



QUALITY ASSURANCE (QA)
AND QUALITY CONTROL (QC) PLAN
FOR THE COLLECTION OF EFFLUENT SAMPLES
AT THE
FOX-2 (LONGSTAFF BLUFF)
DEW LINE SITE

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ENVIRONMENTAL SCIENCES GROUP
for
DEFENCE CONSTRUCTION CANADA
&
UMA ENGINEERING LTD



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APPENDIX A: PROOF OF LABORATORY ACCREDITATION



1. Introduction

During the clean-up of the FOX-2 DEW Line site at Longstaff Bluff, Nunavut the collection of sewage effluent samples was undertaken as required by the Water use License. The collection of wastewater samples is similar to the collection of other types of water samples.

As stated in the Water Use License, the contents of the Sewage Disposal Facility shall be analyzed once at 30 days after its establishment and a second time prior to discharge. All waste discharged from this Facility will be analyzed for the following parameters:

- Oil and grease (observations of presence/absence of sheen will be made – no samples will be collected or analyzed);
- Total suspended solids (TSS);
- Biological oxygen demand (BOD₅);
- Faecal coliforms; and
- pH.

2. Sample Collection

2.1. Location

GPS coordinates of sample locations are collected and recorded. Photographs of the sample location are also taken.

2.2. Sampling Equipment

The following table summarizes the equipment and storage requirements for each water sample type collected. New bottles were used in all cases for the collection of the water samples.

Contaminant	Container	Amount	Rinse	Storage	Special Treatment
TSS, pH	1L Plastic Bottle	Full	No	Cool	Do not filter
BOD ₅	250 mL amber glass bottle	Full – no headspace	No	Cool	Do not filter
Bacteria and coliforms	Bacti bottles (Accutest)	Full	No	Cool	Analyze within 48 hours of collection



2.3. Sampling Methods

Sample bottles will be filled completely at the time of sampling. Bottles are not to be filled progressively over the course of days. If there is not sufficient water to completely fill the bottle(s), then no water sample will be collected. The bottles are to be filled with no headspace remaining to guard against volatilization of dissolved phases. Generally, the samples will be collected immediately prior to departure from the site and submitted for analysis within 48 hours.

3. Sample Handling

3.1. Preservation

The water samples will be kept cool (approximately 4⁰ C) prior to and during shipping. In general, water samples will be collected when transportation from the site will be available almost immediately after, as many types of the required analyses should be performed as quickly as possible after collection.

Ideally, samples collected for inorganic analyses should be acidified in the field, at the time of collection. However, regulations concerning the transportation of dangerous goods make supplying concentrated nitric acid in the field difficult. Where samples can not be acidified in the field, it will be requested that the samples are acidified immediately upon receipt in the lab, *prior* to decanting or sample extraction. When acidifying in the lab, the container will be rinsed with 35% HNO₃ and included with the sample.

Samples are not to be filtered at any time. If samples contain excessive sediment, the samples will simply be decanted in the southern laboratory (*following* acidification, for metal analyses) prior to analysis.

3.2. Sample Identification

Each water sample will be given a blind number that was the only number provided on the labels of samples submitted for analysis. This sample number corresponds to the number assigned to that specific sample location which will be recorded on a map and in the field notebook.



3.3. Transportation

Samples are to be shipped by guaranteed airfreight in coolers from the site to their respective accredited laboratory for analysis. Chain-of-custody forms will be filled out and checked for each sample before shipment from the North, and the contents of shipments will be verified upon receipt in the laboratory.

4. Lab Analysis

4.1. Lab Accreditation

All laboratory analysis is carried out at accredited labs. The following laboratories are the ones primarily responsible for the analysis of water samples collected at FOX-2 (Longstaff Bluff):

- 1) Analytical Services Unit, Queen's University, Kingston ON; and
- 2) Analytical Sciences Group, Royal Military College of Canada, Kingston ON.

Proof of accreditation from these laboratories is located in Appendix A. The standard methods used by the laboratories for each of these analyses are listed in the laboratory's scope of accreditation.

4.2. Detection Limits

The following table provides a summary of the detection limits for the analysis to be performed on water samples collected at FOX-2 (Longstaff Bluff).

Parameter	Detection Limit
Biological oxygen demand (BOD ₅)	3 mg/L
Total suspended solids (TSS)	1 mg/L
Faecal coliforms	0 counts/100 mL

4.3. Methodology

The following is a summary of the methods to be used in the analysis of the water samples collected from FOX-2 (Longstaff Bluff).



4.3.1. *Total Suspended Solids*

Analyses were conducted by the Analytical Services Group, Royal Military College, Kingston, Ontario. Each sample was clearly labelled and stored at low temperatures in a secured area before and after analysis.

Total suspended solids (TSS) in water were determined by filtering a sample through a 0.45-micron glass fibre filter. The filter was first dried in an oven at 105 °C for 4 hours, allowed to cool, and weighed. A measured volume of water (usually 500 mL) was poured through the filter, which was then oven-dried for 12-18 hours, cooled, and reweighed. The TSS were reported as the weight of suspended material divided by the volume of water (units of mg/L).

4.3.2. *Biological Oxygen Demand (BOD₅)*

Analyses were conducted by the Analytical Services Group, Royal Military College, Kingston, Ontario. Each sample was clearly labeled and stored at low temperatures in a secured area before and after analysis.

The dissolved O₂ consumed over a five-day period was used as a measure of organic matter oxidizable by biological means. Nutrients were added to each sample solution. Dissolved oxygen was determined using a probe while stirring each solution. Samples were diluted if necessary. The difference in the dissolved oxygen measured in a sample upon receipt and after five days was taken as the measure of its biological oxygen demand (BOD).

4.3.3. *Analysis of Faecal Coliforms in Water*

Analyses were conducted by the Analytical Services Group, Royal Military College, Kingston, Ontario. Each sample was tested for storage temperature and checked for holding time in receipt. All samples were clearly labeled and stored at low temperatures in a secured area before and after analysis. Drinking water analyses were conducted in accordance with Canadian Drinking Water Quality Guidelines and according to procedures appropriate to Ontario Reg. 169/03 (Safe Drinking Water Act, 2002).

A vacuum filtration apparatus was used to filter 100 mL of sample onto a 47 mm diameter, 0.45 µm pore size cellulose ester membrane filter. The membrane filter was then placed on a fecal coliform (FC) agar plate and incubated at 44.5 ± 0.2 °C for 24 ± 2 hours. After the incubation period, fecal coliform colony-forming units (CFU) appeared as blue colonies on the membrane filter.



The presence of any fecal coliform bacteria per 100 mL in drinking water samples is considered adverse (Table 1, Microbiological Standards of Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines (MOE 2003) according to the Safe Drinking Water Act O. Reg. 169/03. Coliforms are not necessarily pathogenic, but the presence of coliforms in water samples, especially *E. coli*, is indicative of recent fecal contamination and hence the possibility of contamination by the pathogenic organisms commonly associated with fecal waste.

4.3.4. pH Measurement

Measurements on water and soil samples were conducted by the Analytical Services Group, Royal Military College, Kingston, Ontario.

Water samples were measured directly using a 50-mL sample; the pH of soil was determined by mixing 10 g of soil with 10 mL of distilled water, allowing the mixture to settle, and measuring the pH of the supernatant. The pH was measured with a Denver Instruments model 220/300729.1 pH meter and probe, relative to buffered reference standards and control.

4.4. Reporting Requirements

The following types of QA/QC samples will also be collected as part of the water sampling program. Note that if more than one type of bottle is used for each water sample, QA/QC samples will be submitted in each type of bottle used for the collection of the samples.

Field duplicates: Approximately 10% of the samples were collected as field duplicates. That is, two samples were collected from one sample location. These samples were handled in the same way and submitted blindly to the laboratories for analysis.

Field blanks: Field blanks consisted of distilled water and were collected to ensure that there is no corruption of samples from the sampling method. The distilled water was poured from its container into the sample container at the same time and using the same techniques as used to collect the regular water samples.

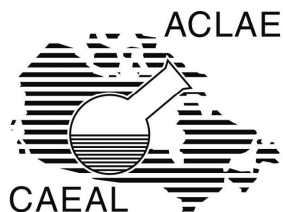
Travel blanks: The purpose of travel blanks is to ensure that there is no corruption of the sample or sample container during travel. Ideally, a full set of travel blanks should accompany each shipment of water samples. However, in cases where very few samples are shipped at a time, this guideline can be extended to a more reasonable number. Travel blanks were filled at ESG prior to leaving for the field. They were shipped with the



sample bottles, stored with the sample bottles on site, brought out to the sampling location in the field, returned to the lab, and shipped to the labs with the water samples. They should not be opened unless the other bottles or water samples are opened for some reason during shipping.



Appendix A: Proof of Laboratory Accreditation



CAEAL Directory of Laboratories

Membership Number: 2709
Laboratory Name: Queen's Analytical Services Unit
Parent Institution: Queen's University
Address: Environmental Studies Biosciences Complex Kingston ON K7L 3N6
Contact: Dr. Allison Rutter
Phone: (613) 533-2642
Fax: (613) 533-2897
Email: ruttera@queensu.ca; kettlewb@queensu.ca

Standard: Conforms with requirements of ISO/IEC 17025
Clients Served:
Revised On: August 11, 2008
Valid To: September 18, 2009

Scope of Accreditation

Oil

PCB - Oil (004)	
ASU 04; based on EPA 8081	
GC/ECD - EXTRACTION	RDL Range
Total PCB	1 - 5 µg/g

Soil (Inorganic)

Mercury - Soil (014)	
ASU012; based on MILESTONE METHODS	
COLD VAPOUR AA	RDL Range
Mercury	5 - 25 ng/g

Soil (Inorganic)

Metals - Soil (007)	
ASU007; based on EPA 200.7	
ICP/OES - DIGESTION	RDL Range
Aluminum	50 - 250 µg/g
Antimony	10 - 50 µg/g
Arsenic	1 - 5 µg/g
Barium	5 - 25 µg/g
Beryllium	1 - 5 µg/g
Boron	10 - 50 µg/g
Cadmium	1 - 5 µg/g
Calcium	
Chromium	10 - 50 µg/g
Cobalt	5 - 25 µg/g
Copper	5 - 25 µg/g
Iron	50 - 250 µg/g
Lead	10 - 50 µg/g
Magnesium	
Manganese	1 - 5 µg/g

† "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).

Molybdenum	
Nickel	5 - 25 µg/g
Phosphorus	
Potassium	
Selenium	
Silver	
Sodium	
Strontium	5 - 25 µg/g
Sulphur	
Thallium	
Tin	1 - 5 µg/g
Titanium	10 - 50 µg/g
Uranium	10 - 50 µg/g
Vanadium	10 - 50 µg/g
Zinc	10 - 50 µg/g

Solids

Metals - Solids (015)

ASU015; based on MOE TCLP-LEACH E9002

ICP/AES - TCLP

RDL Range

Arsenic
Barium
Boron
Cadmium
Chromium
Lead
Mercury
Selenium
Silver
Uranium

Water (Inorganic)

Ammonia - Water (009)

ASU09; based on TECHNICON METHOD

AUTO COLOR

RDL Range

Ammonia

.1 - .5 mg/L

Water (Inorganic)

Dissolved Metals - Water (008)

ASU08; based on EPA 200.7

ICP/AES

RDL Range

Aluminum (High)
Antimony
Arsenic
Barium (High)
Beryllium
Boron (High)
Cadmium
Calcium
Chromium (High)
Cobalt (High)
Copper (High)
Iron (High)
Lead (High)
Magnesium
Manganese (High)
Molybdenum (High)
Nickel (High)

.1 - .5 mg/L

.05 - .25 mg/L

.1 - .5 mg/L

.01 - .05 mg/L
.01 - .05 mg/L
.1 - .5 mg/L
.05 - .25 mg/L
.01 - .05 mg/L

.05 - .25 mg/L
.05 - .25 mg/L
.1 - .5 mg/L

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Phosphorus	
Potassium	
Selenium	
Silver	
Sodium	
Strontium (High)	.01 - .05 mg/L
Sulphur	
Thallium (High)	.01 - .05 mg/L
Tin	
Titanium (High)	.01 - .05 mg/L
Uranium	
Vanadium (High)	.01 - .05 mg/L
Zinc (High)	.01 - .05 mg/L

Water (Inorganic)

Major Ions - Water (003)

ASU 03; based on DIONEX MANUAL
ION CHROMATOGRAPHY

RDL Range

Bromate	
Bromide	.1 - .5 mg/L
Chloride	.05 - .25 mg/L
Fluoride	.05 - .25 mg/L
Fluoride	
Nitrate	.05 - .25 mg/L
Nitrite	.05 - .25 mg/L
Phosphate	.1 - .5 mg/L
Sulfate	.1 - .5 mg/L

Water (Inorganic)

Mercury - Water (013)

ASU015; based on MILESTONE METHODS
COLD VAPOUR AA

RDL Range

Mercury	.005 - .025 µg/L
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Water (Inorganic)

Oil and Grease - Water (010)

ASU10; based on SM 5520 (20TH EDITION)
GRAVIMETRIC - EXTRACTION

RDL Range

Total Oil and Grease	1 - 5 mg/L
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Water (Inorganic)

Total Metals - Water (012)

ASU08; based on EPA 200.7
ICP/AES

RDL Range

Aluminum	.1 - .5 mg/L
Antimony	
Arsenic	
Barium	.05 - .25 mg/L
Beryllium	
Boron	.1 - .5 mg/L
Cadmium	
Calcium	
Chromium	.01 - .05 mg/L
Cobalt	.01 - .05 mg/L
Copper	.1 - .5 mg/L
Iron	.05 - .25 mg/L
Lead	.01 - .05 mg/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).

Magnesium	
Manganese	.05 - .25 mg/L
Molybdenum	.05 - .25 mg/L
Nickel	.1 - .5 mg/L
Potassium	
Selenium	
Silver	
Sodium	
Strontium	.01 - .05 mg/L
Sulphur	
Thallium	.01 - .05 mg/L
Tin	
Titanium	.01 - .05 mg/L
Uranium	
Vanadium	.01 - .05 mg/L
Zinc	.01 - .05 mg/L

Water (Inorganic)

Total Phosphorus (TP) - Water (016)

ASU06; based on TECHNICON METHOD
AUTO COLOR

RDL Range

Total Phosphorus

.01 - .05 mg/L

Water (Organic)

Biphenyl - Water (005)

ASU 05; based on EPA 3510 C
GC/FID - EXTRACTION

RDL Range

Biphenyl

Biphenyl Ether

Water (Organic)

Phenols - Water (001)

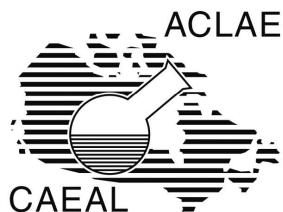
ASU 01; based on MOE METHOD 1983
AUTO COLOR

RDL Range

Total Phenolics

.001 - .005 mg/L

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CAEAL Directory of Laboratories

Membership Number: 2965

Laboratory Name: RMC Analytical Sciences Group

Parent Institution: The Royal Military College of Canada

Address: Dept. of Chemistry & Chemical Engineering RMC, PO Box 17000 Stn. Forces Kingston ON

Contact: Dr. David Kelly

Phone: (613) 541-6000

Fax: (613) 545-8341

Email: david.kelly@rmc.ca; curtis.mcdonald@rmc.ca

Standard: Conforms with requirements of ISO/IEC 17025

Clients Served: Specified Clients

Revised On: August 11, 2008

Valid To: October 10, 2009

Scope of Accreditation

Oil

Total Chlorine - Oil (003)

ASG003; based on J. RADIONAL CHEM., 50, 229-234 (1979), ANAL. CHIM. ACTA., 108, 137-147 (1979).

NAA

RDL Range

Total Chlorine

Soil (Inorganic)

Mercury - Soil (026)

ASG014; based on EPA 7470 A

COLD VAPOUR AA - MICROWAVE DIGESTION

RDL Range

Mercury

Soil (Organic)

BTEX - Soil (039)

ASG016; based on EPA 624, EPA 8260 B

GC/MS - EXTRACTION

RDL Range

Benzene

Ethylbenzene

m/p-xylene

(Parameter suspended on 8/11/2008)

o-xylene

(Parameter suspended on 8/11/2008)

Toluene

Soil (Organic)

Petroleum Hydrocarbons (PHC) - Soil (025)

ASG053; CCME REFERENCE METHOD FOR THE CANADA-WIDE STANDARD FOR PETROLEUM

HYDROCARBONS IN SOIL - TIER 1 METHOD, 2001

GC/FID - EXTRACTION

RDL Range

F2: C10-C16

F3: C16-C34

F4: C34-C50

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Soil (Organic)

Petroleum Hydrocarbons (PHC) - Soil (038)

ASG053; CCME REFERENCE METHOD FOR THE CANADA-WIDE STANDARD FOR PETROLEUM HYDROCARBONS IN SOIL - TIER 1 METHOD, 2001

GC/FID - PURGE AND TRAP

RDL Range

F1: C6-C10

Soil/Sediment

Polycyclic Aromatic Hydrocarbons (PAH) - Soil (001)

ASG002; based on EPA 8100

GC/MS - EXTRACTION

RDL Range

Acenaphthene

Acenaphthylene

Anthracene

Benzo (a) anthracene

Benzo (a) pyrene

Benzo (b) fluoranthene

Benzo (g,h,i) perylene

Benzo (k) fluoranthene

Chrysene

Dibenzo (a,h) anthracene

Fluoranthene

Fluorene

Indeno (1,2,3 - cd) pyrene

Naphthalene

Phenanthrene

Pyrene

Soil/Sediment

Total Petroleum Hydrocarbons (C8-C34) - Soil (010)

ASG010/ASG 064/ ASG 065; based on EPA 3550B, EPA 8015C

GC/FID - EXTRACTION

RDL Range

Total Petroleum Hydrocarbons (C8-C34)

Soil/Sediment

Trace Elements - Soil (030)

ASG057; based on EPA 6020

ICP/MS

RDL Range

Antimony

.1 - .5 µg/g

Arsenic

Beryllium

Cadmium

Chromium

Cobalt

Copper

Lead

Nickel

Uranium

Uranium-235

Uranium-238

Zinc

Soil/Sediment (Radiochemistry)

Radionuclide Activity- Soil (007)

ASG030; based on SM 7120 and EPA 901.1.

GAMMA SPECTROSCOPY

RDL Range

Barium-140
Cerium-144
Cesium-134
Cesium-136
Cesium-137
Cesium-138
Iodine-131
Iodine-132
Iodine-133
Iodine-134
Iodine-135
Lanthanum-140
Molybdenum-99
Niobium-95
Rubidium-86
Rubidium-88
Ruthenium-103
Ruthenium/Rhodium-106
Strontium-91
Tellurium-129m
Tellurium-131m
Tellurium-132
Uranium - 235
Uranium - 238
Yttrium-90m
Yttrium-91m
Zirconium-95

Tissue (Radiochemistry)

Radionuclide Activity - Biota (008)

ASG031; based on SM 7120 and EPA 901.1.

GAMMA SPECTROSCOPY

RDL Range

Barium-140
Cerium-144
Cesium-134
Cesium-136
Cesium-137
Cesium-138
Cobalt-60
Iodine-131
Iodine-132
Iodine-133
Iodine-134
Iodine-135
Lanthanum-140
Molybdenum-99
Niobium-95
Rubidium-86
Rubidium-88
Ruthenium-103
Ruthenium/Rhodium-106
Strontium-91
Tellurium-129m
Tellurium-131m
Tellurium-132
Yttrium-90m
Yttrium-91m

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Urine and Water

Alpha/Beta Radiation - Urine and Water (035)

ASG 069; based on RMC-CMR LSC PROCEDURES MANUAL VEC 1.0 (IN-HOUSE)

LIQUID SCINTILLATION COUNTING

RDL Range

Alpha radiation

Beta radiation

Water (Inorganic)

Biochemical Oxygen Demand (BOD) - Water (Surface/Sewage/Ground) (019)

ASG042; based on NAQUADAT NO. 08201, EPA 405.1, SM 5210

D.O. METER

RDL Range

BOD (5 day)

Water (Inorganic)

Conductivity - Water (Drinking/Surface/Sewage/Ground) (016)

ASG038; based on SM 2510, EPA 120.1

CONDUCTIVITY METER

RDL Range

Conductivity (25°C)

Water (Inorganic)

Dissolved and Extractable Mercury - Water (Ground/Surface/Drinking) (011)

ASG021; based on EPA 7470A

COLD VAPOUR AA - MICROWAVE DIGESTION

RDL Range

Mercury

.1 - .5 µg/L

Water (Inorganic)

Dissolved and Extractable Metals - Water (024)

ASG049; based on EPA 200.8, SM 3125 D

ICP/MS-MICROWAVE EXTRACTION

RDL Range

Aluminum

Antimony

Arsenic

Beryllium

Boron

Cadmium

Chromium

Cobalt

Copper

Lead

Manganese

Molybdenum

Nickel

Silver

Strontium

Thallium

Tin

Uranium

Vanadium

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Water (Inorganic)

pH - Water (Drinking/Surface/Sewage/Ground) (015)

ASG037; based on SM 4500-H+ B, EPA 150.1

pH METER

RDL Range

pH

Water (Inorganic)

Solids - Water (Drinking/Surface/Sewage/Ground) (017)

ASG039; based on EPA 160.2, SM 2540D

GRAVIMETRIC

RDL Range

Total Dissolved Solids

Total Suspended Solids

Water (Microbiology)

Coliforms - Water (Drinking/Surface/Sewage/Ground) (014)

ASG036; based on MOE MICROMEFDCE3407, SM 9225

MEMBRANE FILTRATION (DC)

RDL Range

Escherichia coli (E. coli)

Total Coliforms

Water (Microbiology)

Fecal Coliforms - Water (Drinking/Surface/Sewage/Ground) (022)

ASG044; based on MOE MICROMEFDCE3407, SM 9222D

MEMBRANE FILTRATION (m FC)

RDL Range

Fecal (Thermotolerant) Coliforms

Water (Microbiology)

Heterotrophic Plate Count (HPC) - Water (Drinking/Surface/Sewage/Ground) (023)

ASG041; based on SM 9215D

MEMBRANE FILTRATION

RDL Range

Heterotrophic Plate Count (HPC)

Water (Organic)

Total PCB - Water (021)

ASG006; based on EPA 8082, EPA 617, FRAME, ET. AL. J. HIGH RESOL. CHROMATOGR., 19: 657-668, 1996.

GC/ECD - EXTRACTION

RDL Range

Total PCB

Water (Organic)

Total PCB - Water (Surface/Sewage/Ground) (009)

ASG015, ASG022; based on EPA 8082, EPA 617, FRAME, ET. AL. J. HIGH RESOL. CHROMATOGR., 19: 657-668, 1996

GC/MS - EXTRACTION

RDL Range

Total PCB

Water (Organic)

Volatile Organic Compounds (VOC) - Water (Drinking/Surface/Ground) (012)

ASG023; based on EPA 624, EPA 8260B

GC/MS - PURGE AND TRAP

RDL Range

1,1-Dichloroethane

1,1-dichloroethylene

1,1,1-Trichloroethane

1,1,2-Trichloroethane

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1,1,2,2-Tetrachloroethane
 1,2-dichlorobenzene
 1,2-dichloroethane
 1,2-Dichloropropane
 1,3-Dichloropropane
 1,3,5-Trimethylbenzene
 1,4-dichlorobenzene
 Benzene
 Bromodichloromethane
 Bromoform
 Bromomethane
 Carbon Tetrachloride
 Chlorobenzene
 Chlorodibromomethane
 Chloroethane
 Chloroform
 Chloromethane
 cis-1,2-Dichloroethylene
 cis-1,3-Dichloropropene
 Dichloromethane
 Ethylbenzene
 Ethylene Dibromide
 m/p-xylene
 o-xylene
 Tetrachloroethylene
 Toluene
 trans-1,2-Dichloroethylene
 trans-1,3-Dichloropropene
 Trichloroethylene
 Trichlorofluoromethane
 Vinyl Chloride

Water (Radiochemistry)

Alpha/Beta Radiation (Swab) (004)

ASG004; RMC-CMR LSC PROCEDURES MANUAL VER. 1.0
 LIQUID SCINTILLATION COUNTING

RDL Range

Alpha radiation
 Beta radiation

Water (Radiochemistry)

Radionuclide Activity - Water (006)

ASG024; based on SM 7120, and EPA 901.1.

GAMMA SPECTROSCOPY

RDL Range

Barium-140
 Cerium-144
 Cesium-134 (Parameter suspended on 7/3/2008)
 Cesium-136
 Cesium-137 (Parameter suspended on 7/3/2008)
 Cesium-138
 Cobalt-60 (Parameter suspended on 7/3/2008)
 Iodine-131
 Iodine-132
 Iodine-133
 Iodine-134
 Iodine-135
 Lanthanum-140
 Molybdenum-99
 Niobium-95
 Rubidium-86
 Rubidium-88

† "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).

Ruthenium-103
Ruthenium/Rhodium-106
Strontium-91
Tellurium-129m
Tellurium-131m
Tellurium-132
Uranium - 235
Uranium - 238
Yttrium-90m
Yttrium-91m
Zirconium-95

† “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).