Report to:

DEPARTMENT OF COMMUNITY & GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

Quality Assurance and Quality Control Plan for the Kugaaruk Landfarm Facility NWB Licence No. 8BR-KRK0609

Document No. 0222880805-PQP-V0001-00

WARDROP

Report to:

DEPARTMENT OF COMMUNITY & GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

QUALITY ASSURANCE AND QUALITY CONTROL PLAN FOR THE KUGAARUK LANDFARM FACILITY

NWB LICENCE NO. 8BR-KRK0609

FEBRUARY 2010

Prepared by _____ Date Feb 23/10
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1.0 INTRODUCTION

A Quality Assurance (QA) and Quality Control (QC) plan is required as fulfillment of the conditions associated with the Nunavut Water Board (NWB) Licence No. 8BR-KRK0609 issued to the Government of Nunavut's Department of Community and Government Services for the purposes of water use and waste disposal activities associated with the Kugaaruk Landfarm Facility.

The following is a comprehensive QA/QC plan in compliance with the 1996 Indian and Northern Affairs Canada (INAC) guideline for "Class B Licenses in Collecting Representative Water Samples in the Field."

2.0 SAMPLE COLLECTION

2.1 LOCATION OF SAMPLING STATION

2.1.1 *LANDFARM RETENTION CELL*

A scaled site plan has been prepared to ensure that surficial water quality samples collected from the retention cell are collected in the same position as previous events. The surficial water quality sample was collected at the centre of the south berm, approximately 0.5 m from the edge of the water. The site plan is presented in Appendix A.

2.1.2 *GROUNDWATER MONITORING WELLS*

Five groundwater monitoring wells were installed along the south and southwest perimeter of the Landfarm retention cell. The monitoring well PVC caps under the protective steel roadboxes are labeled for easy well identification. The site plan also depicts the location of the monitoring wells.

2.2 SAMPLING METHODS AND EQUIPMENT

Wardrop personnel will be responsible for the collection of groundwater monitoring well samples. Additionally, Wardrop has trained two local individuals during the October 2009 sampling event to collect surficial water quality samples; these two individuals (Mr. Paul Illuitok and Mr. Robert Sigguk) should be employed to collect the surficial water samples.

2.2.1 *SURFACE WATER SAMPLE COLLECTION*

The surface water sample will be collected by hand without aid of a pump. Fresh clean disposable nitrile gloves will be worn during the handing of sampling equipment, bottles, preservatives, or the water to be sampled. Nitrile gloves are to be disposed of after each individual sample collection to prevent cross-contamination. Clean, laboratory-supplied containers will be immersed in the water, just below the surface and filled; disturbance of bottom sediments will be avoided. If the sampling containers contain preservative, the sample will be collected via a clean laboratory supplied container, without preservative, and decanted to the appropriate sample containers for the associated analysis. The benzene, toluene, ethylbenzene and xylenes (BTEX) and Petroleum Hydrocarbon (PHC) Fraction F1 40 mL vials are to have zero headspace within the sample vials, and less than 1 cm of sediment.

The PHC Fraction F2 to F4 250 mL Amber bottles are to be filled to the neck of the bottle, and contain less than 1 cm of sediment. Water samples will be appropriately labelled and stored in coolers equipped with ice to sustain a temperature of approximately 4°C, pending and during transit to an accredited laboratory.

The following table displays the appropriate laboratory supplied bottles and preservative required for laboratory analysis which may be performed on the groundwater samples collected from the monitoring wells. The table also indicates the laboratory hold time.

SURFACE WATER SAMPLE ANALYSIS			
Analysis	**Sample Container**	**Preservative**	**Hold Time**
BTEX, PHC F1	3 x 40 mL clear glass vials	Sodium Bisulfate, 4°C	14 days
PHC F2-F4	2 x 250 mL amber glass bottles	None, 4°C	7 days

2.2.2 GROUNDWATER MONITORING WELL SAMPLE COLLECTION

Clear dedicated disposable polyethylene bailers will be used to limit the loss of volatiles during sample collection. Fresh clean disposable nitrile gloves will be worn during the handing of sampling equipment, bottles, preservatives, or the water to be sampled. Nitrile gloves are to be disposed of after each individual sample collection to prevent cross-contamination. Each well is to be purged dry of groundwater or alternatively, purged of at least three well casing volumes, using the following equation. The groundwater in the well should be allowed to recover to approximately 50% of the static water level, prior to sampling.

$$V_p = 3 \times (\pi/4) \times (h_b - h_s) \times d_w^2 / 1000$$

Where, V_p = minimum purging volume (L)
h_b = depth to bottom of well (m)
h_s = depth to static water level in well (m)
d_w = diameter of well casing (mm)

To sample the groundwater, the bailer will be lowered slowly in the well and allowed to sink into the upper column of water. The bailer will be slowly retrieved in order to prevent an increase in turbidity. The water sample will be immediately transferred into laboratory supplied containers for each analysis required and preserved as appropriate. If samples collected for metals analysis are field filtered (using a waterra 0.45 μm filter), the appropriate preservative should be added after the sample is filtered and decanted into the appropriate sample container; thus, avoiding an exothermic reaction. If the sample is not field filtered, no preservative should be used. The laboratory will subsequently filter and preserve the sample upon its arrival at the lab.

The BTEX and PHC Fraction F1, 40 mL vials are to have zero headspace within the sample vials. Groundwater bottles for BTEX and PHC F1 to F4 are to contain less than 1 cm of sediment, to avoid interference will analysis.

The following table displays the appropriate laboratory supplied bottles and preservative required for laboratory analysis which may be performed on the groundwater samples collected from the monitoring wells. The table also indicates the laboratory hold time.

GROUNDWATER SAMPLE ANALYSIS			
Analysis	**Sample Container**	**Preservative**	**Hold Time**
BTEX, PHC F1	3 x 40 mL clear glass vials	0.2 g Sodium Bisulfate, 4°C	14 days
PHC F2-F4	2 x 250 mL amber glass bottles	None, 4°C	7 days
PCB	0.5 L to 1 L amber glass bottle	None, 4°C	1 year
PAH	0.5 L to 1 L amber glass bottle	None, 4°C	7 days
Dissolved Metals	250 mL plastic bottle	3 mL Nitric Acid[1], 4°C	6 months
Notes: PCB = Polychlorinated Biphenyls PAH = Polycyclic Aromatic Hydrocarbons [1]Added if sample is field filtered.			

The samples will be appropriately labelled and stored in coolers equipped with ice to sustain a temperature of approximately 4°C, pending and during transit to an accredited laboratory.

2.2.3 *QA/QC Groundwater Monitoring Well Sample Collection*

As part of a complete QA/QC plan, duplicate groundwater samples, a field blank and a trip blank should be collected to ensure accuracy of laboratory results. Groundwater field duplicate samples will be collected throughout the program; the frequency of duplicate samples will be approximately one for every ten samples submitted for laboratory analyses. Groundwater field duplicate samples are prepared by collecting a sample and splitting it into two sample containers. Fresh clean disposable nitrile gloves will be worn during the handling of sampling equipment, bottles, groundwater and laboratory supplied blank water samples. Nitrile gloves are to be disposed of after each individual sample collection to prevent cross-contamination.

A field blank is used to quantify any background PHC concentrations at the sampling points, if any. The field blank is prepared by pouring laboratory supplied organic-free water into the appropriate laboratory supplied sampling containers for BTEX and PHC F1 and F2.

A trip blank is used to evaluate potential sample contamination from volatile organic compounds that may be present in the air on-site or in the sample shipping containers. A trip blank consists of laboratory supplied distilled deionized water in a closed container. The blank accompanies the empty sample bottles to the field as well as the samples returning to the laboratory for analysis. The sample is not opened until the laboratory analyzes it. The laboratory may affix a seal on the trip blanks; this seal must not be broken.

3.0 SAMPLE HANDLING

3.1 SAMPLE IDENTIFICATION

Clear and accurate labeling of environmental samples is an important aspect of quality assurance which needs to be consistent throughout the lifetime of a project. Clear and accurate labeling ensures that the data reported corresponds to the correct sampling location. Each sampling container will be labeled using the laboratory-provided labels; prior to sampling using an indelible writing instrument, such as a permanent ink felt pen or a good quality ball point pen. The sample label will be filled out in full to include the sample identification name, date and time of sample, and the Wardrop project number.

The information recorded on the sample containers will be consistent with the information recorded on the laboratory-supplied Chain of Custody form and subsequent reports (figures and tables generated by Wardrop). The naming convention for water samples collected at the Kugaaruk Landfarm Facility, are as follows:

Sample Name as Shown on Label and CoC	Description
MW1	Groundwater Monitoring Well 1 Sample
MW2	Groundwater Monitoring Well 2 Sample
MW3	Groundwater Monitoring Well 3 Sample
MW4	Groundwater Monitoring Well 4 Sample
MW5	Groundwater Monitoring Well 5 Sample
SUMP	Retention Cell Water Sample

3.2 CHAIN OF CUSTODY

A Chain of Custody (CoC) form is required for sample submission to the laboratory, and is considered a legal document. The purpose of the CoC is to guarantee the identity and integrity of the sample from collection through to reporting of the analysis. The CoC must accompany the samples and should be placed within the cooler. The CoC must contain contact information, project identification information, sample identification (sample name as indicated in Section 3.1), date and time the sample was collected, sample type (i.e., water), and analysis requested. If samples are preserved and/or field filtered, this must be indicated on the CoC in the appropriate section. The CoC must be signed and dated when released to the courier. A sample CoC is presented in Appendix B, information to be updated after sample collection is highlighted.

3.3 SAMPLE PACKING

The samples are to be stored in coolers equipped with ice, at approximately 4°C, pending and during transit to an accredited laboratory. Samples are not permitted to exceed 10°C. All samples are to be packaged in a manner to minimize possible breakage en route to the laboratory. The 3 x 40 mL vials can be bubble wrapped together, while the larger bottles must be individually bubble wrapped. Samples from the same monitoring location should be placed within a common ziplock bag and sealed to ensure that water from melting ice will not infiltrate, or to contain leakage if a sample bottle should break.

The cooler should be lined with bubble wrap and ice should be double ziplocked to ensure that free water does not contact the samples; sufficient ice should be used to ensure the samples will maintain a temperature of approximately 4°C until their arrival at the laboratory. Sufficient bubble wrap should be used to ensure the sample bottles are secure; bubble wrap should be placed between each of the ziplocked sample bags, between the samples and ice, and at the top of the cooler for maximum insulation.

The CoC is to be filled out and placed at the top of the cooler. The cooler should then be tapped shut. If a custody seal has been sent by the laboratory with the sample bottles, it should be affixed to the outside of the cooler over the opening, to ensure the samples have not been tampered with. Coolers should be labeled as "fragile" to minimize potential for breakage by couriers.

3.4 TRANSPORTATION

Sample collection should be appropriately timed to ensure that samples do not exceed laboratory hold times as indicated in section 2.2.2. Samples should be transported immediately to the laboratory after collection. ALS Laboratory Group (ALS) has a laboratory in Yellowknife that can accept the samples, and will forward them to their environmental laboratory in Edmonton for analysis. Laboratory contact information is presented below.

ALS Yellowknife
75 Con Road
Yellowknife, Northwest Territories X1A 2R2
P: (867) 837-5593
F: (867) 920-4238
Hours: 7 a.m. to 5 p.m.
Note: Sample reception is available outside of office hours; call to make arrangements.

ALS Edmonton
9936 – 67 Avenue
Edmonton, Alberta 6E 0P5
P: (780) 413-5227
F: (780) 413-2311
Hours: 8 a.m. to 5 p.m. (Mon. to Fri.)
9 a.m. to 1 p.m. (Sat.)

Two airlines provide service between Kugaaruk and Yellowknife, First Air (www.firstair.ca) and Canadian North (www.cdn-north.com). A flight schedule is provided below; however, it is noted that the flight schedule may change, and aircraft landing in Kugaaruk is subject to weather conditions.

To ensure that samples are kept at the optimum temperature, arrangements should be made with the ALS Yellowknife laboratory for sample reception upon aircraft arrival. Alternatively, samples may be kept at the airline hangar terminal for pickup the following morning, granted the airline can store the samples in a fridge in a secure area.

Flight Schedules – Kugaaruk to Yellowknife							
Carrier	Weekday						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
First Air	-	17:05-20:55	17:10-22:05	-	15:25-19:15	16:05-19:55	16:15-22:05
Canadian North	14:20-19:20	-	-	13:55-17:50	-	-	13:50-18:50

4.0 LAB ANALYSIS

4.1 LABORATORY ACCREDITATION

Wardrop will utilize ALS in Edmonton, Alberta for the analysis all environmental samples; the Yellowknife location will be used solely as a depot. Both locations hold the Canadian Association for Laboratory Accreditation Inc. (CALA) accreditation (Accreditation Number A1352). The CALA documents for the Edmonton laboratory and the ALS Canadian *Statement of Qualifications* are presented in Appendix C, attached.

4.2 DETECTION LIMITS AND METHODOLOGY

Reportable detection limits (RDL) and methodology's are listed in the CALA accreditation document, attached.

4.3 REPORTING REQUIREMENTS

One sample duplicate will be collected for every ten (or less) environmental samples submitted to the laboratory. Field blanks also will be prepared and submitted to the laboratory, and will accompany each sampling event.

Wardrop will review the laboratory calibration checks, quality control standard recoveries, RPDs, spikes, and blanks to ensure they are within the laboratory's quality control limits. Laboratory results for field duplicate samples will be compared by calculating the relative percent difference (RPD_{DUP}) between the original and duplicate sample. The RPD_{DUP} is defined as the absolute value of the difference between the two samples, divided by the average. Due to analytical errors near the method detection limit, RPD_{DUP} should only be applied where the concentrations are greater than the practical quantitation limit (defined as five times the laboratory detection limit). For the parameters measured in soil, a RPD_{DUP} value of less than 100% is considered acceptable. For the parameters measured in water, a RPD_{DUP} value of less than 80% is considered acceptable.

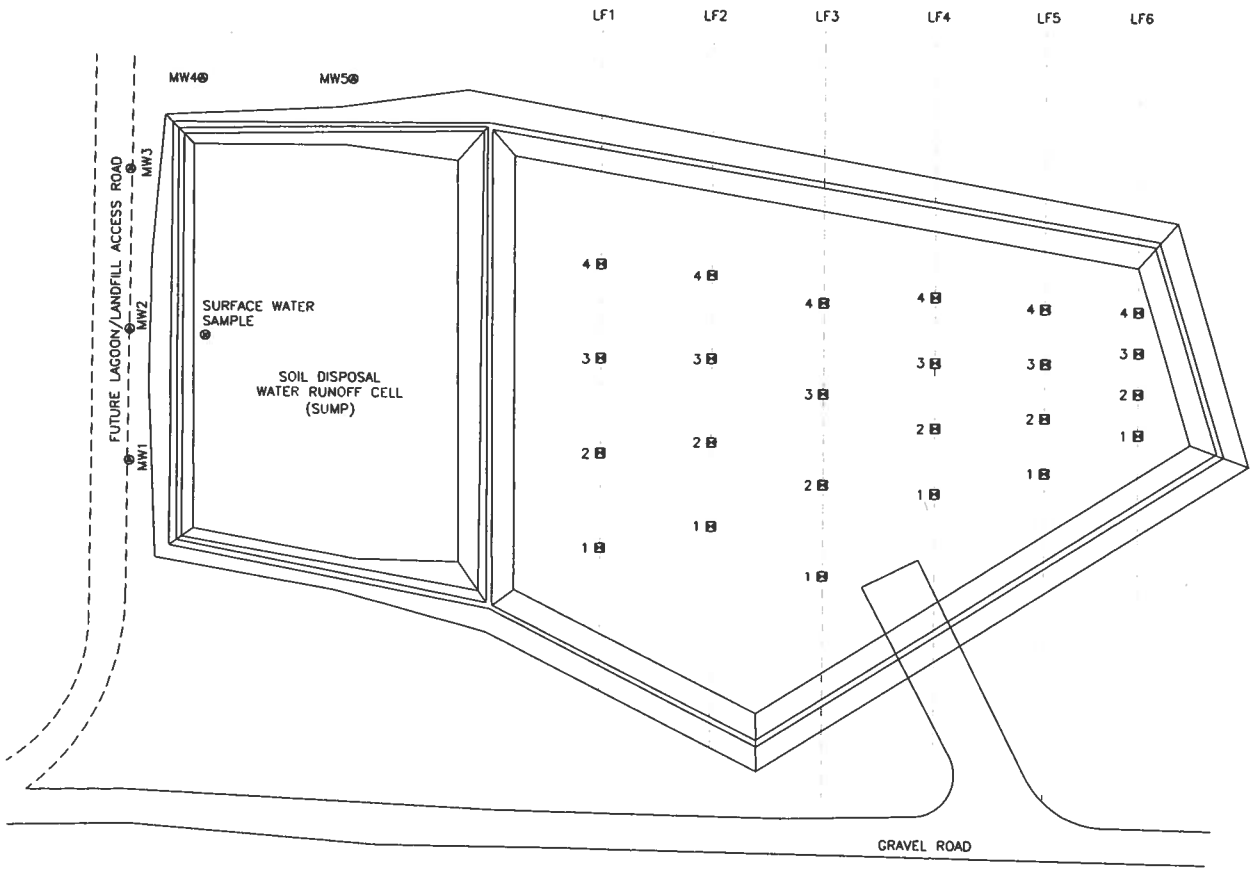
5.0 REFERENCES

Department of Indian and Northern Affairs Canada, Water Resources Division, and the Northwest Territories Water Board, July 1996. *Quality Assurance (QA) and Quality Control (QC) Guidelines For Use By Class "B" Licensees in Collecting Representative Water Samples In The Field and For Submission of a QA/QC Plan.*

APPENDIX A

SITE PLAN
SAMPLING LOCATIONS

X:\A-G\GOVERNMENT OF NUNAVUT\02228808.05 - LAND FARM WATER LICENSE COMPLIANCE ASSISTANCE\CAD\ENV\0222880805-SKT-V0001-A2.DWG 09.12.22 10:03 AM PRECOURT, SYLVIO



PRELIMINARY DRAWING

NOT TO BE USED FOR CONSTRUCTION

LEGEND
- SOIL SAMPLE LOCATION
- SOIL SAMPLING LINE
- MONITORING WELL
- SURFACE WATER SAMPLE

REFERENCE DRAWINGS: 0222880801-SKT-V0004-A4

0 10 20 30 40 50 m
SCALE 1:800 (APPROXIMATE)

NO.	DATE	DESCRIPTION	ISSUED BY

REVISIONS/ISSUE

WARDROP A TETRA TECH COMPANY

PEOPLE, PASSION, PERFORMANCE. TRUSTED GLOBALLY

AUTHORIZED BY:

DATE: 09.11.30

CLIENT DRAWING NO.

CLIENT
GOVERNMENT OF NUNAVUT

DRAWING DESCRIPTION
FIGURE 1: SITE PLAN SHOWING 2009 LANDFARM SAMPLING LOCATIONS KUGAARUK, NUNAVUT

DESIGNED BY:	SP	DRAWN BY:	SP	DRAWING NO.	REV.
REVIEWED BY:	SZ	SCALE:	1:800	0222880805-SKT-V0001	A2

AL (11" x 8.5")

APPENDIX B

CHAIN OF CUSTODY

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

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Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Wardrop Engineering Inc.	☑ Standard ☐ Other	◉ Regular (Default)
Contact:	Dave Ediger	☑ PDF ☐ Excel ☐ Digital ☐ Fax	○ Priority (Specify Date Required → →) Surcharges apply
Address:	400-386 Broadway	Email 1: dave.ediger@wardrop.com	○ Emergency (1 Business Day) - 100% Surcharge
	Winnipeg, Manitoba R3C 4M8	Email 2:	○ For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	(204) 956-0980 Fax: (204) 957-5389		**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		Job #: 022288-08-05	
Contact:		PO / AFE:	
Address:		LSD: Kugaaruk, Nunavut	
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		**ALS Contact:**	**Sampler:**

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BTEX, PHC F1	PHC F2-F4	Dissolved Metals	PAH	PCB								Number of Containers
					P												
	MW1			Water	X	X	X	X	X								
	MW2			Water	X	X	X	X	X								
	MW3			Water	X	X	X	X	X								
	MW4			Water	X	X	X	X	X								
	MW5			Water	X	X	X	X	X								
	SUMP			Water	X	X											

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature: °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

APPENDIX C

LABORATORY ACCREDITATION AND STATEMENT OF QUALIFICATIONS

CALA
Canadian Association for Laboratory Accreditation Inc.

CALA Directory of Laboratories

Membership Number: 1352
Laboratory Name: ALS Laboratory Group - Environmental Division (Edmonton)
Parent Institution: ALS Canada Ltd.
Address: 9936 - 67th Ave. NW Edmonton AB T6E 0P5
Contact: Ms. Lori McLeod
Phone: (780) 413-5251
Fax: (780) 437-2311
Email: linda.neimor@alsenviro.com; lori.mcleod@alsenviro.com

Standard: Conforms with requirements of ISO/IEC 17025
Clients Served: All Interested Parties
Revised On: October 14, 2009
Valid To: July 11, 2011

Scope of Accreditation

Air (Inorganic)
Dustfall - Air (120)
ISOP 127; based on AB ENVIRONMENT 32020

GRAVIMETRIC	RDL Range
Dustfall, Fixed	
Dustfall, Total	

Air (Inorganic)
Metals - Air Filter (016)
ISOP 32/ISOP 96; based on EPA 3051/200.8

ICP/MS - DIGESTION	RDL Range
Aluminum	
Barium	
Beryllium	
Cadmium	.05 - .25 µg/HVF
Calcium	
Chromium	
Cobalt	
Copper	.1 - .5 µg/HVF
Iron	
Lead	.1 - .5 µg/HVF
Magnesium	
Manganese	
Mercury	
Molybdenum	
Nickel	
Potassium	
Silver	
Sodium	
Strontium	
Thallium	

† "OSDWA" indicates the appendix is used for the analysis of Ontario drinking water samples, which is subject to the rules and related regulations under the Ontario "Safe Drinking Water Act" (2002).

Tin	
Vanadium	
Zinc	5 - 25 µg/HVF

Air (Organic)

Dioxins/Furans (PCDD/PCDF) - Air (138)

UTCSOP18/; based on EPA 1613 AND ENVIRONMENT CANADA, EPS 1/RM/19

GC-HRMS-EXTRACTION	RDL Range
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,4,7,8-Hexachlorodibenzofuran	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,6,7,8-Hexachlorodibenzofuran	
1,2,3,7,8-Pentachlorodibenzofuran	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	
1,2,3,7,8,9-Hexachlorodibenzofuran	
2,3,4,6,7,8-Hexachlorodibenzofuran	
2,3,4,7,8-Pentachlorodibenzofuran	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	
2,3,7,8-Tetrachlorodibenzofuran	
Heptachlorodibenzo-p-dioxins (Total)	
Heptachlorodibenzofurans (Total)	
Hexachlorodibenzo-p-dioxins (Total)	
Hexachlorodibenzofurans (Total)	
Octachlorodibenzo-p-dioxin	
Octachlorodibenzofuran	
Pentachlorodibenzo-p-dioxins (Total)	
Pentachlorodibenzofurans (Total)	
Tetrachlorodibenzo-p-dioxins (Total)	
Tetrachlorodibenzofurans (Total)	

Air (Organic)

Volatile Organic Compounds (VOC) - Air (Canisters) (122)

HSOP55; based on EPA TO-15

GC/MS	RDL Range
1,1-Dichloroethane	
1,1-Dichloroethene	
1,1,1-Trichloroethane	
1,1,2-Trichloroethane	
1,1,2,2-Tetrachloroethane	
1,2-Dibromoethane	
1,2-Dichlorobenzene	
1,2-Dichloroethane	
1,2-Dichloropropane	
1,2,4-Trichlorobenzene	
1,2,4-Trimethylbenzene	
1,3-Dichlorobenzene	
1,3,5-Trimethylbenzene	
1,4-Dichlorobenzene	
Benzene	
Bromomethane	
Carbon tetrachloride	

† "OSDWA" indicates the appendix is used for the analysis of Ontario drinking water samples, which is subject to the rules and related regulations under the Ontario "Safe Drinking Water Act" (2002).

Chlorobenzene
Chloroform
Chloromethane
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibromochloromethane
Dichloromethane
Ethyl chloride
Ethylbenzene
Halocarbon 11
Halocarbon 113
Halocarbon 114
Halocarbon 12
Hexachloro-1,3-butadiene
m/p-xylene
Methylene Chloride
o-xylene
Styrene
Tetrachloroethylene
Toluene
Trans-1,2-dichloroethylene
trans-1,3-Dichloropropene
Trichlorethylene
Vinyl Chloride

Air (Organic)

Volatile Organic Compounds (VOC) - Air (Carbotrap Tubes) (121)
HSOP2; based on NIOSH 2549, EPA TO-17

GC/MS - THERMAL DESORPTION	RDL Range
1,1-Dichloroethane	
1,1-Dichloroethene	
1,1,1-Trichloroethane	
1,1,2-Trichloroethane	
1,1,2,2-Tetrachloroethane	
1,2-Dibromoethane	
1,2-Dichlorobenzene	
1,2-Dichloroethane	
1,2-Dichloropropane	
1,2,4-Trichlorobenzene	
1,2,4-Trimethylbenzene	
1,3-Dichlorobenzene	
1,3,5-Trimethylbenzene	
1,4-Dichlorobenzene	
Benzene	
Bromomethane	
Carbon tetrachloride	
Chlorobenzene	
Chloroform	
Chloromethane	
cis-1,2-Dichloroethylene	
cis-1,3-Dichloropropene	
Dibromochloromethane	
Dichloromethane	
Ethyl chloride	
Ethylbenzene	
Halocarbon 11	

† "OSDWA" indicates the appendix is used for the analysis of Ontario drinking water samples, which is subject to the rules and related regulations under the Ontario "Safe Drinking Water Act" (2002).

Halocarbon 113
Halocarbon 114
Halocarbon 12
Hexachloro-1,3-butadiene
m/p-xylene
Methylene Chloride
o-xylene
Styrene
Tetrachloroethylene
Toluene
Trans-1,2-dichloroethylene
trans-1,3-Dichloropropene
Trichlorethylene
Vinyl Chloride

Oil (Organic)
Total PCBs - Oil (002)
MSOP 8; based on EPA 8080, ASTM D4059

GC/ECD - EXTRACTION	RDL Range
Total PCB	1 - 5 µg/g

Paint
Lead - Paint (153)
ISOP 50, ISOP 100; based on EPA 3050, EPA 6010

ICP - DIGESTION	RDL Range
Lead	

Serum
Perfluorinated Organics (PFC) - Serum (147)
UTCSOP 153; based on ENVIRO. SCI. TECH, 38, 3698-3704

LC-MS/MS - EXTRACTION	RDL Range
Perfluorodecane sulfonate	
Perfluorodecanoic acid	
Perfluorododecanoic acid	
Perfluorohexane sulfonate	
Perfluorononanoic acid	
Perfluorooctane sulfonate	
Perfluorooctanoic acid	
Perfluoroundecanoic acid	

Solids (Inorganic)
Ammonia - Soil (177)
ISOP 49/70; based on CSSS 15.2/SM 4500-NH3

COLORIMETRIC (SATURATED PASTE)	RDL Range
Ammonia	

Solids (Inorganic)
Anions - Soil (176)
ISOP 49/46/ISOP 100; based on CSSS 15.2/SM 4110 B

ION CHROMATOGRAPHY (SATURATED PASTE)	RDL Range
Nitrate	
Nitrite	
Sulfate	

† "OSDWA" indicates the appendix is used for the analysis of Ontario drinking water samples, which is subject to the rules and related regulations under the Ontario "Safe Drinking Water Act" (2002).

Solids (Inorganic)
Barium - Soil (172)
ISOP 158; based on SSSA PART 3, 1996, PG 202

ICP - FUSION	RDL Range
Barium	

Solids (Inorganic)
Chloride - Saturated Paste, Soil (168)
ISOP 49/129; based on CSSS 15.2/SM 4500 - CL E

COLORIMETRIC	RDL Range
Chloride	

Solids (Inorganic)
Conductivity - Soil (156)
ISOP 49/ISOP 18/ISOP19; based on MCKEAGUE 3.21, based on CARTER CSSS 15.2/15.3

SATURATED PASTE, METER	RDL Range
Conductivity	

Solids (Inorganic)
Conductivity - Soil (157)
ISOP 18/ISOP 19; based on CARTER CSSS 15.3

1:2 EXTRACTION, METER	RDL Range
Conductivity	

Solids (Inorganic)
Density - Soil (170)
ISOP 114; based on ASTM D5057

GRAVIMETRIC	RDL Range
Density	

Solids (Inorganic)
Grain Size - Soil (028)
ISOP 68; based on ASTM D422-63

SIEVING	RDL Range
Grain Size	

Solids (Inorganic)
Hexavalent Chromium - Soil (148)
ISOP 108; based on EPA 3060 A

IC-ALKALINE DIGESTION	RDL Range
Chromium	

Solids (Inorganic)
Hot Water Soluble Boron - Soil (145)
ISOP144/ISOP100; based on KEREN 1996 METHODS OF SOIL ANALYSIS

ICP - EXTRACTION	RDL Range
Boron	

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Solids (Inorganic)
Mercury - Soil (164)
ISOP 50/ISOP 12; based on EPA 200.2/SM 3112 B

COLD VAPOUR AA - DIGESTION	RDL Range
Mercury	50 - 250 ng/g

Solids (Inorganic)
Metals - Soil (023)
ISOP 50/ISOP 96; based on EPA 200.2/6020

ICP/MS - DIGESTION	RDL Range
Aluminum	100 - 500 µg/g
Barium	5 - 25 µg/g
Beryllium	1 - 5 µg/g
Cadmium	.5 - 2.5 µg/g
Calcium	
Chromium	.5 - 2.5 µg/g
Cobalt	1 - 5 µg/g
Copper	1 - 5 µg/g
Iron	1 - 5 µg/g
Lead	5 - 25 µg/g
Magnesium	
Manganese	10 - 50 µg/g
Molybdenum	
Nickel	1 - 5 µg/g
Phosphorus	
Potassium	
Silver	
Sodium	
Strontium	1 - 5 µg/g
Thallium	
Tin	5 - 25 µg/g
Titanium	5 - 25 µg/g
Vanadium	1 - 5 µg/g
Zinc	10 - 50 µg/g

Solids (Inorganic)
Oil and Grease - Soil (029)
ISOP 13; based on EPA 5520

GRAVIMETRIC - EXTRACTION	RDL Range
Oil and Grease	

Solids (Inorganic)
Particle Size - Soil (110)
ETLSOP7_1; based on CARTER - HYDROMETER

PARTICLE SIZE	RDL Range
% Clay	
% Sand	
% Silt	

Solids (Inorganic)
Percent Moisture - Soil (179)
MSOP104; ASTM D2216-80

GRAVIMETRIC	RDL Range
% Moisture	

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Solids (Inorganic)
Percent Saturation - Soil (169)
ISOP 49; based on CSSS 15.2

GRAVIMETRIC	RDL Range
% Saturation	

Solids (Inorganic)
pH - Soil (099)
ISOP 49/ISOP 18; based on MCKEAGUE 3.21, based on CARTER CSSS 15.2/16.2

SATURATED PASTE, METER	RDL Range
pH	

Solids (Inorganic)
pH - Soil (100)
ISOP 18; based on CARTER CSSS 16.2

1:2 EXTRACTION, METER	RDL Range
pH	

Solids (Inorganic)
pH (1:2 CaCl2) - Soil (163)
ISOP 69; based on CSSS 16.3

1:2 CaCl2 EXTRACTION - METER	RDL Range
pH (1:2 CaCl2)	

Solids (Inorganic)
Salinity - Soil (160)
ISOP 49/ISOP 100; based on MCKEAGUE 3.21/EPA 6010

ICP (SATURATED PASTE)	RDL Range
Calcium	
Magnesium	
Potassium	
Sodium	
Sulfur SO4	

Solids (Inorganic)
Sulfate - Solids (173)
ISOP 155; based on CSA A23.2

IC - DIGESTION	RDL Range
Sulfate	

Solids (Organic)
Dioxins/Furans - Soil, Sediment (085)
UTCSOP18; based on EPA 1613, EPS 1/RM/19

HRGC/HRMS - EXTRACTION	RDL Range
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,4,7,8-Hexachlorodibenzofuran	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	

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1,2,3,6,7,8-Hexachlorodibenzofuran
1,2,3,7,8-Pentachlorodibenzofuran
1,2,3,7,8-Pentachlorodibenzo-p-dioxin
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
1,2,3,7,8,9-Hexachlorodibenzofuran
2,3,4,6,7,8-Hexachlorodibenzofuran
2,3,4,7,8-Pentachlorodibenzofuran
2,3,7,8-Tetrachlorodibenzo-p-dioxin
2,3,7,8-Tetrachlorodibenzofuran
Heptachlorodibenzo-p-dioxins (Total)
Heptachlorodibenzofurans (Total)
Hexachlorodibenzo-p-dioxins (Total)
Hexachlorodibenzofurans (Total)
Octachlorodibenzo-p-dioxin
Octachlorodibenzofuran
Pentachlorodibenzo-p-dioxins (Total)
Pentachlorodibenzofurans (Total)
Tetrachlorodibenzo-p-dioxins (Total)
Tetrachlorodibenzofurans (Total)

Solids (Organic)
Extractable Petroleum Hydrocarbons (EPH) - Soil (109)
MSOP 119; based on BC MELP EPH IN SOLIDS BY GC/FID

GC/FID - EXTRACTION	RDL Range
EPH 10-19	
EPH 19-32	

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Soil (129)
MSOP139; CCME

GC/FID - SOXHLET EXTRACTION	RDL Range
F2: C10-C16	5 - 25 mg/kg
F3: C16-C34	5 - 25 mg/kg
F4: C34-C50	5 - 25 mg/kg

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Soil (130)
MSOP139; CCME

GRAVIMETRIC	RDL Range
F4: Gravimetric	100 - 500 mg/kg

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Soil (154)
MSOP 173; CCME

GC/MS - HEADSPACE	RDL Range
Benzene	.005 - .025 mg/kg
Ethylbenzene	.01 - .05 mg/kg
m/p-xylene	.01 - .05 mg/kg
o-xylene	.01 - .05 mg/kg
Toluene	.01 - .05 mg/kg

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Solids (Organic)
Petroleum Hydrocarbons (PHC) - Soil (155)
MSOP 142; CCME

GC/FID - HEADSPACE	RDL Range
F1: C6-C10	5 - 25 mg/kg

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Soil (158)
NA-TM-1100 v03; CCME

GC/FID - EXTRACTION TUMBLER	RDL Range
F2: C10-C16	10 - 50 mg/kg
F3: C16-C34	10 - 50 mg/kg
F4: C34-C50	10 - 50 mg/kg

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Soil (171)
NA-TM-1100 v03; CCME

GRAVIMETRIC - TUMBLER	RDL Range
F4: Gravimetric	500 - 2500 mg/kg

Solids (Organic)
Phenols - Soil (077)
MSOP70; based on EPA 8270/3540

GC/MS - EXTRACTION	RDL Range
2-Chlorophenol	
2-Methylphenol (o-Cresol)	
2-Nitrophenol	
2,3-Dichlorophenol	
2,3,4-Trichlorophenol	
2,3,4,5-Tetrachlorophenol	
2,3,4,6 Tetrachlorophenol	
2,3,5-Trichlorophenol	
2,3,5,6-Tetrachlorophenol	
2,3,6-Trichlorophenol	
2,4 & 2,5-Dichlorophenol	
2,4-Dimethylphenol	
2,4-Dinitrophenol	
2,4,5-Trichlorophenol	
2,4,6-Trichlorophenol	
2,6-Dichlorophenol	
3-Chlorophenol	
3-Methylphenol (m-Cresol)	
3,4-Dichlorophenol	
3,4,5-Trichlorophenol	
3,5-Dichlorophenol	
4-Chloro-3-methylphenol	
4-Chlorophenol	
4-Methylphenol (p-Cresol)	
4-Nitrophenol	
4,6-Dinitro-2-methylphenol	
Pentachlorophenol	
Phenol	

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Solids (Organic)
Polychlorinated Biphenyls (PCB) - Soil, Sediment (088)
UTCSOP18; based on EPA 1668A

HRGC/HRMS - EXTRACTION	RDL Range
PCB 1	
PCB 100	
PCB 101	
PCB 102	
PCB 103	
PCB 104	
PCB 105	
PCB 106	
PCB 108/86/125	
PCB 11	
PCB 110	
PCB 111/117	
PCB 112	
PCB 113	
PCB 114	
PCB 115	
PCB 116	
PCB 118	
PCB 12	
PCB 120	
PCB 122	
PCB 123/107/109	
PCB 124	
PCB 126	
PCB 127	
PCB 128/162	
PCB 13	
PCB 130	
PCB 131/142/133	
PCB 132	
PCB 134	
PCB 135	
PCB 136	
PCB 137	
PCB 138	
PCB 139/143	
PCB 14	
PCB 140	
PCB 141	
PCB 144	
PCB 145	
PCB 146	
PCB 147/149	
PCB 148	
PCB 15	
PCB 150	
PCB 151	
PCB 152	
PCB 153/168	
PCB 154	
PCB 155	
PCB 156	
PCB 157	

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PCB 158/129
PCB 159
PCB 16
PCB 160/163
PCB 161
PCB 164
PCB 165
PCB 166
PCB 167
PCB 169
PCB 17
PCB 170
PCB 171
PCB 172
PCB 173
PCB 174
PCB 175/182
PCB 176
PCB 177
PCB 178
PCB 179
PCB 18
PCB 180
PCB 181
PCB 183
PCB 184
PCB 185
PCB 186
PCB 187
PCB 188
PCB 189
PCB 19
PCB 190
PCB 191
PCB 192
PCB 193
PCB 194
PCB 195
PCB 197
PCB 198
PCB 199
PCB 2
PCB 200
PCB 201/204
PCB 202
PCB 203/196
PCB 205
PCB 206
PCB 208
PCB 209
PCB 21/20/23
PCB 22
PCB 23
PCB 24
PCB 25
PCB 26
PCB 27

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PCB 28
PCB 29
PCB 3
PCB 30
PCB 31
PCB 32
PCB 34
PCB 35
PCB 36
PCB 37
PCB 38
PCB 39
PCB 4/10
PCB 40/68
PCB 41
PCB 43/52
PCB 44
PCB 45
PCB 46
PCB 47
PCB 48/49
PCB 5
PCB 50
PCB 51
PCB 53
PCB 54
PCB 55
PCB 56
PCB 57
PCB 58/67
PCB 59/42
PCB 6
PCB 60
PCB 61
PCB 63/76
PCB 64
PCB 66
PCB 69
PCB 7
PCB 70
PCB 71
PCB 72
PCB 74
PCB 75/65/62
PCB 77
PCB 78
PCB 79
PCB 8
PCB 80
PCB 81
PCB 82
PCB 83/119
PCB 84/89
PCB 85
PCB 87
PCB 88/121
PCB 9

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PCB 90/101
PCB 91
PCB 92
PCB 93
PCB 94
PCB 95
PCB 96
PCB 97
PCB 98
PCB 99

Solids (Organic)
Polycyclic Aromatic Hydrocarbons (PAH) - Soil (064)
MSOP 143; based on EPA 8270/3540

GC/MS - EXTRACTION	RDL Range
1,3-Dimethylnaphthalene	
1,3-Methylnaphthalene	
2-Methylanthracene	
2-Methylnaphthalene	
3-Methylcholanthrene	
Acenaphthene	.01 - .05 µg/g
Acenaphthylene	.01 - .05 µg/g
Anthracene	.01 - .05 µg/g
Benzo (a) anthracene	.01 - .05 µg/g
Benzo (a) pyrene	.01 - .05 µg/g
Benzo (b) fluoranthene	.01 - .05 µg/g
Benzo (g,h,i) perylene	.01 - .05 µg/g
Benzo (k) fluoranthene	.01 - .05 µg/g
Carbazole	
Chrysene	.01 - .05 µg/g
Dibenzo (a,h) anthracene	.01 - .05 µg/g
Dibenzofuran	
Fluoranthene	.01 - .05 µg/g
Fluorene	.01 - .05 µg/g
Indeno (1,2,3 - cd) pyrene	.01 - .05 µg/g
Naphthalene	.01 - .05 µg/g
Phenanthrene	.01 - .05 µg/g
Pyrene	.01 - .05 µg/g
Quinoline	

Solids (Organic)
Total PCBs - Soil (097)
MSOP 7; based on EPA 3550/8082

GC/ECD - EXTRACTION	RDL Range
Total PCB	.05 - .25 µg/g

Solids (Organic)
Volatile Organic Compounds (VOC) - Soil (167)
MSOP 50; based on EPA 5021/8260

GC/MS - HEADSPACE/EXTRACTION	RDL Range
1,1-Dichloroethane	.01 - .05 µg/g
1,1-dichloroethylene	.01 - .05 µg/g
1,1,1-Trichloroethane	.01 - .05 µg/g
1,1,2-Trichloroethane	.01 - .05 µg/g
1,1,2,2-Tetrachloroethane	.1 - .5 µg/g

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1,2-dichlorobenzene	.01 - .05 µg/g
1,2-dichloroethane	.01 - .05 µg/g
1,2-Dichloropropane	.01 - .05 µg/g
1,2,3-Trichloropropane	
1,3-Dichlorobenzene	.01 - .05 µg/g
1,4-dichlorobenzene	.01 - .05 µg/g
2-Hexanone	
Acetone (2-Propanone)	1 - 5 µg/g
Acrylonitrile	
Benzene	.01 - .05 µg/g
Bromodichloromethane	.01 - .05 µg/g
Bromoform	.01 - .05 µg/g
Bromomethane	
Carbon Disulphide	
Carbon Tetrachloride	.01 - .05 µg/g
Chlorobenzene	.01 - .05 µg/g
Chlorodibromomethane	.01 - .05 µg/g
Chloroethane	
Chloroform	.01 - .05 µg/g
Chloromethane	
cis-1,3-Dichloropropene	.01 - .05 µg/g
cis-1,4-Dichloro-2-Butene	
Dichlorodifluoromethane	
Dichloromethane	.01 - .05 µg/g
Ethyl Alcohol	
Ethyl Methacrylate	
Ethylbenzene	.01 - .05 µg/g
Ethylene Dibromide	.01 - .05 µg/g
m/p-xylene	.01 - .05 µg/g
Methyl Ethyl Ketone	1 - 5 µg/g
Methyl Iodide	
Methyl isobutyl Ketone	.1 - .5 µg/g
o-xylene	.01 - .05 µg/g
Styrene	.01 - .05 µg/g
Tetrachloroethylene	.01 - .05 µg/g
Toluene	.01 - .05 µg/g
trans-1,2-Dichloroethylene	.01 - .05 µg/g
trans-1,3-Dichloropropene	.01 - .05 µg/g
Trans-1,4-Dichloro-2-Butene	
Trichloroethylene	.01 - .05 µg/g
Trichlorofluoromethane	.01 - .05 µg/g
Vinyl Chloride	.1 - .5 µg/g

Tissue (Inorganic)
Mercury - Biological (054)
ISOP 52/ISOP 12; based on SM 2711/1599

COLD VAPOR AA - DIGESTION	RDL Range
Mercury	

Tissue (Inorganic)
Metals - Biological (060)
ISOP 77/ISOP 96; based on EPA 3051/200.8

ICP/MS - DIGEST	RDL Range
Aluminum	
Antimony	

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Arsenic
Barium
Beryllium
Cadmium
Calcium
Chromium
Cobalt
Copper
Iron
Lead
Lithium
Magnesium
Manganese
Mercury
Molybdenum
Nickel
Potassium
Selenium
Silver
Sodium
Strontium
Thallium
Uranium
Vanadium
Zinc

Tissue (Organic)
Dioxins/Furans (PCDD/PCDF) - Biological (086)
UTCSOP18; based on EPA 1613, EPS 1/RM/19

HRGC/HRMS - EXTRACTION	RDL Range
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,4,7,8-Hexachlorodibenzofuran	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,6,7,8-Hexachlorodibenzofuran	
1,2,3,7,8-Pentachlorodibenzofuran	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	
1,2,3,7,8,9-Hexachlorodibenzofuran	
2,3,4,6,7,8-Hexachlorodibenzofuran	
2,3,4,7,8-Pentachlorodibenzofuran	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	
2,3,7,8-Tetrachlorodibenzofuran	
Heptachlorodibenzo-p-dioxins (Total)	
Heptachlorodibenzofurans (Total)	
Hexachlorodibenzo-p-dioxins (Total)	
Hexachlorodibenzofurans (Total)	
Octachlorodibenzo-p-dioxin	
Octachlorodibenzofuran	
Pentachlorodibenzo-p-dioxins (Total)	
Pentachlorodibenzofurans (Total)	
Tetrachlorodibenzo-p-dioxins (Total)	
Tetrachlorodibenzofurans (Total)	

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Tissue (Organic)
Polychlorinated Biphenyls (PCB) - Biological (089)
UTCSOP18; based on EPA 1668A

HRGC/HRMS - EXTRACTION	RDL Range
PCB 1	
PCB 100	
PCB 102	
PCB 103	
PCB 104	
PCB 105	
PCB 106	
PCB 108/86/125	
PCB 11	
PCB 110	
PCB 111/117	
PCB 112	
PCB 113	
PCB 114	
PCB 115	
PCB 116	
PCB 118	
PCB 12	
PCB 120	
PCB 122	
PCB 123/107/109	
PCB 124	
PCB 126	
PCB 127	
PCB 128/162	
PCB 13	
PCB 130	
PCB 131/142/133	
PCB 132	
PCB 134	
PCB 135	
PCB 136	
PCB 137	
PCB 138	
PCB 139/143	
PCB 14	
PCB 140	
PCB 141	
PCB 144	
PCB 145	
PCB 146	
PCB 147/149	
PCB 148	
PCB 15	
PCB 150	
PCB 151	
PCB 152	
PCB 153/168	
PCB 154	
PCB 155	
PCB 156	

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PCB 157
PCB 159
PCB 16
PCB 160/163
PCB 161
PCB 164
PCB 165
PCB 166
PCB 167
PCB 169
PCB 17
PCB 170
PCB 171
PCB 172
PCB 173
PCB 174
PCB 175/182
PCB 176
PCB 177
PCB 178
PCB 179
PCB 18
PCB 180
PCB 181
PCB 183
PCB 184
PCB 185
PCB 186
PCB 187
PCB 188
PCB 189
PCB 19
PCB 190
PCB 191
PCB 192
PCB 193
PCB 194
PCB 195
PCB 197
PCB 198
PCB 199
PCB 2
PCB 200
PCB 201/204
PCB 202
PCB 205
PCB 206
PCB 208
PCB 209
PCB 21/20/23
PCB 22
PCB 23
PCB 24
PCB 25
PCB 26
PCB 27
PCB 28

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PCB 29
PCB 3
PCB 30
PCB 31
PCB 32
PCB 34
PCB 35
PCB 36
PCB 37
PCB 38
PCB 39
PCB 4/10
PCB 40/68
PCB 41
PCB 43/52
PCB 44
PCB 45
PCB 46
PCB 47
PCB 48/49
PCB 5
PCB 50
PCB 51
PCB 52
PCB 53
PCB 54
PCB 55
PCB 56
PCB 57
PCB 58/67
PCB 59/42
PCB 6
PCB 60
PCB 61
PCB 63/76
PCB 64
PCB 66
PCB 69
PCB 7
PCB 70
PCB 71
PCB 72
PCB 73
PCB 74
PCB 75/65/62
PCB 77
PCB 78
PCB 79
PCB 8
PCB 80
PCB 81
PCB 82
PCB 83/119
PCB 84/89
PCB 85
PCB 87
PCB 88/121

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PCB 9
PCB 90/101
PCB 91
PCB 92
PCB 93
PCB 94
PCB 95
PCB 96
PCB 97
PCB 98
PCB 99

Waste
BTEX - TCLP Leachate - Waste (135)
ISOP74, MSOP142; based on EPA 1311, EPA 8260 B

GC/MS - TCLP	RDL Range
Benzene	
Ethylbenzene	
m/p - xylene	
o-xylene	
Toluene	

Waste
Flashpoint - Waste (055)
ISOP 48; ASTM 93-D

PENSKE-MARTEN CLOSED CUP	RDL Range
Flashpoint	

Waste
Metals - TCLP Leachate - Waste (141)
ISOP 74, ISOP 96; based on EPA 1311, EPA 6020

ICP/MS - TCLP	RDL Range
Antimony	
Arsenic	
Barium	
Beryllium	
Boron	
Cadmium	
Chromium	
Cobalt	
Copper	
Iron	
Lead	
Nickel	
Selenium	
Silver	
Thallium	
Uranium	
Vanadium	
Zinc	
Zirconium	

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Waste (Inorganic)
Mercury - TCLP - Waste (162)
ISOP 74/ISOP12; based on EPA 1311/SM 3112 B

COLD VAPOUR AA - DIGESTION - TCLP	RDL Range
Mercury	

Waste (Inorganic)
Specific Gravity - Waste (174)
ISOP 114; based on SM 2710 F

GRAVIMETRIC	RDL Range
Specific Gravity	

Water (Inorganic)
Alkalinity - Water (004)
ISOP 117; based on SM 2320 B

TITRIMETRIC	RDL Range
Alkalinity (pH 4.5)	5 - 25 mg/L

Water (Inorganic)
Ammonia - Water (178)
ISOP70; APHA 4500 NH3

COLORIMETRIC	RDL Range
Ammonia	

Water (Inorganic)
Anions - Water (005)
NATM 1001; based on SM 4110 B

ION CHROMATOGRAPHY	RDL Range
Bromide	.1 - .5 mg/L
Chloride	.5 - 2.5 mg/L
Fluoride	
Nitrate	.05 - .25 mg/L
Nitrite	.05 - .25 mg/L
Sulfate	.5 - 2.5 mg/L

Water (Inorganic)
Biochemical Oxygen Demand (BOD) - Water (013)
ISOP 28/ISOP135; based on SM 5210B

D.O. METER	RDL Range
BOD (5 day)	
BODu (ultimate)	

Water (Inorganic)
Carbon - Water (118)
ISOP 6; based on SM 5310 B

IR - COMBUSTION	RDL Range
Dissolved Inorganic Carbon (DIC)	
DOC	1 - 5 mg/L
Total Carbon (TC)	
Total Inorganic Carbon (TIC)	
Total Organic Carbon (TOC)	

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Water (Inorganic)
Chemical Oxygen Demand (COD) - Water (051)
ISOP 30; based on SM 5220 D

COLORIMETRIC - DIGESTION	RDL Range
COD	5 - 25 mg/L

Water (Inorganic)
Chlorine - Water (123)
ISOP134; based on SM 4500 CL-A,F,G

COLORIMETRIC	RDL Range
Chlorine, Free Residual Chlorine	.1 - .5 mg/L

Water (Inorganic)
Colour - Water (152)
ISOP 137; based on SM 2120 A, C

SPECTROPHOTOMETRIC	RDL Range
Colour	

Water (Inorganic)
Conductivity - Water (006)
ISOP-117; based on SM 2510 B

CONDUCTIVITY METER	RDL Range
Conductivity (25°C)	.1 - .5 µs/cm

Water (Inorganic)
Disinfection By-Products - Water (056)
ISOP 24; based on EPA 300.B

ION CHROMATOGRAPHY	RDL Range
Bromate	
Chlorate	
Chlorite	

Water (Inorganic)
Dissolved and Extractable Metals - Water (083)
ISOP 26/ISOP 100; based on SM 3120B

ICP	RDL Range
Calcium	.5 - 2.5 mg/L
Iron	.005 - .025 mg/L
Magnesium	.1 - .5 mg/L
Manganese	.001 - .005 mg/L
Potassium	.1 - .5 mg/L
Sodium	1 - 5 mg/L

Water (Inorganic)
Dissolved Metals - Water (111)
ISOP 122; based on APHA 3113 B

AA GRAPHITE - FILTRATION	RDL Range
Chromium	.0001 - .0005 mg/L

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Water (Inorganic)
Dissolved Metals - Water (007)
ISOP 96; based on EPA 6020

ICP/MS	RDL Range
Aluminum	.01 - .05 mg/L
Antimony	
Arsenic	
Barium	.0001 - .0005 mg/L
Beryllium	.0005 - .0025 mg/L
Bismuth	
Boron	.001 - .005 mg/L
Cadmium	.0001 - .0005 mg/L
Chromium	.0001 - .0005 mg/L
Cobalt	.0001 - .0005 mg/L
Copper	.0005 - .0025 mg/L
Lead	.0001 - .0005 mg/L
Lithium	
Mercury	
Molybdenum	.0001 - .0005 mg/L
Nickel	.0001 - .0005 mg/L
Selenium	
Silver	.0001 - .0005 mg/L
Strontium	.0001 - .0005 mg/L
Thallium	.00005 - .00025 mg/L
Tin	.0001 - .0005 mg/L
Vanadium	.0001 - .0005 mg/L
Zinc	.001 - .005 mg/L

Water (Inorganic)
Fluoride - Water (008)
ISOP 117; based on SM 4500-F,C

SELECTIVE ION ELECTRODE	RDL Range
Fluoride	.05 - .25 mg/L

Water (Inorganic)
Hexavalent Chromium- Water (035)
ISOP 108; based on SM 3500-CR,C

ION CHROMATOGRAPHY	RDL Range
Chromium (Hexavalent)	

Water (Inorganic)
Hydride Metals - Water (036)
ISOP 51/ISOP 53; based on SM 3114 C

HYDRIDE AA - DIGESTION	RDL Range
Antimony	.1 - .5 µg/L
Arsenic	.1 - .5 µg/L
Selenium	.1 - .5 µg/L

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Water (Inorganic)
Mercury - Water (149)
ISOP 151; based on EPA 245.7

COLD VAPOUR AA, COLD OXIDATION	RDL Range
Mercury	.01 - .05 µg/L

Water (Inorganic)
Metals (Ultra Trace) - Water (061)
ISOP 96; based on EPA 6020

ICP/MS	RDL Range
Calcium	
Dissolved Aluminum	
Dissolved Barium	
Dissolved Beryllium	
Dissolved Boron	
Dissolved Cadmium	
Dissolved Chromium	
Dissolved Cobalt	
Dissolved Copper	
Dissolved Iron	
Dissolved Lead	
Dissolved Manganese	
Dissolved Molybdenum	
Dissolved Nickel	
Dissolved Silver	
Dissolved Thallium	
Dissolved Tin	
Dissolved Vanadium	
Dissolved Zinc	
Magnesium	
Mercury	
Potassium	
Sodium	
Strontium	
Total Antimony	
Total Arsenic	
Total Selenium	
Uranium	

Water (Inorganic)
Microtox - Water (161)
ISOP 157; based on WCMUC (1991)

BIOLUMINESCENCE	RDL Range
Microtox IC50 (15 min)	

Water (Inorganic)
Nitrate/Nitrite - Water (057)
ISOP 130; based on SM 4500-NO2,B / SM 4500-NO3,H

COLORIMETRIC	RDL Range
Nitrate plus Nitrite	.1 - .5 mg/L
Nitrite	.05 - .25 mg/L

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Water (Inorganic)
Oil and Grease - Water (038)
ISOP 14; based on SM 5520 A,B,F

GRAVIMETRIC	RDL Range
Total Oil and Grease	1 - 5 mg/L

Water (Inorganic)
Oil and Grease - Water (059)
ISOP 41; based on EPA 1664, SM 5520

GRAVIMETRIC	RDL Range
Total Oil and Grease	1 - 5 mg/L

Water (Inorganic)
Oil and Grease - Water (159)
ISOP 83; based on SM 5520 C, F

INFRA-RED	RDL Range
Hydrocarbon Oil and Grease	
Total Oil and Grease	

Water (Inorganic)
pH - Water (015)
ISOP 117; based on SM 4500-H,B

pH METER	RDL Range
pH	

Water (Inorganic)
Phenols - Water (146)
ISOP149; based on ALBERTA ENVIRONMENT 154

COLORIMETRIC	RDL Range
Total Phenolics	.001 - .005 mg/L

Water (Inorganic)
Phosphate - Water (084)
ISOP 128; based on SM 4500-P

COLORIMETRIC	RDL Range
Phosphate	.01 - .05 mg/L

Water (Inorganic)
Phosphorus - Water (011)
ISOP 128; based on SM 4500-P,B,E

COLORIMETRIC - DIGESTION	RDL Range
Total Dissolved Phosphorus	
Total Phosphorus	.01 - .05 mg/L

Water (Inorganic)
Phosphorus - Water (119)
ISOP93, ISOP 128; based on SM 4500-P B, E

COLORIMETRIC	RDL Range
Inorganic Phosphorus	

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Water (Inorganic)
Solids - Water (012)
ISOP 21; based on SM 2540 A,B,C,D,E

GRAVIMETRIC	RDL Range
Fixed Suspended Solids	
Total Dissolved Solids	5 - 25 mg/L
Total Suspended Solids	1 - 5 mg/L

Water (Inorganic)
Speciated Arsenic/Selenium - Water (151)
ISOP 148; IN-HOUSE

IC-ICP-MS	RDL Range
Arsenic +3	
Arsenic +5	
Selenium +4	
Selenium +6	

Water (Inorganic)
Sulfide - Water (033)
ISOP 2; based on SM 4500-S2 A, D,E

COLORIMETRIC	RDL Range
Sulfide	

Water (Inorganic)
Total Kjeldahl Nitrogen (TKN) - Water (010)
ISOP 79; based on AB ENVIR. 235

COLORIMETRIC - DIGESTION	RDL Range
Dissolved Kjeldahl Nitrogen	
Total Kjeldahl Nitrogen	.1 - .5 mg/L

Water (Inorganic)
Total Metals - Water (115)
ISOP 7/ISOP 122; based on APHA 3113 B

AA GRAPHITE - FILTRATION	RDL Range
Chromium	.0005 - .0025 mg/L

Water (Inorganic)
Total Metals - Water (081)
ISOP 7/ISOP 100; based on EPA 3015/6010

ICP - DIGESTION	RDL Range
Calcium	.5 - 2.5 mg/L
Iron	.005 - .025 mg/L
Magnesium	.1 - .5 mg/L
Manganese	.001 - .005 mg/L
Potassium	.1 - .5 mg/L
Silicon	
Sodium	1 - 5 mg/L
Sulfur	

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Water (Inorganic)
Total Metals - Water (082)
ISOP 7/ISOP 96; based on EPA 3015/6020

ICP/MS - DIGESTION	RDL Range
Aluminum	.01 - .05 mg/L
Antimony	
Arsenic	
Barium	.001 - .005 mg/L
Beryllium	
Bismuth	
Boron	.05 - .25 mg/L
Cadmium	
Chromium	.005 - .025 mg/L
Cobalt	.001 - .005 mg/L
Copper	.001 - .005 mg/L
Lead	.005 - .025 mg/L
Lithium	
Molybdenum	.005 - .025 mg/L
Nickel	.001 - .005 mg/L
Selenium	
Silver	
Strontium	.001 - .005 mg/L
Thallium	.05 - .25 mg/L
Tin	
Uranium	
Vanadium	.001 - .005 mg/L
Zinc	.001 - .005 mg/L

Water (Inorganic)
Turbidity - Water (078)
ISOP 38; based on SM 2130 A,B

TURBIDIMETRIC	RDL Range
Turbidity	.1 - .5 NTU

Water (Organic)
Base Neutral Extractables - Water (117)
MSOP 161; based on EPA 3510/8270

GC/MS - EXTRACTION	RDL Range
1,2,3-Trichlorobenzene	
1,2,4-Trichlorobenzene	
2-Chloronaphthalene	
2,4-Dinitrotoluene	
2,6-Dinitrotoluene	
Hexachlorobenzene	
Hexachlorobutadiene	
Hexachlorocyclopentadiene	
Hexachloroethane	
Pentachlorobenzene	

Water (Organic)
Chlorophenols - Water (019)
MSOP 42; based on EPA 1653 AND ALBERTA ENVIRONMENT 130.0

GC/MS - EXTRACTION	RDL Range
2-Chlorophenol	
2-Chlorosyringaldehyde	

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2,4,5-Trichlorophenol
2,6-Dichlorophenol
2,6-Dichlorosyringaldehyde
3,4-Dichlorocatechol
3,4-Dichloroguaiacol
3,4,5-Trichlorocatechol
3,4,5-Trichloroguaiacol
3,4,5-Trichloroveratrole
3,4,6-Trichlorocatechol
3,4,6-Trichloroguaiacol
3,5-Dichlorocatechol
3,6-Dichlorocatechol
4-Chlorocatechol
4-Chloroguaiacol
4-Chlorophenol
4,5-Dichlorocatechol
4,5-Dichloroguaiacol
4,5-Dichloroveratrole
4,5,6-Trichloroguaiacol
4,5,6-Trichlorosyringol
4,6-Dichloroguaiacol
5-Chlorovanillin
5,6-Dichlorovanillin
6-Chlorovanillin
Tetrachlorocatechol
Tetrachloroguaiacol
Tetrachloroveratrole
Trichlorotrimethoxybenzene

Water (Organic)
Dioxins and Furans (PCDD/PCDF) - Water (049)
UTCSOP 17; based on EPA 1613, EPS 1/RM/19

GC/HRMS - EXTRACTION	RDL Range
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,4,7,8-Hexachlorodibenzofuran	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,6,7,8-Hexachlorodibenzofuran	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	
1,2,3,7,8-Pentachlorodibenzofuran	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	
1,2,3,7,8,9-Hexachlorodibenzofuran	
2,3,4,6,7,8-Hexachlorodibenzofuran	
2,3,4,7,8-Pentachlorodibenzofuran	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	
2,3,7,8-Tetrachlorodibenzofuran	
Heptachlorodibenzo-p-dioxins (Total)	
Heptachlorodibenzofurans (Total)	
Hexachlorodibenzo-p-dioxins (Total)	
Hexachlorodibenzofurans (Total)	
Octachlorodibenzo-p-dioxin	
Octachlorodibenzofuran	
Pentachlorodibenzo-p-dioxins (Total)	
Pentachlorodibenzofurans (Total)	

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Tetrachlorodibenzo-p-dioxins (Total)
Tetrachlorodibenzofurans (Total)

Water (Organic)
Extractable Petroleum Hydrocarbons (EPH) - Water (108)
MSOP 125; based on BC MELP EPH IN WATER BY GC/FID

GC/FID - EXTRACTION	RDL Range
EPH 10-19	
EPH 19-32	

Water (Organic)
Formaldehyde - Water (116)
MSOP47; based on ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 1989, 23:838-847

GC/MS - EXTRACTION	RDL Range
Formaldehyde	

Water (Organic)
Organometallics - Water (150)
ISOP 153; IN-HOUSE

GC-ICP-MS	RDL Range
Tetraethyl lead	
Tributyl tin	

Water (Organic)
Pesticides - Water (066)
PSOP 101; based on EPA 8151 - GC/MS

GC/MS - EXTRACTION/DERIV	RDL Range
2,4-dichlorophenoxyacetic acid	.1 - .5 µg/L
2,4,5-trichlorophenoxyacetic acid	1 - 5 µg/L
Bromoxynil	1 - 5 µg/L
Dicamba	.1 - .5 µg/L
Diclofop-methyl (as free acid)	.1 - .5 µg/L
Dinoseb	1 - 5 µg/L
Picloram	.1 - .5 µg/L

Water (Organic)
Petroleum Hydrocarbons (PHC) - Water (074)
MSOP 142; based on EPA 5030/8015

GC/FID - PURGE AND TRAP	RDL Range
F1: C6-C10	

Water (Organic)
Petroleum Hydrocarbons (PHC) - Water (075)
MSOP 141; based on EPA 3510/8015

GC/FID - EXTRACTION	RDL Range
F2: C10-C16	
F3: C16-C34	
F4: C34-C50	

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Water (Organic)
Petroleum Hydrocarbons (PHC) - Water (165)
NA-TM-1103; based on EPA 5021/8260

GC/FID - HEADSPACE	RDL Range
F1: C6-C10	

Water (Organic)
Phenols - Water (076)
MSOP71; based on EPA 8270/3510

GC/MS - EXTRACTION	RDL Range
2-Chlorophenol	
2-Methylphenol (o-Cresol)	
2-Nitrophenol	
2,3-Dichlorophenol	
2,3,4-Trichlorophenol	
2,3,4,5-Tetrachlorophenol	
2,3,4,6-tetrachlorophenol	.5 - 2.5 µg/L
2,3,5-Trichlorophenol	
2,3,5,6-Tetrachlorophenol	
2,3,6-Trichlorophenol	
2,4 & 2,5-Dichlorophenol	
2,4-Dimethylphenol	
2,4-Dinitrophenol	
2,4,5-Trichlorophenol	
2,4,6-trichlorophenol	.5 - 2.5 µg/L
2,6-Dichlorophenol	
3-Chlorophenol	
3-Methylphenol (m-Cresol)	
3,4-Dichlorophenol	
3,4,5-Trichlorophenol	
3,5-Dichlorophenol	
4-Chloro-3-methylphenol	
4-Chlorophenol	
4-Methylphenol (p-Cresol)	
4-Nitrophenol	
4,6-Dinitro-2-methylphenol	
Pentachlorophenol	.5 - 2.5 µg/L
Phenol	

Water (Organic)
Polychlorinated Biphenyls (PCB) - Water (087)
UTCSOP17; based on EPA 1668 A

HRGC/HRMS - EXTRACTION	RDL Range
PCB 1	
PCB 100	
PCB 102	
PCB 103	
PCB 104	
PCB 105	
PCB 106	
PCB 108/86/125	
PCB 11	
PCB 110	
PCB 111/117	
PCB 112	
PCB 113	

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PCB 114
PCB 115
PCB 116
PCB 118
PCB 12
PCB 120
PCB 122
PCB 123/107/109
PCB 124
PCB 126
PCB 127
PCB 128/162
PCB 13
PCB 130
PCB 131/142/133
PCB 132
PCB 134
PCB 135
PCB 136
PCB 137
PCB 138
PCB 139/143
PCB 14
PCB 140
PCB 141
PCB 144
PCB 145
PCB 146
PCB 147/149
PCB 148
PCB 15
PCB 150
PCB 151
PCB 152
PCB 153/168
PCB 154
PCB 155
PCB 156
PCB 157
PCB 158/129
PCB 159
PCB 16
PCB 160/163
PCB 161
PCB 164
PCB 165
PCB 166
PCB 167
PCB 168
PCB 169
PCB 17
PCB 170
PCB 171
PCB 172
PCB 173
PCB 174
PCB 175/182

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PCB 176
PCB 177
PCB 178
PCB 179
PCB 18
PCB 180
PCB 181
PCB 183
PCB 184
PCB 185
PCB 186
PCB 187
PCB 188
PCB 189
PCB 19
PCB 190
PCB 191
PCB 192
PCB 193
PCB 194
PCB 195
PCB 197
PCB 198
PCB 199
PCB 2
PCB 200
PCB 201/204
PCB 202
PCB 203/196
PCB 205
PCB 206
PCB 207
PCB 208
PCB 209
PCB 21/20/23
PCB 22
PCB 23
PCB 24
PCB 25
PCB 26
PCB 27
PCB 28
PCB 29
PCB 3
PCB 30
PCB 31
PCB 32
PCB 34
PCB 35
PCB 36
PCB 37
PCB 38
PCB 39
PCB 4/10
PCB 40/68
PCB 41
PCB 43/52

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PCB 44
PCB 45
PCB 46
PCB 47
PCB 48/49
PCB 5
PCB 50
PCB 51
PCB 53
PCB 54
PCB 55
PCB 56
PCB 57
PCB 58/67
PCB 59/42
PCB 6
PCB 60
PCB 61
PCB 63/76
PCB 64
PCB 66
PCB 69
PCB 7
PCB 70
PCB 71
PCB 72
PCB 73
PCB 74
PCB 75/65/62
PCB 77
PCB 78
PCB 79
PCB 8
PCB 80
PCB 81
PCB 82
PCB 83/119
PCB 84/89
PCB 85
PCB 87
PCB 88/121
PCB 9
PCB 90/101
PCB 91
PCB 92
PCB 93
PCB 94
PCB 95
PCB 96
PCB 97
PCB 98
PCB 99

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Water (Organic)
Polycyclic Aromatic Hydrocarbons (PAH) - Water (003)
MSOP 5; based on EPA 8270/3510

GC/MS - EXTRACTION	RDL Range
1-Methylnaphthalene	
1,3-Dimethylnaphthalene	
2-Methylanthracene	
2-Methylnaphthalene	
3-Methylcholanthrene	
Acenaphthene	.01 - .05 µg/L
Acenaphthylene	.01 - .05 µg/L
Anthracene	.01 - .05 µg/L
Benzo (a) anthracene	.01 - .05 µg/L
Benzo (a) pyrene	.01 - .05 µg/L
Benzo (b) fluoranthene	.01 - .05 µg/L
Benzo (g,h,i) perylene	.01 - .05 µg/L
Benzo (k) fluoranthene	.01 - .05 µg/L
Carbazole	
Chrysene	.01 - .05 µg/L
Dibenzo (a,h) anthracene	.01 - .05 µg/L
Dibenzofuran	
Fluoranthene	.01 - .05 µg/L
Fluorene	.01 - .05 µg/L
Indeno (1,2,3 - cd) pyrene	.01 - .05 µg/L
Naphthalene	.01 - .05 µg/L
Phenanthrene	.01 - .05 µg/L
Pyrene	.01 - .05 µg/L

Water (Organic)
Resin and Fatty Acids - Water (020)
MSOP 26; based on ALBERTA ENVIRONMENT 129.0

GC/MS - EXTRACTION	RDL Range
12-Chlorodehydroabietic Acid	
12,14-Dichlorodehydroabietic Acid	
14-Chlorodehydroabietic Acid	
9,10-Dichlorostearic Acid	
Abietic Acid	
Arachidic Acid	
Dehydroabietic Acid	
Isopimaric Acid	
Levopimaric Acid	
Linoleic Acid	
Linolenic Acid	
Myristic Acid	
Neoabietic Acid	
Oleic Acid	
Palmitic Acid	
Palustric Acid	
Pimaric Acid	
Sandaracopimaric Acid	
Stearic Acid	

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Water (Organic)
Resin and Fatty Acids - Water (132)
MSOP26; ALBERTA ENVIRONMENT 129.0

GC/MS - EXTRACTION (RFA-Low ED)	RDL Range
12-Chlorodehydroabietic acid	
12,14-Dichlorodehydroabietic acid	
14-Chlorodehydroabietic acid	
9,10-Dichlorostearic acid	
Abietic acid	
Arachidic acid	
Dehydroabietic Acid	
Isopimaric acid	
Levopimaric acid	
Linoleic Acid	
Linolenic Acid	
Myristic acid	
Neoabietic acid	
Oleic Acid	
Palmitic Acid	
Palustric acid	
Pimaric acid	
Sandaracopimaric acid	
Stearic Acid	

Water (Organic)
Total PCBs - Water (096)
MSOP4; based on EPA 3510/8082

GC/ECD - EXTRACTION	RDL Range
Total PCB	.05 - .25 µg/L

Water (Organic)
Volatile Organic Compounds (VOC) - Water (009)
MSOP 12; based on EPA 8240/5030

GC/MS - PURGE AND TRAP		RDL Range
1,1-Dichloroethane		1 - 5 µg/L
1,1-dichloroethylene		1 - 5 µg/L
1,1,1-Trichloroethane		1 - 5 µg/L
1,1,2-Trichloroethane		1 - 5 µg/L
1,1,2,2-Tetrachloroethane		10 - 50 µg/L
1,2-dichlorobenzene		1 - 5 µg/L
1,2-dichloroethane		1 - 5 µg/L
1,2-Dichloropropane		1 - 5 µg/L
1,2,3-Trichloropropane		
1,3-Dichlorobenzene		1 - 5 µg/L
1,4-dichlorobenzene		1 - 5 µg/L
2-Hexanone		
Acetone (2-Propanone)		100 - 500 µg/L
Acrylonitrile		
Benzene		1 - 5 µg/L
Bromodichloromethane		1 - 5 µg/L
Bromoform	(Parameter suspended on 8/20/2009)	1 - 5 µg/L
Bromomethane		
Carbon Disulphide		
Carbon Tetrachloride		1 - 5 µg/L
Chlorobenzene		1 - 5 µg/L
Chlorodibromomethane		1 - 5 µg/L

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Chloroethane	
Chloroform	1 - 5 µg/L
Chloromethane	
cis-1,3-Dichloropropene	1 - 5 µg/L
cis-1,4-Dichloro-2-Butene	
Dibromomethane	
Dichlorodifluoromethane	
Dichloromethane	1 - 5 µg/L
Ethyl Alcohol	
Ethyl Methacrylate	
Ethylbenzene	1 - 5 µg/L
Ethylene Dibromide	1 - 5 µg/L
m/p-xylene	1 - 5 µg/L
Methyl Ethyl Ketone	100 - 500 µg/L
Methyl Iodide	
Methyl isobutyl Ketone	10 - 50 µg/L
o-xylene	1 - 5 µg/L
Styrene	1 - 5 µg/L
Tetrachloroethylene	1 - 5 µg/L
Toluene	1 - 5 µg/L
trans-1,2-Dichloroethylene	1 - 5 µg/L
trans-1,3-Dichloropropene	1 - 5 µg/L
trans-1,4-Dichloro-2-Butene	
Trichloroethylene	1 - 5 µg/L
Trichlorofluoromethane	1 - 5 µg/L
Vinyl Chloride	1 - 5 µg/L

Water (Organic)

Volatile Organic Compounds (VOC) - Water (166)

MSOP 50; based on EPA 5021/8260

GC/MS - HEADSPACE	RDL Range
1,1-Dichloroethane	1 - 5 µg/L
1,1-dichloroethylene	1 - 5 µg/L
1,1,1-Trichloroethane	1 - 5 µg/L
1,1,2-Trichloroethane	1 - 5 µg/L
1,1,2,2-Tetrachloroethane	10 - 50 µg/L
1,2-dichlorobenzene	1 - 5 µg/L
1,2-dichloroethane	1 - 5 µg/L
1,2-Dichloropropane	1 - 5 µg/L
1,2,3-Trichloropropane	
1,3-Dichlorobenzene	1 - 5 µg/L
1,4-dichlorobenzene	1 - 5 µg/L
2-Hexanone	
Acetone (2-Propanone)	100 - 500 µg/L
Acrylonitrile	
Benzene	1 - 5 µg/L
Bromodichloromethane	1 - 5 µg/L
Bromoform	1 - 5 µg/L
Bromomethane	
Carbon Disulphide	
Carbon Tetrachloride	1 - 5 µg/L
Chlorobenzene	1 - 5 µg/L
Chlorodibromomethane	1 - 5 µg/L
Chloroethane	
Chloroform	1 - 5 µg/L
Chloromethane	

† "OSDWA" indicates the appendix is used for the analysis of Ontario drinking water samples, which is subject to the rules and related regulations under the Ontario "Safe Drinking Water Act" (2002).

cis-1,3-Dichloropropene	1 - 5 µg/L
cis-1,4-Dichloro-2-Butene	
Dichlorodifluoromethane	
Dichloromethane	1 - 5 µg/L
Ethyl Alcohol	
Ethyl Methacrylate	
Ethylbenzene	1 - 5 µg/L
Ethylene Dibromide	1 - 5 µg/L
m/p-xylene	1 - 5 µg/L
Methyl Ethyl Ketone	100 - 500 µg/L
Methyl Iodide	
Methyl isobutyl Ketone	10 - 50 µg/L
o-xylene	1 - 5 µg/L
Styrene	1 - 5 µg/L
Tetrachloroethylene	1 - 5 µg/L
Toluene	1 - 5 µg/L
trans-1,2-Dichloroethylene	1 - 5 µg/L
trans-1,3-Dichloropropene	1 - 5 µg/L
Trans-1,4-Dichloro-2-Butene	
Trichloroethylene	1 - 5 µg/L
Trichlorofluoromethane	1 - 5 µg/L
Vinyl Chloride	1 - 5 µg/L

† "OSDWA" indicates the appendix is used for the analysis of Ontario drinking water samples, which is subject to the rules and related regulations under the Ontario "Safe Drinking Water Act" (2002).

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division (Canada)

Statement of Qualifications

Right solutions....
....Right partner

Contents

Company Profile

ALS Environmental (Canada) is one of the largest and most geographically diverse environmental testing companies in Canada. With 16 locations across Canada (from Vancouver to Halifax), ALS can provide you with full analytical support for all your project needs. Our comprehensive range of environmental testing and technical support services is complemented by a solid commitment to quality and customer service.

Laboratory tests are not a commodity. Successful environmental programs require careful integration between environmental managers and knowledgeable laboratory professionals. ALS Environmental Canada employs over 700 professional laboratory and support personnel to ensure work is properly managed and deliverables are met. Our staff are specialists in their fields and are well respected by the various regulatory agencies.

ALS Environmental is a division of the ALS Laboratory Group, which has 70 laboratories operating in 24 countries staffed by over 3,000 employees. ALS provides a broad range of sophisticated, state of the art services to four main market segments; environmental monitoring (ALS Environmental), mining and mineral exploration (ALS Chemex), equipment maintenance through used lubricant analysis (ALS Wearcheck), and commodity analysis & certification. We are part of the long established Australian public company Campbell Brothers Limited that began operations in 1863.

ALS strives to become a world leader in providing high quality yet cost effective analytical testing services. In doing so we support our client's requirements for reliable data from which they make informed decisions that impact their business, human health or our environment.

Laboratory Services & Capabilities

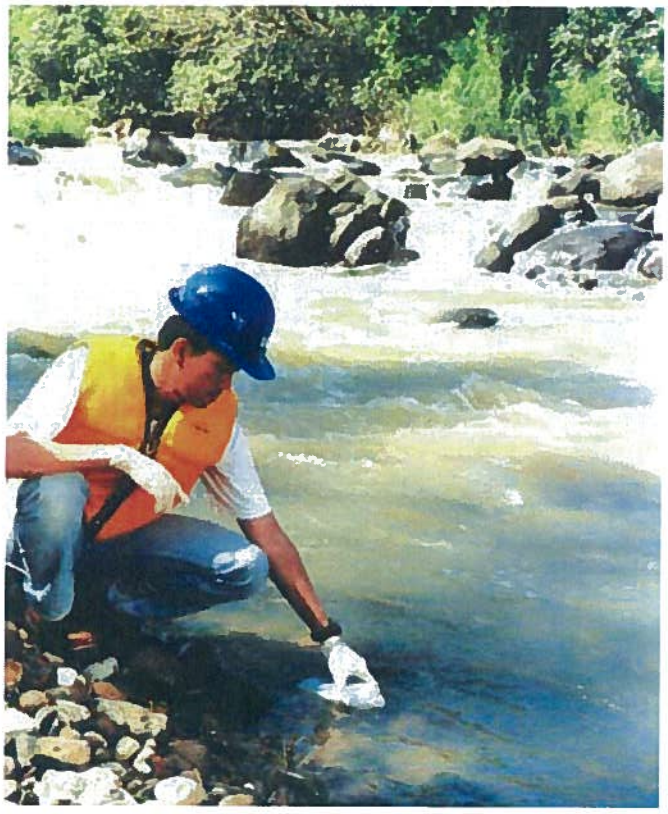
ALS Environmental provides a level of service and quality unparalleled in our industry. Our reputation as a leader in the field of environmental chemistry is based on the commitment to maintain our laboratories at the forefront of analytical technology while also focusing on a "best value" business philosophy. Feedback from our loyal client base confirms that the extra effort required to increase value is indeed appreciated. The following section highlights our diverse scope of analytical services as well as our specialty services that adds value to our clients' projects. From identifying unknown spilled contaminants to determining the cause of toxicological impacts, ALS has the necessary resources. Our experts in chemistry, microbiology, toxicity, industrial hygiene, food safety, industrial processes, quality systems, data management and IT are available to partner with you to solve any number of challenging problems.

Routine Laboratory Services

Few analytical laboratories provide as full a scope of services as ALS Environmental. Our extensive capabilities range from routine high volume parameters through to highly specialized services requiring sophisticated resources and expertise.

Environmental

- Air, soil, tissue, and water analysis to comply with Canadian and most international regulations.
- Environmental effects and operational monitoring analysis.
- Drinking water analysis.
- Occupational hygiene analysis.
- Waste characterization.
- Mobile & on-site laboratory services.



Agricultural

- Soil and tissue analysis for fertility management.
- Water analysis for irrigation, livestock, spray water and domestic consumption.
- Manure and sludge analysis for land application and pesticide residue analysis.
- Soil and plant recommendation software (pcF.A.R.M) and Regional Agronomist Database (R.A.D) software.

Biocontaminants in Indoor Air (Fungi/Moulds)

- Fungi/mould identification.
- Sick building syndrome identification.
- Toxic metabolite identification (e.g. mycotoxins).
- Consultation and workplace evaluation.

Ultra Trace Chemistry Services

- Identification and analysis of Endocrine Disrupting Chemicals (EDCs), such as dioxins/furans, polychlorinated biphenyls, brominated flame retardants and organochlorine compounds in soil, water, air and biological tissue.
- Analysis of air toxics.
- Characterization of complex organic chemicals.
- More than one-hundred years of combined ultra trace chemistry experience.

Forensic Services

- Determination of toxicity effects in livestock, wildlife, birds and pets.
- Poison identification.
- Determination of causes of fish toxicity in industrial effluent.
- Determination of sources of petroleum spills.

Industrial Hygiene Services

- Accredited member of the American Industrial Hygiene Association (AIHA).
- AIHA Certified Industrial Hygienist.
- Identification of troublesome compounds and contaminants.

Limnology & Bioassay Testing Services

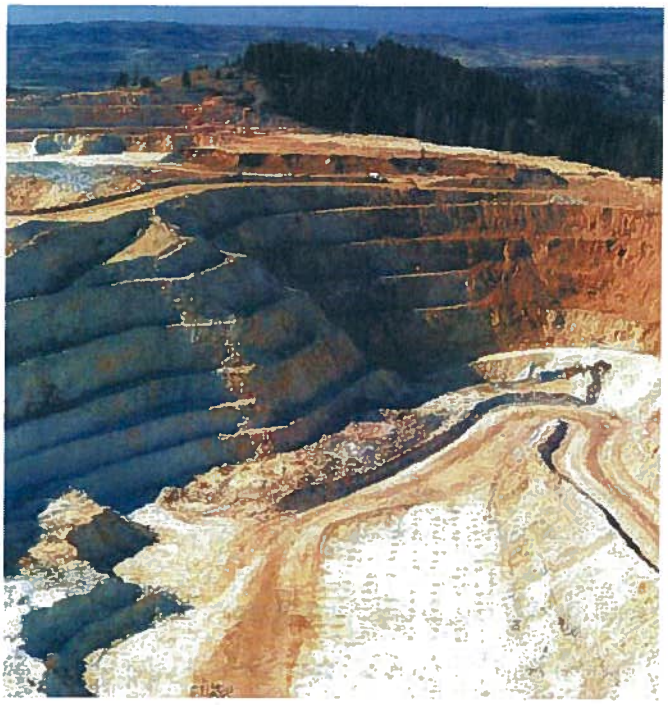
- Phytoplankton and benthic community assessment.
- Acute toxicity testing for rainbow trout, daphnia magna and microtox.
- Blue-green algae and microcystin-LR determination.
- Analysis performed to various taxonomic levels from coast to coast.
- Reference libraries provided with each project.

Microbiology

- Microbiological analyses of food, soil, water, and wastewater.
- Giardia, cryptosporidium and legionella analysis.
- Specific organisms and human pathogens enumerated and identified down to species level.

Mining

- Mineral exploration and mine development testing.
- Baseline environmental effects monitoring.
- Acid base accounting, humidity cell facilities and testing.
- Arsenic, chromium, iron, manganese, mercury and selenium speciation in water and tissue.
- Assessment of toxic metal exposure (fish bile, liver and tissue analysis).

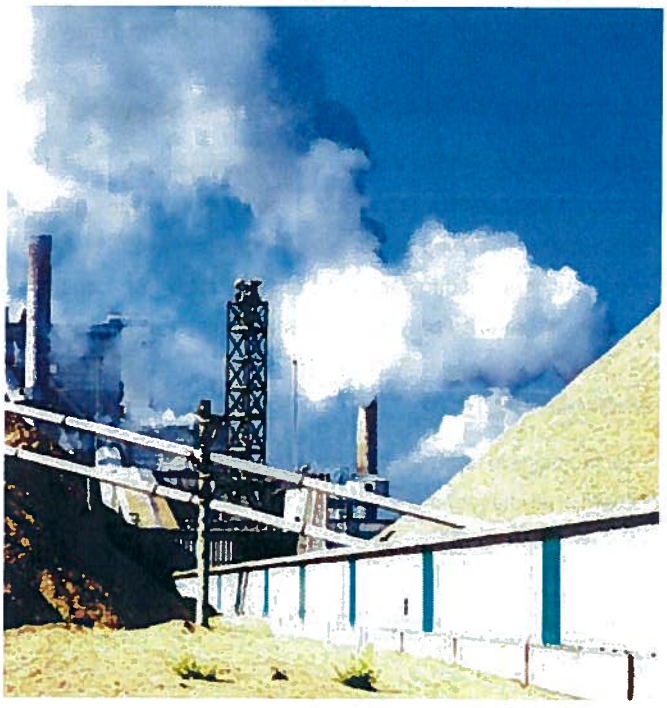


Pesticide Residues

- Analysis of parent compounds and their metabolites.
- Analysis of most pesticides (GLP) in accordance with OECD and EPA Good Laboratory Practice standards.
- Registration of agricultural pesticides in the United States (US EPA) and in Canada (Pesticide Management Regulatory Agency (PMRA)).
- Studies on soil dissipation, crop residues and water.

Pulp & Paper Services

- Comprehensive analytical packages.
- AOX screening.
- Analysis of dioxins/furans, resin and fatty acids, chlorinated phenolics, catechols and guaiacols at low concentrations in a variety of sample matrices.
- Rapid screening methods available for on-site spill response and remediation.



Oil & Gas Services

- Site remediation - upstream and downstream.
- Drilling waste analyses.
- Coal bed methane (CBM)- groundwater analysis.
- Soil vapour analyses.
- Hydrocarbon fingerprinting.

Specialty Services

ALS strives to offer the best value service in the industry by listening to our clients and understanding what service means to them. The following section identifies the services that our client surveys have identified as being unique and of greater value.

Personalized Service

- Our account managers are highly trained and knowledgeable scientists who understand your day to day needs.
- Report formats (electronic and hard copy options) customized to fit your existing IT needs.
- Prompt response to questions and project planning.

Fast Turnaround Times

- Industry leading localized capacity to manage even the largest projects in a timely manner.

Exceptional Quality

- Undertakes more performance testing evaluations in a year than any other laboratory group in Canada – ensures the accuracy of results is continuously monitored and improved.
- Commits CAD $1 million annually to accreditation programs and quality assurance costs.
- ALS volunteers six assessors and lead assessors (CALA and SCC).
- Volunteers numerous Advisory Panel members (CALA, SCC, BCEWQA Steering Committee).

Toxicological Testing & Consulting Services

- Provides toxicity identification evaluations (T.I.E.) and toxicity reduction evaluations (T.R.E.) for industrial processes and wastewaters.
- Environmental toxicologist and certified industrial hygienist on staff.
- Exposure assessment.
- Human health risk and ecological risk assessments.
- Comprehensive library facilities to provide professional interpretations of all analytical results.

Legal Sampling

- Recognized by the Provincial Crown Prosecutor's office in Alberta and Manitoba as the only approved laboratory to accept legal environmental samples in the respective provinces.
- Standard operating procedures written and proven to be defensible in Court.

Seminars & Training

- Client and industry customized seminars and workshops.
- Regulation updates.
- Education on new priority pollutants.

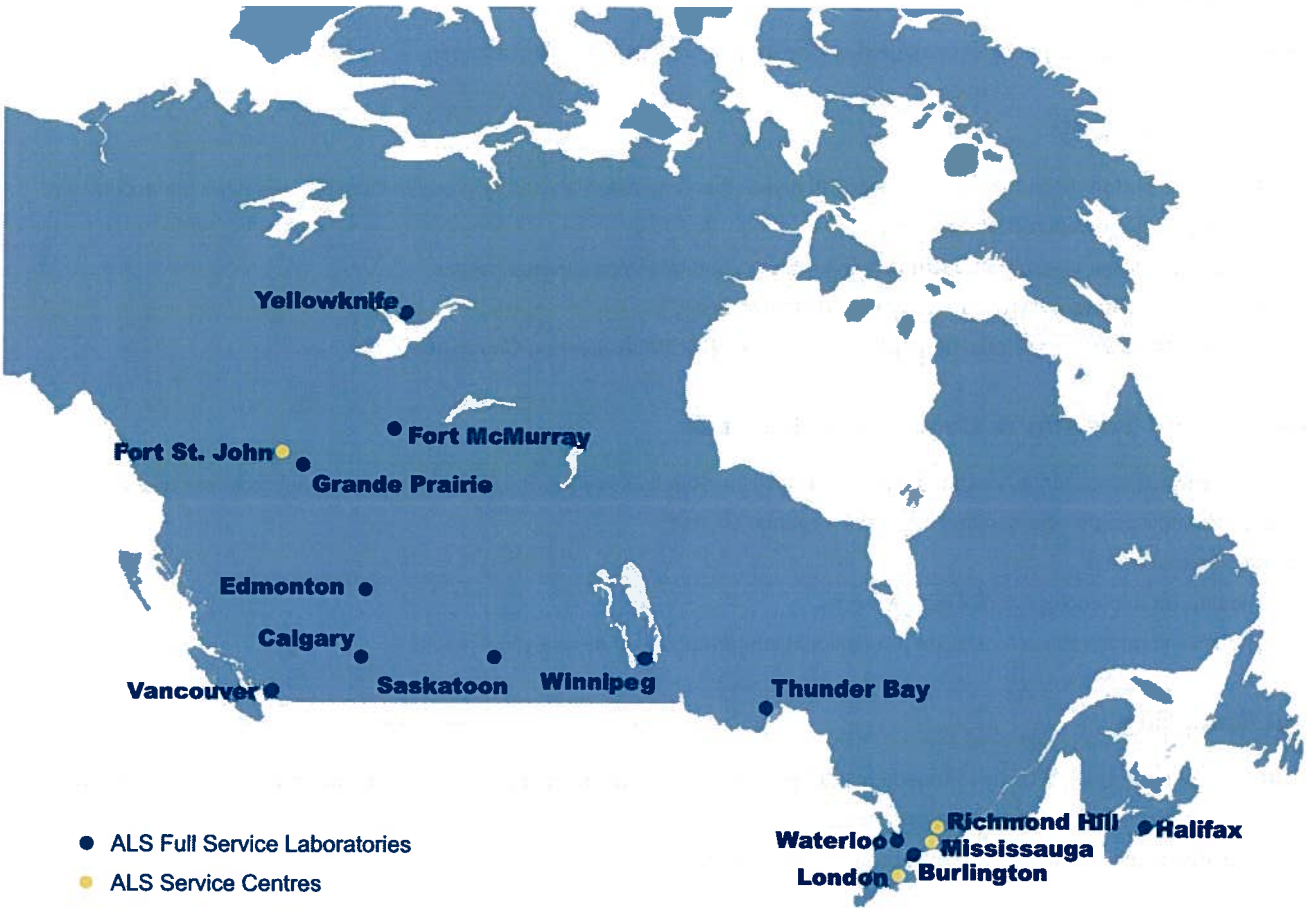
Pesticide Registration Audits

- Pesticide registration studies in accordance to EPA FIFRA Good Laboratory Practice (GLP) Regulations.
- Provision of field and lab GLP-compliance audits by ALS Quality Assurance Unit (QAU).

Laboratory Capabilities

Each laboratory within the ALS network has evolved to meet the needs of the local clientele. The facilities range from large multi-disciplinary laboratories to smaller service centres with limited testing capabilities. This "centres of excellence" approach allows ALS to provide the requisite services while maintaining production efficiencies demanded in today's competitive market.

The following section provides an overview of the services offered regionally within Canada. Further details are included in the Laboratory Capabilities table at the end of this section, which summarizes analytical capabilities by laboratory as well as routine turnaround times for each parameter group. It is important to note that emergency services are also available as and when required. Please contact your laboratory representative for further details.



British Columbia

British Columbia is serviced by a full service laboratory in Vancouver with capabilities in the measurement of organic, inorganic, and physical parameters in air, water, seawater, soils, sediments and solids. The Vancouver facility is dedicated to environmental analysis and has been involved in environmental baseline monitoring projects for the mining and oil and gas industries all over the world since 1982. ALS Fort St. John is a microbiological laboratory and a service centre for our Vancouver and our Alberta labs.

Alberta

ALS provides two full service laboratories in Edmonton and Calgary, as well as two industry specific laboratories in Grande Prairie and Fort McMurray. ALS Edmonton has unique capabilities in the following:

- Ultra trace metal and metals speciation analysis.
- Industrial hygiene.
- Air quality and air toxics.
- Persistent organic pollutant (POP) and endocrine disruptor. chemicals (EDC) analysis.
- Pesticide and herbicide analysis to OECD and EPA GLP standards.

ALS Calgary is a well equipped, high throughput, laboratory servicing the environmental and Oil & Gas markets.

ALS Fort McMurray provides market specific analyses for the upstream energy sector and ALS Grande Prairie provides specific analyses for the forest products sector as well as the upstream energy sector.

Saskatchewan

ALS Saskatoon is a full service agricultural and environmental analytical laboratory. The Agricultural services include water, soil and plant analyses for this industry, whereas the environmental testing services the Oil & Gas, drinking water and wastewater markets.

Manitoba

Manitoba is serviced by a full service laboratory in Winnipeg that provides analyses of inorganic, organic, and biological parameters in water, soil and air samples. Unique capabilities include bioassay (fish and biota) testing, microbiological testing, mould/fungi testing and asbestos testing.

Ontario

Ontario is serviced by one full service laboratory and four specialty laboratories. The Waterloo laboratory is the main service center for ALS Environmental in Ontario with capabilities in trace organics, metals, general chemistry and microbiology. ALS Waterloo is licensed to perform drinking water analyses in Ontario and also supports the various regulatory requirements in Central and Eastern Canada. ALS Burlington is an environmental laboratory focused on the air toxics and the High Resolution Mass Spectrometry (HRMS) markets. The laboratory specializes in the analysis of samples from stack and ambient air monitoring. ALS London is licensed to provide microbiological testing as well as act as a service depot for the ALS Waterloo laboratory. ALS Richmond Hill and Mississauga are also depots that service the Greater Toronto Area.

Northern Ontario is serviced by ALS' Thunder Bay laboratory, which offers basic dinking water and compliance monitoring testing for the pulp and paper, mining, forestry and municipal markets.

Nova Scotia

The Canadian Maritimes are serviced by our full service laboratory in Halifax. This laboratory provides extensive services in the analysis of a wide range of sample types for parameters including physical, inorganic and organic compounds.

Northwest Territories

ALS Yellowknife offers specific analytical services to the mining and municipal sectors as well a service centre for the Northern Region.

Regional Services & Turnaround Times

The following table provides information on the routine analytical capabiliities of each of ALS's locations, as well as an indication of the routine turnaround time in days for each capability at each location. Please note that samples can be submitted to any ALS office regardless of location of actual testing.

Environmental	Vancouver	Fort St. John	Edmonton	Calgary	Grande Prairie	Fort McMurray	Saskatoon	Winnipeg	Thunder Bay	Waterloo	London	Ottawa	Burlington	Halifax	Yellowknife
Soils - Inorganics															
Metals															
• Routine ICP-OES	√		√	√	√		√	√		√					
• Trace ICP-MS	√		√	√				√		√				√	
• AAS Flame / Furnace	√		√												
• AAS Hydride (As, Se, Sb)	√		√												
• Mercury (Cold Vapour)	√		√	√				√		√				√	
• Metals Speciation	√		√							√					
Major Cations/Anions	√	√	√	√	√		√	√		√				√	
Salinity	√	√	√	√	√		√			√					
Acidity	√														
Exchangeable							√								
Available							√								
Sulphur/Nitrogen	√						√			√					
Carbon	√						√			√					
Cyanide	√									√					
Sulphur, Elemental	√		√	√											
Mine Waste, Marine															
• Acid Volatile Sulfide	√														
• Simultaneous Extr. Metals	√														
Soils - Organics															
Hydrocarbons															
• Oil/Hydrocarbons (Recov.)	√		√	√	√		√	√		√					
• Oil & Grease	√		√	√		√	√	√		√					
• BTEX/TEH	√		√	√	√		√	√		√				√	
• CCME PHC	√		√	√			√	√		√				√	
• Histograms C11-C60[1]	√			√			√								
Alkanolamines			√												
Alcohols	√			√				√		√					
Chlorophenols	√		√					√		√					
Dioxins/Furans			√										√		
EOX/EOCL			√	√											
Glycols	√			√				√		√					
Non-Target GC/MS	√		√							√					
PAH's	√		√		√			√		√			√	√	

Environmental	Vancouver	Fort St. John	Edmonton	Calgary	Grande Prairie	Fort McMurray	Saskatoon	Winnipeg	Thunder Bay	Waterloo	London	Ottawa	Burlington	Halifax	Yellowknife
Soils - Organics Continued															
PAH's - Extended/Alkylated	√		√							√			√		
PCB's	√		√					√		√			√		
PCB's - Congener			√										√		
Pesticides - EPA 808 1B	√		√												
Phenols				√						√					
Phenolics	√			√						√					
VOC's	√		√							√				√	
Soils - Physical															
Atterburg Limits							√								
Bulk Density			√	√	√	√	√								
CEC				√			√								
Hydraulic Conductivity							√								
pH/EC	√	√	√	√	√	√	√	√		√				√	
Particle Size															
• Hydrometer			√	√	√		√			√				√	
• Sieve			√	√			√							√	
Porosity							√								
Specific Gravity		√	√	√	√	√	√								
Waste Characterization															
Corrosivity	√		√	√	√			√		√					
Flash Point		√	√	√	√	√	√	√		√					
Flammability				√				√		√					
Organic Halides/EOX[2]															
Leachate TCLP/CGSB/SWEP	√		√	√	√			√		√				√	
• Metals	√		√	√				√						√	
• Inorganic (CN, NH_4, NO_3, etc.)	√		√	√						√					
• VOC's	√		√	√						√				√	
• BTEX	√		√	√	√			√		√				√	
• PCB's	√		√							√					
• Semi-Vol. Organics	√		√							√					
Spontaneous Combustion				√											
Drilling Waste	√	√		√	√	√	√								
Toxicological															
Fish Bioassay								√							
Daphnia								√							
Microtox		√	√	√	√	√		√							
Biological															
Blood															
• Metals								√							
• Other			√					√							

Environmental	Vancouver	Fort St. John	Edmonton	Calgary	Grande Prairie	Fort McMurray	Saskatoon	Winnipeg	Thunder Bay	Waterloo	London	Ottawa	Burlington	Halifax	Yellowknife
Biological Continued															
Alkylated PAH's			√										√		
Benthic Enumeration[3]								√							
Limnological Examination[3]								√							
Phytoplankton Enumeration[3]								√							
Chlorophyll-a in Algae	√					√		√							
Dioxins/Furans			√										√		
Hair - Metals								√		√					
Metals	√		√												√
Mold Identification & Count								√							
PBDE's			√										√		
Water - Inorganics															
Major - Cations/Anions	√	√	√	√		√	√	√	√	√				√	
Metals															
• Routine Level	√		√	√			√	√	√	√					√
• Trace Level (ICP-MS)	√		√	√				√		√				√	
• Ultra Trace (ICP-MS)	√		√												
• Speciated Metals	√		√												
• Hydride Metals (As, Se, Sb, Hg)	√		√							√					√
• Trace Hg	√		√	√				√		√				√	
Acidity	√							√	√						
Alkalinity	√		√	√	√		√	√	√	√					
BOD	√		√	√		√		√	√	√				√	√
Carbon (TOC/DOC/TIC)	√			√				√		√				√	
Chlorate/Chlorite			√												
COD	√		√	√	√	√		√	√	√				√	
Colour	√		√	√	√	√		√	√	√					
Conductivity	√		√	√	√		√	√	√	√				√	√
Cyanide	√							√		√					√
Nutrients (N + P)	√		√	√			√	√	√	√					
pH	√		√	√	√	√	√	√	√	√				√	√
Solids	√		√	√		√	√	√	√	√				√	√
Sulphide	√		√							√					
Thiocyanate	√									√					
Turbidity	√		√	√	√			√	√	√				√	√
Water - Organics															
Hydrocarbons															
• Histograms C11-C60[1]				√			√			√					
• BTEX, PHC's	√			√	√		√	√		√				√	
• BTEX, F1, F2 (CCME)	√		√	√			√	√		√					
Alkanolamines			√												

	Vancouver	Fort St. John	Edmonton	Calgary	Grande Prairie	Fort McMurray	Saskatoon	Winnipeg	Thunder Bay	Waterloo	London	Ottawa	Burlington	Halifax	Yellowknife
Environmental															
Water - Organics Continued															
Chlorophenols	√		√					√		√					
Dioxins/Furans			√										√		
Glycols	√			√				√		√					
Haloacetic Acids	√							√							
Naphthenic Acids						√									
Non-Target	√		√							√					
PAH's	√		√					√		√			√	√	
PAH's - Extended/Alkylated	√		√										√		
PCB's	√		√					√		√			√		
PCB's - Congener													√		
Specialized Organics			√							√			√		
Surfactants								√							
Tannin & Lignin	√		√					√		√					
THM's (Halomethanes)	√		√					√		√				√	
VOC's	√		√					√		√				√	
Water - Microbiological															
Coliforms (Total-Fecal)	√	√	√	√				√	√	√	√				√
E-Coli	√	√	√	√				√	√	√	√				√
Standard Plate Counts (HPC)	√	√	√	√				√	√	√	√				√
Giardia & Cryptosporidium								√							
Legionella								√							
Iron	√							√							
Sulphur Reducing	√			√				√							
Specialty Micro-organisms				√				√	√						
Agricultural															
Soil															
Fertility (NPKS)[4]							√								
DTPA Metals[4]							√								
Tissue/Vegetation															
N Total (Instrument)							√								
N Total (TKN)							√								
Water Soluble Nutrients							√								
Plant Digests	√						√								
Metals - ICP	√						√								
Air - Industrial Hygiene															
Ammonia			√										√		
Anions			√												
Asbestos - Bulk			√	√				√							
Asbestos - Fibre Counts			√	√				√							
Breathing Air Compressed			√												

	Vancouver	Fort St. John	Edmonton	Calgary	Grande Prairie	Fort McMurray	Saskatoon	Winnipeg	Thunder Bay	Waterloo	London	Ottawa	Burlington	Halifax	Yellowknife
Air - Industrial Hygiene Continued															
Dioxins			√										√		
Formaldehyde			√												
Metals & Mercury	√		√										√		
Hydrocarbons/Organics															
• Canisters, Summa, TO 14+15			√												
• Carbotrap Tubes	√		√												
• Gasbags	√		√												
• MM5 Trains			√												
• Passive Monitors	√		√												
• PUF Cartridges	√		√												
• VOST Trains			√										√		
NOX			√										√		
Ozone			√												
Particulates (Total)	√		√							√			√		
PCB's			√										√		
Sample Media			√												
Sampling Consulting															
Silica, Quartz			√												
Solvents			√										√		
Total/Fixed Dustfall	√														
TSP Hivol	√												√		
VOC's (BTEX)	√		√										√		
Welding Fumes			√												
Pesticides/Herbicides															
Individual Pesticides[3]	√		√					√		√					
Specialized Screens[3]	√		√					√		√					
Phenoxy-Neutral Herb Screen	√		√							√					
Sterilant Screen			√							√					
Sulfonylurea Screen			√												
Organo-Phosphorus Screen			√												
Carbamate Screen			√												
Triazine Screen			√												
Canadian Drinking Water Screen			√												
CCME			√												
Golf Course Screen			√												
GLP Analysis[3]			√												
Food															
Metals								√							
Microbiological								√							

1 - Includes hydrocarbon distribution report for product identification
2 - Sublet.
3 - Call laboratory for turnaround time.
4 - Turnaround time during agricultural season only, otherwise 5 days

Quality Management System

The ALS Quality Management System has been structured to include the needs of our clients, our company policies, as well as accreditation, licensing and certification requirements. This management system is defined in our documentation and extensive training and monitoring in all locations by Quality Assurance (QA) staff ensures effective implementation. Our Quality Assurance group is independent of operations and is comprised of trained and active assessors who are respected professionals in their field. The following is a brief overview of the elements of our quality management system.

All systems that play a role in ensuring the quality of analytical results and client services are documented under the authority of management to ensure consistent provision of services to all clients. Training in all critical job tasks is provided, measured, documented and monitored to demonstrate the effectiveness of training and consistent application of procedures.

All analytical methods used at ALS undergo planned validation prior to their approval for use in the laboratory. The approved methods contain criteria for quality control tools that provide information on each preparation and analytical stage of analysis. The results of these tools are compared to data quality objectives and demonstrate sample results are traceable and defensible prior to issuing a test report.

Scheduled internal audits are performed on all quality management system elements. The audit system ensures conformance to the quality plan and applicable performance criteria. Accreditation, certification and licensing bodies also perform audits to ensure conformity to the applicable standards or regulations. In addition, clients may wish to perform audits to their own requirements. We welcome this opportunity to work closely with our clients to ensure their needs are understood and met.

Performance Testing programs are used to monitor testing activities. Results are reported to accreditation bodies when applicable and are used to measure performance and meet accreditation and license requirements.

Accreditations, Recognitions and Licenses

The ALS Environmental Division Laboratories in Canada are involved in accreditation programs specific to their specialized testing and client needs. Note that the accreditations and recognition are held for specific tests. Please contact any ALS Laboratory to receive scopes of accreditation or certificates of recognition for a specific laboratory. Our laboratories are involved with one or more of the following accreditation providers or programs of recognition:

- Canadian Association for Laboratory Accreditation Inc. (CALA)
- Standards Council of Canada (SCC)
- American Industrial Hygiene Association (AIHA)
- National Environmental Laboratory Accreditation Program (NELAP)
- EPA and OECD Good Laboratory Practices (GLP)
- State of Washington Department of Ecology
- BC Ministry of Environment EDQA
- Ontario Ministry of the Environment Drinking Water License
- BC Provincial Health Officer

Performance Testing Programs

ALS Laboratory Group – Environmental Division is committed to fully utilizing performance testing samples to ensure the performance of our methods compare with industry standards. The various performance programs that our laboratories have been routinely involved with for the past several years, includes, but is not limited to:

- Canadian Association for Laboratory Accreditation Inc. (CALA)
- American Industrial Hygiene Association (AIHA)
- Canadian Food Inspection Agency (CFIA)
- Alberta Water Analysts Committee (AWAC)
- Western Canada Microtox Users Committee (WCMUC)
- Centre for Disease Control (CDC)
- National Water Research Institute (NWRI)
- AOAC International
- Quebec Centre of Toxicology
- North American Proficiency Testing Program (NAPT)
- Resource Technology Corperation (RTC)
- Ryerson Polytechnic University
- Clinical Microbiology Proficiency Testing (CMPT)
- Environmental Resources Associates (ERA)
- National Research Council (NRC)
- International Atomic Energy Agency Marine Environmental Studies Laboratory (IAEA-MEL)
- Wibby Environmental
- Analytical Products Group (APG)
- Western Enviro-Agricultural Laboratory Association (WEALA)

Quality Commitment

ALS Environmental Division Canada allocates over CAD$ 1 million annually to accreditation programs, performance testing programs and quality assurance staff costs. We are also committed to supporting accreditation programs by volunteering six assessors and lead assessors (CALA and SCC) and Advisory Panel Members (CALA, AIHA and BC EWQA Steering Committee).

All feedback from clients is documented, tracked, resolved, and used as part of our continuous improvement plan. Monitoring of improvements provides clients with the secure knowledge that we have addressed their concerns.

The ALS management team performs scheduled reviews of monitoring activities to ensure the continued suitability of the quality management system to meet all expectations. The reviews are also used to set measurable goals and timelines for future performance and growth.

We are proud of the quality management systems implemented within the ALS Laboratory Group and believe in maintaining an open approach within our laboratories. We invite clients to visit the nearest ALS Laboratory for a tour and welcome their review of our management systems.

Corporate Responsibility

The ALS Laboratory Group is committed to performing our duties in efficient and ethical ways and at all times meeting and often exceeding the relevant laws and standards that govern the operations of the company. ALS also recognizes our responsibility to our clients and is committed to delivering the highest standard of services and products.

Compliance

ALS believes that the meeting of compliance obligations is a responsibility essential to its long term success and is committed to adhering to all legislation that relates to the operations of ALS.

All ALS employees are responsible for complying with policies and procedures established to ensure ALS fulfills requisite legislative requirements and every employee, contractor or agent of the company will be held accountable to conform with the law and act ethically at all times.

Health and Safety

ALS is committed to achieving the highest levels of Occupational Health and Safety performance in all of its laboratories through the systematic reduction of risk of workplace injuries and illness.

ALS has a comprehensive Health and Safety program which protects our staff, our contractors and visitors, our property, and the general public. Compliance with Health and Safety legislation, development of Safe Operating Procedures, employee training programs, regular site inspections and annual audits ensure that employees at every level are responsible and accountable for the company's Health and Safety performance.

Environment

ALS is committed to minimising its environmental footprint as part of its responsibility within the business community. To support this goal each laboratory in our Group adheres to relevant legislation in their jurisdiction with regards to waste storage and disposal. Samples and waste products are recycled or disposed of in an environmentally responsible manner and containers and packaging are recycled wherever possible.

Confidentiality

At ALS we understand the importence of confidentiality and have implemented policies, which ensure the protection of our client's information. All our employees are required to sign and follow our Ethics, Conflict of Interest and Confidentiality Policies. These agreements are required to ensure that all employees are aware of (i) the laboratory policy regarding ethics and the standards of integrity that are expected of them, and (ii) that they are free from any undue pressures that might adversely affect the quality of their work.

In addition, we ensure that procedures for sending test results by mail, facsimilie, or other electronic means meet the client's requirements for confidentiality. Requests for records made by a third party must be accompanied by written consent from the client. All ALS emplyees ensure requirements for client confidentiality are obsereved at all times, when making records available.

We understand the nature of some projects can be sensitive and require a high integrity, laboratory service supplier like ALS.

ALS Management & Professional Staff

ALS strives to employ the best management and technical staff in the business. Our focus on staff retention and career development has earned ALS a reputation as the "employer of choice" for laboratory professionals. This loyalty translates into a staff resource with the most expertise and experience of any laboratory in Canada.

ALS is managed using a regional structure with the autonomy to deliver services that meet local needs. Because the majority of our staff, including senior management, are chemists, we understand our client's testing requirements. The key positions within our company include:

- **Our managers** - are responsible for resource management and ensuring the efficient delivery of our service.
- **Our technical specialists** - are responsible for keeping ALS at the forefront of the analytical testing market by staying abreast of emerging technologies. These same technical specialists are often consulted by industry and regulatory bodies to provide expert assistance on a wide range of unique projects.
- **Our Account Managers (AM)** - provide the day to day service that ALS is renowned for. Each client is assigned an AM that develops an understanding of your particular needs and service requirements.
- **Our chemists and technical staff** - are highly skilled professionals trained in the most up to date analytical procedures demanded by today's marketplace.
- **Our support staff** – ensure that the requisite services are available to provide our clients with the timely and secure delivery of their data.

For up to date contact information, please consult our Website at: www.alsenviro.com or request an updated contact list. Bios of key staff are also available upon request.

What This Means To Our Clients

ALS' depth of technical and management expertise allows us to deliver a consistently high level of service to all of our clients. The personal service delivered by our Account Managers is commonly known to be the best in the industry. Our commitment to having the highest level of technical staff provides the assurance that our product (analytical data) is backed up by a sound quality program using only state-of-the-art equipment and procedures. Finally, it is the commitment of our management and support staff to work as an integral part of our team, to produce the high quality data and service that has always been associated with the ALS brand, now and for years to come.

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

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