APPENDIX-D

QA/QC LOG SHEET OF GN-DOE ON DRINKING WATER QUALITY MANAGEMENT, 2008

27/67

CLYDE RIVER

January 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

February 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
Feb 13/08	Water Truck	#2	0	0	#1	0	0													-6	0	0	2
	Water Truck																			0	0	0	0
Feb 13/08	Pump Station		0	0																-2	0	0	1
Feb 13/08	Nursing Station		0	0																-2	0	0	1
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			-10	0	0	4

March 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

April 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
April 22/2008	Water Truck	#2	0	0	#1	0	0													-6	0	0	2
	Water Truck																			0	0	0	0
April 22/2008	Pump House		0	0																-2	0	0	1
April 22/2008	RCMP Detachment		0	0																-2	0	0	1
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0

28/67

																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			-10	0	0	4

May 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

June 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

July 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

August 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0

																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

September 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
Sept 30/08	Northern Store		0	0																-2	0	0	1
Sept 30/08	Nursing Station		0	0																-2	0	0	1
Sept 30/08	Day Care Centre		0	0																-2	0	0	1
Sept 30/08	Quluaq School		0	0																-2	0	0	1
Sept 30/08	Aprujaq Store		0	0																-2	0	0	1
Sept 30/08	Hamlet		0	0																-2	0	0	1
Sept 30/08	Illisarsivik		0	0																-2	0	0	1
Sept 30/08	Hamlet Office		0	0																-2	0	0	1
Sept 30/08	Pump House		0	0																-2	0	0	1
																				0	0	0	0
																				0	0	0	0
	TOTAL																			-18	0	0	9

October 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

November 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
																				0	0	0	0
	TOTAL																			0	0	0	0

December 2008

Date	Source	(1)	TC	FC	(2)	TC	FC	(3)	TC	FC	(4)	TC	FC	(5)	TC	FC	(6)	TC	FC	SubRpt	TC	FC	NumSmp
	Water Truck																			0	0	0	0
	Water Truck																			0	0	0	0
																				0	0	0	0
																				0	0	0	0

30/67

	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
TOTAL	0	0	0	0

Comments

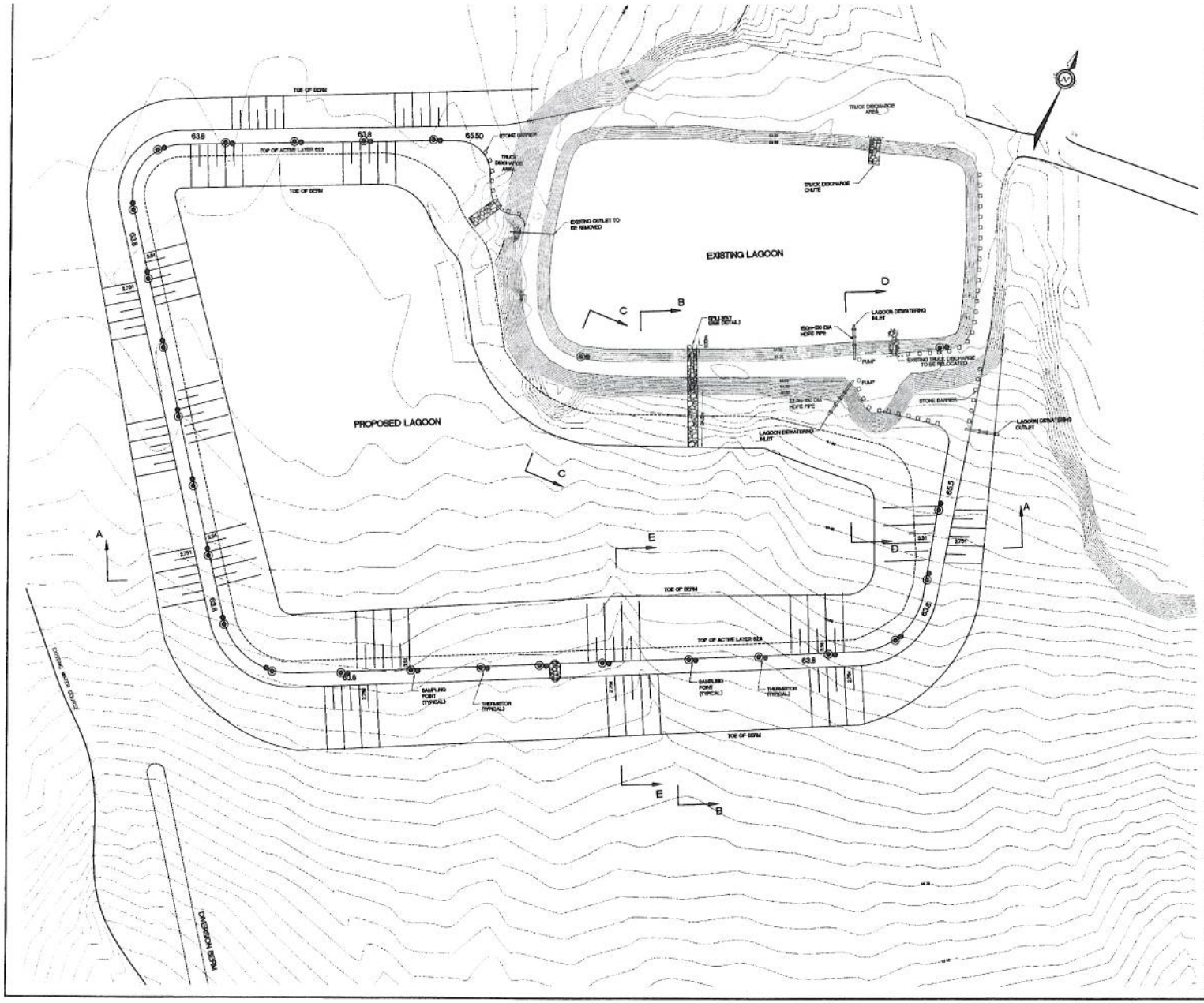
Month	Comments

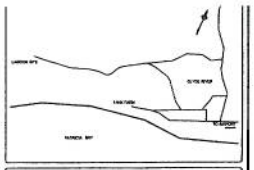
APPENDIX-E

CONSTRUCTION SCHEDULE OF SEWAGE LAGOONS

31/67

19/28





LEGEND

PERMIT OF PRACTICE
TROW ASSOCIATES INC.
Signature
Date Feb 22/08
PERMIT NUMBER P184
The Association of Professional Engineers, Geologists and Geophysicists of the NWT/NU

BENCH MARK

BM 1 ELEV. = 65.16

RE-BAR SET NEAR THE INTERSECTION OF THE LAGOON ACCESS ROAD AND METAL DUMP ACCESS ROAD, NORTH-EAST OF THE LAGOON SITE.

No.	DESCRIPTION	DATE	BY	APP'D

REVISIONS

PROFESSIONAL ENGINEERS S.L. SURDEN LICENSEE Feb 22/08 N.W.T.

Trow Associates Inc.
154 Colonnade Road South, Ottawa, Ont. K2E 7J5
Tel:(613)225-9940 Fax:(613)225-7337

CLIENT: GOVERNMENT OF NUNAVUT

PROJECT: CLYDE RIVER WASTEWATER LAGOON

TITLE: SITE PLAN

design by	SAD	project no.	OTC000180534
drawn by	MEB	drawing no.	SP-2
checked by	S.L.B.		
date	30/08/2007		
scale	1:500		

CONSTRUCTION SCHEDULE OF CLYDE RIVER SEWAGE LAGOONS

Phase :	Year	Months			
		June	July	August	September
1	2008				
2	2009				
3	2009				
4	2010				
Commissioning:	2010				

Note 1. Phase 1: Production of granualr materials at quarry site
Phase 2: Hauling materials and construction of berm core
Pahse 3: Innstalltion of liner and completion of berms
Phase 4: Rehabilitation of Existing Lagoon
Commissioning: Start using the facilities.

From: Greg Clarkin [mailto:gclarkin@caduceonlabs.com]
Sent: Tuesday, February 17, 2009 10:39 AM
To: Roy, Bhabesh
Subject: Bottle Requirements, Testing Procedures

Bhabesh Roy,

Further to our telephone conversation of this morning please find attached the following documents:

- Method A-TSS-01 for the determination of Total Suspended Solids.
- Method C-BOD-01 for the determination of Biological Oxygen Demand and,
- SOP-05 Summarizing the bottles utilized by Caduceon Environmental Laboratories for the various tests performed at our facilities.
- A blank C-O-C form that is to be completed by the sampler and sent along with the samples to our facility.
- Completed C-O-C form for report B09-19579 submitted from the Hamlet of Clyde River.

Feel free to contact me at the coordinates below should you have any questions regarding the contents of this e-mail.

Sincerely,

Greg Clarkin, B.Sc., C.Chem
Caduceon Environmental Laboratories
Lab Manager - Ottawa District
Tel: (613) 526-0123
Fax: (613) 526-1244
E-mail: gclarkin@caduceonlabs.com

Sample Bottle Requirements

1.0 Scope

1.1 This standard operating procedure (SOP) provides instructions on the provision of sampling materials and the steps required for the documentation of bottle requests received from the client. A detailed summary of parameters, sample containers, volumes, preservatives and holding times can be found in Appendices A to C.

2.0 Purpose

2.1 This SOP will ensure that the client is provided with the appropriate bottles and preservatives for field sampling.

2.2 The necessary records will be kept as per instruction in this SOP.

3.0 Procedure

3.1 All containers supplied to clients will be pre-cleaned, be of the required material (i.e. glass/plastic) and volume, contain the appropriate preservative **(note: the preservative used should be clearly indicated in the appropriate section on the label)** and be labelled.

3.2 When a client requests sample containers and supplies, the information is recorded in the Bottle Request Log. The person receiving the bottle request is responsible for documenting the following information:

- Date of order
- Order received by
- Company Name and Address
- Contact Name
- Shipping Address if different from above
- Date Required
- Detailed Parameter List or Quotation Number if available
- Any special instructions/requests (i.e. additional supplies, travel/field blanks, duplicates, spikes, bottle seals etc.)

Once the bottle order has been completed the person completing the bottle order shall sign and date the bottle request. The request can then be filed in the Bottle Request Log.

3.3 All bottles will be provided to the client with the appropriate packaging to minimize receiving damaged bottles as a result of shipping and handling in the field and during transit to the lab.

3.4 The client shall be responsible for labelling the sample containers and completing the chain of custody record prior to submitting samples to the lab. (refer to SOP-01 and SOP-02).

3.5 A detailed summary of parameters, sample containers, volumes, preservatives and holding times can be found in Appendices A to C.

4.0 Sample Handling Practices Specifically for Drinking Water Samples

4.1 Drinking-water samples should not be filtered in the field or at the laboratory prior to analysis. As it is not expected that the consumer filters their water prior to drinking it, unfiltered samples will provide a more representative sample of what the consumer is drinking. Unfiltered samples for the measurement of organic compounds and microbiological parameters are very important because many organic compounds adsorb to the particulate present in a water sample and membrane filtering will remove bacteria from the sample. Filtering is not permitted in order to compensate for poor sampling technique or the use of inappropriate methods of analysis.

Appendix A: Individual Parameters for Water Analysis

Parameter	Sample Containers		Minimum Volume (mL)	Preservative	Storage Conditions	Holding Times		
	Size (mL)	Type				Caduceon	EPA/SM(Reg.)	MOE
GENERAL CHEMISTRY, PHYSICAL PROPERTIES								
Alkalinity	500	P	50	None	1	7d	14d/14d	7d
Ammonia (NH3)	125	P or G	50	pH <2 H_2SO_4/None	1	28d/3d	28d/28d	10d
BOD5/CBOD5	500	P	300	None	1	4d	48h/48h	4d
Bromide	500	P	50	None	1	28d	-	-
Chloride	500	P	50	None	1	28 d	28d/28d	30d
COD	125, 250	P or G	50	pH<2 H_2SO_4	1	28 d	28d/28d	30d
Colour	500	P	100	None	1	48h/7d	48h/48h	7d
Conductivity	500	P	100	None	1	4d	28d/28d	4d
Cyanide (free)	125	P	50	pH >12 NaOH	1, in dark	7d	- /14 d	7d(MISA)
Cyanide (total)	125	P	50	pH >12 NaOH	1	6 m	14d/14d	6 m
Fluoride	500	P	50	None	1	28d	28d/28d	30d
Hardness	250	P	100	pH<2 HNO_3	2	28d	6m/6m	28d
Hydrogen Sulphide (H2S)	125, 250	P or G	100	2N zinc acetate + pH>9 NaOH	1	7d	7d/7d	7d(MISA)
Mercury	250	P,G,AG	100	$K_2Cr_2O_7$ + HNO_3	2	7d	28d/-	14d, 7d(MISA)
Metals- except Mercury	250	P	100	pH<2 HNO_3	2	60d	6m/6m	60d
Nitrate (N)	500	P	50	None	1	7d	48h/48h	7d
Nitrite (N)	500	P	50	None	1	7d	48h/48h	7d
Nitrate-Nitrite (N)	500	P	50	None	1	7d	48h/48h	7d
Nitrogen (Total Kjeldahl)	125, 250	P or G	100	pH<2 H_2SO_4	1	28d	28d/-	-
Organic Carbon, Dissolved (DOC)	125	G or P	50	Field filter + pH <2 H_2SO_4 / None	1	28d/7d	-	-
Organic Carbon, Total (TOC)	125	G or P	50	pH<2 H_2SO_4	1	28d	28d/28d	-
Oil & Grease, Total, A/V/Mineral	1000	G	1000	HCl/None	1	28d/7d	28d/28d	7d(MISA)
pH	500	P	100	None	1	4d	Imm./Imm.	4d/asap(MISA)
Phenolics (4-aap) *	60,125, 250	AG	50	pH<2 H_2SO_4	1	28d	28d/28d	30d(MISA)
Phosphate, dissolved (P)	125	P	50	Filter, analyze ASAP/pH<2 H_2SO_4	1	48h/28d	48h/-	-
Phosphorus (total)	125, 250	P or G	100	pH<2 H_2SO_4	1	28d	28d/-	30d(MISA)
Solids (TS,TSS,TDS,VS,VSS)	500	P	500	None	1	7d	7d/2-7d	7d(MISA)-
Silica	125, 250	P	100	pH<2 HNO_3	2	28d	28d/-	-
Sulfate	500	P	50	None	1	28d	28d/28d	30d(MISA)
Turbidity	500	P	100	analyze ASAP	1	48h/7d	48h/48h	48h(MISA)

45/67

MICROBIOLOGICAL								
Coliforms, Total, Fecal, Eschericia	300, 250	SP	100 (per test)	None, $Na_2S_2O_3$(chlorinated)	1	48h	-/30h	48h/24h(MISA)
Background	300, 250	SP	100	None, $Na_2S_2O_3$(chlorinated)	1	48h	-/30h	48h
Heterotrophic Plate Count	300, 250	SP	50	None, $Na_2S_2O_3$(chlorinated)	1	48h	-/24h	48h
Fecal Streptococcus	300, 250	SP	100	None, $Na_2S_2O_3$(chlorinated)	1	48h	-/24h	48h
Pseudomonas	300, 250	SP	100	None, $Na_2S_2O_3$(chlorinated)	1	48h	-/24h	48h
Iron Related Bacteria	300, 250	SP	100	None	1	48h	-	-
Chlorophyll-a	1000	AG	1000	None, Wrap in Aluminum Foil	1, in dark	30d	- /30d	-
ORGANICS								
Diquat/Paraquat	1000	P	250	None, $Na_2S_2O_3$(chlorinated)	1	14dpre/20dpost	7dpre/21dpost	20d
Glyphosate	1000	P	50	None, $Na_2S_2O_3$(chlorinated)	1	14d	14d	20d
Glycols	40	GV	40	None	1	7d		
OC Pesticides	1000	AG	1000	None, $Na_2S_2O_3$(chlorinated)	1	10dpre/40dpost	14dpre/30dpost	42d
PAH's	1000	AG	1000 (x2)	None	1	14dpre/40dpost	14dpre/30dpost	35d
PCB's	1000	AG	1000	None, $Na_2S_2O_3$(chlorinated)	1	10dpre/40dpost	14dpre/30dpost	42d
PHC (F1)	40	AGV	40 (x2)	None, $Na_2S_2O_3$(chlorinated), HCl	1	14d	-	7d
PHC (F2-F4)	1000	AG	1000	None	1	14d	-	14dpre/7dpost
Phenols by GC/MS	1000	AG	1000	None	1	7dpre/ 30dpost	14dpre/30dpost	20d/30d(MISA)
SVOC (Acid, Base/Neutral Ext.)	1000	AG	1000 (x2)	None	1	14dpre/40dpost	14dpre/30dpost	30d
VOC's	40	AGV	40 (x2)	None, $Na_2S_2O_3$(chlorinated), HCl	1	7 to 14d	14d/14d	14d, 7to14(MISA)
SUBCONTRACTED PARAMETERS								
Dioxins/Furans	1000	AG	1000	None	1	30d	30d	
Formaldehyde	1000	AG	1000	None	1	7d		
NDMA	1000	AG	1000 (x2)	None	1	10d		10 d
NTA	1000	AG	100	None	1	30d		30 d
Radionuclides (Gross Alpha, Beta and Tritium)	1000	P	1000	None / HNO_3	1	10d / 6m		
Radionuclide (ODWS Table 3)	1000	P	1000 (x3)	None / HNO_3	1	10d / 6m		

Sample Container Codes:

P = Plastic, either HDPE or PETE

G = Glass, GV = Glass Vial

AG = Amber Glass, AGV = Amber Glass Vial,

SP = Sterile Plastic

* Teflon-lined phenate free cap

Storage Conditions Codes:

1 = 4 ± 3°C

2 = Room Temperature (if preserved)

d = days

m = months

Imm = Immediate

Appendix B: Soil Sample Analysis/General

Parameter	Sample Containers		Minimum Volume (mL)	Preservative	Storage Conditions	Holding Times		
	Size (mL)	Type				Caduceon	EPA	MOE
PHC (F2-F4)	180	AGJ	180	None	1	7 d	-	14 d
BTEX/PHC (F1)	100	AGJ	50	None	1	7 d	-	7 d
VOC's	100	AGJ	50	None	1	7 d	14 d	7 to 14 d
Metals (including mercury)	180	AGJ	180	None	2	28 d	28 d	Indefinite
Inorganic General	180	AGJ	180	None	2	see individual	see individual	see individual
Oil & Grease	180	AGJ	180	None	1	28 d	-	-
Nutrients (TOC,TP,TKN)	180	AGJ	180	None	2	28 d	-	-
Anions	180	AGJ	180	None	2	28 d	-	-
Semivolatiles	180	AGJ	180	None	1	see individual	see individual	see individual
Pesticides	180	AGJ	180	None	1	see individual	see individual	see individual

Sample Container Codes:
AGJ = Amber Glass Jar

Storage Conditions Codes:
1 = 4 ± 3°C
2 = Room Temperature

Indefinite = indefinite when dried
individual = individual parameter test method
d = days m = months

Appendix C: Bottles required for Regulatory Ontario Drinking Water Submissions

Parameter	Bottle	Sampling	Storage
THM's	Two - 40 mL VOC amber glass vials, $Na_2S_2O_3$ added	Fill slowly and completely - no air bubbles present	4 ± 3°C
Nitrate and Nitrite	125 mL HDPE, 250 mL HDPE or 500mL PETE, no preservative (4°C)	Grab	4 ± 3°C

Schedule 23: Inorganic Parameters

Parameter	Bottle	Sampling	Storage
Metals Mercury	250 mL HDPE, HNO_3 added $K_2Cr_2O_7 + HNO_3$	No rinsing. Be careful of acid preservative	4 ± 3°C

Schedule 24: Organic Parameters

Parameter	Bottle	Sampling	Storage
VOC's	Two - 40 mL VOC amber glass vials, $Na_2S_2O_3$ added	Fill slowly and completely - no air bubbles present	4 ± 3°C
Pesticides	**2**- 1 L Amber Glass, no preservative – **Pest MS,** **1** - 1 L HDPE, $Na_2S_2O_3$ added - **Diquat, Paraquat & Glyphosate** **2** - 1 L Amber Glass, no preservative – **OC Pesticides**	Grab	4 ± 3°C

Log of Revisions

Date	Rev	Description	Author
05-Nov-02	1.0	-New Document following common format and numbering system for two-site laboratory system	GC/DEP
03-Sep-03	1.1	Updated Document to reflect the changes due to the changes in the ODWS (i.e O. Reg 170/03)	GC
08-Apr-05	1.2	Section 4.0 Added to address specific policies pertaining to the collection and handling of Drinking Water Samples under the Safe Drinking Water Act Appendic C – Number of bottles required for Schedule 24 Pesticides Sampling updated	GC/DEP
22-Nov-07	2.0	Sections 1, 2 & 3 rewritten to encompass company wide policies Appendix C removed as too lab specific Appendices A & B updated Appendix D renamed Appendix C	SB/GC/DEP

Document Review

This document was last reviewed and authorized by:

Laboratory Branch Manager _____ Date _____