

DownUnder Geotechnical Limited

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July 11, 2018
Ref. No. D17105D1

Public Works and Government Services Canada - Ontario Region
Real Property Branch
4900 Yonge Street, 11th Floor
Toronto, Ontario
M2N 6A6

**Attention: Mr. Dave Ness, P.Eng.
Project Manager, Parks Canada Infrastructure**

**Re: Sediment Sampling, Locks 39 to 41
Parks Canada Infrastructure, Trent-Severn Waterway
Kirkfield Bundle, Project No. R.076951.050**

Downunder Geotechnical Limited was retained by Public Works and Government Services Canada (PWGSC) to carry out sediment sampling at Locks 39, 40 and 41. Locks 39 and 40 are located east of Gamebridge. Lock 41 is located southwest of Gamebridge adjacent to Regional Road 50. The lock locations are presented in Figure No. 1.

Authorization to proceed with this investigation was provided by PWGSC under Call-up No. EQ754-131106/002/PWL, dated January 30, 2017. The work carried out for this investigation was completed in general accordance with Downunder Geotechnical's proposal dated January 23, 2017(revised) and the PWGSC Project Brief dated December 15, 2016.

This report was prepared with the assumption that the design will be in accordance with all applicable standards and codes, regulations, and good engineering practice will be exercised. Further, the recommendations and opinions in this report are applicable only to the proposed project as described above.

Any questions concerning the geotechnical aspects of the proposed project should be directed to Downunder Geotechnical Limited for further elaboration and/or clarification.

Environmental Soil Sampling

Soil samples were obtained by manual sampling of the base of the canal at Locks 39, 40 and 41 on April 21, 2017. The base of the locks were either water filled or no sediment was present within the locks. Samples were obtained downstream of Lock 39 and upstream of Locks 40 and 41. Sample locations and photographs of the site are presented in Appendix A.

Soil sampling was carried out under the direction of an experienced geotechnical technician from Downunder Geotechnical. The technician followed strict sample handling practices, including the changing of disposable nitrile gloves between samples to ensure the integrity of the samples collected. All soil samples selected for analytical analyses

were placed in laboratory prepared containers and stored in a cooler packed with ice packs. The samples were delivered and submitted to Caduceon Environmental Laboratories in Richmond Hill, Ontario, which is an accredited laboratory from the Canadian Association for Laboratory Accreditation.

Selected soil samples were submitted for the following analysis:

- Petroleum hydrocarbon fractions (PHC F1 – F4);
- Volatile Organic Compounds (VOCs);
- O. Reg. 153/04 Inorganics and Metals;
- Polycyclic Aromatic Hydrocarbons;
- Organochlorine Pesticides; and,
- Poly-Chlorinated Biphenyls.

Soil samples were submitted for testing in accordance with Ontario Regulation 347 (as amended by 558/00) Schedule 4 waste classification protocol, which includes leachate concentrations for 88 parameters.

The results are presented in Appendix B.

Results

The results have been compared to the Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOECC Standards, 2011) for residential/parkland/institutional/industrial/commercial/community property use (Table 8) and Table 1 for disposal options. Table 8 has been used as the site is within 30m from a water body and the area is in a potable groundwater condition.

The results meet Tables 1 and 8 MOECC Standards and are presented in Appendix B.

Samples were also submitted for with Ontario Regulation 347 (as amended by 558/00) Schedule 4 waste classification protocol, which includes leachate concentrations for 88 parameters. The results meet Schedule 4 criteria and are presented in Appendix B.

Based on the test results obtained excess soil may be disposed off-site at a licensed MOECC landfill as non-impacted, non-hazardous waste, or at another Table 1 site that will accept the sediment.

Closure

The attached Report Limitations are an integral part of this report.

Sincerely,



Andrew Drevininkas, P. Eng.

A handwritten signature in black ink that reads "Geoffrey Creer".

Geoffrey Creer, P.Eng.

DownUnder Geotechnical Limited

REPORT LIMITATIONS

The conclusions and recommendations given in this report are based on information determined at the sample locations. Subsurface conditions beyond the sample locations may differ from those encountered at the sample locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation.

This report was prepared for PWGSC and its agents. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Downunder Geotechnical Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

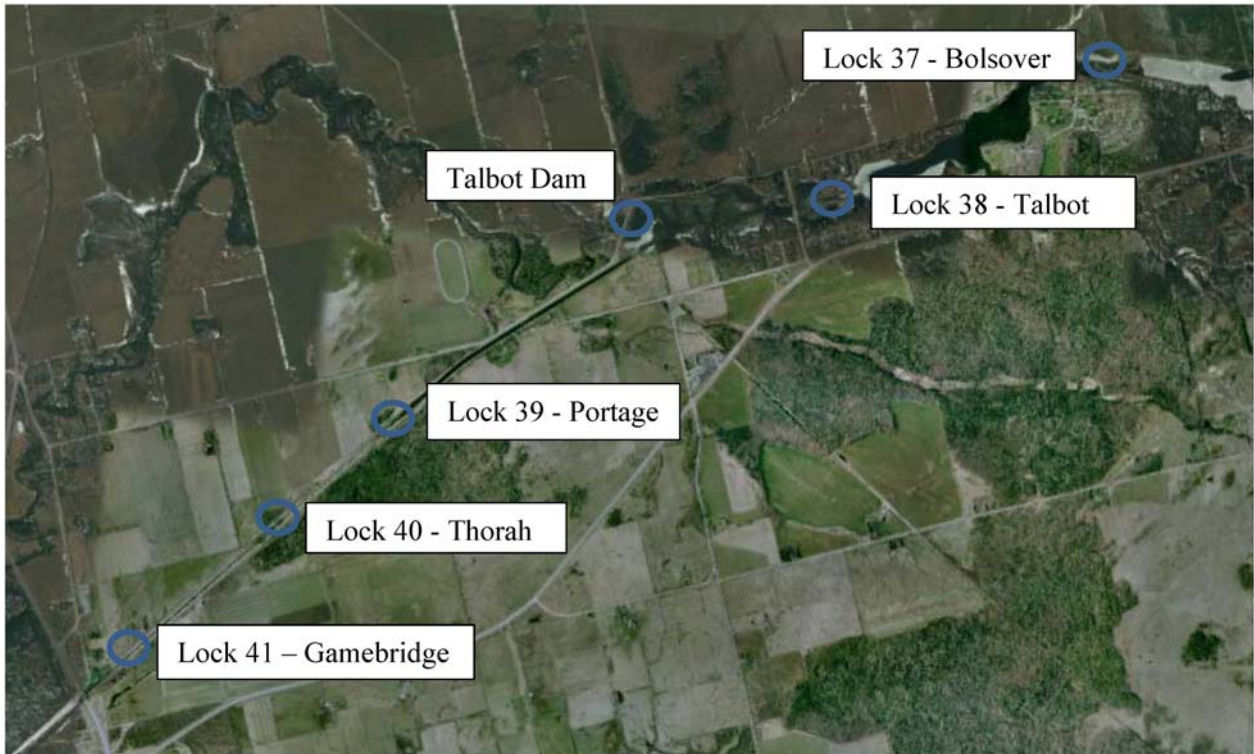


Figure No.1
Location of Locks 39 to 41

APPENDIX A

LOCK 39



Approximate sample location downstream of Lock 39.



Sample location downstream of Lock 39.

LOCK 40



Approximate
sample location
upstream of
Lock 40.



Sample location upstream of
Lock 40.



Lock 40 water filled base
inaccessible and no sediment
accumulation.

LOCK 41



Approximate
sample location
upstream of
Lock 41.



Sample location upstream of
Lock 41.



Lock 41 water filled base
inaccessible.

APPENDIX B

Dichlorophenol, 2,4-	EPA 8270	25-Apr-17/K	0.1 µg/g	0.1 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Diethyl Phthalate	EPA 8270	25-Apr-17/K	0.5 µg/g	0.5 µg/g	0.1	µg/g	< 0.5	< 0.5	< 0.5
Dimethyl Phthalate	EPA 8270	25-Apr-17/K	0.5 µg/g	0.5 µg/g	0.1	µg/g	< 0.5	< 0.5	< 0.5
Dimethylphenol, 2,4-	EPA 8270	25-Apr-17/K	0.2 µg/g	0.2 µg/g	0.1	µg/g	< 0.5	< 0.5	< 0.6
Dinitrophenol, 2,4-	EPA 8270	25-Apr-17/K	2 µg/g	2 µg/g	0.1	µg/g	< 0.5	< 0.5	< 0.6
Dinitrotoluene, 2,4-	EPA 8270	25-Apr-17/K	0.5 µg/g	0.5 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Dinitrotoluene, 2,6-	EPA 8270	25-Apr-17/K	0.5 µg/g	0.5 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Fluoranthene	EPA 8270	25-Apr-17/K	0.56 µg/g	0.69 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Fluorene	EPA 8270	25-Apr-17/K	0.12 µg/g	0.19 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	EPA 8270	25-Apr-17/K	0.23 µg/g	0.23 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Methylnaphthalene,1-	EPA 8270	25-Apr-17/K	0.59 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Methylnaphthalene,2-	EPA 8270	25-Apr-17/K	0.59 µg/g	0.59 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Methylnaphthalene 2-(1-)	EPA 8270	25-Apr-17/K	0.59 µg/g	0.59 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Naphthalene	EPA 8270	25-Apr-17/K	0.09 µg/g	0.09 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Pentachlorophenol	EPA 8270	25-Apr-17/K	0.1 µg/g	0.1 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Phenanthrene	EPA 8270	25-Apr-17/K	0.69 µg/g	0.69 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Phenol	EPA 8270	25-Apr-17/K	0.5 µg/g	0.5 µg/g	0.01	µg/g	< 0.05	< 0.05	< 0.06
Pyrene	EPA 8270	25-Apr-17/K	1 µg/g	1 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Trichlorobenzene,1,2,4-	EPA 8270	25-Apr-17/K	0.05 µg/g	0.05 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Trichlorophenol, 2,4,5-	EPA 8270	25-Apr-17/K	0.1 µg/g	0.1 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Trichlorophenol 2,4,6-	EPA 8270	25-Apr-17/K	0.1 µg/g	0.1 µg/g	0.02	µg/g	< 0.09	< 0.1	< 0.1
Aldrin	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Chlordane (alpha)	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
Chlordane (Gamma)	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
Chlordane Total (alpha+gamma)	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
DDD, 2,4-	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
DDD, 4,4-	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
DDD Total	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
DDE, 2,4-	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
DDE, 4,4-	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
DDE Total	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
DDT, 2,4-	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
DDT, 4,4-	EPA 8080	27-Apr-17/K			0.05	µg/g	< 0.05	< 0.05	< 0.05
DDT Total	EPA 8080	27-Apr-17/K	1.4 µg/g	1.4 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Dieldrin	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Lindane (Hexachlorocyclohexane, Gamma)	EPA 8080	27-Apr-17/K	0.01 µg/g	0.01 µg/g	0.01	µg/g	< 0.01	< 0.01	< 0.01
Endosulfan I	EPA 8080	27-Apr-17/K			0.04	µg/g	< 0.04	< 0.04	< 0.04
Endosulfan II	EPA 8080	27-Apr-17/K			0.04	µg/g	< 0.04	< 0.04	< 0.04
Endosulfan I/II	EPA 8080	27-Apr-17/K	0.04 µg/g	0.04 µg/g	0.04	µg/g	< 0.04	< 0.04	< 0.04
Endrin	EPA 8080	27-Apr-17/K	0.04 µg/g	0.04 µg/g	0.04	µg/g	< 0.04	< 0.04	< 0.04
Heptachlor	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Heptachlor Epoxide	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	EPA 8080	27-Apr-17/K	0.01 µg/g	0.02 µg/g	0.01	µg/g	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	EPA 8080	27-Apr-17/K	0.01 µg/g	0.01 µg/g	0.01	µg/g	< 0.01	< 0.01	< 0.01
Hexachloroethane	EPA 8080	27-Apr-17/K	0.01 µg/g	0.01 µg/g	0.01	µg/g	< 0.01	< 0.01	< 0.01
Methoxychlor	EPA 8080	27-Apr-17/K	0.05 µg/g	0.05 µg/g	0.05	µg/g	< 0.05	< 0.05	< 0.05
Poly-Chlorinated Biphenyls (PCB's)	EPA 8080	27-Apr-17/K	0.3 µg/g	0.3 µg/g	0.3	µg/g	< 0.3	< 0.3	< 0.3

M.D.L. = Method Detection Limit

C.O.C.: ---

REPORT No. B17-10294 (i)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway
 D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		Lock 39	Lock 40	Lock 41	
			Reference Method	Date/Site Analyzed	B17-10294-1	B17-10294-2	B17-10294-3	
pH @25°C	pH Units		MOEE 3137	26-Apr-17/R	6.99	7.57	7.13	
Conductivity @25°C	mS/cm	0.07	MOEE3138	26-Apr-17/R	0.26	0.17	0.44	
Cyanide (Free)	µg/g	0.05	SM4500CN	25-Apr-17/R	< 0.05	< 0.05	< 0.05	
Sodium Adsorption Ratio	units		SM 3120	27-Apr-17/O	0.339	0.180	0.175	
Antimony	µg/g	0.4	EPA 200.8	26-Apr-17/R	< 0.4	< 0.4	< 0.4	
Arsenic	µg/g	0.5	EPA 200.8	26-Apr-17/R	0.9	0.7	1.1	
Barium	µg/g	0.4	EPA 200.8	26-Apr-17/R	76.3	77.4	92.8	
Beryllium	µg/g	0.05	EPA 200.8	26-Apr-17/R	0.24	0.35	0.43	
Boron	µg/g	0.5	EPA 200.8	26-Apr-17/R	7.7	6.0	6.1	
Cadmium	µg/g	0.03	EPA 200.8	26-Apr-17/R	0.07	0.17	0.17	
Chromium	µg/g	0.4	EPA 200.8	26-Apr-17/R	15.7	18.8	19.2	
Chromium (VI)	µg/g	0.5	EPA3060A	25-Apr-17/R	< 0.5	< 0.5	< 0.5	
Cobalt	µg/g	0.2	EPA 200.8	26-Apr-17/R	3.2	5.3	5.1	
Copper	µg/g	0.4	EPA 200.8	26-Apr-17/R	11.0	11.1	14.6	
Lead	µg/g	0.1	EPA 200.8	26-Apr-17/R	8.7	32.2	22.2	
Mercury	µg/g	0.005	EPA7471A	27-Apr-17/R	0.007	0.016	0.015	
Molybdenum	µg/g	0.1	EPA 200.8	26-Apr-17/R	0.3	0.2	0.2	

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

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 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	Lock 39	Lock 40	Lock 41	
					Sample I.D.	Date Collected			
Nickel	µg/g	0.4	EPA 200.8	26-Apr-17/R	B17-10294-1	20-Apr-17	8.0	10.2	10.3
Selenium	µg/g	0.1	EPA 200.8	26-Apr-17/R	B17-10294-2	20-Apr-17	0.4	0.4	0.4
Silver	µg/g	0.01	EPA 200.8	26-Apr-17/R	B17-10294-3	20-Apr-17	0.03	0.02	0.02
Thallium	µg/g	0.02	EPA 200.8	26-Apr-17/R			0.07	0.08	0.09
Uranium	µg/g	0.02	EPA 200.8	26-Apr-17/R			0.82	0.51	0.38
Vanadium	µg/g	0.8	EPA 200.8	26-Apr-17/R			26.6	31.6	25.5
Zinc	µg/g	30	EPA 200.8	26-Apr-17/R			40	100	130

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph 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.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
 QC will be made available upon request.



Christine Burke
 Lab Manager

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REPORT No. B17-10294 (ii)

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Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway
 D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	Lock 39	Lock 40	Lock 41
					Sample I.D.	20-Apr-17	20-Apr-17	20-Apr-17
Acetone	µg/g	0.5	EPA 8260	25-Apr-17/R	B17-10294-1	B17-10294-2	B17-10294-3	
Benzene	µg/g	0.02	EPA 8260	25-Apr-17/R				
Bromodichloromethane	µg/g	0.02	EPA 8260	25-Apr-17/R				
Bromoform	µg/g	0.02	EPA 8260	25-Apr-17/R				
Bromomethane	µg/g	0.05	EPA 8260	25-Apr-17/R				
Carbon Tetrachloride	µg/g	0.05	EPA 8260	25-Apr-17/R				
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	EPA 8260	25-Apr-17/R				
Chloroform	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dibromochloromethane	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichlorobenzene, 1,2-	µg/g	0.05	EPA 8260	25-Apr-17/R				
Dichlorobenzene, 1,3-	µg/g	0.05	EPA 8260	25-Apr-17/R				
Dichlorobenzene, 1,4-	µg/g	0.05	EPA 8260	25-Apr-17/R				
Dichlorodifluoromethane	µg/g	0.05	EPA 8260	25-Apr-17/R				
Dichloroethane, 1,1-	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichloroethane, 1,2-	µg/g	0.02	EPA 8260	25-Apr-17/R				

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

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P.O. NUMBER: Waterway
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WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	Lock 39	Lock 40	Lock 41
					Sample I.D.	20-Apr-17	20-Apr-17	20-Apr-17
Dichloroethylene,1,1-	µg/g	0.02	EPA 8260	25-Apr-17/R	B17-10294-1	B17-10294-2	B17-10294-3	
Dichloroethene, cis-1,2-	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichloroethene, trans-1,2-	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichloropropane,1,2-	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichloropropene, cis-1,3-	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichloropropene, trans-1,3-	µg/g	0.02	EPA 8260	25-Apr-17/R				
Dichloropropene 1,3-cis+trans	µg/g	0.02	EPA 8260	25-Apr-17/R				
Ethylbenzene	µg/g	0.05	EPA 8260	25-Apr-17/R				
Dibromoethane,1,2-(Ethylene Dibromide)	µg/g	0.02	EPA 8260	25-Apr-17/R				
Hexane	µg/g	0.02	EPA 8260	25-Apr-17/R				
Methyl Ethyl Ketone	µg/g	0.5	EPA 8260	25-Apr-17/R				
Methyl Isobutyl Ketone	µg/g	0.5	EPA 8260	25-Apr-17/R				
Methyl-t-butyl Ether	µg/g	0.05	EPA 8260	25-Apr-17/R				
Dichloromethane (Methylene Chloride)	µg/g	0.05	EPA 8260	25-Apr-17/R				

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					Sample I.D.	20-Apr-17	20-Apr-17	20-Apr-17
Styrene	µg/g	0.05	EPA 8260	25-Apr-17/R	B17-10294-1	< 0.05	< 0.05	< 0.05
Tetrachloroethane,1,1,1,2-	µg/g	0.02	EPA 8260	25-Apr-17/R	B17-10294-2	< 0.02	< 0.02	< 0.02
Tetrachloroethane,1,1,2,2-	µg/g	0.05	EPA 8260	25-Apr-17/R	B17-10294-3	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	EPA 8260	25-Apr-17/R		< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.2	EPA 8260	25-Apr-17/R		< 0.2	< 0.2	< 0.2
Trichloroethane,1,1,1-	µg/g	0.02	EPA 8260	25-Apr-17/R		< 0.02	< 0.02	< 0.02
Trichloroethane,1,1,2-	µg/g	0.02	EPA 8260	25-Apr-17/R		< 0.02	< 0.02	< 0.02
Trichloroethylene	µg/g	0.05	EPA 8260	25-Apr-17/R		< 0.05	< 0.05	< 0.05
Trichlorofluoromethane	µg/g	0.02	EPA 8260	25-Apr-17/R		< 0.02	< 0.02	< 0.02
Vinyl Chloride	µg/g	0.02	EPA 8260	25-Apr-17/R		< 0.02	< 0.02	< 0.02
Xylene, m,p-	µg/g	0.03	EPA 8260	25-Apr-17/R		< 0.03	< 0.03	< 0.03
Xylene, o-	µg/g	0.03	EPA 8260	25-Apr-17/R		< 0.03	< 0.03	< 0.03
Xylene, m,p,o-	µg/g	0.03	EPA 8260	25-Apr-17/R		< 0.03	< 0.03	< 0.03
PHC F1 (C6-C10)	µg/g	10	CWS Tier 1	25-Apr-17/R		< 10	< 10	< 20
PHC F2 (>C10-C16)	µg/g	5	CWS Tier 1	25-Apr-17/K		< 6	< 6	< 7
PHC F3 (>C16-C34)	µg/g	10	CWS Tier 1	25-Apr-17/K		37	64	111

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: ---

REPORT No. B17-10294 (ii)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway
 P.O. NUMBER: D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	Lock 39	Lock 40	Lock 41	
					Sample I.D.	Date Collected			
PHC F4 (>C34-C50)	µg/g	10	CWS Tier 1	25-Apr-17/K	B17-10294-1	20-Apr-17	10	30	59
% moisture	%			25-Apr-17/R	B17-10294-2	20-Apr-17	28.9	34.1	45.9
					B17-10294-3	20-Apr-17			

1 Elevated RL due to moisture content

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph 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.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC

QC will be made available upon request.



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: ---

REPORT No. B17-10294 (iii)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway
 D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		Lock 39	Lock 40	Lock 41	
			Reference Method	Date/Site Analyzed	B17-10294-1	B17-10294-2	B17-10294-3	
Acenaphthene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Acenaphthylene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Anthracene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Benzo(g,h,i)perylene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Biphenyl, 1, 1-	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Bis(2-Chloroethyl)ether	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Bis(2-Chloroisopropyl)ether	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Bis(2-ethylhexyl) Phthalate	µg/g	0.5	EPA 8270	25-Apr-17/K	< 2	< 3	< 3	
Chloroaniline, 4-	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Chlorophenol, 2-	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Chrysene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Dibenzo(a,h)anthracene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Dichlorobenzidine, 3,3'-	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.2	< 0.3	< 0.3	

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

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C.O.C.: ---

REPORT No. B17-10294 (iii)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway D17105C

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10294-1	B17-10294-2	B17-10294-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Dichlorophenol, 2,4-	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Diethyl Phthalate	µg/g	0.1	EPA 8270	25-Apr-17/K	< 0.5	< 0.5	< 0.5	
Dimethyl Phthalate	µg/g	0.1	EPA 8270	25-Apr-17/K	< 0.5	< 0.5	< 0.5	
Dimethylphenol, 2,4-	µg/g	0.1	EPA 8270	25-Apr-17/K	< 0.5	< 0.5	< 0.6	
Dinitrophenol, 2,4-	µg/g	0.1	EPA 8270	25-Apr-17/K	< 0.5	< 0.5	< 0.6	
Dinitrotoluene, 2,4-	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Dinitrotoluene, 2,6-	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Fluoranthene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Fluorene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Methylnaphthalene,1-	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Methylnaphthalene,2-	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Methylnaphthalene 2-(1-)	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Naphthalene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Pentachlorophenol	µg/g	0.02	EPA 8270	25-Apr-17/K	< 0.09	< 0.1	< 0.1	
Phenanthrene	µg/g	0.05	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.05	
Phenol	µg/g	0.01	EPA 8270	25-Apr-17/K	< 0.05	< 0.05	< 0.06	

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

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C.O.C.: ---

REPORT No. B17-10294 (iii)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	Lock 39	Lock 40	Lock 41
					Sample I.D.	Date Collected		
Pyrene	µg/g	0.05	EPA 8270	25-Apr-17/K	B17-10294-1	20-Apr-17	20-Apr-17	20-Apr-17
Trichlorobenzene,1,2,4-	µg/g	0.02	EPA 8270	25-Apr-17/K	B17-10294-2	< 0.05	< 0.05	< 0.05
Trichlorophenol, 2,4,5-	µg/g	0.02	EPA 8270	25-Apr-17/K	B17-10294-3	< 0.09	< 0.1	< 0.1
Trichlorophenol 2,4,6-	µg/g	0.02	EPA 8270	25-Apr-17/K		< 0.09	< 0.1	< 0.1

1 Elevated RL due to moisture content

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph 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.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC

requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC

QC will be made available upon request.



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: ---

REPORT No. B17-10294 (iv)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway
 D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		Lock 39	Lock 40	Lock 41	
			Reference Method	Date/Site Analyzed	B17-10294-1	B17-10294-2	B17-10294-3	
Aldrin	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Chlordane (alpha)	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Chlordane (Gamma)	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Chlordane Total (alpha+gamma)	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDD, 2,4-	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDD, 4,4-	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDD Total	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDE, 2,4-	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDE, 4,4-	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDE Total	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDT, 2,4-	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDT, 4,4-	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
DDT Total	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Diieldrin	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request



Christine Burke
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: ---

REPORT No. B17-10294 (iv)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 03-May-17

SAMPLE MATRIX: Soil

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn

P.O. NUMBER: Waterway
 D17105C

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		Lock 39	Lock 40	Lock 41	
			Reference Method	Date/Site Analyzed	B17-10294-1	B17-10294-2	B17-10294-3	
Lindane (Hexachlorocyclohexane, Gamma)	µg/g	0.01	EPA 8080	27-Apr-17/K	< 0.01	< 0.01	< 0.01	
Endosulfan I	µg/g	0.04	EPA 8080	27-Apr-17/K	< 0.04	< 0.04	< 0.04	
Endosulfan II	µg/g	0.04	EPA 8080	27-Apr-17/K	< 0.04	< 0.04	< 0.04	
Endosulfan I/II	µg/g	0.04	EPA 8080	27-Apr-17/K	< 0.04	< 0.04	< 0.04	
Endrin	µg/g	0.04	EPA 8080	27-Apr-17/K	< 0.04	< 0.04	< 0.04	
Heptachlor	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Heptachlor Epoxide	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Hexachlorobenzene	µg/g	0.01	EPA 8080	27-Apr-17/K	< 0.01	< 0.01	< 0.01	
Hexachlorobutadiene	µg/g	0.01	EPA 8080	27-Apr-17/K	< 0.01	< 0.01	< 0.01	
Hexachloroethane	µg/g	0.01	EPA 8080	27-Apr-17/K	< 0.01	< 0.01	< 0.01	
Methoxychlor	µg/g	0.05	EPA 8080	27-Apr-17/K	< 0.05	< 0.05	< 0.05	
Poly-Chlorinated Biphenyls (PCB's)	µg/g	0.3	EPA 8080	27-Apr-17/K	< 0.3	< 0.3	< 0.3	

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph 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.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC

requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the

greater of the two numbers are to be used in application to the

CWS PHC

QC will be made available upon request.



Christine Burke
 Lab Manager

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C.O.C.: ---

REPORT No. B17-10305 (i)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 P.O. NUMBER: D17105C

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Flashpoint	°C	20.0	ASTM D93	01-May-17/O	> 65.0	> 65.0	> 65.0	
Cyanide (Free)	mg/L	0.005	SM 4500CN	27-Apr-17/K	< 0.005	< 0.005	< 0.005	
Fluoride	mg/L	0.1	SM 4500FD	26-Apr-17/K	< 0.1	< 0.1	0.2	
Nitrite (N)	mg/L	0.1	SM4110C	26-Apr-17/O	< 1	< 1	< 1	
Nitrate (N)	mg/L	0.1	SM4110C	26-Apr-17/O	< 1	< 1	< 1	
Nitrate + Nitrite (N)	mg/L	0.1	SM4110C	26-Apr-17/O	< 1	< 1	< 1	
Arsenic	mg/L	0.02	EPA 1311	26-Apr-17/R	< 0.02	< 0.02	< 0.02	
Barium	mg/L	0.05	EPA 1311	26-Apr-17/R	0.78	0.99	0.88	
Boron	mg/L	0.03	EPA 1311	26-Apr-17/R	< 0.03	< 0.03	< 0.03	
Cadmium	mg/L	0.01	EPA 1311	26-Apr-17/R	< 0.01	< 0.01	< 0.01	
Chromium	mg/L	0.04	EPA 1311	26-Apr-17/R	< 0.04	< 0.04	< 0.04	
Lead	mg/L	0.02	EPA 1311	26-Apr-17/R	< 0.02	< 0.02	< 0.02	
Mercury	mg/L	0.0005	EPA1311	26-Apr-17/R	< 0.005	< 0.005	< 0.005	
Selenium	mg/L	0.03	EPA 1311	26-Apr-17/R	< 0.03	< 0.03	< 0.03	
Silver	mg/L	0.01	EPA 1311	26-Apr-17/R	< 0.01	< 0.01	< 0.01	
Uranium	mg/L	0.02	EPA 1311	26-Apr-17/R	< 0.02	< 0.02	< 0.02	



Christine Burke
 Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

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C.O.C.: ---

REPORT No. B17-10305 (ii)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14

Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 D17105C

P.O. NUMBER:

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Benzene	µg/L	0.5	EPA 8260	26-Apr-17/O	< 5	< 5	< 5	
Carbon Tetrachloride	µg/L	0.2	EPA 8260	26-Apr-17/O	< 2	< 2	< 2	
Monochlorobenzene (Chlorobenzene)	µg/L	0.2	EPA 8260	26-Apr-17/O	< 2	< 2	< 2	
Chloroform	µg/L	0.3	EPA 8260	26-Apr-17/O	< 3	< 3	< 3	
Dichlorobenzene, 1,2-	µg/L	0.1	EPA 8260	26-Apr-17/O	< 1	< 1	< 1	
Dichlorobenzene, 1,4-	µg/L	0.2	EPA 8260	26-Apr-17/O	< 2	< 2	< 2	
Dichloroethane, 1,2-	µg/L	0.1	EPA 8260	26-Apr-17/O	< 1	< 1	< 1	
Dichloroethene, 1,1-	µg/L	0.1	EPA 8260	26-Apr-17/O	< 1	< 1	< 1	
Dichloromethane (Methylene Chloride)	µg/L	0.3	EPA 8260	26-Apr-17/O	< 3	< 3	< 3	
Methyl Ethyl Ketone	µg/L	1	EPA 8260	26-Apr-17/O	< 10	< 10	< 10	
Tetrachloroethylene	µg/L	0.2	EPA 8260	26-Apr-17/O	< 2	< 2	< 2	
Trichloroethylene	µg/L	0.1	EPA 8260	26-Apr-17/O	< 1	< 1	< 1	
Vinyl Chloride	µg/L	0.2	EPA 8260	26-Apr-17/O	< 2	< 2	< 2	



Christine Burke
 Lab Manager

R.L. = Reporting Limit

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Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

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C.O.C.: ---

REPORT No. B17-10305 (iii)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 P.O. NUMBER: D17105C

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Benzo(a)pyrene	mg/L	0.0005	EPA 8270	01-May-17/K	< 0.0005	< 0.0005	< 0.0005	
Cresol, m,p,o-	mg/L	0.01	EPA 8270	01-May-17/K	< 0.01	< 0.01	< 0.01	
Dichlorophenol, 2,4-	mg/L	0.002	EPA 8270	01-May-17/K	< 0.002	< 0.002	< 0.002	
Dinitrotoluene, 2,4-	mg/L	0.002	EPA 8270	01-May-17/K	< 0.002	< 0.002	< 0.002	
Hexachlorobenzene	mg/L	0.001	EPA 8270	01-May-17/K	< 0.001	< 0.001	< 0.001	
Hexachlorobutadiene	mg/L	0.001	EPA 8270	01-May-17/K	< 0.001	< 0.001	< 0.001	
Hexachloroethane	mg/L	0.001	EPA 8270	01-May-17/K	< 0.001	< 0.001	< 0.001	
Nitrobenzene	mg/L	0.01	EPA 8270	01-May-17/K	< 0.01	< 0.01	< 0.01	
Pentachlorophenol	mg/L	0.002	EPA 8270	01-May-17/K	< 0.002	< 0.002	< 0.002	
Tetrachlorophenol, 2,3,4,6-	mg/L	0.002	EPA 8270	01-May-17/K	< 0.002	< 0.002	< 0.002	
Trichlorophenol, 2,4,5-	mg/L	0.002	EPA 8270	01-May-17/K	< 0.002	< 0.002	< 0.002	
Trichlorophenol 2,4,6-	mg/L	0.002	EPA 8270	01-May-17/K	< 0.002	< 0.002	< 0.002	
Poly-Chlorinated Biphenyls (PCB's)	µg/L	0.05	EPA 8082A	28-Apr-17/R	< 0.05	< 0.05	< 0.05	
Aroclor	-		-	28-Apr-17	-	-	-	



Christine Burke
 Lab Manager

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

C.O.C.: ---

REPORT No. B17-10305 (iv)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9

Tel: 289-475-5442

Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 D17105C

P.O. NUMBER:

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Aldrin	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Atrazine	µg/L	0.5	subcontract	04-May-17	< 0.5	< 0.5	< 0.5	
Atrazine (Desethyl)	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Azinphos-methyl	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
BHC (alpha)	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
BHC (beta)	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
BHC (delta)	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Bromoxynil	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	
Chlordane (alpha)	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Chlordane (Gamma)	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Chlorpyrifos	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
Cyanazine	µg/L	0.6	subcontract	04-May-17	< 0.6	< 0.6	< 0.6	
Dichlorophenoxy acetic acid, 2,4- (2,4-D)	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	
DDD, 4,4-	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
DDE, 4,4-	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
DDT, 2,4-	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
DDT, 4,4-	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Diazinon	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
Dicamba	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	
Dieldrin	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Dimethoate	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
Dinoseb	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	
Diquat	µg/g	0.007	subcontract	04-May-17	<7	<7	<7	
Endrin	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	



Christine Burke
 Lab Manager

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

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C.O.C.: ---

REPORT No. B17-10305 (iv)

Report To:

Downunder Geotechnical

2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 P.O. NUMBER: D17105C

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Lock 39	Lock 40	Lock 41	
Glyphosate	µg/g	20	subcontract	04-May-17	< 20	< 20	< 20	
Heptachlor Epoxide	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Heptachlor	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Lindane (Hexachlorocyclohexane, Gamma)	µg/L	0.01	subcontract	04-May-17	< 0.01	< 0.01	< 0.01	
Malathion	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Metolachlor	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Methoxychlor	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	
Methyl Parathion	µg/L	0.6	subcontract	04-May-17	< 0.6	< 0.6	< 0.6	
Metribuzin	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Nitrosodimethylamine (NDMA)	µg/L	0.6	subcontract	04-May-17	< 0.6	< 0.6	< 0.6	
Nitritotriacetic acid (NTA)	mg/L	0.5	subcontract	04-May-17	< 0.5	< 0.5	< 0.5	
Paraquat	µg/g	0.001	subcontract	04-May-17	< 1	< 1	< 1	
Parathion	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
Phorate	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
Picloram	µg/L	50	subcontract	04-May-17	< 50	< 50	< 50	
Simazine	µg/L	0.4	subcontract	04-May-17	< 0.4	< 0.4	< 0.4	
Terbufos	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Triallate	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Trifluralin	µg/L	0.3	subcontract	04-May-17	< 0.3	< 0.3	< 0.3	
Trichlorophenoxy acetic acid, 2,4,5-	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	



Christine Burke
 Lab Manager

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Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill

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 2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

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110 West Beaver Creek Rd Unit 14
 Richmond Hill ON L4B 1J9
 Tel: 289-475-5442
 Fax: 289-562-1963

Attention: Andrew Drevininkas

DATE RECEIVED: 24-Apr-17

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON

DATE REPORTED: 23-May-17

P.O. NUMBER: D17105C

SAMPLE MATRIX: Soil/Leachate

WATERWORKS NO.

			Client I.D.	Lock 39	Lock 40	Lock 41		
			Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3		
			Date Collected	20-Apr-17	20-Apr-17	20-Apr-17		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Trichlorophenoxypropionic acid, 2,4,5-	µg/L	10	subcontract	04-May-17	< 10	< 10	< 10	

1 All analyses on this section subcontracted to Testmark Labs



Christine Burke
 Lab Manager

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REPORT No. B17-10305 (v)

Report To:

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2943 Major MacKenzie Drive, PO Box 96737
 Maple ON L6A 0A2

Attention: Andrew Drevininkas

Caduceon Environmental Laboratories

110 West Beaver Creek Rd Unit 14
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DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 P.O. NUMBER: D17105C

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
2378-Tcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total TCDFs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
12378-Pecdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
23478-Pecdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total PeCDFs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
123478-Hxcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
123678-Hxcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
234678-Hxcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
123789-Hxcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total HxCDFs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
1234678-Hpcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
1234789-Hpcdf	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total HpCDFs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	



Christine Burke
 Lab Manager

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Tel: 289-475-5442

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DATE RECEIVED: 24-Apr-17

DATE REPORTED: 23-May-17

SAMPLE MATRIX: Soil/Leachate

JOB/PROJECT NO.: Locks 39 to 41, Trent Severn
 Waterway, ON
 D17105C

P.O. NUMBER:

WATERWORKS NO.

Client I.D.	Lock 39	Lock 40	Lock 41	
Sample I.D.	B17-10305-1	B17-10305-2	B17-10305-3	
Date Collected	20-Apr-17	20-Apr-17	20-Apr-17	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Octachlorodibenzofuran	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
2378-Tcdd	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total TCDDs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
12378-Pecdd	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total PeCDDs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
123478-Hxcdd	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
123678-Hxcdd	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
123789-Hxcdd	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
Total HxCDDs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	< 1	< 1	
1234678-Hpcdd	ppq	1	E.C. 1/RM/19	23-May-17	< 1	1	2	
Total HpCDDs	ppq	1	E.C. 1/RM/19	23-May-17	< 1	3	5	
Octachlorodibenzodioxin	ppq	1	E.C. 1/RM/19	23-May-17	2	4	6	
Dioxin & Furan (TEQ)	ppt		E.C. 1/RM/19	23-May-17	0.002	0.014	0.026	

1 All analyses on this section subcontracted to Wellington Labs



Christine Burke
 Lab Manager

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