CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 04596

REPORT No. B10-18666

Report To:

Hamlet of Clyde River
Box 89
Clyde River, Nunavut, X0A 0E0
Attention: Steven Aipeelee

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa, Ontario, K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 30-Jun-10
DATE REPORTED: 09-Jul-10
SAMPLE MATRIX: Solid Sludge

JOB/PROJECT NO.:
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		Lagoon (Bottom / Floor)			
			Sample I.D.:		B10-18666-1			
			Date Collected:		24-Jun-10			
Parameter	**Units**	**M.D.L.**	**Reference Method**	**Date/Site Analyzed**				
Silver	µg/g	0.2	EPA 6010	02-Jul-10/O	1.1			
Thallium	µg/g	0.1	EPA 6020	05-Jul-10/O	< 0.4			
Vanadium	µg/g	1	EPA 6010	02-Jul-10/O	13			
Zinc	µg/g	1	EPA 6010	02-Jul-10/O	130			
Benzene	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2 [1]			
Bromodichloromethane	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Bromoform	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Bromomethane	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Carbon Tetrachloride	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Chloroform	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dibromochloromethane	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dibromoethane,1,2- (Ethylene Dibromide)	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichlorobenzene,1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichlorobenzene,1,3-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			

Note: NDP = No Distinct Pattern, FO = Fuel Oil #2 Range Organics, HO = Heavy Oil like Pattern.

Gord Murphy
Lab Supervisor

M.D.L. = Method Detection Limit
Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

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Parameter	**Units**	**M.D.L.**	**Reference Method**	**Date/Site Analyzed**				
Dichlorobenzene,1,4-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloroethane,1,1-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloroethane,1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloroethene, 1,1-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloroethene, cis-1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloroethene, trans-1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloromethane (Methylene Chloride)	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloropropane,1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloropropene, cis-1,3-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Dichloropropene, trans-1,3-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Ethylbenzene	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Monochlorobenzene (Chlorobenzene)	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Naphthalene	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			

Note: NDP = No Distinct Pattern, FO = Fuel Oil #2 Range Organics, HO = Heavy Oil like Pattern.

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WATERWORKS NO.

			Client I.D.:		Lagoon (Bottom / Floor)			
			Sample I.D.:		B10-18666-1			
			Date Collected:		24-Jun-10			
Parameter	**Units**	**M.D.L.**	**Reference Method**	**Date/Site Analyzed**				
Styrene	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Tetrachloroethane,1,1,1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Tetrachloroethane,1,1,2,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Tetrachloroethylene	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Toluene	µg/g	0.001	EPA 8260	05-Jul-10/O	9.6			
Trichlorobenzene,1,2,4-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Trichloroethane,1,1,1-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Trichloroethane,1,1,2-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Trichloroethylene	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Vinyl Chloride	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
Xylene, m,p-	µg/g	0.002	EPA 8260	05-Jul-10/O	< 0.4			
Xylene, o-	µg/g	0.001	EPA 8260	05-Jul-10/O	< 0.2			
PHC F1 (C6-C10)	µg/g	10	CWS Tier 1	06-Jul-10/O	20			
PHC F2 (>C10-C16)	µg/g	3	CWS Tier 1	06-Jul-10/O	599			
PHC F3 (>C16-C34)	µg/g	9	CWS Tier 1	06-Jul-10/O	12200			

Note: NDP = No Distinct Pattern, FO = Fuel Oil #2 Range Organics, HO = Heavy Oil like Pattern.

Gord Murphy
Lab Supervisor

M.D.L. = Method Detection Limit
Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

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P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		Lagoon (Bottom / Floor)			
			Sample I.D.:		B10-18666-1			
			Date Collected:		24-Jun-10			
Parameter	**Units**	**M.D.L.**	**Reference Method**	**Date/Site Analyzed**				
PHC F4 (>C34-C50)	µg/g	8	CWS Tier 1	06-Jul-10/O	7540			
Comment-extractable	-		-	06-Jul-10	FO/HO			
Comment-purgeable	-		-	06-Jul-10/O	NDP			

1 Diluted due to sample matrix

Note: NDP = No Distinct Pattern, FO = Fuel Oil #2 Range Organics, HO = Heavy Oil like Pattern.

µg/g = micrograms per gram (parts per million)
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.
Unless otherwise noted all extraction and analysis limits for holding time were met.
QC will be made available upon request.

M.D.L. = Method Detection Limit
Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

Gord Murphy
Lab Supervisor

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e: paracel@paracellabs.com

www.paracellabs.com

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Certificate of Analysis

Trow Associates Inc. (Ottawa)
100-2650 Queensview Dr.
Ottawa, ON K2B 8K2
Attn: Chris Kimmerly

Phone: (613) 225-9940
Fax: (613) 225-7337

Client PO:
Project: OTT-00019055-A0
Custody: 76455

Report Date: 27-Jul-2010
Order Date: 20-Jul-2010
Order #: 1030088

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1030088-01	Clyde River - Lagoon

Approved By: Mark Foto

Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

PARACEL
LABORATORIES LTD.

Order #: 1030088

Certificate of Analysis

Report Date: 27-Jul-2010
Order Date:20-Jul-2010

Client: **Trow Associates Inc. (Ottawa)**
Client PO:

Project Description: OTT-00019055-A0

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
CCME PHC F1	CWS Tier 1 - P&T GC-FID	21-Jul-10	23-Jul-10
CCME PHC F2 - F4	CWS Tier 1 - GC-FID, extraction	21-Jul-10	27-Jul-10
Solids, %	Gravimetric, calculation	21-Jul-10	21-Jul-10

PARACEL
LABORATORIES LTD.

Order #: 1030088

Certificate of Analysis

Report Date: 27-Jul-201(
Order Date:20-Jul-201(

Client: **Trow Associates Inc. (Ottawa)**
Client PO:

Project Description: OTT-00019055-A0

	Client ID:	Clyde River - Lagoon	-	-	-
	Sample Date:	24-Jun-10	-	-	-
	Sample ID:	1030088-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	22.1	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	10 ug/g dry	<10 [1]	-	-	-
F2 PHCs (C10-C16)	10 ug/g dry	13 [2] [3]	-	-	-
F3 PHCs (C16-C34)	10 ug/g dry	856 [2] [3]	-	-	-
F4 PHCs (C34-C50)	10 ug/g dry	299 [2] [3]	-	-	-

PARACEL
LABORATORIES LTD.

Order #: 1030088

Certificate of Analysis

Report Date: 27-Jul-2010
Order Date:20-Jul-2010

Client: **Trow Associates Inc. (Ottawa)**
Client PO:

Project Description: OTT-00019055-A0

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	10	ug/g						
F2 PHCs (C10-C16)	ND	10	ug/g						
F3 PHCs (C16-C34)	ND	10	ug/g						
F4 PHCs (C34-C50)	ND	10	ug/g						

PARACEL LABORATORIES LTD.

Order #: 1030088

Certificate of Analysis

Report Date: 27-Jul-2010
Order Date:20-Jul-2010

Client: **Trow Associates Inc. (Ottawa)**
Client PO:

Project Description: OTT-00019055-A0

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	29	10	ug/g dry	ND				32	QR-01
F2 PHCs (C10-C16)	104	10	ug/g dry	192			59.1	50	QR-01
F3 PHCs (C16-C34)	267	10	ug/g dry	287			7.4	50	
F4 PHCs (C34-C50)	31	10	ug/g dry	14			73.7	50	QR-01
Physical Characteristics									
% Solids	85.1	0.1	% by Wt.	85.7			0.6	25	

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Order #: 1030088

Certificate of Analysis

Report Date: 27-Jul-2010
Order Date:20-Jul-2010

Client: **Trow Associates Inc. (Ottawa)**
Client PO:

Project Description: OTT-00019055-A0

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	104	10	ug/g	ND	104	80-120			
F2 PHCs (C10-C16)	61	10	ug/g	ND	76.0	61-129			
F3 PHCs (C16-C34)	176	10	ug/g	ND	88.0	61-129			
F4 PHCs (C34-C50)	96	10	ug/g	ND	80.0	61-129			

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Order #: 1030088

Certificate of Analysis

Report Date: 27-Jul-201(
Order Date:20-Jul-201(

Client: **Trow Associates Inc. (Ottawa)**
Client PO:

Project Description: OTT-00019055-A0

Sample and QC Qualifiers Notes

1- H-01 : Holding time had been exceeded upon sample receipt.

2- ORG11 : High non-mineral organic content in sample. Additional silica gel cleanup performed, however, results may be biased high.

3- PHC01 : Moisture content >50%, sample air dried prior to extraction.

4- QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

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Chain of Custody

(lab use only)

Nº 76455

Page 1 of 1

Reg. Drinking Water

Client Name: Trow Associates Inc.	Project Ref: OTT-00019055-A0	Waterworks Name:	Sample Taken by:
Contact Name: Mark Devlin / Chris Kimmerly	Quote #	Waterworks Number:	Print Name:
Address:	PO #	Address:	Signature:
	E-mail Address:	After hours Contact:	TAT: [ ] 1-day [ ] 2-day [✓] Reg.
Telephone:	Fax:	Public Health Unit:	

Matrix Types: S–Soil/Sed. GW–Ground Water SW–Surface Water SS–Storm/Sanitary Sewer DW-Drinking Water RDW-Regulated Drinking Water P- Paint A-Air O-Other

Samples submitted under: (Indicate **ONLY** one)
[ ] O. Reg 153 (511) Table ___ [ ] O. Reg 170/03 [ ] O. Reg 318/08 [ ] Private well
[✓] CCME ____ [ ] O. Reg 243/07 [ ] O. Reg 319/08 [ ] Other: ____

Type of DW Sample: R = Raw; T = Treated; D = Distribution
Location Types: S = Surface Water; G = Ground Water

Paracel Order Number: 1030088

	Sample ID / Location Name	Matrix	Air Volume	Type of Sample	# of Containers	Sample Taken: Date	Sample Taken: Time	Free / Combined Chlorine Residual mg/L	Required Analyses: PHC (F1-F4)
1	Clyde River - Lagoon	SED		R	1	June 24/10			X
2									
3									
4									
5									
6									
7									
8									
9									
10									

Comments: Analysis dispite holding time ; container, Not labelled call Clyde River - Lagoon

Preservation Verification: pH _____ Temperature: ____
Verified by: _____

Relinquished By (Print & Sign): Mark Devlin / Mark Devlin

Date/Time: July 20, 2010 / 5:31pm

Lab Use Only:

Received By Driver/Depot:	Received at Lab:	Verified By:
Date/Time:	Date/Time: 20-July-10 5:31PM	Date/Time: July 20/10 18:21

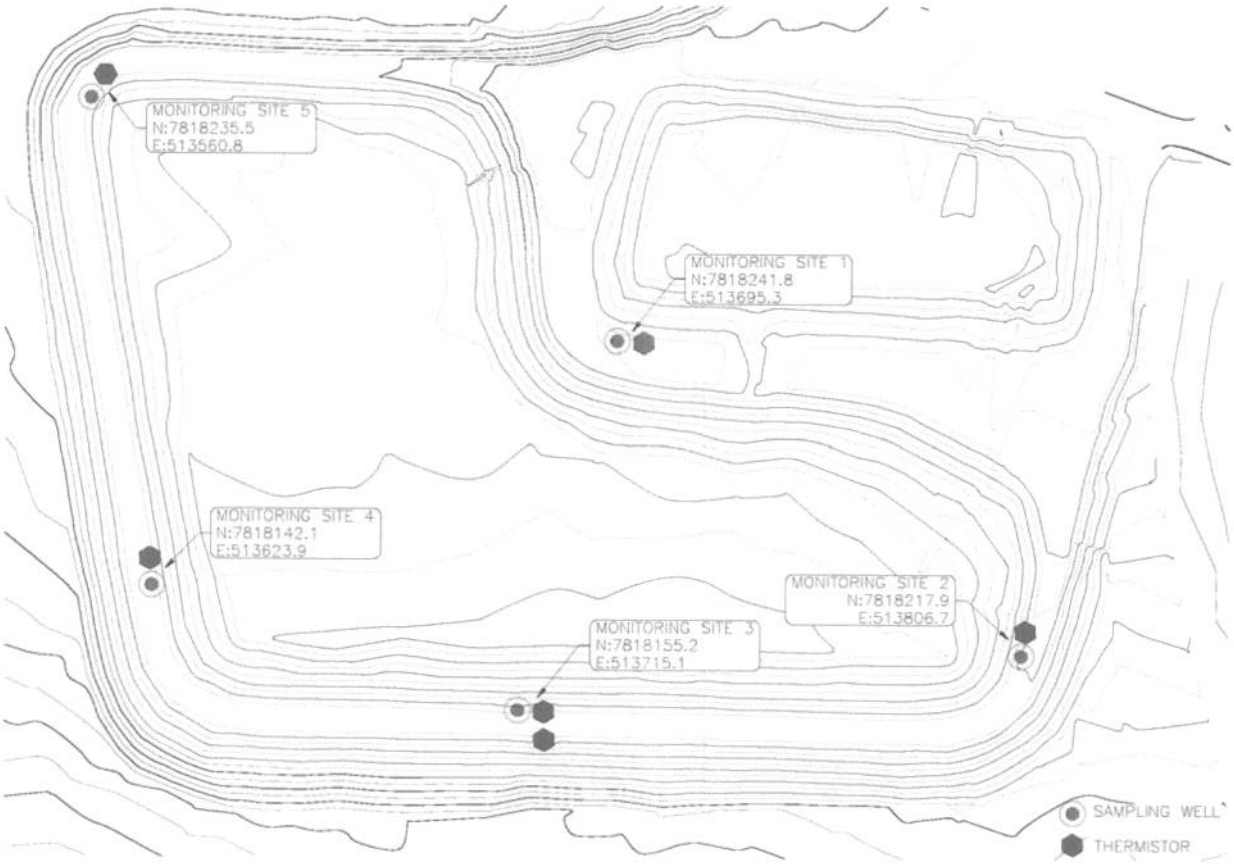
APPENDIX-C

LAB SUPPORTED LETTER FOR QA/QC

APPENDIX-D

LOCATION PLAN FOR MONITORING LOCATIONS

Figure 2 - Monitoring Site Locations



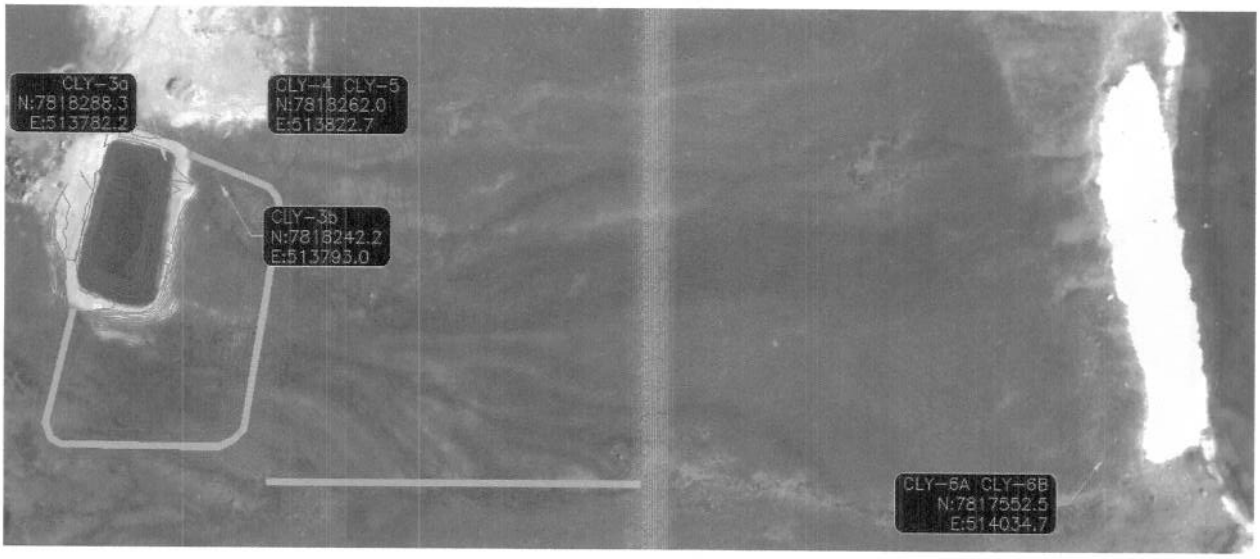
3.3 Sludge Management

It is anticipated that the sewage lagoon will not require desludging during its 20 year design life, the available storage for sludge is greater than the quantity estimated to be generated.

Effluent quality will guide when a sludge management program is implemented. Monitoring of the effluent from the lagoon will indicate when the performance of the lagoon starts to degrade. Degradation of the performance of a lagoon is normally caused by sludge accumulation and will be the indicator to desludge the lagoon.

Prior to disposal, the sludge must be tested to ensure the disposal method chosen is safe and environmentally responsible.

Figure 4 - Sampling Points



4.4 Sampling Parameters

Samples should be analyzed for the following parameters:

Biochemical Oxygen Demand – BOD_5	Faecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease (visual)	Total Phenols
Magnesium	Calcium
Sodium	Potassium
Chloride	Sulphate
Total Hardness	Total Alkalinity
Ammonia Nitrogen	Total Zinc
Total Cadmium	Total Iron
Total Cobalt	Total Manganese
Total Chromium	Total Nickel
Total Copper	Total Lead
Total Aluminum	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)q