Quality Assurance (QA) and Quality Control (QC) Plan CFS Eureka (ERK), Nunavut

In support of the
Nunavut Water Board Licence
No. 8BC-ERK1621

Originally prepared: September 2010
Revised: August 2021

Prepared for:
1 Canadian Air Division,
Department of National Defence

Originally prepared by:
Environmental Services
Defence Construction Canada

Revised by:
8 Wing Environmental Management
Department of National Defence

Canada

Revision Control Page

Revision No.	Revised By	Date	Issue/Revision Description
1.0	Defence Construction Canada	September 2010	Final.
2.0	Department of National Defence	February 2015	Final. Revised contracted external CALA-accredited laboratory.
3.0	Department of National Defence	August 2021	Revised contracted external CALA-accredited laboratory.

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ACRONYMS

AGAT	AGAT Laboratories Ltd. (former contracted laboratory)
ALS	ALS Environmental
BOD	Biological Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CFS	Canadian Forces Station
ERK	CFS Eureka
EXOVA	Exova Canada Inc. (current contracted laboratory)
HAWS	High Arctic Weather Station
NWB	Nunavut Water Board
PAH	Polycyclic Aromatic Hydrocarbons
pH	Measure of acidity and alkalinity
QA	Quality Assurance
QC	Quality Control
SNP	Surveillance Network Program
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids

1. INTRODUCTION

This document has been updated in relation to the new water licence application, under Licence number 8BC-ERK1621, issued to the Department of National Defence (DND) on June 18, 2010. This new Class B Water Licence issued allows for the disposal of waste during operation and maintenance of Canadian Forces Station (CFS) Eureka ("Eureka"). Eureka is located on Slidre Fiord on the west coast of Ellesmere Island within the Qikiqtani Region of Nunavut (latitude 79°59'20"N / longitude 85°56'30"W).

Eureka has been operational since 1947 and was originally established as a High Arctic Weather Station, and is currently a remote camp maintained by DND as a military detachment and training area. Eureka is located approximately 2 km from the Eureka High Arctic Weather Station (HAWS) operated by Environment Canada. This station is only seasonally active during the summer months, which may include June, July and August in the Arctic, and is used by DND, Environment Canada, and arctic research projects. During the summer months the peak population is 35 people, and on average ranges between 20 to 25 people.

This document has been prepared in accordance with the *QA/QC Guidelines for Use by Class "B" Licensees in Collecting Representative Water Sample in the Field and for Submission of a QA/QC Plan*, published in 1996 by the Department of Indian and Northern Affairs Canada Water Resources Division and the Northwest Territories Water Board. As outlined in the Licence, five (5) monitoring stations shall be maintained at Eureka at the following locations: Sewage Treatment Facility, Landfarm Facility, Landfill, Battery Dump and Barrel Dump, for the purpose of assessing water quality. The original QA/QC Plan at was approved by the NWB and implemented; this revised QA/QC Plan will be implemented one month after NWB approval.

2. SAMPLE COLLECTION

2.1 Sampling Locations

As part of the NWB Licence, the Surveillance Network Program (SNP) consists of five water monitoring stations at Eureka, which include:

a) ERK-1: Final Discharge Point of the Sewage Treatment Facility
b) ERK-2: Final Discharge Point of the Landfarm Facility
c) ERK-3: Runoff/leachate from the Landfill
d) ERK-4: Runoff/leachate from the Battery Dump
e) ERK-5: Runoff/leachate from the Barrel Dump

To date water monitoring has not been conducted at Eureka. Sampling locations were established by the NWB and listed above and identified on Figure 1 (Appendix A). The exact sampling locations will be identified at the commencement of the sampling program in 2011, and if feasible with assistance from an Inspector. GPS coordinates and photographic records of the sampling locations will be documented, and

locations will be identified using markers for consistency and repeatability in subsequent months and years.

Timing of Sampling
Timing of the collection of the water samples at Eureka is outlined in the requirements of the NWB Licence, which specify:

- ERK-1 shall be sampled prior to the release of effluent from the Sewage Treatment Plant;
- ERK-2 shall be sampled prior to the release of effluent from the Landfarm Facility; and,
- ERK-3-4-5 shall be sampled monthly during periods of runoff or seepage from the Landfill, Battery Dump and Barrel Dump.

Documenting Non-Sampling Events
In the event that water samples are not successfully collected and submitted for analysis from the Landfarm (ERK-2), Landfill (ERK-3), Battery Dump (ERK-4) and/or the Barrel Dump (ERK-5) the following will be documented:

- Location(s) of the sampling attempts will be recorded (i.e., GPS coordinates, photographic records and the sampling locations will be identified on a map); and,
- Justification outlining why a sample was not successfully collected.

Attempted unsuccessful sampling event(s) and justification will be reported to the NWB in the Annual Report for Eureka.

2.2 Sampling Equipment

As of August 2021, ALS Environmental Ltd . is the external CALA-accredited Laboratory in support of this licence.

No specialized equipment will be required for the collection of water samples at Eureka. New sample bottles will be supplied by an external CALA-accredited Laboratory and used for the collection of all water samples. Samples are not to be filtered.

The table below identifies the sample bottles necessary for each sampling round. Extra bottles will be requested for duplicate samples, field blanks and/or in case of breakage.

<table>
<tr><th>Sewage Treatment Facility (ERK-1)</th><th>Runoff/Leachate from Landfill/Dump (ERK-3-4-5)</th></tr>
<tr><td><u>4 Bottles:</u>
1 x routine (pH)
1 x routine (TSS)
1 x BOD (BOD)
1 x sterile (fecal coliforms)</td><td rowspan="3"><u>11 Bottles/Site:</u>
1 x 1L glass amber bottle (extractable HC for TPH)
1 x 1L glass amber bottle (PAHs)
1 x 1L glass amber bottle (Oil and Grease)
2 x 40 mL vials (F1, BTEX)
1 x BOD (BOD)
1 x routine (pH,NO2-N,NO3-N,Mg,Na,Ca,K, SO4,conductivity,alkalinity,hardness)
1 x nutrient (NH3)
1 x routine (TSS)
1 x metals bottle (total As,Cu,Fe,Hg,Cd,Cr,Pb,Ni)
1 x 100 mL glass amber bottle (phenols)
1 x sterile (fecal coliform)</td></tr>
<tr><th>Landfarm Facility (ERK-2)</th></tr>
<tr><td><u>5 Bottles:</u>
2 x 40 mL vials (benzene,toluene,ethylbenzene)
1 x 300 mL metals bottle (lead)
1 x 1L glass amber bottle (Oil and Grease)
1 x 100 mL glass amber bottle (phenols)</td></tr>
</table>

2.3 Sampling Methods

Methodology for the collection of the water samples:

Parameter	Instructions
Routine and Nutrients	1. Rinse bottle three (3) times with sample 2. Fill to top and cap bottle 3. Keep cool at 4°C
BOD	1. Rinse bottle three (3) times with sample 2. Fill to top and cap bottle 3. Keep cool at 4°C 4. Sample must be sent to laboratory within 24 hours
Microbiological (fecal coliforms)	**1. Do not rinse bottle** 2. Fill to top and cap bottle 3. Keep cool at 4°C 4. Sample must be sent to laboratory within 24 hours
Total Metals (including Lead)	1. Rinse bottle three (3) times with sample 2. Fill to near the top 3. Add contents of preservative vial (nitric acid) 4. Cap bottle and mix
Hexane Extractable Material (Oil and Grease)	**1. Do not rinse bottle** 2. Fill to shoulder of bottle 3. Add contents of preservative vial (sulphuric acid) 4. Cap bottle and mix
BTEX, THM and Purgeable Hydrocarbons	**1. Do not rinse bottle** 2. Fill bottle completely leaving no air bubbles 3. Keep cool at 4°C
Extractable Hydrocarbons (including PAH)	**1. Do not rinse bottle** 2. Fill to top and cap bottle 3. Keep cool at 4°C
Phenol	1. Rinse bottle three (3) times with sample 2. Fill to near top 3. Add contents of preservative vial (sulphuric acid) 4. Cap bottle and mix

Refer to Table 1 (Appendix B) for additional laboratory considerations, including minimum sample size, rinsing, filtering and storage requirements for the parameters. Additionally, samples for ERK-1 and ERK-2 will be collected prior to the release of any effluent to demonstrate compliance with the criteria set out by the NWB (refer to Section 4.4B).

3. SAMPLE HANDLING

3.1 Preservation

Samples will be preserved in accordance with requirements identified by an external CALA-accredited Laboratory for the parameters to be analysed (refer to 2.3 Sampling Methods and Appendix B).

Preservatives nitric acid (HNO3) and sulphuric acid (H2SO4) are classified as Class 8 Dangerous Goods. Based on the quantity of preservative needed for sampling, these acids will be transported together in regular cargo as *dangerous goods in accepted quantities*. Nitric acid will be added to preserve lead and metals samples, and sulphuric acid will be added to preserve oil and grease, and phenols samples, immediately after the samples are collected. Samples requiring analysis within 24 hours will be collected immediately prior to shipping. All samples will be stored on ice and kept cool at approximately 4°C prior to and during shipping.

3.2 Sample Identification

Samples collected will be labelled using consistent terminology, identifying the water monitoring station (corresponding to the facility), followed by the year, month and sample number. For example, ERK-1-2011-06-1 denotes a water sample collected for the Sewage Treatment Facility, in June 2011, and is the first sample collected for the month.

Similarly, blind duplicate samples collected will be labelled using consistent terminology, identifying the station, followed by the year, month and duplicate sample number. For example, ERK-2011-06-DUP1 denotes a blind duplicate water sample collected at Eureka, in June 2011, and is the first duplicated collected for the month. Trip and field blanks will be labelled as such.

At the time of collection, sample identification will be recorded in a field notebook for consistency in terminology, and to ensure the sample identifiers are unique. Sample labels will also include the following information: name of organization, time and date. Information provided on the sample labels will be clearly printed in permanent (i.e., waterproof) non-smear ink (marker or pen).

A Chain-of-Custody shall be completed for each sampling round and will accompany the samples to the laboratory.

3.3 Transportation

Samples will be packed appropriately (i.e., packed upright, immobile) in coolers, sealed and shipped to CFS Alert via the Royal Canadian Air Force or a contractor by DND for furtherance south to the external CALA-accredited Laboratory. Samples are arranged to be picked up by DND (while the station is active) for furtherance to an external CALA-accredited Laboratory without delay.

In addition, the external CALA-accredited Laboratory will be immediately notified when the samples are in transit, in order to start analysis as quickly as possible on samples with a maximum storage of 24-48

hours. A Chain of Custody will accompany the sample shipment and will clearly identify the location of samples requiring immediate analysis.

4. LAB ANALYSIS

4.1 Lab Accreditation

An external CALA-accredited Laboratory* will analyze all the samples collected in support of this licence.

As of August 2021, ALS Envirinmental Inc. is the external CALA-accredited Laboratory in support of this licence.

ALS Environmental Inc. is accredited to conduct analysis on each of the required sampling parameters, with the exception of total hardness.

*Prior to ALS Enviromental (June 2018) and Exova Canada Inc. (June 2014), AGAT Laboratories Ltd. in Mississauga, ON, was the previous DND contract holder from 2010-2013. Refer to Appendix C for proof of laboratory accreditation in accordance with ISO/IEC17025:2005 to conduct analyses on each of the required sampling parameters.

4.2 Detection Limits

Laboratory detection limits for all parameters required by the NWB are identified in Table 1 (Appendix B). The laboratory shall report the detection limits of the methods used for the analysis of the samples.

4.3 Methodology

The laboratory sample analysis methodology will follow the methods outlined in the *Standard Methods for the Examination of Water and Wastewater* (2012), if not described below in Appendix B.

4.4 Reporting Requirements

Duplicates and Blanks
Duplicate samples and blanks shall be submitted to and analysed by the accredited laboratory to provide an internal (i.e., laboratory) and external (i.e., at time of sampling, shipping) QA/QC check to verify the reliability of the sample results. Duplicates samples shall be collected for approximately 10 percent of the samples. A duplicate sample is a repeat sample collected and handled using the same methods and submitted blindly for analysis. Based on the analytical results the laboratory will match the blind duplicate to the corresponding sample.

Field blanks and travel blanks will also be analysed. Field blanks will consist of bottling distilled water during the sampling round, using the sampling methods used to collect the water samples, to ensure reliability of the sampling method. Travel blanks consist of distilled water and are provided by the laboratory to accompany a shipment of sample bottles roundtrip to confirm the integrity of the samples was maintained.

NWB Effluent Standards

Analytical results of effluent discharged from the Sewage Treatment Facility and the Landfarm Facility will be reported against the following effluent quality standards provided by the NWB:

Parameter	Maximum Concentration of any Grab Sample
Sewage Treatment Facility (ERK-1)	
BOD5	80 mg/L
Total Suspended Solids	70 mg/L
Fecal Coliforms	1 X 10^6 CFU/100mL
Oil and Grease	No visible sheen
pH	between 6 and 9
Landfarm Facility (ERK-2)	
Benzene (µg/L)	370
Toluene (µg/L)	2
Ethylbenzene (µg/L)	90
Lead (µg/L)	1
Oil and Grease (mg/L)	15 and no visible sheen
Phenols (µg/L)	20

Effluent standards provided by the NWB are consistent with the *Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories (1992)*, or are consistent with other municipal licences.

5. QA/QC PLAN REVIEW

This document, *QA/QC Plan for CFS Eureka*, shall be reviewed annually to ensure that this plan remains current and consistently reflects the operations, activities and technology at CFS Eureka. Any revisions required to this document shall be submitted to the NWB in the form of an Addendum with supporting letter of approval from the external CALA-accredited Laboratory, and subsequently implemented. Changes to this plan will also be reflected in the Annual Report.

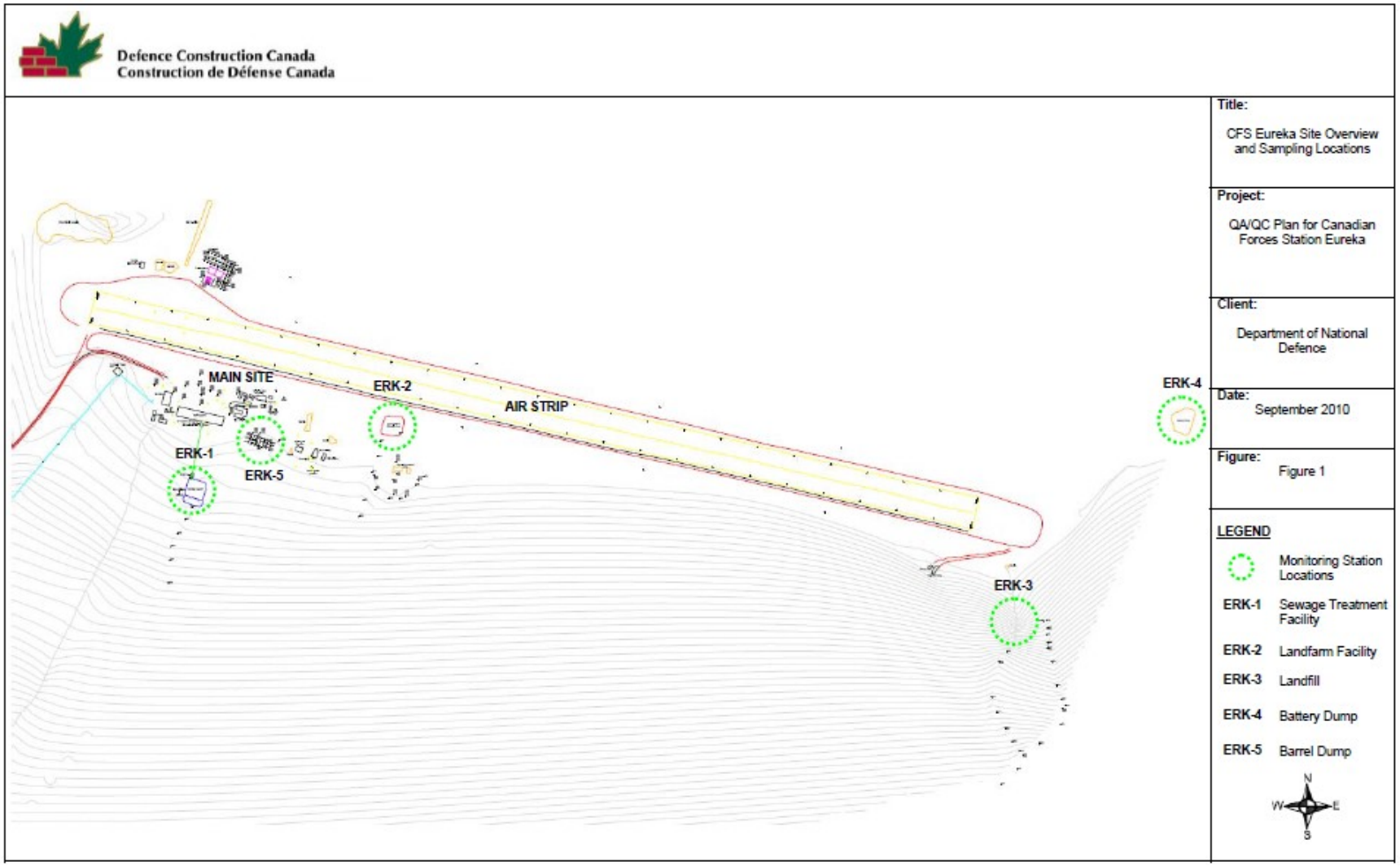
6. REFERENCES

Department of Indian and Northern Affairs Canada Water Resources Division and the Northwest Territories Water Board. 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.* July 1996.

Eaton, A., Clesceri, L., Rice, E., and A. Greenberg. Standard Methods for the *Examination of Water and Wastewater – 21st* Edition. 2005.

Nunavut Water Board. *Letter, RE: NWB Licence No. 3BC-ERK1015*. June 18, 2010.

Appendix A: CFS Eureka Site Overview and Sampling Locations


Defence Construction Canada
Construction de Défense Canada
MAIN SITE
ERK-1
ERK-2
ERK-5
AIR STRIP
ERK-3
ERK-4
Title:
CFS Eureka Site Overview and Sampling Locations
Project:
QA/QC Plan for Canadian Forces Station Eureka
Client:
Department of National Defence
Date:
September 2010
Figure:
Figure 1
LEGEND
Monitoring Station Locations
ERK-1 Sewage Treatment Facility
ERK-2 Landfarm Facility
ERK-3 Landfill
ERK-4 Battery Dump
ERK-5 Barrel Dump
N
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Appendix B: Parameter Consideration

Parameter	Container	Minimum Amount	Rinse	Filter	Preservation	Maximum Storage Recommendation	Detection Limit	Method	Accredited
Sewage Treatment Facility (ERK-1)									
BOD5	1L plastic	500mL	3 times	n/a	keep cool at 4°C	7 days	1 mg/L	SM 5210 B	Yes
TSS	1L plastic	100mL	3 times	n/a	keep cool at 4°C	14 days	2 mg/L	SM 2540D	Yes
Fecal Coliforms	300mL plastic	100mL	No	n/a	Na2S2O3	2 days	0 CFU/100mL	SM9222:D	Yes
pH	1L plastic	50mL	3 times	n/a	keep cool at 4°C	14 days	0.1 unit	SM 4500-H B	Yes
Landfarm Facility (ERK-2)									
Benzene	40mL glass vial	2x40mL	No	n/a	keep cool at 4°C	7 days	0.05 mg/L	EPA 8260C	Yes
Toluene	40mL glass vial	2x40mL	No	n/a	keep cool at 4°C	7 days	0.05 mg/L	EPA 8260C	Yes
Ethylbenzene	40mL glass vial	2x40mL	No	n/a	keep cool at 4°C	7 days	0.05 mg/L	EPA 8260C	Yes
Lead	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.05 ug/L	EPA 200.8	Yes
Oil and Grease	1L amber glass	1000mL	No	n/a	keep cool at 4°C	7 days	1.0 mg/L	MOE DECPH-E-3421	Yes
Phenols	125mL amber glass	100mL	No	n/a	1mL 50% H2SO4	28 days	0.001 mg/L	SM 5530D	Yes
Runoff and Leachate from Landfill (ERK-3), Battery Dump (ERK-4), Barrel Dump (ERK-5)									
TPH	1L amber	1000mL	No	n/a	keep cool at 4°C	14 days	0.2 mg/L	MOE E3397A	Yes
Extractable HC	1L amber	1000mL	No	n/a	keep cool at 4°C	14 days	0.2 mg/L	EPA8015B	Yes
F1, BTEX	40mL glass vial	2x40mL	No	n/a	keep cool at 4°C	14 days	0.1-0.5 ug/L	EPA 8260C	Yes
PAH	1L amber glass	1000mL	No	n/a	keep cool at 4°C	14 days	Refer to Table 2	EPA SW856/8270C	Yes
BTEX	40mL glass vial	2x40mL	No	n/a	keep cool at 4°C	7 days	0.1-0.5 ug/L	EPA 8260C	Yes
BOD5	1L plastic	500mL	3 times	n/a	keep cool at 4°C	7 days	1 mg/L	SM 5210 B	Yes
pH	1L plastic	50mL	3 times	n/a	keep cool at 4°C	14 days	0.1 unit	SM 4500-H B	Yes
TSS	1L plastic	100mL	3 times	n/a	keep cool at 4°C	14 days	2 mg/L	SM 2540D	Yes
Nitrate-Nitrite	1L plastic	100mL	3 times	n/a	keep cool at 4°C	7 days	0.005-0.10 mg/L	SM 4500	Yes
Total Phenols	125mL amber glass	100mL	No	n/a	1mL 50% H2SO4	28 days	0.001 mg/L	SM 5530D	Yes
Total Hardness	125mL plastic	50mL	3 times	n/a	HNO3	60 Days	1.0 mg/L	Calculation	Yes
Magnesium	125mL plastic	50mL	3 times	n/a	HNO3	60 days	0.1 mg/L	EPA SW846 3050/SM3111	Yes
Sodium	125mL plastic	50mL	3 times	n/a	HNO3	60 days	0.05 mg/L	EPA SW846 3050/SM3111	Yes
Total Arsenic	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.1 ug/L	EPA SW846 3050/EPA 200.8	Yes
Total Copper	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.2 ug/L	EPA SW846 3050/EPA 200.8	Yes
Total Iron	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	30 ug/L	EPA SW846 3050/EPA 200.8	Yes
Total Mercury	125mL plastic	100mL	3 times	n/a	HCL	14 days	0.01 ug/L	SM 3112 B	Yes
Fecal Coliforms	300mL plastic	100mL	No	n/a	Na2S2O3	2 days	0 CFU/100mL	SM 9222 D	Yes
Conductivity	1L plastic	50mL	3 times	n/a	keep cool at 4°C	14 days	5 uS/cm	SM 2510 B	Yes
Oil and Grease	1L amber glass	1000mL	No	n/a	keep cool at 4°C	7 days	1.0 mg/L	MOE DECPH-E 3421	Yes
Ammonia Nitrogen	125mL plastic	100mL	3 times	n/a	H2SO4	28 days	0.02 mg/L	SM 4500 NH3 – F+G	Yes
Total Alkalinity	1L plastic	100mL	3 times	n/a	keep cool at 4°C	1 day	5 mg/L	SM 2320 B	Yes
Calcium	125mL plastic	50mL	3 times	n/a	HNO3	60 days	0.1 mg/L	EPA SW846 3050/EPA SM3111	Yes
Potassium	125mL plastic	50mL	3 times	n/a	HNO3	60 days	0.1 mg/L	EPA SW846 3050/EPA SM3111	Yes
Sulphate	1L plastic	100mL	3 times	n/a	keep cool at 4°C	28 days	1 mg/L	SM 4110 B	Yes
Total Cadium	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.01 ug/L	EPA SW846 3050/EPA 200.8	Yes
Total Chromium	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.5 ug/L	EPA SW846 3050/EPA 200.8	Yes
Total Lead	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.05 ug/L	EPA SW846 3050/EPA 200.8	Yes
Total Nickel	125mL plastic	100mL	3 times	n/a	5mL 1:3 HNO3	60 days	0.5 ug/L	EPA SW846 3050/EPA 200.8	Yes

Table 2: ALS PAH detection limits.

Parameter	Detection Limit
Naphthalene	0.1 ug/L
Acenaphthylene	0.1 ug/L
Acenapthene	0.1 ug/L
Fluorene	0.1 ug/L
Phenanthrene	0.1 ug/L
Anthracene	0.1 ug/L
Pyrene	0.01 ug/L
Benzo(a)anthracene	0.01 ug/L
Chrysene	0.05 ug/L
Benzo(b)fluoranthene	0.05 ug/L
Benzo(k)fluoranthene	0.05 ug/L
Benzo(a)pyrene	0.01 ug/L
Indeno(123-cd)pyrene	0.1 ug/L
Dibenzo(ah)anthracene	0.1 ug/L
Benzo(ghi)perylene	0.1 ug/L

Appendix C: Proof of Laboratory Accreditation – EXOVA Canada Inc.

Canadian Association
for Laboratory Accreditation Inc.

CALA

Certificate of Accreditation

ALS Environmental (Waterloo)
ALS Canada Ltd.
60 Northland Rd., Unit 1
Waterloo, Ontario

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Accreditation No.: A3149
Issued On: August 18, 2020
Accreditation Date: January 3, 2005
Expiry Date: February 16, 2023

Andrew M. Adams
President & CEO

CALA

This certificate is the property of the Canadian Association for Laboratory Accreditation Inc. and must be returned on request; reproduction must follow policy in place at date of issue.
For the specific tests to which this accreditation applies, please refer to the laboratory's scope of accreditation at www.cala.ca.

Note: As of June 2018, DND retained ALS Environmental Inc. as the new external CALA-accredited laboratory. This is a copy of their valid Certificate of Accreditation.

Appendix D: Confirmation of Laboratory Acceptance of QA/QC Plan

CALA
Canadian Association for Laboratory Accreditation Inc.

CALA Directory of Laboratories

Membership Number: 3149
Laboratory Name: ALS Environmental (Waterloo)
Parent Institution: ALS Canada Ltd.
Address: 60 Northland Rd. Unit 1 Waterloo ON N2V 2B8
Contact: Mr. Cameron McIntosh
Phone: (519) 886-6910
Fax: (519) 886-9047
Email: alswt.quality@alsglobal.com; David.Gurdibaniuk@alsglobal.com

Standard: Conforms with requirements of ISO/IEC 17025
Clients Served: All Interested Parties
Revised On: May 28, 2021
Valid To: February 16, 2023

Scope of Accreditation

Air (Inorganic)
Fixed Gases - Air (180)
WT-TM-1703; modified from ASTM D1946-90 and EPA 3C
GC/FID & TCD - GC/FID & TCD
Carbon dioxide (CO2)
Carbon monoxide (CO)
Methane
Nitrogen
Oxygen

Air (Organic)
Reduced Sulphur Compounds - Air (201)
WT-TM-1704; modified from ASTM 5504-12
GC/SCD-PASSIVATE CANISTER
2-Ethylthiophene
2-Methylthiophene
2,5-Dimethylthiophene
3-Methylthiophene
Butyl mercaptan (1-Butanethiol)
Carbon disulfide
Carbonyl sulfide
Diethyl disulfide
Diethyl sulfide

† "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).

The list of tests and measurement capabilities for which a laboratory is accredited can change at any time due to circumstances such as scope extensions, voluntary withdrawal of tests by the laboratory and suspension. Scopes are published by the CALA via the Internet at http://www.cala.ca/cala_directories.html

Dimethyl disulfide
Dimethyl sulfide
Ethyl mercaptan (Ethanethiol)
Ethyl methyl sulfide
Hydrogen Sulfide
Isobutyl mercaptan (2-Methyl-1-propanethiol)
Isopropyl mercaptan (2-Propanethiol)
Methyl mercaptan (Methanethiol)
Propyl mercaptan (1-Propanethiol)
sec-Butyl mercaptan (2-Butanethiol)
tert-Butyl mercaptan (2-Methyl-2-propanethiol, tert-Butylthiol, TBM)
Tetrahydrothiophene
Thiophene

Air (Organic)
Volatile Organic Compounds (VOC) - Air (202)
WT-TM-1701; modified from EPA TO-15
GC/MS-PASSIVE CANNISTER
1,1-Dichloroethane
1,1-Dichloroethene
1,1,1-Trichloroethane
1,1,1,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
1,2-Dibromoethane (Ethylene dibromide)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,2,3-Trimethylbenzene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,3-Butadiene
1,3-Dichlorobenzene
1,3,5-Trimethylbenzene
1,4-Dichlorobenzene
1,4-Dioxane (p-dioxane)
2-Butanone (Methyl ethyl ketone, MEK)
2-Chlorotoluene
2-Ethyltoluene
2-Hexanone (Methyl butyl ketone, MBK)
2-Methyl-1,3-butadiene (Isoprene)
2-Methylbutane (Isopentane)
2-Methylpentane
2-Propanol (Isopropyl alcohol)
2,2,4-Trimethylpentane (Isooctane)

† "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).

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2

3-Methylhexane
3-Methylpentane
4-Ethyltoluene (1-Ethyl-4-methylbenzene)
4-isopropyltoluene (p-Cymene)
Acetone (2-Propanone)
Acetonitrile
Acrolein (Propenal)
Acrylonitrile
Aliphatic >C10-C12
Aliphatic >C12-C16
Aliphatic C6-C8
Aliphatic >C8-C10
Allyl chloride (3-chloropropene)
Aromatic >C10-C12 fraction
Aromatic >C10-C16 fraction
Aromatic C6-C8 fraction
Aromatic >C8-C10 fraction
Benzene
Benzyl chloride (a-Chlorotoluene)
Bromodichloromethane
Bromoethene (Vinyl bromide)
Bromoform
Bromomethane
Butane
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chlorodifluoromethane
Chloroethane (Ethyl Chloride)
Chloroethene (Vinyl chloride)
Chloroform
Chloromethane (Methyl chloride)
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Cyclohexane
Dibromochloromethane
Dibromomethane
Dichlorodifluoromethane
Dichloromethane (Methylene Chloride)
Ethanol
Ethyl acetate
Ethylbenzene
F1
F2

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3

Freon 113
Freon 114
Hexachlorobutadiene
Isopropylbenzene (Cumene)
m,p-Xylene
Methyl isobutyl ketone (MIBK)
Methyl methacrylate
Methyl tert-butyl ether (MTBE)
n-Decane
n-Heptane
n-Hexane
n-Pentane
n-Propylbenzene
Naphthalene
Nonane
o-Xylene
Octane
Propene (Propylene)
Styrene
tert-Butanol (2-Methyl-2-propanol)
Tetrachloroethylene
Tetrahydrofuran (THF)
Toluene
Total C>10-C12
Total C>12-C16
Total C>8-C10
Total C6-C8
trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate

Air (Organic)
Volatile Organic Compounds (VOC) - Air (203)
WT-TM-1700; modified from EPA TO-17
GC/MS-SORBENT TUBE
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
1,2-Dibromoethane (Ethylene dibromide)
1,2-Dichlorobenzene

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1,2-Dichloroethane
1,2-Dichloropropane
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,3-Butadiene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,3,5-Trimethylbenzene
1,4-Dichlorobenzene
1,4-Dioxane (p-dioxane)
2-Chlorotoluene
2-Methylnaphthalene
2-Propanol (Isopropyl alcohol)
2,2-Dichloropropane
2,2,4-Trimethylpentane (Isooctane)
4-Chlorotoluene (p-Chlorotoluene)
4-Ethyltoluene (1-Ethyl-4-methylbenzene)
4-isopropyltoluene (p-Cymene)
4-Phenylcyclohexene
Acetone (2-Propanone)
Allyl chloride (3-chloropropene)
Benzene
Benzyl chloride (a-Chlorotoluene)
Bromochloromethane
Bromodichloromethane
Bromoform
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl Chloride)
Chloroethene (Vinyl chloride)
Chloroform
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Cyclohexane
Decamethylcyclopentasiloxane
Decamethyltetrasiloxane
Decane
Dibromochloromethane
Dichlorodifluoromethane
Dichloromethane (Methylene Chloride)
Dodecamethylcyclohexasiloxane
Dodecamethylpentasiloxane
Ethyl acetate

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Ethylbenzene
Heptane
Hexachlorobutadiene
Hexamethylcyclotrisiloxane
Hexamethyldisiloxane
Hexane
m,p-Xylene
n-Butylbenzene
n-Propylbenzene
Naphthalene
Nonane
o-Xylene
Octamethylcyclotetrasiloxane
Octamethyltrisiloxane
Octane
sec-Butylbenzene
Styrene
tert-Butylbenzene
Tetrachloroethylene
Tetrahydrofuran (THF)
Toluene
trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethene
Trichlorofluoromethane

Biosolids (Microbiology)
Escherichia coli (E. coli) - Biosolids (087)
WT-TM-1200; modified from ON MOECC E3433
MEMBRANE FILTRATION (mFC-BCIG)
Escherichia coli (E. coli)

Biosolids (Organic)
Nonylphenol and Nonylphenol Ethoxylates - Biosolids (165)
WT-TM-1521; modified from JOURNAL OF CHROMATOGRAPHY A, 849 (1999) 467-482
LC/MS - EXTRACTION
Bisphenol A
Nonylphenol Diethoxylate (NP2EO)
Nonylphenol Ethoxylates
Nonylphenol Monoethoxylates (NP1EO)
Nonylphenols
Octylphenol Diethoxylate (OP2EO)
Octylphenol Monoethoxylate (OP1EO)
Octylphenol (OP)

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Serum (Organic)
Perfluorinated Compounds (PFC) - Biomaterials [Serum] (196)
WT-TM-1565; J. ANALY. TOXICOL. 34: 400-410
LC/MS/MS
Perfluorodecanesulfonic acid (PFDS, Perfluorodecanesulfonate)
Perfluorododecanoic acid (PFDoA, Perfluorododecanoate)
Perfluorohexane sulfonic acid (PFHxS, Perfluorohexanesulfonate)
Perfluorononanoic acid (PFNA, Perfluorononanoate)
Perfluorooctanesulfonic acid (PFOS, Perfluorooctanesulfonate)
Perfluorooctanoic acid (PFOA, Perfluorooctanoate)
Perfluorotetradecanoic acid (PFTeDA, Perfluorotetradecanoate)
Perfluoroundecanoic acid (PFUnA, Perfluoroundecanoate)

Soil (Organic)
Pesticides - Solids [Soil] (208)
WT-TM-1589; modified from ON MOECC E3501
LC/MS/MS
Atrazine
Atrazine-2-hydroxy
Azoxystrobin
Boscalid
Bromacil
Carbaryl
Chlorantraniliprole
DCPMU
Desethyl atrazine
Desethyl atrazine + Desisopropyl atrazine
Desisopropyl atrazine
Diuron
Fludioxonil
Imidacloprid
Linuron
Metalaxyl
Myclobutanil
Propiconazole
Pyraclostrobin
Simazine
Tebuthiuron
Trifloxystrobin
Triticonazole

Soil (Organic)
Phenoxy Acid Herbicides - Solids [Soil] (210)
WT-TM-1591; modified from ON MOECC E3552
LC/MS/MS
2,4-Dichlorophenoxyacetic acid (2,4-D)
2,4-Dichlorophenoxybutyric acid (2,4-DB)

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2,4-Dichlorophenoxypropionic acid (2,4-DP, Dichlorprop)
2,4,5-TP (Silvex)
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)
Asulam
Brodifacoum
Bromoxynil
Clopyralid
Dicamba
Diflufenican
Dinoseb
MCPA (2-Methyl-4-chlorophenoxyacetic acid)
MCPB (4-(4-chloro-2-methylphenoxy)butanoic acid)
MCPP (Mecoprop, Methylchlorophenoxypropionic acid)
Nicarbazin
Oryzalin
Picloram
Propanil
Terbacil
Triclopyr

Solids (Inorganic)
Acid Volatile Sulphide (AVS) - Solids (226)
WT-TM-1003; SM 4500-S2- J
COLORIMETRIC
Acid Volatile Sulphide

Solids (Inorganic)
Ammonia - Solids [Soil] (225)
WT-TM-1043; modified from JOURNAL OF ENVIRONMENTAL MONITORING (2005) SECTION 7, P. 37-42 (ANALYSIS) and SM 4500-NH3 B (PREPARATION)
FLUOROMETRIC
Ammonia

Solids (Inorganic)
Anions - Solids (136)
NA-TM-1001, NA-TM-1700; modified from EPA 1311 (PREPARATION) and EPA 300.1 (ANALYSIS)
ION CHROMATOGRAPHY (IC) - TCLP
Fluoride
Nitrate
Nitrite

Solids (Inorganic)
Anions - Solids [Sludge, Soil] (041)
NA-TM-1001, WT-TP-2013; modified from EPA 300.1
ION CHROMATOGRAPHY (IC)
Bromide
Chloride
Fluoride
Nitrate-N

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Nitrite

Sulphate

Solids (Inorganic)
Conductivity - Solids [Soil] (109)
WT-TM-1010; modified from SM 2510 B
CONDUCTIVITY METER
Conductivity (25°C)

Solids (Inorganic)
Cyanide - Solids [Soil] (079)
NA-TM-1003, WT-TP-2011; modified from ASTM D7237-15A and EPA 9013A and ISO 14403 and SM 4500-CN- I
AUTOMATED COLORIMETRIC - DIGESTION
Cyanide, Free
Cyanide (SAD)
Cyanide (WAD)

Solids (Inorganic)
Hexavalent Chromium - Solids [Soil] (158)
WT-TM-1035; modified from EPA 1636 and EPA 3060 and EPA 7199
ION CHROMATOGRAPHY (IC)
Hexavalent Chromium

Solids (Inorganic)
Hot Water Soluble Boron - Solids [Soil] (186)
NA-TP-2010, WT-TM-1026; modified from EPA 6010C and SOIL SAMPLING & METHODS OF ANALYSIS, CARTER, 2008
ICP/OES
Boron (Hot Water Soluble)

Solids (Inorganic)
Mercury - Solids (139)
NA-TM-1005, NA-TM-1700; modified from EPA 1311 (PREPARATION) and EPA 1631E (ANALYSIS)
COLD VAPOUR ATOMIC ABSORPTION (CVAA) - TCLP
Mercury

Solids (Inorganic)
Mercury - Solids [Compost, Sludge, Soil] (050)
NA-TM-1005, NA-TP-2004; modified from EPA 1631E and EPA 200.2
COLD VAPOUR ATOMIC ABSORPTION (CVAA)
Mercury

Solids (Inorganic)
Metals - Solids (138)
NA-TM-1002, NA-TM-1700; modified from EPA 1311 (PREPARATION) and EPA 6020B (ANALYSIS)
ICP/MS - TCLP
Antimony
Arsenic
Barium
Beryllium
Bismuth
Boron
Cadmium

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Calcium
Chromium
Iron
Lead
Lithium
Magnesium
Manganese
Potassium
Selenium
Silver
Sodium
Strontium
Sulphur (Sulfur)
Thallium
Tin
Uranium
Zinc
Zirconium

Solids (Inorganic)
Metals - Solids [Compost, Sediment, Sludge, Soil] (006)
NA-TM-1002, NA-TP-2004; modified from EPA 200.2 and EPA 6020B

ICP/MS
Aluminum
Antimony
Arsenic
Barium
Beryllium
Bismuth
Boron
Cadmium
Calcium
Chromium
Cobalt
Copper
Iron
Lead
Lithium
Magnesium
Manganese
Molybdenum
Nickel
Phosphorus
Potassium
Selenium

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Silver
Sodium
Strontium
Sulphur (Sulfur)
Thallium
Tin
Titanium
Uranium
Vanadium
Zinc

Solids (Inorganic)
Metals - Solids [Soil] (187)
WT-TM-1026, WT-TP-1012; modified from EPA 6010C and SOIL SAMPLING & METHODS OF ANALYSIS, CARTER 2ND EDITION, 2008, CHAP. 15.2.2
ICP/OES - FIXED RATIO EXTRACTION
Calcium
Magnesium
Sodium

Solids (Inorganic)
Moisture - Solids [Soil] (188)
NA-TM-1200; REFERENCE METHOD FOR THE CANADA-WIDE STANDARD FOR PERTROLEUM HYDROCARBONS IN SOIL - TIER 1 METHOD & ADDENDUM. CCME DECEMBER 2000. NO. 1310
GRAVIMETRIC
Percent Moisture

Solids (Inorganic)
Oil and Grease - Solids [Sludge, Soil] (031)
WT-TM-1100; modified from EPA 8015 and SM 5520 B and SM 5520 D and SM 5520 E and SM 5520 F
GRAVIMETRIC - EXTRACTION
Mineral Oil and Grease
Total Oil and Grease

Solids (Inorganic)
Particle Size Analysis (PSA) - Solids [Soil] (156)
WT-TM-1034; modified from SOIL SAMPLING & METHODS OF ANALYSIS CAN. SOCIETY OF SOIL SCIENCE (1993)
SEIVE
Particle Size

Solids (Inorganic)
pH - Solids [Soil] (107)
WT-TM-1001; modified from SM 4500-H+ B
pH METER
pH

Solids (Inorganic)
Phenols - Solids [Soil] (170)
WT-TM-1027; modified from EPA 9066
COLORIMETRIC
Total Phenolics

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Solids (Inorganic)
Polyaromatic Hydrocarbons (PAH) - Solids (232)
NA-TM-1100, NA-TP-2107; modified from EPA 3570 (PREPARATION) and EPA 8270E (ANALYSIS)
GC/MS - TUMBLER EXTRACTION
1-Methylnaphthalene
2-Methylnaphthalene
Acenaphthene
Acenaphthylene
Acridine
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(b,j)fluoranthene
Benzo(e)pyrene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoranthene
Fluorene
Indeno(1,2,3 - cd)pyrene
Naphthalene
Perylene
Phenanthrene
Pyrene
Quinoline

Solids (Inorganic)
Solids - Solids [Compost, Sediment, Sludge, Soil] (028)
WT-TM-1011; modified from SM 2540 B and SM 2540 E and SM 2540 G
GRAVIMETRIC
Fixed Solids
Total Solids
Volatile Solids

Solids (Inorganic)
Total and Free Cyanide - Solids (140)
NA-TM-1003, NA-TM-1700; modified from ASTM D7237-15A (ANALYSIS) and EPA 1311 (PREPARATION) and ISO 14403 (ANALYSIS) and SM 4500-CN- I (ANALYSIS)
COLORIMETRIC - TCLP
Cyanide (SAD)
Cyanide (WAD)

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Solids (Inorganic)
Total Organic Carbon (TOC) - Solids [Soil] (034)
WT-TM-1005; modified from SOIL SAMPLING & METHODS OF ANALYSIS, CARTER METHOD 21.3.2
TITRIMETRIC - WET OXIDATION-REDOX
Organic Carbon

Solids (Organic)
1,4-Dioxane - Solids [Soil] (173)
WT-TM-1406; modified from EPA 5021A and EPA 8260C
GC/MS-HEADSPACE
1,4-Dioxane (p-dioxane)

Solids (Organic)
Alkanolamines - Solids [Soil] (217)
WT-TM-1574; modified from ASTM D7599
LC/MS/MS
Diethanolamine (DEA)
Diisopropanolamine (DIPA)
Methyldiethanolamine (MDEA)
Monoethanolamine (MEA)
Monoisopropanolamine (MIPA)
Triethanolamine (TEA)

Solids (Organic)
Aminopyralid - Solids [Soil] (223)
WT-TM-1578; IN-HOUSE
LC/MS
Aminopyralid

Solids (Organic)
Base Neutral Acid Extractables (BNA) - Solids (141)
NA-TM-1700, WT-TM-1101, WT-TM-1300; modified from EPA 1311 (PREPARATION) and EPA 8270 (ANALYSIS)
GC/MS - TCLP
2-Methylphenol (o-Cresol)
2,3,4,6-Tetrachlorophenol
2,4-Dichlorophenol
2,4-Dinitrotoluene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
3/4-Methylphenol
Benzo(a)pyrene
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Nitrobenzene
Pentachlorophenol

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Solids (Organic)

Base Neutral Acid Extractables (BNA) - Solids [Sediment, Sludge, Soil] (016)
WT-TM-1101, WT-TM-1300; modified from EPA 3570C and EPA 8270D

GC/MS - EXTRACTION

1-Chloronaphthalene
1,2-Dichlorobenzene
1,2,4-Trichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2-Chloronaphthalene
2-Chlorophenol
2-Methylphenol (o-Cresol)
2-Nitrophenol
2,3,4-Trichlorophenol
2,3,4,5-Tetrachlorophenol
2,3,4,6-Tetrachlorophenol
2,3,5-Trichlorophenol
2,3,5,6-Tetrachlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,6-Dichlorophenol
2,6-Dinitrotoluene (2,6-DNT)
3,3'-Dichlorobenzidine
4-Chloro-3-methylphenol
4-Chloroaniline (p-Chloroaniline)
4-Chloroaniline (p-Chloroaniline)
4-Chlorophenyl phenyl ether
4-Nitrophenol
4,6-Dinitro-o-cresol
5-Nitroancenphthene
Biphenyl (1,1-Biphenyl)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether
Bis(2-chloroisopropyl) ether
Bis(2-ethylhexyl) phthalate (Diethylhexyl phthalate)
Butyl benzyl phthalate
Camphene
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate

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Diphenyl ether
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indole
Isophorone
m,p-Cresol
N-Nitrosodi-n-propylamine
Nitrobenzene
PBDE 3 (4-Bromophenyl phenyl ether)
Pentachlorophenol
Phenol
Total Diphenylamine

Solids (Organic)
Energetics - Solids [Soil] (195)
WT-TM-1608; modified from EPA 8330A and EPA 8330B
HPLC/UV - EXTRACTION
1,2-Dinitrobenzene (o-Dinitrobenzene)
1,3-Dinitrobenzene (1,3-DNB)
1,3,5-Trinitrobenzene (1,3,5-TNB)
2-Amino-4,6-dinitrotoluene (2-A-DNT, 2-Am-DNT)
2-Nitrotoluene (2-NT)
2,4-Dinitrotoluene
2,4,6-Trinitrotoluene (2,4,6-TNT)
2,6-Dinitrotoluene (2,6-DNT)
3-Nitrotoluene (3-NT)
3,5-Dinitroaniline (3,5-DNA)
4-Amino-2,6-dinitrotoluene (4-A-DNT)
4-Nitrotoluene (4-NT)
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
Methyl-2,4,6-trinitrophenylnitramine
Nitrobenzene
Nitroglycerin
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
Pentaerythritol tetranitrate (PETN)

Solids (Organic)
Extractable Petroleum Hydrocarbons (EPH) - Solids [Soil] (110)
WT-TM-1406; modified from CCME CWS PETROLEUM HYDROCARBONS IN SOIL - TIER 1 METHOD and EPA 5021A and EPA 8260C
GC/FID-HEADSPACE
F1: C6-C10

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Solids (Organic)
Organochlorine (OC) Pesticides - Solids [Soil] (020)
WT-TM-1102, WT-TM-1302; modified from EPA 3570C and EPA 8270D

GC/MS - EXTRACTION
2,4'-DDD (o,p'-DDD)
2,4'-DDE (o,p'-DDE)
2,4'-DDT (o,p'-DDT)
4,4'-DDD (p,p'-DDD)
4,4'-DDE (p,p'-DDE)
4,4'-DDT (p,p'-DDT)
4,4'-Methoxychlor (p,p'-Methoxychlor)
Aldrin
alpha-BHC
alpha-Chlordane
beta-BHC
Chlordane
delta-HCH (d-HCH, d-BHC, delta-BHC, delta-Hexachlorocyclohexane)
Dieldrin
Endosulfan I (a-Endosulfan)
Endosulfan II (b-Endosulfan)
Endosulfan Sulfate
Endrin
Endrin Aldehyde
gamma-Chlordane
Heptachlor
Heptachlor epoxide
Lindane (gamma-BHC)
Mirex
Oxychlordane

Solids (Organic)
Organochlorine (OC) Pesticides - Solids [Soil] (234)
WT-TM-1120, WT-TP-2100; modified from EPA 3570 (PREPARATION) and EPA 8270E (ANALYSIS)

GC/MS - SHAKE EXTRACTION
2,4'-DDD (o,p'-DDD)
2,4'-DDE (o,p'-DDE)
2,4'-DDT (o,p'-DDT)
4,4'-DDD (p,p'-DDD)
4,4'-DDE (p,p'-DDE)
4,4'-DDT (p,p'-DDT)
4,4'-Methoxychlor (p,p'-Methoxychlor)
Aldrin
alpha-BHC
alpha-Chlordane
beta-BHC
delta-HCH (d-HCH, d-BHC, delta-BHC, delta-Hexachlorocyclohexane)

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Dieldrin
Endosulfan I (a-Endosulfan)
Endosulfan II (b-Endosulfan)
Endosulfan Sulfate
Endrin
Endrin Aldehyde
gamma-Chlordane
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Lindane (gamma-BHC)
Mirex
Oxychlordane
Pentachloronitrobenzene (Quintozene)
trans-Nonachlor

Solids (Organic)
Organochlorine (OC) Pesticides - Solids [Soil] (235)
WT-TM-1120, WT-TP-2109; modified from EPA 3570 (PREPARATION) and EPA 8270E (ANALYSIS)
GC/MS/MS - SHAKE EXTRACTION
2,4'-DDD (o,p'-DDD)
2,4'-DDE (o,p'-DDE)
2,4'-DDT (o,p'-DDT)
4,4'-DDD (p,p'-DDD)
4,4'-DDE (p,p'-DDE)
4,4'-DDT (p,p'-DDT)
4,4'-Methoxychlor (p,p'-Methoxychlor)
Aldrin
alpha-BHC
alpha-Chlordane
beta-BHC
delta-HCH (d-HCH, d-BHC, delta-BHC, delta-Hexachlorocyclohexane)
Dieldrin
Endosulfan I (a-Endosulfan)
Endosulfan II (b-Endosulfan)
Endosulfan Sulfate
Endrin
Endrin Aldehyde
gamma-Chlordane
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene

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Hexachloroethane
Lindane (gamma-BHC)
Mirex
Oxychlordane
Pentachloronitrobenzene (Quintozene)
trans-Nonachlor

Solids (Organic)
Perchlorate and Bromate - Solids [Soil] (176)
WT-TM-1503; modified from EPA 6850
LC/MS/MS
Bromate
Perchlorate

Solids (Organic)
Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) - Solids [Soil] (175)
WT-TM-1557; modified from ON MOECC E3506
LC/MS/MS
10:2 Fluorotelomer sulfonic acid (10:2 FTS)
4:2 Fluorotelomer sulfonic acid (4:2 FTS)
6:2 Fluorotelomer sulfonic acid (6:2 FTS)
8:2 Fluorotelomer sulfonic acid (8:2 FTS)
N-Ethyl perfluorooctane sulfonamide (EtFOSA)
N-Ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSSA)
N-Ethyl perfluorooctanesulfonamidoethanol (EtFOSE)
N-Methyl perfluorooctane sulfonamide (MeFOSA)
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)
Perfluorobutanesulfonic acid (PFBS, Perfluorobutanesulfonate)
Perfluorobutanoic acid (PFBA, Perfluorobutanoate)
Perfluorodecanesulfonic acid (PFDS, Perfluorodecanesulfonate)
Perfluorodecanoic acid (PFDA, Perfluorodecanoate)
Perfluorododecanoic acid (PFDoA, Perfluorododecanoate)
Perfluoroheptanesulfonic acid (PFHpS, Perfluoroheptanesulfonate)
Perfluoroheptanoic acid (PFHpA, Perfluorohepanoate)
Perfluorohexanesulfonic acid (PFHxS, Perfluorohexanesulfonate)
Perfluorohexanoic acid (PFHxA, Perfluorohexanoate)
Perfluorononanoic acid (PFNA, Perfluorononanoate)
Perfluorooctanesulfonic acid (PFOS, Perfluorooctanesulfonate)
Perfluorooctanesulfonamide (PFOSA)
Perfluorooctanoic acid (PFOA, Perfluorooctanoate)
Perfluoropentanesulfonic acid (PFPeS, Perfluoropentanesulfonate)
Perfluoropentanoic acid (PFPeA, Perfluoropentanoate)
Perfluorotetradecanoic acid (PFTeDA, Perfluorotetradecanoate)
Perfluorotridecanoic acid (PFTrDA, Perfluorotridecanoate)
Perfluoroundecanoic acid (PFUnA, Perfluoroundecanoate)

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Solids (Organic)
Pesticides - Solids [Soil] (150)
WT-TM-1107, WT-TM-1302; modified from EPA 3570C and EPA 8270
GC/MS - EXTRACTION
Alachlor
Ametryn
Atrazine
Atrazine, desethyl
Azinphos-methyl (Guthion)
Bendiocarb
Bromoxynil
Carbaryl
Carbofuran
Chlorpyrifos
Cyanazine
Diazinon
Diclofop-methyl
Dimethoate
Malathion
Metolachlor
Metribuzin
Parathion
Phorate
Prometon
Prometryne
Propazine
Simazine
Temephos (Abate)
Terbufos
Terbutryn
Triallate
Trifluralin

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Solids [Soil] (065)
NA-TM-1100, WT-TM-1307; CCME CWS PETROLEUM HYDROCARBONS IN SOIL - TIER 1 METHOD
GC/FID - EXTRACTION
F2: C10-C16
F3: C16-C34
F4: C34-C50

Solids (Organic)
Petroleum Hydrocarbons (PHC) - Solids [Soil] (071)
NA-TM-1100; CCME CWS PETROLEUM HYDROCARBONS IN SOIL - TIER 1 METHOD
GRAVIMETRIC
F4: Gravimetric

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Solids (Organic)
Phenols - Solids [Soil] (204)
WT-TM-1593; modified from EPA 600/SR-97/027
LC/MS/MS
Phenol

Solids (Organic)
Polyaromatic Hydrocarbons (PAH) - Solids [Soil] (221)
WT-TM-1103, WT-TM-1304; modified from EPA 3570 and EPA 8270E
GC/MS - EXTRACTION
1-Methylnaphthalene
2-Methylnaphthalene
Acenaphthene
Acenaphthylene
Acridine
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(b,j)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoranthene
Fluorene
Indeno(1,2,3 - cd)pyrene
Naphthalene
Perylene
Phenanthrene
Pyrene
Quinoline

Solids (Organic)
Polychlorinated Biphenyls (PCB) - Solids (137)
NA-TM-1700, WT-TM-1105, WT-TM-1301; modified from EPA 1311 (PREPARATION) and EPA 8270 (ANALYSIS)
GC/MS - TCLP
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260
Total PCB

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Solids (Organic)
Polychlorinated Biphenyls (PCB) - Solids [Soil] (018)
WT-TM-1105, WT-TM-1301; modified from EPA 3570C and EPA 8270D
GC/MS - EXTRACTION
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260
Total PCB

Solids (Organic)
Pyridine - Solids (167)
NA-TM-1700, WT-TM-1600; modified from EPA 1311 (PREPARATION) and EPA 8260B (ANALYSIS)
GC/MS
Pyridine

Solids (Organic)
Sulfolane - Solids [Soil] (206)
WT-TM-1574; modified from ASTM D7599
LC/MS/MS
Sulfolane

Solids (Organic)
Volatile Organic Compounds (VOC) - Solids (182)
WT-TM-1017, WT-TM-1406; modified from EPA 1311 (PREPARATION) and EPA 8260 (ANALYSIS)
GC/MS-HEADSPACE - TCLP
1,1-Dichloroethylene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
Benzene
Carbon tetrachloride
Chloroform
Dichloromethane
Ethylbenzene
m,p-Xylene
Methyl ethyl ketone
o-Xylene
Tetrachloroethylene
Toluene

Solids (Organic)
Volatile Organic Compounds (VOC) - Solids [Soil] (112)
WT-TM-1406; modified from EPA 5021A and EPA 8260C
GC/MS-HEADSPACE
1,1-Dichloroethane
1,1-Dichloroethylene
1,1,1-Trichloroethane
1,1,1,2-Tetrachloroethane
1,1,1,2-Tetrachloroethane

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1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
1,2-Dibromomethane
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2-Hexanone (Methyl butyl ketone, MBK)
Acetone (2-Propanone)
Benzene
Bromodichloromethane
Bromoform
Bromomethane
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane (Ethyl Chloride)
Chloroethene (Vinyl chloride)
Chloroform
Chloromethane (Methyl chloride)
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibromochloromethane
Dibromomethane
Dichlorodifluoromethane
Dichloromethane
Dichloromethane (Methylene Chloride)
Ethylbenzene
Ethylene Dibromide
Hexane
m,p-Xylene
Methyl ethyl ketone
Methyl isobutyl ketone (MIBK)
Methyl t-butyl ether
o-Xylene
Styrene
Tetrachloroethylene
Toluene
trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane

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Tissue (Organic)
Perfluorinated Compounds (PFC) - Tissue (198)
WT-TM-1557; modified from ANALYTICA CHIMICA ACTA (2008) 619:221-230
LC/MS/MS
2-(N-ethylperfluoro-1-Octanesulfonamide)-EtOH (N-EtFOSE)
2-(N-methylperfluoro-1-Octanesulfonamide)-Etoh (N-MeFOSE)
N-Ethylperfluoro-1-Octanesulfonamide (N-EtFOSA)
N-Methylperfluoro-1-Octanesulfonamide (N-MeFOSE)
Perfluorobutanesulfonic acid (PFBS, Perfluorobutanesulfonate)
Perfluorobutanoic acid (PFBA, Perfluorobutanoate)
Perfluorodecanesulfonic acid (PFDS, Perfluorodecanesulfonate)
Perfluorodecanoic acid (PFDA, Perfluorodecanoate)
Perfluorodecanoic acid (PFDA, Perfluorodecanoate)
Perfluorododecanoic acid (PFDoA, Perfluorododecanoate)
Perfluoroheptanesulfonic acid (PFHpS, Perfluoroheptanesulfonate)
Perfluoroheptanoic acid (PFHpA, Perfluorohepanoate)
Perfluorohexanesulfonic acid (PFHxS, Perfluorohexanesulfonate)
Perfluorohexanoic acid (PFHxA, Perfluorohexanoate)
Perfluorononanoic acid (PFNA, Perfluorononanoate)
Perfluorooctanesulfonic acid (PFOS, Perfluorooctanesulfonate)
Perfluorooctanesulfonamide (PFOSA)
Perfluorooctanoic acid (PFOA, Perfluorooctanoate)
Perfluoropentanoic acid (PFPeA, Perfluoropentanoate)
Perfluorotetradecanoic acid (PFTeDA, Perfluorotetradecanoate)
Perfluorotridecanoic acid (PFTrDA, Perfluorotridecanoate)

Water (Inorganic) OSDWA †
Acidity - Water (227)
WT-TM-1028; modified from SM 2310 B
ION SELECTIVE ELECTRODE (ISE)
Acidity

Water (Inorganic) OSDWA †
Alkalinity - Water (070)
WT-TM-1028; modified from SM 2320 B
AUTOMATED TITRIMETRIC
Alkalinity (pH 4.5)

Water (Inorganic) OSDWA †
Ammonia - Water (212)
WT-TM-1043; modified from JOURNAL OF ENVIRONMENTAL MONITORING (2005) SECTION 7, P. 37-42
FLUOROMETRIC
Ammonia

Water (Inorganic) OSDWA †
Anions - Water [Wastewater] (003)
NA-TM-1001; modified from EPA 300.1
ION CHROMATOGRAPHY (IC)
Bromide

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Chloride
Fluoride
Nitrate
Nitrite
Sulfate

Water (Inorganic) OSDWA †
Biochemical Oxygen Demand (BOD) - Water (001)
WT-TM-1002; modified from SM 5210 B
DISSOLVED OXYGEN METER (DO)
BOD (5 day)
CBOD (5 day)

Water (Inorganic) OSDWA †
Carbon - Water (047)
WT-TM-1024; modified from SM 5310 B
INFRARED SPECTROSCOPY (IR) - COMBUSTION
Organic Carbon

Water (Inorganic) OSDWA †
Chemical Oxygen Demand (COD) - Water (035)
NA-TM-1201; modified from SM 5220 D
COLORIMETRIC - REFLUX
COD

Water (Inorganic) OSDWA †
Chlorate and Chlorite - Water (211)
WT-TM-1044; modified from EPA 300.1
ION CHROMATOGRAPHY (IC)
Chlorate
Chlorite

Water (Inorganic) OSDWA †
Chlorine - Water (074)
WT-TM-1021; modified from SM 4500-CL G
COLORIMETRIC
Free Chlorine
Total Chlorine

Water (Inorganic) OSDWA †
Colour - Water (097)
WT-TM-1014; modified from SM 2120 C
COLORIMETRIC
Apparent Colour
True Colour

Water (Inorganic) OSDWA †
Conductivity - Water (048)
WT-TM-1010; modified from EPA 9050A and SM 2510 B
CONDUCTIVITY METER
Conductivity (25°C)

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Water (Inorganic) OSDWA †
Conductivity - Water (108)
WT-TM-1028; modified from SM 2510 B
ION SELECTIVE ELECTRODE (ISE)
Conductivity (25°C)

Water (Inorganic) OSDWA †
Cyanate - Water (161)
WT-TM-1036; modified from SM 4500-CN- L and SM 4500-NH3 D
ION SELECTIVE ELECTRODE (ISE)
Cyanate

Water (Inorganic) OSDWA †
Cyanide - Water [Wastewater] (004)
NA-TM-1003; modified from ASTM D7237-10 and ISO 14403 and SM 4500-CN- I
COLORIMETRIC - DISTILLATION
Cyanide, Free
Cyanide (SAD)
Cyanide (WAD)

Water (Inorganic) OSDWA †
Dissolved Metals - Water (005)
NA-TM-1002, NA-TP-2002; modified from EPA 3030B and EPA 6020B
ICP/MS
Aluminum
Antimony
Arsenic
Barium
Beryllium
Bismuth
Boron
Cadmium
Calcium
Cesium
Chromium
Cobalt
Copper
Iron
Lead
Lithium
Magnesium
Manganese
Molybdenum
Nickel
Phosphorus
Potassium
Rubidium
Selenium

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