ICPMS (DRY)</b>							
Aluminum (Al)-Total	6.6		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Arsenic (As)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Barium (Ba)-Total	3.80		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Beryllium (Be)-Total	<0.010		0.010	mg/kg	21-MAR-19	25-MAR-19	R4582634
Boron (B)-Total	1.5		1.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cadmium (Cd)-Total	0.0944		0.0050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Calcium (Ca)-Total	621		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Chromium (Cr)-Total	<0.050		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Cobalt (Co)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Copper (Cu)-Total	3.83		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Iron (Fe)-Total	40.2		3.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Lead (Pb)-Total	<0.020		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Magnesium (Mg)-Total	1120		2.0	mg/kg	21-MAR-19	25-MAR-19	R4582634
Manganese (Mn)-Total	24.4		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Molybdenum (Mo)-Total	0.921		0.020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Nickel (Ni)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Phosphorus (P)-Total	3380		10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Potassium (K)-Total	5740		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Sodium (Na)-Total	<20		20	mg/kg	21-MAR-19	25-MAR-19	R4582634
Strontium (Sr)-Total	1.90		0.050	mg/kg	21-MAR-19	25-MAR-19	R4582634
Thallium (Tl)-Total	<0.0020		0.0020	mg/kg	21-MAR-19	25-MAR-19	R4582634
Vanadium (V)-Total	<0.10		0.10	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zinc (Zn)-Total	16.6		0.50	mg/kg	21-MAR-19	25-MAR-19	R4582634
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	21-MAR-19	25-MAR-19	R4582634
<b>Chlorophenols as acetate derivatives</b>							
Pentachlorophenol	<2.1	[U]	2.1	ng/g	21-MAR-19	28-MAR-19	R4681338
Surrogate: 13C6-Pentachlorophenol	50.4		50-150	%	21-MAR-19	28-MAR-19	R4681338
<b>OC Pesticides by Method 1699</b>							
alpha-BHC	<0.057	[U]	0.057	ng/g	13-MAR-19	27-MAR-19	R4690188
beta-BHC	<0.10	[U]	0.10	ng/g	13-MAR-19	27-MAR-19	R4690188
delta-BHC	<0.087	[U]	0.087	ng/g	13-MAR-19	27-MAR-19	R4690188
gamma-BHC	<0.070	[U]	0.070	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor	<0.0055	[U]	0.0055	ng/g	13-MAR-19	27-MAR-19	R4690188
Aldrin	<0.0048	[U]	0.0048	ng/g	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide	<0.0047	[U]	0.0047	ng/g	13-MAR-19	27-MAR-19	R4690188
trans-Chlordane	<0.023	[U]	0.023	ng/g	13-MAR-19	27-MAR-19	R4690188
cis-Chlordane	<0.020	[U]	0.020	ng/g	13-MAR-19	27-MAR-19	R4690188
Dieldrin	0.030	M,J,R	0.013	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin	<0.018	[U]	0.018	ng/g	13-MAR-19	27-MAR-19	R4690188
Endrin Aldehyde	<0.027	[U]	0.027	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan I	<0.036	[U]	0.036	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan II	<0.091	[U]	0.091	ng/g	13-MAR-19	27-MAR-19	R4690188
Endosulfan Sulfate	<0.030	[U]	0.030	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDE	<0.022	[U]	0.022	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDD	<0.058	[U]	0.058	ng/g	13-MAR-19	27-MAR-19	R4690188
4,4-DDT	<0.14	[U]	0.14	ng/g	13-MAR-19	27-MAR-19	R4690188

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-50 18-D7-WW-CH-209							
Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:55							
Matrix: Plant Tissue							
<b>OC Pesticides by Method 1699</b>							
Methoxychlor	<0.43	U,1.	0.43	ng/g	13-MAR-19	27-MAR-19	R4690188
Mirex	<0.014	[U]	0.014	ng/g	13-MAR-19	27-MAR-19	R4690188
Surrogate: alpha-BHC, 13C6-	61.0		16-129	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: gamma-BHC-D6	62.0		11-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Heptachlor, 13C10-	39.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Dieldrin, 13C12-	57.0		40-151	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endrin, 13C12-	53.0		35-155	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Endosulfan II, 13C9-	42.0		5-122	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDE, 13C12-	56.0		21-125	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDT, 13C12-	33.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Methoxychlor-D6	78.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: Mirex, 13C10-	48.0		5-120	%	13-MAR-19	27-MAR-19	R4690188
Surrogate: 4,4'-DDD, 13C12-	36.0		5-150	%	13-MAR-19	27-MAR-19	R4690188
Heptachlor Epoxide A	<0.031	[U]	0.031	ng/g	13-MAR-19	27-MAR-19	R4690188
<b>Dioxins and Furans HR 1613B</b>							
2,3,7,8-TCDD	<0.026	[U]	0.026	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8-PeCDD	<0.011	[U]	0.011	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8-HxCDD	<0.014	M,U	0.014	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,6,7,8-HxCDD	0.015	M,J	0.012	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8,9-HxCDD	0.024	M,J,R	0.012	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDD	0.085	M,J,R	0.015	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
OCDD	0.403	M,J	0.019	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,7,8-TCDF	<0.026	[U]	0.026	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8-PeCDF	0.0200	M,J,R	0.0042	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,4,7,8-PeCDF	0.0110	M,J,R	0.0034	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8-HxCDF	0.016	M,J,R	0.013	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,6,7,8-HxCDF	0.022	M,J,R	0.013	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
2,3,4,6,7,8-HxCDF	0.015	M,J,R	0.013	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,7,8,9-HxCDF	0.031	M,J,R	0.016	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,6,7,8-HpCDF	0.0490	M,J,R	0.0078	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
1,2,3,4,7,8,9-HpCDF	0.0220	M,J,R	0.0097	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
OCDF	0.087	M,J,R	0.018	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total-TCDD	<0.026	[U]	0.026	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-PeCDD	0.037		0.011	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total PeCDD # Homologues	1				20-MAR-19	29-MAR-19	R4587121
Total-HxCDD	0.067		0.014	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HxCDD # Homologues	2				20-MAR-19	29-MAR-19	R4587121
Total-HpCDD	<0.015	[U]	0.015	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HpCDD # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-TCDF	<0.026	[U]	0.026	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total TCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-PeCDF	<0.0042	[U]	0.0042	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total PeCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-HxCDF	<0.016	[U]	0.016	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HxCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Total-HpCDF	<0.0097	[U]	0.0097	pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Total HpCDF # Homologues	0				20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDD	94.0		25-164	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDD	93.0		25-181	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	75.0		32-141	%	20-MAR-19	29-MAR-19	R4587121

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-50 18-D7-WW-CH-209 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:55 Matrix: Plant Tissue							
<b>Dioxins and Furans HR 1613B</b>							
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	82.0		28-130	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	83.0		23-140	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-OCDD	70.0		17-157	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,7,8-TCDF	76.0		24-169	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8-PeCDF	88.0		21-192	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,4,7,8-PeCDF	90.0		21-178	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	70.0		26-152	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	78.0		26-123	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	78.0		29-147	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	76.0		28-136	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,6,7,8-HxCDF	80.0		28-143	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	92.0		26-138	%	20-MAR-19	29-MAR-19	R4587121
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	79.0		31-197	%	20-MAR-19	29-MAR-19	R4587121
Lower Bound PCDD/F TEQ (WHO 2005)	0.00164			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Mid Point PCDD/F TEQ (WHO 2005)	0.0384			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
Upper Bound PCDD/F TEQ (WHO 2005)	0.0589			pg/g wwt	20-MAR-19	29-MAR-19	R4587121
L2222986-51 18-N4-FB-CH-211 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:30 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.000050		0.000050	mg/L		28-FEB-19	R4533650
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
Arsenic (As)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Barium (Ba)-Total	<0.020		0.020	mg/L		26-FEB-19	R4530615
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		26-FEB-19	R4530615
Boron (B)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		26-FEB-19	R4530615
Calcium (Ca)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Copper (Cu)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Iron (Fe)-Total	<0.030		0.030	mg/L		26-FEB-19	R4530615
Lead (Pb)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Magnesium (Mg)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Potassium (K)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Silver (Ag)-Total	<0.000020		0.000020	mg/L		26-FEB-19	R4530615
Sodium (Na)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Sulfur (S)-Total	<0.50		0.50	mg/L		26-FEB-19	R4530615
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		26-FEB-19	R4530615
Titanium (Ti)-Total	<0.010		0.010	mg/L		26-FEB-19	R4530615
Vanadium (V)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	<0.21		0.21	mg/L		27-FEB-19	

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-52 18-S4-FB-CH-213 Sampled By: Pascal Tuarze on 26-SEP-18 @ 09:00 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		28-FEB-19	R4533650
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
Arsenic (As)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Barium (Ba)-Total	<0.020		0.020	mg/L		26-FEB-19	R4530615
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		26-FEB-19	R4530615
Boron (B)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-FEB-19	R4530615
Calcium (Ca)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Copper (Cu)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Iron (Fe)-Total	<0.030		0.030	mg/L		26-FEB-19	R4530615
Lead (Pb)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Magnesium (Mg)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Potassium (K)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Silver (Ag)-Total	<0.000020		0.000020	mg/L		26-FEB-19	R4530615
Sodium (Na)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Sulfur (S)-Total	<0.50		0.50	mg/L		26-FEB-19	R4530615
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		26-FEB-19	R4530615
Titanium (Ti)-Total	<0.010		0.010	mg/L		26-FEB-19	R4530615
Vanadium (V)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	<0.21		0.21	mg/L		27-FEB-19	
L2222986-53 18-E1-FB-CH-214 Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:30 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		28-FEB-19	R4533650
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		27-FEB-19	R4530567
Arsenic (As)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4530567
Barium (Ba)-Total	<0.020		0.020	mg/L		27-FEB-19	R4530567
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		27-FEB-19	R4530567
Boron (B)-Total	<0.10		0.10	mg/L		27-FEB-19	R4530567
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		27-FEB-19	R4530567
Calcium (Ca)-Total	<0.10		0.10	mg/L		27-FEB-19	R4530567
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4530567
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		27-FEB-19	R4530567
Copper (Cu)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4530567
Iron (Fe)-Total	<0.030		0.030	mg/L		27-FEB-19	R4530567
Lead (Pb)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4530567
Magnesium (Mg)-Total	<0.10		0.10	mg/L		27-FEB-19	R4530567
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		27-FEB-19	R4530567
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4530567

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-53 18-E1-FB-CH-214 Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:30 Matrix: Water							
<b>Total Metals in Water by CRC ICPMS</b>							
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4530567
Potassium (K)-Total	<2.0		2.0	mg/L		27-FEB-19	R4530567
Silver (Ag)-Total	<0.000020		0.000020	mg/L		27-FEB-19	R4530567
Sodium (Na)-Total	<2.0		2.0	mg/L		27-FEB-19	R4530567
Sulfur (S)-Total	<0.50		0.50	mg/L		27-FEB-19	R4530567
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		27-FEB-19	R4530567
Titanium (Ti)-Total	<0.010		0.010	mg/L		27-FEB-19	R4530567
Vanadium (V)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4530567
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		27-FEB-19	R4530567
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	<0.21		0.21	mg/L		27-FEB-19	
L2222986-54 18-N4-RB-CH-215 Sampled By: Pascal Tuarze on 05-JUL-18 @ 12:30 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-FEB-19	R4529970
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	0.0223		0.0050	mg/L		05-MAR-19	R4544509
Arsenic (As)-Total	<0.00050		0.00050	mg/L		05-MAR-19	R4544509
Barium (Ba)-Total	<0.020		0.020	mg/L		05-MAR-19	R4544509
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		05-MAR-19	R4544509
Boron (B)-Total	<0.10		0.10	mg/L		05-MAR-19	R4544509
Cadmium (Cd)-Total	0.0000063		0.0000050	mg/L		05-MAR-19	R4544509
Calcium (Ca)-Total	0.12		0.10	mg/L		05-MAR-19	R4544509
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		05-MAR-19	R4544509
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		05-MAR-19	R4544509
Copper (Cu)-Total	<0.0010		0.0010	mg/L		05-MAR-19	R4544509
Iron (Fe)-Total	<0.030		0.030	mg/L		05-MAR-19	R4544509
Lead (Pb)-Total	<0.00050		0.00050	mg/L		05-MAR-19	R4544509
Magnesium (Mg)-Total	<0.10		0.10	mg/L		05-MAR-19	R4544509
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		05-MAR-19	R4544509
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		05-MAR-19	R4544509
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		05-MAR-19	R4544509
Potassium (K)-Total	<2.0		2.0	mg/L		05-MAR-19	R4544509
Silver (Ag)-Total	<0.000020		0.000020	mg/L		05-MAR-19	R4544509
Sodium (Na)-Total	<2.0		2.0	mg/L		05-MAR-19	R4544509
Sulfur (S)-Total	<0.50		0.50	mg/L		05-MAR-19	R4544509
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		05-MAR-19	R4544509
Titanium (Ti)-Total	<0.010		0.010	mg/L		05-MAR-19	R4544509
Vanadium (V)-Total	<0.00050		0.00050	mg/L		05-MAR-19	R4544509
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		05-MAR-19	R4544509
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	<0.21		0.21	mg/L		06-MAR-19	
L2222986-55 18-W2-RB-CH-216 Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:15 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-FEB-19	R4529970
<b>Total Metals in Water by CRC ICPMS</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-55 18-W2-RB-CH-216 Sampled By: Pascal Tuarze on 25-SEP-18 @ 12:15 Matrix: Water							
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	0.0085		0.0050	mg/L		27-FEB-19	R4532289
Arsenic (As)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4532289
Barium (Ba)-Total	<0.020		0.020	mg/L		27-FEB-19	R4532289
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		27-FEB-19	R4532289
Boron (B)-Total	<0.10		0.10	mg/L		27-FEB-19	R4532289
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		27-FEB-19	R4532289
Calcium (Ca)-Total	0.13		0.10	mg/L		27-FEB-19	R4532289
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4532289
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		27-FEB-19	R4532289
Copper (Cu)-Total	0.0017		0.0010	mg/L		27-FEB-19	R4532289
Iron (Fe)-Total	<0.030		0.030	mg/L		27-FEB-19	R4532289
Lead (Pb)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4532289
Magnesium (Mg)-Total	<0.10		0.10	mg/L		27-FEB-19	R4532289
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		27-FEB-19	R4532289
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4532289
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4532289
Potassium (K)-Total	<2.0		2.0	mg/L		27-FEB-19	R4532289
Silver (Ag)-Total	<0.000020		0.000020	mg/L		27-FEB-19	R4532289
Sodium (Na)-Total	<2.0		2.0	mg/L		27-FEB-19	R4532289
Sulfur (S)-Total	<0.50		0.50	mg/L		27-FEB-19	R4532289
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		27-FEB-19	R4532289
Titanium (Ti)-Total	<0.010		0.010	mg/L		27-FEB-19	R4532289
Vanadium (V)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4532289
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		27-FEB-19	R4532289
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	0.38		0.21	mg/L		28-FEB-19	
L2222986-56 18-E1-RB-CH-217 Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:20 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-FEB-19	R4529970
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	0.0095		0.0050	mg/L		27-FEB-19	R4532289
Arsenic (As)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4532289
Barium (Ba)-Total	<0.020		0.020	mg/L		27-FEB-19	R4532289
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		27-FEB-19	R4532289
Boron (B)-Total	<0.10		0.10	mg/L		27-FEB-19	R4532289
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		27-FEB-19	R4532289
Calcium (Ca)-Total	0.12		0.10	mg/L		27-FEB-19	R4532289
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4532289
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		27-FEB-19	R4532289
Copper (Cu)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4532289
Iron (Fe)-Total	<0.030		0.030	mg/L		27-FEB-19	R4532289
Lead (Pb)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4532289
Magnesium (Mg)-Total	<0.10		0.10	mg/L		27-FEB-19	R4532289
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		27-FEB-19	R4532289
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		27-FEB-19	R4532289
Nickel (Ni)-Total	0.0052		0.0010	mg/L		27-FEB-19	R4532289
Potassium (K)-Total	<2.0		2.0	mg/L		27-FEB-19	R4532289
Silver (Ag)-Total	<0.000020		0.000020	mg/L		27-FEB-19	R4532289

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-56 18-E1-RB-CH-217 Sampled By: Pascal Tuarze on 16-OCT-18 @ 12:20 Matrix: Water							
<b>Total Metals in Water by CRC ICPMS</b>							
Sodium (Na)-Total	<2.0		2.0	mg/L		27-FEB-19	R4532289
Sulfur (S)-Total	<0.50		0.50	mg/L		27-FEB-19	R4532289
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		27-FEB-19	R4532289
Titanium (Ti)-Total	<0.010		0.010	mg/L		27-FEB-19	R4532289
Vanadium (V)-Total	<0.00050		0.00050	mg/L		27-FEB-19	R4532289
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		27-FEB-19	R4532289
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	0.41		0.21	mg/L		28-FEB-19	
L2222986-57 18-S4-TB-CH-220 Sampled By: Pascal Tuarze on 14-JAN-19 @ 16:30 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		28-FEB-19	R4533650
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
Arsenic (As)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Barium (Ba)-Total	<0.020		0.020	mg/L		26-FEB-19	R4530615
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		26-FEB-19	R4530615
Boron (B)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-FEB-19	R4530615
Calcium (Ca)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Copper (Cu)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Iron (Fe)-Total	<0.030		0.030	mg/L		26-FEB-19	R4530615
Lead (Pb)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Magnesium (Mg)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Potassium (K)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Silver (Ag)-Total	<0.000020		0.000020	mg/L		26-FEB-19	R4530615
Sodium (Na)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Sulfur (S)-Total	<0.50		0.50	mg/L		26-FEB-19	R4530615
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		26-FEB-19	R4530615
Titanium (Ti)-Total	<0.010		0.010	mg/L		26-FEB-19	R4530615
Vanadium (V)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	<0.21		0.21	mg/L		27-FEB-19	
L2222986-58 18-N4-TB-CH-221 Sampled By: Pascal Tuarze on 14-JAN-19 @ 16:30 Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		28-FEB-19	R4533650
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
Arsenic (As)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Barium (Ba)-Total	<0.020		0.020	mg/L		26-FEB-19	R4530615

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-58 18-N4-TB-CH-221							
Sampled By: Pascal Tuarze on 14-JAN-19 @ 16:30							
Matrix: Water							
<b>Total Metals in Water by CRC ICPMS</b>							
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		26-FEB-19	R4530615
Boron (B)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-FEB-19	R4530615
Calcium (Ca)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Copper (Cu)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Iron (Fe)-Total	<0.030		0.030	mg/L		26-FEB-19	R4530615
Lead (Pb)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Magnesium (Mg)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Potassium (K)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Silver (Ag)-Total	<0.000020		0.000020	mg/L		26-FEB-19	R4530615
Sodium (Na)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Sulfur (S)-Total	<0.50		0.50	mg/L		26-FEB-19	R4530615
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		26-FEB-19	R4530615
Titanium (Ti)-Total	<0.010		0.010	mg/L		26-FEB-19	R4530615
Vanadium (V)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
<b>Miscellaneous Parameters</b>							
Silicon (as SiO2)-Total	<0.21		0.21	mg/L		27-FEB-19	
L2222986-59 18-E1-TB-CH-222							
Sampled By: Pascal Tuarze on 14-JAN-19 @ 16:30							
Matrix: Water							
<b>Total Metals in Water + Hg (CCME/BCWQG)</b>							
<b>Total Mercury in Water by CVAAS or CVAFS</b>							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		28-FEB-19	R4533650
<b>Total Metals in Water by CRC ICPMS</b>							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
Arsenic (As)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Barium (Ba)-Total	<0.020		0.020	mg/L		26-FEB-19	R4530615
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		26-FEB-19	R4530615
Boron (B)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-FEB-19	R4530615
Calcium (Ca)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Cobalt (Co)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Copper (Cu)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Iron (Fe)-Total	<0.030		0.030	mg/L		26-FEB-19	R4530615
Lead (Pb)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Magnesium (Mg)-Total	<0.10		0.10	mg/L		26-FEB-19	R4530615
Manganese (Mn)-Total	<0.00030		0.00030	mg/L		26-FEB-19	R4530615
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		26-FEB-19	R4530615
Potassium (K)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Silver (Ag)-Total	<0.000020		0.000020	mg/L		26-FEB-19	R4530615
Sodium (Na)-Total	<2.0		2.0	mg/L		26-FEB-19	R4530615
Sulfur (S)-Total	<0.50		0.50	mg/L		26-FEB-19	R4530615
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		26-FEB-19	R4530615

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2222986-59 18-E1-TB-CH-222							
Sampled By: Pascal Tuarze on 14-JAN-19 @ 16:30							
Matrix: Water							
<b>Total Metals in Water by CRC ICPMS</b>							
Titanium (Ti)-Total	<0.010		0.010	mg/L		26-FEB-19	R4530615
Vanadium (V)-Total	<0.00050		0.00050	mg/L		26-FEB-19	R4530615
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		26-FEB-19	R4530615
<b>Miscellaneous Parameters</b>							
Silicon (as SiO <sub>2</sub> )-Total	<0.21		0.21	mg/L		27-FEB-19	

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

## Qualifiers for Individual Samples Listed:

Lab Sample ID	Client Sample ID	Qualifier	Description
L2222986-55	18-W2-RB-CH-216	UCM	Unknown sample container (non-ALS) submitted for metals analysis (excluding Hg). ALS cannot verify container cleanliness or suitability for trace metals tests.
L2222986-56	18-E1-RB-CH-217	UCM	Unknown sample container (non-ALS) submitted for metals analysis (excluding Hg). ALS cannot verify container cleanliness or suitability for trace metals tests.

## Sample Parameter Qualifier Key:

Qualifier	Description
<W	No Measurable Response (Zero): < Reported Value
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,B	The analyte was detected below the calibrated range but above the EDL, and was detected in the Method Blank at >10% of the sample concentration.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M	A peak has been manually integrated.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,B	A peak has been manually integrated. Target analyte was detected below the calibrated range but above the EDL. Compound was detected in the method blank at >10% of the sample concentration.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AG-DRY-CCMS-N-VA	Tissue	Silver in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A
This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.			
CL-DRY-SOL-IC-ED	Tissue	Chloride (Cl) - Soluble Dry weight	Comm Soil Sci 16:7/APHA 4110B
Leachable Anions in vegetation analysis is carried out using a leaching procedure which involves the gentle tumbling of the sample in a specified leaching solution (typically deionized water) for a specific length of time. The resulting extract is then analyzed for chloride by ion chromatography with conductivity or UV detection.			
CL-LEACH-IC-VA	Soil	Chloride leach (1:10) by IC	APHA 4110 IC
Leachable Anions in Sediment/Soil Method analysis is carried out using a leaching procedure which involves the gentle tumbling of the sample in a specified leaching solution (typically deionized water) for a specific length of time. The resulting extract is then analysed anions by ion chromatography with conductivity or UV detection. The method is applicable to the following anions: fluoride, chloride, phosphate, bromide, nitrate, sulphate.			
CP-CUSTOM-LRMS-BU	Solid	Chlorophenols as acetate derivatives	EPA 8270 (modified)
Chlorophenols as acetate derivatives by SIM GC/MS.			
DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

## Reference Information

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<p>Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS</p>			
DX-1613B-HRMS-BU	Tissue	Dioxins and Furans HR 1613B	USEPA 1613B
<p>Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS.</p>			
F-1:5-DI-SIE-VA	Soil	Fluoride leach (1:5) by SIE	BCMOE/APHA Method 4500-F Fluoride
<p>This analysis is carried out using procedures from the Method: "Fluoride in Soils by 5:1 Aqueous Extraction", BC Ministry of Environment, 22 January 2008, and procedures adapted from APHA Method 4500-F "Fluoride". The procedure involves mixing the dried (at &lt;60 C) and sieved (2mm) sample with deionized/distilled water at a 1:5 ratio of soil to water. Fluoride is determined using a selective ion electrode</p>			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
<p>Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO<sub>3</sub> equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.</p>			
HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
<p>Soil samples are digested with hot nitric and hydrochloric acids, followed by CVAAS analysis. This method is fully compliant with the BC SALM strong acid leachable metals digestion method.</p>			
HG-DRY-CVAFS-N-VA	Tissue	Mercury in Tissue by CVAAS (DRY)	EPA 200.3, EPA 245.7
<p>This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.</p>			
HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)
<p>Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.</p>			
MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
<p>Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the &lt;2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.</p>			
<p>Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H<sub>2</sub>S) may be excluded if lost during sampling, storage, or digestion.</p>			
MET-DRY-CCMS-N-VA	Tissue	Metals in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A
<p>This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).</p>			
<p>Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.</p>			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
<p>Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.</p>			
<p>Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.</p>			
MOISTURE-BU	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)
<p>This method is used to determine the percent moisture in a sample. Samples are homogenized, moisture is removed by heating at 105 C until constant mass is achieved. The residues are measured gravimetrically and the difference in weight between the wet sample and the dried sample is used to determine the moisture content. This percent moisture can be used, in conjunction with analytical results, to report data on a dry weight basis.</p>			
MOISTURE-BU	Tissue	% Moisture	ASTM METHOD D2794-00
<p>This method is used to determine the percent moisture in a sample. Samples are homogenized, moisture is removed by heating at 105 C until constant mass is achieved. The residues are measured gravimetrically and the difference in weight between the wet sample and the dried sample is used to determine the moisture content. This percent moisture can be used, in conjunction with analytical results, to report data on a dry weight basis.</p>			
MOISTURE-VA	Soil	Moisture content	CCME PHC in Soil - Tier 1 (mod)



## Reference Information

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.			
OCPEST-1699-HRMS-BU	Solid	OC Pesticides by Method 1699	OC PESTICIDES 1699
Samples are extracted by Soxhlet, prepared by column chromatography, and analyzed by GC-HRMS.			
OCPEST-1699-HRMS-BU	Tissue	OC Pesticides by Method 1699	EPA 1699
Samples are extracted by Soxhlet, prepared by gel-permeation chromatography followed by column chromatography, and analyzed by GC-HRMS.			
S-DRY-CCMS-N-VA	Tissue	Sulfur in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A
This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.			
SIO2-T-CALC-VA	Water	Total Silicon (reported as Silica)	CALCULATION
Total Silicon (as SiO <sub>2</sub> ) is a calculated parameter. Total Silicon (as SiO <sub>2</sub> mg/L) = 2.139 x Total Silicon (mg/L).			
TI-DRY-CCMS-N-VA	Tissue	Ti in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A
This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

### Chain of Custody Numbers:

#### GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



## Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>HG-T-CVAA-VA</b>								
<b>Water</b>								
<b>Batch</b>	<b>R4529970</b>							
<b>WG2996298-7</b>	<b>DUP</b>	<b>L2222986-56</b>						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	27-FEB-19
<b>WG2996298-2</b>	<b>LCS</b>							
Mercury (Hg)-Total			100.9		%		80-120	27-FEB-19
<b>WG2996298-1</b>	<b>MB</b>							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	27-FEB-19
<b>Batch</b>	<b>R4533650</b>							
<b>WG2997256-12</b>	<b>DUP</b>	<b>L2236615-5</b>						
Mercury (Hg)-Total		0.0000076	0.0000081		mg/L	6.3	20	28-FEB-19
<b>WG2997256-14</b>	<b>DUP</b>	<b>L2237037-2</b>						
Mercury (Hg)-Total		0.0000063	<0.0000050	RPD-NA	mg/L	N/A	20	28-FEB-19
<b>WG2997256-15</b>	<b>DUP</b>	<b>L2237232-1</b>						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	28-FEB-19
<b>WG2997256-18</b>	<b>DUP</b>	<b>L2237252-18</b>						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	28-FEB-19
<b>WG2997256-4</b>	<b>DUP</b>	<b>L2235863-7</b>						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	28-FEB-19
<b>WG2997256-7</b>	<b>DUP</b>	<b>L2236141-3</b>						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	28-FEB-19
<b>WG2997256-9</b>	<b>DUP</b>	<b>L2222986-58</b>						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	28-FEB-19
<b>WG2997256-2</b>	<b>LCS</b>							
Mercury (Hg)-Total			102.6		%		80-120	28-FEB-19
<b>WG2997256-1</b>	<b>MB</b>							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	28-FEB-19
<b>WG2997256-11</b>	<b>MS</b>	<b>L2236314-4</b>						
Mercury (Hg)-Total			99.3		%		70-130	28-FEB-19
<b>WG2997256-13</b>	<b>MS</b>	<b>L2236615-9</b>						
Mercury (Hg)-Total			98.6		%		70-130	28-FEB-19
<b>WG2997256-16</b>	<b>MS</b>	<b>L2237232-2</b>						
Mercury (Hg)-Total			96.7		%		70-130	28-FEB-19
<b>WG2997256-17</b>	<b>MS</b>	<b>L2237252-12</b>						
Mercury (Hg)-Total			96.4		%		70-130	28-FEB-19
<b>WG2997256-3</b>	<b>MS</b>	<b>L2235602-1</b>						
Mercury (Hg)-Total			100.0		%		70-130	28-FEB-19
<b>WG2997256-5</b>	<b>MS</b>	<b>L2235863-8</b>						
Mercury (Hg)-Total			100.2		%		70-130	28-FEB-19
<b>WG2997256-6</b>	<b>MS</b>	<b>L2236141-2</b>						





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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>HG-T-CVAA-VA</b>								
	Water							
<b>Batch</b>	<b>R4533650</b>							
<b>WG2997256-6 MS</b>		<b>L2236141-2</b>						
Mercury (Hg)-Total			101.5		%		70-130	28-FEB-19
<b>WG2997256-8 MS</b>		<b>L2222986-57</b>						
Mercury (Hg)-Total			103.3		%		70-130	28-FEB-19
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4530567</b>							
<b>WG2995614-3 DUP</b>		<b>L2236641-2</b>						
Aluminum (Al)-Total		0.355	0.356		mg/L	0.5	20	27-FEB-19
Arsenic (As)-Total		0.0111	0.0109		mg/L	1.1	20	27-FEB-19
Barium (Ba)-Total		0.0230	0.0230		mg/L	0.0	20	27-FEB-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	27-FEB-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	27-FEB-19
Cadmium (Cd)-Total		0.0000904	0.0000953		mg/L	5.4	20	27-FEB-19
Calcium (Ca)-Total		12.7	13.1		mg/L	2.9	20	27-FEB-19
Chromium (Cr)-Total		0.00270	0.00284		mg/L	4.9	20	27-FEB-19
Cobalt (Co)-Total		0.00040	0.00040		mg/L	1.0	20	27-FEB-19
Copper (Cu)-Total		0.00880	0.00882		mg/L	0.2	20	27-FEB-19
Iron (Fe)-Total		0.440	0.437		mg/L	0.9	20	27-FEB-19
Lead (Pb)-Total		0.00128	0.00129		mg/L	0.8	20	27-FEB-19
Magnesium (Mg)-Total		0.835	0.849		mg/L	1.7	20	27-FEB-19
Manganese (Mn)-Total		0.0786	0.0776		mg/L	1.3	20	27-FEB-19
Molybdenum (Mo)-Total		0.000373	0.000389		mg/L	4.1	20	27-FEB-19
Nickel (Ni)-Total		0.00135	0.00134		mg/L	0.9	20	27-FEB-19
Potassium (K)-Total		2.27	2.33		mg/L	2.8	20	27-FEB-19
Silver (Ag)-Total		0.000048	0.000039	J	mg/L	0.000009	0.00002	27-FEB-19
Sodium (Na)-Total		2.24	2.34		mg/L	4.2	20	27-FEB-19
Sulfur (S)-Total		24.1	24.9		mg/L	3.2	20	27-FEB-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	27-FEB-19
Titanium (Ti)-Total		0.00813	0.00806		mg/L	0.8	20	27-FEB-19
Vanadium (V)-Total		0.00066	0.00066		mg/L	0.3	20	27-FEB-19
Zinc (Zn)-Total		0.0427	0.0425		mg/L	0.5	20	27-FEB-19
<b>WG2995614-2 LCS</b>								
Aluminum (Al)-Total			93.3		%		80-120	27-FEB-19
Arsenic (As)-Total			92.9		%		80-120	27-FEB-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>		<b>Water</b>						
<b>Batch</b>	<b>R4530567</b>							
<b>WG2995614-2</b>	<b>LCS</b>							
Barium (Ba)-Total			92.2		%		80-120	27-FEB-19
Beryllium (Be)-Total			93.6		%		80-120	27-FEB-19
Boron (B)-Total			89.1		%		80-120	27-FEB-19
Cadmium (Cd)-Total			95.2		%		80-120	27-FEB-19
Calcium (Ca)-Total			93.6		%		80-120	27-FEB-19
Chromium (Cr)-Total			95.7		%		80-120	27-FEB-19
Cobalt (Co)-Total			93.8		%		80-120	27-FEB-19
Copper (Cu)-Total			92.5		%		80-120	27-FEB-19
Iron (Fe)-Total			93.8		%		80-120	27-FEB-19
Lead (Pb)-Total			90.5		%		80-120	27-FEB-19
Magnesium (Mg)-Total			95.5		%		80-120	27-FEB-19
Manganese (Mn)-Total			95.0		%		80-120	27-FEB-19
Molybdenum (Mo)-Total			99.9		%		80-120	27-FEB-19
Nickel (Ni)-Total			94.1		%		80-120	27-FEB-19
Potassium (K)-Total			93.7		%		80-120	27-FEB-19
Silver (Ag)-Total			96.2		%		80-120	27-FEB-19
Sodium (Na)-Total			101.2		%		80-120	27-FEB-19
Sulfur (S)-Total			88.0		%		80-120	27-FEB-19
Thallium (Tl)-Total			88.7		%		80-120	27-FEB-19
Titanium (Ti)-Total			87.2		%		80-120	27-FEB-19
Vanadium (V)-Total			96.4		%		80-120	27-FEB-19
Zinc (Zn)-Total			92.7		%		80-120	27-FEB-19
<b>WG2995614-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	27-FEB-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Boron (B)-Total			<0.010		mg/L		0.01	27-FEB-19
Cadmium (Cd)-Total			<0.000005		mg/L		0.000005	27-FEB-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-FEB-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-FEB-19
Iron (Fe)-Total			<0.010		mg/L		0.01	27-FEB-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>		<b>Water</b>						
<b>Batch R4530567</b>								
<b>WG2995614-1 MB</b>								
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-FEB-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-FEB-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	27-FEB-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-FEB-19
Potassium (K)-Total			<0.050		mg/L		0.05	27-FEB-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	27-FEB-19
Sodium (Na)-Total			<0.050		mg/L		0.05	27-FEB-19
Sulfur (S)-Total			<0.50		mg/L		0.5	27-FEB-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	27-FEB-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	27-FEB-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	27-FEB-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-FEB-19
<b>Batch R4530615</b>								
<b>WG2995243-3 DUP</b>		<b>L2236514-2</b>						
Aluminum (Al)-Total		0.0193	0.0191		mg/L	0.8	20	26-FEB-19
Arsenic (As)-Total		0.00013	0.00015		mg/L	17	20	26-FEB-19
Barium (Ba)-Total		0.00377	0.00386		mg/L	2.4	20	26-FEB-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-FEB-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	26-FEB-19
Cadmium (Cd)-Total		0.0000336	0.0000309		mg/L	8.4	20	26-FEB-19
Calcium (Ca)-Total		277	291		mg/L	4.8	20	26-FEB-19
Chromium (Cr)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-FEB-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-FEB-19
Copper (Cu)-Total		0.113	0.114		mg/L	0.9	20	26-FEB-19
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	26-FEB-19
Lead (Pb)-Total		0.000257	0.000262		mg/L	2.2	20	26-FEB-19
Magnesium (Mg)-Total		10.7	10.9		mg/L	2.4	20	26-FEB-19
Manganese (Mn)-Total		0.00079	0.00080		mg/L	1.2	20	26-FEB-19
Molybdenum (Mo)-Total		0.000221	0.000250		mg/L	12	20	26-FEB-19
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-FEB-19
Potassium (K)-Total		0.948	0.957		mg/L	0.9	20	26-FEB-19
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-FEB-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4530615</b>							
<b>WG2995243-3</b>	<b>DUP</b>	<b>L2236514-2</b>						
Sodium (Na)-Total		1.43	1.44		mg/L	1.0	20	26-FEB-19
Sulfur (S)-Total		276	288		mg/L	4.4	20	26-FEB-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-FEB-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-FEB-19
Zinc (Zn)-Total		0.0060	0.0051		mg/L	16	20	26-FEB-19
<b>WG2995243-2</b>	<b>LCS</b>							
Aluminum (Al)-Total			94.1		%		80-120	26-FEB-19
Arsenic (As)-Total			90.4		%		80-120	26-FEB-19
Barium (Ba)-Total			88.6		%		80-120	26-FEB-19
Beryllium (Be)-Total			87.3		%		80-120	26-FEB-19
Boron (B)-Total			91.6		%		80-120	26-FEB-19
Cadmium (Cd)-Total			89.3		%		80-120	26-FEB-19
Calcium (Ca)-Total			89.8		%		80-120	26-FEB-19
Chromium (Cr)-Total			91.6		%		80-120	26-FEB-19
Cobalt (Co)-Total			91.6		%		80-120	26-FEB-19
Copper (Cu)-Total			90.9		%		80-120	26-FEB-19
Iron (Fe)-Total			94.4		%		80-120	26-FEB-19
Lead (Pb)-Total			96.0		%		80-120	26-FEB-19
Magnesium (Mg)-Total			91.7		%		80-120	26-FEB-19
Manganese (Mn)-Total			94.8		%		80-120	26-FEB-19
Molybdenum (Mo)-Total			91.7		%		80-120	26-FEB-19
Nickel (Ni)-Total			90.1		%		80-120	26-FEB-19
Potassium (K)-Total			91.2		%		80-120	26-FEB-19
Silver (Ag)-Total			92.5		%		80-120	26-FEB-19
Sodium (Na)-Total			90.7		%		80-120	26-FEB-19
Sulfur (S)-Total			96.8		%		80-120	26-FEB-19
Thallium (Tl)-Total			96.8		%		80-120	26-FEB-19
Titanium (Ti)-Total			90.2		%		80-120	26-FEB-19
Vanadium (V)-Total			91.7		%		80-120	26-FEB-19
Zinc (Zn)-Total			87.1		%		80-120	26-FEB-19
<b>WG2995243-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	26-FEB-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	26-FEB-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	26-FEB-19



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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4530615</b>							
<b>WG2995243-1</b>	<b>MB</b>							
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	26-FEB-19
Boron (B)-Total			<0.010		mg/L		0.01	26-FEB-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	26-FEB-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	26-FEB-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	26-FEB-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	26-FEB-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	26-FEB-19
Iron (Fe)-Total			<0.010		mg/L		0.01	26-FEB-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	26-FEB-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	26-FEB-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	26-FEB-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	26-FEB-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	26-FEB-19
Potassium (K)-Total			<0.050		mg/L		0.05	26-FEB-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	26-FEB-19
Sodium (Na)-Total			<0.050		mg/L		0.05	26-FEB-19
Sulfur (S)-Total			<0.50		mg/L		0.5	26-FEB-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	26-FEB-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	26-FEB-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	26-FEB-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	26-FEB-19
<b>WG2995243-4</b>	<b>MS</b>	<b>L2236514-1</b>						
Aluminum (Al)-Total			89.6		%		70-130	26-FEB-19
Arsenic (As)-Total			94.3		%		70-130	26-FEB-19
Barium (Ba)-Total			84.5		%		70-130	26-FEB-19
Beryllium (Be)-Total			83.9		%		70-130	26-FEB-19
Boron (B)-Total			85.7		%		70-130	26-FEB-19
Cadmium (Cd)-Total			86.6		%		70-130	26-FEB-19
Calcium (Ca)-Total			N/A	MS-B	%		-	26-FEB-19
Chromium (Cr)-Total			90.9		%		70-130	26-FEB-19
Cobalt (Co)-Total			89.1		%		70-130	26-FEB-19
Copper (Cu)-Total			84.2		%		70-130	26-FEB-19
Iron (Fe)-Total			93.1		%		70-130	26-FEB-19
Lead (Pb)-Total			90.9		%		70-130	26-FEB-19



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70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4530615</b>							
<b>WG2995243-4 MS</b>		<b>L2236514-1</b>						
Magnesium (Mg)-Total			N/A	MS-B	%		-	26-FEB-19
Manganese (Mn)-Total			93.7		%		70-130	26-FEB-19
Molybdenum (Mo)-Total			95.4		%		70-130	26-FEB-19
Nickel (Ni)-Total			86.5		%		70-130	26-FEB-19
Potassium (K)-Total			90.2		%		70-130	26-FEB-19
Silver (Ag)-Total			94.1		%		70-130	26-FEB-19
Sodium (Na)-Total			93.4		%		70-130	26-FEB-19
Sulfur (S)-Total			N/A	MS-B	%		-	26-FEB-19
Thallium (Tl)-Total			90.1		%		70-130	26-FEB-19
Titanium (Ti)-Total			92.1		%		70-130	26-FEB-19
Vanadium (V)-Total			91.5		%		70-130	26-FEB-19
Zinc (Zn)-Total			79.9		%		70-130	26-FEB-19
<b>Batch</b>	<b>R4532289</b>							
<b>WG2995248-3 DUP</b>		<b>L2222986-55</b>						
Aluminum (Al)-Total		0.0085	0.0094		mg/L	9.5	20	27-FEB-19
Arsenic (As)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-FEB-19
Barium (Ba)-Total		<0.020	<0.020	RPD-NA	mg/L	N/A	20	27-FEB-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	27-FEB-19
Boron (B)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	27-FEB-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	27-FEB-19
Calcium (Ca)-Total		0.13	0.15		mg/L	14	20	27-FEB-19
Chromium (Cr)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-FEB-19
Cobalt (Co)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	27-FEB-19
Copper (Cu)-Total		0.0017	0.0017		mg/L	0.4	20	27-FEB-19
Iron (Fe)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	27-FEB-19
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-FEB-19
Magnesium (Mg)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	27-FEB-19
Manganese (Mn)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	27-FEB-19
Molybdenum (Mo)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-FEB-19
Nickel (Ni)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-FEB-19
Potassium (K)-Total		<2.0	<2.0	RPD-NA	mg/L	N/A	20	27-FEB-19
Silver (Ag)-Total		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	27-FEB-19
Sodium (Na)-Total		<2.0	<2.0	RPD-NA	mg/L	N/A	20	27-FEB-19



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70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4532289</b>							
<b>WG2995248-3</b>	<b>DUP</b>	<b>L2222986-55</b>						
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	27-FEB-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	27-FEB-19
Titanium (Ti)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	27-FEB-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-FEB-19
Zinc (Zn)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-FEB-19
<b>WG2995248-2</b>	<b>LCS</b>							
Aluminum (Al)-Total			99.1		%		80-120	27-FEB-19
Arsenic (As)-Total			94.0		%		80-120	27-FEB-19
Barium (Ba)-Total			93.0		%		80-120	27-FEB-19
Beryllium (Be)-Total			105.3		%		80-120	27-FEB-19
Boron (B)-Total			105.6		%		80-120	27-FEB-19
Cadmium (Cd)-Total			93.4		%		80-120	27-FEB-19
Calcium (Ca)-Total			101.0		%		80-120	27-FEB-19
Chromium (Cr)-Total			98.7		%		80-120	27-FEB-19
Cobalt (Co)-Total			93.1		%		80-120	27-FEB-19
Copper (Cu)-Total			93.9		%		80-120	27-FEB-19
Iron (Fe)-Total			91.7		%		80-120	27-FEB-19
Lead (Pb)-Total			95.2		%		80-120	27-FEB-19
Magnesium (Mg)-Total			96.5		%		80-120	27-FEB-19
Manganese (Mn)-Total			97.9		%		80-120	27-FEB-19
Molybdenum (Mo)-Total			96.7		%		80-120	27-FEB-19
Nickel (Ni)-Total			91.9		%		80-120	27-FEB-19
Potassium (K)-Total			95.1		%		80-120	27-FEB-19
Silver (Ag)-Total			89.9		%		80-120	27-FEB-19
Sodium (Na)-Total			99.3		%		80-120	27-FEB-19
Sulfur (S)-Total			87.8		%		80-120	27-FEB-19
Thallium (Tl)-Total			92.2		%		80-120	27-FEB-19
Titanium (Ti)-Total			88.2		%		80-120	27-FEB-19
Vanadium (V)-Total			96.2		%		80-120	27-FEB-19
Zinc (Zn)-Total			94.6		%		80-120	27-FEB-19
<b>WG2995248-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	27-FEB-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	27-FEB-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4532289</b>							
<b>WG2995248-1</b>	<b>MB</b>							
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Boron (B)-Total			<0.010		mg/L		0.01	27-FEB-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	27-FEB-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-FEB-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-FEB-19
Iron (Fe)-Total			<0.010		mg/L		0.01	27-FEB-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-FEB-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-FEB-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	27-FEB-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	27-FEB-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-FEB-19
Potassium (K)-Total			<0.050		mg/L		0.05	27-FEB-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	27-FEB-19
Sodium (Na)-Total			<0.050		mg/L		0.05	27-FEB-19
Sulfur (S)-Total			<0.50		mg/L		0.5	27-FEB-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	27-FEB-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	27-FEB-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	27-FEB-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-FEB-19
<b>WG2995248-4</b>	<b>MS</b>	<b>L2222986-56</b>						
Aluminum (Al)-Total			98.5		%		70-130	27-FEB-19
Arsenic (As)-Total			94.4		%		70-130	27-FEB-19
Barium (Ba)-Total			91.7		%		70-130	27-FEB-19
Beryllium (Be)-Total			108.7		%		70-130	27-FEB-19
Boron (B)-Total			107.6		%		70-130	27-FEB-19
Cadmium (Cd)-Total			92.8		%		70-130	27-FEB-19
Calcium (Ca)-Total			103.7		%		70-130	27-FEB-19
Chromium (Cr)-Total			99.7		%		70-130	27-FEB-19
Cobalt (Co)-Total			95.3		%		70-130	27-FEB-19
Copper (Cu)-Total			97.7		%		70-130	27-FEB-19
Iron (Fe)-Total			94.9		%		70-130	27-FEB-19
Lead (Pb)-Total			98.6		%		70-130	27-FEB-19





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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4532289</b>							
<b>WG2995248-4 MS</b>		<b>L2222986-56</b>						
Magnesium (Mg)-Total			95.2		%		70-130	27-FEB-19
Manganese (Mn)-Total			97.8		%		70-130	27-FEB-19
Molybdenum (Mo)-Total			89.8		%		70-130	27-FEB-19
Nickel (Ni)-Total			96.5		%		70-130	27-FEB-19
Potassium (K)-Total			94.8		%		70-130	27-FEB-19
Silver (Ag)-Total			93.0		%		70-130	27-FEB-19
Sodium (Na)-Total			100.6		%		70-130	27-FEB-19
Sulfur (S)-Total			99.6		%		70-130	27-FEB-19
Thallium (Tl)-Total			94.8		%		70-130	27-FEB-19
Titanium (Ti)-Total			97.3		%		70-130	27-FEB-19
Vanadium (V)-Total			96.6		%		70-130	27-FEB-19
Zinc (Zn)-Total			96.0		%		70-130	27-FEB-19
<b>Batch</b>	<b>R4533089</b>							
<b>WG2997407-3 DUP</b>		<b>L2237721-1</b>						
Aluminum (Al)-Total		0.164	0.179		mg/L	9.2	20	28-FEB-19
Arsenic (As)-Total		0.00031	0.00033		mg/L	4.3	20	28-FEB-19
Barium (Ba)-Total		0.102	0.103		mg/L	0.5	20	28-FEB-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	28-FEB-19
Boron (B)-Total		0.028	0.028		mg/L	0.7	20	28-FEB-19
Cadmium (Cd)-Total		0.0000596	0.0000584		mg/L	2.0	20	28-FEB-19
Calcium (Ca)-Total		116	115		mg/L	1.0	20	28-FEB-19
Chromium (Cr)-Total		0.00025	0.00024		mg/L	5.1	20	28-FEB-19
Cobalt (Co)-Total		0.00014	0.00014		mg/L	1.4	20	28-FEB-19
Copper (Cu)-Total		0.00069	0.00065		mg/L	5.8	20	28-FEB-19
Iron (Fe)-Total		0.095	0.095		mg/L	0.1	20	28-FEB-19
Lead (Pb)-Total		0.000127	0.000123		mg/L	3.0	20	28-FEB-19
Magnesium (Mg)-Total		59.6	58.9		mg/L	1.2	20	28-FEB-19
Manganese (Mn)-Total		0.0110	0.0109		mg/L	0.9	20	28-FEB-19
Molybdenum (Mo)-Total		0.00248	0.00237		mg/L	4.7	20	28-FEB-19
Nickel (Ni)-Total		0.00133	0.00134		mg/L	1.3	20	28-FEB-19
Potassium (K)-Total		1.70	1.74		mg/L	2.2	20	28-FEB-19
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	28-FEB-19
Sodium (Na)-Total		10.6	10.4		mg/L	1.9	20	28-FEB-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4533089</b>							
<b>WG2997407-3</b>	<b>DUP</b>	<b>L2237721-1</b>						
Sulfur (S)-Total		103	102		mg/L	0.4	20	28-FEB-19
Thallium (Tl)-Total		0.000036	0.000034		mg/L	4.5	20	28-FEB-19
Titanium (Ti)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	28-FEB-19
Vanadium (V)-Total		0.00067	0.00068		mg/L	0.7	20	28-FEB-19
Zinc (Zn)-Total		0.0115	0.0113		mg/L	2.1	20	28-FEB-19
<b>WG2997407-2</b>	<b>LCS</b>							
Aluminum (Al)-Total			100.0		%		80-120	28-FEB-19
Arsenic (As)-Total			98.0		%		80-120	28-FEB-19
Barium (Ba)-Total			98.8		%		80-120	28-FEB-19
Beryllium (Be)-Total			100.1		%		80-120	28-FEB-19
Boron (B)-Total			98.9		%		80-120	28-FEB-19
Cadmium (Cd)-Total			99.9		%		80-120	28-FEB-19
Calcium (Ca)-Total			98.1		%		80-120	28-FEB-19
Chromium (Cr)-Total			97.6		%		80-120	28-FEB-19
Cobalt (Co)-Total			98.0		%		80-120	28-FEB-19
Copper (Cu)-Total			96.8		%		80-120	28-FEB-19
Iron (Fe)-Total			96.2		%		80-120	28-FEB-19
Lead (Pb)-Total			93.2		%		80-120	28-FEB-19
Magnesium (Mg)-Total			105.1		%		80-120	28-FEB-19
Manganese (Mn)-Total			99.3		%		80-120	28-FEB-19
Molybdenum (Mo)-Total			97.1		%		80-120	28-FEB-19
Nickel (Ni)-Total			96.5		%		80-120	28-FEB-19
Potassium (K)-Total			102.1		%		80-120	28-FEB-19
Silver (Ag)-Total			94.2		%		80-120	28-FEB-19
Sodium (Na)-Total			101.3		%		80-120	28-FEB-19
Sulfur (S)-Total			98.8		%		80-120	28-FEB-19
Thallium (Tl)-Total			92.9		%		80-120	28-FEB-19
Titanium (Ti)-Total			96.5		%		80-120	28-FEB-19
Vanadium (V)-Total			98.8		%		80-120	28-FEB-19
Zinc (Zn)-Total			100.2		%		80-120	28-FEB-19
<b>WG2997407-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	28-FEB-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	28-FEB-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	28-FEB-19



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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4533089</b>							
<b>WG2997407-1</b>	<b>MB</b>							
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	28-FEB-19
Boron (B)-Total			<0.010		mg/L		0.01	28-FEB-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	28-FEB-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	28-FEB-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	28-FEB-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	28-FEB-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	28-FEB-19
Iron (Fe)-Total			<0.010		mg/L		0.01	28-FEB-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	28-FEB-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	28-FEB-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	28-FEB-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	28-FEB-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	28-FEB-19
Potassium (K)-Total			<0.050		mg/L		0.05	28-FEB-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	28-FEB-19
Sodium (Na)-Total			<0.050		mg/L		0.05	28-FEB-19
Sulfur (S)-Total			<0.50		mg/L		0.5	28-FEB-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	28-FEB-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	28-FEB-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	28-FEB-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	28-FEB-19
<b>WG2997407-4</b>	<b>MS</b>	<b>L2237721-3</b>						
Aluminum (Al)-Total			N/A	MS-B	%		-	28-FEB-19
Arsenic (As)-Total			99.8		%		70-130	28-FEB-19
Barium (Ba)-Total			N/A	MS-B	%		-	28-FEB-19
Beryllium (Be)-Total			94.0		%		70-130	28-FEB-19
Boron (B)-Total			98.2		%		70-130	28-FEB-19
Cadmium (Cd)-Total			101.0		%		70-130	28-FEB-19
Calcium (Ca)-Total			N/A	MS-B	%		-	28-FEB-19
Chromium (Cr)-Total			95.8		%		70-130	28-FEB-19
Cobalt (Co)-Total			93.2		%		70-130	28-FEB-19
Copper (Cu)-Total			91.6		%		70-130	28-FEB-19
Iron (Fe)-Total			93.0		%		70-130	28-FEB-19
Lead (Pb)-Total			88.5		%		70-130	28-FEB-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4533089</b>							
<b>WG2997407-4 MS</b>		<b>L2237721-3</b>						
Magnesium (Mg)-Total			N/A	MS-B	%		-	28-FEB-19
Manganese (Mn)-Total			92.4		%		70-130	28-FEB-19
Molybdenum (Mo)-Total			97.0		%		70-130	28-FEB-19
Nickel (Ni)-Total			91.4		%		70-130	28-FEB-19
Potassium (K)-Total			97.4		%		70-130	28-FEB-19
Silver (Ag)-Total			95.4		%		70-130	28-FEB-19
Sodium (Na)-Total			N/A	MS-B	%		-	28-FEB-19
Sulfur (S)-Total			N/A	MS-B	%		-	28-FEB-19
Thallium (Tl)-Total			90.4		%		70-130	28-FEB-19
Titanium (Ti)-Total			99.7		%		70-130	28-FEB-19
Vanadium (V)-Total			99.6		%		70-130	28-FEB-19
Zinc (Zn)-Total			93.1		%		70-130	28-FEB-19
<b>Batch</b>	<b>R4544509</b>							
<b>WG2999706-3 DUP</b>		<b>L2238713-1</b>						
Aluminum (Al)-Total		0.0226	0.0209		mg/L	7.6	20	05-MAR-19
Arsenic (As)-Total		0.00095	0.00097		mg/L	2.3	20	05-MAR-19
Barium (Ba)-Total		0.0482	0.0486		mg/L	0.7	20	05-MAR-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	05-MAR-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	05-MAR-19
Cadmium (Cd)-Total		0.0000386	0.0000463		mg/L	18	20	05-MAR-19
Calcium (Ca)-Total		36.3	34.4		mg/L	5.4	20	05-MAR-19
Chromium (Cr)-Total		0.00015	<0.00010	RPD-NA	mg/L	N/A	20	05-MAR-19
Cobalt (Co)-Total		0.00015	0.00014		mg/L	5.8	20	05-MAR-19
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	05-MAR-19
Iron (Fe)-Total		0.253	0.259		mg/L	2.4	20	05-MAR-19
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	05-MAR-19
Magnesium (Mg)-Total		21.8	21.5		mg/L	1.7	20	05-MAR-19
Manganese (Mn)-Total		0.234	0.234		mg/L	0.1	20	05-MAR-19
Molybdenum (Mo)-Total		0.00526	0.00510		mg/L	3.1	20	05-MAR-19
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	05-MAR-19
Potassium (K)-Total		0.65	0.66		mg/L	1.5	20	05-MAR-19
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	05-MAR-19
Sodium (Na)-Total		22.6	22.8		mg/L	1.0	20	05-MAR-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4544509</b>							
<b>WG2999706-3</b>	<b>DUP</b>	<b>L2238713-1</b>						
Sulfur (S)-Total		8.25	8.60		mg/L	4.1	20	05-MAR-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	05-MAR-19
Titanium (Ti)-Total		0.00038	0.00048	J	mg/L	0.00009	0.0006	05-MAR-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	05-MAR-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	05-MAR-19
<b>WG2999706-2</b>	<b>LCS</b>							
Aluminum (Al)-Total			97.6		%		80-120	05-MAR-19
Arsenic (As)-Total			93.5		%		80-120	05-MAR-19
Barium (Ba)-Total			98.0		%		80-120	05-MAR-19
Beryllium (Be)-Total			98.3		%		80-120	05-MAR-19
Boron (B)-Total			99.9		%		80-120	05-MAR-19
Cadmium (Cd)-Total			100.1		%		80-120	05-MAR-19
Calcium (Ca)-Total			94.0		%		80-120	05-MAR-19
Chromium (Cr)-Total			99.3		%		80-120	05-MAR-19
Cobalt (Co)-Total			96.4		%		80-120	05-MAR-19
Copper (Cu)-Total			98.6		%		80-120	05-MAR-19
Iron (Fe)-Total			88.2		%		80-120	05-MAR-19
Lead (Pb)-Total			99.2		%		80-120	05-MAR-19
Magnesium (Mg)-Total			95.8		%		80-120	05-MAR-19
Manganese (Mn)-Total			98.8		%		80-120	05-MAR-19
Molybdenum (Mo)-Total			97.2		%		80-120	05-MAR-19
Nickel (Ni)-Total			95.2		%		80-120	05-MAR-19
Potassium (K)-Total			95.4		%		80-120	05-MAR-19
Silver (Ag)-Total			93.2		%		80-120	05-MAR-19
Sodium (Na)-Total			111.6		%		80-120	05-MAR-19
Sulfur (S)-Total			81.4		%		80-120	05-MAR-19
Thallium (Tl)-Total			98.6		%		80-120	05-MAR-19
Titanium (Ti)-Total			97.0		%		80-120	05-MAR-19
Vanadium (V)-Total			96.3		%		80-120	05-MAR-19
Zinc (Zn)-Total			101.9		%		80-120	05-MAR-19
<b>WG2999706-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	05-MAR-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	05-MAR-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	05-MAR-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4544509</b>							
<b>WG2999706-1</b>	<b>MB</b>							
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	05-MAR-19
Boron (B)-Total			<0.010		mg/L		0.01	05-MAR-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	05-MAR-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	05-MAR-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	05-MAR-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	05-MAR-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	05-MAR-19
Iron (Fe)-Total			<0.010		mg/L		0.01	05-MAR-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	05-MAR-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	05-MAR-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	05-MAR-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	05-MAR-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	05-MAR-19
Potassium (K)-Total			<0.050		mg/L		0.05	05-MAR-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	05-MAR-19
Sodium (Na)-Total			<0.050		mg/L		0.05	05-MAR-19
Sulfur (S)-Total			<0.50		mg/L		0.5	05-MAR-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	05-MAR-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	05-MAR-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	05-MAR-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	05-MAR-19
<b>WG2999706-4</b>	<b>MS</b>	<b>L2239564-3</b>						
Aluminum (Al)-Total			N/A	MS-B	%		-	05-MAR-19
Arsenic (As)-Total			94.9		%		70-130	05-MAR-19
Barium (Ba)-Total			97.3		%		70-130	05-MAR-19
Beryllium (Be)-Total			98.2		%		70-130	05-MAR-19
Boron (B)-Total			99.97		%		70-130	05-MAR-19
Cadmium (Cd)-Total			100.7		%		70-130	05-MAR-19
Calcium (Ca)-Total			N/A	MS-B	%		-	05-MAR-19
Chromium (Cr)-Total			97.2		%		70-130	05-MAR-19
Cobalt (Co)-Total			93.8		%		70-130	05-MAR-19
Copper (Cu)-Total			92.9		%		70-130	05-MAR-19
Iron (Fe)-Total			95.7		%		70-130	05-MAR-19
Lead (Pb)-Total			96.5		%		70-130	05-MAR-19



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70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-CCMS-VA</b>								
	Water							
<b>Batch</b>	<b>R4544509</b>							
<b>WG2999706-4</b>	<b>MS</b>	<b>L2239564-3</b>						
Magnesium (Mg)-Total			N/A	MS-B	%		-	05-MAR-19
Manganese (Mn)-Total			N/A	MS-B	%		-	05-MAR-19
Molybdenum (Mo)-Total			94.2		%		70-130	05-MAR-19
Nickel (Ni)-Total			93.1		%		70-130	05-MAR-19
Potassium (K)-Total			109.5		%		70-130	05-MAR-19
Silver (Ag)-Total			96.1		%		70-130	05-MAR-19
Sodium (Na)-Total			N/A	MS-B	%		-	05-MAR-19
Sulfur (S)-Total			100.4		%		70-130	05-MAR-19
Thallium (Tl)-Total			89.5		%		70-130	05-MAR-19
Titanium (Ti)-Total			97.3		%		70-130	05-MAR-19
Vanadium (V)-Total			96.0		%		70-130	05-MAR-19
Zinc (Zn)-Total			99.7		%		70-130	05-MAR-19
<b>CL-LEACH-IC-VA</b>								
	Soil							
<b>Batch</b>	<b>R4586535</b>							
<b>WG3015508-2</b>	<b>DUP</b>	<b>L2222986-27</b>						
Chloride (Cl)		30.6	9.1	DUP-H	mg/kg	21.5	10	27-MAR-19
<b>WG3015373-2</b>	<b>LCS</b>							
Chloride (Cl)			102.4		%		70-130	27-MAR-19
<b>WG3015508-3</b>	<b>LCS</b>							
Chloride (Cl)			102.8		%		70-130	27-MAR-19
<b>WG3015373-1</b>	<b>MB</b>							
Chloride (Cl)			<5.0		mg/kg		5	27-MAR-19
<b>WG3015508-1</b>	<b>MB</b>							
Chloride (Cl)			<5.0		mg/kg		5	27-MAR-19
<b>Batch</b>	<b>R4587202</b>							
<b>WG3015818-2</b>	<b>LCS</b>							
Chloride (Cl)			101.3		%		70-130	28-MAR-19
<b>WG3015818-1</b>	<b>MB</b>							
Chloride (Cl)			<5.0		mg/kg		5	28-MAR-19
<b>DX-1613B-HRMS-BU</b>								
	Soil							
<b>Batch</b>	<b>R4579287</b>							
<b>WG2991214-4</b>	<b>DUP</b>	<b>L2222986-1</b>						
2,3,7,8-TCDD		0.289	0.310		pg/g	7.0	50	17-MAR-19
1,2,3,7,8-PeCDD		0.327	0.316		pg/g	3.4	50	17-MAR-19
1,2,3,4,7,8-HxCDD		0.278	0.270		pg/g	2.9	50	17-MAR-19



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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4579287</b>							
<b>WG2991214-4</b>	<b>DUP</b>	<b>L2222986-1</b>						
1,2,3,6,7,8-HxCDD		0.493	0.568		pg/g	14	50	17-MAR-19
1,2,3,7,8,9-HxCDD		0.517	0.663		pg/g	25	50	17-MAR-19
1,2,3,4,6,7,8-HpCDD		7.20	7.56		pg/g	4.9	50	17-MAR-19
OCDD		42.7	44.1		pg/g	3.2	50	17-MAR-19
2,3,7,8-TCDF		0.364	0.369		pg/g	1.4	50	17-MAR-19
1,2,3,7,8-PeCDF		0.250	0.297		pg/g	17	50	17-MAR-19
2,3,4,7,8-PeCDF		0.662	0.686		pg/g	3.6	50	17-MAR-19
1,2,3,4,7,8-HxCDF		0.431	0.454		pg/g	5.2	50	17-MAR-19
1,2,3,6,7,8-HxCDF		0.401	0.420		pg/g	4.6	50	17-MAR-19
2,3,4,6,7,8-HxCDF		0.526	0.572		pg/g	8.4	50	17-MAR-19
1,2,3,7,8,9-HxCDF		0.158	0.169		pg/g	6.7	50	17-MAR-19
1,2,3,4,6,7,8-HpCDF		2.23	2.43		pg/g	8.6	50	17-MAR-19
1,2,3,4,7,8,9-HpCDF		0.244	0.230		pg/g	5.9	50	17-MAR-19
OCDF		3.64	4.23		pg/g	15	50	17-MAR-19
Total-TCDD		1.41	2.03		pg/g	36	50	17-MAR-19
Total-PeCDD		3.55	3.75		pg/g	5.5	50	17-MAR-19
Total-HxCDD		6.80	7.37		pg/g	8.0	50	17-MAR-19
Total-HpCDD		13.4	14.2		pg/g	5.8	50	17-MAR-19
Total-TCDF		7.47	8.15		pg/g	8.7	50	17-MAR-19
Total-PeCDF		8.29	8.67		pg/g	4.5	50	17-MAR-19
Total-HxCDF		5.38	5.88		pg/g	8.9	50	17-MAR-19
Total-HpCDF		3.81	3.87		pg/g	1.6	50	17-MAR-19
<b>WG2991214-2</b>	<b>LCS</b>							
2,3,7,8-TCDD			107.0		%		67-158	17-MAR-19
1,2,3,7,8-PeCDD			120.0		%		70-142	17-MAR-19
1,2,3,4,7,8-HxCDD			109.0		%		70-164	17-MAR-19
1,2,3,6,7,8-HxCDD			118.0		%		76-134	17-MAR-19
1,2,3,7,8,9-HxCDD			120.0		%		64-162	17-MAR-19
1,2,3,4,6,7,8-HpCDD			110.0		%		70-140	17-MAR-19
OCDD			114.0		%		78-144	17-MAR-19
2,3,7,8-TCDF			109.0		%		75-158	17-MAR-19
1,2,3,7,8-PeCDF			116.0		%		80-134	17-MAR-19
2,3,4,7,8-PeCDF			106.0		%		68-160	17-MAR-19





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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>		<b>Soil</b>						
<b>Batch</b>	<b>R4579287</b>							
<b>WG2991214-2 LCS</b>								
1,2,3,4,7,8-HxCDF			109.0		%		72-134	17-MAR-19
1,2,3,6,7,8-HxCDF			109.0		%		84-130	17-MAR-19
2,3,4,6,7,8-HxCDF			108.0		%		70-156	17-MAR-19
1,2,3,7,8,9-HxCDF			115.0		%		78-130	17-MAR-19
1,2,3,4,6,7,8-HpCDF			108.0		%		82-122	17-MAR-19
1,2,3,4,7,8,9-HpCDF			111.0		%		78-138	17-MAR-19
OCDF			138.0		%		63-170	17-MAR-19
<b>WG2991214-1 MB</b>								
2,3,7,8-TCDD			<0.011	[U]	pg/g		0.011	17-MAR-19
1,2,3,7,8-PeCDD			0.0473	[J]	pg/g		0.0075	17-MAR-19
1,2,3,4,7,8-HxCDD			0.0702	[J]	pg/g		0.0059	17-MAR-19
1,2,3,6,7,8-HxCDD			0.0776	[J]	pg/g		0.0064	17-MAR-19
1,2,3,7,8,9-HxCDD			0.120	J,R	pg/g		0.0062	17-MAR-19
1,2,3,4,6,7,8-HpCDD			0.183	[J]	pg/g		0.0057	17-MAR-19
OCDD			0.557	[J]	pg/g		0.011	17-MAR-19
2,3,7,8-TCDF			0.0089	M,J	pg/g		0.0082	17-MAR-19
1,2,3,7,8-PeCDF			0.0561	[J]	pg/g		0.005	17-MAR-19
2,3,4,7,8-PeCDF			0.0342	[J]	pg/g		0.0043	17-MAR-19
1,2,3,4,7,8-HxCDF			0.0614	[J]	pg/g		0.0047	17-MAR-19
1,2,3,6,7,8-HxCDF			0.0575	[J]	pg/g		0.0046	17-MAR-19
2,3,4,6,7,8-HxCDF			0.0695	[J]	pg/g		0.0046	17-MAR-19
1,2,3,7,8,9-HxCDF			0.110	[J]	pg/g		0.0052	17-MAR-19
1,2,3,4,6,7,8-HpCDF			0.130	J,R	pg/g		0.0066	17-MAR-19
1,2,3,4,7,8,9-HpCDF			0.106	[J]	pg/g		0.0079	17-MAR-19
OCDF			0.501	[J]	pg/g		0.011	17-MAR-19
Total-TCDD			<0.011	[U]	pg/g		0.011	17-MAR-19
Total-PeCDD			0.0712	A	pg/g		0.0075	17-MAR-19
Total-HxCDD			0.176	A	pg/g		0.0064	17-MAR-19
Total-HpCDD			0.183	A	pg/g		0.0057	17-MAR-19
Total-TCDF			0.0225	A	pg/g		0.0082	17-MAR-19
Total-PeCDF			0.0903	A	pg/g		0.005	17-MAR-19
Total-HxCDF			0.298	A	pg/g		0.0052	17-MAR-19
Total-HpCDF			0.106	A	pg/g		0.0079	17-MAR-19
Surrogate: 13C12-2,3,7,8-TCDD			71.0		%		25-164	17-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>								
<b>Soil</b>								
<b>Batch R4579287</b>								
<b>WG2991214-1 MB</b>								
Surrogate: 13C12-1,2,3,7,8-PeCDD			74.0		%		25-181	17-MAR-19
Surrogate: 13C12-1,2,3,4,7,8-HxCDD			80.0		%		32-141	17-MAR-19
Surrogate: 13C12-1,2,3,6,7,8-HxCDD			74.0		%		28-130	17-MAR-19
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD			90.0		%		23-140	17-MAR-19
Surrogate: 13C12-OCDD			75.0		%		17-157	17-MAR-19
Surrogate: 13C12-2,3,7,8-TCDF			70.0		%		24-169	17-MAR-19
Surrogate: 13C12-1,2,3,7,8-PeCDF			78.0		%		24-185	17-MAR-19
Surrogate: 13C12-2,3,4,7,8-PeCDF			80.0		%		21-178	17-MAR-19
Surrogate: 13C12-1,2,3,4,7,8-HxCDF			83.0		%		26-152	17-MAR-19
Surrogate: 13C12-1,2,3,6,7,8-HxCDF			84.0		%		26-123	17-MAR-19
Surrogate: 13C12-2,3,4,6,7,8-HxCDF			86.0		%		29-147	17-MAR-19
Surrogate: 13C12-1,2,3,7,8,9-HxCDF			95.0		%		28-136	17-MAR-19
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF			90.0		%		28-143	17-MAR-19
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF			101.0		%		26-138	17-MAR-19
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)			69.0		%		35-197	17-MAR-19
COMMENTS: Method blank has low level targets present.								
<b>F-1:5-DI-SIE-VA</b>								
<b>Soil</b>								
<b>Batch R4586022</b>								
<b>WG3007681-7 DUP</b>		<b>L2222986-7</b>						
Fluoride (F)			1.44	1.39	mg/kg	3.2	30	28-MAR-19
<b>WG3007681-6 LCS</b>								
Fluoride (F)				94.2	%		70-130	28-MAR-19
<b>WG3007681-5 MB</b>								
Fluoride (F)				<0.20	mg/kg		0.2	28-MAR-19
<b>WG3007681-8 MS</b>		<b>L2222986-17</b>						
Fluoride (F)				94.0	%		60-140	28-MAR-19
<b>Batch R4586702</b>								
<b>WG3013961-3 DUP</b>		<b>L2222986-36</b>						
Fluoride (F)			3.97	3.97	mg/kg	0.0	30	28-MAR-19
<b>WG3013961-2 LCS</b>								
Fluoride (F)				98.6	%		70-130	28-MAR-19
<b>WG3013961-1 MB</b>								
Fluoride (F)				<0.20	mg/kg		0.2	28-MAR-19
<b>WG3013961-5 MS</b>		<b>L2222986-43</b>						
Fluoride (F)				108.4	%		60-140	28-MAR-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>HG-200.2-CVAF-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4570191</b>							
<b>WG3007677-4</b>	<b>CRM</b>	<b>VA-NRC-PACS3</b>						
Mercury (Hg)			97.6		%		70-130	19-MAR-19
<b>WG3007677-2</b>	<b>DUP</b>	<b>L2243750-3</b>						
Mercury (Hg)		0.974	0.894		mg/kg	8.5	40	19-MAR-19
<b>WG3007677-3</b>	<b>LCS</b>							
Mercury (Hg)			94.3		%		80-120	19-MAR-19
<b>WG3007677-1</b>	<b>MB</b>							
Mercury (Hg)			<0.0050		mg/kg		0.005	19-MAR-19
<b>Batch</b>	<b>R4575467</b>							
<b>WG3007737-4</b>	<b>CRM</b>	<b>VA-NRC-PACS3</b>						
Mercury (Hg)			101.4		%		70-130	21-MAR-19
<b>WG3007737-2</b>	<b>DUP</b>	<b>L2243790-5</b>						
Mercury (Hg)		0.121	0.124		mg/kg	2.3	40	21-MAR-19
<b>WG3007737-3</b>	<b>LCS</b>							
Mercury (Hg)			104.5		%		80-120	21-MAR-19
<b>WG3007737-1</b>	<b>MB</b>							
Mercury (Hg)			<0.0050		mg/kg		0.005	21-MAR-19
<b>Batch</b>	<b>R4578310</b>							
<b>WG3007695-4</b>	<b>CRM</b>	<b>VA-NRC-PACS3</b>						
Mercury (Hg)			92.7		%		70-130	22-MAR-19
<b>WG3007695-2</b>	<b>DUP</b>	<b>L2222986-11</b>						
Mercury (Hg)		0.0409	0.0397		mg/kg	3.0	40	22-MAR-19
<b>WG3007695-3</b>	<b>LCS</b>							
Mercury (Hg)			94.3		%		80-120	22-MAR-19
<b>WG3007695-1</b>	<b>MB</b>							
Mercury (Hg)			<0.0050		mg/kg		0.005	22-MAR-19
<b>MET-200.2-CCMS-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4570390</b>							
<b>WG3007677-4</b>	<b>CRM</b>	<b>VA-NRC-PACS3</b>						
Aluminum (Al)			106.9		%		70-130	18-MAR-19
Arsenic (As)			96.7		%		70-130	18-MAR-19
Barium (Ba)			110.8		%		70-130	18-MAR-19
Beryllium (Be)			107.8		%		70-130	18-MAR-19
Boron (B)			112.9		%		70-130	18-MAR-19
Cadmium (Cd)			102.0		%		70-130	18-MAR-19
Calcium (Ca)			106.2		%		70-130	18-MAR-19
Chromium (Cr)			102.1		%		70-130	18-MAR-19



## Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4570390</b>							
<b>WG3007677-4</b>	<b>CRM</b>	<b>VA-NRC-PACS3</b>						
Cobalt (Co)			103.5		%		70-130	18-MAR-19
Copper (Cu)			109.0		%		70-130	18-MAR-19
Iron (Fe)			103.4		%		70-130	18-MAR-19
Lead (Pb)			101.2		%		70-130	18-MAR-19
Magnesium (Mg)			109.6		%		70-130	18-MAR-19
Manganese (Mn)			100.2		%		70-130	18-MAR-19
Molybdenum (Mo)			100.7		%		70-130	18-MAR-19
Nickel (Ni)			101.8		%		70-130	18-MAR-19
Phosphorus (P)			104.3		%		70-130	18-MAR-19
Potassium (K)			103.2		%		70-130	18-MAR-19
Silver (Ag)			108.1		%		70-130	18-MAR-19
Sodium (Na)			105.5		%		70-130	18-MAR-19
Strontium (Sr)			105.0		%		70-130	18-MAR-19
Thallium (Tl)			100.3		%		70-130	18-MAR-19
Titanium (Ti)			105.9		%		70-130	18-MAR-19
Vanadium (V)			104.1		%		70-130	18-MAR-19
Zinc (Zn)			105.7		%		70-130	18-MAR-19
Zirconium (Zr)			100.6		%		70-130	18-MAR-19
<b>WG3007677-2</b>	<b>DUP</b>	<b>L2243750-3</b>						
Aluminum (Al)		16300	18200		mg/kg	11	40	18-MAR-19
Arsenic (As)		5.80	5.55		mg/kg	4.4	30	18-MAR-19
Barium (Ba)		122	107		mg/kg	13	40	18-MAR-19
Beryllium (Be)		0.31	0.29		mg/kg	4.8	30	18-MAR-19
Boron (B)		5.9	5.3		mg/kg	12	30	18-MAR-19
Cadmium (Cd)		0.580	0.507		mg/kg	13	30	18-MAR-19
Calcium (Ca)		23700	12300	DUP-H	mg/kg	63	30	18-MAR-19
Chromium (Cr)		25.6	28.4		mg/kg	10	30	18-MAR-19
Cobalt (Co)		9.81	10.5		mg/kg	7.2	30	18-MAR-19
Copper (Cu)		96.5	84.4		mg/kg	13	30	18-MAR-19
Iron (Fe)		26500	28100		mg/kg	5.9	30	18-MAR-19
Lead (Pb)		100	90.4		mg/kg	10	40	18-MAR-19
Magnesium (Mg)		8080	9520		mg/kg	16	30	18-MAR-19
Manganese (Mn)		631	809		mg/kg	25	30	18-MAR-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4570390</b>							
<b>WG3007677-2</b>	<b>DUP</b>	<b>L2243750-3</b>						
Molybdenum (Mo)		0.84	0.81		mg/kg	3.6	40	18-MAR-19
Nickel (Ni)		20.9	20.1		mg/kg	3.8	30	18-MAR-19
Phosphorus (P)		781	838		mg/kg	7.1	30	18-MAR-19
Potassium (K)		970	940		mg/kg	3.3	40	18-MAR-19
Silver (Ag)		0.19	0.22		mg/kg	16	40	18-MAR-19
Sodium (Na)		393	382		mg/kg	2.8	40	18-MAR-19
Strontium (Sr)		76.4	62.1		mg/kg	21	40	18-MAR-19
Sulfur (S)		<1000	<1000	RPD-NA	mg/kg	N/A	30	18-MAR-19
Thallium (Tl)		0.056	0.059		mg/kg	6.8	30	18-MAR-19
Titanium (Ti)		1130	1210		mg/kg	6.2	40	18-MAR-19
Vanadium (V)		68.9	71.5		mg/kg	3.6	30	18-MAR-19
Zinc (Zn)		297	241		mg/kg	21	30	18-MAR-19
Zirconium (Zr)		4.4	3.5		mg/kg	24	30	18-MAR-19
<b>WG3007677-3</b>	<b>LCS</b>							
Aluminum (Al)			105.3		%		80-120	18-MAR-19
Arsenic (As)			102.0		%		80-120	18-MAR-19
Barium (Ba)			103.7		%		80-120	18-MAR-19
Beryllium (Be)			115.3		%		80-120	18-MAR-19
Boron (B)			117.2		%		80-120	18-MAR-19
Cadmium (Cd)			106.4		%		80-120	18-MAR-19
Calcium (Ca)			111.4		%		80-120	18-MAR-19
Chromium (Cr)			103.9		%		80-120	18-MAR-19
Cobalt (Co)			104.6		%		80-120	18-MAR-19
Copper (Cu)			104.5		%		80-120	18-MAR-19
Iron (Fe)			113.2		%		80-120	18-MAR-19
Lead (Pb)			107.6		%		80-120	18-MAR-19
Magnesium (Mg)			105.0		%		80-120	18-MAR-19
Manganese (Mn)			104.1		%		80-120	18-MAR-19
Molybdenum (Mo)			110.2		%		80-120	18-MAR-19
Nickel (Ni)			101.4		%		80-120	18-MAR-19
Phosphorus (P)			106.3		%		80-120	18-MAR-19
Potassium (K)			104.9		%		80-120	18-MAR-19
Silver (Ag)			104.8		%		80-120	18-MAR-19



## Quality Control Report

Workorder: L2222986

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>		<b>Soil</b>						
<b>Batch</b>	<b>R4570390</b>							
<b>WG3007677-3</b>	<b>LCS</b>							
Sodium (Na)			108.6		%		80-120	18-MAR-19
Strontium (Sr)			106.9		%		80-120	18-MAR-19
Sulfur (S)			103.2		%		80-120	18-MAR-19
Thallium (Tl)			103.3		%		80-120	18-MAR-19
Titanium (Ti)			105.2		%		80-120	18-MAR-19
Vanadium (V)			107.0		%		80-120	18-MAR-19
Zinc (Zn)			102.9		%		80-120	18-MAR-19
Zirconium (Zr)			106.2		%		70-130	18-MAR-19
<b>WG3007677-1</b>	<b>MB</b>							
Aluminum (Al)			<50		mg/kg		50	18-MAR-19
Arsenic (As)			<0.10		mg/kg		0.1	18-MAR-19
Barium (Ba)			<0.50		mg/kg		0.5	18-MAR-19
Beryllium (Be)			<0.10		mg/kg		0.1	18-MAR-19
Boron (B)			<5.0		mg/kg		5	18-MAR-19
Cadmium (Cd)			<0.020		mg/kg		0.02	18-MAR-19
Calcium (Ca)			<50		mg/kg		50	18-MAR-19
Chromium (Cr)			<0.50		mg/kg		0.5	18-MAR-19
Cobalt (Co)			<0.10		mg/kg		0.1	18-MAR-19
Copper (Cu)			<0.50		mg/kg		0.5	18-MAR-19
Iron (Fe)			<50		mg/kg		50	18-MAR-19
Lead (Pb)			<0.50		mg/kg		0.5	18-MAR-19
Magnesium (Mg)			<20		mg/kg		20	18-MAR-19
Manganese (Mn)			<1.0		mg/kg		1	18-MAR-19
Molybdenum (Mo)			<0.10		mg/kg		0.1	18-MAR-19
Nickel (Ni)			<0.50		mg/kg		0.5	18-MAR-19
Phosphorus (P)			<50		mg/kg		50	18-MAR-19
Potassium (K)			<100		mg/kg		100	18-MAR-19
Silver (Ag)			<0.10		mg/kg		0.1	18-MAR-19
Sodium (Na)			<50		mg/kg		50	18-MAR-19
Strontium (Sr)			<0.50		mg/kg		0.5	18-MAR-19
Sulfur (S)			<1000		mg/kg		1000	18-MAR-19
Thallium (Tl)			<0.050		mg/kg		0.05	18-MAR-19
Titanium (Ti)			<1.0		mg/kg		1	18-MAR-19
Vanadium (V)			<0.20		mg/kg		0.2	18-MAR-19



## Quality Control Report

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
<b>Soil</b>								
<b>Batch R4570390</b>								
<b>WG3007677-1 MB</b>								
Zinc (Zn)			<2.0		mg/kg		2	18-MAR-19
Zirconium (Zr)			<1.0		mg/kg		1	18-MAR-19
<b>Batch R4574887</b>								
<b>WG3007737-4 CRM</b>								
<b>VA-NRC-PACS3</b>								
Aluminum (Al)			123.8		%		70-130	20-MAR-19
Arsenic (As)			102.7		%		70-130	20-MAR-19
Barium (Ba)			124.5		%		70-130	20-MAR-19
Beryllium (Be)			104.6		%		70-130	20-MAR-19
Boron (B)			108.4		%		70-130	20-MAR-19
Cadmium (Cd)			103.4		%		70-130	20-MAR-19
Calcium (Ca)			106.8		%		70-130	20-MAR-19
Chromium (Cr)			108.3		%		70-130	20-MAR-19
Cobalt (Co)			109.3		%		70-130	20-MAR-19
Copper (Cu)			113.8		%		70-130	20-MAR-19
Iron (Fe)			106.8		%		70-130	20-MAR-19
Lead (Pb)			122.8		%		70-130	20-MAR-19
Magnesium (Mg)			126.6		%		70-130	20-MAR-19
Manganese (Mn)			105.7		%		70-130	20-MAR-19
Molybdenum (Mo)			97.1		%		70-130	20-MAR-19
Nickel (Ni)			111.1		%		70-130	20-MAR-19
Phosphorus (P)			103.2		%		70-130	20-MAR-19
Potassium (K)			127.0		%		70-130	20-MAR-19
Silver (Ag)			99.3		%		70-130	20-MAR-19
Sodium (Na)			106.5		%		70-130	20-MAR-19
Strontium (Sr)			115.6		%		70-130	20-MAR-19
Thallium (Tl)			104.9		%		70-130	20-MAR-19
Titanium (Ti)			114.0		%		70-130	20-MAR-19
Vanadium (V)			110.2		%		70-130	20-MAR-19
Zinc (Zn)			114.5		%		70-130	20-MAR-19
Zirconium (Zr)			105.0		%		70-130	20-MAR-19
<b>WG3007737-2 DUP</b>								
<b>L2243790-5</b>								
Aluminum (Al)		8000	8090		mg/kg	1.1	40	20-MAR-19
Arsenic (As)		5.54	6.07		mg/kg	9.3	30	20-MAR-19
Barium (Ba)		567	612		mg/kg	7.7	40	20-MAR-19



## Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4574887</b>							
<b>WG3007737-2</b>	<b>DUP</b>	<b>L2243790-5</b>						
Beryllium (Be)		0.66	0.73		mg/kg	9.7	30	20-MAR-19
Boron (B)		8.6	9.7		mg/kg	12	30	20-MAR-19
Cadmium (Cd)		1.37	1.37		mg/kg	0.2	30	20-MAR-19
Calcium (Ca)		28400	29300		mg/kg	3.0	30	20-MAR-19
Chromium (Cr)		15.9	20.7		mg/kg	26	30	20-MAR-19
Cobalt (Co)		7.33	8.04		mg/kg	9.2	30	20-MAR-19
Copper (Cu)		24.6	24.6		mg/kg	0.2	30	20-MAR-19
Iron (Fe)		11500	12200		mg/kg	6.3	30	20-MAR-19
Lead (Pb)		11.8	13.1		mg/kg	10	40	20-MAR-19
Magnesium (Mg)		9810	9060		mg/kg	8.0	30	20-MAR-19
Manganese (Mn)		255	286		mg/kg	12	30	20-MAR-19
Molybdenum (Mo)		1.49	1.90		mg/kg	24	40	20-MAR-19
Nickel (Ni)		34.4	38.6		mg/kg	12	30	20-MAR-19
Phosphorus (P)		797	826		mg/kg	3.6	30	20-MAR-19
Potassium (K)		2380	2600		mg/kg	8.9	40	20-MAR-19
Silver (Ag)		0.36	0.42		mg/kg	16	40	20-MAR-19
Sodium (Na)		122	133		mg/kg	9.0	40	20-MAR-19
Strontium (Sr)		87.9	89.3		mg/kg	1.6	40	20-MAR-19
Sulfur (S)		<1000	<1000	RPD-NA	mg/kg	N/A	30	20-MAR-19
Thallium (Tl)		0.142	0.141		mg/kg	0.7	30	20-MAR-19
Titanium (Ti)		19.1	19.6		mg/kg	2.4	40	20-MAR-19
Vanadium (V)		34.5	36.9		mg/kg	6.9	30	20-MAR-19
Zinc (Zn)		105	106		mg/kg	1.1	30	20-MAR-19
Zirconium (Zr)		3.5	3.8		mg/kg	8.4	30	20-MAR-19
<b>WG3007737-3</b>	<b>LCS</b>							
Aluminum (Al)			122.7	MES	%		80-120	20-MAR-19
Arsenic (As)			103.9		%		80-120	20-MAR-19
Barium (Ba)			107.7		%		80-120	20-MAR-19
Beryllium (Be)			103.6		%		80-120	20-MAR-19
Boron (B)			105.4		%		80-120	20-MAR-19
Cadmium (Cd)			101.2		%		80-120	20-MAR-19
Calcium (Ca)			100.9		%		80-120	20-MAR-19
Chromium (Cr)			103.3		%		80-120	20-MAR-19





## Quality Control Report

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Report Date: 04-NOV-19

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>		<b>Soil</b>						
<b>Batch</b>	<b>R4574887</b>							
<b>WG3007737-3</b>	<b>LCS</b>							
Cobalt (Co)			101.3		%		80-120	20-MAR-19
Copper (Cu)			101.4		%		80-120	20-MAR-19
Iron (Fe)			109.5		%		80-120	20-MAR-19
Lead (Pb)			110.5		%		80-120	20-MAR-19
Magnesium (Mg)			113.5		%		80-120	20-MAR-19
Manganese (Mn)			102.5		%		80-120	20-MAR-19
Molybdenum (Mo)			105.0		%		80-120	20-MAR-19
Nickel (Ni)			101.1		%		80-120	20-MAR-19
Phosphorus (P)			104.0		%		80-120	20-MAR-19
Potassium (K)			114.4		%		80-120	20-MAR-19
Silver (Ag)			98.4		%		80-120	20-MAR-19
Sodium (Na)			103.1		%		80-120	20-MAR-19
Strontium (Sr)			103.9		%		80-120	20-MAR-19
Sulfur (S)			98.5		%		80-120	20-MAR-19
Thallium (Tl)			110.1		%		80-120	20-MAR-19
Titanium (Ti)			101.1		%		80-120	20-MAR-19
Vanadium (V)			105.0		%		80-120	20-MAR-19
Zinc (Zn)			103.0		%		80-120	20-MAR-19
Zirconium (Zr)			103.8		%		70-130	20-MAR-19
<b>WG3007737-1</b>	<b>MB</b>							
Aluminum (Al)			<50		mg/kg		50	20-MAR-19
Arsenic (As)			<0.10		mg/kg		0.1	20-MAR-19
Barium (Ba)			<0.50		mg/kg		0.5	20-MAR-19
Beryllium (Be)			<0.10		mg/kg		0.1	20-MAR-19
Boron (B)			<5.0		mg/kg		5	20-MAR-19
Cadmium (Cd)			<0.020		mg/kg		0.02	20-MAR-19
Calcium (Ca)			<50		mg/kg		50	20-MAR-19
Chromium (Cr)			<0.50		mg/kg		0.5	20-MAR-19
Cobalt (Co)			<0.10		mg/kg		0.1	20-MAR-19
Copper (Cu)			<0.50		mg/kg		0.5	20-MAR-19
Iron (Fe)			<50		mg/kg		50	20-MAR-19
Lead (Pb)			<0.50		mg/kg		0.5	20-MAR-19
Magnesium (Mg)			<20		mg/kg		20	20-MAR-19
Manganese (Mn)			<1.0		mg/kg		1	20-MAR-19



## Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
<b>Soil</b>								
<b>Batch R4574887</b>								
<b>WG3007737-1 MB</b>								
Molybdenum (Mo)			<0.10		mg/kg		0.1	20-MAR-19
Nickel (Ni)			<0.50		mg/kg		0.5	20-MAR-19
Phosphorus (P)			<50		mg/kg		50	20-MAR-19
Potassium (K)			<100		mg/kg		100	20-MAR-19
Silver (Ag)			<0.10		mg/kg		0.1	20-MAR-19
Sodium (Na)			<50		mg/kg		50	20-MAR-19
Strontium (Sr)			<0.50		mg/kg		0.5	20-MAR-19
Sulfur (S)			<1000		mg/kg		1000	20-MAR-19
Thallium (Tl)			<0.050		mg/kg		0.05	20-MAR-19
Titanium (Ti)			1.2	B	mg/kg		1	20-MAR-19
Vanadium (V)			0.28	B	mg/kg		0.2	20-MAR-19
Zinc (Zn)			<2.0		mg/kg		2	20-MAR-19
Zirconium (Zr)			<1.0		mg/kg		1	20-MAR-19
<b>Batch R4577627</b>								
<b>WG3007695-4 CRM</b>								
<b>VA-NRC-PACS3</b>								
Aluminum (Al)			99.3		%		70-130	21-MAR-19
Arsenic (As)			95.0		%		70-130	21-MAR-19
Barium (Ba)			92.2		%		70-130	21-MAR-19
Beryllium (Be)			95.5		%		70-130	21-MAR-19
Boron (B)			102.0		%		70-130	21-MAR-19
Cadmium (Cd)			94.5		%		70-130	21-MAR-19
Calcium (Ca)			97.5		%		70-130	21-MAR-19
Chromium (Cr)			96.3		%		70-130	21-MAR-19
Cobalt (Co)			96.6		%		70-130	21-MAR-19
Copper (Cu)			103.8		%		70-130	21-MAR-19
Iron (Fe)			95.1		%		70-130	21-MAR-19
Lead (Pb)			95.6		%		70-130	21-MAR-19
Magnesium (Mg)			108.1		%		70-130	21-MAR-19
Manganese (Mn)			96.2		%		70-130	21-MAR-19
Molybdenum (Mo)			90.6		%		70-130	21-MAR-19
Nickel (Ni)			98.7		%		70-130	21-MAR-19
Phosphorus (P)			88.8		%		70-130	21-MAR-19
Potassium (K)			98.4		%		70-130	21-MAR-19
Silver (Ag)			124.1		%		70-130	21-MAR-19



## Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
<b>Soil</b>								
<b>Batch R4577627</b>								
<b>WG3007695-4 CRM VA-NRC-PACS3</b>								
Sodium (Na)			97.9		%		70-130	21-MAR-19
Strontium (Sr)			97.6		%		70-130	21-MAR-19
Thallium (Tl)			97.6		%		70-130	21-MAR-19
Titanium (Ti)			91.8		%		70-130	21-MAR-19
Vanadium (V)			97.8		%		70-130	21-MAR-19
Zinc (Zn)			101.8		%		70-130	21-MAR-19
Zirconium (Zr)			95.3		%		70-130	21-MAR-19
<b>WG3007695-2 DUP L2222986-11</b>								
Aluminum (Al)		14500	14600		mg/kg	0.8	40	21-MAR-19
Arsenic (As)		5.69	5.66		mg/kg	0.6	30	21-MAR-19
Barium (Ba)		66.3	66.1		mg/kg	0.2	40	21-MAR-19
Beryllium (Be)		0.68	0.67		mg/kg	1.6	30	21-MAR-19
Boron (B)		9.0	9.4		mg/kg	5.0	30	21-MAR-19
Cadmium (Cd)		0.474	0.455		mg/kg	4.0	30	21-MAR-19
Calcium (Ca)		7860	5760	DUP-H	mg/kg	31	30	21-MAR-19
Chromium (Cr)		21.7	21.8		mg/kg	0.7	30	21-MAR-19
Cobalt (Co)		7.45	7.69		mg/kg	3.1	30	21-MAR-19
Copper (Cu)		13.6	13.3		mg/kg	1.6	30	21-MAR-19
Iron (Fe)		16800	17300		mg/kg	3.2	30	21-MAR-19
Lead (Pb)		12.4	12.8		mg/kg	2.5	40	21-MAR-19
Magnesium (Mg)		5020	5050		mg/kg	0.6	30	21-MAR-19
Manganese (Mn)		344	348		mg/kg	1.1	30	21-MAR-19
Molybdenum (Mo)		1.35	1.40		mg/kg	3.5	40	21-MAR-19
Nickel (Ni)		18.9	19.1		mg/kg	0.9	30	21-MAR-19
Phosphorus (P)		572	490		mg/kg	15	30	21-MAR-19
Potassium (K)		1800	1860		mg/kg	3.4	40	21-MAR-19
Silver (Ag)		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	21-MAR-19
Sodium (Na)		56	67		mg/kg	19	40	21-MAR-19
Strontium (Sr)		16.2	14.6		mg/kg	11	40	21-MAR-19
Sulfur (S)		<1000	<1000	RPD-NA	mg/kg	N/A	30	21-MAR-19
Thallium (Tl)		0.198	0.199		mg/kg	0.8	30	21-MAR-19
Titanium (Ti)		106	123		mg/kg	15	40	21-MAR-19
Vanadium (V)		32.8	35.0		mg/kg	6.5	30	21-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4577627</b>							
<b>WG3007695-2</b>	<b>DUP</b>	<b>L2222986-11</b>						
Zinc (Zn)		52.0	52.1		mg/kg	0.2	30	21-MAR-19
Zirconium (Zr)		2.2	2.1		mg/kg	3.8	30	21-MAR-19
<b>WG3007695-3</b>	<b>LCS</b>							
Aluminum (Al)			102.9		%		80-120	21-MAR-19
Arsenic (As)			100.8		%		80-120	21-MAR-19
Barium (Ba)			103.7		%		80-120	21-MAR-19
Beryllium (Be)			97.7		%		80-120	21-MAR-19
Boron (B)			96.3		%		80-120	21-MAR-19
Cadmium (Cd)			100.1		%		80-120	21-MAR-19
Calcium (Ca)			97.0		%		80-120	21-MAR-19
Chromium (Cr)			99.6		%		80-120	21-MAR-19
Cobalt (Co)			101.2		%		80-120	21-MAR-19
Copper (Cu)			96.5		%		80-120	21-MAR-19
Iron (Fe)			100.5		%		80-120	21-MAR-19
Lead (Pb)			97.0		%		80-120	21-MAR-19
Magnesium (Mg)			105.9		%		80-120	21-MAR-19
Manganese (Mn)			105.3		%		80-120	21-MAR-19
Molybdenum (Mo)			99.4		%		80-120	21-MAR-19
Nickel (Ni)			100.8		%		80-120	21-MAR-19
Phosphorus (P)			98.5		%		80-120	21-MAR-19
Potassium (K)			101.8		%		80-120	21-MAR-19
Silver (Ag)			99.9		%		80-120	21-MAR-19
Sodium (Na)			104.1		%		80-120	21-MAR-19
Strontium (Sr)			100.2		%		80-120	21-MAR-19
Sulfur (S)			95.5		%		80-120	21-MAR-19
Thallium (Tl)			97.2		%		80-120	21-MAR-19
Titanium (Ti)			97.6		%		80-120	21-MAR-19
Vanadium (V)			103.3		%		80-120	21-MAR-19
Zinc (Zn)			101.0		%		80-120	21-MAR-19
Zirconium (Zr)			98.4		%		70-130	21-MAR-19
<b>WG3007695-1</b>	<b>MB</b>							
Aluminum (Al)			<50		mg/kg		50	21-MAR-19
Arsenic (As)			<0.10		mg/kg		0.1	21-MAR-19
Barium (Ba)			<0.50		mg/kg		0.5	21-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4577627</b>							
<b>WG3007695-1</b>	<b>MB</b>							
Beryllium (Be)			<0.10		mg/kg		0.1	21-MAR-19
Boron (B)			<5.0		mg/kg		5	21-MAR-19
Cadmium (Cd)			<0.020		mg/kg		0.02	21-MAR-19
Calcium (Ca)			<50		mg/kg		50	21-MAR-19
Chromium (Cr)			<0.50		mg/kg		0.5	21-MAR-19
Cobalt (Co)			<0.10		mg/kg		0.1	21-MAR-19
Copper (Cu)			<0.50		mg/kg		0.5	21-MAR-19
Iron (Fe)			<50		mg/kg		50	21-MAR-19
Lead (Pb)			<0.50		mg/kg		0.5	21-MAR-19
Magnesium (Mg)			<20		mg/kg		20	21-MAR-19
Manganese (Mn)			<1.0		mg/kg		1	21-MAR-19
Molybdenum (Mo)			<0.10		mg/kg		0.1	21-MAR-19
Nickel (Ni)			<0.50		mg/kg		0.5	21-MAR-19
Phosphorus (P)			<50		mg/kg		50	21-MAR-19
Potassium (K)			<100		mg/kg		100	21-MAR-19
Silver (Ag)			<0.10		mg/kg		0.1	21-MAR-19
Sodium (Na)			<50		mg/kg		50	21-MAR-19
Strontium (Sr)			<0.50		mg/kg		0.5	21-MAR-19
Sulfur (S)			<1000		mg/kg		1000	21-MAR-19
Thallium (Tl)			<0.050		mg/kg		0.05	21-MAR-19
Titanium (Ti)			<1.0		mg/kg		1	21-MAR-19
Vanadium (V)			<0.20		mg/kg		0.2	21-MAR-19
Zinc (Zn)			<2.0		mg/kg		2	21-MAR-19
Zirconium (Zr)			<1.0		mg/kg		1	21-MAR-19
<b>MOISTURE-BU</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4551577</b>							
<b>WG2991215-3</b>	<b>DUP</b>	<b>L2222986-1</b>						
% Moisture		10.2	9.91		%	2.6	20	08-MAR-19
<b>WG2991215-2</b>	<b>LCS</b>							
% Moisture			97.2		%		90-110	08-MAR-19
<b>WG2991215-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.3	08-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MOISTURE-BU</b>		<b>Soil</b>						
Batch	R4557951							
WG2991230-2	LCS							
% Moisture			95.4		%		90-110	12-MAR-19
WG2991230-1	MB							
% Moisture			<0.10		%		0.3	12-MAR-19
Batch	R4560298							
WG2991245-2	LCS							
% Moisture			99.0		%		90-110	13-MAR-19
WG2991245-1	MB							
% Moisture			<0.10		%		0.3	13-MAR-19
<b>MOISTURE-VA</b>		<b>Soil</b>						
Batch	R4568024							
WG3007725-3	DUP	L2243463-2						
Moisture		82.9	82.9		%	0.0	20	16-MAR-19
WG3007725-4	DUP	L2243947-34						
Moisture		22.0	21.7		%	1.4	20	16-MAR-19
WG3007725-2	LCS							
Moisture			95.9		%		90-110	16-MAR-19
WG3007725-6	LCS							
Moisture			95.6		%		90-110	16-MAR-19
WG3007725-1	MB							
Moisture			<0.25		%		0.25	16-MAR-19
WG3007725-5	MB							
Moisture			<0.25		%		0.25	16-MAR-19
<b>AG-DRY-CCMS-N-VA</b>		<b>Tissue</b>						
Batch	R4581418							
WG3011451-3	CRM	VA-NRC-DORM4						
Silver (Ag)-Total			99.4		%		70-130	23-MAR-19
WG3011451-2	DUP	L2222986-6						
Silver (Ag)-Total		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	40	23-MAR-19
WG3011451-4	LCS							
Silver (Ag)-Total			74.2		%		70-130	23-MAR-19
WG3011451-1	MB							
Silver (Ag)-Total			<0.0050		mg/kg		0.005	23-MAR-19
Batch	R4582634							
WG3011342-3	CRM	VA-NRC-DORM4						
Silver (Ag)-Total			104.3		%		70-130	25-MAR-19
WG3011342-2	DUP	L2222986-5						



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>AG-DRY-CCMS-N-VA</b>		<b>Tissue</b>						
<b>Batch</b>	<b>R4582634</b>							
<b>WG3011342-2</b>	<b>DUP</b>	<b>L2222986-5</b>						
Silver (Ag)-Total		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	40	25-MAR-19
<b>WG3011342-1</b>	<b>MB</b>							
Silver (Ag)-Total			<0.0050		mg/kg		0.005	25-MAR-19
<b>CL-DRY-SOL-IC-ED</b>		<b>Tissue</b>						
<b>Batch</b>	<b>R4586235</b>							
<b>WG3014541-3</b>	<b>DUP</b>	<b>L2222986-6</b>						
Chloride (Cl)		457	457		mg/kg	0.0	35	27-MAR-19
<b>WG3014663-3</b>	<b>DUP</b>	<b>L2222986-49</b>						
Chloride (Cl)		422	418		mg/kg	0.9	35	27-MAR-19
<b>WG3014541-2</b>	<b>LCS</b>							
Chloride (Cl)			102.7		%		70-130	27-MAR-19
<b>WG3014663-2</b>	<b>LCS</b>							
Chloride (Cl)			102.7		%		70-130	27-MAR-19
<b>WG3014541-1</b>	<b>MB</b>							
Chloride (Cl)			<20		mg/kg		20	27-MAR-19
<b>WG3014663-1</b>	<b>MB</b>							
Chloride (Cl)			<20		mg/kg		20	27-MAR-19
<b>WG3014541-4</b>	<b>MS</b>	<b>L2222986-32</b>						
Chloride (Cl)			107.0		%		70-130	27-MAR-19
<b>WG3014663-4</b>	<b>MS</b>	<b>L2222986-35</b>						
Chloride (Cl)			103.8		%		70-130	27-MAR-19
<b>DX-1613B-HRMS-BU</b>		<b>Tissue</b>						
<b>Batch</b>	<b>R4586945</b>							
<b>WG2991222-4</b>	<b>DUP</b>	<b>L2222986-2</b>						
2,3,7,8-TCDD		<0.056	<0.044	RPD-NA	pg/g wwt	N/A	50	27-MAR-19
1,2,3,7,8-PeCDD		0.082	0.085		pg/g wwt	3.9	50	27-MAR-19
1,2,3,4,7,8-HxCDD		0.090	0.094		pg/g wwt	4.1	50	27-MAR-19
1,2,3,6,7,8-HxCDD		0.130	0.100		pg/g wwt	26	50	27-MAR-19
1,2,3,7,8,9-HxCDD		0.130	0.118		pg/g wwt	9.7	50	27-MAR-19
1,2,3,4,6,7,8-HpCDD		1.39	1.24		pg/g wwt	11	50	27-MAR-19
OCDD		7.86	6.64		pg/g wwt	17	50	27-MAR-19
2,3,7,8-TCDF		0.120	0.107		pg/g wwt	11	50	27-MAR-19
1,2,3,7,8-PeCDF		0.108	0.083		pg/g wwt	26	50	27-MAR-19
2,3,4,7,8-PeCDF		0.084	0.070		pg/g wwt	18	50	27-MAR-19
1,2,3,4,7,8-HxCDF		0.121	0.101		pg/g wwt	18	50	27-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>		<b>Tissue</b>						
<b>Batch</b>	<b>R4586945</b>							
<b>WG2991222-4</b>	<b>DUP</b>	<b>L2222986-2</b>						
1,2,3,6,7,8-HxCDF		0.104	0.081		pg/g wwt	25	50	27-MAR-19
2,3,4,6,7,8-HxCDF		0.063	0.094		pg/g wwt	40	50	27-MAR-19
1,2,3,7,8,9-HxCDF		0.056	0.055		pg/g wwt	1.8	50	27-MAR-19
1,2,3,4,6,7,8-HpCDF		0.590	0.464		pg/g wwt	24	50	27-MAR-19
1,2,3,4,7,8,9-HpCDF		<0.024	0.063	G	pg/g wwt	N/A	50	27-MAR-19
OCDF		1.57	1.35		pg/g wwt	15	50	27-MAR-19
Total-TCDD		0.308	0.512		pg/g wwt	50	50	27-MAR-19
Total-PeCDD		0.901	1.66	G	pg/g wwt	59	50	27-MAR-19
Total-HxCDD		2.97	2.67		pg/g wwt	11	50	27-MAR-19
Total-HpCDD		3.83	3.38		pg/g wwt	12	50	27-MAR-19
Total-TCDF		1.82	1.68		pg/g wwt	8.0	50	27-MAR-19
Total-PeCDF		1.28	0.919		pg/g wwt	33	50	27-MAR-19
Total-HxCDF		0.841	0.851		pg/g wwt	1.2	50	27-MAR-19
Total-HpCDF		0.590	0.748		pg/g wwt	24	50	27-MAR-19

COMMENTS: Sample an duplicate are outside method RPD criteria for select low level targets.

<b>WG2991222-2</b>	<b>LCS</b>							
2,3,7,8-TCDD			104.0		%		67-158	27-MAR-19
1,2,3,7,8-PeCDD			107.0		%		70-142	27-MAR-19
1,2,3,4,7,8-HxCDD			101.0		%		70-164	27-MAR-19
1,2,3,6,7,8-HxCDD			95.0		%		76-134	27-MAR-19
1,2,3,7,8,9-HxCDD			103.0		%		64-162	27-MAR-19
1,2,3,4,6,7,8-HpCDD			105.0		%		70-140	27-MAR-19
OCDD			102.0		%		78-144	27-MAR-19
2,3,7,8-TCDF			99.0		%		75-158	27-MAR-19
1,2,3,7,8-PeCDF			104.0		%		80-134	27-MAR-19
2,3,4,7,8-PeCDF			91.0		%		68-160	27-MAR-19
1,2,3,4,7,8-HxCDF			101.0		%		72-134	27-MAR-19
1,2,3,6,7,8-HxCDF			104.0		%		84-130	27-MAR-19
2,3,4,6,7,8-HxCDF			101.0		%		70-156	27-MAR-19
1,2,3,7,8,9-HxCDF			107.0		%		78-130	27-MAR-19
1,2,3,4,6,7,8-HpCDF			105.0		%		82-122	27-MAR-19
1,2,3,4,7,8,9-HpCDF			103.0		%		78-138	27-MAR-19
OCDF			102.0		%		63-170	27-MAR-19

**WG2991222-1** MB





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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>		<b>Tissue</b>						
<b>Batch</b>	<b>R4586945</b>							
<b>WG2991222-1</b>	<b>MB</b>							
2,3,7,8-TCDD			<0.0089	[U]	pg/g wwt		0.0089	27-MAR-19
1,2,3,7,8-PeCDD			0.0140	M,J,R	pg/g wwt		0.0036	27-MAR-19
1,2,3,4,7,8-HxCDD			0.0220	M,J	pg/g wwt		0.0065	27-MAR-19
1,2,3,6,7,8-HxCDD			0.0210	M,J	pg/g wwt		0.0061	27-MAR-19
1,2,3,7,8,9-HxCDD			0.0330	M,J,R	pg/g wwt		0.0061	27-MAR-19
1,2,3,4,6,7,8-HpCDD			0.0680	M,J	pg/g wwt		0.0066	27-MAR-19
OCDD			0.425	[J]	pg/g wwt		0.0086	27-MAR-19
2,3,7,8-TCDF			<0.0066	[U]	pg/g wwt		0.0066	27-MAR-19
1,2,3,7,8-PeCDF			0.0200	M,J	pg/g wwt		0.0053	27-MAR-19
2,3,4,7,8-PeCDF			0.0100	[J]	pg/g wwt		0.0043	27-MAR-19
1,2,3,4,7,8-HxCDF			0.0200	M,J	pg/g wwt		0.0055	27-MAR-19
1,2,3,6,7,8-HxCDF			0.0160	M,J,R	pg/g wwt		0.0055	27-MAR-19
2,3,4,6,7,8-HxCDF			0.0170	M,J	pg/g wwt		0.0055	27-MAR-19
1,2,3,7,8,9-HxCDF			0.0290	M,J	pg/g wwt		0.0075	27-MAR-19
1,2,3,4,6,7,8-HpCDF			0.0470	[J]	pg/g wwt		0.0039	27-MAR-19
1,2,3,4,7,8,9-HpCDF			0.0290	[J]	pg/g wwt		0.0053	27-MAR-19
OCDF			0.117	M,J	pg/g wwt		0.0071	27-MAR-19
Total-TCDD			<0.0089	[U]	pg/g wwt		0.0089	27-MAR-19
Total-PeCDD			<0.0036	[U]	pg/g wwt		0.0036	27-MAR-19
Total-HxCDD			0.0430	A	pg/g wwt		0.0065	27-MAR-19
Total-HpCDD			0.0680	A	pg/g wwt		0.0066	27-MAR-19
Total-TCDF			<0.0066	[U]	pg/g wwt		0.0066	27-MAR-19
Total-PeCDF			0.0310	A	pg/g wwt		0.0053	27-MAR-19
Total-HxCDF			0.0670	A	pg/g wwt		0.0075	27-MAR-19
Total-HpCDF			0.0760	A	pg/g wwt		0.0053	27-MAR-19
Surrogate: 13C12-2,3,7,8-TCDD			83.0		%		25-164	27-MAR-19
Surrogate: 13C12-1,2,3,7,8-PeCDD			81.0		%		25-181	27-MAR-19
Surrogate: 13C12-1,2,3,4,7,8-HxCDD			74.0		%		32-141	27-MAR-19
Surrogate: 13C12-1,2,3,6,7,8-HxCDD			82.0		%		28-130	27-MAR-19
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD			74.0		%		23-140	27-MAR-19
Surrogate: 13C12-OCDD			64.0		%		17-157	27-MAR-19
Surrogate: 13C12-2,3,7,8-TCDF			84.0		%		24-169	27-MAR-19
Surrogate: 13C12-1,2,3,7,8-PeCDF			81.0		%		21-192	27-MAR-19

COMMENTS: Blank appears to have low level PCDDF contamination. Instrument blank run prior is clean.



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>		<b>Tissue</b>						
<b>Batch R4586945</b>								
<b>WG2991222-1 MB</b>								
Surrogate: 13C12-2,3,4,7,8-PeCDF			79.0		%		21-178	27-MAR-19
Surrogate: 13C12-1,2,3,4,7,8-HxCDF			73.0		%		26-152	27-MAR-19
Surrogate: 13C12-1,2,3,6,7,8-HxCDF			79.0		%		26-123	27-MAR-19
Surrogate: 13C12-2,3,4,6,7,8-HxCDF			78.0		%		29-147	27-MAR-19
Surrogate: 13C12-1,2,3,7,8,9-HxCDF			74.0		%		28-136	27-MAR-19
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF			73.0		%		28-143	27-MAR-19
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF			71.0		%		26-138	27-MAR-19
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)			92.0		%		31-197	27-MAR-19
COMMENTS: Blank appears to have low level PCDDF contamination. Instrument blank run prior is clean.								
<b>Batch R4587121</b>								
<b>WG3000722-2 LCS</b>								
2,3,7,8-TCDD			90.0		%		67-158	28-MAR-19
1,2,3,7,8-PeCDD			111.0		%		70-142	28-MAR-19
1,2,3,4,7,8-HxCDD			102.0		%		70-164	28-MAR-19
1,2,3,6,7,8-HxCDD			101.0		%		76-134	28-MAR-19
1,2,3,7,8,9-HxCDD			110.0		%		64-162	28-MAR-19
1,2,3,4,6,7,8-HpCDD			103.0		%		70-140	28-MAR-19
OCDD			102.0		%		78-144	28-MAR-19
2,3,7,8-TCDF			103.0		%		75-158	28-MAR-19
1,2,3,7,8-PeCDF			106.0		%		80-134	28-MAR-19
2,3,4,7,8-PeCDF			98.0		%		68-160	28-MAR-19
1,2,3,4,7,8-HxCDF			104.0		%		72-134	28-MAR-19
1,2,3,6,7,8-HxCDF			106.0		%		84-130	28-MAR-19
2,3,4,6,7,8-HxCDF			103.0		%		70-156	28-MAR-19
1,2,3,7,8,9-HxCDF			111.0		%		78-130	28-MAR-19
1,2,3,4,6,7,8-HpCDF			114.0		%		82-122	28-MAR-19
1,2,3,4,7,8,9-HpCDF			94.0		%		78-138	28-MAR-19
OCDF			98.0		%		63-170	28-MAR-19
<b>WG3000722-1 MB</b>								
2,3,7,8-TCDD			<0.028	[U]	pg/g wwt		0.028	28-MAR-19
1,2,3,7,8-PeCDD			<0.014	[U]	pg/g wwt		0.014	28-MAR-19
1,2,3,4,7,8-HxCDD			<0.013	M,U	pg/g wwt		0.013	28-MAR-19
1,2,3,6,7,8-HxCDD			<0.012	M,U	pg/g wwt		0.012	28-MAR-19
1,2,3,7,8,9-HxCDD			<0.012	M,U	pg/g wwt		0.012	28-MAR-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU</b>		<b>Tissue</b>						
<b>Batch</b>	<b>R4587121</b>							
<b>WG3000722-1</b>	<b>MB</b>							
1,2,3,4,6,7,8-HpCDD			0.035	M,J	pg/g wwt		0.012	28-MAR-19
OCDD			0.079	M,J,R	pg/g wwt		0.011	28-MAR-19
2,3,7,8-TCDF			<0.023	[U]	pg/g wwt		0.023	28-MAR-19
1,2,3,7,8-PeCDF			0.020	M,J	pg/g wwt		0.012	28-MAR-19
2,3,4,7,8-PeCDF			<0.0094	[U]	pg/g wwt		0.0094	28-MAR-19
1,2,3,4,7,8-HxCDF			<0.011	M,U	pg/g wwt		0.011	28-MAR-19
1,2,3,6,7,8-HxCDF			<0.011	[U]	pg/g wwt		0.011	28-MAR-19
2,3,4,6,7,8-HxCDF			<0.011	[U]	pg/g wwt		0.011	28-MAR-19
1,2,3,7,8,9-HxCDF			0.020	M,J,R	pg/g wwt		0.014	28-MAR-19
1,2,3,4,6,7,8-HpCDF			0.0190	M,J,R	pg/g wwt		0.0089	28-MAR-19
1,2,3,4,7,8,9-HpCDF			<0.011	[U]	pg/g wwt		0.011	28-MAR-19
OCDF			0.043	M,J	pg/g wwt		0.014	28-MAR-19
Total-TCDD			<0.028	[U]	pg/g wwt		0.028	28-MAR-19
Total-PeCDD			<0.014	[U]	pg/g wwt		0.014	28-MAR-19
Total-HxCDD			<0.013	[U]	pg/g wwt		0.013	28-MAR-19
Total-HpCDD			0.056	A	pg/g wwt		0.012	28-MAR-19
Total-TCDF			<0.023	[U]	pg/g wwt		0.023	28-MAR-19
Total-PeCDF			0.020	A	pg/g wwt		0.012	28-MAR-19
Total-HxCDF			<0.014	[U]	pg/g wwt		0.014	28-MAR-19
Total-HpCDF			<0.011	[U]	pg/g wwt		0.011	28-MAR-19
Surrogate: 13C12-2,3,7,8-TCDD			93.0		%		25-164	28-MAR-19
Surrogate: 13C12-1,2,3,7,8-PeCDD			88.0		%		25-181	28-MAR-19
Surrogate: 13C12-1,2,3,4,7,8-HxCDD			67.0		%		32-141	28-MAR-19
Surrogate: 13C12-1,2,3,6,7,8-HxCDD			76.0		%		28-130	28-MAR-19
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD			83.0		%		23-140	28-MAR-19
Surrogate: 13C12-OCDD			71.0		%		17-157	28-MAR-19
Surrogate: 13C12-2,3,7,8-TCDF			78.0		%		24-169	28-MAR-19
Surrogate: 13C12-1,2,3,7,8-PeCDF			85.0		%		21-192	28-MAR-19
Surrogate: 13C12-2,3,4,7,8-PeCDF			83.0		%		21-178	28-MAR-19
Surrogate: 13C12-1,2,3,4,7,8-HxCDF			63.0		%		26-152	28-MAR-19
Surrogate: 13C12-1,2,3,6,7,8-HxCDF			74.0		%		26-123	28-MAR-19
Surrogate: 13C12-2,3,4,6,7,8-HxCDF			70.0		%		29-147	28-MAR-19
Surrogate: 13C12-1,2,3,7,8,9-HxCDF			71.0		%		28-136	28-MAR-19

COMMENTS: Blank has low levels of select targets. No impact to data quality is expected.



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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>DX-1613B-HRMS-BU Tissue</b>								
Batch R4587121								
WG3000722-1 MB								
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF			75.0		%		28-143	28-MAR-19
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF			83.0		%		26-138	28-MAR-19
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)			80.0		%		31-197	28-MAR-19
COMMENTS: Blank has low levels of select targets. No impact to data quality is expected.								
<b>HG-DRY-CVAFS-N-VA Tissue</b>								
Batch R4582669								
WG3011342-3 CRM VA-NRC-DORM4								
Mercury (Hg)-Total			110.4		%		70-130	25-MAR-19
WG3011451-3 CRM VA-NRC-DORM4								
Mercury (Hg)-Total			111.3		%		70-130	25-MAR-19
WG3011342-2 DUP L2222986-5								
Mercury (Hg)-Total			0.0165	0.0144	mg/kg	14	40	25-MAR-19
WG3011451-2 DUP L2222986-6								
Mercury (Hg)-Total			<0.0050	<0.0050	RPD-NA mg/kg	N/A	40	25-MAR-19
WG3011342-4 LCS								
Mercury (Hg)-Total			98.3		%		70-130	25-MAR-19
WG3011451-4 LCS								
Mercury (Hg)-Total			95.4		%		70-130	25-MAR-19
WG3011342-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	25-MAR-19
WG3011451-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	25-MAR-19
<b>MET-DRY-CCMS-N-VA Tissue</b>								
Batch R4581418								
WG3011451-3 CRM VA-NRC-DORM4								
Aluminum (Al)-Total			116.3		%		70-130	23-MAR-19
Arsenic (As)-Total			100.5		%		70-130	23-MAR-19
Barium (Ba)-Total			104.7		%		70-130	23-MAR-19
Beryllium (Be)-Total			0.015		mg/kg		0.005-0.025	23-MAR-19
Boron (B)-Total			94.0		%		70-130	23-MAR-19
Cadmium (Cd)-Total			95.0		%		70-130	23-MAR-19
Calcium (Ca)-Total			108.3		%		70-130	23-MAR-19
Chromium (Cr)-Total			114.7		%		70-130	23-MAR-19
Cobalt (Co)-Total			103.3		%		70-130	23-MAR-19
Copper (Cu)-Total			100.3		%		70-130	23-MAR-19



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70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-DRY-CCMS-N-VA Tissue</b>								
<b>Batch</b>	<b>R4581418</b>							
<b>WG3011451-3 CRM</b>		<b>VA-NRC-DORM4</b>						
Iron (Fe)-Total			118.9		%		70-130	23-MAR-19
Lead (Pb)-Total			114.6		%		70-130	23-MAR-19
Magnesium (Mg)-Total			112.5		%		70-130	23-MAR-19
Manganese (Mn)-Total			106.6		%		70-130	23-MAR-19
Molybdenum (Mo)-Total			92.4		%		70-130	23-MAR-19
Nickel (Ni)-Total			101.4		%		70-130	23-MAR-19
Phosphorus (P)-Total			105.8		%		70-130	23-MAR-19
Potassium (K)-Total			113.1		%		70-130	23-MAR-19
Sodium (Na)-Total			114.4		%		70-130	23-MAR-19
Strontium (Sr)-Total			96.6		%		70-130	23-MAR-19
Thallium (Tl)-Total			81.0		%		70-130	23-MAR-19
Vanadium (V)-Total			108.0		%		70-130	23-MAR-19
Zinc (Zn)-Total			113.5		%		70-130	23-MAR-19
Zirconium (Zr)-Total			0.28		mg/kg		0.05-0.45	23-MAR-19
<b>WG3011451-2 DUP</b>		<b>L2222986-6</b>						
Aluminum (Al)-Total		<2.0	<2.0	RPD-NA	mg/kg	N/A	40	23-MAR-19
Arsenic (As)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	23-MAR-19
Barium (Ba)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	23-MAR-19
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	23-MAR-19
Boron (B)-Total		2.1	1.9		mg/kg	14	40	23-MAR-19
Cadmium (Cd)-Total		0.0055	<0.0050	RPD-NA	mg/kg	N/A	40	23-MAR-19
Calcium (Ca)-Total		48	45		mg/kg	6.3	60	23-MAR-19
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	23-MAR-19
Cobalt (Co)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	23-MAR-19
Copper (Cu)-Total		1.67	1.61		mg/kg	3.8	40	23-MAR-19
Iron (Fe)-Total		16.4	16.8		mg/kg	2.5	40	23-MAR-19
Lead (Pb)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	23-MAR-19
Magnesium (Mg)-Total		1020	1070		mg/kg	4.7	40	23-MAR-19
Manganese (Mn)-Total		3.42	3.28		mg/kg	4.3	40	23-MAR-19
Molybdenum (Mo)-Total		0.297	0.248		mg/kg	18	40	23-MAR-19
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	23-MAR-19
Phosphorus (P)-Total		3130	3120		mg/kg	0.4	40	23-MAR-19
Potassium (K)-Total		4070	3990		mg/kg	2.0	40	23-MAR-19



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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-DRY-CCMS-N-VA</b>								
	<b>Tissue</b>							
<b>Batch</b>	<b>R4581418</b>							
<b>WG3011451-2</b>	<b>DUP</b>	<b>L2222986-6</b>						
Sodium (Na)-Total		<20	<20	RPD-NA	mg/kg	N/A	40	23-MAR-19
Strontium (Sr)-Total		0.055	<0.050	RPD-NA	mg/kg	N/A	60	23-MAR-19
Thallium (Tl)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	23-MAR-19
Vanadium (V)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	23-MAR-19
Zinc (Zn)-Total		18.4	18.7		mg/kg	1.5	40	23-MAR-19
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	23-MAR-19
<b>WG3011451-4</b>	<b>LCS</b>							
Aluminum (Al)-Total			111.9		%		70-130	23-MAR-19
Arsenic (As)-Total			105.5		%		70-130	23-MAR-19
Barium (Ba)-Total			102.9		%		70-130	23-MAR-19
Beryllium (Be)-Total			99.9		%		70-130	23-MAR-19
Boron (B)-Total			104.5		%		70-130	23-MAR-19
Cadmium (Cd)-Total			96.6		%		70-130	23-MAR-19
Calcium (Ca)-Total			104.7		%		70-130	23-MAR-19
Chromium (Cr)-Total			107.2		%		70-130	23-MAR-19
Cobalt (Co)-Total			104.2		%		70-130	23-MAR-19
Copper (Cu)-Total			102.8		%		70-130	23-MAR-19
Iron (Fe)-Total			101.2		%		70-130	23-MAR-19
Lead (Pb)-Total			102.2		%		70-130	23-MAR-19
Magnesium (Mg)-Total			111.5		%		70-130	23-MAR-19
Manganese (Mn)-Total			107.0		%		70-130	23-MAR-19
Molybdenum (Mo)-Total			107.2		%		70-130	23-MAR-19
Nickel (Ni)-Total			104.4		%		70-130	23-MAR-19
Phosphorus (P)-Total			114.8		%		70-130	23-MAR-19
Potassium (K)-Total			114.3		%		70-130	23-MAR-19
Sodium (Na)-Total			114.2		%		70-130	23-MAR-19
Strontium (Sr)-Total			110.5		%		70-130	23-MAR-19
Thallium (Tl)-Total			100.1		%		70-130	23-MAR-19
Vanadium (V)-Total			109.8		%		70-130	23-MAR-19
Zinc (Zn)-Total			102.7		%		70-130	23-MAR-19
Zirconium (Zr)-Total			101.1		%		70-130	23-MAR-19
<b>WG3011451-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<2.0		mg/kg		2	23-MAR-19
Arsenic (As)-Total			<0.020		mg/kg		0.02	23-MAR-19



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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-DRY-CCMS-N-VA</b>								
	<b>Tissue</b>							
<b>Batch</b>	<b>R4581418</b>							
<b>WG3011451-1</b>	<b>MB</b>							
Barium (Ba)-Total			<0.050		mg/kg		0.05	23-MAR-19
Beryllium (Be)-Total			<0.010		mg/kg		0.01	23-MAR-19
Boron (B)-Total			<1.0		mg/kg		1	23-MAR-19
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	23-MAR-19
Calcium (Ca)-Total			<20		mg/kg		20	23-MAR-19
Chromium (Cr)-Total			<0.050		mg/kg		0.05	23-MAR-19
Cobalt (Co)-Total			<0.020		mg/kg		0.02	23-MAR-19
Copper (Cu)-Total			<0.10		mg/kg		0.1	23-MAR-19
Iron (Fe)-Total			<3.0		mg/kg		3	23-MAR-19
Lead (Pb)-Total			<0.020		mg/kg		0.02	23-MAR-19
Magnesium (Mg)-Total			<2.0		mg/kg		2	23-MAR-19
Manganese (Mn)-Total			<0.050		mg/kg		0.05	23-MAR-19
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	23-MAR-19
Nickel (Ni)-Total			<0.20		mg/kg		0.2	23-MAR-19
Phosphorus (P)-Total			<10		mg/kg		10	23-MAR-19
Potassium (K)-Total			<20		mg/kg		20	23-MAR-19
Sodium (Na)-Total			<20		mg/kg		20	23-MAR-19
Strontium (Sr)-Total			<0.050		mg/kg		0.05	23-MAR-19
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	23-MAR-19
Vanadium (V)-Total			<0.10		mg/kg		0.1	23-MAR-19
Zinc (Zn)-Total			<0.50		mg/kg		0.5	23-MAR-19
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	23-MAR-19
<b>Batch</b>	<b>R4582634</b>							
<b>WG3011342-3</b>	<b>CRM</b>	<b>VA-NRC-DORM4</b>						
Aluminum (Al)-Total			110.8		%		70-130	25-MAR-19
Arsenic (As)-Total			103.2		%		70-130	25-MAR-19
Barium (Ba)-Total			111.1		%		70-130	25-MAR-19
Beryllium (Be)-Total			0.015		mg/kg		0.005-0.025	25-MAR-19
Boron (B)-Total			98.0		%		70-130	25-MAR-19
Cadmium (Cd)-Total			101.9		%		70-130	25-MAR-19
Calcium (Ca)-Total			106.5		%		70-130	25-MAR-19
Chromium (Cr)-Total			115.6		%		70-130	25-MAR-19
Cobalt (Co)-Total			115.3		%		70-130	25-MAR-19
Copper (Cu)-Total			112.4		%		70-130	25-MAR-19





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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-DRY-CCMS-N-VA</b>								
<b>Tissue</b>								
<b>Batch R4582634</b>								
<b>WG3011342-3 CRM</b>								
<b>VA-NRC-DORM4</b>								
Iron (Fe)-Total			120.1		%		70-130	25-MAR-19
Lead (Pb)-Total			103.1		%		70-130	25-MAR-19
Magnesium (Mg)-Total			115.5		%		70-130	25-MAR-19
Manganese (Mn)-Total			108.7		%		70-130	25-MAR-19
Molybdenum (Mo)-Total			91.0		%		70-130	25-MAR-19
Nickel (Ni)-Total			107.4		%		70-130	25-MAR-19
Phosphorus (P)-Total			105.5		%		70-130	25-MAR-19
Potassium (K)-Total			108.4		%		70-130	25-MAR-19
Sodium (Na)-Total			110.4		%		70-130	25-MAR-19
Strontium (Sr)-Total			94.8		%		70-130	25-MAR-19
Thallium (Tl)-Total			83.2		%		70-130	25-MAR-19
Vanadium (V)-Total			107.2		%		70-130	25-MAR-19
Zinc (Zn)-Total			115.0		%		70-130	25-MAR-19
Zirconium (Zr)-Total			0.24		mg/kg		0.05-0.45	25-MAR-19
<b>WG3011342-4 LCS</b>								
Aluminum (Al)-Total			109.7		%		70-130	25-MAR-19
Arsenic (As)-Total			105.1		%		70-130	25-MAR-19
Barium (Ba)-Total			105.1		%		70-130	25-MAR-19
Beryllium (Be)-Total			104.0		%		70-130	25-MAR-19
Boron (B)-Total			102.7		%		70-130	25-MAR-19
Cadmium (Cd)-Total			99.9		%		70-130	25-MAR-19
Calcium (Ca)-Total			103.7		%		70-130	25-MAR-19
Chromium (Cr)-Total			107.2		%		70-130	25-MAR-19
Cobalt (Co)-Total			104.4		%		70-130	25-MAR-19
Copper (Cu)-Total			105.9		%		70-130	25-MAR-19
Iron (Fe)-Total			104.8		%		70-130	25-MAR-19
Lead (Pb)-Total			100.0		%		70-130	25-MAR-19
Magnesium (Mg)-Total			109.9		%		70-130	25-MAR-19
Manganese (Mn)-Total			107.9		%		70-130	25-MAR-19
Molybdenum (Mo)-Total			101.5		%		70-130	25-MAR-19
Nickel (Ni)-Total			107.1		%		70-130	25-MAR-19
Phosphorus (P)-Total			112.5		%		70-130	25-MAR-19
Potassium (K)-Total			110.7		%		70-130	25-MAR-19
Sodium (Na)-Total			114.0		%		70-130	25-MAR-19





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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-DRY-CCMS-N-VA Tissue</b>								
<b>Batch R4582634</b>								
<b>WG3011342-4 LCS</b>								
Strontium (Sr)-Total			109.1		%		70-130	25-MAR-19
Thallium (Tl)-Total			98.3		%		70-130	25-MAR-19
Vanadium (V)-Total			110.2		%		70-130	25-MAR-19
Zinc (Zn)-Total			103.1		%		70-130	25-MAR-19
Zirconium (Zr)-Total			95.5		%		70-130	25-MAR-19
<b>WG3011342-1 MB</b>								
Aluminum (Al)-Total			<2.0		mg/kg		2	25-MAR-19
Arsenic (As)-Total			<0.020		mg/kg		0.02	25-MAR-19
Barium (Ba)-Total			<0.050		mg/kg		0.05	25-MAR-19
Beryllium (Be)-Total			<0.010		mg/kg		0.01	25-MAR-19
Boron (B)-Total			<1.0		mg/kg		1	25-MAR-19
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	25-MAR-19
Calcium (Ca)-Total			<20		mg/kg		20	25-MAR-19
Chromium (Cr)-Total			<0.050		mg/kg		0.05	25-MAR-19
Cobalt (Co)-Total			<0.020		mg/kg		0.02	25-MAR-19
Copper (Cu)-Total			<0.10		mg/kg		0.1	25-MAR-19
Iron (Fe)-Total			<3.0		mg/kg		3	25-MAR-19
Lead (Pb)-Total			<0.020		mg/kg		0.02	25-MAR-19
Magnesium (Mg)-Total			<2.0		mg/kg		2	25-MAR-19
Manganese (Mn)-Total			<0.050		mg/kg		0.05	25-MAR-19
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	25-MAR-19
Nickel (Ni)-Total			<0.20		mg/kg		0.2	25-MAR-19
Phosphorus (P)-Total			<10		mg/kg		10	25-MAR-19
Potassium (K)-Total			<20		mg/kg		20	25-MAR-19
Sodium (Na)-Total			<20		mg/kg		20	25-MAR-19
Strontium (Sr)-Total			<0.050		mg/kg		0.05	25-MAR-19
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	25-MAR-19
Vanadium (V)-Total			<0.10		mg/kg		0.1	25-MAR-19
Zinc (Zn)-Total			<0.50		mg/kg		0.5	25-MAR-19
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	25-MAR-19
<b>Batch R4585028</b>								
<b>WG3011342-2 DUP</b>								
		<b>L2222986-5</b>						
Aluminum (Al)-Total		67.7	53.5		mg/kg	23	40	26-MAR-19
Arsenic (As)-Total		0.049	0.039		mg/kg	24	40	26-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-DRY-CCMS-N-VA</b>								
	<b>Tissue</b>							
<b>Batch</b>	<b>R4585028</b>							
<b>WG3011342-2</b>	<b>DUP</b>	<b>L2222986-5</b>						
Barium (Ba)-Total		14.6	13.0		mg/kg	12	40	26-MAR-19
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	26-MAR-19
Boron (B)-Total		5.5	5.0		mg/kg	10	40	26-MAR-19
Cadmium (Cd)-Total		0.274	0.246		mg/kg	11	40	26-MAR-19
Calcium (Ca)-Total		5240	4810		mg/kg	8.6	60	26-MAR-19
Chromium (Cr)-Total		0.413	0.352		mg/kg	16	40	26-MAR-19
Cobalt (Co)-Total		0.078	0.067		mg/kg	15	40	26-MAR-19
Copper (Cu)-Total		7.92	7.21		mg/kg	9.4	40	26-MAR-19
Iron (Fe)-Total		132	112		mg/kg	17	40	26-MAR-19
Lead (Pb)-Total		0.216	0.188		mg/kg	14	40	26-MAR-19
Magnesium (Mg)-Total		3440	2960		mg/kg	15	40	26-MAR-19
Manganese (Mn)-Total		91.7	80.4		mg/kg	13	40	26-MAR-19
Molybdenum (Mo)-Total		4.49	4.09		mg/kg	9.4	40	26-MAR-19
Nickel (Ni)-Total		2.55	2.29		mg/kg	10	40	26-MAR-19
Phosphorus (P)-Total		5990	5330		mg/kg	12	40	26-MAR-19
Potassium (K)-Total		45100	40600		mg/kg	10	40	26-MAR-19
Sodium (Na)-Total		87	78		mg/kg	10	40	26-MAR-19
Strontium (Sr)-Total		9.02	8.34		mg/kg	7.8	60	26-MAR-19
Thallium (Tl)-Total		0.0034	0.0033		mg/kg	3.0	40	26-MAR-19
Vanadium (V)-Total		0.21	0.17		mg/kg	20	40	26-MAR-19
Zinc (Zn)-Total		27.0	24.0		mg/kg	12	40	26-MAR-19
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	26-MAR-19
<b>MOISTURE-BU</b>								
	<b>Tissue</b>							
<b>Batch</b>	<b>R4558429</b>							
<b>WG3003722-2</b>	<b>LCS</b>							
% Moisture			97.3		%		50-150	12-MAR-19
<b>WG3003722-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.1	12-MAR-19
<b>Batch</b>	<b>R4560301</b>							
<b>WG3003739-2</b>	<b>LCS</b>							
% Moisture			99.1		%		50-150	13-MAR-19
<b>WG3003739-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.1	13-MAR-19
<b>OCPEST-1699-HRMS-BU</b>								
	<b>Tissue</b>							



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU Tissue</b>								
<b>Batch R4690188</b>								
<b>WG2991227-2 LCS</b>								
alpha-BHC			90.0		%		50-120	27-MAR-19
beta-BHC			136.0	G	%		50-120	27-MAR-19
delta-BHC			119.0		%		50-120	27-MAR-19
gamma-BHC			95.0		%		50-120	27-MAR-19
Heptachlor			90.0		%		50-120	27-MAR-19
Aldrin			70.0		%		50-120	27-MAR-19
Heptachlor Epoxide			95.0		%		50-150	27-MAR-19
trans-Chlordane			86.0		%		50-120	27-MAR-19
cis-Chlordane			86.0		%		50-120	27-MAR-19
Dieldrin			91.0		%		50-120	27-MAR-19
Endrin			91.0		%		50-120	27-MAR-19
Endrin Aldehyde			144.0		%		20-200	27-MAR-19
Endosulfan I			55.0		%		50-120	27-MAR-19
Endosulfan II			96.0		%		5-200	27-MAR-19
Endosulfan Sulfate			166.0		%		50-200	27-MAR-19
4,4-DDE			88.0		%		50-120	27-MAR-19
4,4-DDD			83.0		%		42-120	27-MAR-19
4,4-DDT			91.0		%		50-120	27-MAR-19
Methoxychlor			82.0		%		50-120	27-MAR-19
Mirex			95.0		%		50-120	27-MAR-19
Heptachlor Epoxide A			99.0		%		50-150	27-MAR-19

COMMENTS: The recoveries of selected surrogates are outside the method limits.  
Isotope dilution calculation for native target is recovery corrected so impact to data quality is minimal.

**WG2991227-1 MB**

alpha-BHC			<0.048	[U]	ng/g		0.76	27-MAR-19
beta-BHC			<0.085	[U]	ng/g		0.76	27-MAR-19
delta-BHC			<0.067	[U]	ng/g		0.76	27-MAR-19
gamma-BHC			<0.053	[U]	ng/g		0.76	27-MAR-19
Heptachlor			<0.0059	[U]	ng/g		0.76	27-MAR-19
Aldrin			<0.0058	[U]	ng/g		0.76	27-MAR-19
Heptachlor Epoxide			<0.0091	[U]	ng/g		0.76	27-MAR-19
trans-Chlordane			<0.018	[U]	ng/g		0.76	27-MAR-19
cis-Chlordane			<0.016	[U]	ng/g		0.76	27-MAR-19
Dieldrin			<0.014	[U]	ng/g		0.76	27-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU Tissue</b>								
<b>Batch R4690188</b>								
<b>WG2991227-1 MB</b>								
Endrin			<0.020	[U]	ng/g		0.76	27-MAR-19
Endrin Aldehyde			<0.051	[U]	ng/g		0.76	27-MAR-19
Endosulfan I			<0.010	[U]	ng/g		0.76	27-MAR-19
Endosulfan II			<0.050	[U]	ng/g		0.76	27-MAR-19
Endosulfan Sulfate			<0.18	[U]	ng/g		0.76	27-MAR-19
4,4-DDE			<0.012	[U]	ng/g		0.76	27-MAR-19
4,4-DDD			<0.018	[U]	ng/g		0.76	27-MAR-19
4,4-DDT			<0.029	[U]	ng/g		0.76	27-MAR-19
Methoxychlor			<0.14		ng/g		0.76	27-MAR-19
Mirex			0.0045	M,J,R	ng/g		0.76	27-MAR-19
Surrogate: alpha-BHC, 13C6-			61.0		%		16-129	27-MAR-19
Surrogate: gamma-BHC-D6			63.0		%		11-120	27-MAR-19
Surrogate: Heptachlor, 13C10-			37.0		%		5-120	27-MAR-19
Surrogate: Dieldrin, 13C12-			63.0		%		40-151	27-MAR-19
Surrogate: Endrin, 13C12-			59.0		%		35-155	27-MAR-19
Surrogate: Endosulfan II, 13C9-			80.0		%		5-122	27-MAR-19
Surrogate: 4,4'-DDE, 13C12-			79.0		%		21-125	27-MAR-19
Surrogate: 4,4'-DDT, 13C12-			135.0	G	%		5-120	27-MAR-19
Surrogate: Methoxychlor-D6			304.0	G	%		5-120	27-MAR-19
Surrogate: Mirex, 13C10-			258.0	G	%		5-120	27-MAR-19
Surrogate: 4,4'-DDD, 13C12-			111.0		%		5-150	27-MAR-19
Heptachlor Epoxide A			<0.061	[U]	ng/g		0.76	27-MAR-19
<p>COMMENTS: The recoveries of selected surrogates are outside the method limits. Isotope dilution calculation for native target is recovery corrected so impact to data quality is minimal.</p>								
<b>Batch R4690215</b>								
<b>WG3010136-2 LCS</b>								
alpha-BHC			98.0		%		50-120	29-MAR-19
beta-BHC			94.0		%		50-120	29-MAR-19
delta-BHC			107.0		%		50-120	29-MAR-19
gamma-BHC			101.0		%		50-120	29-MAR-19
Heptachlor			100.0		%		50-120	29-MAR-19
Aldrin			95.0		%		50-120	29-MAR-19
Heptachlor Epoxide			111.0		%		50-150	29-MAR-19
trans-Chlordane			102.0		%		50-120	29-MAR-19



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Client: STANTEC CONSULTING LTD.  
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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU Tissue</b>								
<b>Batch R4690215</b>								
<b>WG3010136-2 LCS</b>								
cis-Chlordane			97.0		%		50-120	29-MAR-19
Dieldrin			99.0		%		50-120	29-MAR-19
Endrin			101.0		%		50-120	29-MAR-19
Endrin Aldehyde			71.0		%		20-200	29-MAR-19
Endosulfan I			91.0		%		50-120	29-MAR-19
Endosulfan II			97.0		%		5-200	29-MAR-19
Endosulfan Sulfate			100.0		%		50-200	29-MAR-19
4,4-DDE			104.0		%		50-120	29-MAR-19
4,4-DDD			102.0		%		42-120	29-MAR-19
4,4-DDT			99.0		%		50-120	29-MAR-19
Methoxychlor			89.0		%		50-120	29-MAR-19
Mirex			99.0		%		50-120	29-MAR-19
Heptachlor Epoxide A			100.0		%		50-150	29-MAR-19
<b>WG3010136-1 MB</b>								
alpha-BHC			<0.013	[U]	ng/g		0.1	30-MAR-19
beta-BHC			<0.020	[U]	ng/g		0.1	30-MAR-19
delta-BHC			<0.017	[U]	ng/g		0.1	30-MAR-19
gamma-BHC			<0.015	[U]	ng/g		0.1	30-MAR-19
Heptachlor			<0.0018	[U]	ng/g		0.1	30-MAR-19
Aldrin			<0.0016	[U]	ng/g		0.1	30-MAR-19
Heptachlor Epoxide			0.0041	M,J	ng/g		0.1	30-MAR-19
trans-Chlordane			<0.0059	[U]	ng/g		0.1	30-MAR-19
cis-Chlordane			<0.0054	[U]	ng/g		0.1	30-MAR-19
Dieldrin			<0.0051	[U]	ng/g		0.1	30-MAR-19
Endrin			<0.012	[U]	ng/g		0.1	30-MAR-19
Endrin Aldehyde			<0.0078	[U]	ng/g		0.1	30-MAR-19
Endosulfan I			<0.024	[U]	ng/g		0.1	30-MAR-19
Endosulfan II			<0.045	[U]	ng/g		0.1	30-MAR-19
Endosulfan Sulfate			<0.0070	[U]	ng/g		0.1	30-MAR-19
4,4-DDE			<0.0070	[U]	ng/g		0.1	30-MAR-19
4,4-DDD			<0.0058	[U]	ng/g		0.1	30-MAR-19
4,4-DDT			<0.0094	[U]	ng/g		0.1	30-MAR-19
Methoxychlor			<0.13		ng/g		0.1	30-MAR-19
Mirex			0.00310	M,J,R	ng/g		0.1	30-MAR-19



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU Tissue</b>								
<b>Batch R4690215</b>								
<b>WG3010136-1 MB</b>								
	Surrogate: alpha-BHC, 13C6-		32.0		%		16-129	30-MAR-19
	Surrogate: gamma-BHC-D6		34.0		%		11-120	30-MAR-19
	Surrogate: Heptachlor, 13C10-		47.0		%		5-120	30-MAR-19
	Surrogate: Dieldrin, 13C12-		60.0		%		40-151	30-MAR-19
	Surrogate: Endrin, 13C12-		72.0		%		35-155	30-MAR-19
	Surrogate: Endosulfan II, 13C9-		47.0		%		5-122	30-MAR-19
	Surrogate: 4,4'-DDE, 13C12-		60.0		%		21-125	30-MAR-19
	Surrogate: 4,4'-DDT, 13C12-		66.0		%		5-120	30-MAR-19
	Surrogate: Methoxychlor-D6		68.0		%		5-120	30-MAR-19
	Surrogate: Mirex, 13C10-		64.0		%		5-120	30-MAR-19
	Surrogate: 4,4'-DDD, 13C12-		60.0		%		5-150	30-MAR-19
	Heptachlor Epoxide A		<0.017	[U]	ng/g		0.1	30-MAR-19
<b>S-DRY-CCMS-N-VA Tissue</b>								
<b>Batch R4581418</b>								
<b>WG3011451-3 CRM VA-NRC-DORM4</b>								
	Sulfur (S)-Total		115.2		%		70-130	23-MAR-19
<b>WG3011451-2 DUP L2222986-6</b>								
	Sulfur (S)-Total	1050	880		mg/kg	17	40	23-MAR-19
<b>WG3011451-4 LCS</b>								
	Sulfur (S)-Total		111.6		%		70-130	23-MAR-19
<b>WG3011451-1 MB</b>								
	Sulfur (S)-Total		<100		mg/kg		100	23-MAR-19
<b>Batch R4582634</b>								
<b>WG3011342-3 CRM VA-NRC-DORM4</b>								
	Sulfur (S)-Total		117.7		%		70-130	25-MAR-19
<b>WG3011342-4 LCS</b>								
	Sulfur (S)-Total		109.6		%		70-130	25-MAR-19
<b>WG3011342-1 MB</b>								
	Sulfur (S)-Total		<100		mg/kg		100	25-MAR-19
<b>Batch R4585028</b>								
<b>WG3011342-2 DUP L2222986-5</b>								
	Sulfur (S)-Total	3430	3090		mg/kg	10	40	26-MAR-19
<b>TI-DRY-CCMS-N-VA Tissue</b>								



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Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>TI-DRY-CCMS-N-VA</b>								
	<b>Tissue</b>							
<b>Batch</b>	<b>R4581418</b>							
<b>WG3011451-2</b>	<b>DUP</b>	<b>L2222986-6</b>						
Titanium (Ti)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	23-MAR-19
<b>WG3011451-4</b>	<b>LCS</b>							
Titanium (Ti)-Total			104.1		%		70-130	23-MAR-19
<b>WG3011451-1</b>	<b>MB</b>							
Titanium (Ti)-Total			<0.10		mg/kg		0.1	23-MAR-19
<b>Batch</b>	<b>R4582634</b>							
<b>WG3011342-3</b>	<b>CRM</b>	<b>VA-NRC-DORM4</b>						
Titanium (Ti)-Total			104.7		%		70-130	25-MAR-19
<b>WG3011342-2</b>	<b>DUP</b>	<b>L2222986-5</b>						
Titanium (Ti)-Total		1.64	1.33		mg/kg	21	40	25-MAR-19
<b>WG3011342-4</b>	<b>LCS</b>							
Titanium (Ti)-Total			102.0		%		70-130	25-MAR-19
<b>WG3011342-1</b>	<b>MB</b>							
Titanium (Ti)-Total			<0.10		mg/kg		0.1	25-MAR-19
<b>Batch</b>	<b>R4588138</b>							
<b>WG3016565-4</b>	<b>LCS</b>							
Titanium (Ti)-Total			100.4		%		70-130	30-MAR-19
<b>WG3016565-1</b>	<b>MB</b>							
Titanium (Ti)-Total			<0.10		mg/kg		0.1	30-MAR-19
<b>Batch</b>	<b>R4588513</b>							
<b>WG3016565-3</b>	<b>CRM</b>	<b>VA-NRC-DORM4</b>						
Titanium (Ti)-Total			95.1		%		70-130	01-APR-19
<b>WG3016565-2</b>	<b>DUP</b>	<b>L2222986-39</b>						
Titanium (Ti)-Total		0.12	0.12		mg/kg	1.0	40	01-APR-19
<b>CP-CUSTOM-LRMS-BU</b>								
	<b>Solid</b>							
<b>Batch</b>	<b>R4681338</b>							
<b>WG3000729-2</b>	<b>LCS</b>							
Pentachlorophenol			110.3		%		50-150	28-MAR-19
<b>WG3000729-1</b>	<b>MB</b>							
Pentachlorophenol			59	R	ng/g		10	28-MAR-19
Surrogate: 13C6-Pentachlorophenol			49.2	G	%		50-150	28-MAR-19
COMMENTS: The recovery of 13C6-Pentachlorophenol is below the method control limit. The reported value may be biased low.								
<b>OCPEST-1699-HRMS-BU</b>								
	<b>Solid</b>							



## Quality Control Report

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU</b>								
	<b>Solid</b>							
<b>Batch</b>	<b>R4689169</b>							
<b>WG2991237-4</b>	<b>DUP</b>	<b>L2222986-11</b>						
alpha-BHC		<0.043	<0.035	RPD-NA	ng/g	N/A	50	26-MAR-19
beta-BHC		<0.074	<0.061	RPD-NA	ng/g	N/A	50	26-MAR-19
delta-BHC		<0.053	<0.044	RPD-NA	ng/g	N/A	50	26-MAR-19
gamma-BHC		<0.043	<0.036	RPD-NA	ng/g	N/A	50	26-MAR-19
Heptachlor		<0.0037	<0.0029	RPD-NA	ng/g	N/A	50	26-MAR-19
Aldrin		<0.0031	<0.0027	RPD-NA	ng/g	N/A	50	26-MAR-19
Heptachlor Epoxide		0.0213	0.0213		ng/g	0.0	50	26-MAR-19
trans-Chlordane		<0.018	<0.018	RPD-NA	ng/g	N/A	50	26-MAR-19
cis-Chlordane		<0.017	<0.017	RPD-NA	ng/g	N/A	50	26-MAR-19
Dieldrin		0.033	0.0325		ng/g	1.8	50	26-MAR-19
Endrin		<0.016	<0.0093	RPD-NA	ng/g	N/A	50	26-MAR-19
Endrin Aldehyde		<0.016	<0.013	RPD-NA	ng/g	N/A	50	26-MAR-19
Endosulfan I		<0.011	<0.016	RPD-NA	ng/g	N/A	50	26-MAR-19
Endosulfan II		<0.034	<0.036	RPD-NA	ng/g	N/A	50	26-MAR-19
Endosulfan Sulfate		<0.0022	<0.0072	RPD-NA	ng/g	N/A	50	26-MAR-19
4,4-DDE		0.331	0.314		ng/g	5.3	50	26-MAR-19
4,4-DDD		<0.012	<0.012	RPD-NA	ng/g	N/A	50	26-MAR-19
4,4-DDT		0.304	0.322		ng/g	5.8	50	26-MAR-19
Methoxychlor		<0.17	<0.18	RPD-NA	ng/g	N/A	50	26-MAR-19
Mirex		0.0082	0.0070		ng/g	16	50	26-MAR-19
Heptachlor Epoxide A		<0.023	<0.020	RPD-NA	ng/g	N/A	50	26-MAR-19
<b>WG2991237-2</b>	<b>LCS</b>							
alpha-BHC			98.0		%		50-120	26-MAR-19
beta-BHC			114.0		%		50-120	26-MAR-19
delta-BHC			122.0	G	%		50-120	26-MAR-19
gamma-BHC			99.0		%		50-120	26-MAR-19
Heptachlor			92.0		%		50-120	26-MAR-19
Aldrin			86.0		%		50-120	26-MAR-19
Heptachlor Epoxide			103.0		%		20-200	26-MAR-19
trans-Chlordane			88.0		%		50-120	26-MAR-19
cis-Chlordane			94.0		%		50-120	26-MAR-19
Dieldrin			99.0		%		50-120	26-MAR-19
Endrin			93.0		%		50-120	26-MAR-19





## Quality Control Report

Workorder: L2222986

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU Solid</b>								
<b>Batch R4689169</b>								
<b>WG2991237-2 LCS</b>								
Endrin Aldehyde			143.0		%		20-200	26-MAR-19
Endosulfan I			71.0		%		50-120	26-MAR-19
Endosulfan II			96.0		%		5-200	26-MAR-19
Endosulfan Sulfate			116.0		%		50-200	26-MAR-19
4,4-DDE			97.0		%		50-120	26-MAR-19
4,4-DDD			64.0		%		42-120	26-MAR-19
4,4-DDT			94.0		%		50-120	26-MAR-19
Methoxychlor			91.0		%		50-120	26-MAR-19
Mirex			97.0		%		50-120	26-MAR-19
Heptachlor Epoxide A			104.0		%		50-150	26-MAR-19
COMMENTS: 13C10-Mirex % recovery above the method limit, Isotope dilution calculation for native target is recovery corrected so impact to data quality is minimal. delta-BHC % recovery above the method limit, no positives found in the samples;								
<b>WG2991237-1 MB</b>								
alpha-BHC			<0.033	[U]	ng/g		0.2	26-MAR-19
beta-BHC			<0.057	[U]	ng/g		0.2	26-MAR-19
delta-BHC			<0.045	[U]	ng/g		0.2	26-MAR-19
gamma-BHC			<0.037	[U]	ng/g		0.2	26-MAR-19
Heptachlor			<0.0039	[U]	ng/g		0.2	26-MAR-19
Aldrin			<0.0039	[U]	ng/g		0.2	26-MAR-19
Heptachlor Epoxide			<0.0049	[U]	ng/g		0.2	26-MAR-19
trans-Chlordane			<0.011	[U]	ng/g		0.2	26-MAR-19
cis-Chlordane			<0.010	[U]	ng/g		0.2	26-MAR-19
Dieldrin			<0.0090	[U]	ng/g		0.2	26-MAR-19
Endrin			<0.015	[U]	ng/g		0.2	26-MAR-19
Endrin Aldehyde			<0.011	[U]	ng/g		0.2	26-MAR-19
Endosulfan I			<0.014	[U]	ng/g		0.2	26-MAR-19
Endosulfan II			<0.031	[U]	ng/g		0.2	26-MAR-19
Endosulfan Sulfate			<0.0052	[U]	ng/g		0.2	26-MAR-19
4,4-DDE			<0.0089	[U]	ng/g		0.2	26-MAR-19
4,4-DDD			<0.0093	[U]	ng/g		0.2	26-MAR-19
4,4-DDT			<0.0066	[U]	ng/g		0.2	26-MAR-19
Methoxychlor			<0.12		ng/g		0.2	26-MAR-19
Mirex			0.00328	M,J	ng/g		0.2	26-MAR-19



## Quality Control Report

Workorder: L2222986

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Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

Contact: Katherine Ketis

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>OCPEST-1699-HRMS-BU Solid</b>								
<b>Batch R4689169</b>								
<b>WG2991237-1 MB</b>								
Surrogate: alpha-BHC, 13C6-			74.0		%		16-129	26-MAR-19
Surrogate: gamma-BHC-D6			76.0		%		11-120	26-MAR-19
Surrogate: Heptachlor, 13C10-			48.0		%		5-120	26-MAR-19
Surrogate: trans-Nonachlor, 13C10-			81.0		%		14-136	26-MAR-19
Surrogate: Dieldrin, 13C12-			82.0		%		40-151	26-MAR-19
Surrogate: Endrin, 13C12-			66.0		%		35-155	26-MAR-19
Surrogate: Endosulfan II, 13C9-			101.0		%		5-122	26-MAR-19
Surrogate: 4,4'-DDE, 13C12-			90.0		%		21-125	26-MAR-19
Surrogate: 4,4'-DDT, 13C12-			78.0		%		5-120	26-MAR-19
Surrogate: Methoxychlor-D6			82.0		%		5-120	26-MAR-19
Surrogate: Mirex, 13C10-			127.0	G	%		5-120	26-MAR-19
Heptachlor Epoxide A			<0.033	[U]	ng/g		0.2	26-MAR-19
Surrogate: 4,4'-DDD, 13C12-			87.0		%		5-120	26-MAR-19

COMMENTS: 13C10-Mirex % recovery above the method limit, Isotope dilution calculation for native target is recovery corrected so impact to data quality is minimal.

# Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5

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Contact: Katherine Ketis

## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

---

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J	Duplicate results and limits are expressed in terms of absolute difference.
J,B	The analyte was detected below the calibrated range but above the EDL, and was detected in the Method Blank at >10% of the sample concentration.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M	A peak has been manually integrated.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,B	A peak has been manually integrated. Target analyte was detected below the calibrated range but above the EDL. Compound was detected in the method blank at >10% of the sample concentration.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

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# Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

Client: STANTEC CONSULTING LTD.  
 70 Southgate Dr, Suite 01  
 Guelph ON N1G 4P5  
 Contact: Katherine Ketis

**Hold Time Exceedances:**

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
<b>Physical Tests</b>							
Moisture content	15	17-OCT-18 11:50	16-MAR-19 00:50	14	150	days	EHTR
	30	25-SEP-18 14:25	16-MAR-19 00:50	14	171	days	EHTR
	37	26-SEP-18 09:30	16-MAR-19 00:50	14	171	days	EHTR
	41	17-OCT-18 11:20	16-MAR-19 00:50	14	150	days	EHTR
<b>Leachable Anions &amp; Nutrients</b>							
Fluoride leach (1:5) by SIE	1	05-JUL-18 14:30	27-MAR-19 19:03	28	265	days	EHTR
	4	16-OCT-18 16:15	27-MAR-19 19:03	28	162	days	EHTR
	7	17-OCT-18 08:30	27-MAR-19 19:03	28	161	days	EHTR
	8	17-OCT-18 08:40	27-MAR-19 19:03	28	161	days	EHTR
	11	05-JUL-18 12:30	27-MAR-19 19:03	28	265	days	EHTR
	14	17-OCT-18 11:30	27-MAR-19 19:03	28	161	days	EHTR
	15	17-OCT-18 11:50	27-MAR-19 19:03	28	161	days	EHTR
	17	16-OCT-18 14:00	27-MAR-19 19:03	28	162	days	EHTR
	20	26-SEP-18 11:25	27-MAR-19 19:03	28	182	days	EHTR
	21	26-SEP-18 11:35	27-MAR-19 19:03	28	182	days	EHTR
	24	16-OCT-18 12:30	27-MAR-19 19:03	28	162	days	EHTR
	27	17-OCT-18 10:30	27-MAR-19 19:03	28	161	days	EHTR
	29	25-SEP-18 14:30	27-MAR-19 21:46	28	183	days	EHTR
	30	25-SEP-18 14:25	27-MAR-19 21:46	28	183	days	EHTR
	33	25-SEP-18 15:45	27-MAR-19 21:46	28	183	days	EHTR
	36	26-SEP-18 09:30	27-MAR-19 21:46	28	183	days	EHTR
	37	26-SEP-18 09:30	27-MAR-19 21:46	28	183	days	EHTR
	40	17-OCT-18 11:00	27-MAR-19 21:46	28	161	days	EHTR
	41	17-OCT-18 11:20	27-MAR-19 21:46	28	161	days	EHTR
	43	05-JUL-18 12:40	27-MAR-19 21:46	28	265	days	EHTR
	44	25-SEP-18 14:35	27-MAR-19 21:46	28	183	days	EHTR
	47	17-OCT-18 08:50	27-MAR-19 21:46	28	162	days	EHTR
<b>Metals</b>							
Mercury in Soil by CVAAS	1	05-JUL-18 14:30	15-MAR-19 09:00	28	253	days	EHTR
	4	16-OCT-18 16:15	15-MAR-19 09:00	28	150	days	EHTR
	7	17-OCT-18 08:30	15-MAR-19 09:00	28	149	days	EHTR
	8	17-OCT-18 08:40	15-MAR-19 12:59	28	149	days	EHTR
	11	05-JUL-18 12:30	15-MAR-19 12:59	28	253	days	EHTR
	14	17-OCT-18 11:30	15-MAR-19 12:59	28	149	days	EHTR
	15	17-OCT-18 11:50	15-MAR-19 12:59	28	149	days	EHTR
	17	16-OCT-18 14:00	15-MAR-19 12:59	28	150	days	EHTR
	20	26-SEP-18 11:25	15-MAR-19 12:59	28	170	days	EHTR
	21	26-SEP-18 11:35	15-MAR-19 12:59	28	170	days	EHTR
	24	16-OCT-18 12:30	15-MAR-19 12:59	28	150	days	EHTR
	27	17-OCT-18 10:30	15-MAR-19 12:59	28	149	days	EHTR
	29	25-SEP-18 14:30	16-MAR-19 15:47	28	172	days	EHTR
	30	25-SEP-18 14:25	16-MAR-19 15:47	28	172	days	EHTR
	33	25-SEP-18 15:45	16-MAR-19 15:47	28	172	days	EHTR
	36	26-SEP-18 09:30	16-MAR-19 15:47	28	171	days	EHTR
	37	26-SEP-18 09:30	16-MAR-19 15:47	28	171	days	EHTR
	40	17-OCT-18 11:00	16-MAR-19 15:47	28	150	days	EHTR
	41	17-OCT-18 11:20	16-MAR-19 15:47	28	150	days	EHTR
	43	05-JUL-18 12:40	16-MAR-19 15:47	28	254	days	EHTR
	44	25-SEP-18 14:35	16-MAR-19 15:47	28	172	days	EHTR

# Quality Control Report

Workorder: L2222986

Report Date: 04-NOV-19

Client: STANTEC CONSULTING LTD.  
70 Southgate Dr, Suite 01  
Guelph ON N1G 4P5  
Contact: Katherine Ketis

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## Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
<b>Metals</b>							
Mercury in Soil by CVAAS	47	17-OCT-18 08:50	16-MAR-19 15:47	28	150	days	EHTR
Metals in Soil by CRC ICPMS	1	05-JUL-18 14:30	15-MAR-19 09:00	180	253	days	EHTR
	11	05-JUL-18 12:30	15-MAR-19 12:59	180	253	days	EHTR
	43	05-JUL-18 12:40	16-MAR-19 15:47	180	254	days	EHTR
<b>Total Metals</b>							
Total Mercury in Water by CVAAS or CVAFS							
	51	05-JUL-18 12:30	28-FEB-19 10:39	28	238	days	EHTR
	52	26-SEP-18 09:00	28-FEB-19 10:39	28	155	days	EHTR
	53	16-OCT-18 12:30	28-FEB-19 10:39	28	135	days	EHTR
	54	05-JUL-18 12:30	27-FEB-19 14:12	28	237	days	EHTR
	55	25-SEP-18 12:15	27-FEB-19 14:12	28	155	days	EHTR
	56	16-OCT-18 12:20	27-FEB-19 14:12	28	134	days	EHTR
	57	14-JAN-19 16:30	28-FEB-19 10:39	28	45	days	EHT
	58	14-JAN-19 16:30	28-FEB-19 10:39	28	45	days	EHT
	59	14-JAN-19 16:30	28-FEB-19 10:39	28	45	days	EHT
Total Silicon (reported as Silica)							
	51	05-JUL-18 12:30	27-FEB-19 13:30	150	237	days	EHTR
	52	26-SEP-18 09:00	27-FEB-19 13:30	150	154	days	EHT
	54	05-JUL-18 12:30	06-MAR-19 13:50	150	244	days	EHTR
	55	25-SEP-18 12:15	28-FEB-19 20:35	150	156	days	EHT

## Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.  
EHTR: Exceeded ALS recommended hold time prior to sample receipt.  
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.  
EHT: Exceeded ALS recommended hold time prior to analysis.  
Rec. HT: ALS recommended hold time (see units).

Notes\*:  
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.  
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2222986 were received on 15-JAN-19 16:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 29-Mar-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** Chlorophenols as acetate derivatives by SIM GC/MS

There was a co-eluting interference on the laboratory method blank for pentachlorophenol. Since there was no PCP in any of the samples there is no need for concern on laboratory bias and therefore re-injection of the laboratory method blank was not necessary.

Certified by:

A handwritten signature in black ink, appearing to read "R. McLeod", is written over a horizontal line.

Ron McLeod, PhD  
Technical Director

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank	18-W4-FC-CH-011	18-N4-WW-CH-027	18-E2-SB-CH-051	18-D5-SB-CH-205	18-D6-FC-CH-207
ALS Sample ID	WG3000729-1	L2222986-6	L2222986-13	L2222986-23	L2222986-48	L2222986-49
Sample Size	1.00	5.14	4.88	4.92	5.04	5.03
Sample units	g	g	g	g	g	g
Moisture Content	n/a	28.8%	34.6%	40.4%	40.6%	40.6%
Matrix	QC	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	n/a	16-Oct-18	5-Jul-18	26-Sep-18	26-Sep-18	16-Oct-18
Extraction Date	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>
Pentachlorophenol	<60	<1.9 U	<2 U	<2 U	<2 U	<2 U
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C-Pentachlorophenol	49	46	51	43	40	42
<p>U Indicates that this compound was not detected above the LOR.</p>						

ALS Environmental

Sample Analysis Summary Report

Sample Name	18-D7-WW-CH-209	Laboratory Control Sample
ALS Sample ID	L2222986-50	WG3000729-2
Sample Size	4.84	1
Sample units	g	n/a
Moisture Content	35.2%	n/a
Matrix	Plant Tissue	QC
Sampling Date	5-Jul-18	n/a
Extraction Date	21-Mar-19	21-Mar-19

Target Analytes	ng/g	% Recovery
Pentachlorophenol	<2.1 U	110 R
Extraction Standards	% Rec	% Rec
13C-Pentachlorophenol	50	53

U Indicates that this compound was not detected above the LOR.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.



# ALS Environmental

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a
ALS Sample ID	WG3000729-1	Extraction Date	21-Mar-19
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 g		
Percent Moisture	n/a		
Split Ratio	1		

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	19032826.D
Run Date	3/28/2019 16:41
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USN267447H

<b>Target Analytes</b>	<b>Ret. Time</b>	<b>Concentration ng/g</b>	<b>Flags</b>
Pentachlorophenol	13.88	<60	R

<b>Extraction Standards</b>		<b>% Rec</b>
13C-Pentachlorophenol	200 13.89	49

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

# ALS Environmental

## Sample Analysis Report

**Sample Name** 18-W4-FC-CH-011  
ALS Sample ID L2222986-6  
Analysis Method SIM GC/MS  
Analysis Type sample  
Sample Matrix Plant Tissue  
Sample Size 5.14 g  
Percent Moisture 28.8%  
Split Ratio 1

Sampling Date 16-Oct-18  
Extraction Date 21-Mar-19

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-2019

### Run Information

#### Run 1

Filename 19032827.D  
Run Date 3/28/2019 17:05  
Final Volume 1 mL  
Dilution Factor 1  
Analysis Units ng/g  
Instrument MSD-2  
Column HP-5MS USN127357H

Target Analytes	Ret. Time	Concentration ng/g	Flags
Pentachlorophenol	13.88	<1.9	U
Extraction Standards		% Rec	
13C-Pentachlorophenol	200 13.88	46	

U Indicates that this compound was not detected above the LOR.

# ALS Environmental

## Sample Analysis Report

**Sample Name** 18-N4-WW-CH-027  
ALS Sample ID L2222986-13  
Analysis Method SIM GC/MS  
Analysis Type sample  
Sample Matrix Plant Tissue  
Sample Size 4.88 g  
Percent Moisture 34.6%  
Split Ratio 1

Sampling Date 5-Jul-18  
Extraction Date 21-Mar-19

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-2019

### Run Information

#### Run 1

Filename 19032828.D  
Run Date 3/28/2019 17:29  
Final Volume 1 mL  
Dilution Factor 1  
Analysis Units ng/g  
Instrument MSD-2  
Column HP-5MS USN127357H

Target Analytes	Ret. Time	Concentration ng/g	Flags
Pentachlorophenol	13.88	<2	U
Extraction Standards		% Rec	
13C-Pentachlorophenol	200 13.89	51	

U Indicates that this compound was not detected above the LOR.

# ALS Environmental

## Sample Analysis Report

**Sample Name** 18-E2-SB-CH-051  
ALS Sample ID L2222986-23  
Analysis Method SIM GC/MS  
Analysis Type sample  
Sample Matrix Plant Tissue  
Sample Size 4.92 g  
Percent Moisture 40.4%  
Split Ratio 1

Sampling Date 26-Sep-18  
Extraction Date 21-Mar-19

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-2019

### Run Information

#### Run 1

Filename 19032829.D  
Run Date 3/28/2019 17:53  
Final Volume 1 mL  
Dilution Factor 1  
Analysis Units ng/g  
Instrument MSD-2  
Column HP-5MS USN127357H

Target Analytes	Ret. Time	Concentration ng/g	Flags
Pentachlorophenol	13.89	<2	U
Extraction Standards		% Rec	
13C-Pentachlorophenol	200	13.90	43

U Indicates that this compound was not detected above the LOR.

# ALS Environmental

## Sample Analysis Report

**Sample Name** 18-D5-SB-CH-205  
 ALS Sample ID L2222986-48  
 Analysis Method SIM GC/MS  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 5.04 g  
 Percent Moisture 40.6%  
 Split Ratio 1

Sampling Date 26-Sep-18  
 Extraction Date 21-Mar-19

Approved:  
*Andrew Reid*  
 --e-signature--  
 29-Mar-2019

**Run Information** **Run 1**  
 Filename 19032830.D  
 Run Date 3/28/2019 18:16  
 Final Volume 1 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USN127357H

Target Analytes	Ret. Time	Concentration ng/g	Flags
Pentachlorophenol	13.90	<2	U
<b>Extraction Standards</b>		<b>% Rec</b>	
13C-Pentachlorophenol	200 13.90	40	

U Indicates that this compound was not detected above the LOR.

# ALS Environmental

## Sample Analysis Report

**Sample Name** 18-D6-FC-CH-207  
 ALS Sample ID L2222986-49  
 Analysis Method SIM GC/MS  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 5.03 g  
 Percent Moisture 40.6%  
 Split Ratio 1

Sampling Date 16-Oct-18  
 Extraction Date 21-Mar-19

Approved:  
*Andrew Reid*  
 --e-signature--  
 29-Mar-2019

**Run Information** **Run 1**  
 Filename 19032831.D  
 Run Date 3/28/2019 18:40  
 Final Volume 1 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USN127357H

Target Analytes	Ret. Time	Concentration ng/g	Flags
Pentachlorophenol	13.89	<2	U
<b>Extraction Standards</b>		<b>% Rec</b>	
13C-Pentachlorophenol	200	13.89	42

U Indicates that this compound was not detected above the LOR.

# ALS Environmental

## Sample Analysis Report

**Sample Name** 18-D7-WW-CH-209  
ALS Sample ID L2222986-50  
Analysis Method SIM GC/MS  
Analysis Type sample  
Sample Matrix Plant Tissue  
Sample Size 4.84 g  
Percent Moisture 35.2%  
Split Ratio 1

Sampling Date 5-Jul-18  
Extraction Date 21-Mar-19

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-2019

### Run Information

#### Run 1

Filename 19032832.D  
Run Date 3/28/2019 19:04  
Final Volume 1 mL  
Dilution Factor 1  
Analysis Units n/a  
Instrument MSD-2  
Column HP-5MS US7526352H

Target Analytes	Ret. Time	Concentration n/a	Flags
Pentachlorophenol	13.90	<2.1	U
Extraction Standards		% Rec	
13C-Pentachlorophenol	200 13.90	50	

U Indicates that this compound was not detected above the LOR.

# ALS Environmental

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a
ALS Sample ID	WG3000729-2	Extraction Date	21-Mar-19
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1	n/a	
Percent Moisture	n/a		
Split Ratio	1		

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	19032824.D
Run Date	3/28/2019 15:53
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS US7526352H

Target Analytes	ug spiked	Ret. Time	% Recovery	Flags
Pentachlorophenol	200	13.89	110	R
<b>Extraction Standards</b>			<b>% Rec</b>	
13C-Pentachlorophenol	200	13.89	53	

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.





1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

<b>ALS Project Contact:</b> Lynne Wrona	<b>Client Name:</b> Stantec Consulting Limited
<b>ALS Project ID:</b> 14789	<b>Client Address:</b> 70 Southgate Dr, Suite 1
<b>ALS WO#:</b> L2222986	Guelph, ON, N1G 4P5
<b>Date of Report:</b> 29-Mar-19	Canada
<b>Date of Sample Receipt:</b> 15-Jan-19	<b>Client Contact:</b> Katherine Ketis
	<b>Client Project ID:</b> 122160003

**COMMENTS:** PCDD/F by EPA 1613B via Isotope Dilution

Certified by:

A handwritten signature in black ink, appearing to read "R. McLeod", is written over a horizontal line.

Ron McLeod, PhD, C.Chem.  
Director, Air Toxics & Special Chemistries, Life Sciences

Results in this certificate relate only to the samples as submitted to the laboratory.

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# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-W2-SS-CH-001	Duplicate	18-W4-SS-CH-007	18-N2-SS-CH-013	18-N4-SS-CH-023	18-N5-SS-CH-029
ALS Sample ID	L2222986-1	WG2991214-4	L2222986-4	L2222986-7	L2222986-11	L2222986-14
Sample Size	18.27	18.09	15.39	15.46	18.01	16.01
Sample size units	g	g	g	g	g	g
Percent Moisture	10.17%	9.91%	23.10%	23.98%	10.97%	20.78%
Sample Matrix	Soil	QC	Soil	Soil	Soil	Soil
Sampling Date	5-Jul-18	n/a	16-Oct-18	17-Oct-18	5-Jul-18	17-Oct-18
Extraction Date	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	0.289	0.310	0.560	0.322	0.197	0.204
1,2,3,7,8-PeCDD	0.327	0.316	0.361	0.251	0.224	0.233
1,2,3,4,7,8-HxCDD	0.278	<0.27	0.368	0.245	<0.19	0.353
1,2,3,6,7,8-HxCDD	0.493	0.568	1.41	0.485	0.456	0.836
1,2,3,7,8,9-HxCDD	0.517	0.663	0.979	0.499	0.422	0.672
1,2,3,4,6,7,8-HpCDD	7.20	7.56	24.5	5.76	5.46	15.8
OCDD	42.7	44.1	116	32.7	31.9	151
2,3,7,8-TCDF	0.364	0.369	<0.51	<0.34	0.345	<0.062
1,2,3,7,8-PeCDF	<0.25	0.297	0.373	0.314	0.256	0.300
2,3,4,7,8-PeCDF	0.662	0.686	0.686	0.582	0.488	<0.43
1,2,3,4,7,8-HxCDF	0.431	0.454	0.593	0.437	0.372	1.01
1,2,3,6,7,8-HxCDF	0.401	0.420	0.543	0.360	0.319	0.632
2,3,4,6,7,8-HxCDF	0.526	0.572	0.736	<0.39	0.396	0.693
1,2,3,7,8,9-HxCDF	0.158	0.169	0.204	0.152	0.131	<0.18
1,2,3,4,6,7,8-HpCDF	2.23	2.43	7.62	1.91	1.70	8.92
1,2,3,4,7,8,9-HpCDF	0.244	<0.23	0.497	0.164	<0.14	0.544
OCDF	3.64	4.23	16.6	2.80	2.46	21.8
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	90	64	72	84	85	85
13C12-1,2,3,7,8-PeCDD	80	58	69	79	78	78
13C12-1,2,3,4,7,8-HxCDD	86	70	77	87	88	87
13C12-1,2,3,6,7,8-HxCDD	87	65	73	85	84	90
13C12-1,2,3,4,6,7,8-HpCDD	94	72	83	89	94	100
13C12-OCDD	80	59	70	71	84	92
13C12-2,3,7,8-TCDF	91	65	72	86	77	79
13C12-1,2,3,7,8-PeCDF	86	61	71	83	80	81
13C12-2,3,4,7,8-PeCDF	85	63	73	85	81	82
13C12-1,2,3,4,7,8-HxCDF	96	75	81	96	90	94
13C12-1,2,3,6,7,8-HxCDF	90	76	79	90	90	94
13C12-2,3,4,6,7,8-HxCDF	95	76	83	95	93	95
13C12-1,2,3,7,8,9-HxCDF	111	87	93	104	101	104
13C12-1,2,3,4,6,7,8-HpCDF	98	77	84	94	94	99
13C12-1,2,3,4,7,8,9-HpCDF	108	83	93	102	103	107
<b>Cleanup Standard</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	88	63	75	80	80	73
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	1.41	2.03	3.35	2.72	1.46	1.18
Total-PeCDD	3.55	3.75	3.93	3.98	2.74	4.14
Total-HxCDD	6.80	7.37	11.2	7.55	6.73	9.51
Total-HpCDD	13.4	14.2	39.4	11.5	10.7	32.4
Total-TCDF	7.47	8.15	10.3	9.00	8.71	5.14
Total-PeCDF	8.29	8.67	8.80	7.35	6.86	6.13
Total-HxCDF	5.38	5.88	9.55	4.35	4.23	8.19
Total-HpCDF	3.81	3.87	17.3	3.18	2.46	14.8
<b>Toxic Equivalency - (WHO 2005)</b>						
Lower Bound PCDD/F TEQ (WHO 2005)	1.24	1.28	1.99	1.06	0.901	1.17
Mid Point PCDD/F TEQ (WHO 2005)	1.25	1.31	2.04	1.14	0.921	1.32
Upper Bound PCDD/F TEQ (WHO 2005)	1.25	1.31	2.04	1.14	0.921	1.32

# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-E1-SS-CH-037	18-E2-SS-CH-043	18-E5-SS-CH-053	18-E6-SS-CH-059	18-S1-SS-CH-063	18-S2-SS-CH-073
ALS Sample ID	L2222986-17	L2222986-20	L2222986-24	L2222986-27	L2222986-29	L2222986-33
Sample Size	15.94	15.86	16.70	15.78	16.46	15.76
Sample size units	g	g	g	g	g	g
Percent Moisture	20.44%	22.65%	18.55%	22.00%	19.60%	22.06%
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Sampling Date	16-Oct-18	26-Sep-18	16-Oct-18	17-Oct-18	25-Sep-18	25-Sep-18
Extraction Date	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	0.260	0.188	<0.12	0.296	0.388	0.550
1,2,3,7,8-PeCDD	0.230	0.200	0.169	0.362	0.245	<0.24
1,2,3,4,7,8-HxCDD	0.253	0.190	0.180	0.459	0.192	0.217
1,2,3,6,7,8-HxCDD	0.381	0.392	0.380	0.821	0.393	0.449
1,2,3,7,8,9-HxCDD	0.411	0.449	0.372	0.879	0.410	0.401
1,2,3,4,6,7,8-HpCDD	6.04	6.03	5.14	14.6	6.92	5.02
OCDD	43.6	38.4	30.6	125	44.5	32.8
2,3,7,8-TCDF	<0.31	<0.33	<0.21	0.390	<0.25	<0.021
1,2,3,7,8-PeCDF	0.309	0.198	0.193	0.431	<0.19	0.242
2,3,4,7,8-PeCDF	0.425	<0.37	0.313	0.564	0.399	0.456
1,2,3,4,7,8-HxCDF	0.574	0.336	0.373	1.01	0.346	0.362
1,2,3,6,7,8-HxCDF	0.363	<0.22	0.269	0.723	<0.25	0.307
2,3,4,6,7,8-HxCDF	0.367	0.342	0.311	0.689	0.359	0.370
1,2,3,7,8,9-HxCDF	0.130	<0.079	0.107	0.221	0.0991	<0.11
1,2,3,4,6,7,8-HpCDF	3.17	1.59	1.71	5.72	1.57	1.70
1,2,3,4,7,8,9-HpCDF	<0.15	<0.13	0.109	<0.40	<0.13	0.142
OCDF	4.51	2.02	2.33	12.4	2.67	2.25
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	78	74	85	84	85	81
13C12-1,2,3,7,8-PeCDD	74	68	79	77	77	71
13C12-1,2,3,4,7,8-HxCDD	80	76	100	80	86	92
13C12-1,2,3,6,7,8-HxCDD	84	75	89	86	84	82
13C12-1,2,3,4,6,7,8-HpCDD	92	82	98	87	89	88
13C12-OCDD	81	71	84	73	74	76
13C12-2,3,7,8-TCDF	69	68	76	77	78	73
13C12-1,2,3,7,8-PeCDF	79	71	80	79	76	74
13C12-2,3,4,7,8-PeCDF	77	69	81	79	78	73
13C12-1,2,3,4,7,8-HxCDF	85	80	104	91	90	95
13C12-1,2,3,6,7,8-HxCDF	89	79	101	85	91	91
13C12-2,3,4,6,7,8-HxCDF	86	78	100	88	89	91
13C12-1,2,3,7,8,9-HxCDF	94	86	109	95	96	97
13C12-1,2,3,4,6,7,8-HpCDF	91	81	101	88	87	92
13C12-1,2,3,4,7,8,9-HpCDF	97	86	104	93	93	94
<b>Cleanup Standard</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	70	67	78	75	77	75
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	1.55	1.57	1.20	2.97	2.35	3.12
Total-PeCDD	2.16	3.28	2.30	6.11	4.29	3.81
Total-HxCDD	6.79	4.45	3.93	13.5	6.53	6.49
Total-HpCDD	12.1	11.5	9.91	30.1	12.6	10.3
Total-TCDF	5.99	3.60	4.51	7.54	5.94	7.19
Total-PeCDF	5.36	4.92	3.84	7.42	4.65	5.49
Total-HxCDF	4.04	2.84	3.11	7.78	3.38	3.88
Total-HpCDF	4.21	2.18	2.54	8.89	2.80	2.60
<b>Toxic Equivalency - (WHO 2005)</b>						
Lower Bound PCDD/F TEQ (WHO 2005)	0.981	0.653	0.547	1.60	1.03	0.984
Mid Point PCDD/F TEQ (WHO 2005)	1.01	0.828	0.688	1.61	1.09	1.24
Upper Bound PCDD/F TEQ (WHO 2005)	1.01	0.828	0.688	1.61	1.09	1.24

# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-S4-SS-CH-087	18-S7-SS-CH-079	18-D1-SS-CH-200	18-D2-SS-CH-201
ALS Sample ID	L2222986-36	L2222986-40	L2222986-43	L2222986-44
Sample Size	15.11	14.91	18.04	16.61
Sample size units	g	g	g	g
Percent Moisture	25.40%	26.29%	10.03%	18.19%
Sample Matrix	Soil	Soil	Soil	Soil
Sampling Date	26-Sep-18	17-Oct-18	5-Jul-18	25-Sep-18
Extraction Date	7-Mar-19	7-Mar-19	7-Mar-19	7-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.25	0.263	0.198	0.305
1,2,3,7,8-PeCDD	0.417	<0.21	0.212	0.179
1,2,3,4,7,8-HxCDD	0.258	0.228	0.210	0.121
1,2,3,6,7,8-HxCDD	0.711	0.492	0.388	0.361
1,2,3,7,8,9-HxCDD	0.678	0.512	0.411	0.341
1,2,3,4,6,7,8-HpCDD	11.8	7.02	5.15	5.64
OCDD	65.2	49.6	31.9	35.0
2,3,7,8-TCDF	0.511	0.392	0.377	0.261
1,2,3,7,8-PeCDF	0.330	0.268	<0.23	0.230
2,3,4,7,8-PeCDF	0.643	0.445	0.538	0.332
1,2,3,4,7,8-HxCDF	0.474	0.453	0.387	0.301
1,2,3,6,7,8-HxCDF	0.381	0.362	0.311	0.235
2,3,4,6,7,8-HxCDF	0.538	<0.40	0.385	0.320
1,2,3,7,8,9-HxCDF	0.130	<0.12	0.106	<0.071
1,2,3,4,6,7,8-HpCDF	2.71	2.43	1.79	1.38
1,2,3,4,7,8,9-HpCDF	<0.22	<0.21	<0.14	0.138
OCDF	6.18	4.71	2.52	2.11
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	64	73	76	80
13C12-1,2,3,7,8-PeCDD	69	76	77	69
13C12-1,2,3,4,7,8-HxCDD	89	93	80	88
13C12-1,2,3,6,7,8-HxCDD	81	78	84	78
13C12-1,2,3,4,6,7,8-HpCDD	90	87	88	85
13C12-OCDD	77	71	72	69
13C12-2,3,7,8-TCDF	54	65	67	73
13C12-1,2,3,7,8-PeCDF	70	75	78	70
13C12-2,3,4,7,8-PeCDF	70	77	78	70
13C12-1,2,3,4,7,8-HxCDF	89	99	88	88
13C12-1,2,3,6,7,8-HxCDF	88	92	81	87
13C12-2,3,4,6,7,8-HxCDF	89	90	85	85
13C12-1,2,3,7,8,9-HxCDF	101	97	97	95
13C12-1,2,3,4,6,7,8-HpCDF	91	86	84	84
13C12-1,2,3,4,7,8,9-HpCDF	96	93	93	90
<b>Cleanup Standard</b>				
37Cl4-2,3,7,8-TCDD (Cleanup)	57	69	72	76
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	1.36	1.09	0.955	1.69
Total-PeCDD	4.45	3.33	2.71	3.54
Total-HxCDD	9.92	7.57	5.07	5.08
Total-HpCDD	20.0	14.6	9.92	10.1
Total-TCDF	11.7	5.38	9.52	5.97
Total-PeCDF	7.42	5.41	6.63	4.75
Total-HxCDF	5.60	3.64	4.04	2.43
Total-HpCDF	5.26	3.82	2.77	2.44
<b>Toxic Equivalency - (WHO 2005)</b>				
Lower Bound PCDD/F TEQ (WHO 2005)	1.15	0.759	0.909	0.867
Mid Point PCDD/F TEQ (WHO 2005)	1.41	1.02	0.917	0.874
Upper Bound PCDD/F TEQ (WHO 2005)	1.41	1.02	0.917	0.874

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2991214-1	WG2991214-2
Sample Size	16.00	1
Sample size units	g	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	7-Mar-19	7-Mar-19
<b>Target Analytes</b>		
	<b>pg/g</b>	<b>% Rec</b>
2,3,7,8-TCDD	<0.011	107
1,2,3,7,8-PeCDD	0.0473	120
1,2,3,4,7,8-HxCDD	0.0702	109
1,2,3,6,7,8-HxCDD	0.0776	118
1,2,3,7,8,9-HxCDD	<0.12	120
1,2,3,4,6,7,8-HpCDD	0.183	110
OCDD	0.557	114
2,3,7,8-TCDF	0.00889	109
1,2,3,7,8-PeCDF	0.0561	116
2,3,4,7,8-PeCDF	0.0342	106
1,2,3,4,7,8-HxCDF	0.0614	109
1,2,3,6,7,8-HxCDF	0.0575	109
2,3,4,6,7,8-HxCDF	0.0695	108
1,2,3,7,8,9-HxCDF	0.110	115
1,2,3,4,6,7,8-HpCDF	<0.13	108
1,2,3,4,7,8,9-HpCDF	0.106	111
OCDF	0.501	138
<b>Extraction Standards</b>		
	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	71	79
13C12-1,2,3,7,8-PeCDD	74	74
13C12-1,2,3,4,7,8-HxCDD	80	86
13C12-1,2,3,6,7,8-HxCDD	74	74
13C12-1,2,3,4,6,7,8-HpCDD	90	86
13C12-OCDD	75	71
13C12-2,3,7,8-TCDF	70	79
13C12-1,2,3,7,8-PeCDF	78	78
13C12-2,3,4,7,8-PeCDF	80	78
13C12-1,2,3,4,7,8-HxCDF	83	87
13C12-1,2,3,6,7,8-HxCDF	84	85
13C12-2,3,4,6,7,8-HxCDF	86	87
13C12-1,2,3,7,8,9-HxCDF	95	95
13C12-1,2,3,4,6,7,8-HpCDF	90	87
13C12-1,2,3,4,7,8,9-HpCDF	101	99
<b>Cleanup Standard</b>		
37Cl4-2,3,7,8-TCDD (Cleanup)	69	83
<b>Homologue Group Totals</b>		
	<b>pg/g</b>	
Total-TCDD	<0.011	
Total-PeCDD	0.0712	
Total-HxCDD	0.176	
Total-HpCDD	0.183	
Total-TCDF	0.0225	
Total-PeCDF	0.0903	
Total-HxCDF	0.298	
Total-HpCDF	0.106	
<b>Toxic Equivalency - (WHO 2005)</b>		
Lower Bound PCDD/F TEQ (WHO 2005)	0.108	
Mid Point PCDD/F TEQ (WHO 2005)	0.127	
Upper Bound PCDD/F TEQ (WHO 2005)	0.132	

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W2-SS-CH-001  
 ALS Sample ID L2222986-1  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 5-Jul-18  
 Extraction Date 7-Mar-19  
 Sample Size 18.27 g  
 Percent Moisture 10.2%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190316A20  
 Run Date 17-Mar-19 04:56  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.95	0.289	0.014	J		0.55
1,2,3,7,8-PeCDD	1	32.06	0.327	0.0094	J,B		2.7
1,2,3,4,7,8-HxCDD	0.1	34.13	0.278	0.011	J,B		2.7
1,2,3,6,7,8-HxCDD	0.1	34.18	0.493	0.011	J,B		2.7
1,2,3,7,8,9-HxCDD	0.1	34.31	0.517	0.011	M,J		2.7
1,2,3,4,6,7,8-HpCDD	0.01	35.79	7.20	0.015			2.7
OCDD	0.0003	37.30	42.7	0.028			5.5
2,3,7,8-TCDF	0.1	27.01	0.364	0.011	M,J		0.55
1,2,3,7,8-PeCDF	0.03	31.13	<0.25	0.013	M,J,R	0.25	2.7
2,3,4,7,8-PeCDF	0.3	31.84	0.662	0.011	J		2.7
1,2,3,4,7,8-HxCDF	0.1	33.64	0.431	0.0080	J,B		2.7
1,2,3,6,7,8-HxCDF	0.1	33.70	0.401	0.0076	J,B		2.7
2,3,4,6,7,8-HxCDF	0.1	34.02	0.526	0.0074	J,B		2.7
1,2,3,7,8,9-HxCDF	0.1	34.45	0.158	0.0084	J,B		2.7
1,2,3,4,6,7,8-HpCDF	0.01	35.24	2.23	0.010	J		2.7
1,2,3,4,7,8,9-HpCDF	0.01	36.04	0.244	0.012	J,B		2.7
OCDF	0.0003	37.38	3.64	0.012	J,B		5.5

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.93	90 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	80 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.11	86 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.17	87 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.78	94 23-140
13C12-OCDD	4000	37.29	80 17-157
13C12-2,3,7,8-TCDF	2000	27.00	91 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	86 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	85 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	96 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.69	90 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.02	95 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.43	111 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.22	98 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.03	108 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.95	88 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	9.00	1.41	0.014	0.55
Total-PeCDD	8.00	3.55	0.0094	2.7
Total-HxCDD	7.00	6.80	0.011	2.7
Total-HpCDD	2.00	13.4	0.015	2.7
Total-TCDF	17.00	7.47	0.011	0.55
Total-PeCDF	12.00	8.29	0.013	2.7
Total-HxCDF	10.00	5.38	0.0084	2.7
Total-HpCDF	4.00	3.81	0.012	2.7

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	1.24
Mid Point PCDD/F TEQ (WHO 2005)	1.25
Upper Bound PCDD/F TEQ (WHO 2005)	1.25

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

<b>Sample Name</b>	<b>Duplicate</b>	<b>Sampling Date</b>	n/a	
ALS Sample ID	WG2991214-4	Extraction Date	7-Mar-19	
Analysis Method	EPA 1613B	Sample Size	18.09	g
Analysis Type	Sample	Percent Moisture	9.9%	
Sample Matrix	QC	Split Ratio	1	

Approved:  
*E. Sabljic*  
--e-signature--  
22-Mar-2019

<b>Run Information</b>		<b>Run 1</b>	
Filename	5-190316A21		
Run Date	17-Mar-19 05:38		
Final Volume	20	uL	
Dilution Factor	1		
Analysis Units	pg/g		
Instrument - Column	HRMS5 DB5MSUSR8262264		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.96	0.310	0.016	J		0.55
1,2,3,7,8-PeCDD	1	32.07	0.316	0.0088	J,B		2.8
1,2,3,4,7,8-HxCDD	0.1	34.13	<0.27	0.020	J,R	0.27	2.8
1,2,3,6,7,8-HxCDD	0.1	34.18	0.568	0.021	J,B		2.8
1,2,3,7,8,9-HxCDD	0.1	34.31	0.663	0.020	M,J		2.8
1,2,3,4,6,7,8-HpCDD	0.01	35.80	7.56	0.018			2.8
OCDD	0.0003	37.30	44.1	0.029			5.5
2,3,7,8-TCDF	0.1	27.01	0.369	0.017	M,J		0.55
1,2,3,7,8-PeCDF	0.03	31.13	0.297	0.018	M,J,B		2.8
2,3,4,7,8-PeCDF	0.3	31.86	0.686	0.015	J		2.8
1,2,3,4,7,8-HxCDF	0.1	33.64	0.454	0.021	J,B		2.8
1,2,3,6,7,8-HxCDF	0.1	33.71	0.420	0.021	J,B		2.8
2,3,4,6,7,8-HxCDF	0.1	34.03	0.572	0.022	J,B		2.8
1,2,3,7,8,9-HxCDF	0.1	34.46	0.169	0.024	J,B		2.8
1,2,3,4,6,7,8-HpCDF	0.01	35.24	2.43	0.0092	J		2.8
1,2,3,4,7,8,9-HpCDF	0.01	36.04	<0.23	0.012	J,R	0.23	2.8
OCDF	0.0003	37.39	4.23	0.032	J,B		5.5
<b>Extraction Standards</b>	<b>pg</b>	<b>% Rec</b>	<b>Limits</b>				
13C12-2,3,7,8-TCDD	2000	27.93	64	25-164			
13C12-1,2,3,7,8-PeCDD	2000	32.06	58	25-181			
13C12-1,2,3,4,7,8-HxCDD	2000	34.13	70	32-141			
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	65	28-130			
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	72	23-140			
13C12-OCDD	4000	37.30	59	17-157			
13C12-2,3,7,8-TCDF	2000	27.00	65	24-169			
13C12-1,2,3,7,8-PeCDF	2000	31.12	61	24-185			
13C12-2,3,4,7,8-PeCDF	2000	31.84	63	21-178			
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	75	26-152			
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	76	26-123			
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	76	29-147			
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	87	28-136			
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	77	28-143			
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	83	26-138			
<b>Cleanup Standard</b>	<b>pg</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.96	63	35-197			
<b>Homologue Group Totals</b>	<b># peaks</b>	<b>Conc.</b>	<b>EDL</b>				
		<b>pg/g</b>	<b>pg/g</b>				
Total-TCDD	11.00	2.03	0.016	0.55			
Total-PeCDD	8.00	3.75	0.0088	2.8			
Total-HxCDD	6.00	7.37	0.021	2.8			
Total-HpCDD	2.00	14.2	0.018	2.8			
Total-TCDF	20.00	8.15	0.017	0.55			
Total-PeCDF	12.00	8.67	0.018	2.8			
Total-HxCDF	11.00	5.88	0.024	2.8			
Total-HpCDF	3.00	3.87	0.012	2.8			

<b>Toxic Equivalency - (WHO 2005)</b>	<b>pg/g</b>
<b>Lower Bound PCDD/F TEQ (WHO 2005)</b>	1.28
<b>Mid Point PCDD/F TEQ (WHO 2005)</b>	1.31
<b>Upper Bound PCDD/F TEQ (WHO 2005)</b>	1.31

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
M	Indicates that a peak has been manually integrated.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W4-SS-CH-007  
 ALS Sample ID L2222986-4  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 16-Oct-18  
 Extraction Date 7-Mar-19  
 Sample Size 15.39 g  
 Percent Moisture 23.1%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190316A22  
 Run Date 17-Mar-19 06:20  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.96	0.560	0.019	J	0.65	
1,2,3,7,8-PeCDD	1	32.07	0.361	0.012	J,B	3.2	
1,2,3,4,7,8-HxCDD	0.1	34.14	0.368	0.026	J,B	3.2	
1,2,3,6,7,8-HxCDD	0.1	34.19	1.41	0.028	J	3.2	
1,2,3,7,8,9-HxCDD	0.1	34.31	0.979	0.027	M,J	3.2	
1,2,3,4,6,7,8-HpCDD	0.01	35.80	24.5	0.026		3.2	
OCDD	0.0003	37.30	116	0.037		6.5	
2,3,7,8-TCDF	0.1	27.01	<0.51	0.025	M,J,R	0.51	0.65
1,2,3,7,8-PeCDF	0.03	31.13	0.373	0.029	M,J,B	3.2	
2,3,4,7,8-PeCDF	0.3	31.86	0.686	0.024	M,J	3.2	
1,2,3,4,7,8-HxCDF	0.1	33.64	0.593	0.016	J,B	3.2	
1,2,3,6,7,8-HxCDF	0.1	33.71	0.543	0.014	J,B	3.2	
2,3,4,6,7,8-HxCDF	0.1	34.03	0.736	0.015	J	3.2	
1,2,3,7,8,9-HxCDF	0.1	34.46	0.204	0.017	J,B	3.2	
1,2,3,4,6,7,8-HpCDF	0.01	35.24	7.62	0.017		3.2	
1,2,3,4,7,8,9-HpCDF	0.01	36.04	0.497	0.021	J,B	3.2	
OCDF	0.0003	37.39	16.6	0.017		6.5	

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.93	72 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.06	69 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.13	77 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	73 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	83 23-140
13C12-OCDD	4000	37.30	70 17-157
13C12-2,3,7,8-TCDF	2000	27.01	72 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.12	71 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.84	73 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	81 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	79 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	83 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	93 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	84 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	93 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	40	27.96	75 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	12.00	3.35	0.019	0.65
Total-PeCDD	7.00	3.93	0.012	3.2
Total-HxCDD	8.00	11.2	0.028	3.2
Total-HpCDD	2.00	39.4	0.026	3.2
Total-TCDF	17.00	10.3	0.025	0.65
Total-PeCDF	15.00	8.80	0.029	3.2
Total-HxCDF	10.00	9.55	0.017	3.2
Total-HpCDF	4.00	17.3	0.021	3.2

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	1.99
Mid Point PCDD/F TEQ (WHO 2005)	2.04
Upper Bound PCDD/F TEQ (WHO 2005)	2.04

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N2-SS-CH-013  
 ALS Sample ID L2222986-7  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 17-Oct-18  
 Extraction Date 7-Mar-19  
 Sample Size 15.46 g  
 Percent Moisture 24.0%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190316A23  
 Run Date 17-Mar-19 07:01  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.96	0.322	0.015	J	0.65	
1,2,3,7,8-PeCDD	1	32.07	0.251	0.013	J,B	3.2	
1,2,3,4,7,8-HxCDD	0.1	34.13	0.245	0.023	J,B	3.2	
1,2,3,6,7,8-HxCDD	0.1	34.18	0.485	0.024	J,B	3.2	
1,2,3,7,8,9-HxCDD	0.1	34.31	0.499	0.023	M,J	3.2	
1,2,3,4,6,7,8-HpCDD	0.01	35.80	5.76	0.022		3.2	
OCDD	0.0003	37.31	32.7	0.025		6.5	
2,3,7,8-TCDF	0.1	27.04	<0.34	0.017	M,J,R	0.34	0.65
1,2,3,7,8-PeCDF	0.03	31.13	0.314	0.027	M,J,B	3.2	
2,3,4,7,8-PeCDF	0.3	31.86	0.582	0.022	J	3.2	
1,2,3,4,7,8-HxCDF	0.1	33.64	0.437	0.0069	J,B	3.2	
1,2,3,6,7,8-HxCDF	0.1	33.71	0.360	0.0065	J,B	3.2	
2,3,4,6,7,8-HxCDF	0.1	34.03	<0.39	0.0064	J,R	0.39	3.2
1,2,3,7,8,9-HxCDF	0.1	34.46	0.152	0.0077	J,B	3.2	
1,2,3,4,6,7,8-HpCDF	0.01	35.25	1.91	0.012	J	3.2	
1,2,3,4,7,8,9-HpCDF	0.01	36.04	0.164	0.014	J,B	3.2	
OCDF	0.0003	37.40	2.80	0.016	J,B	6.5	

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.93	84 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.06	79 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.13	87 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	89 23-140
13C12-OCDD	4000	37.30	71 17-157
13C12-2,3,7,8-TCDF	2000	27.01	86 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.12	83 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.84	85 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	96 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	90 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	95 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	104 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	94 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	102 26-138

Cleanup Standard	pg		
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.96	80 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	11.00	2.72	0.015	0.65
Total-PeCDD	9.00	3.98	0.013	3.2
Total-HxCDD	7.00	7.55	0.024	3.2
Total-HpCDD	2.00	11.5	0.022	3.2
Total-TCDF	17.00	9.00	0.017	0.65
Total-PeCDF	15.00	7.35	0.027	3.2
Total-HxCDF	9.00	4.35	0.0077	3.2
Total-HpCDF	4.00	3.18	0.014	3.2

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	1.06
Mid Point PCDD/F TEQ (WHO 2005)	1.14
Upper Bound PCDD/F TEQ (WHO 2005)	1.14

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-SS-CH-023  
 ALS Sample ID L2222986-11  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 5-Jul-18  
 Extraction Date 7-Mar-19  
 Sample Size 18.01 g  
 Percent Moisture 11.0%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C04  
 Run Date 19-Mar-19 20:40  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.95	0.197	0.026	J		0.56
1,2,3,7,8-PeCDD	1	32.06	0.224	0.0096	J,B		2.8
1,2,3,4,7,8-HxCDD	0.1	34.13	<0.19	0.014	M,J,R	0.19	2.8
1,2,3,6,7,8-HxCDD	0.1	34.18	0.456	0.015	J,B		2.8
1,2,3,7,8,9-HxCDD	0.1	34.30	0.422	0.015	M,J		2.8
1,2,3,4,6,7,8-HpCDD	0.01	35.80	5.46	0.020			2.8
OCDD	0.0003	37.30	31.9	0.018			5.6
2,3,7,8-TCDF	0.1	26.99	0.345	0.021	M,J		0.56
1,2,3,7,8-PeCDF	0.03	31.12	0.256	0.012	M,J,B		2.8
2,3,4,7,8-PeCDF	0.3	31.84	0.488	0.010	J		2.8
1,2,3,4,7,8-HxCDF	0.1	33.64	0.372	0.0084	J,B		2.8
1,2,3,6,7,8-HxCDF	0.1	33.71	0.319	0.0083	J,B		2.8
2,3,4,6,7,8-HxCDF	0.1	34.03	0.396	0.0083	J,B		2.8
1,2,3,7,8,9-HxCDF	0.1	34.46	0.131	0.0096	J,B		2.8
1,2,3,4,6,7,8-HpCDF	0.01	35.24	1.70	0.0079	J		2.8
1,2,3,4,7,8,9-HpCDF	0.01	36.05	<0.14	0.0098	J,R	0.14	2.8
OCDF	0.0003	37.39	2.46	0.019	J,B		5.6

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.92	85 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	78 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	88 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	84 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	94 23-140
13C12-OCDD	4000	37.30	84 17-157
13C12-2,3,7,8-TCDF	2000	26.99	77 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	80 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	81 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	90 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	90 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	93 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	101 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	94 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	103 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.95	80 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	7.00	1.46	0.026	0.56
Total-PeCDD	7.00	2.74	0.0096	2.8
Total-HxCDD	6.00	6.73	0.015	2.8
Total-HpCDD	2.00	10.7	0.020	2.8
Total-TCDF	22.00	8.71	0.021	0.56
Total-PeCDF	18.00	6.86	0.012	2.8
Total-HxCDF	12.00	4.23	0.0096	2.8
Total-HpCDF	2.00	2.46	0.0098	2.8

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.901
Mid Point PCDD/F TEQ (WHO 2005)	0.921
Upper Bound PCDD/F TEQ (WHO 2005)	0.921

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N5-SS-CH-029  
 ALS Sample ID L2222986-14  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 17-Oct-18  
 Extraction Date 7-Mar-19  
 Sample Size 16.01 g  
 Percent Moisture 20.8%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C05  
 Run Date 19-Mar-19 21:22  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.99	0.204	0.074	J		0.63
1,2,3,7,8-PeCDD	1	32.09	0.233	0.037	M,J,B		3.1
1,2,3,4,7,8-HxCDD	0.1	34.14	0.353	0.046	J,B		3.1
1,2,3,6,7,8-HxCDD	0.1	34.20	0.836	0.047	J		3.1
1,2,3,7,8,9-HxCDD	0.1	34.33	0.672	0.047	J		3.1
1,2,3,4,6,7,8-HpCDD	0.01	35.81	15.8	0.061			3.1
OCDD	0.0003	37.31	151	0.086			6.2
2,3,7,8-TCDF	0.1	NotFnd	<0.062	0.062	U		0.63
1,2,3,7,8-PeCDF	0.03	31.14	0.300	0.049	J,B		3.1
2,3,4,7,8-PeCDF	0.3	31.87	<0.43	0.040	J,R	0.43	3.1
1,2,3,4,7,8-HxCDF	0.1	33.65	1.01	0.029	J		3.1
1,2,3,6,7,8-HxCDF	0.1	33.72	0.632	0.027	J		3.1
2,3,4,6,7,8-HxCDF	0.1	34.04	0.693	0.028	J,B		3.1
1,2,3,7,8,9-HxCDF	0.1	34.48	<0.18	0.035	J,R	0.18	3.1
1,2,3,4,6,7,8-HpCDF	0.01	35.25	8.92	0.050			3.1
1,2,3,4,7,8,9-HpCDF	0.01	36.06	0.544	0.062	J,B		3.1
OCDF	0.0003	37.40	21.8	0.065			6.2

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.96	85 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.07	78 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.13	87 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.19	90 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.81	100 23-140
13C12-OCDD	4000	37.31	92 17-157
13C12-2,3,7,8-TCDF	2000	27.04	79 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.13	81 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.86	82 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.64	94 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.71	94 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.04	95 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.45	104 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	99 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.05	107 26-138

Cleanup Standard	pg	Conc.	EDL
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.99	73 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	3.00	1.18	0.074	0.63
Total-PeCDD	8.00	4.14	0.037	3.1
Total-HxCDD	7.00	9.51	0.047	3.1
Total-HpCDD	2.00	32.4	0.061	3.1
Total-TCDF	13.00	5.14	0.062	0.63
Total-PeCDF	10.00	6.13	0.049	3.1
Total-HxCDF	10.00	8.19	0.035	3.1
Total-HpCDF	3.00	14.8	0.062	3.1

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	1.17
Mid Point PCDD/F TEQ (WHO 2005)	1.32
Upper Bound PCDD/F TEQ (WHO 2005)	1.32

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E1-SS-CH-037  
 ALS Sample ID L2222986-17  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 16-Oct-18  
 Extraction Date 7-Mar-19  
 Sample Size 15.94 g  
 Percent Moisture 20.4%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C06  
 Run Date 19-Mar-19 22:04  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.95	0.260	0.043	J		0.63
1,2,3,7,8-PeCDD	1	32.06	0.230	0.024	J,B		3.1
1,2,3,4,7,8-HxCDD	0.1	34.13	0.253	0.030	J,B		3.1
1,2,3,6,7,8-HxCDD	0.1	34.19	0.381	0.031	J,B		3.1
1,2,3,7,8,9-HxCDD	0.1	34.31	0.411	0.030	M,J		3.1
1,2,3,4,6,7,8-HpCDD	0.01	35.80	6.04	0.039			3.1
OCDD	0.0003	37.30	43.6	0.028			6.3
2,3,7,8-TCDF	0.1	27.00	<0.31	0.048	M,J,R	0.31	0.63
1,2,3,7,8-PeCDF	0.03	31.12	0.309	0.020	J,B		3.1
2,3,4,7,8-PeCDF	0.3	31.84	0.425	0.017	J		3.1
1,2,3,4,7,8-HxCDF	0.1	33.64	0.574	0.015	J,B		3.1
1,2,3,6,7,8-HxCDF	0.1	33.71	0.363	0.015	J,B		3.1
2,3,4,6,7,8-HxCDF	0.1	34.04	0.367	0.015	J,B		3.1
1,2,3,7,8,9-HxCDF	0.1	34.46	0.130	0.019	J,B		3.1
1,2,3,4,6,7,8-HpCDF	0.01	35.24	3.17	0.012			3.1
1,2,3,4,7,8,9-HpCDF	0.01	36.05	<0.15	0.015	J,R	0.15	3.1
OCDF	0.0003	37.39	4.51	0.029	J,B		6.3

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.92	78 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	74 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	80 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	84 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	92 23-140
13C12-OCDD	4000	37.30	81 17-157
13C12-2,3,7,8-TCDF	2000	26.99	69 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	79 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	77 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	85 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	89 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	86 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	94 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	91 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	97 26-138

Cleanup Standard	pg		
37C14-2,3,7,8-TCDD (Cleanup)	40	27.95	70 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	6.00	1.55	0.043	0.63
Total-PeCDD	4.00	2.16	0.024	3.1
Total-HxCDD	7.00	6.79	0.031	3.1
Total-HpCDD	2.00	12.1	0.039	3.1
Total-TCDF	14.00	5.99	0.048	0.63
Total-PeCDF	12.00	5.36	0.020	3.1
Total-HxCDF	9.00	4.04	0.019	3.1
Total-HpCDF	2.00	4.21	0.015	3.1

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.981
Mid Point PCDD/F TEQ (WHO 2005)	1.01
Upper Bound PCDD/F TEQ (WHO 2005)	1.01

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E2-SS-CH-043  
 ALS Sample ID L2222986-20  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 26-Sep-18  
 Extraction Date 7-Mar-19  
 Sample Size 15.86 g  
 Percent Moisture 22.7%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C07  
 Run Date 19-Mar-19 22:45  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.93	0.188	0.044	J		0.63
1,2,3,7,8-PeCDD	1	32.05	0.200	0.020	J,B		3.2
1,2,3,4,7,8-HxCDD	0.1	34.12	0.190	0.024	M,J,B		3.2
1,2,3,6,7,8-HxCDD	0.1	34.18	0.392	0.021	J,B		3.2
1,2,3,7,8,9-HxCDD	0.1	34.29	0.449	0.022	M,J		3.2
1,2,3,4,6,7,8-HpCDD	0.01	35.80	6.03	0.038			3.2
OCDD	0.0003	37.30	38.4	0.057			6.3
2,3,7,8-TCDF	0.1	27.00	<0.33	0.046	M,J,R	0.33	0.63
1,2,3,7,8-PeCDF	0.03	31.12	0.198	0.031	J,B		3.2
2,3,4,7,8-PeCDF	0.3	31.84	<0.37	0.028	J,R	0.37	3.2
1,2,3,4,7,8-HxCDF	0.1	33.63	0.336	0.020	J,B		3.2
1,2,3,6,7,8-HxCDF	0.1	33.70	<0.22	0.018	J,R	0.22	3.2
2,3,4,6,7,8-HxCDF	0.1	34.03	0.342	0.019	J,B		3.2
1,2,3,7,8,9-HxCDF	0.1	34.46	<0.079	0.025	J,R	0.079	3.2
1,2,3,4,6,7,8-HpCDF	0.01	35.23	1.59	0.020	J		3.2
1,2,3,4,7,8,9-HpCDF	0.01	36.04	<0.13	0.026	J,R	0.13	3.2
OCDF	0.0003	37.39	2.02	0.031	J,B		6.3

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.92	74 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	68 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.11	76 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.17	75 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	82 23-140
13C12-OCDD	4000	37.29	71 17-157
13C12-2,3,7,8-TCDF	2000	26.99	68 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	71 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	69 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.61	80 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.69	79 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.02	78 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	86 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	81 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.03	86 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	40	27.93	67 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	7.00	1.57	0.044	0.63
Total-PeCDD	10.00	3.28	0.020	3.2
Total-HxCDD	6.00	4.45	0.024	3.2
Total-HpCDD	2.00	11.5	0.038	3.2
Total-TCDF	9.00	3.60	0.046	0.63
Total-PeCDF	15.00	4.92	0.031	3.2
Total-HxCDF	6.00	2.84	0.025	3.2
Total-HpCDF	2.00	2.18	0.026	3.2

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.653
Mid Point PCDD/F TEQ (WHO 2005)	0.828
Upper Bound PCDD/F TEQ (WHO 2005)	0.828

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E5-SS-CH-053  
 ALS Sample ID L2222986-24  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 16-Oct-18  
 Extraction Date 7-Mar-19  
 Sample Size 16.70 g  
 Percent Moisture 18.6%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C08  
 Run Date 19-Mar-19 23:27  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.92	<0.12	0.029	J,R	0.12	0.60
1,2,3,7,8-PeCDD	1	32.06	0.169	0.036	J,B		3.0
1,2,3,4,7,8-HxCDD	0.1	34.12	0.180	0.016	J,B		3.0
1,2,3,6,7,8-HxCDD	0.1	34.18	0.380	0.016	J,B		3.0
1,2,3,7,8,9-HxCDD	0.1	34.30	0.372	0.016	M,J		3.0
1,2,3,4,6,7,8-HpCDD	0.01	35.80	5.14	0.034			3.0
OCDD	0.0003	37.30	30.6	0.030			6.0
2,3,7,8-TCDF	0.1	26.99	<0.21	0.037	M,J,R	0.21	0.60
1,2,3,7,8-PeCDF	0.03	31.12	0.193	0.019	M,J,B		3.0
2,3,4,7,8-PeCDF	0.3	31.84	0.313	0.016	J,B		3.0
1,2,3,4,7,8-HxCDF	0.1	33.64	0.373	0.019	J,B		3.0
1,2,3,6,7,8-HxCDF	0.1	33.70	0.269	0.019	J,B		3.0
2,3,4,6,7,8-HxCDF	0.1	34.03	0.311	0.020	J,B		3.0
1,2,3,7,8,9-HxCDF	0.1	34.47	0.107	0.024	J,B		3.0
1,2,3,4,6,7,8-HpCDF	0.01	35.24	1.71	0.014	J		3.0
1,2,3,4,7,8,9-HpCDF	0.01	36.05	0.109	0.019	J,B		3.0
OCDF	0.0003	37.39	2.33	0.020	J,B		6.0

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.92	85 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	79 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	100 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.17	89 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	98 23-140
13C12-OCDD	4000	37.29	84 17-157
13C12-2,3,7,8-TCDF	2000	26.99	76 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	80 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	81 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	104 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.69	101 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.02	100 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	109 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	101 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	104 26-138

Cleanup Standard	pg	Conc.	EDL
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.93	78 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	7.00	1.20	0.029	0.60
Total-PeCDD	7.00	2.30	0.036	3.0
Total-HxCDD	6.00	3.93	0.016	3.0
Total-HpCDD	2.00	9.91	0.034	3.0
Total-TCDF	13.00	4.51	0.037	0.60
Total-PeCDF	9.00	3.84	0.019	3.0
Total-HxCDF	8.00	3.11	0.024	3.0
Total-HpCDF	4.00	2.54	0.019	3.0

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.547
Mid Point PCDD/F TEQ (WHO 2005)	0.688
Upper Bound PCDD/F TEQ (WHO 2005)	0.688

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E6-SS-CH-059  
**ALS Sample ID** L2222986-27  
**Analysis Method** EPA 1613B  
**Analysis Type** Sample  
**Sample Matrix** Soil

**Sampling Date** 17-Oct-18  
**Extraction Date** 7-Mar-19  
**Sample Size** 15.78 g  
**Percent Moisture** 22.0%  
**Split Ratio** 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
**Filename** 5-190319C09  
**Run Date** 20-Mar-19 00:08  
**Final Volume** 20 uL  
**Dilution Factor** 1  
**Analysis Units** pg/g  
**Instrument - Column** HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.93	0.296	0.033	J		0.63
1,2,3,7,8-PeCDD	1	32.07	0.362	0.017	J,B		3.2
1,2,3,4,7,8-HxCDD	0.1	34.13	0.459	0.035	J,B		3.2
1,2,3,6,7,8-HxCDD	0.1	34.19	0.821	0.037	J		3.2
1,2,3,7,8,9-HxCDD	0.1	34.31	0.879	0.036	M,J		3.2
1,2,3,4,6,7,8-HpCDD	0.01	35.81	14.6	0.041			3.2
OCDD	0.0003	37.31	125	0.046			6.3
2,3,7,8-TCDF	0.1	27.00	0.390	0.038	M,J		0.63
1,2,3,7,8-PeCDF	0.03	31.12	0.431	0.025	M,J,B		3.2
2,3,4,7,8-PeCDF	0.3	31.86	0.564	0.022	J		3.2
1,2,3,4,7,8-HxCDF	0.1	33.64	1.01	0.018	J		3.2
1,2,3,6,7,8-HxCDF	0.1	33.71	0.723	0.017	J		3.2
2,3,4,6,7,8-HxCDF	0.1	34.04	0.689	0.017	J,B		3.2
1,2,3,7,8,9-HxCDF	0.1	34.47	0.221	0.022	J,B		3.2
1,2,3,4,6,7,8-HpCDF	0.01	35.24	5.72	0.026			3.2
1,2,3,4,7,8,9-HpCDF	0.01	36.05	<0.40	0.033	J,R	0.40	3.2
OCDF	0.0003	37.40	12.4	0.038			6.3
<b>Extraction Standards</b>	<b>pg</b>		<b>% Rec</b>	<b>Limits</b>			
13C12-2,3,7,8-TCDD	2000	27.92	84	25-164			
13C12-1,2,3,7,8-PeCDD	2000	32.06	77	25-181			
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	80	32-141			
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	86	28-130			
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	87	23-140			
13C12-OCDD	4000	37.30	73	17-157			
13C12-2,3,7,8-TCDF	2000	26.99	77	24-169			
13C12-1,2,3,7,8-PeCDF	2000	31.11	79	24-185			
13C12-2,3,4,7,8-PeCDF	2000	31.83	79	21-178			
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	91	26-152			
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	85	26-123			
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	88	29-147			
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	95	28-136			
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	88	28-143			
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.05	93	26-138			
<b>Cleanup Standard</b>	<b>pg</b>						
37C14-2,3,7,8-TCDD (Cleanup)	40	27.95	75	35-197			
<b>Homologue Group Totals</b>	<b># peaks</b>		<b>Conc. pg/g</b>	<b>EDL pg/g</b>			
Total-TCDD	9.00		2.97	0.033			0.63
Total-PeCDD	7.00		6.11	0.017			3.2
Total-HxCDD	7.00		13.5	0.037			3.2
Total-HpCDD	2.00		30.1	0.041			3.2
Total-TCDF	18.00		7.54	0.038			0.63
Total-PeCDF	13.00		7.42	0.025			3.2
Total-HxCDF	12.00		7.78	0.022			3.2
Total-HpCDF	3.00		8.89	0.033			3.2

**Toxic Equivalency - (WHO 2005)** **pg/g**  
**Lower Bound PCDD/F TEQ (WHO 2005)** 1.60  
**Mid Point PCDD/F TEQ (WHO 2005)** 1.61  
**Upper Bound PCDD/F TEQ (WHO 2005)** 1.61

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S1-SS-CH-063  
 ALS Sample ID L2222986-29  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 25-Sep-18  
 Extraction Date 7-Mar-19  
 Sample Size 16.46 g  
 Percent Moisture 19.6%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C10  
 Run Date 20-Mar-19 00:50  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.93	0.388	0.031	J		0.61
1,2,3,7,8-PeCDD	1	32.06	0.245	0.017	M,J,B		3.0
1,2,3,4,7,8-HxCDD	0.1	34.13	0.192	0.018	J,B		3.0
1,2,3,6,7,8-HxCDD	0.1	34.19	0.393	0.019	J,B		3.0
1,2,3,7,8,9-HxCDD	0.1	34.30	0.410	0.018	M,J		3.0
1,2,3,4,6,7,8-HpCDD	0.01	35.80	6.92	0.029			3.0
OCDD	0.0003	37.30	44.5	0.032			6.1
2,3,7,8-TCDF	0.1	26.96	<0.25	0.037	M,J,R	0.25	0.61
1,2,3,7,8-PeCDF	0.03	31.12	<0.19	0.015	M,J,R	0.19	3.0
2,3,4,7,8-PeCDF	0.3	31.84	0.399	0.012	J		3.0
1,2,3,4,7,8-HxCDF	0.1	33.64	0.346	0.012	J,B		3.0
1,2,3,6,7,8-HxCDF	0.1	33.71	<0.25	0.012	J,R	0.25	3.0
2,3,4,6,7,8-HxCDF	0.1	34.03	0.359	0.012	J,B		3.0
1,2,3,7,8,9-HxCDF	0.1	34.47	0.0991	0.015	M,J,B		3.0
1,2,3,4,6,7,8-HpCDF	0.01	35.24	1.57	0.012	J		3.0
1,2,3,4,7,8,9-HpCDF	0.01	36.05	<0.13	0.016	J,R	0.13	3.0
OCDF	0.0003	37.39	2.67	0.021	J,B		6.1

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.92	85 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	77 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	86 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	84 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	89 23-140
13C12-OCDD	4000	37.30	74 17-157
13C12-2,3,7,8-TCDF	2000	26.99	78 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	76 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	78 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	90 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	91 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	89 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	96 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	87 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	93 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	40	27.95	77 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	9.00	2.35	0.031	0.61
Total-PeCDD	8.00	4.29	0.017	3.0
Total-HxCDD	8.00	6.53	0.019	3.0
Total-HpCDD	2.00	12.6	0.029	3.0
Total-TCDF	14.00	5.94	0.037	0.61
Total-PeCDF	11.00	4.65	0.015	3.0
Total-HxCDF	10.00	3.38	0.015	3.0
Total-HpCDF	3.00	2.80	0.016	3.0

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	1.03
Mid Point PCDD/F TEQ (WHO 2005)	1.09
Upper Bound PCDD/F TEQ (WHO 2005)	1.09

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S2-SS-CH-073  
 ALS Sample ID L2222986-33  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 25-Sep-18  
 Extraction Date 7-Mar-19  
 Sample Size 15.76 g  
 Percent Moisture 22.1%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C11  
 Run Date 20-Mar-19 01:32  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.95	0.550	0.037	J		0.64
1,2,3,7,8-PeCDD	1	32.06	<0.24	0.014	M,J,R	0.24	3.2
1,2,3,4,7,8-HxCDD	0.1	34.12	0.217	0.029	J,B		3.2
1,2,3,6,7,8-HxCDD	0.1	34.18	0.449	0.029	J,B		3.2
1,2,3,7,8,9-HxCDD	0.1	34.30	0.401	0.029	M,J		3.2
1,2,3,4,6,7,8-HpCDD	0.01	35.80	5.02	0.027			3.2
OCDD	0.0003	37.30	32.8	0.032			6.3
2,3,7,8-TCDF	0.1	NotFnd	<0.021	0.021	U		0.64
1,2,3,7,8-PeCDF	0.03	31.12	0.242	0.020	M,J,B		3.2
2,3,4,7,8-PeCDF	0.3	31.84	0.456	0.017	M,J		3.2
1,2,3,4,7,8-HxCDF	0.1	33.64	0.362	0.024	J,B		3.2
1,2,3,6,7,8-HxCDF	0.1	33.70	0.307	0.024	J,B		3.2
2,3,4,6,7,8-HxCDF	0.1	34.03	0.370	0.025	J,B		3.2
1,2,3,7,8,9-HxCDF	0.1	34.46	<0.11	0.031	J,R	0.11	3.2
1,2,3,4,6,7,8-HpCDF	0.01	35.24	1.70	0.011	J		3.2
1,2,3,4,7,8,9-HpCDF	0.01	36.05	0.142	0.015	J,B		3.2
OCDF	0.0003	37.39	2.25	0.020	J,B		6.3

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.92	81 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	71 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.11	92 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.17	82 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	88 23-140
13C12-OCDD	4000	37.29	76 17-157
13C12-2,3,7,8-TCDF	2000	26.99	73 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.11	74 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	73 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	95 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.69	91 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.02	91 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	97 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.23	92 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	94 26-138

Cleanup Standard	pg		
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.95	75 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	8.00	3.12	0.037	0.64
Total-PeCDD	6.00	3.81	0.014	3.2
Total-HxCDD	6.00	6.49	0.029	3.2
Total-HpCDD	2.00	10.3	0.027	3.2
Total-TCDF	13.00	7.19	0.021	0.64
Total-PeCDF	10.00	5.49	0.020	3.2
Total-HxCDF	9.00	3.88	0.031	3.2
Total-HpCDF	3.00	2.60	0.015	3.2

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.984
Mid Point PCDD/F TEQ (WHO 2005)	1.24
Upper Bound PCDD/F TEQ (WHO 2005)	1.24

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S4-SS-CH-087  
 ALS Sample ID L2222986-36  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 26-Sep-18  
 Extraction Date 7-Mar-19  
 Sample Size 15.11 g  
 Percent Moisture 25.4%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C12  
 Run Date 20-Mar-19 02:13  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.96	<0.25	0.038	J,R	0.25	0.66
1,2,3,7,8-PeCDD	1	32.07	0.417	0.024	J,B		3.3
1,2,3,4,7,8-HxCDD	0.1	34.13	0.258	0.026	J,B		3.3
1,2,3,6,7,8-HxCDD	0.1	34.19	0.711	0.027	J,B		3.3
1,2,3,7,8,9-HxCDD	0.1	34.31	0.678	0.027	M,J		3.3
1,2,3,4,6,7,8-HpCDD	0.01	35.81	11.8	0.059			3.3
OCDD	0.0003	37.31	65.2	0.052			6.6
2,3,7,8-TCDF	0.1	27.03	0.511	0.073	J		0.66
1,2,3,7,8-PeCDF	0.03	31.13	0.330	0.024	J,B		3.3
2,3,4,7,8-PeCDF	0.3	31.86	0.643	0.020	J		3.3
1,2,3,4,7,8-HxCDF	0.1	33.65	0.474	0.012	J,B		3.3
1,2,3,6,7,8-HxCDF	0.1	33.71	0.381	0.012	J,B		3.3
2,3,4,6,7,8-HxCDF	0.1	34.04	0.538	0.012	J,B		3.3
1,2,3,7,8,9-HxCDF	0.1	34.48	0.130	0.014	J,B		3.3
1,2,3,4,6,7,8-HpCDF	0.01	35.25	2.71	0.020	J		3.3
1,2,3,4,7,8,9-HpCDF	0.01	36.05	<0.22	0.027	J,R	0.22	3.3
OCDF	0.0003	37.40	6.18	0.031	J		6.6

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.93	64 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.06	69 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	89 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	81 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	90 23-140
13C12-OCDD	4000	37.30	77 17-157
13C12-2,3,7,8-TCDF	2000	27.00	54 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.12	70 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.84	70 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.64	89 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	88 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	89 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.45	101 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	91 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.05	96 26-138

Cleanup Standard	pg		
37C14-2,3,7,8-TCDD (Cleanup)	40	27.95	57 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	5.00	1.36	0.038	0.66
Total-PeCDD	7.00	4.45	0.024	3.3
Total-HxCDD	7.00	9.92	0.027	3.3
Total-HpCDD	2.00	20.0	0.059	3.3
Total-TCDF	15.00	11.7	0.073	0.66
Total-PeCDF	11.00	7.42	0.024	3.3
Total-HxCDF	10.00	5.60	0.014	3.3
Total-HpCDF	3.00	5.26	0.027	3.3

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	1.15
Mid Point PCDD/F TEQ (WHO 2005)	1.41
Upper Bound PCDD/F TEQ (WHO 2005)	1.41

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S7-SS-CH-079  
 ALS Sample ID L2222986-40  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 17-Oct-18  
 Extraction Date 7-Mar-19  
 Sample Size 14.91 g  
 Percent Moisture 26.3%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C13  
 Run Date 20-Mar-19 02:55  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.96	0.263	0.036	J		0.67
1,2,3,7,8-PeCDD	1	32.07	<0.21	0.020	J,R	0.21	3.4
1,2,3,4,7,8-HxCDD	0.1	34.13	0.228	0.023	J,B		3.4
1,2,3,6,7,8-HxCDD	0.1	34.19	0.492	0.023	J,B		3.4
1,2,3,7,8,9-HxCDD	0.1	34.31	0.512	0.023	J		3.4
1,2,3,4,6,7,8-HpCDD	0.01	35.81	7.02	0.036			3.4
OCDD	0.0003	37.31	49.6	0.037			6.7
2,3,7,8-TCDF	0.1	27.01	0.392	0.039	M,J		0.67
1,2,3,7,8-PeCDF	0.03	31.13	0.268	0.029	M,J,B		3.4
2,3,4,7,8-PeCDF	0.3	31.86	0.445	0.023	J		3.4
1,2,3,4,7,8-HxCDF	0.1	33.64	0.453	0.010	J,B		3.4
1,2,3,6,7,8-HxCDF	0.1	33.71	0.362	0.0099	J,B		3.4
2,3,4,6,7,8-HxCDF	0.1	34.04	<0.40	0.010	J,R	0.40	3.4
1,2,3,7,8,9-HxCDF	0.1	34.46	<0.12	0.014	J,R	0.12	3.4
1,2,3,4,6,7,8-HpCDF	0.01	35.24	2.43	0.013	J		3.4
1,2,3,4,7,8,9-HpCDF	0.01	36.05	<0.21	0.017	J,R	0.21	3.4
OCDF	0.0003	37.40	4.71	0.023	J,B		6.7

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.93	73 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.06	76 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	93 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	78 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	87 23-140
13C12-OCDD	4000	37.30	71 17-157
13C12-2,3,7,8-TCDF	2000	27.00	65 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.12	75 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.84	77 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.64	99 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	92 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	90 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.45	97 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	86 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.05	93 26-138

Cleanup Standard	pg		
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.95	69 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	4.00	1.09	0.036	0.67
Total-PeCDD	7.00	3.33	0.020	3.4
Total-HxCDD	7.00	7.57	0.023	3.4
Total-HpCDD	2.00	14.6	0.036	3.4
Total-TCDF	13.00	5.38	0.039	0.67
Total-PeCDF	15.00	5.41	0.029	3.4
Total-HxCDF	8.00	3.64	0.014	3.4
Total-HpCDF	3.00	3.82	0.017	3.4

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.759
Mid Point PCDD/F TEQ (WHO 2005)	1.02
Upper Bound PCDD/F TEQ (WHO 2005)	1.02

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D1-SS-CH-200  
 ALS Sample ID L2222986-43  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 5-Jul-18  
 Extraction Date 7-Mar-19  
 Sample Size 18.04 g  
 Percent Moisture 10.0%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C14  
 Run Date 20-Mar-19 03:36  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.93	0.198	0.025	J		0.55
1,2,3,7,8-PeCDD	1	32.06	0.212	0.011	J,B		2.8
1,2,3,4,7,8-HxCDD	0.1	34.12	0.210	0.011	J,B		2.8
1,2,3,6,7,8-HxCDD	0.1	34.18	0.388	0.012	J,B		2.8
1,2,3,7,8,9-HxCDD	0.1	34.29	0.411	0.012	M,J		2.8
1,2,3,4,6,7,8-HpCDD	0.01	35.80	5.15	0.018			2.8
OCDD	0.0003	37.30	31.9	0.021			5.5
2,3,7,8-TCDF	0.1	26.97	0.377	0.025	M,J		0.55
1,2,3,7,8-PeCDF	0.03	31.12	<0.23	0.019	M,J,R	0.23	2.8
2,3,4,7,8-PeCDF	0.3	31.83	0.538	0.017	J		2.8
1,2,3,4,7,8-HxCDF	0.1	33.63	0.387	0.010	J,B		2.8
1,2,3,6,7,8-HxCDF	0.1	33.70	0.311	0.010	J,B		2.8
2,3,4,6,7,8-HxCDF	0.1	34.03	0.385	0.0098	J,B		2.8
1,2,3,7,8,9-HxCDF	0.1	34.46	0.106	0.012	J,B		2.8
1,2,3,4,6,7,8-HpCDF	0.01	35.23	1.79	0.012	J		2.8
1,2,3,4,7,8,9-HpCDF	0.01	36.04	<0.14	0.015	J,R	0.14	2.8
OCDF	0.0003	37.39	2.52	0.014	J,B		5.5

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.90	76 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.05	77 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.11	80 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.17	84 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	88 23-140
13C12-OCDD	4000	37.29	72 17-157
13C12-2,3,7,8-TCDF	2000	26.99	67 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.10	78 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.83	78 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.61	88 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.69	81 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.02	85 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.43	97 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.22	84 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.03	93 26-138

Cleanup Standard	pg	Conc.	EDL
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.93	72 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	4.00	0.955	0.025	0.55
Total-PeCDD	10.00	2.71	0.011	2.8
Total-HxCDD	6.00	5.07	0.012	2.8
Total-HpCDD	2.00	9.92	0.018	2.8
Total-TCDF	18.00	9.52	0.025	0.55
Total-PeCDF	14.00	6.63	0.019	2.8
Total-HxCDF	10.00	4.04	0.012	2.8
Total-HpCDF	3.00	2.77	0.015	2.8

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.909
Mid Point PCDD/F TEQ (WHO 2005)	0.917
Upper Bound PCDD/F TEQ (WHO 2005)	0.917

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D2-SS-CH-201  
 ALS Sample ID L2222986-44  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 25-Sep-18  
 Extraction Date 7-Mar-19  
 Sample Size 16.61 g  
 Percent Moisture 18.2%  
 Split Ratio 1

Approved:  
*E. Sabljic*  
 --e-signature--  
 22-Mar-2019

**Run Information** **Run 1**  
 Filename 5-190319C15  
 Run Date 20-Mar-19 04:18  
 Final Volume 20 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS5 DB5MSUSR8262264

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	27.95	0.305	0.032	J		0.60
1,2,3,7,8-PeCDD	1	32.07	0.179	0.014	J,B		3.0
1,2,3,4,7,8-HxCDD	0.1	34.13	0.121	0.015	J,B		3.0
1,2,3,6,7,8-HxCDD	0.1	34.19	0.361	0.016	J,B		3.0
1,2,3,7,8,9-HxCDD	0.1	34.31	0.341	0.015	M,J		3.0
1,2,3,4,6,7,8-HpCDD	0.01	35.81	5.64	0.027			3.0
OCDD	0.0003	37.31	35.0	0.043			6.0
2,3,7,8-TCDF	0.1	27.03	0.261	0.017	M,J		0.60
1,2,3,7,8-PeCDF	0.03	31.13	0.230	0.016	J,B		3.0
2,3,4,7,8-PeCDF	0.3	31.86	0.332	0.014	J,B		3.0
1,2,3,4,7,8-HxCDF	0.1	33.65	0.301	0.0074	J,B		3.0
1,2,3,6,7,8-HxCDF	0.1	33.71	0.235	0.0074	J,B		3.0
2,3,4,6,7,8-HxCDF	0.1	34.04	0.320	0.0076	J,B		3.0
1,2,3,7,8,9-HxCDF	0.1	34.48	<0.071	0.0092	J,R	0.071	3.0
1,2,3,4,6,7,8-HpCDF	0.01	35.25	1.38	0.011	J		3.0
1,2,3,4,7,8,9-HpCDF	0.01	36.05	0.138	0.013	J,B		3.0
OCDF	0.0003	37.40	2.11	0.021	J,B		6.0

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	2000	27.93	80 25-164
13C12-1,2,3,7,8-PeCDD	2000	32.06	69 25-181
13C12-1,2,3,4,7,8-HxCDD	2000	34.12	88 32-141
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	78 28-130
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.80	85 23-140
13C12-OCDD	4000	37.31	69 17-157
13C12-2,3,7,8-TCDF	2000	27.00	73 24-169
13C12-1,2,3,7,8-PeCDF	2000	31.12	70 24-185
13C12-2,3,4,7,8-PeCDF	2000	31.84	70 21-178
13C12-1,2,3,4,7,8-HxCDF	2000	33.64	88 26-152
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	87 26-123
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	85 29-147
13C12-1,2,3,7,8,9-HxCDF	2000	34.45	95 28-136
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	84 28-143
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.05	90 26-138

Cleanup Standard	pg		
37Cl4-2,3,7,8-TCDD (Cleanup)	40	27.96	76 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	8.00	1.69	0.032	0.60
Total-PeCDD	8.00	3.54	0.014	3.0
Total-HxCDD	7.00	5.08	0.016	3.0
Total-HpCDD	2.00	10.1	0.027	3.0
Total-TCDF	16.00	5.97	0.017	0.60
Total-PeCDF	12.00	4.75	0.016	3.0
Total-HxCDF	6.00	2.43	0.0092	3.0
Total-HpCDF	3.00	2.44	0.013	3.0

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.867
Mid Point PCDD/F TEQ (WHO 2005)	0.874
Upper Bound PCDD/F TEQ (WHO 2005)	0.874

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	Method Blank	Sampling Date	n/a		
ALS Sample ID	WG2991214-1	Extraction Date	7-Mar-19		
Analysis Method	EPA 1613B	Sample Size	16.00	g	
Analysis Type	Blank	Percent Moisture	n/a		
Sample Matrix	QC	Split Ratio	1		

Approved:  
E. Sabljic  
--e-signature--  
22-Mar-2019

<b>Run Information</b>		<b>Run 1</b>	
Filename	5-190316A19		
Run Date	17-Mar-19 04:15		
Final Volume	20	uL	
Dilution Factor	1		
Analysis Units	pg/g		
Instrument - Column	HRMS5 DB5MSUSR8262264		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.011	0.011	U		0.63
1,2,3,7,8-PeCDD	1	32.07	0.0473	0.0075	J		3.1
1,2,3,4,7,8-HxCDD	0.1	34.13	0.0702	0.0059	J		3.1
1,2,3,6,7,8-HxCDD	0.1	34.18	0.0776	0.0064	J		3.1
1,2,3,7,8,9-HxCDD	0.1	34.31	<0.12	0.0062	J,R	0.12	3.1
1,2,3,4,6,7,8-HpCDD	0.01	35.80	0.183	0.0057	J		3.1
OCDD	0.0003	37.31	0.557	0.011	J		6.3
2,3,7,8-TCDF	0.1	27.00	0.00889	0.0082	M,J		0.63
1,2,3,7,8-PeCDF	0.03	31.13	0.0561	0.0050	J		3.1
2,3,4,7,8-PeCDF	0.3	31.86	0.0342	0.0043	J		3.1
1,2,3,4,7,8-HxCDF	0.1	33.64	0.0614	0.0047	J		3.1
1,2,3,6,7,8-HxCDF	0.1	33.71	0.0575	0.0046	J		3.1
2,3,4,6,7,8-HxCDF	0.1	34.04	0.0695	0.0046	J		3.1
1,2,3,7,8,9-HxCDF	0.1	34.45	0.110	0.0052	J		3.1
1,2,3,4,6,7,8-HpCDF	0.01	35.24	<0.13	0.0066	J,R	0.13	3.1
1,2,3,4,7,8,9-HpCDF	0.01	36.04	0.106	0.0079	J		3.1
OCDF	0.0003	37.39	0.501	0.011	J		6.3
<b>Extraction Standards</b>	<b>pg</b>		<b>% Rec</b>	<b>Limits</b>			
13C12-2,3,7,8-TCDD	2000	27.93	71	25-164			
13C12-1,2,3,7,8-PeCDD	2000	32.06	74	25-181			
13C12-1,2,3,4,7,8-HxCDD	2000	34.13	80	32-141			
13C12-1,2,3,6,7,8-HxCDD	2000	34.18	74	28-130			
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	90	23-140			
13C12-OCDD	4000	37.30	75	17-157			
13C12-2,3,7,8-TCDF	2000	27.00	70	24-169			
13C12-1,2,3,7,8-PeCDF	2000	31.12	78	24-185			
13C12-2,3,4,7,8-PeCDF	2000	31.84	80	21-178			
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	83	26-152			
13C12-1,2,3,6,7,8-HxCDF	2000	33.70	84	26-123			
13C12-2,3,4,6,7,8-HxCDF	2000	34.03	86	29-147			
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	95	28-136			
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.24	90	28-143			
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.04	101	26-138			
<b>Cleanup Standard</b>	<b>pg</b>						
37C14-2,3,7,8-TCDD (Cleanup)	40	27.95	69	35-197			
<b>Homologue Group Totals</b>	<b># peaks</b>		<b>Conc. pg/g</b>	<b>EDL pg/g</b>			
Total-TCDD	0.00	<0.011	0.011		U		0.63
Total-PeCDD	2.00	0.0712	0.0075				3.1
Total-HxCDD	3.00	0.176	0.0064				3.1
Total-HpCDD	1.00	0.183	0.0057				3.1
Total-TCDF	2.00	0.0225	0.0082				0.63
Total-PeCDF	2.00	0.0903	0.0050				3.1
Total-HxCDF	4.00	0.298	0.0052				3.1
Total-HpCDF	1.00	0.106	0.0079				3.1

<b>Toxic Equivalency - (WHO 2005)</b>	<b>pg/g</b>
Lower Bound PCDD/F TEQ (WHO 2005)	0.108
Mid Point PCDD/F TEQ (WHO 2005)	0.127
Upper Bound PCDD/F TEQ (WHO 2005)	0.132

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a	
ALS Sample ID	WG2991214-2	Extraction Date	7-Mar-19	
Analysis Method	EPA 1613B	Sample Size	1	n/a
Analysis Type	LCS	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

Approved:  
E. Sabljic  
--e-signature--  
22-Mar-2019

<b>Run Information</b>		<b>Run 1</b>	
Filename	5-190316A17		
Run Date	17-Mar-19 02:52		
Final Volume	20	uL	
Dilution Factor	1		
Analysis Units	%		
Instrument - Column	HRMS5 DB5MSUSR8262264		

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
2,3,7,8-TCDD	200	27.98	107	67-158	
1,2,3,7,8-PeCDD	1000	32.07	120	70-142	
1,2,3,4,7,8-HxCDD	1000	34.13	109	70-164	
1,2,3,6,7,8-HxCDD	1000	34.18	118	76-134	
1,2,3,7,8,9-HxCDD	1000	34.31	120	64-162	
1,2,3,4,6,7,8-HpCDD	1000	35.79	110	70-140	
OCDD	2000	37.30	114	78-144	
2,3,7,8-TCDF	200	27.04	109	75-158	
1,2,3,7,8-PeCDF	1000	31.13	116	80-134	
2,3,4,7,8-PeCDF	1000	31.86	106	68-160	
1,2,3,4,7,8-HxCDF	1000	33.64	109	72-134	
1,2,3,6,7,8-HxCDF	1000	33.70	109	84-130	
2,3,4,6,7,8-HxCDF	1000	34.03	108	70-156	
1,2,3,7,8,9-HxCDF	1000	34.44	115	78-130	
1,2,3,4,6,7,8-HpCDF	1000	35.23	108	82-122	
1,2,3,4,7,8,9-HpCDF	1000	36.04	111	78-138	
OCDF	2000	37.39	138	63-170	
<b>Extraction Standards</b>	<b>pg</b>		<b>% Rec</b>	<b>Limits</b>	
13C12-2,3,7,8-TCDD	2000	27.95	79	20-175	
13C12-1,2,3,7,8-PeCDD	2000	32.06	74	21-227	
13C12-1,2,3,4,7,8-HxCDD	2000	34.11	86	21-193	
13C12-1,2,3,6,7,8-HxCDD	2000	34.17	74	25-163	
13C12-1,2,3,4,6,7,8-HpCDD	2000	35.79	86	26-166	
13C12-OCDD	4000	37.29	71	13-138	
13C12-2,3,7,8-TCDF	2000	27.03	79	22-152	
13C12-1,2,3,7,8-PeCDF	2000	31.12	78	21-192	
13C12-2,3,4,7,8-PeCDF	2000	31.84	78	13-328	
13C12-1,2,3,4,7,8-HxCDF	2000	33.63	87	19-202	
13C12-1,2,3,6,7,8-HxCDF	2000	33.69	85	21-159	
13C12-2,3,4,6,7,8-HxCDF	2000	34.02	87	17-205	
13C12-1,2,3,7,8,9-HxCDF	2000	34.44	95	22-176	
13C12-1,2,3,4,6,7,8-HpCDF	2000	35.22	87	21-158	
13C12-1,2,3,4,7,8,9-HpCDF	2000	36.03	99	20-186	
<b>Cleanup Standard</b>	<b>pg</b>				
37C14-2,3,7,8-TCDD (Cleanup)	40	27.98	83	31-191	



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

<b>ALS Project Contact:</b> Lynne Wrona	<b>Client Name:</b> Stantec Consulting Limited
<b>ALS Project ID:</b> 14559	<b>Client Address:</b> 70 Southgate Dr, Suite 1
<b>ALS WO#:</b> L2222986	Guelph, ON, N1G 4P5
<b>Date of Report:</b> 31-Mar-19	Canada
<b>Date of Sample Receipt:</b> 15-Jan-19	<b>Client Contact:</b> Katherine Ketis
	<b>Client Project ID:</b> 122160003

**COMMENTS: Chlorinated Pesticides by EPA 1699 (modified)**

The GC Breakdown Standard at the beginning of the run was mis-injected. The following injections of the Breakdown Standard (mid and post-run) did not show any indication that GC breakdown was occurring during this run.

The 13C10-Mirex Extraction (internal) Standard in the Method Blank was marginally above the method acceptance criterion. The client samples were not affected.

Some native targets were elevated in the Laboratory Control Sample (d-BHC and endrin aldehyde). None of the affected targets were present in the client samples so no impact to overall data quality is expected.

Certified by:

A handwritten signature in black ink, appearing to read "Bradley Reimer", is written over a horizontal line.

Bradley Reimer  
GC/MS Laboratory Senior Technical Specialist

Results in this certificate relate only to the samples as submitted to the laboratory.

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# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-N2-SD-CH-015	18-N4-SS-CH-023	18-N4-SS-CH-023 Duplicate	18-E2-SD-CH-045	18-E6-SS-CH-059	18-S1-SS-CH-063
ALS Sample ID	L2222986-8	L2222986-11	WG2991237-4	L2222986-21	L2222986-27	L2222986-29
Sample Size	18.47	20.08	20.07	19.93	19.94	19.9
Sample size units	g	g	g	g	g	g
Percent Moisture	63.30%	11.00%	11.00%	21.70%	22.00%	19.60%
Sample Matrix	Sediment	Soil	QC	Sediment	Soil	Soil
Sampling Date	17-Oct-18	5-Jul-18	n/a	26-Sep-18	17-Oct-18	25-Sep-18
Extraction Date	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>
alpha-BHC	<0.023	<0.043	<0.035	<0.045	<0.041	<0.054
beta-BHC	<0.039	<0.074	<0.061	<0.077	<0.071	<0.093
gamma-BHC	<0.027	<0.043	<0.036	<0.047	<0.043	<0.059
delta-BHC	<0.033	<0.053	<0.044	<0.057	<0.053	<0.073
Heptachlor	<0.0022	<0.0037	<0.0029	<0.0032	<0.0024	<0.0039
Aldrin	<0.0020	<0.0031	<0.0027	<0.0033	<0.0035	<0.0046
Heptachlor Epoxide B	<0.0028	0.0213	0.0213	<0.0038	0.0111	<0.0039
Heptachlor Epoxide A	<0.019	<0.023	<0.020	<0.026	<0.026	<0.027
trans-Chlordane	<0.0084	<0.018	<0.018	<0.013	<0.019	<0.023
cis-Chlordane	0.0221	<0.017	<0.017	<0.012	<0.018	<0.021
Dieldrin	0.0139	0.0331	0.0325	<0.0085	0.0194	<0.011
Endrin	0.0159	<0.016	<0.0093	<0.010	<0.013	<0.015
Endosulfan I	<0.011	<0.011	<0.016	<0.012	<0.018	<0.022
Endosulfan II	<0.024	<0.034	<0.036	<0.039	<0.029	<0.035
Endosulfan Sulfate	<0.0050	<0.0022	<0.0072	<0.0070	<0.012	<0.0054
4,4'-DDE	0.101	0.331	0.314	<0.0096	0.207	0.166
4,4'-DDD	<0.015	<0.012	<0.012	<0.0090	<0.017	<0.011
4,4'-DDT	<0.020	0.304	0.322	<0.010	0.165	0.0981
Endrin Aldehyde	<0.0064	<0.016	<0.013	<0.0071	<0.011	<0.017
Methoxychlor	<0.15	<0.17	<0.18	<0.11	<0.15	<0.12
Mirex	<0.0033	0.00820	0.00701	<0.0022	<0.0057	<0.0019
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	99	80	100	80	77	72
gamma-BHC, d6-	101	89	113	86	85	73
Heptachlor, 13C10-	57	56	67	65	59	55
trans-Nonachlor, 13C10-	87	84	98	81	79	78
Dieldrin, 13C12-	83	89	100	85	82	77
Endrin, 13C12-	79	80	96	85	82	80
Endosulfan II, 13C9-	92	91	107	91	85	87
4,4'-DDE, 13C12-	106	98	101	102	95	84
4,4'-DDD, 13C12-	97	103	108	114	99	95
4,4'-DDT, 13C12-	72	84	102	91	85	87
Methoxychlor, d6-	70	81	104	98	92	106
Mirex, 13C10-	97	95	107	101	96	108

# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-D1-SS-CH-200	18-D2-SS-CH-201	18-D4-SD-CH-204
ALS Sample ID	L2222986-43	L2222986-44	L2222986-47
Sample Size	20.04	20.04	20.01
Sample size units	g	g	g
Percent Moisture	10.00%	18.20%	55.00%
Sample Matrix	Soil	Soil	Sediment
Sampling Date	5-Jul-18	25-Sep-18	17-Oct-18
Extraction Date	14-Mar-19	14-Mar-19	14-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>
alpha-BHC	<0.032	<0.049	<0.027
beta-BHC	<0.056	<0.086	<0.046
gamma-BHC	<0.034	<0.054	<0.030
delta-BHC	<0.042	<0.066	<0.037
Heptachlor	<0.0031	<0.0051	<0.0022
Aldrin	<0.0025	<0.0040	<0.0040
Heptachlor Epoxide B	0.0218	<0.0036	<0.0050
Heptachlor Epoxide A	<0.035	<0.025	<0.034
trans-Chlordane	<0.012	<0.018	<0.013
cis-Chlordane	<0.011	<0.017	<0.012
Dieldrin	<0.025	<0.013	<0.022
Endrin	<0.010	<0.016	<0.014
Endosulfan I	<0.012	<0.025	<0.013
Endosulfan II	<0.019	<0.029	<0.027
Endosulfan Sulfate	<0.0049	<0.0076	<0.0061
4,4'-DDE	0.298	0.237	0.169
4,4'-DDD	0.0106	<0.0086	0.0352
4,4'-DDT	0.290	0.132	0.0420
Endrin Aldehyde	<0.015	<0.011	<0.0082
Methoxychlor	<0.11	<0.11	<0.14
Mirex	0.00678	0.00384	<0.0040
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	91	84	84
gamma-BHC, d6-	99	87	91
Heptachlor, 13C10-	68	55	66
trans-Nonachlor, 13C10-	94	80	86
Dieldrin, 13C12-	95	77	88
Endrin, 13C12-	99	80	91
Endosulfan II, 13C9-	102	90	89
4,4'-DDE, 13C12-	106	93	109
4,4'-DDD, 13C12-	110	101	106
4,4'-DDT, 13C12-	93	90	71
Methoxychlor, d6-	92	101	53
Mirex, 13C10-	105	111	72

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2991237-1	WG2991237-2
Sample Size	20.05	1
Sample size units	g	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	14-Mar-19	14-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>% Rec</b>
alpha-BHC	<0.033	98
beta-BHC	<0.057	114
gamma-BHC	<0.037	99
delta-BHC	<0.045	122
Heptachlor	<0.0039	92
Aldrin	<0.0039	86
Heptachlor Epoxide B	<0.0049	103
Heptachlor Epoxide A	<0.033	104
trans-Chlordane	<0.011	88
cis-Chlordane	<0.010	94
Dieldrin	<0.0090	99
Endrin	<0.015	93
Endosulfan I	<0.014	71
Endosulfan II	<0.031	96
Endosulfan Sulfate	<0.0052	116
4,4'-DDE	<0.0089	97
4,4'-DDD	<0.0093	64
4,4'-DDT	<0.0066	94
Endrin Aldehyde	<0.011	143
Methoxychlor	<0.12	91
Mirex	0.00328	97
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	74	72
gamma-BHC, d6-	76	84
Heptachlor, 13C10-	48	50
trans-Nonachlor, 13C10-	81	81
Dieldrin, 13C12-	82	80
Endrin, 13C12-	66	70
Endosulfan II, 13C9-	101	100
4,4'-DDE, 13C12-	90	93
4,4'-DDD, 13C12-	87	95
4,4'-DDT, 13C12-	78	87
Methoxychlor, d6-	82	94
Mirex, 13C10-	127	134

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N2-SD-CH-015  
 ALS Sample ID L2222986-8  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Sediment

Sampling Date 17-Oct-18  
 Extraction Date 14-Mar-19  
 Sample Size 18.47 g  
 Percent Moisture 63.3%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B06  
 Run Date 26-Mar-19 13:47  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.023	0.023	U		0.22
beta-BHC	NotFnd	<0.039	0.039	U		0.22
gamma-BHC	NotFnd	<0.027	0.027	U		0.22
delta-BHC	NotFnd	<0.033	0.033	U		0.22
Heptachlor	NotFnd	<0.0022	0.0022	U		0.22
Aldrin	NotFnd	<0.0020	0.0020	U		0.22
Heptachlor Epoxide B	NotFnd	<0.0028	0.0028	U		0.22
Heptachlor Epoxide A	NotFnd	<0.019	0.019	U		0.22
trans-Chlordane	NotFnd	<0.0084	0.0084	U		0.22
cis-Chlordane	23.44	0.0221	0.0077	M,J		0.22
Dieldrin	24.11	0.0139	0.0065	M,J		0.22
Endrin	24.72	0.0159	0.0089	M,J		0.22
Endosulfan I	NotFnd	<0.011	0.011	U		0.22
Endosulfan II	NotFnd	<0.024	0.024	U		0.22
Endosulfan Sulfate	NotFnd	<0.0050	0.0050	U		0.22
4,4'-DDE	24.05	0.101	0.0050	M,J		0.22
4,4'-DDD	25.26	<0.015	0.0034	M,J,R	0.015	0.22
4,4'-DDT	26.30	<0.020	0.010	J,R	0.020	0.22
Endrin Aldehyde	NotFnd	<0.0064	0.0064	U		0.22
Methoxychlor	NotFnd	<0.15	0.15	U,1		0.22
Mirex	28.65	<0.0033	0.00064	M,J,R	0.0033	0.22

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.71	99	16-129
gamma-BHC, d6-	250	17.65	101	11-120
Heptachlor, 13C10-	250	20.01	57	5-120
Dieldrin, 13C12-	250	24.10	83	40-151
Endrin, 13C12-	250	24.72	79	35-155
Endosulfan II, 13C9-	250	24.98	92	5-122
4,4'-DDE, 13C12-	250	24.04	106	21-125
4,4'-DDD, 13C12-	250	25.25	97	5-150
4,4'-DDT, 13C12-	250	26.28	72	5-120
Methoxychlor, d6-	250	27.59	70	5-120
Mirex, 13C10-	250	28.65	97	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-SS-CH-023  
 ALS Sample ID L2222986-11  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 5-Jul-18  
 Extraction Date 14-Mar-19  
 Sample Size 20.08 g  
 Percent Moisture 11.0%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B07  
 Run Date 26-Mar-19 14:21  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.043	0.043	U		0.20
beta-BHC	NotFnd	<0.074	0.074	U		0.20
gamma-BHC	NotFnd	<0.043	0.043	U		0.20
delta-BHC	NotFnd	<0.053	0.053	U		0.20
Heptachlor	NotFnd	<0.0037	0.0037	U		0.20
Aldrin	NotFnd	<0.0031	0.0031	U		0.20
Heptachlor Epoxide B	22.29	0.0213	0.0033	M,J		0.20
Heptachlor Epoxide A	NotFnd	<0.023	0.023	U		0.20
trans-Chlordane	NotFnd	<0.018	0.018	U		0.20
cis-Chlordane	NotFnd	<0.017	0.017	U		0.20
Dieldrin	24.11	0.0331	0.012	M,J		0.20
Endrin	24.74	<0.016	0.016	M,U	0.012	0.20
Endosulfan I	NotFnd	<0.011	0.011	U		0.20
Endosulfan II	NotFnd	<0.034	0.034	U		0.20
Endosulfan Sulfate	NotFnd	<0.0022	0.0022	U		0.20
4,4'-DDE	24.06	0.331	0.012	M		0.20
4,4'-DDD	NotFnd	<0.012	0.012	U		0.20
4,4'-DDT	26.32	0.304	0.015			0.20
Endrin Aldehyde	NotFnd	<0.016	0.016	U		0.20
Methoxychlor	NotFnd	<0.17	0.17	U,1		0.20
Mirex	28.67	0.00820	0.0010	J,B		0.20

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.72	80	16-129
gamma-BHC, d6-	250	17.66	89	11-120
Heptachlor, 13C10-	250	20.02	56	5-120
Dieldrin, 13C12-	250	24.10	89	40-151
Endrin, 13C12-	250	24.73	80	35-155
Endosulfan II, 13C9-	250	24.99	91	5-122
4,4'-DDE, 13C12-	250	24.05	98	21-125
4,4'-DDD, 13C12-	250	25.26	103	5-150
4,4'-DDT, 13C12-	250	26.30	84	5-120
Methoxychlor, d6-	250	27.59	81	5-120
Mirex, 13C10-	250	28.65	95	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-SS-CH-023 Duplicate  
 ALS Sample ID WG2991237-4  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix QC

Sampling Date n/a  
 Extraction Date 14-Mar-19  
 Sample Size 20.07 g  
 Percent Moisture 11.0%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B08  
 Run Date 26-Mar-19 14:55  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.035	0.035	U		0.20
beta-BHC	NotFnd	<0.061	0.061	U		0.20
gamma-BHC	NotFnd	<0.036	0.036	U		0.20
delta-BHC	NotFnd	<0.044	0.044	U		0.20
Heptachlor	NotFnd	<0.0029	0.0029	U		0.20
Aldrin	NotFnd	<0.0027	0.0027	U		0.20
Heptachlor Epoxide B	22.27	0.0213	0.0029	M,J		0.20
Heptachlor Epoxide A	NotFnd	<0.020	0.020	U		0.20
trans-Chlordane	NotFnd	<0.018	0.018	U		0.20
cis-Chlordane	NotFnd	<0.017	0.017	U		0.20
Dieldrin	24.10	0.0325	0.0068	M,J		0.20
Endrin	NotFnd	<0.0093	0.0093	U		0.20
Endosulfan I	NotFnd	<0.016	0.016	U		0.20
Endosulfan II	NotFnd	<0.036	0.036	U		0.20
Endosulfan Sulfate	NotFnd	<0.0072	0.0072	U		0.20
4,4'-DDE	24.04	0.314	0.011	M		0.20
4,4'-DDD	NotFnd	<0.012	0.012	U		0.20
4,4'-DDT	26.30	0.322	0.0097			0.20
Endrin Aldehyde	NotFnd	<0.013	0.013	U		0.20
Methoxychlor	NotFnd	<0.18	0.18	U,1.		0.20
Mirex	28.65	0.00701	0.0010	M,J,B		0.20

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.70	100	16-129
gamma-BHC, d6-	250	17.64	113	11-120
Heptachlor, 13C10-	250	20.00	67	5-120
Dieldrin, 13C12-	250	24.09	100	40-151
Endrin, 13C12-	250	24.71	96	35-155
Endosulfan II, 13C9-	250	24.97	107	5-122
4,4'-DDE, 13C12-	250	24.03	101	21-125
4,4'-DDD, 13C12-	250	25.23	108	5-150
4,4'-DDT, 13C12-	250	26.28	102	5-120
Methoxychlor, d6-	250	27.58	104	5-120
Mirex, 13C10-	250	28.64	107	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 B  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E2-SD-CH-045  
 ALS Sample ID L2222986-21  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Sediment

Sampling Date 26-Sep-18  
 Extraction Date 14-Mar-19  
 Sample Size 19.93 g  
 Percent Moisture 21.7%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B12  
 Run Date 26-Mar-19 17:13  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.045	0.045	U		0.21
beta-BHC	NotFnd	<0.077	0.077	U		0.21
gamma-BHC	NotFnd	<0.047	0.047	U		0.21
delta-BHC	NotFnd	<0.057	0.057	U		0.21
Heptachlor	NotFnd	<0.0032	0.0032	U		0.21
Aldrin	NotFnd	<0.0033	0.0033	U		0.21
Heptachlor Epoxide B	NotFnd	<0.0038	0.0038	U		0.21
Heptachlor Epoxide A	NotFnd	<0.026	0.026	U		0.21
trans-Chlordane	NotFnd	<0.013	0.013	U		0.21
cis-Chlordane	NotFnd	<0.012	0.012	U		0.21
Dieldrin	NotFnd	<0.0085	0.0085	U		0.21
Endrin	NotFnd	<0.010	0.010	U		0.21
Endosulfan I	NotFnd	<0.012	0.012	U		0.21
Endosulfan II	NotFnd	<0.039	0.039	U		0.21
Endosulfan Sulfate	NotFnd	<0.0070	0.0070	U		0.21
4,4'-DDE	NotFnd	<0.0096	0.0096	U		0.21
4,4'-DDD	NotFnd	<0.0090	0.0090	U		0.21
4,4'-DDT	NotFnd	<0.010	0.010	U		0.21
Endrin Aldehyde	NotFnd	<0.0071	0.0071	U		0.21
Methoxychlor	NotFnd	<0.11	0.11	U,1.		0.21
Mirex	28.65	<0.0022	0.0022	M,U	0.0022	0.21

Extraction Standards	ng	Ret. Time	Conc. ng/g	EDL ng/g
alpha-BHC, 13C6-	250	16.71	80	16-129
gamma-BHC, d6-	250	17.64	86	11-120
Heptachlor, 13C10-	250	20.00	65	5-120
Dieldrin, 13C12-	250	24.10	85	40-151
Endrin, 13C12-	250	24.72	85	35-155
Endosulfan II, 13C9-	250	24.98	91	5-122
4,4'-DDE, 13C12-	250	24.04	102	21-125
4,4'-DDD, 13C12-	250	25.25	114	5-150
4,4'-DDT, 13C12-	250	26.28	91	5-120
Methoxychlor, d6-	250	27.59	98	5-120
Mirex, 13C10-	250	28.65	101	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E6-SS-CH-059  
 ALS Sample ID L2222986-27  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 17-Oct-18  
 Extraction Date 14-Mar-19  
 Sample Size 19.94 g  
 Percent Moisture 22.0%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B13  
 Run Date 26-Mar-19 17:47  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.041	0.041	U		0.21
beta-BHC	NotFnd	<0.071	0.071	U		0.21
gamma-BHC	NotFnd	<0.043	0.043	U		0.21
delta-BHC	NotFnd	<0.053	0.053	U		0.21
Heptachlor	NotFnd	<0.0024	0.0024	U		0.21
Aldrin	NotFnd	<0.0035	0.0035	U		0.21
Heptachlor Epoxide B	22.28	0.0111	0.0037	M,J		0.21
Heptachlor Epoxide A	NotFnd	<0.026	0.026	U		0.21
trans-Chlordane	NotFnd	<0.019	0.019	U		0.21
cis-Chlordane	NotFnd	<0.018	0.018	U		0.21
Dieldrin	24.11	0.0194	0.011	M,J		0.21
Endrin	NotFnd	<0.013	0.013	U		0.21
Endosulfan I	NotFnd	<0.018	0.018	U		0.21
Endosulfan II	NotFnd	<0.029	0.029	U		0.21
Endosulfan Sulfate	NotFnd	<0.012	0.012	U		0.21
4,4'-DDE	24.05	0.207	0.013	M		0.21
4,4'-DDD	25.26	<0.017	0.012	M,J,R	0.017	0.21
4,4'-DDT	26.30	0.165	0.012	J		0.21
Endrin Aldehyde	NotFnd	<0.011	0.011	U		0.21
Methoxychlor	NotFnd	<0.15	0.15	U,1		0.21
Mirex	28.65	<0.0057	0.00096	M,J,R	0.0057	0.21

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.71	77	16-129
gamma-BHC, d6-	250	17.64	85	11-120
Heptachlor, 13C10-	250	20.00	59	5-120
Dieldrin, 13C12-	250	24.09	82	40-151
Endrin, 13C12-	250	24.72	82	35-155
Endosulfan II, 13C9-	250	24.98	85	5-122
4,4'-DDE, 13C12-	250	24.04	95	21-125
4,4'-DDD, 13C12-	250	25.25	99	5-150
4,4'-DDT, 13C12-	250	26.28	85	5-120
Methoxychlor, d6-	250	27.59	92	5-120
Mirex, 13C10-	250	28.65	96	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S1-SS-CH-063  
 ALS Sample ID L2222986-29  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 25-Sep-18  
 Extraction Date 14-Mar-19  
 Sample Size 19.9 g  
 Percent Moisture 19.6%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B14  
 Run Date 26-Mar-19 18:21  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.054	0.054	U		0.21
beta-BHC	NotFnd	<0.093	0.093	U		0.21
gamma-BHC	NotFnd	<0.059	0.059	U		0.21
delta-BHC	NotFnd	<0.073	0.073	U		0.21
Heptachlor	NotFnd	<0.0039	0.0039	U		0.21
Aldrin	NotFnd	<0.0046	0.0046	U		0.21
Heptachlor Epoxide B	NotFnd	<0.0039	0.0039	U		0.21
Heptachlor Epoxide A	NotFnd	<0.027	0.027	U		0.21
trans-Chlordane	NotFnd	<0.023	0.023	U		0.21
cis-Chlordane	NotFnd	<0.021	0.021	U		0.21
Dieldrin	NotFnd	<0.011	0.011	U		0.21
Endrin	NotFnd	<0.015	0.015	U		0.21
Endosulfan I	NotFnd	<0.022	0.022	U		0.21
Endosulfan II	NotFnd	<0.035	0.035	U		0.21
Endosulfan Sulfate	NotFnd	<0.0054	0.0054	U		0.21
4,4'-DDE	24.04	0.166	0.017	M,J		0.21
4,4'-DDD	NotFnd	<0.011	0.011	U		0.21
4,4'-DDT	26.30	0.0981	0.021	J		0.21
Endrin Aldehyde	NotFnd	<0.017	0.017	U		0.21
Methoxychlor	NotFnd	<0.12	0.12	U,1		0.21
Mirex	28.65	<0.0019	0.0010	M,J,R	0.0019	0.21

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.70	72	16-129
gamma-BHC, d6-	250	17.64	73	11-120
Heptachlor, 13C10-	250	20.00	55	5-120
Dieldrin, 13C12-	250	24.09	77	40-151
Endrin, 13C12-	250	24.72	80	35-155
Endosulfan II, 13C9-	250	24.98	87	5-122
4,4'-DDE, 13C12-	250	24.04	84	21-125
4,4'-DDD, 13C12-	250	25.25	95	5-150
4,4'-DDT, 13C12-	250	26.28	87	5-120
Methoxychlor, d6-	250	27.58	106	5-120
Mirex, 13C10-	250	28.64	108	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D1-SS-CH-200  
 ALS Sample ID L2222986-43  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 5-Jul-18  
 Extraction Date 14-Mar-19  
 Sample Size 20.04 g  
 Percent Moisture 10.0%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B18  
 Run Date 26-Mar-19 20:38  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.032	0.032	U		0.20
beta-BHC	NotFnd	<0.056	0.056	U		0.20
gamma-BHC	NotFnd	<0.034	0.034	U		0.20
delta-BHC	NotFnd	<0.042	0.042	U		0.20
Heptachlor	NotFnd	<0.0031	0.0031	U		0.20
Aldrin	NotFnd	<0.0025	0.0025	U		0.20
Heptachlor Epoxide B	22.28	0.0218	0.0051	M,J		0.20
Heptachlor Epoxide A	NotFnd	<0.035	0.035	U		0.20
trans-Chlordane	NotFnd	<0.012	0.012	U		0.20
cis-Chlordane	NotFnd	<0.011	0.011	U		0.20
Dieldrin	24.11	<0.025	0.0079	M,J,R	0.025	0.20
Endrin	24.73	<0.010	0.010	M,J,R	0.010	0.20
Endosulfan I	NotFnd	<0.012	0.012	U		0.20
Endosulfan II	NotFnd	<0.019	0.019	U		0.20
Endosulfan Sulfate	NotFnd	<0.0049	0.0049	U		0.20
4,4'-DDE	24.05	0.298	0.010	M		0.20
4,4'-DDD	25.26	0.0106	0.0079	J		0.20
4,4'-DDT	26.30	0.290	0.0052			0.20
Endrin Aldehyde	NotFnd	<0.015	0.015	U		0.20
Methoxychlor	NotFnd	<0.11	0.11	U,1.		0.20
Mirex	28.67	0.00678	0.00079	M,J,B		0.20

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.71	91	16-129
gamma-BHC, d6-	250	17.65	99	11-120
Heptachlor, 13C10-	250	20.01	68	5-120
Dieldrin, 13C12-	250	24.10	95	40-151
Endrin, 13C12-	250	24.73	99	35-155
Endosulfan II, 13C9-	250	24.99	102	5-122
4,4'-DDE, 13C12-	250	24.05	106	21-125
4,4'-DDD, 13C12-	250	25.25	110	5-150
4,4'-DDT, 13C12-	250	26.30	93	5-120
Methoxychlor, d6-	250	27.59	92	5-120
Mirex, 13C10-	250	28.65	105	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D2-SS-CH-201  
 ALS Sample ID L2222986-44  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Soil

Sampling Date 25-Sep-18  
 Extraction Date 14-Mar-19  
 Sample Size 20.04 g  
 Percent Moisture 18.2%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B19  
 Run Date 26-Mar-19 21:13  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.049	0.049	U		0.20
beta-BHC	NotFnd	<0.086	0.086	U		0.20
gamma-BHC	NotFnd	<0.054	0.054	U		0.20
delta-BHC	NotFnd	<0.066	0.066	U		0.20
Heptachlor	NotFnd	<0.0051	0.0051	U		0.20
Aldrin	NotFnd	<0.0040	0.0040	U		0.20
Heptachlor Epoxide B	NotFnd	<0.0036	0.0036	U		0.20
Heptachlor Epoxide A	NotFnd	<0.025	0.025	U		0.20
trans-Chlordane	NotFnd	<0.018	0.018	U		0.20
cis-Chlordane	NotFnd	<0.017	0.017	U		0.20
Dieldrin	NotFnd	<0.013	0.013	U		0.20
Endrin	NotFnd	<0.016	0.016	U		0.20
Endosulfan I	NotFnd	<0.025	0.025	U		0.20
Endosulfan II	NotFnd	<0.029	0.029	U		0.20
Endosulfan Sulfate	NotFnd	<0.0076	0.0076	U		0.20
4,4'-DDE	24.05	0.237	0.012	M		0.20
4,4'-DDD	NotFnd	<0.0086	0.0086	U		0.20
4,4'-DDT	26.30	0.132	0.013	J		0.20
Endrin Aldehyde	NotFnd	<0.011	0.011	U		0.20
Methoxychlor	NotFnd	<0.11	0.11	U,1.		0.20
Mirex	28.65	0.00384	0.0013	M,J,B		0.20

Extraction Standards	ng	Ret. Time	Conc. ng/g	EDL ng/g
alpha-BHC, 13C6-	250	16.71	84	16-129
gamma-BHC, d6-	250	17.65	87	11-120
Heptachlor, 13C10-	250	20.01	55	5-120
Dieldrin, 13C12-	250	24.10	77	40-151
Endrin, 13C12-	250	24.72	80	35-155
Endosulfan II, 13C9-	250	24.98	90	5-122
4,4'-DDE, 13C12-	250	24.04	93	21-125
4,4'-DDD, 13C12-	250	25.25	101	5-150
4,4'-DDT, 13C12-	250	26.28	90	5-120
Methoxychlor, d6-	250	27.59	101	5-120
Mirex, 13C10-	250	28.65	111	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D4-SD-CH-204  
 ALS Sample ID L2222986-47  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Sediment

Sampling Date 17-Oct-18  
 Extraction Date 14-Mar-19  
 Sample Size 20.01 g  
 Percent Moisture 55.0%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190326B20  
 Run Date 26-Mar-19 21:47  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.027	0.027	U		0.20
beta-BHC	NotFnd	<0.046	0.046	U		0.20
gamma-BHC	NotFnd	<0.030	0.030	U		0.20
delta-BHC	NotFnd	<0.037	0.037	U		0.20
Heptachlor	NotFnd	<0.0022	0.0022	U		0.20
Aldrin	NotFnd	<0.0040	0.0040	U		0.20
Heptachlor Epoxide B	NotFnd	<0.0050	0.0050	U		0.20
Heptachlor Epoxide A	NotFnd	<0.034	0.034	U		0.20
trans-Chlordane	NotFnd	<0.013	0.013	U		0.20
cis-Chlordane	NotFnd	<0.012	0.012	U		0.20
Dieldrin	24.11	<0.022	0.010	M,J,R	0.022	0.20
Endrin	NotFnd	<0.014	0.014	U		0.20
Endosulfan I	NotFnd	<0.013	0.013	U		0.20
Endosulfan II	NotFnd	<0.027	0.027	U		0.20
Endosulfan Sulfate	NotFnd	<0.0061	0.0061	U		0.20
4,4'-DDE	24.06	0.169	0.0085	M,J		0.20
4,4'-DDD	25.26	0.0352	0.0058	M,J		0.20
4,4'-DDT	26.30	0.0420	0.011	M,J		0.20
Endrin Aldehyde	NotFnd	<0.0082	0.0082	U		0.20
Methoxychlor	NotFnd	<0.14	0.14	U,1.		0.20
Mirex	28.65	<0.0040	0.0010	M,J,R	0.0040	0.20

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.71	84	16-129
gamma-BHC, d6-	250	17.65	91	11-120
Heptachlor, 13C10-	250	20.01	66	5-120
Dieldrin, 13C12-	250	24.10	88	40-151
Endrin, 13C12-	250	24.73	91	35-155
Endosulfan II, 13C9-	250	24.99	89	5-122
4,4'-DDE, 13C12-	250	24.05	109	21-125
4,4'-DDD, 13C12-	250	25.25	106	5-150
4,4'-DDT, 13C12-	250	26.30	71	5-120
Methoxychlor, d6-	250	27.59	53	5-120
Mirex, 13C10-	250	28.65	72	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a		
ALS Sample ID	WG2991237-1	Extraction Date	14-Mar-19		
Analysis Method	EPA 1699 (mod)	Sample Size	20.05	g	
Analysis Type	Blank	Percent Moisture	n/a		
Sample Matrix	QC	Split Ratio	2		

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	6-190326B05
Run Date	26-Mar-19 13:13
Final Volume	1020 uL
Dilution Factor	1
Analysis Units	ng/g
Instrument - Column	HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.033	0.033	U		0.20
beta-BHC	NotFnd	<0.057	0.057	U		0.20
gamma-BHC	NotFnd	<0.037	0.037	U		0.20
delta-BHC	NotFnd	<0.045	0.045	U		0.20
Heptachlor	NotFnd	<0.0039	0.0039	U		0.20
Aldrin	NotFnd	<0.0039	0.0039	U		0.20
Heptachlor Epoxide B	NotFnd	<0.0049	0.0049	U		0.20
Heptachlor Epoxide A	NotFnd	<0.033	0.033	U		0.20
trans-Chlordane	NotFnd	<0.011	0.011	U		0.20
cis-Chlordane	NotFnd	<0.010	0.010	U		0.20
Dieldrin	NotFnd	<0.0090	0.0090	U		0.20
Endrin	NotFnd	<0.015	0.015	U		0.20
Endosulfan I	NotFnd	<0.014	0.014	U		0.20
Endosulfan II	NotFnd	<0.031	0.031	U		0.20
Endosulfan Sulfate	NotFnd	<0.0052	0.0052	U		0.20
4,4'-DDE	NotFnd	<0.0089	0.0089	U		0.20
4,4'-DDD	NotFnd	<0.0093	0.0093	U		0.20
4,4'-DDT	NotFnd	<0.0066	0.0066	U		0.20
Endrin Aldehyde	NotFnd	<0.011	0.011	U		0.20
Methoxychlor	NotFnd	<0.12	0.12	U,1.		0.20
Mirex	28.65	0.00328	0.00067	M,J		0.20

Extraction Standards	ng	Ret. Time	Conc. ng/g	EDL ng/g
alpha-BHC, 13C6-	250	16.72	74	16-129
gamma-BHC, d6-	250	17.66	76	11-120
Heptachlor, 13C10-	250	20.01	48	5-120
Dieldrin, 13C12-	250	24.10	82	40-151
Endrin, 13C12-	250	24.72	66	35-155
Endosulfan II, 13C9-	250	24.99	101	5-122
4,4'-DDE, 13C12-	250	24.05	90	21-125
4,4'-DDD, 13C12-	250	25.26	87	5-150
4,4'-DDT, 13C12-	250	26.30	78	5-120
Methoxychlor, d6-	250	27.59	82	5-120
Mirex, 13C10-	250	28.65	127	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.

M Indicates that a peak has been manually integrated.

U Indicates that this compound was not detected above the EDL.

J indicates that a target analyte was detected below the calibrated range.

1. This result is an EMPC

EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a		
ALS Sample ID	WG2991237-2	Extraction Date	14-Mar-19		
Analysis Method	EPA 1699 (mod)	Sample Size	1	n/a	
Analysis Type	LCS	Percent Moisture	n/a		
Sample Matrix	QC	Split Ratio	2		

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	6-190326B03
Run Date	26-Mar-19 12:04
Final Volume	1020 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB-5 #USR737421H

Target Analytes	ng	Ret. Limits			Flags
		Time	% Rec		
alpha-BHC	50	16.73	98	50-120	
beta-BHC	50	17.59	114	50-120	
gamma-BHC	50	17.78	99	50-120	
delta-BHC	50	18.54	122	50-120	M
Heptachlor	50	20.03	92	50-120	
Aldrin	50	21.08	86	50-120	
Heptachlor Epoxide B	50	22.29	103	20-200	
Heptachlor Epoxide A	50	22.41	104	50-120	
trans-Chlordane	50	22.98	88	50-120	
cis-Chlordane	50	23.43	94	50-120	
Dieldrin	50	24.11	99	50-120	
Endrin	50	24.74	93	50-120	
Endosulfan I	50	23.34	71	50-120	
Endosulfan II	50	25.00	96	5-200	
Endosulfan Sulfate	50	26.21	116	50-200	
4,4'-DDE	50	24.05	97	50-120	
4,4'-DDD	50	25.26	64	42-120	R
4,4'-DDT	50	26.30	94	50-120	
Endrin Aldehyde	50	25.55	143	20-200	
Methoxychlor	50	27.64	91	50-120	R
Mirex	50	28.67	97	50-120	
<b>Extraction Standards</b>					
alpha-BHC, 13C6-	250	16.72	72	13-138	
gamma-BHC, d6-	250	17.66	84	5-124	
Heptachlor, 13C10-	250	20.01	50	5-128	
Dieldrin, 13C12-	250	24.10	80	19-161	
Endrin, 13C12-	250	24.73	70	20-157	
Endosulfan II, 13C9-	250	24.99	100	5-144	
4,4'-DDE, 13C12-	250	24.05	93	26-169	
4,4'-DDD, 13C12-	250	25.26	95	13-200	
4,4'-DDT, 13C12-	250	26.30	87	13-200	
Methoxychlor, d6-	250	27.59	94	8-200	
Mirex, 13C10-	250	28.65	134	5-138	

M            Indicates that a peak has been manually integrated.

R            Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

### Certificate of Analysis

<b>ALS Project Contact:</b> Lynne Wrona	<b>Client Name:</b> Stantec Consulting Limited
<b>ALS Project ID:</b> 14559	<b>Client Address:</b> 70 Southgate Dr, Suite 1
<b>ALS WO#:</b> L2222986	Guelph, ON, N1G 4P5
<b>Date of Report:</b> 31-Mar-19	Canada
<b>Date of Sample Receipt:</b> 15-Jan-19	<b>Client Contact:</b> Katherine Ketis
	<b>Client Project ID:</b> 122160003

**COMMENTS: Chlorinated Pesticides by EPA 1699 (modified)**

Initial Calibration: The low level (CS1) standard was misinjected and could not be used as part of the calibration.

Continuing Calibration Verification: Some native targets were not within the method specifications. None of these natives were detected in the samples so no impact to overall data quality expected. Some labeled Extraction (internal) Standard compounds were not within the method specifications. The native results are not biased since they are calculated by Isotope Dilution, so no impact to data quality is expected.

Laboratory Control Sample (LCS): B-BHC was above the method criteria. These analytes were not detected in the client samples so this bias is not expected to have an impact on overall data quality.

In the LCS and Method Blank, d6-methoxychlor and/or 13C10-mirex Extraction (internal) Standards were elevated. The analogous natives calculated by Isotope Dilution demonstrated positive control for these analytes, and these elevated Extraction Standard levels were not observed in the client samples so no impact to data quality is expected.

Certified by:

Bradley Reimer  
GC/MS Laboratory Senior Technical Specialist

Results in this certificate relate only to the samples as submitted to the laboratory.

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# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-W4-NG-CH-009	18-W4-FC-CH-011	18-N4-NG-CH-025	18-N4-WW-CH-027	18-E6-NG-CH-061	18-D3-NG-CH-203
ALS Sample ID	L2222986-5	L2222986-6	L2222986-12	L2222986-13	L2222986-28	L2222986-45
Sample Size	1.00	21.37	2.21	15.39	1.99	5.54
Sample size units	g	g	g	g	g	g
Percent Moisture	80.90%	28.80%	81.80%	34.60%	70.60%	79.70%
Sample Matrix	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	16-Oct-18	16-Oct-18	26-Sep-18	5-Jul-18	17-Oct-18	25-Sep-18
Extraction Date	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>
alpha-BHC	<0.59	<0.019	<0.18	<0.041	<0.22	<0.12
beta-BHC	<1.0	<0.034	<0.32	<0.073	<0.38	<0.22
gamma-BHC	<0.67	<0.022	<0.21	<0.044	<0.22	<0.14
delta-BHC	<0.84	<0.027	<0.26	<0.055	<0.28	<0.18
Heptachlor	<0.079	<0.0023	<0.021	<0.0041	<0.033	<0.011
Aldrin	<0.072	<0.0027	<0.027	<0.0043	<0.032	<0.015
Heptachlor Epoxide B	<0.070	<0.0022	<0.027	<0.0073	0.0765	<0.016
Heptachlor Epoxide A	<0.47	<0.015	<0.16	<0.049	<0.17	<0.11
trans-Chlordane	<0.31	<0.014	<0.14	<0.032	<0.12	<0.10
cis-Chlordane	<0.27	<0.012	<0.13	<0.028	<0.10	<0.091
Dieldrin	0.674	<0.0063	<0.22	<0.016	<0.31	<0.041
Endrin	<0.24	<0.0099	<0.34	<0.021	0.231	<0.068
Endosulfan I	<0.52	<0.014	<0.25	<0.032	<0.29	<0.13
Endosulfan II	<0.47	<0.049	<0.64	<0.051	<0.55	<0.42
Endosulfan Sulfate	<0.33	<0.019	<0.54	<0.016	<0.25	<0.21
4,4'-DDE	<0.23	<0.0085	<0.15	<0.016	<0.14	<0.087
4,4'-DDD	<0.25	<0.020	<0.48	<0.019	<0.26	<0.29
4,4'-DDT	<0.64	<0.047	<0.55	<0.039	<0.32	<0.25
Endrin Aldehyde	<0.48	<0.031	<0.26	<0.039	<0.27	<0.19
Methoxychlor	<1.8	<0.23	<2.3	<0.29	<2.7	<1.0
Mirex	0.215	<0.0053	<0.087	<0.0055	<0.058	<0.053
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	71	79	67	59	67	78
gamma-BHC, d6-	74	83	69	63	74	80
Heptachlor, 13C10-	39	42	39	36	43	57
Dieldrin, 13C12-	61	71	60	52	60	69
Endrin, 13C12-	56	61	47	50	56	52
Endosulfan II, 13C9-	60	51	38	46	46	37
4,4'-DDE, 13C12-	68	72	52	59	63	60
4,4'-DDD, 13C12-	61	39	27	48	39	39
4,4'-DDT, 13C12-	61	37	27	51	41	34
Methoxychlor, d6-	107	70	71	102	87	94
Mirex, 13C10-	95	54	40	67	60	46



# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-D9-NG-CH-220	18-D5-SB-CH-205	18-D6-FC-CH-207	18-D7-WW-CH-209
ALS Sample ID	L2222986-46	L2222986-48	L2222986-49	L2222986-50
Sample Size	4.27	21.27	18.48	16.11
Sample size units	g	g	g	g
Percent Moisture	75.60%	37.80%	27.20%	37.00%
Sample Matrix	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	16-Oct-18	26-Sep-18	16-Oct-18	5-Jul-18
Extraction Date	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>	<b>ng/g</b>
alpha-BHC	<0.17	<0.049	<0.042	<0.057
beta-BHC	<0.31	<0.088	<0.075	<0.10
gamma-BHC	<0.19	<0.053	<0.044	<0.070
delta-BHC	<0.24	<0.067	<0.056	<0.087
Heptachlor	<0.015	<0.0038	<0.0041	<0.0055
Aldrin	<0.018	<0.0036	<0.0038	<0.0048
Heptachlor Epoxide B	0.0328	<0.0051	<0.0036	<0.0047
Heptachlor Epoxide A	<0.20	<0.035	<0.024	<0.031
trans-Chlordane	<0.14	<0.021	<0.017	<0.023
cis-Chlordane	<0.12	<0.019	<0.015	<0.020
Dieldrin	<0.16	0.0547	<0.017	<0.030
Endrin	<0.086	<0.0098	<0.025	<0.018
Endosulfan I	<0.14	<0.018	<0.029	<0.036
Endosulfan II	<0.36	<0.056	<0.063	<0.091
Endosulfan Sulfate	<0.18	<0.026	<0.042	<0.030
4,4'-DDE	<0.12	<0.016	<0.021	<0.022
4,4'-DDD	<0.23	<0.027	<0.045	<0.058
4,4'-DDT	<0.54	<0.069	<0.14	<0.14
Endrin Aldehyde	<0.15	<0.034	<0.036	<0.027
Methoxychlor	<0.85	<0.24	<0.19	<0.43
Mirex	<0.046	<0.0048	<0.013	<0.014
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	69	66	65	61
gamma-BHC, d6-	74	72	74	62
Heptachlor, 13C10-	36	36	40	39
Dieldrin, 13C12-	56	62	62	57
Endrin, 13C12-	47	55	56	53
Endosulfan II, 13C9-	41	54	45	42
4,4'-DDE, 13C12-	54	72	62	56
4,4'-DDD, 13C12-	35	61	40	36
4,4'-DDT, 13C12-	33	63	41	33
Methoxychlor, d6-	65	127	79	78
Mirex, 13C10-	57	97	56	48

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2991227-1	WG2991227-2
Sample Size	20.09	1
Sample size units	g	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	13-Mar-19	13-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>% Rec</b>
alpha-BHC	<0.048	90
beta-BHC	<0.085	136
gamma-BHC	<0.053	95
delta-BHC	<0.067	119
Heptachlor	<0.0059	90
Aldrin	<0.0058	70
Heptachlor Epoxide B	<0.0091	95
Heptachlor Epoxide A	<0.061	99
trans-Chlordane	<0.018	86
cis-Chlordane	<0.016	86
Dieldrin	<0.014	91
Endrin	<0.020	91
Endosulfan I	<0.010	55
Endosulfan II	<0.050	96
Endosulfan Sulfate	<0.18	166
4,4'-DDE	<0.012	88
4,4'-DDD	<0.018	83
4,4'-DDT	<0.029	91
Endrin Aldehyde	<0.051	144
Methoxychlor	<0.14	82
Mirex	<0.0045	95
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	61	33
gamma-BHC, d6-	63	37
Heptachlor, 13C10-	37	21
Dieldrin, 13C12-	63	46
Endrin, 13C12-	59	44
Endosulfan II, 13C9-	80	66
4,4'-DDE, 13C12-	79	60
4,4'-DDD, 13C12-	111	87
4,4'-DDT, 13C12-	135	106
Methoxychlor, d6-	304	242
Mirex, 13C10-	258	208

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W4-NG-CH-009  
 ALS Sample ID L2222986-5  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19  
 Sample Size 1.00 g  
 Percent Moisture 80.9%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B06  
 Run Date 27-Mar-19 06:49  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.59	0.59	U		15
beta-BHC	NotFnd	<1.0	1.0	U		15
gamma-BHC	NotFnd	<0.67	0.67	U		15
delta-BHC	NotFnd	<0.84	0.84	U		15
Heptachlor	NotFnd	<0.079	0.079	U		15
Aldrin	NotFnd	<0.072	0.072	U		15
Heptachlor Epoxide B	NotFnd	<0.070	0.070	U		15
Heptachlor Epoxide A	NotFnd	<0.47	0.47	U		15
trans-Chlordane	NotFnd	<0.31	0.31	U		15
cis-Chlordane	NotFnd	<0.27	0.27	U		15
Dieldrin	24.10	0.674	0.17	M,J		15
Endrin	NotFnd	<0.24	0.24	U		15
Endosulfan I	NotFnd	<0.52	0.52	U		15
Endosulfan II	NotFnd	<0.47	0.47	U		15
Endosulfan Sulfate	NotFnd	<0.33	0.33	U		15
4,4'-DDE	NotFnd	<0.23	0.23	U		15
4,4'-DDD	NotFnd	<0.25	0.25	U		15
4,4'-DDT	NotFnd	<0.64	0.64	U		15
Endrin Aldehyde	NotFnd	<0.48	0.48	U		15
Methoxychlor	NotFnd	<1.8	1.8	U,1.		15
Mirex	28.67	0.215	0.063	M,J		15

Extraction Standards	ng	Ret. Time	Conc. ng/g	EDL ng/g	Flags
alpha-BHC, 13C6-	250	16.71	71	16-129	
gamma-BHC, d6-	250	17.65	74	11-120	
Heptachlor, 13C10-	250	20.01	39	5-120	
Dieldrin, 13C12-	250	24.10	61	40-151	
Endrin, 13C12-	250	24.72	56	35-155	
Endosulfan II, 13C9-	250	24.99	60	5-122	
4,4'-DDE, 13C12-	250	24.04	68	21-125	
4,4'-DDD, 13C12-	250	25.26	61	5-150	
4,4'-DDT, 13C12-	250	26.30	61	5-120	
Methoxychlor, d6-	250	27.59	107	5-120	
Mirex, 13C10-	250	28.65	95	5-120	

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W4-FC-CH-011  
 ALS Sample ID L2222986-6  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19  
 Sample Size 21.37 g  
 Percent Moisture 28.8%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B07  
 Run Date 27-Mar-19 07:23  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.019	0.019	U		0.72
beta-BHC	NotFnd	<0.034	0.034	U		0.72
gamma-BHC	NotFnd	<0.022	0.022	U		0.72
delta-BHC	NotFnd	<0.027	0.027	U		0.72
Heptachlor	NotFnd	<0.0023	0.0023	U		0.72
Aldrin	NotFnd	<0.0027	0.0027	U		0.72
Heptachlor Epoxide B	NotFnd	<0.0022	0.0022	U		0.72
Heptachlor Epoxide A	NotFnd	<0.015	0.015	U		0.72
trans-Chlordane	NotFnd	<0.014	0.014	U		0.72
cis-Chlordane	NotFnd	<0.012	0.012	U		0.72
Dieldrin	NotFnd	<0.0063	0.0063	U		0.72
Endrin	NotFnd	<0.0099	0.0099	U		0.72
Endosulfan I	NotFnd	<0.014	0.014	U		0.72
Endosulfan II	NotFnd	<0.049	0.049	U		0.72
Endosulfan Sulfate	NotFnd	<0.019	0.019	U		0.72
4,4'-DDE	NotFnd	<0.0085	0.0085	U		0.72
4,4'-DDD	NotFnd	<0.020	0.020	U		0.72
4,4'-DDT	NotFnd	<0.047	0.047	U		0.72
Endrin Aldehyde	NotFnd	<0.031	0.031	U		0.72
Methoxychlor	NotFnd	<0.23	0.23	U,1.		0.72
Mirex	NotFnd	<0.0053	0.0053	U		0.72

Extraction Standards	ng
alpha-BHC, 13C6-	250
gamma-BHC, d6-	250
Heptachlor, 13C10-	250
Dieldrin, 13C12-	250
Endrin, 13C12-	250
Endosulfan II, 13C9-	250
4,4'-DDE, 13C12-	250
4,4'-DDD, 13C12-	250
4,4'-DDT, 13C12-	250
Methoxychlor, d6-	250
Mirex, 13C10-	250

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
  
 U Indicates that this compound was not detected above the EDL.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-NG-CH-025  
 ALS Sample ID L2222986-12  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 13-Mar-19  
 Sample Size 2.21 g  
 Percent Moisture 81.8%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B08  
 Run Date 27-Mar-19 07:57  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.18	0.18	U		6.9
beta-BHC	NotFnd	<0.32	0.32	U		6.9
gamma-BHC	NotFnd	<0.21	0.21	U		6.9
delta-BHC	NotFnd	<0.26	0.26	U		6.9
Heptachlor	NotFnd	<0.021	0.021	U		6.9
Aldrin	NotFnd	<0.027	0.027	U		6.9
Heptachlor Epoxide B	22.28	<0.027	0.024	M,J,R	0.027	6.9
Heptachlor Epoxide A	NotFnd	<0.16	0.16	U		6.9
trans-Chlordane	NotFnd	<0.14	0.14	U		6.9
cis-Chlordane	NotFnd	<0.13	0.13	U		6.9
Dieldrin	NotFnd	<0.22	0.22	U		6.9
Endrin	NotFnd	<0.34	0.34	U		6.9
Endosulfan I	NotFnd	<0.25	0.25	U		6.9
Endosulfan II	NotFnd	<0.64	0.64	U		6.9
Endosulfan Sulfate	NotFnd	<0.54	0.54	U		6.9
4,4'-DDE	NotFnd	<0.15	0.15	U		6.9
4,4'-DDD	NotFnd	<0.48	0.48	U		6.9
4,4'-DDT	NotFnd	<0.55	0.55	U		6.9
Endrin Aldehyde	NotFnd	<0.26	0.26	U		6.9
Methoxychlor	NotFnd	<2.3	2.3	U,1.		6.9
Mirex	NotFnd	<0.087	0.087	U		6.9

**Extraction Standards** **ng**

alpha-BHC, 13C6-	250	16.71	67	16-129
gamma-BHC, d6-	250	17.64	69	11-120
Heptachlor, 13C10-	250	20.01	39	5-120
Dieldrin, 13C12-	250	24.10	60	40-151
Endrin, 13C12-	250	24.72	47	35-155
Endosulfan II, 13C9-	250	24.98	38	5-122
4,4'-DDE, 13C12-	250	24.04	52	21-125
4,4'-DDD, 13C12-	250	25.25	27	5-150
4,4'-DDT, 13C12-	250	26.30	27	5-120
Methoxychlor, d6-	250	27.59	71	5-120
Mirex, 13C10-	250	28.65	40	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-WW-CH-027  
 ALS Sample ID L2222986-13  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 5-Jul-18  
 Extraction Date 13-Mar-19  
 Sample Size 15.39 g  
 Percent Moisture 34.6%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B12  
 Run Date 27-Mar-19 10:15  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.041	0.041	U		0.99
beta-BHC	NotFnd	<0.073	0.073	U		0.99
gamma-BHC	NotFnd	<0.044	0.044	U		0.99
delta-BHC	NotFnd	<0.055	0.055	U		0.99
Heptachlor	NotFnd	<0.0041	0.0041	U		0.99
Aldrin	NotFnd	<0.0043	0.0043	U		0.99
Heptachlor Epoxide B	NotFnd	<0.0073	0.0073	U		0.99
Heptachlor Epoxide A	NotFnd	<0.049	0.049	U		0.99
trans-Chlordane	NotFnd	<0.032	0.032	U		0.99
cis-Chlordane	NotFnd	<0.028	0.028	U		0.99
Dieldrin	NotFnd	<0.016	0.016	U		0.99
Endrin	NotFnd	<0.021	0.021	U		0.99
Endosulfan I	NotFnd	<0.032	0.032	U		0.99
Endosulfan II	NotFnd	<0.051	0.051	U		0.99
Endosulfan Sulfate	NotFnd	<0.016	0.016	U		0.99
4,4'-DDE	NotFnd	<0.016	0.016	U		0.99
4,4'-DDD	NotFnd	<0.019	0.019	U		0.99
4,4'-DDT	NotFnd	<0.039	0.039	U		0.99
Endrin Aldehyde	NotFnd	<0.039	0.039	U		0.99
Methoxychlor	NotFnd	<0.29	0.29	U,1.		0.99
Mirex	NotFnd	<0.0055	0.0055	U		0.99

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.71	59	16-129
gamma-BHC, d6-	250	17.65	63	11-120
Heptachlor, 13C10-	250	20.01	36	5-120
Dieldrin, 13C12-	250	24.10	52	40-151
Endrin, 13C12-	250	24.73	50	35-155
Endosulfan II, 13C9-	250	24.99	46	5-122
4,4'-DDE, 13C12-	250	24.05	59	21-125
4,4'-DDD, 13C12-	250	25.26	48	5-150
4,4'-DDT, 13C12-	250	26.30	51	5-120
Methoxychlor, d6-	250	27.59	102	5-120
Mirex, 13C10-	250	28.65	67	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
  
 U Indicates that this compound was not detected above the EDL.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E6-NG-CH-061  
 ALS Sample ID L2222986-28  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 17-Oct-18  
 Extraction Date 13-Mar-19  
 Sample Size 1.99 g  
 Percent Moisture 70.6%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B13  
 Run Date 27-Mar-19 10:49  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.22	0.22	U		7.7
beta-BHC	NotFnd	<0.38	0.38	U		7.7
gamma-BHC	NotFnd	<0.22	0.22	U		7.7
delta-BHC	NotFnd	<0.28	0.28	U		7.7
Heptachlor	NotFnd	<0.033	0.033	U		7.7
Aldrin	NotFnd	<0.032	0.032	U		7.7
Heptachlor Epoxide B	22.27	0.0765	0.025	M,J		7.7
Heptachlor Epoxide A	NotFnd	<0.17	0.17	U		7.7
trans-Chlordane	NotFnd	<0.12	0.12	U		7.7
cis-Chlordane	NotFnd	<0.10	0.10	U		7.7
Dieldrin	24.10	<0.31	0.14	M,J,R	0.31	7.7
Endrin	24.72	0.231	0.19	M,J		7.7
Endosulfan I	NotFnd	<0.29	0.29	U		7.7
Endosulfan II	NotFnd	<0.55	0.55	U		7.7
Endosulfan Sulfate	NotFnd	<0.25	0.25	U		7.7
4,4'-DDE	NotFnd	<0.14	0.14	U		7.7
4,4'-DDD	NotFnd	<0.26	0.26	U		7.7
4,4'-DDT	NotFnd	<0.32	0.32	U		7.7
Endrin Aldehyde	NotFnd	<0.27	0.27	U		7.7
Methoxychlor	NotFnd	<2.7	2.7	U,1.		7.7
Mirex	NotFnd	<0.058	0.058	U		7.7

**Extraction Standards**     **ng**

alpha-BHC, 13C6-	250	16.70	67	16-129
gamma-BHC, d6-	250	17.64	74	11-120
Heptachlor, 13C10-	250	20.00	43	5-120
Dieldrin, 13C12-	250	24.09	60	40-151
Endrin, 13C12-	250	24.72	56	35-155
Endosulfan II, 13C9-	250	24.98	46	5-122
4,4'-DDE, 13C12-	250	24.04	63	21-125
4,4'-DDD, 13C12-	250	25.25	39	5-150
4,4'-DDT, 13C12-	250	26.28	41	5-120
Methoxychlor, d6-	250	27.59	87	5-120
Mirex, 13C10-	250	28.64	60	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D3-NG-CH-203  
 ALS Sample ID L2222986-45  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 13-Mar-19  
 Sample Size 5.54 g  
 Percent Moisture 79.7%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B14  
 Run Date 27-Mar-19 11:23  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.12	0.12	U		2.8
beta-BHC	NotFnd	<0.22	0.22	U		2.8
gamma-BHC	NotFnd	<0.14	0.14	U		2.8
delta-BHC	NotFnd	<0.18	0.18	U		2.8
Heptachlor	NotFnd	<0.011	0.011	U		2.8
Aldrin	NotFnd	<0.015	0.015	U		2.8
Heptachlor Epoxide B	NotFnd	<0.016	0.016	U		2.8
Heptachlor Epoxide A	NotFnd	<0.11	0.11	U		2.8
trans-Chlordane	NotFnd	<0.10	0.10	U		2.8
cis-Chlordane	NotFnd	<0.091	0.091	U		2.8
Dieldrin	NotFnd	<0.041	0.041	U		2.8
Endrin	NotFnd	<0.068	0.068	U		2.8
Endosulfan I	NotFnd	<0.13	0.13	U		2.8
Endosulfan II	NotFnd	<0.42	0.42	U		2.8
Endosulfan Sulfate	NotFnd	<0.21	0.21	U		2.8
4,4'-DDE	NotFnd	<0.087	0.087	U		2.8
4,4'-DDD	NotFnd	<0.29	0.29	U		2.8
4,4'-DDT	NotFnd	<0.25	0.25	U		2.8
Endrin Aldehyde	NotFnd	<0.19	0.19	U		2.8
Methoxychlor	NotFnd	<1.0	1.0	U,1.		2.8
Mirex	NotFnd	<0.053	0.053	U		2.8

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	16.72	78	16-129
gamma-BHC, d6-	250	17.65	80	11-120
Heptachlor, 13C10-	250	20.02	57	5-120
Dieldrin, 13C12-	250	24.10	69	40-151
Endrin, 13C12-	250	24.73	52	35-155
Endosulfan II, 13C9-	250	24.99	37	5-122
4,4'-DDE, 13C12-	250	24.05	60	21-125
4,4'-DDD, 13C12-	250	25.26	39	5-150
4,4'-DDT, 13C12-	250	26.30	34	5-120
Methoxychlor, d6-	250	27.59	94	5-120
Mirex, 13C10-	250	28.65	46	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
  
 U Indicates that this compound was not detected above the EDL.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D9-NG-CH-220  
 ALS Sample ID L2222986-46  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19  
 Sample Size 4.27 g  
 Percent Moisture 75.6%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B18  
 Run Date 27-Mar-19 13:40  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.17	0.17	U		3.6
beta-BHC	NotFnd	<0.31	0.31	U		3.6
gamma-BHC	NotFnd	<0.19	0.19	U		3.6
delta-BHC	NotFnd	<0.24	0.24	U		3.6
Heptachlor	NotFnd	<0.015	0.015	U		3.6
Aldrin	NotFnd	<0.018	0.018	U		3.6
Heptachlor Epoxide B	22.28	0.0328	0.030	M,J		3.6
Heptachlor Epoxide A	NotFnd	<0.20	0.20	U		3.6
trans-Chlordane	NotFnd	<0.14	0.14	U		3.6
cis-Chlordane	NotFnd	<0.12	0.12	U		3.6
Dieldrin	24.11	<0.16	0.056	M,J,R	0.16	3.6
Endrin	NotFnd	<0.086	0.086	U		3.6
Endosulfan I	NotFnd	<0.14	0.14	U		3.6
Endosulfan II	NotFnd	<0.36	0.36	U		3.6
Endosulfan Sulfate	NotFnd	<0.18	0.18	U		3.6
4,4'-DDE	NotFnd	<0.12	0.12	U		3.6
4,4'-DDD	NotFnd	<0.23	0.23	U		3.6
4,4'-DDT	NotFnd	<0.54	0.54	U		3.6
Endrin Aldehyde	NotFnd	<0.15	0.15	U		3.6
Methoxychlor	NotFnd	<0.85	0.85	U,1.		3.6
Mirex	NotFnd	<0.046	0.046	U		3.6

Extraction Standards	ng	Ret. Time	Conc. ng/g	EDL ng/g
alpha-BHC, 13C6-	250	16.71	69	16-129
gamma-BHC, d6-	250	17.65	74	11-120
Heptachlor, 13C10-	250	20.01	36	5-120
Dieldrin, 13C12-	250	24.10	56	40-151
Endrin, 13C12-	250	24.72	47	35-155
Endosulfan II, 13C9-	250	24.98	41	5-122
4,4'-DDE, 13C12-	250	24.04	54	21-125
4,4'-DDD, 13C12-	250	25.25	35	5-150
4,4'-DDT, 13C12-	250	26.30	33	5-120
Methoxychlor, d6-	250	27.59	65	5-120
Mirex, 13C10-	250	28.64	57	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D5-SB-CH-205  
 ALS Sample ID L2222986-48  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 13-Mar-19  
 Sample Size 21.27 g  
 Percent Moisture 37.8%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B19  
 Run Date 27-Mar-19 14:14  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.049	0.049	U		0.72
beta-BHC	NotFnd	<0.088	0.088	U		0.72
gamma-BHC	NotFnd	<0.053	0.053	U		0.72
delta-BHC	NotFnd	<0.067	0.067	U		0.72
Heptachlor	NotFnd	<0.0038	0.0038	U		0.72
Aldrin	NotFnd	<0.0036	0.0036	U		0.72
Heptachlor Epoxide B	NotFnd	<0.0051	0.0051	U		0.72
Heptachlor Epoxide A	NotFnd	<0.035	0.035	U		0.72
trans-Chlordane	NotFnd	<0.021	0.021	U		0.72
cis-Chlordane	NotFnd	<0.019	0.019	U		0.72
Dieldrin	24.11	0.0547	0.0063	M,J		0.72
Endrin	NotFnd	<0.0098	0.0098	U		0.72
Endosulfan I	NotFnd	<0.018	0.018	U		0.72
Endosulfan II	NotFnd	<0.056	0.056	U		0.72
Endosulfan Sulfate	NotFnd	<0.026	0.026	U		0.72
4,4'-DDE	NotFnd	<0.016	0.016	U		0.72
4,4'-DDD	NotFnd	<0.027	0.027	U		0.72
4,4'-DDT	NotFnd	<0.069	0.069	U		0.72
Endrin Aldehyde	NotFnd	<0.034	0.034	U		0.72
Methoxychlor	NotFnd	<0.24	0.24	U,1.		0.72
Mirex	NotFnd	<0.0048	0.0048	U		0.72

Extraction Standards	ng	Ret. Time	Conc. ng/g	EDL ng/g
alpha-BHC, 13C6-	250	16.72	66	16-129
gamma-BHC, d6-	250	17.65	72	11-120
Heptachlor, 13C10-	250	20.01	36	5-120
Dieldrin, 13C12-	250	24.10	62	40-151
Endrin, 13C12-	250	24.72	55	35-155
Endosulfan II, 13C9-	250	24.99	54	5-122
4,4'-DDE, 13C12-	250	24.04	72	21-125
4,4'-DDD, 13C12-	250	25.26	61	5-150
4,4'-DDT, 13C12-	250	26.30	63	5-120
Methoxychlor, d6-	250	27.59	127	5-120
Mirex, 13C10-	250	28.65	97	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D6-FC-CH-207  
 ALS Sample ID L2222986-49  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19  
 Sample Size 18.48 g  
 Percent Moisture 27.2%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B20  
 Run Date 27-Mar-19 14:49  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.042	0.042	U		0.83
beta-BHC	NotFnd	<0.075	0.075	U		0.83
gamma-BHC	NotFnd	<0.044	0.044	U		0.83
delta-BHC	NotFnd	<0.056	0.056	U		0.83
Heptachlor	NotFnd	<0.0041	0.0041	U		0.83
Aldrin	NotFnd	<0.0038	0.0038	U		0.83
Heptachlor Epoxide B	NotFnd	<0.0036	0.0036	U		0.83
Heptachlor Epoxide A	NotFnd	<0.024	0.024	U		0.83
trans-Chlordane	NotFnd	<0.017	0.017	U		0.83
cis-Chlordane	NotFnd	<0.015	0.015	U		0.83
Dieldrin	NotFnd	<0.017	0.017	U		0.83
Endrin	NotFnd	<0.025	0.025	U		0.83
Endosulfan I	NotFnd	<0.029	0.029	U		0.83
Endosulfan II	NotFnd	<0.063	0.063	U		0.83
Endosulfan Sulfate	NotFnd	<0.042	0.042	U		0.83
4,4'-DDE	NotFnd	<0.021	0.021	U		0.83
4,4'-DDD	NotFnd	<0.045	0.045	U		0.83
4,4'-DDT	NotFnd	<0.14	0.14	U		0.83
Endrin Aldehyde	NotFnd	<0.036	0.036	U		0.83
Methoxychlor	NotFnd	<0.19	0.19	U,1.		0.83
Mirex	NotFnd	<0.013	0.013	U		0.83

Extraction Standards	ng
alpha-BHC, 13C6-	250
gamma-BHC, d6-	250
Heptachlor, 13C10-	250
Dieldrin, 13C12-	250
Endrin, 13C12-	250
Endosulfan II, 13C9-	250
4,4'-DDE, 13C12-	250
4,4'-DDD, 13C12-	250
4,4'-DDT, 13C12-	250
Methoxychlor, d6-	250
Mirex, 13C10-	250

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 U Indicates that this compound was not detected above the EDL.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D7-WW-CH-209  
 ALS Sample ID L2222986-50  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 5-Jul-18  
 Extraction Date 13-Mar-19  
 Sample Size 16.11 g  
 Percent Moisture 37.0%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190327B21  
 Run Date 27-Mar-19 15:23  
 Final Volume 1020 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.057	0.057	U		0.95
beta-BHC	NotFnd	<0.10	0.10	U		0.95
gamma-BHC	NotFnd	<0.070	0.070	U		0.95
delta-BHC	NotFnd	<0.087	0.087	U		0.95
Heptachlor	NotFnd	<0.0055	0.0055	U		0.95
Aldrin	NotFnd	<0.0048	0.0048	U		0.95
Heptachlor Epoxide B	NotFnd	<0.0047	0.0047	U		0.95
Heptachlor Epoxide A	NotFnd	<0.031	0.031	U		0.95
trans-Chlordane	NotFnd	<0.023	0.023	U		0.95
cis-Chlordane	NotFnd	<0.020	0.020	U		0.95
Dieldrin	24.11	<0.030	0.013	M,J,R	0.030	0.95
Endrin	NotFnd	<0.018	0.018	U		0.95
Endosulfan I	NotFnd	<0.036	0.036	U		0.95
Endosulfan II	NotFnd	<0.091	0.091	U		0.95
Endosulfan Sulfate	NotFnd	<0.030	0.030	U		0.95
4,4'-DDE	NotFnd	<0.022	0.022	U		0.95
4,4'-DDD	NotFnd	<0.058	0.058	U		0.95
4,4'-DDT	NotFnd	<0.14	0.14	U		0.95
Endrin Aldehyde	NotFnd	<0.027	0.027	U		0.95
Methoxychlor	NotFnd	<0.43	0.43	U,1.		0.95
Mirex	NotFnd	<0.014	0.014	U		0.95

Extraction Standards	ng	ng/g	ng/g	Flags
alpha-BHC, 13C6-	250	16.73	61	16-129
gamma-BHC, d6-	250	17.66	62	11-120
Heptachlor, 13C10-	250	20.02	39	5-120
Dieldrin, 13C12-	250	24.11	57	40-151
Endrin, 13C12-	250	24.73	53	35-155
Endosulfan II, 13C9-	250	24.99	42	5-122
4,4'-DDE, 13C12-	250	24.05	56	21-125
4,4'-DDD, 13C12-	250	25.26	36	5-150
4,4'-DDT, 13C12-	250	26.30	33	5-120
Methoxychlor, d6-	250	27.61	78	5-120
Mirex, 13C10-	250	28.65	48	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	Method Blank	Sampling Date	n/a	
ALS Sample ID	WG2991227-1	Extraction Date	13-Mar-19	
Analysis Method	EPA 1699 (mod)	Sample Size	20.09	g
Analysis Type	Blank	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	2	

Approved:  
*B. Reimer*  
 --e-signature--  
 31-Mar-2019

<b>Run Information</b>		<b>Run 1</b>	
Filename	6-190327B05		
Run Date	27-Mar-19 06:14		
Final Volume	1020 uL		
Dilution Factor	1		
Analysis Units	ng/g		
Instrument - Column	HRMS-6 DB5 #USR737421H		

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.048	0.048	U		0.76
beta-BHC	NotFnd	<0.085	0.085	U		0.76
gamma-BHC	NotFnd	<0.053	0.053	U		0.76
delta-BHC	NotFnd	<0.067	0.067	U		0.76
Heptachlor	NotFnd	<0.0059	0.0059	U		0.76
Aldrin	NotFnd	<0.0058	0.0058	U		0.76
Heptachlor Epoxide B	NotFnd	<0.0091	0.0091	U		0.76
Heptachlor Epoxide A	NotFnd	<0.061	0.061	U		0.76
trans-Chlordane	NotFnd	<0.018	0.018	U		0.76
cis-Chlordane	NotFnd	<0.016	0.016	U		0.76
Dieldrin	NotFnd	<0.014	0.014	U		0.76
Endrin	NotFnd	<0.020	0.020	U		0.76
Endosulfan I	NotFnd	<0.010	0.010	U		0.76
Endosulfan II	NotFnd	<0.050	0.050	U		0.76
Endosulfan Sulfate	NotFnd	<0.18	0.18	U		0.76
4,4'-DDE	NotFnd	<0.012	0.012	U		0.76
4,4'-DDD	NotFnd	<0.018	0.018	U		0.76
4,4'-DDT	NotFnd	<0.029	0.029	U		0.76
Endrin Aldehyde	NotFnd	<0.051	0.051	U		0.76
Methoxychlor	NotFnd	<0.14	0.14	U,1.		0.76
Mirex	28.65	<0.0045	0.0019	M,J,R	0.0045	0.76
<b>Extraction Standards</b>						
alpha-BHC, 13C6-	250	16.72	61	16-129		
gamma-BHC, d6-	250	17.65	63	11-120		
Heptachlor, 13C10-	250	20.01	37	5-120		
Dieldrin, 13C12-	250	24.10	63	40-151		
Endrin, 13C12-	250	24.72	59	35-155		
Endosulfan II, 13C9-	250	24.99	80	5-122		
4,4'-DDE, 13C12-	250	24.05	79	21-125		
4,4'-DDD, 13C12-	250	25.26	111	5-150		
4,4'-DDT, 13C12-	250	26.30	135	5-120		
Methoxychlor, d6-	250	27.61	304	5-120		
Mirex, 13C10-	250	28.65	258	5-120		

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.

M Indicates that a peak has been manually integrated.

U Indicates that this compound was not detected above the EDL.

J Indicates that a target analyte was detected below the calibrated range.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

1. This result is an EMPC

EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a		
ALS Sample ID	WG2991227-2	Extraction Date	13-Mar-19		
Analysis Method	EPA 1699 (mod)	Sample Size	1	n/a	
Analysis Type	LCS	Percent Moisture	n/a		
Sample Matrix	QC	Split Ratio	2		

Approved:  
B. Reimer  
--e-signature--  
31-Mar-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	6-190327B03
Run Date	27-Mar-19 05:06
Final Volume	1020 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB5 #USR737421H

Target Analytes	ng	Ret. Limits		
		Time	% Rec	Flags
alpha-BHC	50	16.73	90	50-120
beta-BHC	50	17.60	136	50-120
gamma-BHC	50	17.78	95	50-120
delta-BHC	50	18.54	119	50-120
Heptachlor	50	20.03	90	50-120
Aldrin	50	21.09	70	50-120
Heptachlor Epoxide B	50	22.29	95	20-200
Heptachlor Epoxide A	50	22.42	99	50-120
trans-Chlordane	50	22.98	86	50-120
cis-Chlordane	50	23.44	86	50-120
Dieldrin	50	24.12	91	50-120
Endrin	50	24.74	91	50-120
Endosulfan I	50	23.35	55	50-120
Endosulfan II	50	25.00	96	5-200
Endosulfan Sulfate	50	26.23	166	50-200
4,4'-DDE	50	24.06	88	50-120
4,4'-DDD	50	25.29	83	42-120
4,4'-DDT	50	26.32	91	50-120
Endrin Aldehyde	50	25.57	144	20-200
Methoxychlor	50	27.67	82	50-120
Mirex	50	28.67	95	50-120
<b>Extraction Standards</b>				
alpha-BHC, 13C6-	250	16.72	33	13-138
gamma-BHC, d6-	250	17.66	37	5-124
Heptachlor, 13C10-	250	20.01	21	5-128
Dieldrin, 13C12-	250	24.10	46	19-161
Endrin, 13C12-	250	24.73	44	20-157
Endosulfan II, 13C9-	250	24.99	66	5-144
4,4'-DDE, 13C12-	250	24.05	60	26-169
4,4'-DDD, 13C12-	250	25.27	87	13-200
4,4'-DDT, 13C12-	250	26.30	106	13-200
Methoxychlor, d6-	250	27.63	242	8-200
Mirex, 13C10-	250	28.65	208	5-138



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

<b>ALS Project Contact:</b> Lynne Wrona	<b>Client Name:</b> Stantec Consulting Limited
<b>ALS Project ID:</b> 14559	<b>Client Address:</b> 70 Southgate Dr, Suite 1
<b>ALS WO#:</b> L2222986	Guelph, ON, N1G 4P5
<b>Date of Report:</b> 31-Mar-19	Canada
<b>Date of Sample Receipt:</b> 15-Jan-19	<b>Client Contact:</b> Katherine Ketis
	<b>Client Project ID:</b> 122160003

**COMMENTS: Chlorinated Pesticides by EPA 1699 (modified)**

Post-Run Continuing Calibration Verification: Some native and labeled analytes are marginally outside method acceptance limits due to matrix contamination of chromatographic components during sample analysis. The native targets affected by the failures are not detected in the sample so no impact to overall data quality is expected.

Initial Calibration: There was some chromatographic peak distortion due to poor injection focusing for selected early eluting compounds in CS1 to CS3 level standards. This is evident in the chromatographic data, but does not affect peak area response or linearity, and did not affect QC or client samples.

Certified by:

A handwritten signature in black ink, appearing to read "Bradley Reimer", is written over a horizontal line.

Bradley Reimer  
GC/MS Laboratory Senior Technical Specialist

Results in this certificate relate only to the samples as submitted to the laboratory.

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# ALS Life Sciences

## Sample Analysis summary Report

**Sample Name** 18-E2-SB-CH-051

ALS Sample ID L2222986-23

Sample Size 19.92

Sample size units g

Percent Moisture 40.40%

Sample Matrix Plant Tissue

Sampling Date 26-Sep-18

Extraction Date 25-Mar-19

**Target Analytes** **ng/g**

alpha-BHC	<0.0071
beta-BHC	<0.011
gamma-BHC	<0.0090
delta-BHC	<0.010
Heptachlor	<0.00085
Aldrin	<0.00087
Heptachlor Epoxide B	0.0170
Heptachlor Epoxide A	<0.010
trans-Chlordane	<0.010
cis-Chlordane	0.0192
Dieldrin	0.0555
Endrin	<0.013
Endosulfan I	<0.013
Endosulfan II	<0.018
Endosulfan Sulfate	0.0167
4,4'-DDE	<0.0050
4,4'-DDD	<0.0056
4,4'-DDT	<0.0093
Endrin Aldehyde	<0.0051
Methoxychlor	<0.21
Mirex	<0.0039

**Extraction Standards** **% Rec**

alpha-BHC, 13C6-	47
gamma-BHC, d6-	49
Heptachlor, 13C10-	65
Dieldrin, 13C12-	65
Endrin, 13C12-	94
Endosulfan II, 13C9-	57
4,4'-DDE, 13C12-	68
4,4'-DDD, 13C12-	66
4,4'-DDT, 13C12-	71
Methoxychlor, d6-	92
Mirex, 13C10-	64



# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG3010136-1	WG3010136-2
Sample Size	20.00	1
Sample size units	g	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	25-Mar-19	25-Mar-19
<b>Target Analytes</b>	<b>ng/g</b>	<b>% Rec</b>
alpha-BHC	<0.013	98
beta-BHC	<0.020	94
gamma-BHC	<0.015	101
delta-BHC	<0.017	107
Heptachlor	<0.0018	100
Aldrin	<0.0016	95
Heptachlor Epoxide B	0.00405	111
Heptachlor Epoxide A	<0.017	100
trans-Chlordane	<0.0059	102
cis-Chlordane	<0.0054	97
Dieldrin	<0.0051	99
Endrin	<0.012	101
Endosulfan I	<0.024	91
Endosulfan II	<0.045	97
Endosulfan Sulfate	<0.0070	100
4,4'-DDE	<0.0070	104
4,4'-DDD	<0.0058	102
4,4'-DDT	<0.0094	99
Endrin Aldehyde	<0.0078	71
Methoxychlor	<0.13	89
Mirex	<0.0031	99
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
alpha-BHC, 13C6-	32	36
gamma-BHC, d6-	34	37
Heptachlor, 13C10-	47	53
Dieldrin, 13C12-	60	54
Endrin, 13C12-	72	74
Endosulfan II, 13C9-	47	59
4,4'-DDE, 13C12-	60	55
4,4'-DDD, 13C12-	60	62
4,4'-DDT, 13C12-	66	68
Methoxychlor, d6-	68	86
Mirex, 13C10-	64	62

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E2-SB-CH-051  
 ALS Sample ID L2222986-23  
 Analysis Method EPA 1699 (mod)  
 Analysis Type Sample  
 Sample Matrix TISSUE

Sampling Date 26-Sep-18  
 Extraction Date 25-Mar-19  
 Sample Size 19.92 g  
 Percent Moisture 40.4%  
 Split Ratio 2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information** **Run 1**  
 Filename 6-190329A18  
 Run Date 30-Mar-19 00:49  
 Final Volume 520 uL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument - Column HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.0071	0.0071	U		0.10
beta-BHC	NotFnd	<0.011	0.011	U		0.10
gamma-BHC	NotFnd	<0.0090	0.0090	U		0.10
delta-BHC	NotFnd	<0.010	0.010	U		0.10
Heptachlor	NotFnd	<0.00085	0.00085	U		0.10
Aldrin	NotFnd	<0.00087	0.00087	U		0.10
Heptachlor Epoxide B	20.42	0.0170	0.0016	M,J,B		0.10
Heptachlor Epoxide A	NotFnd	<0.010	0.010	U		0.10
trans-Chlordane	21.13	<0.010	0.010	M,U		0.10
cis-Chlordane	21.57	0.0192	0.0093	M,J		0.10
Dieldrin	22.22	0.0555	0.0040	J		0.10
Endrin	22.85	<0.013	0.0073	M,J,R	0.013	0.10
Endosulfan I	NotFnd	<0.013	0.013	U		0.10
Endosulfan II	NotFnd	<0.018	0.018	U		0.10
Endosulfan Sulfate	24.33	0.0167	0.0078	M,J		0.10
4,4'-DDE	NotFnd	<0.0050	0.0050	U		0.10
4,4'-DDD	NotFnd	<0.0056	0.0056	U		0.10
4,4'-DDT	NotFnd	<0.0093	0.0093	U		0.10
Endrin Aldehyde	NotFnd	<0.0051	0.0051	U		0.10
Methoxychlor	NotFnd	<0.21	0.21	U,1		0.10
Mirex	26.99	<0.0039	0.00038	M,J,R	0.0039	0.10

**Extraction Standards**      **ng**

alpha-BHC, 13C6-	250	14.94	47	16-129
gamma-BHC, d6-	250	15.86	49	11-120
Heptachlor, 13C10-	250	18.17	65	5-120
Dieldrin, 13C12-	250	22.22	65	40-151
Endrin, 13C12-	250	22.84	94	35-155
Endosulfan II, 13C9-	250	23.11	57	5-122
4,4'-DDE, 13C12-	250	22.22	68	21-125
4,4'-DDD, 13C12-	250	23.42	66	5-150
4,4'-DDT, 13C12-	250	24.47	71	5-120
Methoxychlor, d6-	250	26.08	92	5-120
Mirex, 13C10-	250	26.98	64	5-120

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 1. This result is an EMPC  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**                      **Method Blank**  
 ALS Sample ID                      WG3010136-1  
 Analysis Method                      EPA 1699 (mod)  
 Analysis Type                          Blank  
 Sample Matrix                          QC

Sampling Date                      n/a  
 Extraction Date                      25-Mar-19  
 Sample Size                          20.00                      g  
 Percent Moisture                      n/a  
 Split Ratio                              2

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

**Run Information**                      **Run 1**  
 Filename                                  6-190329A17  
 Run Date                                  30-Mar-19 00:16  
 Final Volume                              520    uL  
 Dilution Factor                              1  
 Analysis Units                              ng/g  
 Instrument - Column                      HRMS-6 DB-5 #USR737421H

Target Analytes	Ret. Time	Conc. ng/g	EDL ng/g	Flags	EMPC ng/g	LQL
alpha-BHC	NotFnd	<0.013	0.013	U		0.10
beta-BHC	NotFnd	<0.020	0.020	U		0.10
gamma-BHC	NotFnd	<0.015	0.015	U		0.10
delta-BHC	NotFnd	<0.017	0.017	U		0.10
Heptachlor	NotFnd	<0.0018	0.0018	U		0.10
Aldrin	NotFnd	<0.0016	0.0016	U		0.10
Heptachlor Epoxide B	20.44	0.00405	0.0027	M,J		0.10
Heptachlor Epoxide A	NotFnd	<0.017	0.017	U		0.10
trans-Chlordane	NotFnd	<0.0059	0.0059	U		0.10
cis-Chlordane	NotFnd	<0.0054	0.0054	U		0.10
Dieldrin	NotFnd	<0.0051	0.0051	U		0.10
Endrin	NotFnd	<0.012	0.012	U		0.10
Endosulfan I	NotFnd	<0.024	0.024	U		0.10
Endosulfan II	NotFnd	<0.045	0.045	U		0.10
Endosulfan Sulfate	NotFnd	<0.0070	0.0070	U		0.10
4,4'-DDE	NotFnd	<0.0070	0.0070	U		0.10
4,4'-DDD	NotFnd	<0.0058	0.0058	U		0.10
4,4'-DDT	NotFnd	<0.0094	0.0094	U		0.10
Endrin Aldehyde	NotFnd	<0.0078	0.0078	U		0.10
Methoxychlor	NotFnd	<0.13	0.13	U,1		0.10
Mirex	26.99	<0.0031	0.00038	M,J,R	0.0031	0.10

**Extraction Standards      ng**

alpha-BHC, 13C6-	250	14.94	32	16-129
gamma-BHC, d6-	250	15.86	34	11-120
Heptachlor, 13C10-	250	18.17	47	5-120
Dieldrin, 13C12-	250	22.21	60	40-151
Endrin, 13C12-	250	22.84	72	35-155
Endosulfan II, 13C9-	250	23.09	47	5-122
4,4'-DDE, 13C12-	250	22.22	60	21-125
4,4'-DDD, 13C12-	250	23.42	60	5-150
4,4'-DDT, 13C12-	250	24.47	66	5-120
Methoxychlor, d6-	250	26.06	68	5-120
Mirex, 13C10-	250	26.98	64	5-120

EDL                      Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 LQL                      Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M                          Indicates that a peak has been manually integrated.  
 U                          Indicates that this compound was not detected above the EDL.  
  
 J                          indicates that a target analyte was detected below the calibrated range.  
 R                          Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 1.                          This result is an EMPC  
 EMPC                      Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a		
ALS Sample ID	WG3010136-2	Extraction Date	25-Mar-19		
Analysis Method	EPA 1699 (mod)	Sample Size	1	n/a	
Analysis Type	LCS	Percent Moisture	n/a		
Sample Matrix	QC	Split Ratio	2		

Approved:  
*B. Reimer*  
 --e-signature--  
 30-Mar-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	6-190329A12
Run Date	29-Mar-19 21:29
Final Volume	520 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB-5 #USR737421H

Target Analytes	ng	Ret. Limits		
		Time	% Rec	Flags
alpha-BHC	50	14.95	98	50-120
beta-BHC	50	15.80	94	50-120
gamma-BHC	50	15.98	101	50-120
delta-BHC	50	16.72	107	50-120
Heptachlor	50	18.19	100	50-120
Aldrin	50	19.22	95	50-120
Heptachlor Epoxide B	50	20.43	111	20-200
Heptachlor Epoxide A	50	20.55	100	50-120
trans-Chlordane	50	21.13	102	50-120
cis-Chlordane	50	21.59	97	50-120
Dieldrin	50	22.24	99	50-120
Endrin	50	22.85	101	50-120
Endosulfan I	50	21.48	91	50-120
Endosulfan II	50	23.12	97	5-200
Endosulfan Sulfate	50	24.33	100	50-200
4,4'-DDE	50	22.24	104	50-120
4,4'-DDD	50	23.43	102	42-120
4,4'-DDT	50	24.49	99	50-120
Endrin Aldehyde	50	23.67	71	20-200
Methoxychlor	50	26.12	89	50-120
Mirex	50	26.99	99	50-120
<b>Extraction Standards</b>	<b>ng</b>			
alpha-BHC, 13C6-	250	14.95	36	13-138
gamma-BHC, d6-	250	15.87	37	5-124
Heptachlor, 13C10-	250	18.17	53	5-128
Dieldrin, 13C12-	250	22.22	54	19-161
Endrin, 13C12-	250	22.84	74	20-157
Endosulfan II, 13C9-	250	23.11	59	5-144
4,4'-DDE, 13C12-	250	22.22	55	26-169
4,4'-DDD, 13C12-	250	23.42	62	13-200
4,4'-DDT, 13C12-	250	24.49	68	13-200
Methoxychlor, d6-	250	26.08	86	8-200
Mirex, 13C10-	250	26.98	62	5-138



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 29-Mar-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** PCDD/F by EPA 1613B via Isotope Dilution

A handwritten signature in black ink, appearing to read "R. A. McLeod", is written over a horizontal line.

Certified by:

Ron McLeod, PhD, C.Chem.  
Director, Air Toxics & Special Chemistries, Life Sciences

Results in this certificate relate only to the samples as submitted to the laboratory.

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# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-W2-NG-CH-003	Duplicate	18-W2-WW-CH-005	18-W4-NG-CH-009	18-W4-FC-CH-011	18-N2-NG-CH-019
ALS Sample ID	L2222986-2	WG2991222-4	L2222986-3	L2222986-5	L2222986-6	L2222986-9
Sample Size	4.54	4.57	13.92	3.84	14.28	3.18
Sample size units	g	g	g	g	g	g
Percent Moisture	77.39%	77.39%	30.71%	80.86%	28.77%	75.77%
Sample Matrix	Plant Tissue	QC	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	25-Sep-18	n/a	5-Jul-18	16-Oct-18	16-Oct-18	17-Oct-18
Extraction Date	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.056	<0.044	<0.013	<0.18	<0.015	<0.082
1,2,3,7,8-PeCDD	<0.082	0.0853	0.00718	0.0807	<0.0050	<0.071
1,2,3,4,7,8-HxCDD	0.0903	0.0941	<0.0065	<0.069	<0.0057	0.113
1,2,3,6,7,8-HxCDD	<0.13	<0.10	0.00718	0.0833	0.00840	0.123
1,2,3,7,8,9-HxCDD	<0.13	0.118	<0.0091	<0.11	<0.0088	<0.10
1,2,3,4,6,7,8-HpCDD	1.39	1.24	0.0496	1.27	<0.024	1.16
OCDD	7.86	6.64	0.460	5.50	0.207	4.43
2,3,7,8-TCDF	<0.12	0.107	0.0180	<0.13	<0.0091	0.176
1,2,3,7,8-PeCDF	0.108	0.0832	0.0180	<0.11	0.00980	0.123
2,3,4,7,8-PeCDF	0.0837	0.0700	0.00718	<0.055	<0.0036	0.0943
1,2,3,4,7,8-HxCDF	0.121	0.101	0.0165	<0.095	0.00840	0.101
1,2,3,6,7,8-HxCDF	0.104	0.0810	<0.0089	0.117	<0.0045	0.104
2,3,4,6,7,8-HxCDF	<0.063	0.0941	<0.0075	<0.053	<0.0077	0.101
1,2,3,7,8,9-HxCDF	<0.056	<0.055	<0.017	<0.10	<0.013	0.0911
1,2,3,4,6,7,8-HpCDF	0.590	0.464	0.0524	0.445	<0.032	0.462
1,2,3,4,7,8,9-HpCDF	<0.024	<0.063	0.0129	<0.046	<0.0062	<0.044
OCDF	1.57	1.35	0.205	0.846	0.152	0.732
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	84	82	86	87	81	74
13C12-1,2,3,7,8-PeCDD	99	88	92	146	85	87
13C12-1,2,3,4,7,8-HxCDD	82	81	82	80	82	76
13C12-1,2,3,6,7,8-HxCDD	86	84	85	82	85	77
13C12-1,2,3,4,6,7,8-HpCDD	83	85	82	94	79	75
13C12-OCDD	66	70	68	89	62	41
13C12-2,3,7,8-TCDF	85	81	83	83	79	77
13C12-1,2,3,7,8-PeCDF	89	84	90	123	79	80
13C12-2,3,4,7,8-PeCDF	93	84	88	136	82	85
13C12-1,2,3,4,7,8-HxCDF	79	79	80	71	76	75
13C12-1,2,3,6,7,8-HxCDF	81	82	83	74	78	74
13C12-2,3,4,6,7,8-HxCDF	80	82	79	74	77	71
13C12-1,2,3,7,8,9-HxCDF	80	79	80	77	72	73
13C12-1,2,3,4,6,7,8-HpCDF	82	84	79	86	76	69
13C12-1,2,3,4,7,8,9-HpCDF	81	83	79	100	77	71
<b>Cleanup Standard</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	85	86	83	86	81	78
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	0.308	0.512	<0.013	<0.18	<0.015	0.726
Total-PeCDD	0.901	1.66	0.0596	0.773	<0.0050	1.19
Total-HxCDD	2.97	2.67	0.0259	0.792	0.00840	2.18
Total-HpCDD	3.83	3.38	0.0496	3.13	<0.0077	3.13
Total-TCDF	1.82	1.68	0.0474	<0.13	<0.0091	2.00
Total-PeCDF	1.28	0.919	0.0503	0.0885	0.00980	1.33
Total-HxCDF	0.841	0.851	0.0165	0.685	0.0161	1.04
Total-HpCDF	0.590	0.748	0.0805	0.682	0.0105	0.462
<b>Toxic Equivalency - (WHO 2005)</b>						
Lower Bound PCDD/F TEQ (WHO 2005)	0.0825	0.188	0.0154	0.120	0.00208	0.131
Mid Point PCDD/F TEQ (WHO 2005)	0.243	0.226	0.0268	0.279	0.0174	0.253
Upper Bound PCDD/F TEQ (WHO 2005)	0.271	0.248	0.0333	0.376	0.0287	0.294

# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-N2-FC-CH-021	18-N4-NG-CH-025	18-N5-NG-CH-035	18-E1-NG-CH-039	18-E1-FC-CH-041	18-E2-NG-CH-049
ALS Sample ID	L2222986-10	L2222986-12	L2222986-16	L2222986-18	L2222986-19	L2222986-22
Sample Size	13.04	3.69	1.20	3.37	15.25	4.30
Sample size units	g	g	g	g	g	g
Percent Moisture	35.69%	81.77%	67.28%	81.44%	25.08%	78.63%
Sample Matrix	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	17-Oct-18	26-Sep-18	17-Oct-18	16-Oct-18	16-Oct-18	26-Sep-18
Extraction Date	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.017	<0.053	<0.53	<0.053	<0.0099	<0.040
1,2,3,7,8-PeCDD	0.0123	0.0624	<0.22	0.0654	0.00984	0.0791
1,2,3,4,7,8-HxCDD	<0.0084	<0.077	0.282	0.0862	0.00984	0.0768
1,2,3,6,7,8-HxCDD	<0.0066	<0.064	<0.24	<0.081	0.0125	0.0885
1,2,3,7,8,9-HxCDD	<0.012	0.111	<0.32	<0.068	0.0190	0.119
1,2,3,4,6,7,8-HpCDD	0.0506	0.770	1.95	1.34	0.0544	0.829
OCDD	0.424	4.61	11.3	6.17	0.477	3.23
2,3,7,8-TCDF	<0.0099	0.0895	<0.38	0.131	<0.0061	0.0745
1,2,3,7,8-PeCDF	0.0130	0.0976	0.299	0.101	<0.017	0.0954
2,3,4,7,8-PeCDF	<0.0076	0.0515	<0.15	0.0802	<0.0086	0.0628
1,2,3,4,7,8-HxCDF	<0.0097	0.0759	<0.21	<0.081	0.0171	0.100
1,2,3,6,7,8-HxCDF	<0.0089	0.0759	<0.29	0.0980	<0.013	<0.080
2,3,4,6,7,8-HxCDF	0.0107	0.0624	<0.20	<0.068	0.0112	0.100
1,2,3,7,8,9-HxCDF	0.0130	0.0895	<0.37	0.0921	0.0210	0.0908
1,2,3,4,6,7,8-HpCDF	0.0399	0.353	0.972	0.377	0.0538	<0.37
1,2,3,4,7,8,9-HpCDF	0.00997	<0.055	<0.18	0.0654	0.0223	0.0768
OCDF	0.146	0.724	1.61	0.561	0.154	0.931
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	78	80	75	73	70	68
13C12-1,2,3,7,8-PeCDD	86	93	92	81	74	77
13C12-1,2,3,4,7,8-HxCDD	84	89	84	85	80	76
13C12-1,2,3,6,7,8-HxCDD	79	87	83	85	81	73
13C12-1,2,3,4,6,7,8-HpCDD	85	91	101	76	78	66
13C12-OCDD	66	69	103	48	45	40
13C12-2,3,7,8-TCDF	77	81	74	77	72	69
13C12-1,2,3,7,8-PeCDF	79	85	90	75	68	71
13C12-2,3,4,7,8-PeCDF	81	90	88	81	72	74
13C12-1,2,3,4,7,8-HxCDF	80	85	81	81	76	73
13C12-1,2,3,6,7,8-HxCDF	80	84	86	83	79	73
13C12-2,3,4,6,7,8-HxCDF	79	84	87	73	74	67
13C12-1,2,3,7,8,9-HxCDF	77	81	86	72	72	68
13C12-1,2,3,4,6,7,8-HpCDF	78	84	101	71	74	62
13C12-1,2,3,4,7,8,9-HpCDF	80	85	103	74	73	64
<b>Cleanup Standard</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	78	83	73	71	71	74
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	<0.017	0.279	<0.53	<0.053	<0.0099	1.15
Total-PeCDD	0.0123	1.01	<0.22	1.22	0.00984	1.27
Total-HxCDD	<0.0068	1.54	2.33	1.68	0.0413	1.82
Total-HpCDD	0.0752	2.05	4.67	3.53	0.0945	2.07
Total-TCDF	<0.0099	0.998	<0.38	1.57	<0.0061	1.96
Total-PeCDF	0.0130	1.09	0.299	1.25	<0.0041	1.14
Total-HxCDF	0.0238	0.450	0.473	0.636	0.0584	0.768
Total-HpCDF	0.0499	0.353	0.972	0.692	0.0754	0.179
<b>Toxic Equivalency - (WHO 2005)</b>						
Lower Bound PCDD/F TEQ (WHO 2005)	0.0162	0.144	0.0703	0.153	0.0204	0.176
Mid Point PCDD/F TEQ (WHO 2005)	0.0321	0.185	0.651	0.209	0.0300	0.208
Upper Bound PCDD/F TEQ (WHO 2005)	0.0411	0.212	1.07	0.236	0.0353	0.228

# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-E5-NG-CH-055	18-E5-FC-CH-057	18-S1-NG-CH-069	18-S1-SB-CH-071	18-S2-NG-CH-075	18-S2-SB-CH-077
ALS Sample ID	L2222986-25	L2222986-26	L2222986-31	L2222986-32	L2222986-34	L2222986-35
Sample Size	3.27	16.00	3.43	13.77	3.24	11.03
Sample size units	g	g	g	g	g	g
Percent Moisture	78.70%	21.36%	83.24%	32.62%	84.20%	45.35%
Sample Matrix	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	16-Oct-18	16-Oct-18	25-Sep-18	25-Sep-18	25-Sep-18	25-Sep-18
Extraction Date	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19	11-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.12	<0.021	<0.17	<0.0091	<0.13	<0.016
1,2,3,7,8-PeCDD	<0.087	0.0212	<0.13	<0.0095	<0.055	0.0181
1,2,3,4,7,8-HxCDD	<0.13	<0.021	<0.17	<0.012	<0.079	<0.024
1,2,3,6,7,8-HxCDD	0.235	<0.020	0.271	<0.012	<0.082	<0.027
1,2,3,7,8,9-HxCDD	0.324	0.0425	<0.29	<0.013	<0.094	<0.041
1,2,3,4,6,7,8-HpCDD	1.70	<0.073	<1.3	0.0472	0.667	0.0607
OCDD	7.32	0.466	6.62	0.284	2.49	0.389
2,3,7,8-TCDF	0.135	<0.016	<0.12	<0.0064	0.145	<0.011
1,2,3,7,8-PeCDF	0.153	<0.024	0.195	0.0218	<0.099	<0.020
2,3,4,7,8-PeCDF	<0.11	<0.0091	<0.087	0.00944	<0.094	<0.013
1,2,3,4,7,8-HxCDF	0.168	<0.025	<0.16	0.0232	<0.10	<0.023
1,2,3,6,7,8-HxCDF	<0.10	0.0237	<0.12	<0.016	<0.070	0.0254
2,3,4,6,7,8-HxCDF	<0.17	<0.020	<0.13	<0.014	<0.094	<0.022
1,2,3,7,8,9-HxCDF	<0.14	<0.031	<0.16	<0.023	0.0927	<0.041
1,2,3,4,6,7,8-HpCDF	<0.55	0.0762	0.586	0.0647	0.368	0.0653
1,2,3,4,7,8,9-HpCDF	<0.15	<0.036	<0.17	0.0276	<0.089	0.0363
OCDF	1.03	0.240	1.16	0.204	0.936	0.227
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	72	77	80	83	82	54
13C12-1,2,3,7,8-PeCDD	81	83	96	88	86	57
13C12-1,2,3,4,7,8-HxCDD	71	69	74	78	78	49
13C12-1,2,3,6,7,8-HxCDD	77	80	86	85	86	54
13C12-1,2,3,4,6,7,8-HpCDD	73	76	91	84	86	52
13C12-OCDD	51	62	74	71	65	45
13C12-2,3,7,8-TCDF	77	81	80	81	85	53
13C12-1,2,3,7,8-PeCDF	79	78	90	83	84	53
13C12-2,3,4,7,8-PeCDF	81	83	92	85	84	55
13C12-1,2,3,4,7,8-HxCDF	67	68	72	78	78	48
13C12-1,2,3,6,7,8-HxCDF	75	79	82	84	85	51
13C12-2,3,4,6,7,8-HxCDF	72	71	78	80	79	50
13C12-1,2,3,7,8,9-HxCDF	69	70	74	77	76	50
13C12-1,2,3,4,6,7,8-HpCDF	72	75	79	79	82	50
13C12-1,2,3,4,7,8,9-HpCDF	70	74	90	80	82	49
<b>Cleanup Standard</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	73	72	80	89	82	59
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	0.679	<0.021	<0.17	<0.0091	<0.13	<0.016
Total-PeCDD	1.39	0.0362	1.14	<0.0036	0.708	0.0308
Total-HxCDD	2.05	0.0662	1.68	<0.0052	1.31	<0.0091
Total-HpCDD	1.70	0.0594	2.18	0.0472	1.53	0.109
Total-TCDF	1.55	<0.016	0.361	<0.0064	0.967	<0.011
Total-PeCDF	0.921	0.0144	1.76	0.0407	0.0742	<0.0065
Total-HxCDF	0.572	0.0237	<0.16	0.0450	0.198	0.0335
Total-HpCDF	0.156	0.0762	0.586	0.0923	0.368	0.102
<b>Toxic Equivalency - (WHO 2005)</b>						
Lower Bound PCDD/F TEQ (WHO 2005)	0.110	0.0288	0.0411	0.00735	0.0351	0.0224
Mid Point PCDD/F TEQ (WHO 2005)	0.351	0.0550	0.385	0.0307	0.211	0.0533
Upper Bound PCDD/F TEQ (WHO 2005)	0.411	0.0676	0.497	0.0356	0.304	0.0618



# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-S4-NG-CH-093	18-S4-SB-CH-095	18-S7-NG-CH-085
ALS Sample ID	L2222986-38	L2222986-39	L2222986-42
Sample Size	4.76	15.98	4.33
Sample size units	g	g	g
Percent Moisture	76.26%	21.38%	78.38%
Sample Matrix	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	26-Sep-18	26-Sep-18	17-Oct-18
Extraction Date	11-Mar-19	11-Mar-19	11-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.071	<0.0094	<0.033
1,2,3,7,8-PeCDD	<0.095	<0.0067	0.0670
1,2,3,4,7,8-HxCDD	0.101	0.0188	<0.090
1,2,3,6,7,8-HxCDD	0.124	<0.012	0.136
1,2,3,7,8,9-HxCDD	<0.11	0.0175	0.153
1,2,3,4,6,7,8-HpCDD	0.750	0.0513	1.57
OCDD	2.75	0.218	9.17
2,3,7,8-TCDF	0.116	<0.0065	0.0994
1,2,3,7,8-PeCDF	0.0903	0.0156	0.0763
2,3,4,7,8-PeCDF	<0.074	0.0106	0.0809
1,2,3,4,7,8-HxCDF	0.0987	0.0181	<0.093
1,2,3,6,7,8-HxCDF	0.0987	0.0156	0.0901
2,3,4,6,7,8-HxCDF	0.101	<0.012	<0.098
1,2,3,7,8,9-HxCDF	<0.092	0.0250	<0.11
1,2,3,4,6,7,8-HpCDF	0.363	0.0419	0.458
1,2,3,4,7,8,9-HpCDF	<0.089	0.0213	0.0786
OCDF	0.529	0.124	1.24
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	77	80	82
13C12-1,2,3,7,8-PeCDD	80	83	96
13C12-1,2,3,4,7,8-HxCDD	74	73	88
13C12-1,2,3,6,7,8-HxCDD	80	82	88
13C12-1,2,3,4,6,7,8-HpCDD	82	76	86
13C12-OCDD	66	70	56
13C12-2,3,7,8-TCDF	80	77	84
13C12-1,2,3,7,8-PeCDF	78	80	91
13C12-2,3,4,7,8-PeCDF	80	80	93
13C12-1,2,3,4,7,8-HxCDF	73	73	85
13C12-1,2,3,6,7,8-HxCDF	79	79	87
13C12-2,3,4,6,7,8-HxCDF	72	77	85
13C12-1,2,3,7,8,9-HxCDF	72	70	85
13C12-1,2,3,4,6,7,8-HpCDF	73	69	81
13C12-1,2,3,4,7,8,9-HpCDF	77	73	82
<b>Cleanup Standard</b>			
37Cl4-2,3,7,8-TCDD (Cleanup)	66	84	81
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	0.595	<0.0094	0.254
Total-PeCDD	0.727	0.00688	0.689
Total-HxCDD	1.64	0.0363	1.86
Total-HpCDD	1.79	0.0807	4.03
Total-TCDF	1.27	<0.0065	1.59
Total-PeCDF	0.739	0.0263	0.887
Total-HxCDF	0.300	0.0588	0.573
Total-HpCDF	0.363	0.0632	0.862
<b>Toxic Equivalency - (WHO 2005)</b>			
Lower Bound PCDD/F TEQ (WHO 2005)	0.0788	0.0144	0.166
Mid Point PCDD/F TEQ (WHO 2005)	0.253	0.0285	0.221
Upper Bound PCDD/F TEQ (WHO 2005)	0.288	0.0335	0.238

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2991222-1	WG2991222-2
Sample Size	10.00	1
Sample size units	g	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	11-Mar-19	11-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>% Rec</b>
2,3,7,8-TCDD	<0.0089	104
1,2,3,7,8-PeCDD	<0.014	107
1,2,3,4,7,8-HxCDD	0.0220	101
1,2,3,6,7,8-HxCDD	0.0210	95
1,2,3,7,8,9-HxCDD	<0.033	103
1,2,3,4,6,7,8-HpCDD	0.0680	105
OCDD	0.425	102
2,3,7,8-TCDF	<0.0066	99
1,2,3,7,8-PeCDF	0.0200	104
2,3,4,7,8-PeCDF	0.0100	91
1,2,3,4,7,8-HxCDF	0.0200	101
1,2,3,6,7,8-HxCDF	<0.016	104
2,3,4,6,7,8-HxCDF	0.0170	101
1,2,3,7,8,9-HxCDF	0.0290	107
1,2,3,4,6,7,8-HpCDF	0.0470	105
1,2,3,4,7,8,9-HpCDF	0.0290	103
OCDF	0.117	102
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	83	95
13C12-1,2,3,7,8-PeCDD	81	82
13C12-1,2,3,4,7,8-HxCDD	74	80
13C12-1,2,3,6,7,8-HxCDD	82	81
13C12-1,2,3,4,6,7,8-HpCDD	74	76
13C12-OCDD	64	70
13C12-2,3,7,8-TCDF	84	90
13C12-1,2,3,7,8-PeCDF	81	82
13C12-2,3,4,7,8-PeCDF	79	81
13C12-1,2,3,4,7,8-HxCDF	73	77
13C12-1,2,3,6,7,8-HxCDF	79	77
13C12-2,3,4,6,7,8-HxCDF	78	78
13C12-1,2,3,7,8,9-HxCDF	74	78
13C12-1,2,3,4,6,7,8-HpCDF	73	75
13C12-1,2,3,4,7,8,9-HpCDF	71	78
<b>Cleanup Standard</b>		
37Cl4-2,3,7,8-TCDD (Cleanup)	92	99
<b>Homologue Group Totals</b>	<b>pg/g</b>	
Total-TCDD	<0.0089	
Total-PeCDD	<0.0036	
Total-HxCDD	0.0430	
Total-HpCDD	0.0680	
Total-TCDF	<0.0066	
Total-PeCDF	0.0310	
Total-HxCDF	0.0670	
Total-HpCDF	0.0760	
<b>Toxic Equivalency - (WHO 2005)</b>		
Lower Bound PCDD/F TEQ (WHO 2005)	0.0161	
Mid Point PCDD/F TEQ (WHO 2005)	0.0398	
Upper Bound PCDD/F TEQ (WHO 2005)	0.0446	

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W2-NG-CH-003  
 ALS Sample ID L2222986-2  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 4.54 g  
 Percent Moisture 77.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A09  
 Run Date 27-Mar-19 17:11  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.056	0.056	U		1.1
1,2,3,7,8-PeCDD	1	31.99	<0.082	0.020	M,J,R	0.082	5.5
1,2,3,4,7,8-HxCDD	0.1	34.03	0.0903	0.027	M,J,B		5.5
1,2,3,6,7,8-HxCDD	0.1	34.09	<0.13	0.025	M,J,R	0.13	5.5
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.13	0.025	M,J,R	0.13	5.5
1,2,3,4,6,7,8-HpCDD	0.01	35.69	1.39	0.044	J		5.5
OCDD	0.0003	37.17	7.86	0.040	J		11
2,3,7,8-TCDF	0.1	26.92	<0.12	0.032	M,J,R	0.12	1.1
1,2,3,7,8-PeCDF	0.03	31.06	0.108	0.024	M,J,B		5.5
2,3,4,7,8-PeCDF	0.3	31.77	0.0837	0.020	J,B		5.5
1,2,3,4,7,8-HxCDF	0.1	33.55	0.121	0.025	M,J,B		5.5
1,2,3,6,7,8-HxCDF	0.1	33.62	0.104	0.026	M,J		5.5
2,3,4,6,7,8-HxCDF	0.1	33.94	<0.063	0.025	M,J,R	0.063	5.5
1,2,3,7,8,9-HxCDF	0.1	34.35	<0.056	0.034	M,J,R	0.056	5.5
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.590	0.017	J		5.5
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.024	0.024	U		5.5
OCDF	0.0003	37.26	1.57	0.027	J		11

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	84 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.98	99 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	82 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	86 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.67	83 23-140
13C12-OCDD	2000	37.17	66 17-157
13C12-2,3,7,8-TCDF	1000	26.89	85 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.05	89 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	93 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	79 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	81 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.93	80 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	80 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	82 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	81 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.84	85 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	1.00	0.308	0.056	1.1
Total-PeCDD	4.00	0.901	0.020	5.5
Total-HxCDD	4.00	2.97	0.027	5.5
Total-HpCDD	2.00	3.83	0.044	5.5
Total-TCDF	9.00	1.82	0.032	1.1
Total-PeCDF	6.00	1.28	0.024	5.5
Total-HxCDF	4.00	0.841	0.034	5.5
Total-HpCDF	1.00	0.590	0.024	5.5

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0825
Mid Point PCDD/F TEQ (WHO 2005)	0.243
Upper Bound PCDD/F TEQ (WHO 2005)	0.271

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

<b>Sample Name</b>	Duplicate	Sampling Date	n/a	
ALS Sample ID	WG2991222-4	Extraction Date	11-Mar-19	Approved: <i>T. Patterson</i> --e-signature-- 29-Mar-2018
Analysis Method	EPA 1613B	Sample Size	4.57 g	
Analysis Type	Sample	Percent Moisture	77.4%	
Sample Matrix	QC	Split Ratio	1	

<b>Run Information</b>		<b>Run 1</b>	
Filename	7-190327A10		
Run Date	27-Mar-19 17:53		
Final Volume	10	uL	
Dilution Factor	1		
Analysis Units	pg/g		
Instrument - Column	HRMS-7 DB5MSUSR339925H		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.044	0.044	U		1.1
1,2,3,7,8-PeCDD	1	32.00	0.0853	0.024	J		5.5
1,2,3,4,7,8-HxCDD	0.1	34.04	0.0941	0.015	M,J,B		5.5
1,2,3,6,7,8-HxCDD	0.1	34.09	<0.10	0.013	M,J,R	0.10	5.5
1,2,3,7,8,9-HxCDD	0.1	34.22	0.118	0.014	M,J		5.5
1,2,3,4,6,7,8-HpCDD	0.01	35.69	1.24	0.023	J		5.5
OCDD	0.0003	37.18	6.64	0.027	J		11
2,3,7,8-TCDF	0.1	26.90	0.107	0.032	M,J		1.1
1,2,3,7,8-PeCDF	0.03	31.06	0.0832	0.018	M,J,B		5.5
2,3,4,7,8-PeCDF	0.3	31.78	0.0700	0.016	M,J,B		5.5
1,2,3,4,7,8-HxCDF	0.1	33.56	0.101	0.023	M,J,B		5.5
1,2,3,6,7,8-HxCDF	0.1	33.62	0.0810	0.023	M,J		5.5
2,3,4,6,7,8-HxCDF	0.1	33.94	0.0941	0.022	M,J,B		5.5
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.055	0.031	M,J,R	0.055	5.5
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.464	0.012	J,B		5.5
1,2,3,4,7,8,9-HpCDF	0.01	35.93	<0.063	0.017	M,J,R	0.063	5.5
OCDF	0.0003	37.26	1.35	0.022	J		11

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.81	82 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.98	88 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	81 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	84 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	85 23-140
13C12-OCDD	2000	37.17	70 17-157
13C12-2,3,7,8-TCDF	1000	26.89	81 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.05	84 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	84 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	79 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	82 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.93	82 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	79 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	84 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	83 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.83	86 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	3.00	0.512	0.044	1.1
Total-PeCDD	8.00	1.66	0.024	5.5
Total-HxCDD	5.00	2.67	0.015	5.5
Total-HpCDD	2.00	3.38	0.023	5.5
Total-TCDF	10.00	1.68	0.032	1.1
Total-PeCDF	8.00	0.919	0.018	5.5
Total-HxCDF	6.00	0.851	0.031	5.5
Total-HpCDF	2.00	0.748	0.017	5.5

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.188
Mid Point PCDD/F TEQ (WHO 2005)	0.226
Upper Bound PCDD/F TEQ (WHO 2005)	0.248

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W2-WW-CH-005  
 ALS Sample ID L2222986-3  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 5-Jul-18  
 Extraction Date 11-Mar-19  
 Sample Size 13.92 g  
 Percent Moisture 30.7%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A11  
 Run Date 27-Mar-19 18:35  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.013	0.013		U	0.36
1,2,3,7,8-PeCDD	1	32.02	0.00718	0.0055	M,J		1.8
1,2,3,4,7,8-HxCDD	0.1	34.04	<0.0065	0.0047	M,J,R	0.0065	1.8
1,2,3,6,7,8-HxCDD	0.1	34.09	0.00718	0.0044	M,J,B		1.8
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.0091	0.0044	M,J,R	0.0091	1.8
1,2,3,4,6,7,8-HpCDD	0.01	35.69	0.0496	0.0078	M,J,B		1.8
OCDD	0.0003	37.17	0.460	0.0055	J,B		3.6
2,3,7,8-TCDF	0.1	26.90	0.0180	0.0090	M,J		0.36
1,2,3,7,8-PeCDF	0.03	31.06	0.0180	0.0058	M,J,B		1.8
2,3,4,7,8-PeCDF	0.3	31.77	0.00718	0.0047	M,J,B		1.8
1,2,3,4,7,8-HxCDF	0.1	33.55	0.0165	0.0044	M,J,B		1.8
1,2,3,6,7,8-HxCDF	0.1	33.62	<0.0089	0.0043	M,J,R	0.0089	1.8
2,3,4,6,7,8-HxCDF	0.1	33.94	<0.0075	0.0044	M,J,R	0.0075	1.8
1,2,3,7,8,9-HxCDF	0.1	34.35	<0.017	0.0057	M,J,R	0.017	1.8
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.0524	0.0045	M,J,B		1.8
1,2,3,4,7,8,9-HpCDF	0.01	35.93	0.0129	0.0057	M,J,B		1.8
OCDF	0.0003	37.26	0.205	0.0063	J,B		3.6

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.81	86 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.98	92 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	82 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	82 23-140
13C12-OCDD	2000	37.17	68 17-157
13C12-2,3,7,8-TCDF	1000	26.89	83 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.05	90 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.76	88 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	80 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	83 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.93	79 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	80 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	79 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	79 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.83	83 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.013	0.013	U		0.36
Total-PeCDD	3.00	0.0596	0.0055			1.8
Total-HxCDD	2.00	0.0259	0.0047			1.8
Total-HpCDD	1.00	0.0496	0.0078			1.8
Total-TCDF	3.00	0.0474	0.0090			0.36
Total-PeCDF	3.00	0.0503	0.0058			1.8
Total-HxCDF	1.00	0.0165	0.0057			1.8
Total-HpCDF	3.00	0.0805	0.0057			1.8

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0154
Mid Point PCDD/F TEQ (WHO 2005)	0.0268
Upper Bound PCDD/F TEQ (WHO 2005)	0.0333

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W4-NG-CH-009  
 ALS Sample ID L2222986-5  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.84 g  
 Percent Moisture 80.9%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A12  
 Run Date 27-Mar-19 19:17  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.18	0.18	U		1.3
1,2,3,7,8-PeCDD	1	32.02	0.0807	0.050	M,J		6.5
1,2,3,4,7,8-HxCDD	0.1	34.03	<0.069	0.048	M,J,R	0.069	6.5
1,2,3,6,7,8-HxCDD	0.1	34.09	0.0833	0.044	M,J,B		6.5
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.11	0.044	M,J,R	0.11	6.5
1,2,3,4,6,7,8-HpCDD	0.01	35.70	1.27	0.047	J		6.5
OCDD	0.0003	37.19	5.50	0.054	J		13
2,3,7,8-TCDF	0.1	NotFnd	<0.13	0.13	U		1.3
1,2,3,7,8-PeCDF	0.03	31.08	<0.11	0.054	M,J,R	0.11	6.5
2,3,4,7,8-PeCDF	0.3	31.79	<0.055	0.040	M,J,R	0.055	6.5
1,2,3,4,7,8-HxCDF	0.1	33.56	<0.095	0.034	M,J,R	0.095	6.5
1,2,3,6,7,8-HxCDF	0.1	33.63	0.117	0.033	M,J		6.5
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.053	0.031	M,J,R	0.053	6.5
1,2,3,7,8,9-HxCDF	0.1	34.38	<0.10	0.040	M,J,R	0.10	6.5
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.445	0.030	M,J,B		6.5
1,2,3,4,7,8,9-HpCDF	0.01	35.94	<0.046	0.037	M,J,R	0.046	6.5
OCDF	0.0003	37.28	0.846	0.050	J,B		13

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.86	87 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	146 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	80 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	82 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	94 23-140
13C12-OCDD	2000	37.18	89 17-157
13C12-2,3,7,8-TCDF	1000	26.93	83 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.07	123 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	136 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	71 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	74 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	74 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	77 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	86 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	100 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.89	86 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g		
Total-TCDD	0.00	<0.18	0.18	U	1.3
Total-PeCDD	5.00	0.773	0.050		6.5
Total-HxCDD	2.00	0.792	0.048		6.5
Total-HpCDD	2.00	3.13	0.047		6.5
Total-TCDF	0.00	<0.13	0.13	U	1.3
Total-PeCDF	1.00	0.0885	0.054		6.5
Total-HxCDF	4.00	0.685	0.040		6.5
Total-HpCDF	2.00	0.682	0.037		6.5

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.120
Mid Point PCDD/F TEQ (WHO 2005)	0.279
Upper Bound PCDD/F TEQ (WHO 2005)	0.376

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W4-FC-CH-011  
 ALS Sample ID L2222986-6  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 14.28 g  
 Percent Moisture 28.8%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A13  
 Run Date 27-Mar-19 19:59  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.015	0.015	U		0.35
1,2,3,7,8-PeCDD	1	NotFnd	<0.0050	0.0050	U		1.8
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<0.0057	0.0057	U		1.8
1,2,3,6,7,8-HxCDD	0.1	34.09	0.00840	0.0053	M,J,B		1.8
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.0088	0.0053	M,J,R	0.0088	1.8
1,2,3,4,6,7,8-HpCDD	0.01	35.70	<0.024	0.0077	M,J,R	0.024	1.8
OCDD	0.0003	37.19	0.207	0.0084	J,B		3.5
2,3,7,8-TCDF	0.1	NotFnd	<0.0091	0.0091	U		0.35
1,2,3,7,8-PeCDF	0.03	31.07	0.00980	0.0045	M,J,B		1.8
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.0036	0.0036	U		1.8
1,2,3,4,7,8-HxCDF	0.1	33.56	0.00840	0.0038	M,J,B		1.8
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.0045	0.0036	M,J,R	0.0045	1.8
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.0077	0.0038	M,J,R	0.0077	1.8
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.013	0.0050	M,J,R	0.013	1.8
1,2,3,4,6,7,8-HpCDF	0.01	35.15	<0.032	0.0046	M,J,R	0.032	1.8
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.0062	0.0062	U		1.8
OCDF	0.0003	37.27	0.152	0.0072	M,J,B		3.5

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	81 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	85 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	82 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	79 23-140
13C12-OCDD	2000	37.18	62 17-157
13C12-2,3,7,8-TCDF	1000	26.92	79 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	79 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	82 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	76 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	78 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	77 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	72 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	76 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	77 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.87	81 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.015	0.015	U		0.35
Total-PeCDD	0.00	<0.0050	0.0050	U		1.8
Total-HxCDD	1.00	0.00840	0.0057			1.8
Total-HpCDD	0.00	<0.0077	0.0077	U		1.8
Total-TCDF	0.00	<0.0091	0.0091	U		0.35
Total-PeCDF	1.00	0.00980	0.0045			1.8
Total-HxCDF	2.00	0.0161	0.0050			1.8
Total-HpCDF	1.00	0.0105	0.0062			1.8

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.00208
Mid Point PCDD/F TEQ (WHO 2005)	0.0174
Upper Bound PCDD/F TEQ (WHO 2005)	0.0287

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N2-NG-CH-019  
 ALS Sample ID L2222986-9  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 17-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.18 g  
 Percent Moisture 75.8%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information**

**Run 1**

Filename 7-190327A14  
 Run Date 27-Mar-19 20:42  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.082	0.082	U		1.6
1,2,3,7,8-PeCDD	1	32.00	<0.071	0.029	M,J,R	0.071	7.9
1,2,3,4,7,8-HxCDD	0.1	34.04	0.113	0.029	M,J,B		7.9
1,2,3,6,7,8-HxCDD	0.1	34.09	0.123	0.027	M,J,B		7.9
1,2,3,7,8,9-HxCDD	0.1	34.21	<0.10	0.027	M,J,R	0.10	7.9
1,2,3,4,6,7,8-HpCDD	0.01	35.69	1.16	0.036	J		7.9
OCDD	0.0003	37.18	4.43	0.059	J		16
2,3,7,8-TCDF	0.1	26.93	0.176	0.049	M,J		1.6
1,2,3,7,8-PeCDF	0.03	31.07	0.123	0.032	M,J,B		7.9
2,3,4,7,8-PeCDF	0.3	31.78	0.0943	0.024	M,J,B		7.9
1,2,3,4,7,8-HxCDF	0.1	33.56	0.101	0.024	M,J,B		7.9
1,2,3,6,7,8-HxCDF	0.1	33.62	0.104	0.024	M,J		7.9
2,3,4,6,7,8-HxCDF	0.1	33.94	0.101	0.026	M,J,B		7.9
1,2,3,7,8,9-HxCDF	0.1	34.36	0.0911	0.031	J,B		7.9
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.462	0.034	J,B		7.9
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.044	0.044	U		7.9
OCDF	0.0003	37.26	0.732	0.049	J,B		16

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	74 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	87 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	76 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	77 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	75 23-140
13C12-OCDD	2000	37.17	41 17-157
13C12-2,3,7,8-TCDF	1000	26.90	77 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	80 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	85 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	75 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	74 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	71 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	73 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	69 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	71 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.86	78 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	2.00	0.726	0.082	1.6
Total-PeCDD	4.00	1.19	0.029	7.9
Total-HxCDD	4.00	2.18	0.029	7.9
Total-HpCDD	2.00	3.13	0.036	7.9
Total-TCDF	9.00	2.00	0.049	1.6
Total-PeCDF	6.00	1.33	0.032	7.9
Total-HxCDF	7.00	1.04	0.031	7.9
Total-HpCDF	1.00	0.462	0.044	7.9

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.131
Mid Point PCDD/F TEQ (WHO 2005)	0.253
Upper Bound PCDD/F TEQ (WHO 2005)	0.294

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N2-FC-CH-021  
 ALS Sample ID L2222986-10  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 17-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 13.04 g  
 Percent Moisture 35.7%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information**
**Run 1**

Filename 7-190327A15  
 Run Date 27-Mar-19 21:24  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.017	0.017		U	0.38
1,2,3,7,8-PeCDD	1	31.99	0.0123	0.0063	M,J		1.9
1,2,3,4,7,8-HxCDD	0.1	34.03	<0.0084	0.0068	M,J,R	0.0084	1.9
1,2,3,6,7,8-HxCDD	0.1	34.09	<0.0066	0.0066	M,J,R	0.0066	1.9
1,2,3,7,8,9-HxCDD	0.1	34.21	<0.012	0.0065	M,J,R	0.012	1.9
1,2,3,4,6,7,8-HpCDD	0.01	35.69	0.0506	0.0077	J,B		1.9
OCDD	0.0003	37.18	0.424	0.0095	J,B		3.8
2,3,7,8-TCDF	0.1	NotFnd	<0.0099	0.0099		U	0.38
1,2,3,7,8-PeCDF	0.03	31.07	0.0130	0.0053	M,J,B		1.9
2,3,4,7,8-PeCDF	0.3	31.78	<0.0076	0.0042	M,J,R	0.0076	1.9
1,2,3,4,7,8-HxCDF	0.1	33.55	<0.0097	0.0042	M,J,R	0.0097	1.9
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.0089	0.0043	M,J,R	0.0089	1.9
2,3,4,6,7,8-HxCDF	0.1	33.94	0.0107	0.0044	M,J,B		1.9
1,2,3,7,8,9-HxCDF	0.1	34.35	0.0130	0.0055	M,J,B		1.9
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.0399	0.0047	M,J,B		1.9
1,2,3,4,7,8,9-HpCDF	0.01	35.93	0.00997	0.0060	M,J,B		1.9
OCDF	0.0003	37.26	0.146	0.0082	M,J,B		3.8

**Extraction Standards**

pg	% Rec	Limits
13C12-2,3,7,8-TCDD 1000	27.83	78 25-164
13C12-1,2,3,7,8-PeCDD 1000	31.98	86 25-181
13C12-1,2,3,4,7,8-HxCDD 1000	34.03	84 32-141
13C12-1,2,3,6,7,8-HxCDD 1000	34.08	79 28-130
13C12-1,2,3,4,6,7,8-HpCDD 1000	35.69	85 23-140
13C12-OCDD 2000	37.17	66 17-157
13C12-2,3,7,8-TCDF 1000	26.90	77 24-169
13C12-1,2,3,7,8-PeCDF 1000	31.05	79 24-185
13C12-2,3,4,7,8-PeCDF 1000	31.77	81 21-178
13C12-1,2,3,4,7,8-HxCDF 1000	33.54	80 26-152
13C12-1,2,3,6,7,8-HxCDF 1000	33.61	80 26-123
13C12-2,3,4,6,7,8-HxCDF 1000	33.93	79 29-147
13C12-1,2,3,7,8,9-HxCDF 1000	34.35	77 28-136
13C12-1,2,3,4,6,7,8-HpCDF 1000	35.13	78 28-143
13C12-1,2,3,4,7,8,9-HpCDF 1000	35.93	80 26-138

**Cleanup Standard**

pg		
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86 78 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g		
Total-TCDD	0.00	<0.017	0.017	U	0.38
Total-PeCDD	1.00	0.0123	0.0063		1.9
Total-HxCDD	0.00	<0.0068	0.0068	U	1.9
Total-HpCDD	2.00	0.0752	0.0077		1.9
Total-TCDF	0.00	<0.0099	0.0099	U	0.38
Total-PeCDF	1.00	0.0130	0.0053		1.9
Total-HxCDF	2.00	0.0238	0.0055		1.9
Total-HpCDF	2.00	0.0499	0.0060		1.9

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0162
Mid Point PCDD/F TEQ (WHO 2005)	0.0321
Upper Bound PCDD/F TEQ (WHO 2005)	0.0411

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-NG-CH-025  
 ALS Sample ID L2222986-12  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.69 g  
 Percent Moisture 81.8%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A16  
 Run Date 27-Mar-19 22:06  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.053	0.053		U	1.4
1,2,3,7,8-PeCDD	1	32.00	0.0624	0.020	M,J		6.8
1,2,3,4,7,8-HxCDD	0.1	34.04	<0.077	0.017	M,J,R	0.077	6.8
1,2,3,6,7,8-HxCDD	0.1	34.10	<0.064	0.016	M,J,R	0.064	6.8
1,2,3,7,8,9-HxCDD	0.1	34.22	0.111	0.016	J		6.8
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.770	0.022	J		6.8
OCDD	0.0003	37.18	4.61	0.028	J		14
2,3,7,8-TCDF	0.1	26.93	0.0895	0.037	M,J		1.4
1,2,3,7,8-PeCDF	0.03	31.07	0.0976	0.021	M,J,B		6.8
2,3,4,7,8-PeCDF	0.3	31.78	0.0515	0.016	J,B		6.8
1,2,3,4,7,8-HxCDF	0.1	33.56	0.0759	0.013	M,J,B		6.8
1,2,3,6,7,8-HxCDF	0.1	33.62	0.0759	0.014	M,J		6.8
2,3,4,6,7,8-HxCDF	0.1	33.94	0.0624	0.014	M,J,B		6.8
1,2,3,7,8,9-HxCDF	0.1	34.36	0.0895	0.018	M,J,B		6.8
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.353	0.012	J,B		6.8
1,2,3,4,7,8,9-HpCDF	0.01	35.94	<0.055	0.015	M,J,R	0.055	6.8
OCDF	0.0003	37.27	0.724	0.027	J,B		14

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	80 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	93 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	89 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	87 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	91 23-140
13C12-OCDD	2000	37.17	69 17-157
13C12-2,3,7,8-TCDF	1000	26.90	81 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	85 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	90 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	85 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	84 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	84 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	81 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	84 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	85 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.86	83 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	1.00	0.279	0.053	1.4
Total-PeCDD	5.00	1.01	0.020	6.8
Total-HxCDD	3.00	1.54	0.017	6.8
Total-HpCDD	2.00	2.05	0.022	6.8
Total-TCDF	8.00	0.998	0.037	1.4
Total-PeCDF	8.00	1.09	0.021	6.8
Total-HxCDF	6.00	0.450	0.018	6.8
Total-HpCDF	1.00	0.353	0.015	6.8

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.144
Mid Point PCDD/F TEQ (WHO 2005)	0.185
Upper Bound PCDD/F TEQ (WHO 2005)	0.212

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N5-NG-CH-035  
 ALS Sample ID L2222986-16  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 17-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 1.20 g  
 Percent Moisture 67.3%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A20  
 Run Date 28-Mar-19 01:03  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.53	0.53	U		4.2
1,2,3,7,8-PeCDD	1	NotFnd	<0.22	0.22	U		21
1,2,3,4,7,8-HxCDD	0.1	34.05	0.282	0.21	M,J		21
1,2,3,6,7,8-HxCDD	0.1	34.11	<0.24	0.20	M,J,R	0.24	21
1,2,3,7,8,9-HxCDD	0.1	34.24	<0.32	0.20	M,J,R	0.32	21
1,2,3,4,6,7,8-HpCDD	0.01	35.71	1.95	0.13	J		21
OCDD	0.0003	37.20	11.3	0.18	J		42
2,3,7,8-TCDF	0.1	NotFnd	<0.38	0.38	U		4.2
1,2,3,7,8-PeCDF	0.03	31.09	0.299	0.19	M,J		21
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.15	0.15	U		21
1,2,3,4,7,8-HxCDF	0.1	33.58	<0.21	0.21	M,J,R	0.21	21
1,2,3,6,7,8-HxCDF	0.1	33.64	<0.29	0.20	M,J,R	0.29	21
2,3,4,6,7,8-HxCDF	0.1	33.98	<0.20	0.20	M,J,R	0.20	21
1,2,3,7,8,9-HxCDF	0.1	34.37	<0.37	0.27	M,J,R	0.37	21
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.972	0.14	J		21
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.18	0.18	U		21
OCDF	0.0003	37.28	1.61	0.18	M,J		42

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.87	75 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	92 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.05	84 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.10	83 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	101 23-140
13C12-OCDD	2000	37.19	103 17-157
13C12-2,3,7,8-TCDF	1000	26.95	74 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.08	90 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.79	88 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	81 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.63	86 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.95	87 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	86 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.15	101 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.95	103 26-138

**Cleanup Standard** **pg**  
 37C14-2,3,7,8-TCDD (Cleanup) 20 27.89 73 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g		
Total-TCDD	0.00	<0.53	0.53	U	4.2
Total-PeCDD	0.00	<0.22	0.22	U	21
Total-HxCDD	3.00	2.33	0.21		21
Total-HpCDD	2.00	4.67	0.13		21
Total-TCDF	0.00	<0.38	0.38	U	4.2
Total-PeCDF	1.00	0.299	0.19		21
Total-HxCDF	2.00	0.473	0.27		21
Total-HpCDF	1.00	0.972	0.18		21

**Toxic Equivalency - (WHO 2005)** **pg/g**  
**Lower Bound PCDD/F TEQ (WHO 2005)** 0.0703  
**Mid Point PCDD/F TEQ (WHO 2005)** 0.651  
**Upper Bound PCDD/F TEQ (WHO 2005)** 1.07

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E1-NG-CH-039  
 ALS Sample ID L2222986-18  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.37 g  
 Percent Moisture 81.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A21  
 Run Date 28-Mar-19 01:45  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.053	0.053	U		1.5
1,2,3,7,8-PeCDD	1	31.99	0.0654	0.024	M,J		7.4
1,2,3,4,7,8-HxCDD	0.1	34.03	0.0862	0.033	M,J,B		7.4
1,2,3,6,7,8-HxCDD	0.1	34.09	<0.081	0.032	M,J,R	0.081	7.4
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.068	0.032	M,J,R	0.068	7.4
1,2,3,4,6,7,8-HpCDD	0.01	35.69	1.34	0.027	J		7.4
OCDD	0.0003	37.18	6.17	0.048	J		15
2,3,7,8-TCDF	0.1	26.90	0.131	0.037	M,J		1.5
1,2,3,7,8-PeCDF	0.03	31.06	0.101	0.021	M,J,B		7.4
2,3,4,7,8-PeCDF	0.3	31.78	0.0802	0.016	M,J,B		7.4
1,2,3,4,7,8-HxCDF	0.1	33.55	<0.081	0.017	M,J,R	0.081	7.4
1,2,3,6,7,8-HxCDF	0.1	33.62	0.0980	0.017	M,J		7.4
2,3,4,6,7,8-HxCDF	0.1	33.92	<0.068	0.019	J,R	0.068	7.4
1,2,3,7,8,9-HxCDF	0.1	34.36	0.0921	0.025	M,J,B		7.4
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.377	0.018	M,J,B		7.4
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.0654	0.022	M,J,B		7.4
OCDF	0.0003	37.26	0.561	0.042	M,J,B		15

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	73 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.98	81 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	85 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.67	76 23-140
13C12-OCDD	2000	37.17	48 17-157
13C12-2,3,7,8-TCDF	1000	26.90	77 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.05	75 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	81 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	81 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	83 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.93	73 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	72 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	71 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	74 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.84	71 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC
Total-TCDD	0.00	<0.053	0.053	U	1.5
Total-PeCDD	4.00	1.22	0.024		7.4
Total-HxCDD	3.00	1.68	0.033		7.4
Total-HpCDD	2.00	3.53	0.027		7.4
Total-TCDF	9.00	1.57	0.037		1.5
Total-PeCDF	9.00	1.25	0.021		7.4
Total-HxCDF	4.00	0.636	0.025		7.4
Total-HpCDF	4.00	0.692	0.022		7.4

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.153
Mid Point PCDD/F TEQ (WHO 2005)	0.209
Upper Bound PCDD/F TEQ (WHO 2005)	0.236

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E1-FC-CH-041  
 ALS Sample ID L2222986-19  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 15.25 g  
 Percent Moisture 25.1%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A22  
 Run Date 28-Mar-19 02:27  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.0099	0.0099	U		0.33
1,2,3,7,8-PeCDD	1	31.99	0.00984	0.0050	M,J		1.6
1,2,3,4,7,8-HxCDD	0.1	34.04	0.00984	0.0044	M,J,B		1.6
1,2,3,6,7,8-HxCDD	0.1	34.09	0.0125	0.0041	M,J,B		1.6
1,2,3,7,8,9-HxCDD	0.1	34.22	0.0190	0.0041	M,J		1.6
1,2,3,4,6,7,8-HpCDD	0.01	35.69	0.0544	0.0051	J,B		1.6
OCDD	0.0003	37.18	0.477	0.0088	J,B		3.3
2,3,7,8-TCDF	0.1	NotFnd	<0.0061	0.0061	U		0.33
1,2,3,7,8-PeCDF	0.03	31.07	<0.017	0.0041	M,J,R	0.017	1.6
2,3,4,7,8-PeCDF	0.3	31.78	<0.0086	0.0031	M,J,R	0.0086	1.6
1,2,3,4,7,8-HxCDF	0.1	33.56	0.0171	0.0037	J,B		1.6
1,2,3,6,7,8-HxCDF	0.1	33.62	<0.013	0.0038	J,R	0.013	1.6
2,3,4,6,7,8-HxCDF	0.1	33.94	0.0112	0.0039	J,B		1.6
1,2,3,7,8,9-HxCDF	0.1	34.36	0.0210	0.0051	M,J,B		1.6
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.0538	0.0040	J,B		1.6
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.0223	0.0050	M,J,B		1.6
OCDF	0.0003	37.26	0.154	0.0089	J,B		3.3

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	70 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.98	74 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	80 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	81 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	78 23-140
13C12-OCDD	2000	37.17	45 17-157
13C12-2,3,7,8-TCDF	1000	26.90	72 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.05	68 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	72 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	76 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	79 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	74 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	72 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	74 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	73 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	71 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g		
Total-TCDD	0.00	<0.0099	0.0099	U	0.33
Total-PeCDD	1.00	0.00984	0.0050		1.6
Total-HxCDD	3.00	0.0413	0.0044		1.6
Total-HpCDD	2.00	0.0945	0.0051		1.6
Total-TCDF	0.00	<0.0061	0.0061	U	0.33
Total-PeCDF	0.00	<0.0041	0.0041	U	1.6
Total-HxCDF	4.00	0.0584	0.0051		1.6
Total-HpCDF	2.00	0.0754	0.0050		1.6

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0204
Mid Point PCDD/F TEQ (WHO 2005)	0.0300
Upper Bound PCDD/F TEQ (WHO 2005)	0.0353

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E2-NG-CH-049  
 ALS Sample ID L2222986-22  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 4.30 g  
 Percent Moisture 78.6%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

### Run Information

### Run 1

Filename 7-190327A23  
 Run Date 28-Mar-19 03:10  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.040	0.040		U	1.2
1,2,3,7,8-PeCDD	1	32.00	0.0791	0.015		M,J	5.8
1,2,3,4,7,8-HxCDD	0.1	34.05	0.0768	0.027		M,J,B	5.8
1,2,3,6,7,8-HxCDD	0.1	34.10	0.0885	0.026		M,J,B	5.8
1,2,3,7,8,9-HxCDD	0.1	34.22	0.119	0.025		M,J	5.8
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.829	0.016		J	5.8
OCDD	0.0003	37.19	3.23	0.031		J,B	12
2,3,7,8-TCDF	0.1	26.93	0.0745	0.031		M,J	1.2
1,2,3,7,8-PeCDF	0.03	31.07	0.0954	0.023		M,J,B	5.8
2,3,4,7,8-PeCDF	0.3	31.78	0.0628	0.019		M,J,B	5.8
1,2,3,4,7,8-HxCDF	0.1	33.56	0.100	0.017		J,B	5.8
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.080	0.016		M,J,R	0.080 5.8
2,3,4,6,7,8-HxCDF	0.1	33.95	0.100	0.018		M,J,B	5.8
1,2,3,7,8,9-HxCDF	0.1	34.36	0.0908	0.023		M,J,B	5.8
1,2,3,4,6,7,8-HpCDF	0.01	35.14	<0.37	0.013		J,R	0.37 5.8
1,2,3,4,7,8,9-HpCDF	0.01	35.95	0.0768	0.017		M,J,B	5.8
OCDF	0.0003	37.27	0.931	0.036		J,B	12

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	68 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	77 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	76 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	73 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	66 23-140
13C12-OCDD	2000	37.18	40 17-157
13C12-2,3,7,8-TCDF	1000	26.92	69 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	71 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	74 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	73 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	73 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	67 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	68 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	62 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	64 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.86	74 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g
Total-TCDD	5.00	1.15	0.040
Total-PeCDD	5.00	1.27	0.015
Total-HxCDD	6.00	1.82	0.027
Total-HpCDD	2.00	2.07	0.016
Total-TCDF	13.00	1.96	0.031
Total-PeCDF	6.00	1.14	0.023
Total-HxCDF	5.00	0.768	0.023
Total-HpCDF	2.00	0.179	0.017

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.176
Mid Point PCDD/F TEQ (WHO 2005)	0.208
Upper Bound PCDD/F TEQ (WHO 2005)	0.228

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E5-NG-CH-055  
 ALS Sample ID L2222986-25  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.27 g  
 Percent Moisture 78.7%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A04  
 Run Date 28-Mar-19 13:23  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.12	0.12	U		1.5
1,2,3,7,8-PeCDD	1	32.02	<0.087	0.046	M,J,R	0.087	7.6
1,2,3,4,7,8-HxCDD	0.1	34.05	<0.13	0.090	M,J,R	0.13	7.6
1,2,3,6,7,8-HxCDD	0.1	34.10	0.235	0.084	M,J		7.6
1,2,3,7,8,9-HxCDD	0.1	34.22	0.324	0.084	M,J		7.6
1,2,3,4,6,7,8-HpCDD	0.01	35.71	1.70	0.079	J		7.6
OCDD	0.0003	37.19	7.32	0.11	J		15
2,3,7,8-TCDF	0.1	26.90	0.135	0.11	M,J		1.5
1,2,3,7,8-PeCDF	0.03	31.07	0.153	0.058	M,J,B		7.6
2,3,4,7,8-PeCDF	0.3	31.78	<0.11	0.046	M,J,R	0.11	7.6
1,2,3,4,7,8-HxCDF	0.1	33.56	0.168	0.056	M,J,B		7.6
1,2,3,6,7,8-HxCDF	0.1	33.64	<0.10	0.053	M,J,R	0.10	7.6
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.17	0.053	M,J,R	0.17	7.6
1,2,3,7,8,9-HxCDF	0.1	34.37	<0.14	0.074	M,J,R	0.14	7.6
1,2,3,4,6,7,8-HpCDF	0.01	35.15	<0.55	0.043	J,R	0.55	7.6
1,2,3,4,7,8,9-HpCDF	0.01	35.95	<0.15	0.058	M,J,R	0.15	7.6
OCDF	0.0003	37.29	1.03	0.10	M,J,B		15

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	72 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	81 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	71 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	77 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	73 23-140
13C12-OCDD	2000	37.19	51 17-157
13C12-2,3,7,8-TCDF	1000	26.89	77 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	79 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	81 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	67 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	75 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	72 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	69 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	72 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	70 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.84	73 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	2.00	0.679	0.12	1.5
Total-PeCDD	3.00	1.39	0.046	7.6
Total-HxCDD	3.00	2.05	0.090	7.6
Total-HpCDD	1.00	1.70	0.079	7.6
Total-TCDF	7.00	1.55	0.11	1.5
Total-PeCDF	4.00	0.921	0.058	7.6
Total-HxCDF	2.00	0.572	0.074	7.6
Total-HpCDF	1.00	0.156	0.058	7.6

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.110
Mid Point PCDD/F TEQ (WHO 2005)	0.351
Upper Bound PCDD/F TEQ (WHO 2005)	0.411

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor                      TEQ                      Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E5-FC-CH-057  
 ALS Sample ID L2222986-26  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 16.00 g  
 Percent Moisture 21.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A05  
 Run Date 28-Mar-19 14:05  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.021	0.021		U	0.31
1,2,3,7,8-PeCDD	1	31.99	0.0212	0.0085	M,J		1.6
1,2,3,4,7,8-HxCDD	0.1	34.04	<0.021	0.011	M,J,R	0.021	1.6
1,2,3,6,7,8-HxCDD	0.1	34.08	<0.020	0.011	M,J,R	0.020	1.6
1,2,3,7,8,9-HxCDD	0.1	34.22	0.0425	0.011	M,J		1.6
1,2,3,4,6,7,8-HpCDD	0.01	35.70	<0.073	0.0096	M,J,R	0.073	1.6
OCDD	0.0003	37.18	0.466	0.011	M,J,B		3.1
2,3,7,8-TCDF	0.1	NotFnd	<0.016	0.016		U	0.31
1,2,3,7,8-PeCDF	0.03	31.06	<0.024	0.012	M,J,R	0.024	1.6
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.0091	0.0091		U	1.6
1,2,3,4,7,8-HxCDF	0.1	33.55	<0.025	0.0077	M,J,R	0.025	1.6
1,2,3,6,7,8-HxCDF	0.1	33.62	0.0237	0.0077	M,J		1.6
2,3,4,6,7,8-HxCDF	0.1	33.94	<0.020	0.0082	M,J,R	0.020	1.6
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.031	0.011	M,J,R	0.031	1.6
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.0762	0.0056	J,B		1.6
1,2,3,4,7,8,9-HpCDF	0.01	35.94	<0.036	0.0073	M,J,R	0.036	1.6
OCDF	0.0003	37.27	0.240	0.017	J,B		3.1

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.81	77 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.98	83 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	69 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	80 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	76 23-140
13C12-OCDD	2000	37.18	62 17-157
13C12-2,3,7,8-TCDF	1000	26.89	81 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.05	78 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	83 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	68 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	79 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	71 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	70 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	75 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	74 26-138

**Cleanup Standard** **pg**  
 37C14-2,3,7,8-TCDD (Cleanup) 20 27.84 72 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g		
Total-TCDD	0.00	<0.021	0.021	U	0.31
Total-PeCDD	2.00	0.0362	0.0085		1.6
Total-HxCDD	2.00	0.0662	0.011		1.6
Total-HpCDD	1.00	0.0594	0.0096		1.6
Total-TCDF	0.00	<0.016	0.016	U	0.31
Total-PeCDF	1.00	0.0144	0.012		1.6
Total-HxCDF	1.00	0.0237	0.011		1.6
Total-HpCDF	1.00	0.0762	0.0073		1.6

**Toxic Equivalency - (WHO 2005)** **pg/g**  
**Lower Bound PCDD/F TEQ (WHO 2005)** 0.0288  
**Mid Point PCDD/F TEQ (WHO 2005)** 0.0550  
**Upper Bound PCDD/F TEQ (WHO 2005)** 0.0676

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S1-NG-CH-069  
 ALS Sample ID L2222986-31  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.43 g  
 Percent Moisture 83.2%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A06  
 Run Date 28-Mar-19 14:47  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.17	0.17	U		1.5
1,2,3,7,8-PeCDD	1	32.03	<0.13	0.080	M,J,R	0.13	7.3
1,2,3,4,7,8-HxCDD	0.1	34.05	<0.17	0.11	M,J,R	0.17	7.3
1,2,3,6,7,8-HxCDD	0.1	34.09	0.271	0.098	M,J		7.3
1,2,3,7,8,9-HxCDD	0.1	34.24	<0.29	0.099	M,J,R	0.29	7.3
1,2,3,4,6,7,8-HpCDD	0.01	35.71	<1.3	0.11	M,J,R	1.3	7.3
OCDD	0.0003	37.20	6.62	0.098	J		15
2,3,7,8-TCDF	0.1	NotFnd	<0.12	0.12	U		1.5
1,2,3,7,8-PeCDF	0.03	31.08	0.195	0.11	M,J,B		7.3
2,3,4,7,8-PeCDF	0.3	31.80	<0.087	0.087	M,U	0.086	7.3
1,2,3,4,7,8-HxCDF	0.1	33.56	<0.16	0.12	M,J,R	0.16	7.3
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.12	0.11	M,J,R	0.12	7.3
2,3,4,6,7,8-HxCDF	0.1	33.96	<0.13	0.12	M,J,R	0.13	7.3
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.16	0.16	M,U		7.3
1,2,3,4,6,7,8-HpCDF	0.01	35.16	0.586	0.040	M,J		7.3
1,2,3,4,7,8,9-HpCDF	0.01	35.95	<0.17	0.045	M,J,R	0.17	7.3
OCDF	0.0003	37.28	1.16	0.072	M,J,B		15

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.86	80 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	96 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	74 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	86 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	91 23-140
13C12-OCDD	2000	37.19	74 17-157
13C12-2,3,7,8-TCDF	1000	26.93	80 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.07	90 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	92 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	72 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.63	82 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.95	78 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	74 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.15	79 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	90 26-138

**Cleanup Standard** **pg**  
 37C14-2,3,7,8-TCDD (Cleanup) 20 27.87 80 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g		
Total-TCDD	0.00	<0.17	0.17	U	1.5
Total-PeCDD	2.00	1.14	0.080		7.3
Total-HxCDD	2.00	1.68	0.11		7.3
Total-HpCDD	1.00	2.18	0.11		7.3
Total-TCDF	1.00	0.361	0.12		1.5
Total-PeCDF	6.00	1.76	0.11		7.3
Total-HxCDF	0.00	<0.16	0.16	U	7.3
Total-HpCDF	1.00	0.586	0.045		7.3

**Toxic Equivalency - (WHO 2005)** **pg/g**  
**Lower Bound PCDD/F TEQ (WHO 2005)** 0.0411  
**Mid Point PCDD/F TEQ (WHO 2005)** 0.385  
**Upper Bound PCDD/F TEQ (WHO 2005)** 0.497

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S1-SB-CH-071  
 ALS Sample ID L2222986-32  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 13.77 g  
 Percent Moisture 32.6%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information**
**Run 1**

Filename 7-190327A27  
 Run Date 28-Mar-19 05:58  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.0091	0.0091		U	0.36
1,2,3,7,8-PeCDD	1	32.00	<0.0095	0.0036	M,J,R	0.0095	1.8
1,2,3,4,7,8-HxCDD	0.1	34.03	<0.012	0.0052	M,J,R	0.012	1.8
1,2,3,6,7,8-HxCDD	0.1	34.09	<0.012	0.0048	M,J,R	0.012	1.8
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.013	0.0048	M,J,R	0.013	1.8
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.0472	0.0055	M,J,B		1.8
OCDD	0.0003	37.18	0.284	0.0051	J,B		3.6
2,3,7,8-TCDF	0.1	NotFnd	<0.0064	0.0064		U	0.36
1,2,3,7,8-PeCDF	0.03	31.07	0.0218	0.0048	M,J,B		1.8
2,3,4,7,8-PeCDF	0.3	31.79	0.00944	0.0039	M,J,B		1.8
1,2,3,4,7,8-HxCDF	0.1	33.56	0.0232	0.0048	M,J,B		1.8
1,2,3,6,7,8-HxCDF	0.1	33.62	<0.016	0.0050	M,J,R	0.016	1.8
2,3,4,6,7,8-HxCDF	0.1	33.96	<0.014	0.0049	M,J,R	0.014	1.8
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.023	0.0069	M,J,R	0.023	1.8
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.0647	0.0052	J,B		1.8
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.0276	0.0067	M,J,B		1.8
OCDF	0.0003	37.27	0.204	0.0062	M,J,B		3.6

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.86	83 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	88 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	78 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	84 23-140
13C12-OCDD	2000	37.18	71 17-157
13C12-2,3,7,8-TCDF	1000	26.93	81 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	83 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	85 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	78 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	84 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	80 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	77 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	79 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	80 26-138

Cleanup Standard	pg	Conc. pg/g	EDL pg/g
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.87	89 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g
Total-TCDD	0.00	<0.0091	0.0091
Total-PeCDD	0.00	<0.0036	0.0036
Total-HxCDD	0.00	<0.0052	0.0052
Total-HpCDD	1.00	0.0472	0.0055
Total-TCDF	0.00	<0.0064	0.0064
Total-PeCDF	3.00	0.0407	0.0048
Total-HxCDF	3.00	0.0450	0.0069
Total-HpCDF	2.00	0.0923	0.0067

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.00735
Mid Point PCDD/F TEQ (WHO 2005)	0.0307
Upper Bound PCDD/F TEQ (WHO 2005)	0.0356

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S2-NG-CH-075  
 ALS Sample ID L2222986-34  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 3.24 g  
 Percent Moisture 84.2%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A07  
 Run Date 28-Mar-19 15:29  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.13	0.13	U		1.5
1,2,3,7,8-PeCDD	1	NotFnd	<0.055	0.055	U		7.7
1,2,3,4,7,8-HxCDD	0.1	34.04	<0.079	0.068	M,J,R	0.079	7.7
1,2,3,6,7,8-HxCDD	0.1	34.10	<0.082	0.063	M,J,R	0.082	7.7
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.094	0.063	M,J,R	0.094	7.7
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.667	0.082	M,J,B		7.7
OCDD	0.0003	37.20	2.49	0.094	M,J,B		15
2,3,7,8-TCDF	0.1	26.93	0.145	0.096	M,J		1.5
1,2,3,7,8-PeCDF	0.03	31.07	<0.099	0.065	M,J,R	0.099	7.7
2,3,4,7,8-PeCDF	0.3	31.78	<0.094	0.052	M,J,R	0.094	7.7
1,2,3,4,7,8-HxCDF	0.1	33.56	<0.10	0.052	M,J,R	0.10	7.7
1,2,3,6,7,8-HxCDF	0.1	33.62	<0.070	0.052	M,J,R	0.070	7.7
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.094	0.055	M,J,R	0.094	7.7
1,2,3,7,8,9-HxCDF	0.1	34.36	0.0927	0.074	M,J,B		7.7
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.368	0.068	M,J,B		7.7
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.089	0.089	U		7.7
OCDF	0.0003	37.28	0.936	0.097	J,B		15

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	82 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	86 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	78 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	86 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	86 23-140
13C12-OCDD	2000	37.18	65 17-157
13C12-2,3,7,8-TCDF	1000	26.90	85 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	84 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	84 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	78 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	85 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	79 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	76 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	82 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	82 26-138

Cleanup Standard	pg	Conc.	EDL
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.84	82 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g
Total-TCDD	0.00	<0.13	0.13 U 1.5
Total-PeCDD	3.00	0.708	0.055 7.7
Total-HxCDD	2.00	1.31	0.068 7.7
Total-HpCDD	2.00	1.53	0.082 7.7
Total-TCDF	6.00	0.967	0.096 1.5
Total-PeCDF	1.00	0.0742	0.065 7.7
Total-HxCDF	2.00	0.198	0.074 7.7
Total-HpCDF	1.00	0.368	0.089 7.7

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0351
Mid Point PCDD/F TEQ (WHO 2005)	0.211
Upper Bound PCDD/F TEQ (WHO 2005)	0.304

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S2-SB-CH-077  
 ALS Sample ID L2222986-35  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 11.03 g  
 Percent Moisture 45.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A29  
 Run Date 28-Mar-19 07:23  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.016	0.016		U	0.45
1,2,3,7,8-PeCDD	1	32.00	0.0181	0.0087	M,J		2.3
1,2,3,4,7,8-HxCDD	0.1	34.04	<0.024	0.0091	M,J,R	0.024	2.3
1,2,3,6,7,8-HxCDD	0.1	34.11	<0.027	0.0084	M,J,R	0.027	2.3
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.041	0.0084	M,J,R	0.041	2.3
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.0607	0.0074	M,J,B		2.3
OCDD	0.0003	37.19	0.389	0.010	J,B		4.5
2,3,7,8-TCDF	0.1	NotFnd	<0.011	0.011		U	0.45
1,2,3,7,8-PeCDF	0.03	31.07	<0.020	0.0065	J,R	0.020	2.3
2,3,4,7,8-PeCDF	0.3	31.78	<0.013	0.0056	M,J,R	0.013	2.3
1,2,3,4,7,8-HxCDF	0.1	33.56	<0.023	0.0060	M,J,R	0.023	2.3
1,2,3,6,7,8-HxCDF	0.1	33.63	0.0254	0.0060	M,J		2.3
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.022	0.0058	J,R	0.022	2.3
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.041	0.0076	M,J,R	0.041	2.3
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.0653	0.0055	M,J,B		2.3
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.0363	0.0070	M,J,B		2.3
OCDF	0.0003	37.28	0.227	0.010	J,B		4.5

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	54 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	57 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	49 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	54 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	52 23-140
13C12-OCDD	2000	37.18	45 17-157
13C12-2,3,7,8-TCDF	1000	26.92	53 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	53 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	55 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	48 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	51 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	50 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	50 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	50 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	49 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.87	59 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.016	0.016	U		0.45
Total-PeCDD	2.00	0.0308	0.0087			2.3
Total-HxCDD	0.00	<0.0091	0.0091	U		2.3
Total-HpCDD	2.00	0.109	0.0074			2.3
Total-TCDF	0.00	<0.011	0.011	U		0.45
Total-PeCDF	0.00	<0.0065	0.0065	U		2.3
Total-HxCDF	2.00	0.0335	0.0076			2.3
Total-HpCDF	2.00	0.102	0.0070			2.3

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0224
Mid Point PCDD/F TEQ (WHO 2005)	0.0533
Upper Bound PCDD/F TEQ (WHO 2005)	0.0618

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S4-NG-CH-093  
 ALS Sample ID L2222986-38  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 4.76 g  
 Percent Moisture 76.3%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A08  
 Run Date 28-Mar-19 16:12  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.071	0.071	U		1.1
1,2,3,7,8-PeCDD	1	32.00	<0.095	0.049	M,J,R	0.095	5.3
1,2,3,4,7,8-HxCDD	0.1	34.04	0.101	0.042	J,B		5.3
1,2,3,6,7,8-HxCDD	0.1	34.10	0.124	0.038	M,J,B		5.3
1,2,3,7,8,9-HxCDD	0.1	34.24	<0.11	0.039	M,J,R	0.11	5.3
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.750	0.043	J		5.3
OCDD	0.0003	37.20	2.75	0.052	J,B		11
2,3,7,8-TCDF	0.1	26.92	0.116	0.056	M,J		1.1
1,2,3,7,8-PeCDF	0.03	31.07	0.0903	0.032	M,J,B		5.3
2,3,4,7,8-PeCDF	0.3	31.79	<0.074	0.026	M,J,R	0.074	5.3
1,2,3,4,7,8-HxCDF	0.1	33.56	0.0987	0.033	M,J,B		5.3
1,2,3,6,7,8-HxCDF	0.1	33.63	0.0987	0.033	M,J		5.3
2,3,4,6,7,8-HxCDF	0.1	33.95	0.101	0.035	M,J,B		5.3
1,2,3,7,8,9-HxCDF	0.1	34.38	<0.092	0.045	M,J,R	0.092	5.3
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.363	0.022	M,J,B		5.3
1,2,3,4,7,8,9-HpCDF	0.01	35.95	<0.089	0.026	M,J,R	0.089	5.3
OCDF	0.0003	37.28	0.529	0.044	M,J,B		11

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	77 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	80 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	74 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	80 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	82 23-140
13C12-OCDD	2000	37.19	66 17-157
13C12-2,3,7,8-TCDF	1000	26.90	80 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	78 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	80 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	73 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	79 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	72 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	72 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	73 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	77 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	66 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	2.00	0.595	0.071	1.1
Total-PeCDD	2.00	0.727	0.049	5.3
Total-HxCDD	4.00	1.64	0.042	5.3
Total-HpCDD	2.00	1.79	0.043	5.3
Total-TCDF	7.00	1.27	0.056	1.1
Total-PeCDF	5.00	0.739	0.032	5.3
Total-HxCDF	3.00	0.300	0.045	5.3
Total-HpCDF	1.00	0.363	0.026	5.3

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0788
Mid Point PCDD/F TEQ (WHO 2005)	0.253
Upper Bound PCDD/F TEQ (WHO 2005)	0.288

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S4-SB-CH-095  
 ALS Sample ID L2222986-39  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 11-Mar-19  
 Sample Size 15.98 g  
 Percent Moisture 21.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A31  
 Run Date 28-Mar-19 08:47  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.0094	0.0094		U	0.31
1,2,3,7,8-PeCDD	1	32.02	<0.0067	0.0038	M,J,R	0.0067	1.6
1,2,3,4,7,8-HxCDD	0.1	34.05	0.0188	0.010	M,J,B		1.6
1,2,3,6,7,8-HxCDD	0.1	34.11	<0.012	0.0097	M,J,R	0.012	1.6
1,2,3,7,8,9-HxCDD	0.1	34.24	0.0175	0.0097	M,J		1.6
1,2,3,4,6,7,8-HpCDD	0.01	35.72	0.0513	0.0059	M,J,B		1.6
OCDD	0.0003	37.20	0.218	0.0062	M,J,B		3.1
2,3,7,8-TCDF	0.1	NotFnd	<0.0065	0.0065		U	0.31
1,2,3,7,8-PeCDF	0.03	31.09	0.0156	0.0033	M,J,B		1.6
2,3,4,7,8-PeCDF	0.3	31.79	0.0106	0.0027	M,J,B		1.6
1,2,3,4,7,8-HxCDF	0.1	33.57	0.0181	0.0046	M,J,B		1.6
1,2,3,6,7,8-HxCDF	0.1	33.63	0.0156	0.0045	M,J		1.6
2,3,4,6,7,8-HxCDF	0.1	33.96	<0.012	0.0046	M,J,R	0.012	1.6
1,2,3,7,8,9-HxCDF	0.1	34.37	0.0250	0.0066	M,J,B		1.6
1,2,3,4,6,7,8-HpCDF	0.01	35.16	0.0419	0.0072	M,J,B		1.6
1,2,3,4,7,8,9-HpCDF	0.01	35.96	0.0213	0.0088	M,J,B		1.6
OCDF	0.0003	37.29	0.124	0.0064	M,J,B		3.1

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	80 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	83 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.05	73 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.10	82 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.71	76 23-140
13C12-OCDD	2000	37.19	70 17-157
13C12-2,3,7,8-TCDF	1000	26.92	77 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.07	80 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	80 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	73 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.63	79 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.95	77 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.37	70 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.16	69 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.96	73 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.87	84 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.0094	0.0094	U		0.31
Total-PeCDD	1.00	0.00688	0.0038			1.6
Total-HxCDD	2.00	0.0363	0.010			1.6
Total-HpCDD	2.00	0.0807	0.0059			1.6
Total-TCDF	0.00	<0.0065	0.0065	U		0.31
Total-PeCDF	2.00	0.0263	0.0033			1.6
Total-HxCDF	3.00	0.0588	0.0066			1.6
Total-HpCDF	2.00	0.0632	0.0088			1.6

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0144
Mid Point PCDD/F TEQ (WHO 2005)	0.0285
Upper Bound PCDD/F TEQ (WHO 2005)	0.0335

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S7-NG-CH-085  
 ALS Sample ID L2222986-42  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 17-Oct-18  
 Extraction Date 11-Mar-19  
 Sample Size 4.33 g  
 Percent Moisture 78.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190327A32  
 Run Date 28-Mar-19 09:29  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.033	0.033		U	1.2
1,2,3,7,8-PeCDD	1	32.00	0.0670	0.014	M,J		5.8
1,2,3,4,7,8-HxCDD	0.1	34.04	<0.090	0.015	J,R	0.090	5.8
1,2,3,6,7,8-HxCDD	0.1	34.09	0.136	0.014	J,B		5.8
1,2,3,7,8,9-HxCDD	0.1	34.22	0.153	0.014	J		5.8
1,2,3,4,6,7,8-HpCDD	0.01	35.70	1.57	0.024	J		5.8
OCDD	0.0003	37.19	9.17	0.035	J		12
2,3,7,8-TCDF	0.1	26.92	0.0994	0.024	J		1.2
1,2,3,7,8-PeCDF	0.03	31.07	0.0763	0.017	M,J,B		5.8
2,3,4,7,8-PeCDF	0.3	31.78	0.0809	0.013	M,J,B		5.8
1,2,3,4,7,8-HxCDF	0.1	33.56	<0.093	0.015	M,J,R	0.093	5.8
1,2,3,6,7,8-HxCDF	0.1	33.62	0.0901	0.015	J		5.8
2,3,4,6,7,8-HxCDF	0.1	33.94	<0.098	0.015	M,J,R	0.098	5.8
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.11	0.019	J,R	0.11	5.8
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.458	0.013	J,B		5.8
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.0786	0.016	J,B		5.8
OCDF	0.0003	37.27	1.24	0.025	J		12

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	82 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	96 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	88 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	88 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	86 23-140
13C12-OCDD	2000	37.18	56 17-157
13C12-2,3,7,8-TCDF	1000	26.90	84 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	91 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	93 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	85 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	87 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	85 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	85 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	81 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	82 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.84	81 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	
Total-TCDD	2.00	0.254	0.033	1.2
Total-PeCDD	4.00	0.689	0.014	5.8
Total-HxCDD	4.00	1.86	0.015	5.8
Total-HpCDD	2.00	4.03	0.024	5.8
Total-TCDF	13.00	1.59	0.024	1.2
Total-PeCDF	6.00	0.887	0.017	5.8
Total-HxCDF	4.00	0.573	0.019	5.8
Total-HpCDF	3.00	0.862	0.016	5.8

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.166
Mid Point PCDD/F TEQ (WHO 2005)	0.221
Upper Bound PCDD/F TEQ (WHO 2005)	0.238

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	Method Blank	Sampling Date	n/a	
ALS Sample ID	WG2991222-1	Extraction Date	11-Mar-19	
Analysis Method	EPA 1613B	Sample Size	10.00	g
Analysis Type	Blank	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

<b>Run Information</b>		<b>Run 1</b>	
Filename	7-190327A05		
Run Date	27-Mar-19 14:22		
Final Volume	10	uL	
Dilution Factor	1		
Analysis Units	pg/g		
Instrument - Column	HRMS-7 DB5MSUSR339925H		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.0089	0.0089	U		0.50
1,2,3,7,8-PeCDD	1	32.02	<0.014	0.0036	M,J,R	0.014	2.5
1,2,3,4,7,8-HxCDD	0.1	34.05	0.0220	0.0065	M,J		2.5
1,2,3,6,7,8-HxCDD	0.1	34.10	0.0210	0.0061	M,J		2.5
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.033	0.0061	M,J,R	0.033	2.5
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.0680	0.0066	M,J		2.5
OCDD	0.0003	37.18	0.425	0.0086	J		5.0
2,3,7,8-TCDF	0.1	NotFnd	<0.0066	0.0066	U		0.50
1,2,3,7,8-PeCDF	0.03	31.07	0.0200	0.0053	M,J		2.5
2,3,4,7,8-PeCDF	0.3	31.79	0.0100	0.0043	J		2.5
1,2,3,4,7,8-HxCDF	0.1	33.56	0.0200	0.0055	M,J		2.5
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.016	0.0055	M,J,R	0.016	2.5
2,3,4,6,7,8-HxCDF	0.1	33.95	0.0170	0.0055	M,J		2.5
1,2,3,7,8,9-HxCDF	0.1	34.37	0.0290	0.0075	M,J		2.5
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.0470	0.0039	J		2.5
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.0290	0.0053	J		2.5
OCDF	0.0003	37.27	0.117	0.0071	M,J		5.0

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	83 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	81 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	74 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	82 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	74 23-140
13C12-OCDD	2000	37.18	64 17-157
13C12-2,3,7,8-TCDF	1000	26.89	84 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	81 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	79 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	73 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	79 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	78 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	74 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	73 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	71 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.84	92 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	LQL
Total-TCDD	0.00	<0.0089	0.0089	U	0.50
Total-PeCDD	0.00	<0.0036	0.0036	U	2.5
Total-HxCDD	2.00	0.0430	0.0065		2.5
Total-HpCDD	1.00	0.0680	0.0066		2.5
Total-TCDF	0.00	<0.0066	0.0066	U	0.50
Total-PeCDF	2.00	0.0310	0.0053		2.5
Total-HxCDF	3.00	0.0670	0.0075		2.5
Total-HpCDF	2.00	0.0760	0.0053		2.5

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0161
Mid Point PCDD/F TEQ (WHO 2005)	0.0398
Upper Bound PCDD/F TEQ (WHO 2005)	0.0446

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a	
ALS Sample ID	WG2991222-2	Extraction Date	11-Mar-19	
Analysis Method	EPA 1613B	Sample Size	1	n/a
Analysis Type	LCS	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

Approved:  
T. Patterson  
--e-signature--  
29-Mar-2018

<b>Run Information</b>		<b>Run 1</b>	
Filename	7-190327A02		
Run Date	27-Mar-19 12:16		
Final Volume	10	uL	
Dilution Factor	1		
Analysis Units	%		
Instrument - Column	HRMS-7 DB5MSUSR339925H		

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
2,3,7,8-TCDD	100	27.86	104	67-158	
1,2,3,7,8-PeCDD	500	31.99	107	70-142	
1,2,3,4,7,8-HxCDD	500	34.03	101	70-164	
1,2,3,6,7,8-HxCDD	500	34.09	95	76-134	
1,2,3,7,8,9-HxCDD	500	34.21	103	64-162	
1,2,3,4,6,7,8-HpCDD	500	35.69	105	70-140	
OCDD	1000	37.17	102	78-144	
2,3,7,8-TCDF	100	26.92	99	75-158	
1,2,3,7,8-PeCDF	500	31.06	104	80-134	
2,3,4,7,8-PeCDF	500	31.77	91	68-160	
1,2,3,4,7,8-HxCDF	500	33.55	101	72-134	
1,2,3,6,7,8-HxCDF	500	33.61	104	84-130	
2,3,4,6,7,8-HxCDF	500	33.94	101	70-156	
1,2,3,7,8,9-HxCDF	500	34.35	107	78-130	
1,2,3,4,6,7,8-HpCDF	500	35.13	105	82-122	
1,2,3,4,7,8,9-HpCDF	500	35.93	103	78-138	
OCDF	1000	37.26	102	63-170	
<b>Extraction Standards</b>	<b>pg</b>		<b>% Rec</b>	<b>Limits</b>	
13C12-2,3,7,8-TCDD	1000	27.83	95	20-175	
13C12-1,2,3,7,8-PeCDD	1000	31.98	82	21-227	
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	80	21-193	
13C12-1,2,3,6,7,8-HxCDD	1000	34.08	81	25-163	
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.67	76	26-166	
13C12-OCDD	2000	37.16	70	13-138	
13C12-2,3,7,8-TCDF	1000	26.90	90	22-152	
13C12-1,2,3,7,8-PeCDF	1000	31.05	82	21-192	
13C12-2,3,4,7,8-PeCDF	1000	31.76	81	13-328	
13C12-1,2,3,4,7,8-HxCDF	1000	33.54	77	19-202	
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	77	21-159	
13C12-2,3,4,6,7,8-HxCDF	1000	33.93	78	17-205	
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	78	22-176	
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.13	75	21-158	
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	78	20-186	
<b>Cleanup Standard</b>	<b>pg</b>				
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	99	31-191	



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567


## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 27-Mar-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** PCB group totals by EPA 680

Certified by: \_\_\_\_\_

  
Ron McLeod, Ph.D.  
Technical Director

Results in this certificate relate only to the samples as submitted to the laboratory.  
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# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	Method Blank	18-W4-NG-CH-009	18-W4-FC-CH-011	18-N4-NG-CH-025	18-N4-WW-CH-027	18-E6-NG-CH-061
ALS Sample ID	WG2991227-1	L2222986-5	L2222986-6	L2222986-12	L2222986-13	L2222986-28
Sample Size	20.00	1.00	21.37	2.21	15.39	2.00
Sample units	g	g	g	g	g	g
Moisture Content	n/a	80.9%	28.8%	81.8%	34.6%	70.6%
Matrix	QC	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	n/a	16-Oct-18	16-Oct-18	26-Sep-18	5-Jul-18	17-Oct-18
Extraction Date	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19

Homologue Groups	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
Total Monochlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	<0.1052
Total Dichlorobiphenyls	0.023	0.777	0.020	0.326	0.052	0.280
Total Trichlorobiphenyls	0.040	0.695	0.029	0.307	0.042	0.366
Total Tetrachlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	0.234
Total Pentachlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	0.236
Total Hexachlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	0.136
Total Heptachlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	<0.1052
Total Octachlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	<0.1052
Total Nonachlorobiphenyls	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	<0.1052
Decachlorobiphenyl	<0.0105	<0.209	<0.0098	<0.0948	<0.0136	<0.1052
Total Chlorinated Biphenyls	0.063	1.472	0.049	0.63	0.09	1.252

Extraction Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
13C12-PCB1ES	40.3	50.4	57.1	52.3	57.2	55.3
13C12-PCB3ES	43.0	51.7	57.5	54.1	61.2	60.1
13C12-PCB4ES	43.9	53.8	59.6	56.2	63.0	59.3
13C12-PCB15ES	50.8	61.4	66.3	62.8	72.5	68.0
13C12-PCB19ES	47.5	58.1	63.8	60.3	67.1	62.8
13C12-PCB37ES	58.4	62.1	69.4	65.4	70.4	66.7
13C12-PCB54ES	47.8	57.4	62.7	58.9	65.7	61.2
13C12-PCB81ES	60.7	61.6	68.9	62.2	66.1	63.4
13C12-PCB104ES	50.7	58.3	64.0	58.1	62.2	59.6
13C12-PCB123ES	68.7	62.7	79.6	63.9	67.5	67.0
13C12-PCB118ES	55.7	58.4	61.9	58.9	62.9	61.4
13C12-PCB114ES	64.4	63.3	74.2	64.7	70.7	68.5
13C12-PCB105ES	60.8	60.8	73.4	62.9	65.7	64.5
13C12-PCB126ES	53.8	53.2	53.1	46.1	54.6	50.5
13C12-PCB155ES	49.1	54.5	66.2	54.8	59.4	58.4
13C12-PCB167ES	73.5	70.0	81.5	71.8	74.6	75.8
13C12-PCB156ES	64.4	64.3	81.2	66.3	73.6	74.5
13C12-PCB157ES	73.4	71.4	85.8	69.4	82.0	72.9
13C12-PCB169ES	71.9	71.7	90.7	70.8	78.0	93.9
13C12-PCB188ES	60.1	59.1	70.8	59.9	65.4	64.5
13C12-PCB202ES	63.1	61.1	74.5	61.8	68.4	68.4
13C12-PCB205ES	67.9	63.5	74.4	65.6	68.8	69.7
13C12-PCB208ES	70.8	67.3	79.4	66.1	67.0	69.0
13C12-PCB206ES	71.9	67.8	79.0	69.3	73.9	74.4
13C12-PCB209ES	75.9	74.1	86.1	73.6	53.5	76.6

M Indicates that a peak has been manually integrated.

# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	18-D3-NG-CH-203	18-D9-NG-CH-220	18-D5-SB-CH-205	18-D6-FC-CH-207	18-D7-WW-CH-209	Laboratory Control Sample
ALS Sample ID	L2222986-45	L2222986-46	L2222986-48	L2222986-49	L2222986-50	WG2991227-2
Sample Size	5.54	17.27	21.27	18.48	16.11	1
Sample units	g	g	g	g	g	n/a
Moisture Content	79.7%	75.6%	37.8%	27.2%	37.0%	n/a
Matrix	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	QC
Sampling Date	25-Sep-18	16-Oct-18	26-Sep-18	16-Oct-18	5-Jul-18	n/a
Extraction Date	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19

Homologue Groups	ng/g	ng/g	ng/g	ng/g	ng/g	% Rec
Total Monochlorobiphenyls	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	184.60
Total Dichlorobiphenyls	0.106	0.032	0.026	0.0	0.0	113.5
Total Trichlorobiphenyls	0.119	0.042	0.020	0.0	0.0	109.2
Total Tetrachlorobiphenyls	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	114.0
Total Pentachlorobiphenyls	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	106.6
Total Hexachlorobiphenyls	0.042	0.012	<0.0099	<0.0114	<0.013	110.2
Total Heptachlorobiphenyls	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	118.3
Total Octachlorobiphenyls	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	101.2
Total Nonachlorobiphenyls	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	97.5
Decachlorobiphenyl	<0.0379	<0.0122	<0.0099	<0.0114	<0.013	97.4
Total Chlorinated Biphenyls	0.27	0.085	0.046	0.1	0.1	115.2

Extraction Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
13C12-PCB1ES	54.2	55.1	59.7	51.1	52.5	34.6
13C12-PCB3ES	59.0	59.1	62.1	56.3	54.5	34.5
13C12-PCB4ES	58.0	59.5	62.5	57.3	56.5	36.0
13C12-PCB15ES	70.1	65.3	71.3	66.9	61.2	39.6
13C12-PCB19ES	64.6	63.0	67.4	63.2	59.6	35.8
13C12-PCB37ES	66.0	63.2	67.1	67.6	60.0	56.5
13C12-PCB54ES	62.5	60.5	64.0	63.2	58.0	39.4
13C12-PCB81ES	61.6	59.4	64.4	68.2	57.0	59.5
13C12-PCB104ES	57.9	60.5	62.8	65.7	57.5	43.0
13C12-PCB123ES	67.2	67.6	69.2	78.2	61.6	65.3
13C12-PCB118ES	59.2	54.5	64.8	62.4	58.7	59.1
13C12-PCB114ES	67.1	64.0	72.6	73.5	64.3	64.7
13C12-PCB105ES	63.7	59.0	67.1	71.4	59.2	61.8
13C12-PCB126ES	48.0	43.8 M	55.8	51.8 M	47.8	52.3
13C12-PCB155ES	56.8	58.8	62.2	66.8	58.8	54.3
13C12-PCB167ES	73.9	67.8	74.7	78.8	65.0	72.7
13C12-PCB156ES	71.6 M	66.6 M	73.8 M	74.5 M	60.7 M	66.4 M
13C12-PCB157ES	71.3	69.6	80.4	84.7	70.9	71.7
13C12-PCB169ES	79.8 M	68.5 M	84.2	77.4	66.1	66.2
13C12-PCB188ES	63.2	61.4	67.5	71.2	60.1	60.0
13C12-PCB202ES	66.8	63.5	69.0	72.7	58.8	63.5
13C12-PCB205ES	65.5	64.1	69.3	74.4	62.9	69.0
13C12-PCB208ES	62.0	67.0	72.6	79.9	60.3	74.9
13C12-PCB206ES	69.9	69.2	73.2	80.4	64.2	70.1
13C12-PCB209ES	74.5	68.3	79.3	84.3	60.4	74.6

M Indicates that a peak has been manually integrated.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a
ALS Sample ID	WG2991227-1	Extraction Date	13-Mar-19
Analysis Method	EPA 680		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	20.00 g		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG2991227

Approved:  
Andrew Reid  
--e-signature--  
27-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032627.D
Run Date	26-Mar-19 19:33
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		0.02	
Total Trichlorobiphenyls		0.0402	
Total Tetrachlorobiphenyls		<0.0105	U
Total Pentachlorobiphenyls		<0.0105	U
Total Hexachlorobiphenyls		<0.0105	U
Total Heptachlorobiphenyls		<0.0105	U
Total Octachlorobiphenyls		<0.0105	U
Total Nonachlorobiphenyls		<0.0105	U
Decachlorobiphenyl		<0.0105	U

Total Chlorinated Biphenyls 0.0631

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.27	40.30	5-145
13C12-PCB3ES	20	6.00	43.00	5-145
13C12-PCB4ES	20	6.42	43.90	5-145
13C12-PCB15ES	20	8.42	50.80	5-145
13C12-PCB19ES	20	7.81	47.50	5-145
13C12-PCB37ES	20	11.16	58.40	5-145
13C12-PCB54ES	20	9.20	47.80	5-145
13C12-PCB81ES	20	13.07	60.70	5-145
13C12-PCB104ES	20	10.94	50.70	5-145
13C12-PCB123ES	20	13.64	68.70	5-145
13C12-PCB118ES	20	13.67	55.70	5-145
13C12-PCB114ES	20	13.85	64.40	5-145
13C12-PCB105ES	20	14.09	60.80	5-145
13C12-PCB126ES	20	14.57	53.80	5-145
13C12-PCB155ES	20	12.38	49.10	5-145
13C12-PCB167ES	20	14.84	73.50	5-145
13C12-PCB156ES	20	15.15	64.40 M	5-145
13C12-PCB157ES	20	15.23	73.40	5-145
13C12-PCB169ES	20	15.63	71.90	5-145
13C12-PCB188ES	20	13.93	60.10	5-145
13C12-PCB202ES	20	15.12	63.10	5-145
13C12-PCB205ES	20	16.64	67.90	5-145
13C12-PCB208ES	20	16.28	70.80	5-145
13C12-PCB206ES	20	17.12	71.90	5-145
13C12-PCB209ES	20	17.64	75.90	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	18-W4-NG-CH-009	Sampling Date	16-Oct-18
ALS Sample ID	L2222986-5	Extraction Date	13-Mar-19
Analysis Method	EPA 680		
Analysis Type	blank		
Sample Matrix	Plant Tissue		
Sample Size	1.00 g		
Percent Moisture	80.9%		
Split Ratio	2	Workgroup	WG2991227

Approved:  
Andrew Reid  
--e-signature--  
27-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032628.D
Run Date	26-Mar-19 19:58
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.209	U
Total Dichlorobiphenyls		0.7766	
Total Trichlorobiphenyls		0.6954	
Total Tetrachlorobiphenyls		<0.209	U
Total Pentachlorobiphenyls		<0.209	U
Total Hexachlorobiphenyls		<0.209	U
Total Heptachlorobiphenyls		<0.209	U
Total Octachlorobiphenyls		<0.209	U
Total Nonachlorobiphenyls		<0.209	U
Decachlorobiphenyl		<0.209	U

Total Chlorinated Biphenyls		1.4720	
<b>Extraction Standards</b>	<b>ng</b>	<b>Ret time</b>	<b>% Rec</b> <b>Limits</b>
13C12-PCB1ES	20	5.28	50.40      5-145
13C12-PCB3ES	20	6.01	51.70      5-145
13C12-PCB4ES	20	6.44	53.80      5-145
13C12-PCB15ES	20	8.43	61.40      5-145
13C12-PCB19ES	20	7.83	58.10      5-145
13C12-PCB37ES	20	11.16	62.10      5-145
13C12-PCB54ES	20	9.20	57.40      5-145
13C12-PCB81ES	20	13.07	61.60      5-145
13C12-PCB104ES	20	10.95	58.30      5-145
13C12-PCB123ES	20	13.64	62.70      5-145
13C12-PCB118ES	20	13.67	58.40      5-145
13C12-PCB114ES	20	13.85	63.30      5-145
13C12-PCB105ES	20	14.09	60.80      5-145
13C12-PCB126ES	20	14.57	53.20      5-145
13C12-PCB155ES	20	12.39	54.50      5-145
13C12-PCB167ES	20	14.84	70.00      5-145
13C12-PCB156ES	20	15.15	64.30 M      5-145
13C12-PCB157ES	20	15.23	71.40      5-145
13C12-PCB169ES	20	15.63	71.70      5-145
13C12-PCB188ES	20	13.93	59.10      5-145
13C12-PCB202ES	20	15.12	61.10      5-145
13C12-PCB205ES	20	16.64	63.50      5-145
13C12-PCB208ES	20	16.28	67.30      5-145
13C12-PCB206ES	20	17.12	67.80      5-145
13C12-PCB209ES	20	17.65	74.10      5-145

M      Indicates that a peak has been manually integrated.  
U      Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-W4-FC-CH-011  
 ALS Sample ID L2222986-6  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 21.37 g  
 Percent Moisture 28.8%  
 Split Ratio 2

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032629.D  
 Run Date 26-Mar-19 20:22  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

### Homologue Groups

Ret. Time	Concentration ng/g	Flags
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Total Monochlorobiphenyls	<0.0098	U
Total Dichlorobiphenyls	0.0199	
Total Trichlorobiphenyls	0.0294	
Total Tetrachlorobiphenyls	<0.0098	U
Total Pentachlorobiphenyls	<0.0098	U
Total Hexachlorobiphenyls	<0.0098	U
Total Heptachlorobiphenyls	<0.0098	U
Total Octachlorobiphenyls	<0.0098	U
Total Nonachlorobiphenyls	<0.0098	U
Decachlorobiphenyl	<0.0098	U

Total Chlorinated Biphenyls 0.0493

### Extraction Standards

ng	Ret time	% Rec	Limits
----	----------	-------	--------

13C12-PCB1ES	20	5.27	57.10	5-145
13C12-PCB3ES	20	6.01	57.50	5-145
13C12-PCB4ES	20	6.44	59.60	5-145
13C12-PCB15ES	20	8.43	66.30	5-145
13C12-PCB19ES	20	7.83	63.80	5-145
13C12-PCB37ES	20	11.16	69.40	5-145
13C12-PCB54ES	20	9.21	62.70	5-145
13C12-PCB81ES	20	13.07	68.90	5-145
13C12-PCB104ES	20	10.95	64.00	5-145
13C12-PCB123ES	20	13.64	79.60	5-145
13C12-PCB118ES	20	13.68	61.90	5-145
13C12-PCB114ES	20	13.85	74.20	5-145
13C12-PCB105ES	20	14.09	73.40	5-145
13C12-PCB126ES	20	14.57	53.10 M	5-145
13C12-PCB155ES	20	12.39	66.20	5-145
13C12-PCB167ES	20	14.84	81.50	5-145
13C12-PCB156ES	20	15.15	81.20 M	5-145
13C12-PCB157ES	20	15.23	85.80	5-145
13C12-PCB169ES	20	15.64	90.70	5-145
13C12-PCB188ES	20	13.93	70.80	5-145
13C12-PCB202ES	20	15.12	74.50	5-145
13C12-PCB205ES	20	16.64	74.40	5-145
13C12-PCB208ES	20	16.28	79.40	5-145
13C12-PCB206ES	20	17.12	79.00	5-145
13C12-PCB209ES	20	17.65	86.10	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-NG-CH-025  
 ALS Sample ID L2222986-12  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 2.21 g  
 Percent Moisture 81.8%  
 Split Ratio 2

Sampling Date 26-Sep-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032630.D  
 Run Date 26-Mar-19 20:47  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0948	U
Total Dichlorobiphenyls		0.3263	
Total Trichlorobiphenyls		0.3066	
Total Tetrachlorobiphenyls		<0.0948	U
Total Pentachlorobiphenyls		<0.0948	U
Total Hexachlorobiphenyls		<0.0948	U
Total Heptachlorobiphenyls		<0.0948	U
Total Octachlorobiphenyls		<0.0948	U
Total Nonachlorobiphenyls		<0.0948	U
Decachlorobiphenyl		<0.0948	U

Total Chlorinated Biphenyls 0.6329

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.27	52.30	5-145
13C12-PCB3ES	20	6.01	54.10	5-145
13C12-PCB4ES	20	6.44	56.20	5-145
13C12-PCB15ES	20	8.43	62.80	5-145
13C12-PCB19ES	20	7.83	60.30	5-145
13C12-PCB37ES	20	11.16	65.40	5-145
13C12-PCB54ES	20	9.20	58.90	5-145
13C12-PCB81ES	20	13.07	62.20	5-145
13C12-PCB104ES	20	10.95	58.10	5-145
13C12-PCB123ES	20	13.64	63.90	5-145
13C12-PCB118ES	20	13.67	58.90	5-145
13C12-PCB114ES	20	13.85	64.70	5-145
13C12-PCB105ES	20	14.09	62.90	5-145
13C12-PCB126ES	20	14.57	46.10	5-145
13C12-PCB155ES	20	12.39	54.80	5-145
13C12-PCB167ES	20	14.84	71.80	5-145
13C12-PCB156ES	20	15.15	66.30 M	5-145
13C12-PCB157ES	20	15.23	69.40	5-145
13C12-PCB169ES	20	15.64	70.80	5-145
13C12-PCB188ES	20	13.93	59.90	5-145
13C12-PCB202ES	20	15.12	61.80	5-145
13C12-PCB205ES	20	16.64	65.60	5-145
13C12-PCB208ES	20	16.28	66.10	5-145
13C12-PCB206ES	20	17.12	69.30	5-145
13C12-PCB209ES	20	17.65	73.60	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-WW-CH-027  
 ALS Sample ID L2222986-13  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 15.39 g  
 Percent Moisture 34.6%  
 Split Ratio 2

Sampling Date 5-Jul-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032631.D  
 Run Date 26-Mar-19 21:11  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0136	U
Total Dichlorobiphenyls		0.0519	
Total Trichlorobiphenyls		0.0421	
Total Tetrachlorobiphenyls		<0.0136	U
Total Pentachlorobiphenyls		<0.0136	U
Total Hexachlorobiphenyls		<0.0136	U
Total Heptachlorobiphenyls		<0.0136	U
Total Octachlorobiphenyls		<0.0136	U
Total Nonachlorobiphenyls		<0.0136	U
Decachlorobiphenyl		<0.0136	U

Total Chlorinated Biphenyls 0.0940

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.28	57.20	5-145
13C12-PCB3ES	20	6.01	61.20	5-145
13C12-PCB4ES	20	6.44	63.00	5-145
13C12-PCB15ES	20	8.43	72.50	5-145
13C12-PCB19ES	20	7.83	67.10	5-145
13C12-PCB37ES	20	11.16	70.40	5-145
13C12-PCB54ES	20	9.20	65.70	5-145
13C12-PCB81ES	20	13.07	66.10	5-145
13C12-PCB104ES	20	10.95	62.20	5-145
13C12-PCB123ES	20	13.64	67.50	5-145
13C12-PCB118ES	20	13.67	62.90	5-145
13C12-PCB114ES	20	13.85	70.70	5-145
13C12-PCB105ES	20	14.09	65.70	5-145
13C12-PCB126ES	20	14.57	54.60	5-145
13C12-PCB155ES	20	12.39	59.40	5-145
13C12-PCB167ES	20	14.84	74.60	5-145
13C12-PCB156ES	20	15.15	73.60 M	5-145
13C12-PCB157ES	20	15.23	82.00	5-145
13C12-PCB169ES	20	15.64	78.00	5-145
13C12-PCB188ES	20	13.93	65.40	5-145
13C12-PCB202ES	20	15.12	68.40	5-145
13C12-PCB205ES	20	16.64	68.80	5-145
13C12-PCB208ES	20	16.28	67.00	5-145
13C12-PCB206ES	20	17.12	73.90	5-145
13C12-PCB209ES	20	17.65	53.50	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E6-NG-CH-061  
 ALS Sample ID L2222986-28  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 2.00 g  
 Percent Moisture 70.6%  
 Split Ratio 2

Sampling Date 17-Oct-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032632.D  
 Run Date 26-Mar-19 21:36  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.1052	U
Total Dichlorobiphenyls		0.2797	
Total Trichlorobiphenyls		0.3657	
Total Tetrachlorobiphenyls		0.2342	
Total Pentachlorobiphenyls		0.2362	
Total Hexachlorobiphenyls		0.1357	
Total Heptachlorobiphenyls		<0.1052	U
Total Octachlorobiphenyls		<0.1052	U
Total Nonachlorobiphenyls		<0.1052	U
Decachlorobiphenyl		<0.1052	U

Total Chlorinated Biphenyls 1.2515

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.27	55.30	5-145
13C12-PCB3ES	20	6.01	60.10	5-145
13C12-PCB4ES	20	6.44	59.30	5-145
13C12-PCB15ES	20	8.43	68.00	5-145
13C12-PCB19ES	20	7.82	62.80	5-145
13C12-PCB37ES	20	11.16	66.70	5-145
13C12-PCB54ES	20	9.20	61.20	5-145
13C12-PCB81ES	20	13.07	63.40	5-145
13C12-PCB104ES	20	10.95	59.60	5-145
13C12-PCB123ES	20	13.64	67.00	5-145
13C12-PCB118ES	20	13.67	61.40	5-145
13C12-PCB114ES	20	13.85	68.50	5-145
13C12-PCB105ES	20	14.09	64.50	5-145
13C12-PCB126ES	20	14.57	50.50	5-145
13C12-PCB155ES	20	12.39	58.40	5-145
13C12-PCB167ES	20	14.84	75.80	5-145
13C12-PCB156ES	20	15.15	74.50 M	5-145
13C12-PCB157ES	20	15.23	72.90	5-145
13C12-PCB169ES	20	15.63	93.90	5-145
13C12-PCB188ES	20	13.93	64.50	5-145
13C12-PCB202ES	20	15.12	68.40	5-145
13C12-PCB205ES	20	16.64	69.70	5-145
13C12-PCB208ES	20	16.28	69.00	5-145
13C12-PCB206ES	20	17.12	74.40	5-145
13C12-PCB209ES	20	17.65	76.60	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D3-NG-CH-203  
 ALS Sample ID L2222986-45  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 5.54 g  
 Percent Moisture 79.7%  
 Split Ratio 2

Sampling Date 25-Sep-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032633.D  
 Run Date 26-Mar-19 22:00  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0379	U
Total Dichlorobiphenyls		0.1	
Total Trichlorobiphenyls		0.1	
Total Tetrachlorobiphenyls		<0.0379	U
Total Pentachlorobiphenyls		<0.0379	U
Total Hexachlorobiphenyls		0.0	
Total Heptachlorobiphenyls		<0.0379	U
Total Octachlorobiphenyls		<0.0379	U
Total Nonachlorobiphenyls		<0.0379	U
Decachlorobiphenyl		<0.0379	U

Total Chlorinated Biphenyls 0.3

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.27	54.20	5-145
13C12-PCB3ES	20	6.00	59.00	5-145
13C12-PCB4ES	20	6.43	58.00	5-145
13C12-PCB15ES	20	8.43	70.10	5-145
13C12-PCB19ES	20	7.82	64.60	5-145
13C12-PCB37ES	20	11.16	66.00	5-145
13C12-PCB54ES	20	9.20	62.50	5-145
13C12-PCB81ES	20	13.07	61.60	5-145
13C12-PCB104ES	20	10.94	57.90	5-145
13C12-PCB123ES	20	13.64	67.20	5-145
13C12-PCB118ES	20	13.67	59.20	5-145
13C12-PCB114ES	20	13.85	67.10	5-145
13C12-PCB105ES	20	14.09	63.70	5-145
13C12-PCB126ES	20	14.57	48.00	5-145
13C12-PCB155ES	20	12.38	56.80	5-145
13C12-PCB167ES	20	14.84	73.90	5-145
13C12-PCB156ES	20	15.15	71.60 M	5-145
13C12-PCB157ES	20	15.22	71.30	5-145
13C12-PCB169ES	20	15.64	79.80 M	5-145
13C12-PCB188ES	20	13.93	63.20	5-145
13C12-PCB202ES	20	15.12	66.80	5-145
13C12-PCB205ES	20	16.64	65.50	5-145
13C12-PCB208ES	20	16.28	62.00	5-145
13C12-PCB206ES	20	17.12	69.90	5-145
13C12-PCB209ES	20	17.65	74.50	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D9-NG-CH-220  
 ALS Sample ID L2222986-46  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 17.27 g  
 Percent Moisture 75.6%  
 Split Ratio 2

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032634.D  
 Run Date 26-Mar-19 22:24  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0122	U
Total Dichlorobiphenyls		0.0	
Total Trichlorobiphenyls		0.0	
Total Tetrachlorobiphenyls		<0.0122	U
Total Pentachlorobiphenyls		<0.0122	U
Total Hexachlorobiphenyls		0.0	
Total Heptachlorobiphenyls		<0.0122	U
Total Octachlorobiphenyls		<0.0122	U
Total Nonachlorobiphenyls		<0.0122	U
Decachlorobiphenyl		<0.0122	U

Total Chlorinated Biphenyls 0.1

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.27	55.10	5-145
13C12-PCB3ES	20	6.01	59.10	5-145
13C12-PCB4ES	20	6.44	59.50	5-145
13C12-PCB15ES	20	8.43	65.30	5-145
13C12-PCB19ES	20	7.83	63.00	5-145
13C12-PCB37ES	20	11.17	63.20	5-145
13C12-PCB54ES	20	9.20	60.50	5-145
13C12-PCB81ES	20	13.07	59.40	5-145
13C12-PCB104ES	20	10.95	60.50	5-145
13C12-PCB123ES	20	13.64	67.60	5-145
13C12-PCB118ES	20	13.68	54.50	5-145
13C12-PCB114ES	20	13.85	64.00	5-145
13C12-PCB105ES	20	14.09	59.00	5-145
13C12-PCB126ES	20	14.57	43.80 M	5-145
13C12-PCB155ES	20	12.39	58.80	5-145
13C12-PCB167ES	20	14.84	67.80	5-145
13C12-PCB156ES	20	15.15	66.60 M	5-145
13C12-PCB157ES	20	15.23	69.60	5-145
13C12-PCB169ES	20	15.64	68.50 M	5-145
13C12-PCB188ES	20	13.93	61.40	5-145
13C12-PCB202ES	20	15.12	63.50	5-145
13C12-PCB205ES	20	16.64	64.10	5-145
13C12-PCB208ES	20	16.28	67.00	5-145
13C12-PCB206ES	20	17.12	69.20	5-145
13C12-PCB209ES	20	17.65	68.30	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D5-SB-CH-205  
 ALS Sample ID L2222986-48  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 21.27 g  
 Percent Moisture 37.8%  
 Split Ratio 2

Sampling Date 26-Sep-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032635.D  
 Run Date 26-Mar-19 22:49  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0099	U
Total Dichlorobiphenyls		0.0	
Total Trichlorobiphenyls		0.0	
Total Tetrachlorobiphenyls		<0.0099	U
Total Pentachlorobiphenyls		<0.0099	U
Total Hexachlorobiphenyls		<0.0099	U
Total Heptachlorobiphenyls		<0.0099	U
Total Octachlorobiphenyls		<0.0099	U
Total Nonachlorobiphenyls		<0.0099	U
Decachlorobiphenyl		<0.0099	U

Total Chlorinated Biphenyls 0.0

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.28	59.70	5-145
13C12-PCB3ES	20	6.01	62.10	5-145
13C12-PCB4ES	20	6.44	62.50	5-145
13C12-PCB15ES	20	8.43	71.30	5-145
13C12-PCB19ES	20	7.83	67.40	5-145
13C12-PCB37ES	20	11.16	67.10	5-145
13C12-PCB54ES	20	9.20	64.00	5-145
13C12-PCB81ES	20	13.07	64.40	5-145
13C12-PCB104ES	20	10.95	62.80	5-145
13C12-PCB123ES	20	13.64	69.20	5-145
13C12-PCB118ES	20	13.67	64.80	5-145
13C12-PCB114ES	20	13.85	72.60	5-145
13C12-PCB105ES	20	14.09	67.10	5-145
13C12-PCB126ES	20	14.57	55.80	5-145
13C12-PCB155ES	20	12.39	62.20	5-145
13C12-PCB167ES	20	14.84	74.70	5-145
13C12-PCB156ES	20	15.15	73.80 M	5-145
13C12-PCB157ES	20	15.23	80.40	5-145
13C12-PCB169ES	20	15.63	84.20	5-145
13C12-PCB188ES	20	13.93	67.50	5-145
13C12-PCB202ES	20	15.12	69.00	5-145
13C12-PCB205ES	20	16.64	69.30	5-145
13C12-PCB208ES	20	16.28	72.60	5-145
13C12-PCB206ES	20	17.12	73.20	5-145
13C12-PCB209ES	20	17.64	79.30	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D6-FC-CH-207  
 ALS Sample ID L2222986-49  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 18.48 g  
 Percent Moisture 27.2%  
 Split Ratio 2

Sampling Date 16-Oct-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

**Run Information** **Run 1**  
 Filename 19032636.D  
 Run Date 26-Mar-19 23:13  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0114	U
Total Dichlorobiphenyls		0.0	
Total Trichlorobiphenyls		0.0	
Total Tetrachlorobiphenyls		<0.0114	U
Total Pentachlorobiphenyls		<0.0114	U
Total Hexachlorobiphenyls		<0.0114	U
Total Heptachlorobiphenyls		<0.0114	U
Total Octachlorobiphenyls		<0.0114	U
Total Nonachlorobiphenyls		<0.0114	U
Decachlorobiphenyl		<0.0114	U

Total Chlorinated Biphenyls 0.1

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.27	51.10	5-145
13C12-PCB3ES	20	6.01	56.30	5-145
13C12-PCB4ES	20	6.44	57.30	5-145
13C12-PCB15ES	20	8.43	66.90	5-145
13C12-PCB19ES	20	7.83	63.20	5-145
13C12-PCB37ES	20	11.16	67.60	5-145
13C12-PCB54ES	20	9.20	63.20	5-145
13C12-PCB81ES	20	13.07	68.20	5-145
13C12-PCB104ES	20	10.95	65.70	5-145
13C12-PCB123ES	20	13.64	78.20	5-145
13C12-PCB118ES	20	13.68	62.40	5-145
13C12-PCB114ES	20	13.85	73.50	5-145
13C12-PCB105ES	20	14.09	71.40	5-145
13C12-PCB126ES	20	14.57	51.80 M	5-145
13C12-PCB155ES	20	12.39	66.80	5-145
13C12-PCB167ES	20	14.84	78.80	5-145
13C12-PCB156ES	20	15.15	74.50 M	5-145
13C12-PCB157ES	20	15.23	84.70	5-145
13C12-PCB169ES	20	15.64	77.40	5-145
13C12-PCB188ES	20	13.93	71.20	5-145
13C12-PCB202ES	20	15.12	72.70	5-145
13C12-PCB205ES	20	16.64	74.40	5-145
13C12-PCB208ES	20	16.28	79.90	5-145
13C12-PCB206ES	20	17.12	80.40	5-145
13C12-PCB209ES	20	17.64	84.30	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D7-WW-CH-209  
 ALS Sample ID L2222986-50  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Plant Tissue  
 Sample Size 16.11 g  
 Percent Moisture 37.0%  
 Split Ratio 2

Sampling Date 5-Jul-18  
 Extraction Date 13-Mar-19

Workgroup WG2991227

Approved:  
*Andrew Reid*  
 --e-signature--  
 27-Mar-19

### Run Information

### Run 1

Filename 19032637.D  
 Run Date 26-Mar-19 23:38  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.013	U
Total Dichlorobiphenyls		0.0	
Total Trichlorobiphenyls		0.0	
Total Tetrachlorobiphenyls		<0.013	U
Total Pentachlorobiphenyls		<0.013	U
Total Hexachlorobiphenyls		<0.013	U
Total Heptachlorobiphenyls		<0.013	U
Total Octachlorobiphenyls		<0.013	U
Total Nonachlorobiphenyls		<0.013	U
Decachlorobiphenyl		<0.013	U

Total Chlorinated Biphenyls 0.1

Extraction Standards	ng	Ret time	% Rec	Limits	% Rec	% Rec
13C12-PCB1ES	20	5.27	52.50	5-145		
13C12-PCB3ES	20	6.01	54.50	5-145		
13C12-PCB4ES	20	6.44	56.50	5-145		
13C12-PCB15ES	20	8.43	61.20	5-145		
13C12-PCB19ES	20	7.83	59.60	5-145		
13C12-PCB37ES	20	11.16	60.00	5-145		
13C12-PCB54ES	20	9.20	58.00	5-145		
13C12-PCB81ES	20	13.07	57.00	5-145		
13C12-PCB104ES	20	10.95	57.50	5-145		
13C12-PCB123ES	20	13.64	61.60	5-145		
13C12-PCB118ES	20	13.67	58.70	5-145		
13C12-PCB114ES	20	13.85	64.30	5-145		
13C12-PCB105ES	20	14.09	59.20	5-145		
13C12-PCB126ES	20	14.57	47.80	5-145		
13C12-PCB155ES	20	12.39	58.80	5-145		
13C12-PCB167ES	20	14.84	65.00	5-145		
13C12-PCB156ES	20	15.15	60.70	5-145	M	
13C12-PCB157ES	20	15.23	70.90	5-145		
13C12-PCB169ES	20	15.64	66.10	5-145		
13C12-PCB188ES	20	13.93	60.10	5-145		
13C12-PCB202ES	20	15.12	58.80	5-145		
13C12-PCB205ES	20	16.64	62.90	5-145		
13C12-PCB208ES	20	16.28	60.30	5-145		
13C12-PCB206ES	20	17.12	64.20	5-145		
13C12-PCB209ES	20	17.65	60.40	5-145		

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG2991227-2	Extraction Date	13-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG2991227

Approved:  
Andrew Reid  
--e-signature--  
27-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032625.D
Run Date	26-Mar-19 18:44
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	8	184.6		
Total Dichlorobiphenyls	88	113.5		
Total Trichlorobiphenyls	142	109.2		
Total Tetrachlorobiphenyls	578	114.0		
Total Pentachlorobiphenyls	666	106.6		
Total Hexachlorobiphenyls	460	110.2		
Total Heptachlorobiphenyls	266	118.3		
Total Octachlorobiphenyls	168	101.2		
Total Nonachlorobiphenyls	72	97.5		
Decachlorobiphenyl	24	97.4		
 Total Chlorinated Biphenyls	 2472	 115.2		

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.28	34.60	15-145
13C12-PCB3ES	20	6.01	34.50	15-145
13C12-PCB4ES	20	6.44	36.00	15-145
13C12-PCB15ES	20	8.43	39.60	15-145
13C12-PCB19ES	20	7.83	35.80	15-145
13C12-PCB37ES	20	11.16	56.50	15-145
13C12-PCB54ES	20	9.20	39.40	15-145
13C12-PCB81ES	20	13.07	59.50	15-145
13C12-PCB104ES	20	10.95	43.00	15-145
13C12-PCB123ES	20	13.64	65.30	15-145
13C12-PCB118ES	20	13.67	59.10	15-145
13C12-PCB114ES	20	13.85	64.70	15-145
13C12-PCB105ES	20	14.09	61.80	15-145
13C12-PCB126ES	20	14.57	52.30	15-145
13C12-PCB155ES	20	12.39	54.30	15-145
13C12-PCB167ES	20	14.84	72.70	15-145
13C12-PCB156ES	20	15.15	66.40 M	15-145
13C12-PCB157ES	20	15.23	71.70	15-145
13C12-PCB169ES	20	15.64	66.20	15-145
13C12-PCB188ES	20	13.93	60.00	15-145
13C12-PCB202ES	20	15.12	63.50	15-145
13C12-PCB205ES	20	16.64	69.00	15-145
13C12-PCB208ES	20	16.28	74.90	15-145
13C12-PCB206ES	20	17.12	70.10	15-145
13C12-PCB209ES	20	17.65	74.60	15-145

M Indicates that a peak has been manually integrated.





1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 3-Apr-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** PCB group totals by EPA 680

Certified by:

A handwritten signature in black ink, appearing to read "R.A. McLeod", written over a horizontal line.

Ron McLeod, Ph.D.  
Technical Director

Results in this certificate relate only to the samples as submitted to the laboratory.  
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ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank	18-N2-SD-CH-015	18-N4-SS-CH-023	Duplicate	18-E6-SS-CH-059	18-S1-SS-CH-063
ALS Sample ID	WG2991237-1	L2222986-8	L2222986-11	WG2991237-4	L2222986-27	L2222986-29
Sample Size	20.00	18.62	20.07	20.06	19.94	19.80
Sample units	g	g	g	g	g	g
Moisture Content	n/a	63.3%	11.0%	11.0%	22.0%	19.6%
Matrix	QC	Sediment	Soil	QC	Soil	Soil
Sampling Date	n/a	17-Oct-18	5-Jul-18	n/a	17-Oct-18	25-Sep-18
Extraction Date	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19

Homologue Groups	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
Total Monochlorobiphenyls	<0.0105	<0.0113	<0.0105	<0.0105	<0.0105	<0.0106
Total Dichlorobiphenyls	<0.0105	<0.0113	0.040	0.023	0.030	0.031
Total Trichlorobiphenyls	<0.0105	<0.0113	0.013	0.015	0.092	<0.0106
Total Tetrachlorobiphenyls	<0.0105	0.088	0.094	0.126	0.203	0.119
Total Pentachlorobiphenyls	<0.0105	0.148	0.549	0.543	0.342	0.473
Total Hexachlorobiphenyls	<0.0105	0.192	0.872	0.825	0.442	0.358
Total Heptachlorobiphenyls	<0.0105	0.080	0.321	0.300	0.195	0.091
Total Octachlorobiphenyls	<0.0105	0.012	0.137	0.110	0.054	0.014
Total Nonachlorobiphenyls	<0.0105	<0.0113	0.049	0.042	0.013	<0.0106
Decachlorobiphenyl	<0.0105	<0.0113	0.049	0.039	0.016	<0.0106
Total Chlorinated Biphenyls	<0.0105	0.520	2.12	2.02	1.39	1.085

Extraction Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
13C12-PCB1ES	58.7	36.2 NJ	31.9	27.6	42.9	6.2
13C12-PCB3ES	57.7	39.0	32.0	27.2	45.0	5.9
13C12-PCB4ES	60.6	45.7	42.4	37.0	50.5	11.9
13C12-PCB15ES	67.9	47.3	49.2	41.9	55.0	15.4
13C12-PCB19ES	68.6	45.0	53.4	48.7	60.2	19.6
13C12-PCB37ES	73.6	57.4	58.1	50.7	57.2	34.0
13C12-PCB54ES	68.1	50.2	57.2	52.4	60.9	26.6
13C12-PCB81ES	71.7	57.2	62.8	57.5	58.1	46.0
13C12-PCB104ES	75.0	63.0	60.7	55.9	61.0	37.0
13C12-PCB123ES	78.3	67.9	65.3	66.5	69.3	57.8
13C12-PCB118ES	76.8	60.5	67.2	55.6	57.0	47.9
13C12-PCB114ES	85.8	67.5	70.0	64.7	66.3	56.4
13C12-PCB105ES	76.7	63.8	67.4	62.9	63.9	56.1
13C12-PCB126ES	63.2	49.3	50.8	48.0	50.3	48.0
13C12-PCB155ES	74.7	62.8	60.0	57.3	61.0	46.5
13C12-PCB167ES	85.5	70.4	74.7	69.9	72.6	63.8
13C12-PCB156ES	85.6 M	64.8 M	67.5 M	63.7 M	73.1 M	63.3 M
13C12-PCB157ES	84.7	70.7	77.3	72.3	75.5	66.3
13C12-PCB169ES	81.9	68.0	73.5	74.1	73.7	67.9
13C12-PCB188ES	80.4	63.4	67.8	62.5	64.2	54.8
13C12-PCB202ES	77.8	61.2	66.1	62.8	65.1	57.3
13C12-PCB205ES	80.7	64.6	70.1	66.1	67.2	62.6
13C12-PCB208ES	86.7	71.2	75.9	71.6	73.9	66.9
13C12-PCB206ES	87.2	69.2	75.8	71.8	73.8	67.9
13C12-PCB209ES	91.3	76.1	82.9	77.0	80.1	71.7

U Indicates that this compound was not detected above the LOD.  
M Indicates that a peak has been manually integrated.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	18-D1-SS-CH-200	18-D2-SS-CH-201	18-D4-SD-CH-204	Laboratory Control Sample (8ng)	Laboratory Control Sample (2ng)
ALS Sample ID	L2222986-43	L2222986-44	L2222986-47	WG2991237-2	WG2991237-5
Sample Size	20.04	20.09	19.99	1	1
Sample units	g	g	g	n/a	n/a
Moisture Content	10.0%	18.2%	55.0%	n/a	n/a
Matrix	Soil	Soil	Sediment	QC	QC
Sampling Date	5-Jul-18	25-Sep-18	17-Oct-18	n/a	n/a
Extraction Date	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19

Homologue Groups	ng/g	ng/g	ng/g	% Rec	% Rec
Total Monochlorobiphenyls	<0.0105	<0.0105	<0.0105	97.7	96.2
Total Dichlorobiphenyls	0.028	0.021	<0.0105	106.6	105.1
Total Trichlorobiphenyls	0.011	<0.0105	<0.0105	104.0	98.8
Total Tetrachlorobiphenyls	0.125	0.012	0.044	113.4	91.9
Total Pentachlorobiphenyls	0.743	0.152	0.475	111.5	102.3
Total Hexachlorobiphenyls	0.972	0.142	0.461	102.3	100.0
Total Heptachlorobiphenyls	0.293	0.086	0.164	104.1	85.8
Total Octachlorobiphenyls	0.092	0.040	0.052	101.9	89.7
Total Nonachlorobiphenyls	0.041	0.011	0.020	98.5	95.0
Decachlorobiphenyl	0.038	<0.0105	0.017	93.7	96.5
Total Chlorinated Biphenyls	2.34	0.464	1.231	103.4	96.1

Extraction Standards	% Rec	% Rec	% Rec	% Rec	% Rec
13C12-PCB1ES	26.4	42.4	34.8 NJ	41.90	58.90
13C12-PCB3ES	25.0	42.2	35.8	40.70	57.20
13C12-PCB4ES	35.9	48.9	44.9	43.20	60.30
13C12-PCB15ES	41.1	59.5	45.0	47.40	71.80
13C12-PCB19ES	48.1	57.9	45.9	44.70	71.00
13C12-PCB37ES	52.4	60.6	56.4	56.20	67.70
13C12-PCB54ES	51.9	59.6	49.5	47.90	70.80
13C12-PCB81ES	57.1	59.9	57.5	56.30	68.80
13C12-PCB104ES	56.1	61.3	60.9	48.80	69.80
13C12-PCB123ES	67.8	72.7	71.7	63.60	77.20
13C12-PCB118ES	57.6	60.6	58.5	62.20	81.00
13C12-PCB114ES	65.2	69.5	68.4	67.00	83.70
13C12-PCB105ES	63.6	66.5	62.9	64.60	76.60
13C12-PCB126ES	47.4	56.5	49.9	51.90	59.30
13C12-PCB155ES	58.8	64.2	64.0	60.70	76.90
13C12-PCB167ES	70.2	73.2	69.9	69.60	77.30
13C12-PCB156ES	69.1 M	72.5 M	68.7 M	66.60 M	65.90 M
13C12-PCB157ES	73.3	76.9	67.8	68.90	76.50
13C12-PCB169ES	69.9	75.3	68.2	59.70	60.80
13C12-PCB188ES	63.7	68.8	63.0	64.20	84.30
13C12-PCB202ES	63.3	66.3	60.2	62.20	71.30
13C12-PCB205ES	67.1	69.5	64.1	74.70	84.20
13C12-PCB208ES	73.1	76.4	68.8	82.20	100.40
13C12-PCB206ES	73.0	73.6	69.0	73.50	81.50
13C12-PCB209ES	78.8	79.9	71.8	78.10	84.00

U Indicates that this compound was not detected above the LOD.  
M Indicates that a peak has been manually integrated.  
NJ Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a
ALS Sample ID	WG2991237-1	Extraction Date	14-Mar-19
Analysis Method	EPA 680		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	20.00 g		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG2991237

Approved:  
*Andrew Reid*  
--e-signature--  
25-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19031916.D
Run Date	19-Mar-19 15:24
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		<0.0105	U
Total Trichlorobiphenyls		<0.0105	U
Total Tetrachlorobiphenyls		<0.0105	U
Total Pentachlorobiphenyls		<0.0105	U
Total Hexachlorobiphenyls		<0.0105	U
Total Heptachlorobiphenyls		<0.0105	U
Total Octachlorobiphenyls		<0.0105	U
Total Nonachlorobiphenyls		<0.0105	U
Decachlorobiphenyl		<0.0105	U
Total Chlorinated Biphenyls		<0.0105	U

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	58.70	5-145
13C12-PCB3ES	20	6.05	57.70	5-145
13C12-PCB4ES	20	6.48	60.60	5-145
13C12-PCB15ES	20	8.47	67.90	5-145
13C12-PCB19ES	20	7.87	68.60	5-145
13C12-PCB37ES	20	11.20	73.60	5-145
13C12-PCB54ES	20	9.26	68.10	5-145
13C12-PCB81ES	20	13.10	71.70	5-145
13C12-PCB104ES	20	11.00	75.00	5-145
13C12-PCB123ES	20	13.67	78.30	5-145
13C12-PCB118ES	20	13.71	76.80	5-145
13C12-PCB114ES	20	13.89	85.80	5-145
13C12-PCB105ES	20	14.12	76.70	5-145
13C12-PCB126ES	20	14.60	63.20	5-145
13C12-PCB155ES	20	12.43	74.70	5-145
13C12-PCB167ES	20	14.87	85.50	5-145
13C12-PCB156ES	20	15.18	85.60 M	5-145
13C12-PCB157ES	20	15.25	84.70	5-145
13C12-PCB169ES	20	15.66	81.90	5-145
13C12-PCB188ES	20	13.96	80.40	5-145
13C12-PCB202ES	20	15.16	77.80	5-145
13C12-PCB205ES	20	16.67	80.70	5-145
13C12-PCB208ES	20	16.31	86.70	5-145
13C12-PCB206ES	20	17.16	87.20	5-145
13C12-PCB209ES	20	17.69	91.30	5-145

M Indicates that a peak has been manually integrated.  
U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name** 18-N2-SD-CH-015  
 ALS Sample ID L2222986-8  
 Analysis Method EPA 680  
 Analysis Type blank  
 Sample Matrix Sediment  
 Sample Size 18.62 g  
 Percent Moisture 63.3%  
 Split Ratio 2

Sampling Date 17-Oct-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031917.D  
 Run Date 19-Mar-19 15:48  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0113	U
Total Dichlorobiphenyls		<0.0113	U
Total Trichlorobiphenyls		<0.0113	U
Total Tetrachlorobiphenyls		0.0883	
Total Pentachlorobiphenyls		0.1484	
Total Hexachlorobiphenyls		0.1918	
Total Heptachlorobiphenyls		0.0799	
Total Octachlorobiphenyls		0.0120	
Total Nonachlorobiphenyls		<0.0113	U
Decachlorobiphenyl		<0.0113	U

Total Chlorinated Biphenyls 0.5204

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	36.20	NJ 5-145
13C12-PCB3ES	20	6.05	39.00	5-145
13C12-PCB4ES	20	6.48	45.70	5-145
13C12-PCB15ES	20	8.47	47.30	5-145
13C12-PCB19ES	20	7.87	45.00	5-145
13C12-PCB37ES	20	11.21	57.40	5-145
13C12-PCB54ES	20	9.26	50.20	5-145
13C12-PCB81ES	20	13.11	57.20	5-145
13C12-PCB104ES	20	11.01	63.00	5-145
13C12-PCB123ES	20	13.67	67.90	5-145
13C12-PCB118ES	20	13.71	60.50	5-145
13C12-PCB114ES	20	13.89	67.50	5-145
13C12-PCB105ES	20	14.13	63.80	5-145
13C12-PCB126ES	20	14.60	49.30	5-145
13C12-PCB155ES	20	12.45	62.80	5-145
13C12-PCB167ES	20	14.87	70.40	5-145
13C12-PCB156ES	20	15.18	64.80	M 5-145
13C12-PCB157ES	20	15.26	70.70	5-145
13C12-PCB169ES	20	15.66	68.00	5-145
13C12-PCB188ES	20	13.97	63.40	5-145
13C12-PCB202ES	20	15.16	61.20	5-145
13C12-PCB205ES	20	16.68	64.60	5-145
13C12-PCB208ES	20	16.31	71.20	5-145
13C12-PCB206ES	20	17.17	69.20	5-145
13C12-PCB209ES	20	17.69	76.10	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.  
  
 NJ Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. Value is an estimated maximum

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-SS-CH-023  
 ALS Sample ID L2222986-11  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Soil  
 Sample Size 20.07 g  
 Percent Moisture 11.0%  
 Split Ratio 2

Sampling Date 5-Jul-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031918.D  
 Run Date 19-Mar-19 16:13  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		0.0400	
Total Trichlorobiphenyls		0.0134	
Total Tetrachlorobiphenyls		0.0942	
Total Pentachlorobiphenyls		0.5489	
Total Hexachlorobiphenyls		0.8716	
Total Heptachlorobiphenyls		0.3212	
Total Octachlorobiphenyls		0.1366	
Total Nonachlorobiphenyls		0.0488	
Decachlorobiphenyl		0.0492	

Total Chlorinated Biphenyls 2.1239

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	31.90	5-145
13C12-PCB3ES	20	6.05	32.00	5-145
13C12-PCB4ES	20	6.48	42.40	5-145
13C12-PCB15ES	20	8.47	49.20	5-145
13C12-PCB19ES	20	7.87	53.40	5-145
13C12-PCB37ES	20	11.21	58.10	5-145
13C12-PCB54ES	20	9.26	57.20	5-145
13C12-PCB81ES	20	13.10	62.80	5-145
13C12-PCB104ES	20	11.00	60.70	5-145
13C12-PCB123ES	20	13.67	65.30	5-145
13C12-PCB118ES	20	13.71	67.20	5-145
13C12-PCB114ES	20	13.89	70.00	5-145
13C12-PCB105ES	20	14.13	67.40	5-145
13C12-PCB126ES	20	14.60	50.80	5-145
13C12-PCB155ES	20	12.43	60.00	5-145
13C12-PCB167ES	20	14.87	74.70	5-145
13C12-PCB156ES	20	15.18	67.50 M	5-145
13C12-PCB157ES	20	15.25	77.30	5-145
13C12-PCB169ES	20	15.66	73.50	5-145
13C12-PCB188ES	20	13.96	67.80	5-145
13C12-PCB202ES	20	15.16	66.10	5-145
13C12-PCB205ES	20	16.67	70.10	5-145
13C12-PCB208ES	20	16.31	75.90	5-145
13C12-PCB206ES	20	17.17	75.80	5-145
13C12-PCB209ES	20	17.69	82.90	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

<b>Sample Name</b>	<b>Duplicate</b>	<b>Sampling Date</b>	n/a
ALS Sample ID	WG2991237-4	<b>Extraction Date</b>	14-Mar-19
<b>Analysis Method</b>	EPA 680		
<b>Analysis Type</b>	sample		
<b>Sample Matrix</b>	QC		
<b>Sample Size</b>	20.06 g		
<b>Percent Moisture</b>	11.0%		
<b>Split Ratio</b>	2	<b>Workgroup</b>	WG2991237

Approved:  
Andrew Reid  
--e-signature--  
25-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19031919.D
Run Date	19-Mar-19 16:37
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		0.0226	
Total Trichlorobiphenyls		0.0149	
Total Tetrachlorobiphenyls		0.1257	
Total Pentachlorobiphenyls		0.5432	
Total Hexachlorobiphenyls		0.8247	
Total Heptachlorobiphenyls		0.2995	
Total Octachlorobiphenyls		0.1104	
Total Nonachlorobiphenyls		0.0415	
Decachlorobiphenyl		0.0389	

Total Chlorinated Biphenyls			2.0214	
Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	27.60	5-145
13C12-PCB3ES	20	6.05	27.20	5-145
13C12-PCB4ES	20	6.48	37.00	5-145
13C12-PCB15ES	20	8.47	41.90	5-145
13C12-PCB19ES	20	7.87	48.70	5-145
13C12-PCB37ES	20	11.21	50.70	5-145
13C12-PCB54ES	20	9.26	52.40	5-145
13C12-PCB81ES	20	13.10	57.50	5-145
13C12-PCB104ES	20	11.00	55.90	5-145
13C12-PCB123ES	20	13.67	66.50	5-145
13C12-PCB118ES	20	13.71	55.60	5-145
13C12-PCB114ES	20	13.89	64.70	5-145
13C12-PCB105ES	20	14.13	62.90	5-145
13C12-PCB126ES	20	14.60	48.00	5-145
13C12-PCB155ES	20	12.43	57.30	5-145
13C12-PCB167ES	20	14.87	69.90	5-145
13C12-PCB156ES	20	15.18	63.70 M	5-145
13C12-PCB157ES	20	15.25	72.30	5-145
13C12-PCB169ES	20	15.66	74.10	5-145
13C12-PCB188ES	20	13.96	62.50	5-145
13C12-PCB202ES	20	15.16	62.80	5-145
13C12-PCB205ES	20	16.67	66.10	5-145
13C12-PCB208ES	20	16.31	71.60	5-145
13C12-PCB206ES	20	17.17	71.80	5-145
13C12-PCB209ES	20	17.69	77.00	5-145

M Indicates that a peak has been manually integrated.  
U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E6-SS-CH-059  
 ALS Sample ID L2222986-27  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Soil  
 Sample Size 19.94 g  
 Percent Moisture 22.0%  
 Split Ratio 2

Sampling Date 17-Oct-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031921.D  
 Run Date 19-Mar-19 17:26  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		0.0302	
Total Trichlorobiphenyls		0.0922	
Total Tetrachlorobiphenyls		0.2025	
Total Pentachlorobiphenyls		0.3420	
Total Hexachlorobiphenyls		0.4420	
Total Heptachlorobiphenyls		0.1945	
Total Octachlorobiphenyls		0.0538	
Total Nonachlorobiphenyls		0.0131	
Decachlorobiphenyl		0.0155	

Total Chlorinated Biphenyls 1.3858

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	42.90	5-145
13C12-PCB3ES	20	6.05	45.00	5-145
13C12-PCB4ES	20	6.48	50.50	5-145
13C12-PCB15ES	20	8.47	55.00	5-145
13C12-PCB19ES	20	7.87	60.20	5-145
13C12-PCB37ES	20	11.21	57.20	5-145
13C12-PCB54ES	20	9.26	60.90	5-145
13C12-PCB81ES	20	13.11	58.10	5-145
13C12-PCB104ES	20	11.00	61.00	5-145
13C12-PCB123ES	20	13.67	69.30	5-145
13C12-PCB118ES	20	13.71	57.00	5-145
13C12-PCB114ES	20	13.89	66.30	5-145
13C12-PCB105ES	20	14.13	63.90	5-145
13C12-PCB126ES	20	14.60	50.30	5-145
13C12-PCB155ES	20	12.43	61.00	5-145
13C12-PCB167ES	20	14.87	72.60	5-145
13C12-PCB156ES	20	15.18	73.10 M	5-145
13C12-PCB157ES	20	15.25	75.50	5-145
13C12-PCB169ES	20	15.66	73.70	5-145
13C12-PCB188ES	20	13.96	64.20	5-145
13C12-PCB202ES	20	15.16	65.10	5-145
13C12-PCB205ES	20	16.67	67.20	5-145
13C12-PCB208ES	20	16.31	73.90	5-145
13C12-PCB206ES	20	17.17	73.80	5-145
13C12-PCB209ES	20	17.69	80.10	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-S1-SS-CH-063  
 ALS Sample ID L2222986-29  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Soil  
 Sample Size 19.80 g  
 Percent Moisture 19.6%  
 Split Ratio 2

Sampling Date 25-Sep-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031922.D  
 Run Date 19-Mar-19 17:51  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0106	U
Total Dichlorobiphenyls		0.0307	
Total Trichlorobiphenyls		<0.0106	U
Total Tetrachlorobiphenyls		0.1187	
Total Pentachlorobiphenyls		0.4732	
Total Hexachlorobiphenyls		0.3578	
Total Heptachlorobiphenyls		0.0907	
Total Octachlorobiphenyls		0.0138	
Total Nonachlorobiphenyls		<0.0106	U
Decachlorobiphenyl		<0.0106	U

Total Chlorinated Biphenyls 1.0849

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	6.20	5-145
13C12-PCB3ES	20	6.05	5.90	5-145
13C12-PCB4ES	20	6.48	11.90	5-145
13C12-PCB15ES	20	8.48	15.40	5-145
13C12-PCB19ES	20	7.87	19.60	5-145
13C12-PCB37ES	20	11.21	34.00	5-145
13C12-PCB54ES	20	9.26	26.60	5-145
13C12-PCB81ES	20	13.10	46.00	5-145
13C12-PCB104ES	20	11.00	37.00	5-145
13C12-PCB123ES	20	13.67	57.80	5-145
13C12-PCB118ES	20	13.71	47.90	5-145
13C12-PCB114ES	20	13.89	56.40	5-145
13C12-PCB105ES	20	14.13	56.10	5-145
13C12-PCB126ES	20	14.60	48.00	5-145
13C12-PCB155ES	20	12.43	46.50	5-145
13C12-PCB167ES	20	14.87	63.80	5-145
13C12-PCB156ES	20	15.18	63.30 M	5-145
13C12-PCB157ES	20	15.25	66.30	5-145
13C12-PCB169ES	20	15.66	67.90	5-145
13C12-PCB188ES	20	13.96	54.80	5-145
13C12-PCB202ES	20	15.16	57.30	5-145
13C12-PCB205ES	20	16.67	62.60	5-145
13C12-PCB208ES	20	16.31	66.90	5-145
13C12-PCB206ES	20	17.16	67.90	5-145
13C12-PCB209ES	20	17.69	71.70	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D1-SS-CH-200  
 ALS Sample ID L2222986-43  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Soil  
 Sample Size 20.04 g  
 Percent Moisture 10.0%  
 Split Ratio 2

Sampling Date 5-Jul-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031923.D  
 Run Date 19-Mar-19 18:15  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		0.0	
Total Trichlorobiphenyls		0.0	
Total Tetrachlorobiphenyls		0.1	
Total Pentachlorobiphenyls		0.7	
Total Hexachlorobiphenyls		1.0	
Total Heptachlorobiphenyls		0.3	
Total Octachlorobiphenyls		0.1	
Total Nonachlorobiphenyls		0.0	
Decachlorobiphenyl		0.0	
Total Chlorinated Biphenyls		2.3	

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	26.40	5-145
13C12-PCB3ES	20	6.05	25.00	5-145
13C12-PCB4ES	20	6.48	35.90	5-145
13C12-PCB15ES	20	8.47	41.10	5-145
13C12-PCB19ES	20	7.87	48.10	5-145
13C12-PCB37ES	20	11.21	52.40	5-145
13C12-PCB54ES	20	9.26	51.90	5-145
13C12-PCB81ES	20	13.11	57.10	5-145
13C12-PCB104ES	20	11.00	56.10	5-145
13C12-PCB123ES	20	13.67	67.80	5-145
13C12-PCB118ES	20	13.71	57.60	5-145
13C12-PCB114ES	20	13.89	65.20	5-145
13C12-PCB105ES	20	14.13	63.60	5-145
13C12-PCB126ES	20	14.60	47.40	5-145
13C12-PCB155ES	20	12.43	58.80	5-145
13C12-PCB167ES	20	14.87	70.20	5-145
13C12-PCB156ES	20	15.18	69.10 M	5-145
13C12-PCB157ES	20	15.25	73.30	5-145
13C12-PCB169ES	20	15.66	69.90	5-145
13C12-PCB188ES	20	13.97	63.70	5-145
13C12-PCB202ES	20	15.16	63.30	5-145
13C12-PCB205ES	20	16.67	67.10	5-145
13C12-PCB208ES	20	16.31	73.10	5-145
13C12-PCB206ES	20	17.16	73.00	5-145
13C12-PCB209ES	20	17.69	78.80	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D2-SS-CH-201  
 ALS Sample ID L2222986-44  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Soil  
 Sample Size 20.09 g  
 Percent Moisture 18.2%  
 Split Ratio 2

Sampling Date 25-Sep-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031924.D  
 Run Date 19-Mar-19 18:39  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		0.0	
Total Trichlorobiphenyls		<0.0105	U
Total Tetrachlorobiphenyls		0.0	
Total Pentachlorobiphenyls		0.2	
Total Hexachlorobiphenyls		0.1	
Total Heptachlorobiphenyls		0.1	
Total Octachlorobiphenyls		0.0	
Total Nonachlorobiphenyls		0.0	
Decachlorobiphenyl		<0.0105	U
Total Chlorinated Biphenyls		0.5	

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	42.40	5-145
13C12-PCB3ES	20	6.05	42.20	5-145
13C12-PCB4ES	20	6.48	48.90	5-145
13C12-PCB15ES	20	8.47	59.50	5-145
13C12-PCB19ES	20	7.87	57.90	5-145
13C12-PCB37ES	20	11.21	60.60	5-145
13C12-PCB54ES	20	9.26	59.60	5-145
13C12-PCB81ES	20	13.10	59.90	5-145
13C12-PCB104ES	20	11.00	61.30	5-145
13C12-PCB123ES	20	13.67	72.70	5-145
13C12-PCB118ES	20	13.71	60.60	5-145
13C12-PCB114ES	20	13.89	69.50	5-145
13C12-PCB105ES	20	14.12	66.50	5-145
13C12-PCB126ES	20	14.60	56.50	5-145
13C12-PCB155ES	20	12.43	64.20	5-145
13C12-PCB167ES	20	14.87	73.20	5-145
13C12-PCB156ES	20	15.18	72.50 M	5-145
13C12-PCB157ES	20	15.25	76.90	5-145
13C12-PCB169ES	20	15.66	75.30	5-145
13C12-PCB188ES	20	13.96	68.80	5-145
13C12-PCB202ES	20	15.16	66.30	5-145
13C12-PCB205ES	20	16.67	69.50	5-145
13C12-PCB208ES	20	16.31	76.40	5-145
13C12-PCB206ES	20	17.16	73.60	5-145
13C12-PCB209ES	20	17.69	79.90	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D4-SD-CH-204  
 ALS Sample ID L2222986-47  
 Analysis Method EPA 680  
 Analysis Type sample  
 Sample Matrix Sediment  
 Sample Size 19.99 g  
 Percent Moisture 55.0%  
 Split Ratio 2

Sampling Date 17-Oct-18  
 Extraction Date 14-Mar-19

Workgroup WG2991237

Approved:  
*Andrew Reid*  
 --e-signature--  
 25-Mar-19

### Run Information

### Run 1

Filename 19031925.D  
 Run Date 19-Mar-19 19:04  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		<0.0105	U
Total Trichlorobiphenyls		<0.0105	U
Total Tetrachlorobiphenyls		0.0	
Total Pentachlorobiphenyls		0.5	
Total Hexachlorobiphenyls		0.5	
Total Heptachlorobiphenyls		0.2	
Total Octachlorobiphenyls		0.1	
Total Nonachlorobiphenyls		0.0	
Decachlorobiphenyl		0.0	
Total Chlorinated Biphenyls		1.2	

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	34.80	NJ 5-145
13C12-PCB3ES	20	6.05	35.80	5-145
13C12-PCB4ES	20	6.48	44.90	5-145
13C12-PCB15ES	20	8.48	45.00	5-145
13C12-PCB19ES	20	7.87	45.90	5-145
13C12-PCB37ES	20	11.22	56.40	5-145
13C12-PCB54ES	20	9.26	49.50	5-145
13C12-PCB81ES	20	13.12	57.50	5-145
13C12-PCB104ES	20	11.01	60.90	5-145
13C12-PCB123ES	20	13.69	71.70	5-145
13C12-PCB118ES	20	13.72	58.50	5-145
13C12-PCB114ES	20	13.90	68.40	5-145
13C12-PCB105ES	20	14.13	62.90	5-145
13C12-PCB126ES	20	14.61	49.90	5-145
13C12-PCB155ES	20	12.48	64.00	5-145
13C12-PCB167ES	20	14.88	69.90	5-145
13C12-PCB156ES	20	15.18	68.70	M 5-145
13C12-PCB157ES	20	15.26	67.80	5-145
13C12-PCB169ES	20	15.67	68.20	5-145
13C12-PCB188ES	20	13.97	63.00	5-145
13C12-PCB202ES	20	15.16	60.20	5-145
13C12-PCB205ES	20	16.69	64.10	5-145
13C12-PCB208ES	20	16.31	68.80	5-145
13C12-PCB206ES	20	17.17	69.00	5-145
13C12-PCB209ES	20	17.70	71.80	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.  
  
 NJ Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. Value is an estimated maximum

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG2991237-2	Extraction Date	14-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1.0000 n/a		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG2991237

Approved:  
Andrew Reid  
--e-signature--  
25-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19031914.D
Run Date	19-Mar-19 14:35
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	8	97.7		
Total Dichlorobiphenyls	88	106.6		
Total Trichlorobiphenyls	138	104.0		
Total Tetrachlorobiphenyls	490	113.4		
Total Pentachlorobiphenyls	506	111.5		
Total Hexachlorobiphenyls	452	102.3		
Total Heptachlorobiphenyls	266	104.1		
Total Octachlorobiphenyls	168	101.9		
Total Nonachlorobiphenyls	72	98.5		
Decachlorobiphenyl	24	93.7		

Total Chlorinated Biphenyls	2212	103.4		
Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	41.90	15-145
13C12-PCB3ES	20	6.05	40.70	15-145
13C12-PCB4ES	20	6.48	43.20	15-145
13C12-PCB15ES	20	8.47	47.40	15-145
13C12-PCB19ES	20	7.87	44.70	15-145
13C12-PCB37ES	20	11.20	56.20	15-145
13C12-PCB54ES	20	9.26	47.90	15-145
13C12-PCB81ES	20	13.10	56.30	15-145
13C12-PCB104ES	20	11.00	48.80	15-145
13C12-PCB123ES	20	13.67	63.60	15-145
13C12-PCB118ES	20	13.71	62.20	15-145
13C12-PCB114ES	20	13.89	67.00	15-145
13C12-PCB105ES	20	14.12	64.60	15-145
13C12-PCB126ES	20	14.60	51.90	15-145
13C12-PCB155ES	20	12.43	60.70	15-145
13C12-PCB167ES	20	14.87	69.60	15-145
13C12-PCB156ES	20	15.18	66.60 M	15-145
13C12-PCB157ES	20	15.25	68.90	15-145
13C12-PCB169ES	20	15.66	59.70	15-145
13C12-PCB188ES	20	13.96	64.20	15-145
13C12-PCB202ES	20	15.16	62.20	15-145
13C12-PCB205ES	20	16.67	74.70	15-145
13C12-PCB208ES	20	16.32	82.20	15-145
13C12-PCB206ES	20	17.16	73.50	15-145
13C12-PCB209ES	20	17.69	78.10	15-145

M Indicates that a peak has been manually integrated.

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG2991237-5	Extraction Date	14-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1.0000 n/a		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG2991237

Approved:  
Andrew Reid  
--e-signature--  
25-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19031913.D
Run Date	19-Mar-19 14:10
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	2	96.2		
Total Dichlorobiphenyls	22	105.1		
Total Trichlorobiphenyls	32	98.8		
Total Tetrachlorobiphenyls	123	91.9		
Total Pentachlorobiphenyls	127	102.3		
Total Hexachlorobiphenyls	111	100.0		
Total Heptachlorobiphenyls	64	85.8		
Total Octachlorobiphenyls	42	89.7		
Total Nonachlorobiphenyls	18	95.0		
Decachlorobiphenyl	6	96.5		
Total Chlorinated Biphenyls	546	96.1		

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	58.90	15-145
13C12-PCB3ES	20	6.05	57.20	15-145
13C12-PCB4ES	20	6.48	60.30	15-145
13C12-PCB15ES	20	8.47	71.80	15-145
13C12-PCB19ES	20	7.87	71.00	15-145
13C12-PCB37ES	20	11.21	67.70	15-145
13C12-PCB54ES	20	9.26	70.80	15-145
13C12-PCB81ES	20	13.10	68.80	15-145
13C12-PCB104ES	20	11.00	69.80	15-145
13C12-PCB123ES	20	13.67	77.20	15-145
13C12-PCB118ES	20	13.71	81.00	15-145
13C12-PCB114ES	20	13.89	83.70	15-145
13C12-PCB105ES	20	14.13	76.60	15-145
13C12-PCB126ES	20	14.60	59.30	15-145
13C12-PCB155ES	20	12.43	76.90	15-145
13C12-PCB167ES	20	14.87	77.30	15-145
13C12-PCB156ES	20	15.18	65.90 M	15-145
13C12-PCB157ES	20	15.25	76.50	15-145
13C12-PCB169ES	20	15.66	60.80	15-145
13C12-PCB188ES	20	13.97	84.30	15-145
13C12-PCB202ES	20	15.16	71.30	15-145
13C12-PCB205ES	20	16.67	84.20	15-145
13C12-PCB208ES	20	16.31	100.40	15-145
13C12-PCB206ES	20	17.16	81.50	15-145
13C12-PCB209ES	20	17.69	84.00	15-145

M Indicates that a peak has been manually integrated.



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 29-Mar-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** PCDD/F by EPA 1613B via Isotope Dilution

Certified by:

A handwritten signature in black ink, appearing to read "R.A. McLeod", is written over a horizontal line.

Ron McLeod, PhD, C.Chem.  
Director, Air Toxics & Special Chemistries, Life Sciences

Results in this certificate relate only to the samples as submitted to the laboratory.

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# ALS Life Sciences

## Sample Analysis summary Report

Sample Name	18-N4-WW-CH-027	18-E2-SB-CH-051	18-E6-NG-CH-061	18-D3-NG-CH-203	18-D9-NG-CH-220	18-D5-SB-CH-205
ALS Sample ID	L2222986-13	L2222986-23	L2222986-28	L2222986-45	L2222986-46	L2222986-48
Sample Size	9.40	19.19	1.12	2.66	2.01	20.94
Sample size units	g	g	g	g	g	g
Percent Moisture	34.59%	40.42%	70.61%	79.75%	75.57%	37.77%
Sample Matrix	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue	Plant Tissue
Sampling Date	5-Jul-18	26-Sep-18	17-Oct-18	25-Sep-18	16-Oct-18	26-Sep-18
Extraction Date	20-Mar-19	20-Mar-19	20-Mar-19	20-Mar-19	20-Mar-19	20-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.089	<0.030	<0.40	<0.098	<0.17	<0.020
1,2,3,7,8-PeCDD	<0.041	<0.014	<0.23	<0.046	0.159	0.0162
1,2,3,4,7,8-HxCDD	<0.039	<0.015	0.303	0.0903	0.154	<0.014
1,2,3,6,7,8-HxCDD	<0.040	<0.014	0.249	0.0903	0.259	0.0124
1,2,3,7,8,9-HxCDD	<0.036	0.0214	0.365	<0.12	<0.19	<0.022
1,2,3,4,6,7,8-HpCDD	0.157	<0.032	3.32	0.718	1.23	<0.030
OCDD	0.668	0.221	20.2	3.05	5.73	0.186
2,3,7,8-TCDF	<0.070	<0.024	<0.34	<0.074	<0.16	<0.015
1,2,3,7,8-PeCDF	<0.046	<0.013	<0.20	<0.073	0.164	0.0258
2,3,4,7,8-PeCDF	<0.035	<0.011	<0.15	<0.063	<0.073	<0.013
1,2,3,4,7,8-HxCDF	<0.028	<0.016	<0.21	0.0903	0.194	0.0119
1,2,3,6,7,8-HxCDF	<0.028	<0.014	0.232	<0.051	0.224	0.0172
2,3,4,6,7,8-HxCDF	<0.033	<0.015	<0.18	<0.053	<0.18	0.0115
1,2,3,7,8,9-HxCDF	<0.040	<0.020	0.312	<0.072	<0.20	<0.026
1,2,3,4,6,7,8-HpCDF	<0.090	0.0339	1.11	0.256	0.613	0.0282
1,2,3,4,7,8,9-HpCDF	<0.028	<0.019	<0.20	<0.062	0.214	<0.017
OCDF	<0.13	0.115	3.15	0.327	<1.0	0.105
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	100	97	86	98	103	91
13C12-1,2,3,7,8-PeCDD	98	85	89	97	95	80
13C12-1,2,3,4,7,8-HxCDD	77	66	67	72	78	63
13C12-1,2,3,6,7,8-HxCDD	86	72	78	85	85	68
13C12-1,2,3,4,6,7,8-HpCDD	89	76	81	81	91	68
13C12-OCDD	76	66	73	74	77	58
13C12-2,3,7,8-TCDF	84	80	73	81	89	73
13C12-1,2,3,7,8-PeCDF	95	80	81	90	90	77
13C12-2,3,4,7,8-PeCDF	92	81	83	93	89	74
13C12-1,2,3,4,7,8-HxCDF	74	64	65	75	75	60
13C12-1,2,3,6,7,8-HxCDF	85	73	77	82	84	67
13C12-2,3,4,6,7,8-HxCDF	81	65	72	81	81	62
13C12-1,2,3,7,8,9-HxCDF	76	64	69	77	78	62
13C12-1,2,3,4,6,7,8-HpCDF	85	69	77	82	87	61
13C12-1,2,3,4,7,8,9-HpCDF	97	85	88	93	93	75
<b>Cleanup Standard</b>						
37Cl4-2,3,7,8-TCDD (Cleanup)	82	80	77	78	85	75
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	<0.089	<0.030	<0.40	0.135	<0.17	<0.020
Total-PeCDD	<0.041	<0.014	0.392	0.105	0.652	0.0162
Total-HxCDD	<0.039	0.0214	2.61	0.606	1.28	0.0124
Total-HpCDD	0.157	<0.014	3.32	1.65	2.90	<0.014
Total-TCDF	<0.070	<0.024	<0.34	0.188	0.548	<0.015
Total-PeCDF	<0.046	<0.013	<0.20	0.369	0.413	0.0258
Total-HxCDF	<0.040	<0.020	1.33	0.376	0.667	0.0406
Total-HpCDF	<0.028	0.0339	1.11	0.331	0.827	0.0282
<b>Toxic Equivalency - (WHO 2005)</b>						
Lower Bound PCDD/F TEQ (WHO 2005)	0.00177	0.00258	0.197	0.0378	0.269	0.0226
Mid Point PCDD/F TEQ (WHO 2005)	0.0931	0.0336	0.586	0.156	0.431	0.0440
Upper Bound PCDD/F TEQ (WHO 2005)	0.176	0.0626	0.953	0.241	0.535	0.0547



# ALS Life Sciences

## Sample Analysis summary Report

<b>Sample Name</b>	<b>18-D6-FC-CH-207 18-D7-WW-CH-209</b>	
ALS Sample ID	L2222986-49	L2222986-50
Sample Size	20.24	9.23
Sample size units	g	g
Percent Moisture	27.15%	36.99%
Sample Matrix	Plant Tissue	Plant Tissue
Sampling Date	16-Oct-18	5-Jul-18
Extraction Date	20-Mar-19	20-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>pg/g</b>
2,3,7,8-TCDD	<0.017	<0.026
1,2,3,7,8-PeCDD	<0.0078	<0.011
1,2,3,4,7,8-HxCDD	<0.0093	<0.014
1,2,3,6,7,8-HxCDD	<0.0087	0.0152
1,2,3,7,8,9-HxCDD	<0.014	<0.024
1,2,3,4,6,7,8-HpCDD	<0.030	<0.085
OCDD	0.195	0.403
2,3,7,8-TCDF	<0.013	<0.026
1,2,3,7,8-PeCDF	<0.0077	<0.020
2,3,4,7,8-PeCDF	<0.0063	<0.011
1,2,3,4,7,8-HxCDF	<0.014	<0.016
1,2,3,6,7,8-HxCDF	0.00988	<0.022
2,3,4,6,7,8-HxCDF	0.0138	<0.015
1,2,3,7,8,9-HxCDF	0.0163	<0.031
1,2,3,4,6,7,8-HpCDF	<0.018	<0.049
1,2,3,4,7,8,9-HpCDF	<0.012	<0.022
OCDF	0.0953	<0.087
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	93	94
13C12-1,2,3,7,8-PeCDD	82	93
13C12-1,2,3,4,7,8-HxCDD	70	75
13C12-1,2,3,6,7,8-HxCDD	75	82
13C12-1,2,3,4,6,7,8-HpCDD	73	83
13C12-OCDD	59	70
13C12-2,3,7,8-TCDF	78	76
13C12-1,2,3,7,8-PeCDF	82	88
13C12-2,3,4,7,8-PeCDF	78	90
13C12-1,2,3,4,7,8-HxCDF	67	70
13C12-1,2,3,6,7,8-HxCDF	76	78
13C12-2,3,4,6,7,8-HxCDF	71	78
13C12-1,2,3,7,8,9-HxCDF	67	76
13C12-1,2,3,4,6,7,8-HpCDF	69	80
13C12-1,2,3,4,7,8,9-HpCDF	80	92
<b>Cleanup Standard</b>		
37Cl4-2,3,7,8-TCDD (Cleanup)	75	79
<b>Homologue Group Totals</b>	<b>pg/g</b>	<b>pg/g</b>
Total-TCDD	<0.017	<0.026
Total-PeCDD	<0.0078	0.0368
Total-HxCDD	<0.0093	0.0672
Total-HpCDD	<0.011	<0.015
Total-TCDF	<0.013	<0.026
Total-PeCDF	<0.0077	<0.0042
Total-HxCDF	0.0400	<0.016
Total-HpCDF	<0.0079	<0.0097
<b>Toxic Equivalency - (WHO 2005)</b>		
<b>Lower Bound PCDD/F TEQ (WHO 2005)</b>	0.00409	0.00164
<b>Mid Point PCDD/F TEQ (WHO 2005)</b>	0.0225	0.0384
<b>Upper Bound PCDD/F TEQ (WHO 2005)</b>	0.0375	0.0589

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG3000722-1	WG3000722-2
Sample Size	10.00	1
Sample size units	g	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	20-Mar-19	20-Mar-19
<b>Target Analytes</b>	<b>pg/g</b>	<b>% Rec</b>
2,3,7,8-TCDD	<0.028	90
1,2,3,7,8-PeCDD	<0.014	111
1,2,3,4,7,8-HxCDD	<0.013	102
1,2,3,6,7,8-HxCDD	<0.012	101
1,2,3,7,8,9-HxCDD	<0.012	110
1,2,3,4,6,7,8-HpCDD	0.0350	103
OCDD	<0.079	102
2,3,7,8-TCDF	<0.023	103
1,2,3,7,8-PeCDF	0.0200	106
2,3,4,7,8-PeCDF	<0.0094	98
1,2,3,4,7,8-HxCDF	<0.011	104
1,2,3,6,7,8-HxCDF	<0.011	106
2,3,4,6,7,8-HxCDF	<0.011	103
1,2,3,7,8,9-HxCDF	<0.020	111
1,2,3,4,6,7,8-HpCDF	<0.019	114
1,2,3,4,7,8,9-HpCDF	<0.011	94
OCDF	0.0430	98
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-2,3,7,8-TCDD	93	107
13C12-1,2,3,7,8-PeCDD	88	91
13C12-1,2,3,4,7,8-HxCDD	67	80
13C12-1,2,3,6,7,8-HxCDD	76	80
13C12-1,2,3,4,6,7,8-HpCDD	83	86
13C12-OCDD	71	80
13C12-2,3,7,8-TCDF	78	87
13C12-1,2,3,7,8-PeCDF	85	89
13C12-2,3,4,7,8-PeCDF	83	86
13C12-1,2,3,4,7,8-HxCDF	63	75
13C12-1,2,3,6,7,8-HxCDF	74	80
13C12-2,3,4,6,7,8-HxCDF	70	78
13C12-1,2,3,7,8,9-HxCDF	71	75
13C12-1,2,3,4,6,7,8-HpCDF	75	74
13C12-1,2,3,4,7,8,9-HpCDF	83	90
<b>Cleanup Standard</b>		
37Cl4-2,3,7,8-TCDD (Cleanup)	80	97
<b>Homologue Group Totals</b>	<b>pg/g</b>	
Total-TCDD	<0.028	
Total-PeCDD	<0.014	
Total-HxCDD	<0.013	
Total-HpCDD	0.0560	
Total-TCDF	<0.023	
Total-PeCDF	0.0200	
Total-HxCDF	<0.014	
Total-HpCDF	<0.011	
<b>Toxic Equivalency - (WHO 2005)</b>		
Lower Bound PCDD/F TEQ (WHO 2005)	0.000963	
Mid Point PCDD/F TEQ (WHO 2005)	0.0303	
Upper Bound PCDD/F TEQ (WHO 2005)	0.0574	

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-N4-WW-CH-027  
 ALS Sample ID L2222986-13  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 5-Jul-18  
 Extraction Date 20-Mar-19  
 Sample Size 9.40 g  
 Percent Moisture 34.6%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A14  
 Run Date 28-Mar-19 20:33  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.089	0.089	U		0.53
1,2,3,7,8-PeCDD	1	NotFnd	<0.041	0.041	U		2.7
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<0.039	0.039	U		2.7
1,2,3,6,7,8-HxCDD	0.1	34.09	<0.040	0.035	M,J,R	0.040	2.7
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<0.036	0.036	U		2.7
1,2,3,4,6,7,8-HpCDD	0.01	35.71	0.157	0.031	J,B		2.7
OCDD	0.0003	37.20	0.668	0.043	M,J		5.3
2,3,7,8-TCDF	0.1	NotFnd	<0.070	0.070	U		0.53
1,2,3,7,8-PeCDF	0.03	NotFnd	<0.046	0.046	U		2.7
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.035	0.035	U		2.7
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<0.028	0.028	U		2.7
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<0.028	0.028	U		2.7
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.033	0.028	M,J,R	0.033	2.7
1,2,3,7,8,9-HxCDF	0.1	34.37	<0.040	0.040	M,U		2.7
1,2,3,4,6,7,8-HpCDF	0.01	35.17	<0.090	0.025	M,J,R	0.090	2.7
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.028	0.028	U		2.7
OCDF	0.0003	37.29	<0.13	0.061	M,J,R	0.13	5.3

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	100 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	98 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	77 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	86 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	89 23-140
13C12-OCDD	2000	37.19	76 17-157
13C12-2,3,7,8-TCDF	1000	26.92	84 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.07	95 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	92 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	74 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	85 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	81 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	76 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	85 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	97 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	82 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.089	0.089	U		0.53
Total-PeCDD	0.00	<0.041	0.041	U		2.7
Total-HxCDD	0.00	<0.039	0.039	U		2.7
Total-HpCDD	1.00	0.157	0.031			2.7
Total-TCDF	0.00	<0.070	0.070	U		0.53
Total-PeCDF	0.00	<0.046	0.046	U		2.7
Total-HxCDF	0.00	<0.040	0.040	U		2.7
Total-HpCDF	0.00	<0.028	0.028	U		2.7

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.00177
Mid Point PCDD/F TEQ (WHO 2005)	0.0931
Upper Bound PCDD/F TEQ (WHO 2005)	0.176

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E2-SB-CH-051  
 ALS Sample ID L2222986-23  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 20-Mar-19  
 Sample Size 19.19 g  
 Percent Moisture 40.4%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A15  
 Run Date 28-Mar-19 21:15  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.030	0.030	U		0.26
1,2,3,7,8-PeCDD	1	NotFnd	<0.014	0.014	U		1.3
1,2,3,4,7,8-HxCDD	0.1	34.05	<0.015	0.015	M,U	0.014	1.3
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<0.014	0.014	U		1.3
1,2,3,7,8,9-HxCDD	0.1	34.23	0.0214	0.014	M,J		1.3
1,2,3,4,6,7,8-HpCDD	0.01	35.70	<0.032	0.014	M,J,R	0.032	1.3
OCDD	0.0003	37.20	0.221	0.012	M,J		2.6
2,3,7,8-TCDF	0.1	NotFnd	<0.024	0.024	U		0.26
1,2,3,7,8-PeCDF	0.03	NotFnd	<0.013	0.013	U		1.3
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.011	0.011	U		1.3
1,2,3,4,7,8-HxCDF	0.1	33.56	<0.016	0.014	M,J,R	0.016	1.3
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<0.014	0.014	U		1.3
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<0.015	0.015	U		1.3
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.020	0.020	M,U	0.019	1.3
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.0339	0.012	M,J		1.3
1,2,3,4,7,8,9-HpCDF	0.01	35.94	<0.019	0.012	M,J,R	0.019	1.3
OCDF	0.0003	37.28	0.115	0.020	M,J,B		2.6

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	97 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	85 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	66 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	72 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	76 23-140
13C12-OCDD	2000	37.19	66 17-157
13C12-2,3,7,8-TCDF	1000	26.90	80 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	80 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	81 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	64 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	73 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	65 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	64 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	69 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	85 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	80 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.030	0.030	U		0.26
Total-PeCDD	0.00	<0.014	0.014	U		1.3
Total-HxCDD	1.00	0.0214	0.015			1.3
Total-HpCDD	0.00	<0.014	0.014	U		1.3
Total-TCDF	0.00	<0.024	0.024	U		0.26
Total-PeCDF	0.00	<0.013	0.013	U		1.3
Total-HxCDF	0.00	<0.020	0.020	U		1.3
Total-HpCDF	1.00	0.0339	0.012			1.3

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.00258
Mid Point PCDD/F TEQ (WHO 2005)	0.0336
Upper Bound PCDD/F TEQ (WHO 2005)	0.0626

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-E6-NG-CH-061  
 ALS Sample ID L2222986-28  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 17-Oct-18  
 Extraction Date 20-Mar-19  
 Sample Size 1.12 g  
 Percent Moisture 70.6%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A16  
 Run Date 28-Mar-19 21:57  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.40	0.40	U		4.5
1,2,3,7,8-PeCDD	1	32.02	<0.23	0.23	M,U	0.19	22
1,2,3,4,7,8-HxCDD	0.1	34.05	0.303	0.20	M,J		22
1,2,3,6,7,8-HxCDD	0.1	34.10	0.249	0.18	M,J		22
1,2,3,7,8,9-HxCDD	0.1	34.23	0.365	0.18	M,J		22
1,2,3,4,6,7,8-HpCDD	0.01	35.71	3.32	0.22	M,J		22
OCDD	0.0003	37.20	20.2	0.25	J		45
2,3,7,8-TCDF	0.1	NotFnd	<0.34	0.34	U		4.5
1,2,3,7,8-PeCDF	0.03	NotFnd	<0.20	0.20	U		22
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.15	0.15	U		22
1,2,3,4,7,8-HxCDF	0.1	33.57	<0.21	0.18	M,J,R	0.21	22
1,2,3,6,7,8-HxCDF	0.1	33.63	0.232	0.18	M,J		22
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.18	0.18	M,U	0.14	22
1,2,3,7,8,9-HxCDF	0.1	34.37	0.312	0.24	M,J		22
1,2,3,4,6,7,8-HpCDF	0.01	35.15	1.11	0.18	M,J		22
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.20	0.20	U		22
OCDF	0.0003	37.29	3.15	0.23	M,J		45

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	86 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	89 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	67 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	78 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	81 23-140
13C12-OCDD	2000	37.19	73 17-157
13C12-2,3,7,8-TCDF	1000	26.90	73 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.07	81 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	83 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	65 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	77 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.95	72 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	69 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	77 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	88 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	77 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.40	0.40	U		4.5
Total-PeCDD	1.00	0.392	0.23			22
Total-HxCDD	4.00	2.61	0.20			22
Total-HpCDD	1.00	3.32	0.22			22
Total-TCDF	0.00	<0.34	0.34	U		4.5
Total-PeCDF	0.00	<0.20	0.20	U		22
Total-HxCDF	4.00	1.33	0.24			22
Total-HpCDF	1.00	1.11	0.20			22

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.197
Mid Point PCDD/F TEQ (WHO 2005)	0.586
Upper Bound PCDD/F TEQ (WHO 2005)	0.953

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor  
 TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D3-NG-CH-203  
 ALS Sample ID L2222986-45  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 25-Sep-18  
 Extraction Date 20-Mar-19  
 Sample Size 2.66 g  
 Percent Moisture 79.7%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A17  
 Run Date 28-Mar-19 22:39  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.098	0.098	U		1.9
1,2,3,7,8-PeCDD	1	32.00	<0.046	0.046	M,U	0.045	9.4
1,2,3,4,7,8-HxCDD	0.1	34.04	0.0903	0.045	M,J		9.4
1,2,3,6,7,8-HxCDD	0.1	34.10	0.0903	0.041	M,J		9.4
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.12	0.041	M,J,R	0.12	9.4
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.718	0.051	M,J		9.4
OCDD	0.0003	37.19	3.05	0.058	J		19
2,3,7,8-TCDF	0.1	NotFnd	<0.074	0.074	U		1.9
1,2,3,7,8-PeCDF	0.03	31.07	<0.073	0.033	M,J,R	0.073	9.4
2,3,4,7,8-PeCDF	0.3	31.78	<0.063	0.027	M,J,R	0.063	9.4
1,2,3,4,7,8-HxCDF	0.1	33.55	0.0903	0.051	M,J		9.4
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.051	0.051	M,U	0.042	9.4
2,3,4,6,7,8-HxCDF	0.1	33.95	<0.053	0.053	M,U		9.4
1,2,3,7,8,9-HxCDF	0.1	34.35	<0.072	0.072	M,U	0.051	9.4
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.256	0.027	J		9.4
1,2,3,4,7,8,9-HpCDF	0.01	35.95	<0.062	0.034	M,J,R	0.062	9.4
OCDF	0.0003	37.29	0.327	0.061	M,J,B		19

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	98 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	97 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	72 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	81 23-140
13C12-OCDD	2000	37.19	74 17-157
13C12-2,3,7,8-TCDF	1000	26.90	81 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	90 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	93 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	75 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	82 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	81 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	77 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	82 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	93 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	78 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	LQL
Total-TCDD	1.00	0.135	0.098	1.9
Total-PeCDD	1.00	0.105	0.046	9.4
Total-HxCDD	3.00	0.606	0.045	9.4
Total-HpCDD	2.00	1.65	0.051	9.4
Total-TCDF	1.00	0.188	0.074	1.9
Total-PeCDF	2.00	0.369	0.033	9.4
Total-HxCDF	3.00	0.376	0.072	9.4
Total-HpCDF	2.00	0.331	0.034	9.4

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0378
Mid Point PCDD/F TEQ (WHO 2005)	0.156
Upper Bound PCDD/F TEQ (WHO 2005)	0.241

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D9-NG-CH-220  
 ALS Sample ID L2222986-46  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 20-Mar-19  
 Sample Size 2.01 g  
 Percent Moisture 75.6%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A18  
 Run Date 28-Mar-19 23:22  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.17	0.17	U		2.5
1,2,3,7,8-PeCDD	1	31.99	0.159	0.12	M,J		12
1,2,3,4,7,8-HxCDD	0.1	34.05	0.154	0.098	M,J		12
1,2,3,6,7,8-HxCDD	0.1	34.09	0.259	0.091	M,J		12
1,2,3,7,8,9-HxCDD	0.1	34.23	<0.19	0.091	M,J,R	0.19	12
1,2,3,4,6,7,8-HpCDD	0.01	35.70	1.23	0.10	M,J		12
OCDD	0.0003	37.19	5.73	0.11	M,J		25
2,3,7,8-TCDF	0.1	NotFnd	<0.16	0.16	U		2.5
1,2,3,7,8-PeCDF	0.03	31.08	0.164	0.094	M,J,B		12
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.073	0.073	U		12
1,2,3,4,7,8-HxCDF	0.1	33.57	0.194	0.063	M,J		12
1,2,3,6,7,8-HxCDF	0.1	33.63	0.224	0.063	M,J		12
2,3,4,6,7,8-HxCDF	0.1	33.96	<0.18	0.064	M,J,R	0.18	12
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.20	0.087	M,J,R	0.20	12
1,2,3,4,6,7,8-HpCDF	0.01	35.14	0.613	0.051	M,J		12
1,2,3,4,7,8,9-HpCDF	0.01	35.94	0.214	0.064	M,J		12
OCDF	0.0003	37.28	<1.0	0.12	M,J,R	1.0	25

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	103 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	95 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	78 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	85 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	91 23-140
13C12-OCDD	2000	37.18	77 17-157
13C12-2,3,7,8-TCDF	1000	26.90	89 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	90 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	89 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	75 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	84 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	81 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.35	78 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	87 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.93	93 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	85 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.17	0.17	U		2.5
Total-PeCDD	2.00	0.652	0.12			12
Total-HxCDD	3.00	1.28	0.098			12
Total-HpCDD	2.00	2.90	0.10			12
Total-TCDF	2.00	0.548	0.16			2.5
Total-PeCDF	2.00	0.413	0.094			12
Total-HxCDF	3.00	0.667	0.087			12
Total-HpCDF	2.00	0.827	0.064			12

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.269
Mid Point PCDD/F TEQ (WHO 2005)	0.431
Upper Bound PCDD/F TEQ (WHO 2005)	0.535

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D5-SB-CH-205  
 ALS Sample ID L2222986-48  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 26-Sep-18  
 Extraction Date 20-Mar-19  
 Sample Size 20.94 g  
 Percent Moisture 37.8%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A19  
 Run Date 29-Mar-19 00:04  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.020	0.020	U		0.24
1,2,3,7,8-PeCDD	1	32.02	0.0162	0.0078	M,J		1.2
1,2,3,4,7,8-HxCDD	0.1	34.05	<0.014	0.010	M,J,R	0.014	1.2
1,2,3,6,7,8-HxCDD	0.1	34.11	0.0124	0.0089	M,J		1.2
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.022	0.0091	M,J,R	0.022	1.2
1,2,3,4,6,7,8-HpCDD	0.01	35.70	<0.030	0.014	M,J,R	0.030	1.2
OCDD	0.0003	37.19	0.186	0.014	M,J		2.4
2,3,7,8-TCDF	0.1	NotFnd	<0.015	0.015	U		0.24
1,2,3,7,8-PeCDF	0.03	31.07	0.0258	0.0094	M,J,B		1.2
2,3,4,7,8-PeCDF	0.3	31.79	<0.013	0.0078	M,J,R	0.013	1.2
1,2,3,4,7,8-HxCDF	0.1	33.56	0.0119	0.0080	M,J		1.2
1,2,3,6,7,8-HxCDF	0.1	33.65	0.0172	0.0081	M,J		1.2
2,3,4,6,7,8-HxCDF	0.1	33.95	0.0115	0.0087	M,J		1.2
1,2,3,7,8,9-HxCDF	0.1	34.37	<0.026	0.012	M,J,R	0.026	1.2
1,2,3,4,6,7,8-HpCDF	0.01	35.15	0.0282	0.0086	M,J		1.2
1,2,3,4,7,8,9-HpCDF	0.01	35.95	<0.017	0.0097	M,J,R	0.017	1.2
OCDF	0.0003	37.28	0.105	0.014	M,J,B		2.4

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	91 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	80 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	63 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	68 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	68 23-140
13C12-OCDD	2000	37.19	58 17-157
13C12-2,3,7,8-TCDF	1000	26.90	73 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	77 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	74 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	60 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	67 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	62 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	62 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	61 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	75 26-138

Cleanup Standard	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD (Cleanup)	20	27.86	75 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.020	0.020	U		0.24
Total-PeCDD	1.00	0.0162	0.0078			1.2
Total-HxCDD	1.00	0.0124	0.010			1.2
Total-HpCDD	0.00	<0.014	0.014	U		1.2
Total-TCDF	0.00	<0.015	0.015	U		0.24
Total-PeCDF	1.00	0.0258	0.0094			1.2
Total-HxCDF	3.00	0.0406	0.012			1.2
Total-HpCDF	1.00	0.0282	0.0097			1.2

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.0226
Mid Point PCDD/F TEQ (WHO 2005)	0.0440
Upper Bound PCDD/F TEQ (WHO 2005)	0.0547

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D6-FC-CH-207  
 ALS Sample ID L2222986-49  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 16-Oct-18  
 Extraction Date 20-Mar-19  
 Sample Size 20.24 g  
 Percent Moisture 27.2%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A20  
 Run Date 29-Mar-19 00:46  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.017	0.017	U		0.25
1,2,3,7,8-PeCDD	1	NotFnd	<0.0078	0.0078	U		1.2
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<0.0093	0.0093	U		1.2
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<0.0087	0.0087	U		1.2
1,2,3,7,8,9-HxCDD	0.1	34.23	<0.014	0.0087	M,J,R	0.014	1.2
1,2,3,4,6,7,8-HpCDD	0.01	35.71	<0.030	0.011	M,J,R	0.030	1.2
OCDD	0.0003	37.20	0.195	0.016	M,J		2.5
2,3,7,8-TCDF	0.1	NotFnd	<0.013	0.013	U		0.25
1,2,3,7,8-PeCDF	0.03	NotFnd	<0.0077	0.0077	U		1.2
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.0063	0.0063	U		1.2
1,2,3,4,7,8-HxCDF	0.1	33.58	<0.014	0.0060	M,J,R	0.014	1.2
1,2,3,6,7,8-HxCDF	0.1	33.62	0.00988	0.0059	M,J		1.2
2,3,4,6,7,8-HxCDF	0.1	33.95	0.0138	0.0062	M,J		1.2
1,2,3,7,8,9-HxCDF	0.1	34.38	0.0163	0.0087	M,J		1.2
1,2,3,4,6,7,8-HpCDF	0.01	35.16	<0.018	0.0069	M,J,R	0.018	1.2
1,2,3,4,7,8,9-HpCDF	0.01	35.96	<0.012	0.0079	M,J,R	0.012	1.2
OCDF	0.0003	37.29	0.0953	0.013	M,J,B		2.5

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.84	93 25-164
13C12-1,2,3,7,8-PeCDD	1000	32.00	82 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.05	70 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.10	75 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	73 23-140
13C12-OCDD	2000	37.20	59 17-157
13C12-2,3,7,8-TCDF	1000	26.92	78 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.07	82 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.78	78 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.56	67 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.63	76 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.95	71 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	67 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.15	69 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.95	80 26-138

Cleanup Standard	pg	Conc. pg/g	EDL pg/g
37C14-2,3,7,8-TCDD (Cleanup)	20	27.87	75 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.017	0.017	U		0.25
Total-PeCDD	0.00	<0.0078	0.0078	U		1.2
Total-HxCDD	0.00	<0.0093	0.0093	U		1.2
Total-HpCDD	0.00	<0.011	0.011	U		1.2
Total-TCDF	0.00	<0.013	0.013	U		0.25
Total-PeCDF	0.00	<0.0077	0.0077	U		1.2
Total-HxCDF	3.00	0.0400	0.0087			1.2
Total-HpCDF	0.00	<0.0079	0.0079	U		1.2

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.00409
Mid Point PCDD/F TEQ (WHO 2005)	0.0225
Upper Bound PCDD/F TEQ (WHO 2005)	0.0375

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** 18-D7-WW-CH-209  
 ALS Sample ID L2222986-50  
 Analysis Method EPA 1613B  
 Analysis Type Sample  
 Sample Matrix Plant Tissue

Sampling Date 5-Jul-18  
 Extraction Date 20-Mar-19  
 Sample Size 9.23 g  
 Percent Moisture 37.0%  
 Split Ratio 1

Approved:  
*T. Patterson*  
 --e-signature--  
 29-Mar-2018

**Run Information** **Run 1**  
 Filename 7-190328A21  
 Run Date 29-Mar-19 01:28  
 Final Volume 10 uL  
 Dilution Factor 1  
 Analysis Units pg/g  
 Instrument - Column HRMS-7 DB5MSUSR339925H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.026	0.026	U		0.54
1,2,3,7,8-PeCDD	1	NotFnd	<0.011	0.011	U		2.7
1,2,3,4,7,8-HxCDD	0.1	34.05	<0.014	0.014	M,U	0.013	2.7
1,2,3,6,7,8-HxCDD	0.1	34.08	0.0152	0.012	M,J		2.7
1,2,3,7,8,9-HxCDD	0.1	34.23	<0.024	0.012	M,J,R	0.024	2.7
1,2,3,4,6,7,8-HpCDD	0.01	35.70	<0.085	0.015	M,J,R	0.085	2.7
OCDD	0.0003	37.19	0.403	0.019	M,J		5.4
2,3,7,8-TCDF	0.1	NotFnd	<0.026	0.026	U		0.54
1,2,3,7,8-PeCDF	0.03	31.08	<0.020	0.0042	M,J,R	0.020	2.7
2,3,4,7,8-PeCDF	0.3	31.78	<0.011	0.0034	M,J,R	0.011	2.7
1,2,3,4,7,8-HxCDF	0.1	33.57	<0.016	0.013	M,J,R	0.016	2.7
1,2,3,6,7,8-HxCDF	0.1	33.63	<0.022	0.013	M,J,R	0.022	2.7
2,3,4,6,7,8-HxCDF	0.1	33.94	<0.015	0.013	M,J,R	0.015	2.7
1,2,3,7,8,9-HxCDF	0.1	34.37	<0.031	0.016	M,J,R	0.031	2.7
1,2,3,4,6,7,8-HpCDF	0.01	35.15	<0.049	0.0078	M,J,R	0.049	2.7
1,2,3,4,7,8,9-HpCDF	0.01	35.94	<0.022	0.0097	M,J,R	0.022	2.7
OCDF	0.0003	37.28	<0.087	0.018	M,J,R	0.087	5.4

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	94 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	93 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	75 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	82 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	83 23-140
13C12-OCDD	2000	37.19	70 17-157
13C12-2,3,7,8-TCDF	1000	26.90	76 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	88 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	90 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	70 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	78 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	78 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	76 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	80 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	92 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	79 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.026	0.026	U		0.54
Total-PeCDD	1.00	0.0368	0.011			2.7
Total-HxCDD	2.00	0.0672	0.014			2.7
Total-HpCDD	0.00	<0.015	0.015	U		2.7
Total-TCDF	0.00	<0.026	0.026	U		0.54
Total-PeCDF	0.00	<0.0042	0.0042	U		2.7
Total-HxCDF	0.00	<0.016	0.016	U		2.7
Total-HpCDF	0.00	<0.0097	0.0097	U		2.7

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.00164
Mid Point PCDD/F TEQ (WHO 2005)	0.0384
Upper Bound PCDD/F TEQ (WHO 2005)	0.0589

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	Method Blank	Sampling Date	n/a	
ALS Sample ID	WG3000722-1	Extraction Date	20-Mar-19	
Analysis Method	EPA 1613B	Sample Size	10.00	g
Analysis Type	Blank	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

Approved:  
T. Patterson  
--e-signature--  
29-Mar-2018

<b>Run Information</b>		<b>Run 1</b>	
Filename	7-190328A13		
Run Date	28-Mar-19 19:51		
Final Volume	10 uL		
Dilution Factor	1		
Analysis Units	pg/g		
Instrument - Column	HRMS-7 DB5MSUSR339925H		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
2,3,7,8-TCDD	1	NotFnd	<0.028	0.028	U		0.50
1,2,3,7,8-PeCDD	1	NotFnd	<0.014	0.014	U		2.5
1,2,3,4,7,8-HxCDD	0.1	34.05	<0.013	0.013	M,U	0.0086	2.5
1,2,3,6,7,8-HxCDD	0.1	34.10	<0.012	0.012	M,U	0.0095	2.5
1,2,3,7,8,9-HxCDD	0.1	34.22	<0.012	0.012	M,U	0.0081	2.5
1,2,3,4,6,7,8-HpCDD	0.01	35.70	0.0350	0.012	M,J		2.5
OCDD	0.0003	37.19	<0.079	0.011	M,J,R	0.079	5.0
2,3,7,8-TCDF	0.1	NotFnd	<0.023	0.023	U		0.50
1,2,3,7,8-PeCDF	0.03	31.08	0.0200	0.012	M,J		2.5
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.0094	0.0094	U		2.5
1,2,3,4,7,8-HxCDF	0.1	33.57	<0.011	0.011	M,U	0.010	2.5
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<0.011	0.011	U		2.5
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<0.011	0.011	U		2.5
1,2,3,7,8,9-HxCDF	0.1	34.36	<0.020	0.014	M,J,R	0.020	2.5
1,2,3,4,6,7,8-HpCDF	0.01	35.15	<0.019	0.0089	M,J,R	0.019	2.5
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.011	0.011	U		2.5
OCDF	0.0003	37.28	0.0430	0.014	M,J		5.0

Extraction Standards	pg	% Rec	Limits
13C12-2,3,7,8-TCDD	1000	27.83	93 25-164
13C12-1,2,3,7,8-PeCDD	1000	31.99	88 25-181
13C12-1,2,3,4,7,8-HxCDD	1000	34.03	67 32-141
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	76 28-130
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.69	83 23-140
13C12-OCDD	2000	37.18	71 17-157
13C12-2,3,7,8-TCDF	1000	26.90	78 24-169
13C12-1,2,3,7,8-PeCDF	1000	31.06	85 24-185
13C12-2,3,4,7,8-PeCDF	1000	31.77	83 21-178
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	63 26-152
13C12-1,2,3,6,7,8-HxCDF	1000	33.61	74 26-123
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	70 29-147
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	71 28-136
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	75 28-143
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	83 26-138

Cleanup Standard	pg	% Rec	Limits
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	80 35-197

Homologue Group Totals	# peaks	Conc. pg/g	EDL pg/g	Flags	EMPC pg/g	LQL
Total-TCDD	0.00	<0.028	0.028	U		0.50
Total-PeCDD	0.00	<0.014	0.014	U		2.5
Total-HxCDD	0.00	<0.013	0.013	U		2.5
Total-HpCDD	2.00	0.0560	0.012			2.5
Total-TCDF	0.00	<0.023	0.023	U		0.50
Total-PeCDF	1.00	0.0200	0.012			2.5
Total-HxCDF	0.00	<0.014	0.014	U		2.5
Total-HpCDF	0.00	<0.011	0.011	U		2.5

Toxic Equivalency - (WHO 2005)	pg/g
Lower Bound PCDD/F TEQ (WHO 2005)	0.000963
Mid Point PCDD/F TEQ (WHO 2005)	0.0303
Upper Bound PCDD/F TEQ (WHO 2005)	0.0574

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor      TEQ Indicates the Toxic Equivalency  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that a target analyte was detected below the calibrated range.  
 R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

# ALS Life sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a	
ALS Sample ID	WG3000722-2	Extraction Date	20-Mar-19	
Analysis Method	EPA 1613B	Sample Size	1	n/a
Analysis Type	LCS	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

Approved:  
T. Patterson  
--e-signature--  
29-Mar-2018

<b>Run Information</b>		<b>Run 1</b>	
Filename	7-190328A10		
Run Date	28-Mar-19 17:45		
Final Volume	10	uL	
Dilution Factor	1		
Analysis Units	%		
Instrument - Column	HRMS-7 DB5MSUSR339925H		

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
2,3,7,8-TCDD	100	27.86	90	67-158	
1,2,3,7,8-PeCDD	500	32.00	111	70-142	
1,2,3,4,7,8-HxCDD	500	34.05	102	70-164	
1,2,3,6,7,8-HxCDD	500	34.10	101	76-134	
1,2,3,7,8,9-HxCDD	500	34.22	110	64-162	
1,2,3,4,6,7,8-HpCDD	500	35.70	103	70-140	
OCDD	1000	37.20	102	78-144	
2,3,7,8-TCDF	100	26.93	103	75-158	
1,2,3,7,8-PeCDF	500	31.07	106	80-134	
2,3,4,7,8-PeCDF	500	31.78	98	68-160	
1,2,3,4,7,8-HxCDF	500	33.56	104	72-134	
1,2,3,6,7,8-HxCDF	500	33.63	106	84-130	
2,3,4,6,7,8-HxCDF	500	33.95	103	70-156	
1,2,3,7,8,9-HxCDF	500	34.36	111	78-130	
1,2,3,4,6,7,8-HpCDF	500	35.15	114	82-122	
1,2,3,4,7,8,9-HpCDF	500	35.95	94	78-138	
OCDF	1000	37.28	98	63-170	
Extraction Standards	pg	% Rec	Limits		
13C12-2,3,7,8-TCDD	1000	27.84	107	20-175	
13C12-1,2,3,7,8-PeCDD	1000	31.99	91	21-227	
13C12-1,2,3,4,7,8-HxCDD	1000	34.04	80	21-193	
13C12-1,2,3,6,7,8-HxCDD	1000	34.09	80	25-163	
13C12-1,2,3,4,6,7,8-HpCDD	1000	35.70	86	26-166	
13C12-OCDD	2000	37.19	80	13-138	
13C12-2,3,7,8-TCDF	1000	26.90	87	22-152	
13C12-1,2,3,7,8-PeCDF	1000	31.06	89	21-192	
13C12-2,3,4,7,8-PeCDF	1000	31.77	86	13-328	
13C12-1,2,3,4,7,8-HxCDF	1000	33.55	75	19-202	
13C12-1,2,3,6,7,8-HxCDF	1000	33.62	80	21-159	
13C12-2,3,4,6,7,8-HxCDF	1000	33.94	78	17-205	
13C12-1,2,3,7,8,9-HxCDF	1000	34.36	75	22-176	
13C12-1,2,3,4,6,7,8-HpCDF	1000	35.14	74	21-158	
13C12-1,2,3,4,7,8,9-HpCDF	1000	35.94	90	20-186	
Cleanup Standard	pg	% Rec	Limits		
37C14-2,3,7,8-TCDD (Cleanup)	20	27.86	97	31-191	



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 3-Apr-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** PCB group totals by EPA 680

Sample L2222986-23 showed significantly high levels of PCB-11 and only PCB-11. The PCB congener is associated with the manufacturing of yellow dyes and is commonly observed in the laboratory background. Despite the absence of this target in the laboratory method blank, this is unlikely to be present due to field contamination of the sample.

Certified by:

Ron McLeod, Ph.D.  
Technical Director

Results in this certificate relate only to the samples as submitted to the laboratory.  
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# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	Method Blank	18-E2-SB-CH-051	Laboratory Control Sample	Laboratory Control Sample
ALS Sample ID	WG3010136-1	L2222986-23	WG3010136-2	WG3010136-4
Sample Size	20.00	19.72	1	1
Sample units	g	g	n/a	n/a
Moisture Content	n/a	40.4%	n/a	n/a
Matrix	QC	Plant Tissue	QC	QC
Sampling Date	n/a	26-Sep-18	n/a	n/a
Extraction Date	25-Mar-19	25-Mar-19	25-Mar-19	25-Mar-19

Homologue Groups	ng/g	ng/g	% Rec	% Rec
Total Monochlorobiphenyls	<0.0105	<0.0106	89.5	97.5
Total Dichlorobiphenyls	<0.0105	0.054	99.4	105.3
Total Trichlorobiphenyls	<0.0105	<0.0106	96.1	106.6
Total Tetrachlorobiphenyls	<0.0105	<0.0106	90.6	104.6
Total Pentachlorobiphenyls	<0.0105	<0.0106	95.2	105.0
Total Hexachlorobiphenyls	<0.0105	<0.0106	82.7	79.3
Total Heptachlorobiphenyls	<0.0105	<0.0106	132.2	150.8
Total Octachlorobiphenyls	<0.0105	<0.0106	108.3	118.5
Total Nonachlorobiphenyls	<0.0105	<0.0106	88.0	97.6
Decachlorobiphenyl	<0.0105	<0.0106	87.0	93.7
Total Chlorinated Biphenyls	<0.0105	0.054	96.9	105.9

Extraction Standards	% Rec	% Rec	% Rec	% Rec
13C12-PCB1ES	38.3	45.3	40.5	44.4
13C12-PCB3ES	36.2	43.7	37.7	41.7
13C12-PCB4ES	38.8	45.7	39.9	43.6
13C12-PCB15ES	42.3	48.6	41.8	46.7
13C12-PCB19ES	39.9	47.3	40.7	44.4
13C12-PCB37ES	50.1	48.3	47.4	47.4
13C12-PCB54ES	43.2	45.8	43.2	45.0
13C12-PCB81ES	58.5	50.2	54.3	51.2
13C12-PCB104ES	49.1	48.1	44.6	46.3
13C12-PCB123ES	64.4	52.6	61.1	58.0
13C12-PCB118ES	63.3	52.0	52.6	49.4
13C12-PCB114ES	65.5	53.5	59.3	54.3
13C12-PCB105ES	65.6	53.2	58.1	55.6
13C12-PCB126ES	56.5	46.2	52.1	48.6
13C12-PCB155ES	6.9 M	47.9	26.1	17.4
13C12-PCB167ES	75.1	61.7	68.1	66.3
13C12-PCB156ES	71.7	57.4	63.0	61.0
13C12-PCB157ES	75.2	62.3	67.4	65.7
13C12-PCB169ES	79.8	67.8	71.8	71.4
13C12-PCB188ES	20.8	53.7	43.9	38.8
13C12-PCB202ES	37.8	56.7	54.5	53.2
13C12-PCB205ES	75.6	62.3	67.3	65.1
13C12-PCB208ES	27.5	59.9	53.7	46.8
13C12-PCB206ES	73.5	64.5	65.9	66.4
13C12-PCB209ES	17.1	68.3	41.9	39.3

M Indicates that a peak has been manually integrated.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a
ALS Sample ID	WG3010136-1	Extraction Date	25-Mar-19
Analysis Method	EPA 680		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	20.00 g		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG3010136

Approved:  
Andrew Reid  
--e-signature--  
29-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032908.D
Run Date	29-Mar-19 11:45
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		<0.0105	U
Total Trichlorobiphenyls		<0.0105	U
Total Tetrachlorobiphenyls		<0.0105	U
Total Pentachlorobiphenyls		<0.0105	U
Total Hexachlorobiphenyls		<0.0105	U
Total Heptachlorobiphenyls		<0.0105	U
Total Octachlorobiphenyls		<0.0105	U
Total Nonachlorobiphenyls		<0.0105	U
Decachlorobiphenyl		<0.0105	U
Total Chlorinated Biphenyls		<0.0105	U

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	38.3	5-145
13C12-PCB3ES	20	6.05	36.2	5-145
13C12-PCB4ES	20	6.48	38.8	5-145
13C12-PCB15ES	20	8.49	42.3	5-145
13C12-PCB19ES	20	7.87	39.9	5-145
13C12-PCB37ES	20	11.24	50.1	5-145
13C12-PCB54ES	20	9.26	43.2	5-145
13C12-PCB81ES	20	13.14	58.5	5-145
13C12-PCB104ES	20	11.02	49.1	5-145
13C12-PCB123ES	20	13.70	64.4	5-145
13C12-PCB118ES	20	13.74	63.3	5-145
13C12-PCB114ES	20	13.91	65.5	5-145
13C12-PCB105ES	20	14.15	65.6	5-145
13C12-PCB126ES	20	14.64	56.5	5-145
13C12-PCB155ES	20	12.45	6.9 M	5-145
13C12-PCB167ES	20	14.90	75.1	5-145
13C12-PCB156ES	20	15.21	71.7	5-145
13C12-PCB157ES	20	15.29	75.2	5-145
13C12-PCB169ES	20	15.70	79.8	5-145
13C12-PCB188ES	20	13.98	20.8	5-145
13C12-PCB202ES	20	15.18	37.8	5-145
13C12-PCB205ES	20	16.71	75.6	5-145
13C12-PCB208ES	20	16.33	27.5	5-145
13C12-PCB206ES	20	17.20	73.5	5-145
13C12-PCB209ES	20	17.72	17.1	5-145

M Indicates that a peak has been manually integrated.  
U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name** 18-E2-SB-CH-051  
 ALS Sample ID L2222986-23  
 Analysis Method EPA 680  
 Analysis Type blank  
 Sample Matrix Plant Tissue  
 Sample Size 19.72 g  
 Percent Moisture 40.4%  
 Split Ratio 2

Sampling Date 26-Sep-18  
 Extraction Date 25-Mar-19

Workgroup WG3010136

Approved:  
*Andrew Reid*  
 --e-signature--  
 29-Mar-19

### Run Information

### Run 1

Filename 19032909.D  
 Run Date 29-Mar-19 12:09  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0106	U
Total Dichlorobiphenyls		0.0539	
Total Trichlorobiphenyls		<0.0106	U
Total Tetrachlorobiphenyls		<0.0106	U
Total Pentachlorobiphenyls		<0.0106	U
Total Hexachlorobiphenyls		<0.0106	U
Total Heptachlorobiphenyls		<0.0106	U
Total Octachlorobiphenyls		<0.0106	U
Total Nonachlorobiphenyls		<0.0106	U
Decachlorobiphenyl		<0.0106	U

Total Chlorinated Biphenyls 0.0539

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	45.30	5-145
13C12-PCB3ES	20	6.05	43.70	5-145
13C12-PCB4ES	20	6.48	45.70	5-145
13C12-PCB15ES	20	8.49	48.60	5-145
13C12-PCB19ES	20	7.87	47.30	5-145
13C12-PCB37ES	20	11.24	48.30	5-145
13C12-PCB54ES	20	9.26	45.80	5-145
13C12-PCB81ES	20	13.14	50.20	5-145
13C12-PCB104ES	20	11.02	48.10	5-145
13C12-PCB123ES	20	13.70	52.60	5-145
13C12-PCB118ES	20	13.74	52.00	5-145
13C12-PCB114ES	20	13.91	53.50	5-145
13C12-PCB105ES	20	14.15	53.20	5-145
13C12-PCB126ES	20	14.63	46.20	5-145
13C12-PCB155ES	20	12.45	47.90	5-145
13C12-PCB167ES	20	14.91	61.70	5-145
13C12-PCB156ES	20	15.21	57.40	5-145
13C12-PCB157ES	20	15.29	62.30	5-145
13C12-PCB169ES	20	15.70	67.80	5-145
13C12-PCB188ES	20	13.98	53.70	5-145
13C12-PCB202ES	20	15.17	56.70	5-145
13C12-PCB205ES	20	16.71	62.30	5-145
13C12-PCB208ES	20	16.33	59.90	5-145
13C12-PCB206ES	20	17.20	64.50	5-145
13C12-PCB209ES	20	17.72	68.30	5-145

U Indicates that this compound was not detected above the MDL.



# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG3010136-2	Extraction Date	25-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG3010136

Approved:  
Andrew Reid  
--e-signature--  
29-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032906.D
Run Date	29-Mar-19 10:56
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	8	89.5000		
Total Dichlorobiphenyls	88	99.4000		
Total Trichlorobiphenyls	142	96.1182		
Total Tetrachlorobiphenyls	578	90.5944		
Total Pentachlorobiphenyls	668	95.1706		
Total Hexachlorobiphenyls	460	82.6706		
Total Heptachlorobiphenyls	266	132.1583		
Total Octachlorobiphenyls	168	108.2667		
Total Nonachlorobiphenyls	72	87.9667		
Decachlorobiphenyl	24	87.0000		
Total Chlorinated Biphenyls	2474	96.8845		

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	40.50	15-145
13C12-PCB3ES	20	6.06	37.70	15-145
13C12-PCB4ES	20	6.49	39.90	15-145
13C12-PCB15ES	20	8.50	41.80	15-145
13C12-PCB19ES	20	7.88	40.70	15-145
13C12-PCB37ES	20	11.25	47.40	15-145
13C12-PCB54ES	20	9.27	43.20	15-145
13C12-PCB81ES	20	13.14	54.30	15-145
13C12-PCB104ES	20	11.03	44.60	15-145
13C12-PCB123ES	20	13.71	61.10	15-145
13C12-PCB118ES	20	13.74	52.60	15-145
13C12-PCB114ES	20	13.92	59.30	15-145
13C12-PCB105ES	20	14.15	58.10	15-145
13C12-PCB126ES	20	14.64	52.10	15-145
13C12-PCB155ES	20	12.45	26.10	15-145
13C12-PCB167ES	20	14.91	68.10	15-145
13C12-PCB156ES	20	15.22	63.00	15-145
13C12-PCB157ES	20	15.29	67.40	15-145
13C12-PCB169ES	20	15.70	71.80	15-145
13C12-PCB188ES	20	13.99	43.90	15-145
13C12-PCB202ES	20	15.18	54.50	15-145
13C12-PCB205ES	20	16.71	67.30	15-145
13C12-PCB208ES	20	16.33	53.70	15-145
13C12-PCB206ES	20	17.20	65.90	15-145
13C12-PCB209ES	20	17.72	41.90	15-145

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG3010136-4	Extraction Date	25-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG3010136

Approved:  
Andrew Reid  
--e-signature--  
29-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032905.D
Run Date	29-Mar-19 10:31
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	2	97.5000		
Total Dichlorobiphenyls	22	105.3429		
Total Trichlorobiphenyls	32	106.5727		
Total Tetrachlorobiphenyls	127	104.6222		
Total Pentachlorobiphenyls	139	105.0059		
Total Hexachlorobiphenyls	125	79.3353		
Total Heptachlorobiphenyls	72	150.7667		
Total Octachlorobiphenyls	42	118.5000		
Total Nonachlorobiphenyls	18	97.5667		
Decachlorobiphenyl	6	93.7000		
Total Chlorinated Biphenyls	584	105.8912		

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	44.40	15-145
13C12-PCB3ES	20	6.05	41.70	15-145
13C12-PCB4ES	20	6.48	43.60	15-145
13C12-PCB15ES	20	8.50	46.70	15-145
13C12-PCB19ES	20	7.87	44.40	15-145
13C12-PCB37ES	20	11.25	47.40	15-145
13C12-PCB54ES	20	9.26	45.00	15-145
13C12-PCB81ES	20	13.14	51.20	15-145
13C12-PCB104ES	20	11.02	46.30	15-145
13C12-PCB123ES	20	13.70	58.00	15-145
13C12-PCB118ES	20	13.74	49.40	15-145
13C12-PCB114ES	20	13.91	54.30	15-145
13C12-PCB105ES	20	14.15	55.60	15-145
13C12-PCB126ES	20	14.64	48.60	15-145
13C12-PCB155ES	20	12.45	17.40	15-145
13C12-PCB167ES	20	14.91	66.30	15-145
13C12-PCB156ES	20	15.21	61.00	15-145
13C12-PCB157ES	20	15.29	65.70	15-145
13C12-PCB169ES	20	15.71	71.40	15-145
13C12-PCB188ES	20	13.98	38.80	15-145
13C12-PCB202ES	20	15.18	53.20	15-145
13C12-PCB205ES	20	16.71	65.10	15-145
13C12-PCB208ES	20	16.33	46.80	15-145
13C12-PCB206ES	20	17.20	66.40	15-145
13C12-PCB209ES	20	17.72	39.30	15-145



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

**ALS Project Contact:** Lynne Wrona  
**ALS Project ID:** 14789  
**ALS WO#:** L2222986  
**Date of Report:** 3-Apr-19  
**Date of Sample Receipt:** 15-Jan-19

**Client Name:** Stantec Consulting Limited  
**Client Address:** 70 Southgate Dr, Suite 1  
Guelph, ON, N1G 4P5  
Canada  
**Client Contact:** Katherine Ketis  
**Client Project ID:** 122160003

**COMMENTS:** PCB group totals by EPA 680

Certified by: \_\_\_\_\_

Ron McLeod  
Technical Director

A handwritten signature in black ink, appearing to read "R. A. McLeod", is written over a horizontal line.

Results in this certificate relate only to the samples as submitted to the laboratory.  
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# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	Method Blank	18-E2-SD-CH-045	Laboratory Control Sample (8ng)	Laboratory Control Sample (2ng)
ALS Sample ID	WG3012060-1	L2222986-21	WG3012060-2	WG3012060-4
Sample Size	20.00	19.81	1	1
Sample units	g	g	n/a	n/a
Moisture Content	n/a	21.7%	n/a	n/a
Matrix	QC	Sediment	QC	QC
Sampling Date	n/a	26-Sep-18	n/a	n/a
Extraction Date	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19

Homologue Groups	ng/g	ng/g	% Rec	% Rec
Total Monochlorobiphenyls	<0.0105	<0.0106	101.1	110.2
Total Dichlorobiphenyls	<0.0105	<0.0106	119.4	111.2
Total Trichlorobiphenyls	<0.0105	<0.0106	114.8	110.3
Total Tetrachlorobiphenyls	<0.0105	<0.0106	109.1	104.2
Total Pentachlorobiphenyls	<0.0105	<0.0106	102.4	106.7
Total Hexachlorobiphenyls	<0.0105	<0.0106	102.1	101.4
Total Heptachlorobiphenyls	<0.0105	<0.0106	111.6	103.4
Total Octachlorobiphenyls	<0.0105	<0.0106	106.5	105.3
Total Nonachlorobiphenyls	<0.0105	<0.0106	100.8	103.8
Decachlorobiphenyl	<0.0105	<0.0106	98.4	102.7
Total Chlorinated Biphenyls	<0.0105	<0.0106	106.6	105.9

Extraction Standards	% Rec	% Rec	% Rec	% Rec
13C12-PCB1ES	53.0	64.0	48.8	71.0
13C12-PCB3ES	55.3	67.1	51.1	69.3
13C12-PCB4ES	56.6	70.7	52.9	72.5
13C12-PCB15ES	58.7	71.1	60.8	73.5
13C12-PCB19ES	56.6	65.3	55.2	70.8
13C12-PCB37ES	61.2	81.8	76.8	76.4
13C12-PCB54ES	57.5	71.8	61.6	72.9
13C12-PCB81ES	63.2	80.7	83.3	79.3
13C12-PCB104ES	60.0	84.0	73.9	73.7
13C12-PCB123ES	72.3	94.2	93.5	89.6
13C12-PCB118ES	63.3	89.4	84.3	76.0
13C12-PCB114ES	67.3	90.4	88.7	82.5
13C12-PCB105ES	67.3	89.6	87.8	82.0
13C12-PCB126ES	56.5	68.7	72.7	67.8
13C12-PCB155ES	62.6	89.3	90.8	75.8
13C12-PCB167ES	73.7	99.8	99.9	91.0
13C12-PCB156ES	68.8	94.8	91.4	84.0
13C12-PCB157ES	73.0	98.0	95.8	88.6
13C12-PCB169ES	76.3	100.4	101.2	91.5
13C12-PCB188ES	68.0	90.8	88.6	82.8
13C12-PCB202ES	67.8	92.1	91.3	84.3
13C12-PCB205ES	73.8	97.9	96.8	90.7
13C12-PCB208ES	71.3	95.8	98.7	88.3
13C12-PCB206ES	75.1	99.1	95.0	90.3
13C12-PCB209ES	80.6	104.3	103.3	90.9

M Indicates that a peak has been manually integrated.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a
ALS Sample ID	WG3012060-1	Extraction Date	26-Mar-19
Analysis Method	EPA 680		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	20.00 g		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG3012060

Approved:  
*Andrew Reid*  
--e-signature--  
29-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032851.D
Run Date	29-Mar-19 02:47
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	ng/g
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0105	U
Total Dichlorobiphenyls		<0.0105	U
Total Trichlorobiphenyls		<0.0105	U
Total Tetrachlorobiphenyls		<0.0105	U
Total Pentachlorobiphenyls		<0.0105	U
Total Hexachlorobiphenyls		<0.0105	U
Total Heptachlorobiphenyls		<0.0105	U
Total Octachlorobiphenyls		<0.0105	U
Total Nonachlorobiphenyls		<0.0105	U
Decachlorobiphenyl		<0.0105	U
Total Chlorinated Biphenyls		<0.0105	U

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	53.00	5-145
13C12-PCB3ES	20	6.05	55.30	5-145
13C12-PCB4ES	20	6.48	56.60	5-145
13C12-PCB15ES	20	8.49	58.70	5-145
13C12-PCB19ES	20	7.87	56.60	5-145
13C12-PCB37ES	20	11.24	61.20	5-145
13C12-PCB54ES	20	9.26	57.50	5-145
13C12-PCB81ES	20	13.14	63.20	5-145
13C12-PCB104ES	20	11.02	60.00	5-145
13C12-PCB123ES	20	13.71	72.30	5-145
13C12-PCB118ES	20	13.74	63.30	5-145
13C12-PCB114ES	20	13.92	67.30	5-145
13C12-PCB105ES	20	14.15	67.30	5-145
13C12-PCB126ES	20	14.64	56.50	5-145
13C12-PCB155ES	20	12.45	62.60	5-145
13C12-PCB167ES	20	14.91	73.70	5-145
13C12-PCB156ES	20	15.22	68.80	5-145
13C12-PCB157ES	20	15.29	73.00	5-145
13C12-PCB169ES	20	15.71	76.30	5-145
13C12-PCB188ES	20	13.99	68.00	5-145
13C12-PCB202ES	20	15.18	67.80	5-145
13C12-PCB205ES	20	16.72	73.80	5-145
13C12-PCB208ES	20	16.33	71.30	5-145
13C12-PCB206ES	20	17.20	75.10	5-145
13C12-PCB209ES	20	17.72	80.60	5-145

U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name** 18-E2-SD-CH-045  
 ALS Sample ID L2222986-21  
 Analysis Method EPA 680  
 Analysis Type blank  
 Sample Matrix Sediment  
 Sample Size 19.81 g  
 Percent Moisture 21.7%  
 Split Ratio 2

Sampling Date 26-Sep-18  
 Extraction Date 26-Mar-19

Workgroup WG3012060

Approved:  
*Andrew Reid*  
 --e-signature--  
 29-Mar-19

### Run Information

### Run 1

Filename 19032852.D  
 Run Date 29-Mar-19 03:11  
 Final Volume 0.11 mL  
 Dilution Factor 1  
 Analysis Units ng/g  
 Instrument MSD-2  
 Column HP-5MS USR433752H

Homologue Groups	Ret. Time	Concentration ng/g	Flags
Total Monochlorobiphenyls		<0.0106	U
Total Dichlorobiphenyls		<0.0106	U
Total Trichlorobiphenyls		<0.0106	U
Total Tetrachlorobiphenyls		<0.0106	U
Total Pentachlorobiphenyls		<0.0106	U
Total Hexachlorobiphenyls		<0.0106	U
Total Heptachlorobiphenyls		<0.0106	U
Total Octachlorobiphenyls		<0.0106	U
Total Nonachlorobiphenyls		<0.0106	U
Decachlorobiphenyl		<0.0106	U
Total Chlorinated Biphenyls		<0.0106	U

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	64.00	5-145
13C12-PCB3ES	20	6.05	67.10	5-145
13C12-PCB4ES	20	6.48	70.70	5-145
13C12-PCB15ES	20	8.50	71.10	5-145
13C12-PCB19ES	20	7.88	65.30	5-145
13C12-PCB37ES	20	11.25	81.80	5-145
13C12-PCB54ES	20	9.27	71.80	5-145
13C12-PCB81ES	20	13.14	80.70	5-145
13C12-PCB104ES	20	11.03	84.00	5-145
13C12-PCB123ES	20	13.70	94.20	5-145
13C12-PCB118ES	20	13.74	89.40	5-145
13C12-PCB114ES	20	13.92	90.40	5-145
13C12-PCB105ES	20	14.15	89.60	5-145
13C12-PCB126ES	20	14.65	68.70 M	5-145
13C12-PCB155ES	20	12.45	89.30	5-145
13C12-PCB167ES	20	14.91	99.80	5-145
13C12-PCB156ES	20	15.22	94.80	5-145
13C12-PCB157ES	20	15.29	98.00	5-145
13C12-PCB169ES	20	15.71	100.40	5-145
13C12-PCB188ES	20	13.99	90.80	5-145
13C12-PCB202ES	20	15.18	92.10	5-145
13C12-PCB205ES	20	16.72	97.90	5-145
13C12-PCB208ES	20	16.33	95.80	5-145
13C12-PCB206ES	20	17.20	99.10	5-145
13C12-PCB209ES	20	17.72	104.30	5-145

M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the MDL.

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG3012060-2	Extraction Date	26-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG3012060

Approved:  
Andrew Reid  
--e-signature--  
29-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032849.D
Run Date	29-Mar-19 01:58
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked	Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	8		101.1000		
Total Dichlorobiphenyls	88		119.3857		
Total Trichlorobiphenyls	142		114.8091		
Total Tetrachlorobiphenyls	578		109.0611		
Total Pentachlorobiphenyls	668		102.4471		
Total Hexachlorobiphenyls	460		102.1235		
Total Heptachlorobiphenyls	266		111.5500		
Total Octachlorobiphenyls	168		106.5000		
Total Nonachlorobiphenyls	72		100.8333		
Decachlorobiphenyl	24		98.4000		
Total Chlorinated Biphenyls	2474		106.6210		

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.31	48.80	15-145
13C12-PCB3ES	20	6.06	51.10	15-145
13C12-PCB4ES	20	6.49	52.90	15-145
13C12-PCB15ES	20	8.50	60.80	15-145
13C12-PCB19ES	20	7.88	55.20	15-145
13C12-PCB37ES	20	11.25	76.80	15-145
13C12-PCB54ES	20	9.27	61.60	15-145
13C12-PCB81ES	20	13.14	83.30	15-145
13C12-PCB104ES	20	11.03	73.90	15-145
13C12-PCB123ES	20	13.71	93.50	15-145
13C12-PCB118ES	20	13.74	84.30	15-145
13C12-PCB114ES	20	13.92	88.70	15-145
13C12-PCB105ES	20	14.15	87.80	15-145
13C12-PCB126ES	20	14.64	72.70	15-145
13C12-PCB155ES	20	12.45	90.80	15-145
13C12-PCB167ES	20	14.91	99.90	15-145
13C12-PCB156ES	20	15.22	91.40	15-145
13C12-PCB157ES	20	15.29	95.80	15-145
13C12-PCB169ES	20	15.71	101.20	15-145
13C12-PCB188ES	20	13.99	88.60	15-145
13C12-PCB202ES	20	15.18	91.30	15-145
13C12-PCB205ES	20	16.71	96.80	15-145
13C12-PCB208ES	20	16.33	98.70	15-145
13C12-PCB206ES	20	17.20	95.00	15-145
13C12-PCB209ES	20	17.72	103.30	15-145

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

<b>Sample Name</b>	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG3012060-4	Extraction Date	26-Mar-19
Analysis Method	EPA 680		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 n/a		
Percent Moisture	n/a		
Split Ratio	2	Workgroup	WG3012060

Approved:  
Andrew Reid  
--e-signature--  
29-Mar-19

<b>Run Information</b>	<b>Run 1</b>
Filename	19032848.D
Run Date	29-Mar-19 01:33
Final Volume	0.11 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USR433752H

Homologue Groups	Ret. ng spiked Time	% Rec	Flags	Limits
Total Monochlorobiphenyls	2	110.2000		
Total Dichlorobiphenyls	22	111.2429		
Total Trichlorobiphenyls	32	110.2636		
Total Tetrachlorobiphenyls	127	104.1722		
Total Pentachlorobiphenyls	139	106.6765		
Total Hexachlorobiphenyls	125	101.4294		
Total Heptachlorobiphenyls	72	103.4167		
Total Octachlorobiphenyls	42	105.3333		
Total Nonachlorobiphenyls	18	103.8333		
Decachlorobiphenyl	6	102.7000		
Total Chlorinated Biphenyls	584	105.9268		

Extraction Standards	ng	Ret time	% Rec	Limits
13C12-PCB1ES	20	5.30	71.00	15-145
13C12-PCB3ES	20	6.05	69.30	15-145
13C12-PCB4ES	20	6.48	72.50	15-145
13C12-PCB15ES	20	8.49	73.50	15-145
13C12-PCB19ES	20	7.87	70.80	15-145
13C12-PCB37ES	20	11.24	76.40	15-145
13C12-PCB54ES	20	9.26	72.90	15-145
13C12-PCB81ES	20	13.14	79.30	15-145
13C12-PCB104ES	20	11.02	73.70	15-145
13C12-PCB123ES	20	13.70	89.60	15-145
13C12-PCB118ES	20	13.74	76.00	15-145
13C12-PCB114ES	20	13.91	82.50	15-145
13C12-PCB105ES	20	14.15	82.00	15-145
13C12-PCB126ES	20	14.64	67.80	15-145
13C12-PCB155ES	20	12.45	75.80	15-145
13C12-PCB167ES	20	14.91	91.00	15-145
13C12-PCB156ES	20	15.22	84.00	15-145
13C12-PCB157ES	20	15.29	88.60	15-145
13C12-PCB169ES	20	15.70	91.50	15-145
13C12-PCB188ES	20	13.99	82.80	15-145
13C12-PCB202ES	20	15.18	84.30	15-145
13C12-PCB205ES	20	16.72	90.70	15-145
13C12-PCB208ES	20	16.33	88.30	15-145
13C12-PCB206ES	20	17.20	90.30	15-145
13C12-PCB209ES	20	17.72	90.90	15-145

M Indicates that a peak has been manually integrated.

NJ Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. Value is an estimated maximum