



August 12, 2019

Lions Group Inc. 10795 Highway 9 Caledon, Ontario L7E 0G5

Attention: Mr. Jay Heming

Re: Hydrogeological Impact Assessment Report for 10795 Highway 9, Caledon, Ontario, L7E 0G5

Safetech Environmental Ltd. (Safetech) is pleased to submit to Lions Group Inc. (Client) the following Hydrogeological Impact Assessment report prepared for 10795 Highway 9, Caledon, Ontario, L7E 0G5 (Site).

This report has been prepared in accordance with the document *Hydrogeological Assessment Submissions, Conservation Authority Guidelines for Development Applications* (Guideline), and specifically with section 3.2 – Impact Assessment.

1 EXISTING CONDITIONS

The Site is zoned as follows on **Zone Map 43** provided under the *Town of Caledon By-Law 2006-50*.

Civic Address	Zoning Designation	Description
	A2-ORM	Rural – Oak Ridges Moraine
10795 Highway 9	EPA2-ORM	Environmental Policy Area 2 Zone – Oak Ridges Moraine

Figure 1: Site Plan – Zoning illustrates the current zoning of the Site.

The Site is currently occupied as follows:

Civic Address	Zoning Designation	Existing Land Use
10795 Highway 9	A2-ORM	Contractor's Facility, Business Office and Open Storage Area
	EPA2-ORM	Undeveloped

The existing contractor's facility, business office and open storage areas have been in place since circa 1960. The contractors yard includes an unpaved area where construction equipment





is stored in the rear of the property, a slab on grade building is used for the maintenance of construction equipment, and an outdoor above ground storage tank is used for the re-fueling of construction equipment.

1.1 PHYSIOGRAPHIC CONDITIONS

As noted on the Ontario Geological Survey (OGS) map *Physiography of Southern Ontario*, the Site is located in an area classified as a kame moraine, bordering on a spillway to the west of the Site.

Based on the OGS map *Bedrock Topography and Overburden Thickness Mapping, Southern Ontario*, bedrock at the Site is at an elevation of approximately 200 m above sea level (masl). With the surface level at the Site between approximately 290 and 295 masl, the overburden thickness is estimated to be approximately 90 – 100 m.

2 PROPOSED DEVELOPMENT

The Client has proposed to amend the current zoning of the Site in order to support the continued operation of the existing Contractor's Facility, Business Office and Open Storage Area, as illustrated in Figure 2: Site Plan – Existing Land Use.

3 ASSESSMENT OF IMPACTS

3.1 GROUNDWATER LEVELS

3.1.1 Groundwater Level Monitoring

A total of six ground water monitoring wells were installed at the Site, as illustrated in Figure 3: Site Plan – Groundwater Monitoring Wells.

The monitoring wells installed consisted of 25 mm Schedule 40 PVC screen and riser. The well screens were 3m in length, had a slot size of approximately 0.25 mm (slot 10) and was sealed at the base with a PVC end cap. The annular space around the well screens was backfilled with well gravel to an average height of 0.6 m above the top of the screens. The well gravel was extended above each of the screens to allow for compaction of the sand pack and expansion of the overlying well seal. A bentonite seal ('Hole Plug') was placed in the borehole annulus from the top of the gravel to approximately 0.3 mbgs. Lubricants and adhesives were not used when constructing the monitoring wells.

A field survey was conducted in order to establish reference elevations for each monitoring point, and groundwater levels were monitored upon completion of the wells, as well as on two dates following their installation in accordance with Section 3.1.7 of the Guideline, as follows:



Well ID	Well Depth (m)	Survey Elevation (mr)	Date	Depth to GW (m)	GW Elevation (mr)
			May 7, 2019	17.48	80.65
BH/MW1	24	98.13	May 16, 2019	16.82	81.31
			July 8, 2019	17.49	80.64
			May 2, 2019	Dry	N/A
BH/MW2	9	100.51	May 16, 2019	Dry	N/A
			July 8, 2019	Dry	N/A
			May 2, 2019	Dry	N/A
BH/MW3	9	101.02	May 16, 2019	Dry	N/A
			July 8, 2019	Dry	N/A
			May 6, 2019	Dry	N/A
BH/MW4	9	99.1	May 16, 2019	Dry	N/A
			July 8, 2019	Dry	N/A
			May 2, 2019	Dry	N/A
BH/MW5	9	99.52	May 16, 2019	Dry	N/A
			July 8, 2019	Dry	N/A
			May 16, 2019	18.73	80.80
MW8	23.5	99.53	May 16, 2019	17.25	82.28
			July 8, 2019	18.73	80.80

Surface and groundwater elevations were measured in meters relative (mr) to a known reference point assumed to be at an elevation of 100m. The reference point used was a cement pad located on the Site.

Borehole logs from the monitoring well installation are included in Appendix B.

3.1.2 Impacts to Groundwater Levels

The proposed rezoning of the Site is for administrative purposes, to support the existing uses of a Contractor's Facility, Business Office and Open Storage Areas.

Safetech understands that there are no plans to:

- Add additional surface cover (i.e. by paving the Site) which could impact the infiltration rate of groundwater; or,
- Perform any construction activities which would involve de-watering of excavations;

Therefore, based on the observed depth to groundwater (16.5+ meters), no significant impacts to the groundwater level are expected to result from the proposed zoning change.

3.2 PUMPING TESTS

Safetech understands that no de-watering or new well installations are proposed as part of the zoning change. Therefore a pumping test is not required.



3.3 GROUNDWATER DISCHARGE BASEFLOW

3.3.1 Investigation

Safetech performed tests involving the creation of an instantaneous change in the well water level by adding a known volume to the well (slug tests) in the two monitoring wells which were found to have groundwater present on July 8, 2019. The slug tests were performed in general accordance with the United States' Environmental Protection Agency (EPA) *SOP* #2046 – *Slug Tests*.

The slug tests were performed by inserting a water level monitor into the well, allowing the water level to stabilize, then inserting a slug into each well and recording the subsequent rise and return to baseline of the groundwater level. The following table summarizes the instrumentation used.

Well	BH/MW1	MW8
Water Level Monitor	Edge LT	Edge LT
	Levelogger M5	Levelogger M5
Serial Number	2011307	2011323
Calibration Date	July 4, 2019	July 4, 2019
Slug Height	5 Feet	5 Feet
Slug Diameter	1 Inch	1 Inch

Levelogger M5's were used in order to achieve an accuracy of +/- 0.3 cm (0.01 feet). The loggers were suspended at depths of 2-3 meters below the measured top of the water column in each well, and each slug was suspended independently above the logger, with sufficient spacing to ensure that the slugs did not touch the loggers.

Graphs in Appendix C illustrate the logger readings for each slug test.

3.3.2 Calculations

Hydraulic conductivity was calculated as follows:

$$K = \frac{r^2 * ln\left(\frac{L}{R}\right)}{2 * L * T_0} \text{ for } \frac{L}{R} > 8$$

$$T_0 = t \leftarrow \frac{H - h(t)}{H - H_0} = 0.37$$

Where:

K is the hydraulic conductivity (ft/s)
T₀ is the Basic Time Lag (s)
r is the well casing radius (ft)
R is the filter pack radius (ft)



L is the length of open screen (ft)

 ${\bf H}$ is the steady state water elevation

 H_0 is the water elevation at t = 0 (immediately after slug insertion)

 ${\boldsymbol{t}}$ is the time since slug insertion

h(t) is the water elevation at t > 0

The following table provides a summary of the values used to calculate hydraulic conductivity:

Parameter	Units	BH/MW1	MW8
r	ft	0.08	0.08
R	ft	0.33	0.33
L	ft	10	10
Н	m	80.64	80.80
H _o	m	80.71	80.96
t ₁	S	20	0
h(t ₁)	m	80.67	80.96
t ₂	s	25	5
h(t ₂)	m	80.66	80.84
To	s	21.7	4.4
к	ft/s	5.45e-5	2.70e-4
ĸ	cm/s	1.66e-3	8.23e-3

3.3.3 Findings

Hydraulic conductivity through the water bearing horizon into which the monitoring wells were installed is estimated to be on the order of 10^{-2} to 10^{-3} cm/s, which is consistent with the semipermeable sand and silty-sand observed during monitoring well installation.

As the proposed zoning change will not result in activities which interfere with the water bearing horizon at the Site, no significant impacts to this groundwater permeability are expected.

3.4 WATER BALANCE ANALYSIS

As no change in the existing property use is proposed following the zoning amendment, no significant changes to the Site's water balance are expected.

3.5 GROUNDWATER QUALITY

3.5.1 Laboratory Analytical Results

Safetech collected groundwater samples from the two monitoring wells with groundwater on May 16, 2019. Groundwater samples were analyzed for the following parameters:

- Petroleum Hydrocarbon Compounds (PHCs) fractions F1 F4; and,
- Volatile Organic Compounds (VOCs)



The following table provides a summary of the laboratory results obtained in comparison to the groundwater quality standards set out under O.Reg. 153/04 as amended for potable groundwater in coarse grained soils (Table 2 Standards). Full laboratory certificates of analysis are included in Appendix D.

Parameter	Standard µg/L	BH/MW1 µg/L	MW8 µg/L
PHC F1	750	< 20	< 20
PHC F2	150	< 20	< 20
PHC F3	500	710	4120
PHC F4	500	440	6930
Chloroform	2.4	5	< 0.5

3.5.2 Findings

Groundwater at the Site currently exceeds the applicable Site Condition Standards for PHCs F3 & F4, as well as chloroform.

No changes to the operations at the Site are proposed as part of the proposed zoning amendment, therefore additional impacts to the groundwater quality at the Site are not expected.

3.6 ON-SITE SEWAGE SYSTEMS

The Site is serviced by an existing septic field, no changes to the septic servicing on the Site are proposed as part of the zoning amendment.

4 CONCLUSIONS

Safetech understands that no development has been proposed which would involve construction near the observed water table, or significant alteration of the existing surface infiltration conditions at the Site.

Therefore, based on the findings of this Hydrogeological Impact Assessment, the proposed zoning amendments to support the existing use of the Site are not expected to result in significant impacts to the groundwater level, base flow, or infiltration at the Site.

5 LIMITATIONS

The information, conclusions and recommendations provided in this and other associated reports were prepared by trained professionals and technical staff in accordance with level of care and skill exercised by members of the environmental engineering and consulting



profession. Recommendations made in this report have been made in the context of existing industry accepted guidelines, which were in place at the date of this report.

In preparing this report, Safetech Environmental Limited (Safetech) relied in good faith on information supplied by individuals or organizations noted in the report. We assumed that the information provided is factual and accurate, and we accept no responsibility for any deficiency, misstatements, or inaccuracies contained in this report as a result of omissions, misrepresentation, or fraudulent acts of any persons or organizations contacted. It should be recognized that the passage of time affects the information provided in this report. Environmental conditions of a site can change. Opinions relating to the site conditions are based upon information that existed at the time the conclusions were formulated. Safetech cannot warrant against undiscovered environmental liabilities.

If any information becomes available that differs from the findings in this report, we request that we be notified immediately to reassess the conclusions provided herein.

This report has been prepared for the sole use of the person or entity to who it is addressed. No other person or entity is entitled to use or rely upon this report without the express written consent of Safetech and the person or entity to who it is addressed. Any use that a third party makes of this report, or any reliance based on conclusions and recommendations made, are the responsibility of such third parties. Safetech accepts no responsibility for damages suffered by third parties as a result of actions based on this report.

Yours truly,

Safetech Environmental Limited,

Robert Fuller, B.A.Sc., P.Eng Engineer – Environmental Services

Thin

Derrick Trim, B.Eng Environmental EIT

Philip I. Warren, P.Eng (QP), PMP Manager – Environmental Services



APPENDIX A: FIGURES

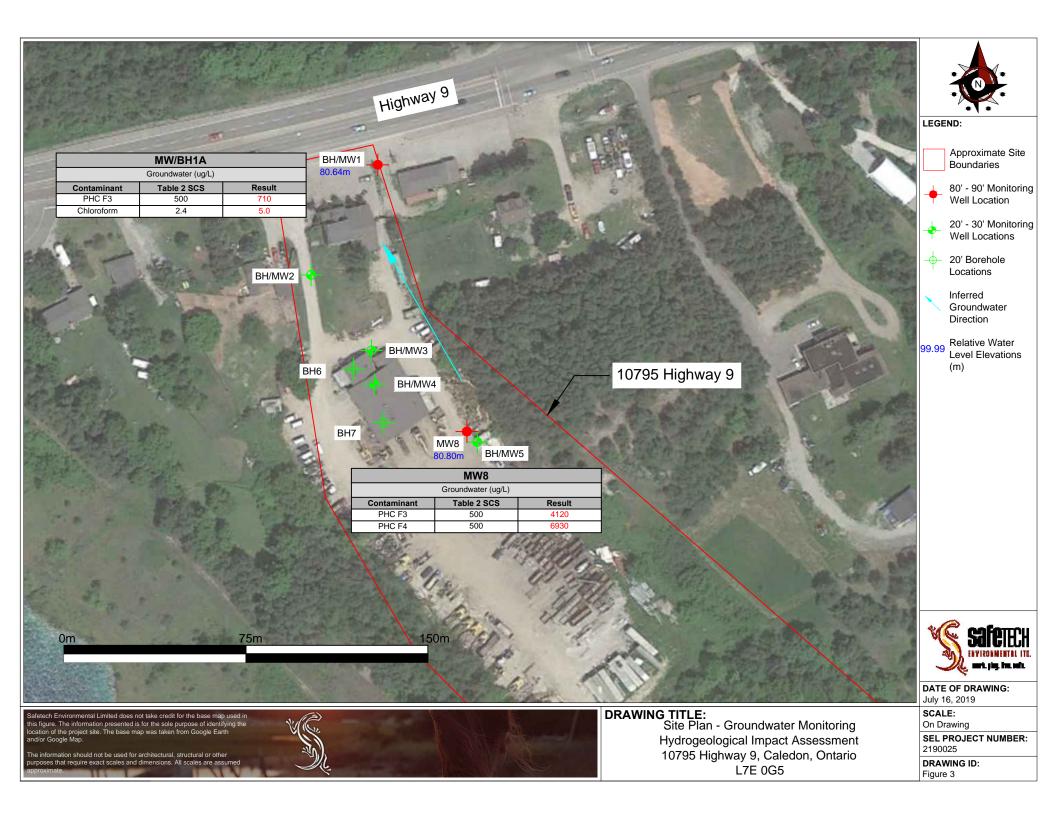
FIGURE 1: SITE PLAN – ZONING

FIGURE 2: SITE PLAN – EXISTING LAND USE

FIGURE 3: SITE PLAN – GROUNDWATER MONITORING WELLS









APPENDIX B: BOREHOLE LOGS

V		afe te Vironmentai ork. piay. live. s		BORIN	IG NU	JMBE		H/MW1 BE 1 OF 1
CLIE	~		us Holdings Inc.	PROJECT NAME				
			607018	PROJECT LOCATION 10795 High		aledon, O	ntario	
			/7/19 COMPLETED _5/8/19					
			CTOR Profile Drilling Inc.		-			
DRIL		IETHOD	Direct Push/Trackmounted Mobile B-60	AT TIME OF DRILLING				
LOGO	GED B	Y DT	CHECKED BY PW	AT END OF DRILLING				
NOTE	ES			AFTER DRILLING <u>17.48 m</u>				
DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
		$\left[\frac{\sqrt{1}}{2}, \frac{1}{2}\right]$	SILT and SAND (Soil) Moist; Loose; Black; Organics Odor 	0.61	SS1	67		
			SAND	/	SS2	41	0	
			Moist; Loose; Brown and Orangish; No Odor		SS3	65	0.03	
			Light Brown		SS4	80	0.02	
	5				SS5	80	0.03	
	L -		trace SILT	6.10	SS6	66	0.03	
	 - 10		AUGER					
50		<u>.</u>	GRAVELY SAND Triable; Multi Colored Gravel, Brown Sand; No Odor	15.24 15.85	SS7	59	0.05	Ţ
			SAND Friable; Brown; No Odor		SS8*	41	0.11	
				21.95	SS9	49	0.12	
			SILTY SAND	24.99	SS10	59	0.03	
			Firm; Brown; No Odor Borehole Termination De					

V	In ENT	afe te Vironmenta ork. play. live. s		BORIN	NG NU	JMBE		H/MW2 Ge 1 OF 1
CLIEN	-		us Holdings Inc.	PROJECT NAME				
			607018	PROJECT LOCATION 10795 High			ntario	
DATE		RTED 5	2/19 COMPLETED 5/2/19	GROUND ELEVATION	HOLE S	SIZE _ 2"		
DRILI	LING C	ONTRA	CTOR Profile Drilling Inc.	GROUND WATER LEVELS:				
DRILI	LING N	IETHOD	Direct Push/Trackmounted Mobile B-45	AT TIME OF DRILLING				
			CHECKED BY PW	AT END OF DRILLING				
NOTE	S	1		AFTER DRILLING	1	1	1	
DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
			GRAVEL/SAND	0.15	SS1	100		
		N 1/2 N 1/2	_Moist; Friable; White Gravel, Black/Brown Sand; No. _ SAND _ SAND _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ \	0.46	SS2	100	0.12	
F -			│ Moist; Friable; Light Brown; No Odor	0.61	SS3	100	0.13	
			TOPSOIL Moist; Friable; Black; No Odor SAND Moist; Friable; Light Brown, some Orange; No Odor		SS4	70	0.12	
	2		Light Brown		SS5	79	0.22	
					SS6*	79	0.16	
	 _ 4 			4.42	SS7	75	0.27	
			SILTY SAND Moist; Friable; Light Brown, No Odor	5.94	SS8	67	0.14	
			SILT Moist; Friable; Light Brown; No Odor	7.47	SS9	84	0.15	
	 8		SILTY SAND					
			Moist; Friable; Light Brown; No Odor	8.99	SS10	83	0.16	
			Borehole Termination D					

V	S S	afe te(vironmental ork. play. live. s	Safetech Environmental Ltd.	BORIN	ig nl	JMBE		H/MW3 BE 1 OF 1
CLIE	1		us Holdings Inc	PROJECT NAME				
			607018	PROJECT LOCATION _10795 High			ntario	
DATE	STAF	RTED 5	2/19 COMPLETED 5/2/19	GROUND ELEVATION	HOLES	SIZE _2"		
DRILI	LING C	ONTRA	CTOR Profile Drilling Inc.	GROUND WATER LEVELS:				
DRILI	LING N	IETHOD	Direct Push/Trackmounted Mobile B-45	AT TIME OF DRILLING				
			CHECKED BY _PW					
NOTE	S			AFTER DRILLING			1	
DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
			GRAVELY SAND _ Moist; Loose; Dark Brown, Black, Dark Orange; No	Odor 0.30	SS1	100	0.18	
L _			SAND		SS2	83	0.14	
			Moist; Loose; Light Brown, some Orange; No Odor Friable; Brown		SS3	67	0	
					SS4	89	0.17	
	2		SILTY SAND	1.98	SS5	100	0.18	
			Moist; Friable; Light Brown, No Odor Brown		SS6*	84	0.31	
			- SANDY SILT ∖ Moist; Friable; Brown, No Odor	4.27 4.42	SS7 SS8	100	0.23	
	 		SAND Moist; Loose; Light Brown, No Odor	5.94	SS9	92	0.27	
			SAND trace Silt Moist; Moist; Brown, No Odor		SS10	54	0.3	
			Borehole Termination D	8.99	SS11	84	0.18	

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CLIE	1	ork. play. live. s endezvo	ana. us Holdings Inc	PROJECT NAME				
			607018	PROJECT LOCATION 10795 Hig		aledon, O	ntario	
DATE		RTED 5	/6/19 COMPLETED 5/6/19					
			CTOR Profile Drilling Inc.					
DRILI	LING N	IETHOD	Direct Push/Trackmounted Mobile B-45	AT TIME OF DRILLING				
LOGO	GED B	Y DT	CHECKED BY _PW	AT END OF DRILLING				
NOTE	S			AFTER DRILLING				
DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
			SILTY SAND Wet; Friable; Brown; No Odor	0.01	SS1*	40	0.67	
			SAND	0.91	SS2	93	0.49	
			Moist; Loose; Brown; No Odor SANDY SILT	1.37				
			Moist; Friable; Brown; No Odor		SS3	76	0.38	
				2.59				
_ 10 _	 		SAND trace Silt Wet; Friable; Brown; No Odor		SS4	74	0.33	
			SANDY SILT	3.66				
	4		Moist/Wet; Friable; Brown; No Odor		SS5	70	0.26	
	 		trace Clay		SS6	70	0.32	
			trace Clay		SS7	81	0.39	
	 - 8 		trace Clay	8.53	SS8	85	0.25	
					SS9	149	0.33	
				9.14				
			Borehole Termination Do	epui. 9.14 m				<u>te interiencere ini</u>

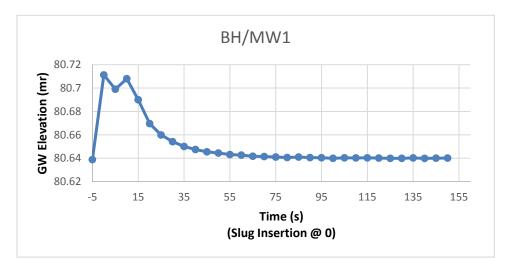
V		afe te Vironmentai 10rk. piay. live. s		BORI	NG NU	JMBE		H/MW5 BE 1 OF 1
CLIEI	~		us Holdings Inc	PROJECT NAME				
			607018	PROJECT LOCATION _10795 High			ntario	
1			/1/19 COMPLETED <u>5/2/19</u>	GROUND ELEVATION	HOLES	SIZE 2"		
			CTOR Profile Drilling Inc.		_			
DRIL		IETHOD	Direct Push/Trackmounted Mobile B-45	AT TIME OF DRILLING				
LOGO	GED B	Y DT	CHECKED BY PW	AT END OF DRILLING				
NOTE	S			AFTER DRILLING				
DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
			GRAVEL/SAND FILL Moist; Loose; Brown; No Odor	0.30				
		001	GRAVELLY SAND	0.61	SS1	77	0.07	
	 		Moist; Friable; Brown; No Odor SAND trace Silt Moist; Friable; Light Brown; No Odor	/	SS2	59	0.02	
				<u>2.13</u>	SS3	79	0.03	
 _ <u>10</u> _	 		SAND		SS4	67	0.06	
	 				SS5	62	0.03	
	 				SS6	75	0.07	
	 				SS7*	70	0.21	
	<u>8</u> 			8.99	SS8	70	0.14	
			Borehole Termination Do	epth: 8.99 m				

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		us Holdings Inc.	PROJECT NAME				
PROJECT	NUMBER	607018	PROJECT LOCATION 1079	5 Highway 9, Ca	aledon, C	ntario	
DATE STAF	RTED 5	/6/19 COMPLETED 5/6/19	GROUND ELEVATION	HOLES	SIZE _ 2"		
		CTOR Profile Drilling Inc.					
		Direct Push/Trackmounted Mobile B-45					
		CHECKED BY PW					
						80	
DEPTH (ft) DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
	- <u>K</u>		0.08				
 	-	SAND Moist; Loose; Brown; No Odor			26	0.45	
	_		1.22				
	-	SILT trace SAND Moist; Loose; Brown; No Odor		SS2	43	0.28	
	-						
<u>10</u>	-		3.66	SS3	65	0.2	
		SANDY SILT Moist; Loose; Brown, No Odor		SS4	75	0.19	
				SS5	73	0.19	
20		Borehole Termination D					
6		Borehole Termination D	6.10 epth: 6.10 m	SS5	73	0.19	

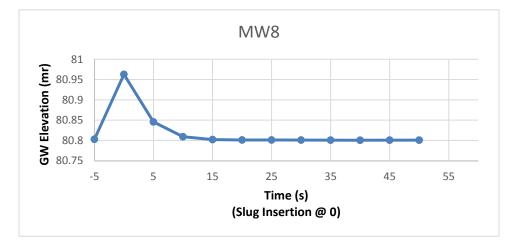
Safetech Environmental Ltd.	BC	DRIN	g nu		R BH7 6e 1 of 1
lings Inc.	PROJECT NAME				
18	PROJECT LOCATION 10795 Highw	ay 9, Ca	ledon, C	ntario	
COMPLETED _5/1/19 GR	OUND ELEVATION	HOLE S	SIZE _2"		
Profile Drilling Inc. GR	OUND WATER LEVELS:				
t Push/Trackmounted Mobile B-45					
CHECKED BY PW					
MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
ICRETE	0.13				
	0.20	SS1	67	0.03	
ID Friable; Light Brown; No Odor		331	07	0.03	
		SS2	70	0.04	
	-	SS3	62	0.11	
	-	SS4	79	0.05	
	_				
		SS5*	79	0.18	
	_				
	5.04	SS6	84	0.12	
Borehole Termination Depth:					
Borehole Termination Depth:	<u>5.94</u> 5.94 m	SS6	84	0.12	

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CLIE	-			2	PROJECT NAME				
								ntario	
DATE	E STAR	TED 5	5/15/19	COMPLETED	GROUND ELEVATION	HOLE	SIZE _ 2"		
				Drilling Inc.					
				Trackmounted Mobile B-60					
				CHECKED BYPW					
DEPTH (ft)	DEPTH (m)	GRAPHIC LOG		MATERIAL DESCRIPTION	LAYER DEPTH (m)	SAMPLE NUMBER	RECOVERY (%)	VAPOUR READING (ppm)	WELL DIAGRAM
			AUGER						
L									
	5								
25									
	10								
	L _								
	15								
50									
									Ā
	20								
5 7									
75									
	1 -								
				Borehole Termination De	24.20				
					סאמו. בד.בט ווו				





APPENDIX C: SLUG TEST DATA





APPENDIX D: GROUNDWATER QUALITY ANALYSIS RESULTS



Environment Testing

Client:	Safetech Environmental Limited
	14 - 3045 Southcreek Rd.
	Mississauga, ON
	L4X 2X7
Attention:	Mr. Derrick Trim
Invoice to:	Safetech Environmental Limited
PO#:	

Report Number: Date Submitted: Date Reported: Project: COC #: Temperature (C): Custody Seal: 1907789 2019-05-17 2019-05-29 606918/607018 203176 15

Page 1 of 10

Dear Derrick Trim:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Environment Testing

Client:	Safetech Environmental Limited
	14 - 3045 Southcreek Rd.
	Mississauga, ON
	L4X 2X7
Attention: PO#:	Mr. Derrick Trim
Invoice to:	Safetech Environmental Limited

Report Number: Date Submitted: Date Reported: Project: COC #: 1907789 2019-05-17 2019-05-29 606918/607018 203176

O.Reg 153-T2-Groundwater-Coarse

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
BH/MW1	Petroleum Hydrocarbons F3	710	ug/L	STD 500
BH/MW1A	Petroleum Hydrocarbons F3	2990	ug/L	STD 500
BH/MW1A	Petroleum Hydrocarbons F4	3900	ug/L	STD 500
MW8	Petroleum Hydrocarbons F3	4120	ug/L	STD 500
MW8	Petroleum Hydrocarbons F4	6930	ug/L	STD 500
Volatiles				
BH/MW1	Chloroform	5.0	ug/L	STD 2.4
BH/MW1A	Chloroform	3.6	ug/L	STD 2.4

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Environment Testing

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	Mississauga, ON
	L4X 2X7
Attention: PO#:	Mr. Derrick Trim
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Report Number: Date Submitted: Date Reported: Project: COC #: 1907789 2019-05-17 2019-05-29 606918/607018 203176

Guideline = O.Reg 153	8-T2-Grou	ndwate	r-Coarse				
<u>Hydrocarbons</u>			Sam	I.D. ple Matrix ple Type	1427166 GW153	1427167 GW153	1427168 GW153
<u>,</u>	Sample Type Sample Date Sampling Time					2019-05-16	2019-05-16
	Sample I.D.					BH/MW1A	MW8
Analyte	Batch No	MRL	Units C	Guideline			
PHC's F1	366251	20	ug/L	STD 750	<20	<20	<20
PHC's F1-BTEX	366253	20	ug/L		<20	<20	<20
PHC's F2	366160	20	ug/L	STD 150	<20	<20	<20
PHC's F3	366160	50	ug/L	STD 500	710*	2990*	4120*
PHC's F4	366160	50	ug/L	STD 500	440	3900*	6930*

<u>Volatiles</u> Analyte	Batch No	MRL	Sam Sam Sam Sam	I.D. ple Matrix ple Type ple Date pling Time ple I.D. Guideline	1427166 GW153 2019-05-16 BH/MW1	1427167 GW153 2019-05-16 BH/MW1A	1427168 GW153 2019-05-16 MW8
Acetone	366442	30	ug/L	STD 2700	<30	<30	<30
Benzene	366251	0.5	ug/L	STD 5	<0.5	<0.5	<0.5
Bromodichloromethane	366251	0.3	ug/L	STD 16	3.7	2.1	<0.3
Bromoform	366251	0.4	ug/L	STD 25	<0.4	<0.4	<0.4
Bromomethane	366251	0.5	ug/L	STD 0.89	<0.5	<0.5	<0.5
Carbon Tetrachloride	366251	0.2	ug/L	STD 0.79	<0.2	<0.2	<0.2
Chlorobenzene	366251	0.5	ug/L	STD 30	<0.5	<0.5	<0.5
Chloroform	366251	0.5	ug/L	STD 2.4	5.0*	3.6*	<0.5
Dibromochloromethane	366251	0.3	ug/L	STD 25	2.3	1.1	<0.3
Dichlorobenzene, 1,2-	366251	0.4	ug/L	STD 3	<0.4	<0.4	<0.4
Dichlorobenzene, 1,3-	366251	0.4	ug/L	STD 59	<0.4	<0.4	<0.4
Dichlorobenzene, 1,4-	366251	0.4	ug/L	STD 1	<0.4	<0.4	<0.4
Dichlorodifluoromethane	366251	0.5	ug/L	STD 590	<0.5	<0.5	<0.5

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Environment Testing

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Report Number: Date Submitted: Date Reported: Project: COC #: 1907789 2019-05-17 2019-05-29 606918/607018 203176

Guideline = O.Reg 15	3-T2-Grou	undwate			1427166	1427167	1427168
<u>Volatiles</u>			5	Sample Matrix Sample Type	GW153	GW153	GW153
				Sample Date Sampling Time	2019-05-16	2019-05-16	2019-05-16
Analyte	Batch No	MRL	ہ Units	Guideline	BH/MW1	BH/MW1A	MW8
Analyte			Units	Guideime			
Dichloroethane, 1,1-	366251	0.4	ug/L	STD 5	<0.4	<0.4	<0.4
Dichloroethane, 1,2-	366251	0.2	ug/L	STD 1.6	<0.2	<0.2	<0.2
Dichloroethylene, 1,1-	366251	0.5	ug/L	STD 1.6	<0.5	<0.5	<0.5
Dichloroethylene, 1,2-cis-	366251	0.4	ug/L	STD 1.6	<0.4	<0.4	<0.4
Dichloroethylene, 1,2-trans-	366251	0.4	ug/L	STD 1.6	<0.4	<0.4	<0.4
Dichloropropane, 1,2-	366251	0.5	ug/L	STD 5	<0.5	<0.5	<0.5
Dichloropropene,1,3-	366442	0.3	ug/L	STD 0.5	<0.3	<0.3	<0.3
Dichloropropene,1,3-cis-	366251	0.2	ug/L		<0.2	<0.2	<0.2
Dichloropropene,1,3-trans-	366251	0.2	ug/L		<0.2	<0.2	<0.2
Ethylbenzene	366251	0.5	ug/L	STD 2.4	<0.5	<0.5	<0.5
Ethylene dibromide	366251	0.2	ug/L	STD 0.2	<0.2	<0.2	<0.2
Hexane (n)	366251	5	ug/L	STD 51	<5	<5	<5
Methyl Ethyl Ketone	366442	10	ug/L	STD 1800	<10	<10	<10
Methyl Isobutyl Ketone	366442	10	ug/L	STD 640	<10	<10	<10
Methyl tert-Butyl Ether (MTBE)	366442	2	ug/L	STD 15	<2	<2	<2
Methylene Chloride	366251	4.0	ug/L	STD 50	<4.0	<4.0	<4.0
Styrene	366251	0.5	ug/L	STD 5.4	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,1,2-	366251	0.5	ug/L	STD 1.1	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,2,2-	366251	0.5	ug/L	STD 1	<0.5	<0.5	<0.5
Tetrachloroethylene	366251	0.3	ug/L	STD 1.6	<0.3	<0.3	<0.3
Toluene	366251	0.5	ug/L	STD 24	0.6	1.2	<0.5
Trichloroethane, 1,1,1-	366251	0.4	ug/L	STD 200	0.9	<0.4	<0.4
Trichloroethane, 1,1,2-	366251	0.4	ug/L	STD 4.7	<0.4	<0.4	<0.4
Trichloroethylene	366251	0.3	ug/L	STD 1.6	<0.3	<0.3	<0.3

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Environment Testing

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Guideline = O.Reg 15	53-T2-Grou	1427166	1427167	1427168				
Volatiles	GW153	GW153	GW153					
			Sam	nple Type nple Date npling Time	2019-05-16	2019-05-16	2019-05-16	
			Sam	nole I.D.	BH/MW1	BH/MW1A	MW8	
Analyte	Batch No	MRL	Units C	Guideline				
Trichlorofluoromethane	366251	0.5	ug/L	STD 150	<0.5	<0.5	<0.5	
Vinyl Chloride	366251	0.2	ug/L	STD 0.5	<0.2	<0.2	<0.2	
Xylene Mixture	366252	0.5	ug/L	STD 300	<0.5	<0.5	<0.5	
Xylene, m/p-	366251	0.4	ug/L		<0.4	<0.4	<0.4	
Xylene, o-	366251	0.4	ug/L		<0.4	<0.4	<0.4	
PHC Surrogate	Sam Sam	I.D. nple Matrix nple Type nple Date npling Time	1427166 GW153 2019-05-16	1427167 GW153 2019-05-16	1427168 GW153 2019-05-16			
Analyta	MDI		nple I.D.	BH/MW1	BH/MW1A	MW8		
Analyte	Batch No	MRL	Units C	Guideline				
Alpha-androstrane	366160	0	%		117	109	113	

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Guideline = O.Reg 15	1427166	1427167	1427168				
VOCs Surrogates	GW153	GW153	GW153				
				Sample Type Sample Date Sampling Time	2019-05-16	2019-05-16	2019-05-16
				Sample I.D.	BH/MW1	BH/MW1A	MW8
Analyte	Batch No	MRL	Units	Guideline			
1,2-dichloroethane-d4	366251	0	%		109	106	114
4-bromofluorobenzene	366251	0	%		123	118	113
Toluene-d8	366251	0	%		102	105	102

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Certificate of Analysis

Environment Testing

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Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
366160	PHC's F2	<20 ug/L	100	60-140		60-140		0-30
366160	PHC's F3	<50 ug/L	100	60-140		60-140		0-30
366160	PHC's F4	<50 ug/L	100	60-140		60-140		0-30
366251	Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	103	60-130	87	50-140	0	0-30
366251	Trichloroethane, 1,1,1-	<0.4 ug/L	94	60-130	83	50-140	0	0-30
366251	Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	114	60-130	101	50-140	0	0-30
366251	Trichloroethane, 1,1,2-	<0.4 ug/L	104	60-130	86	50-140	0	0-30
366251	Dichloroethane, 1,1-	<0.4 ug/L	93	60-130	80	50-140	0	0-30
366251	Dichloroethylene, 1,1-	<0.5 ug/L	94	60-130	81	50-140	0	0-30
366251	Dichlorobenzene, 1,2-	<0.4 ug/L	111	60-130	106	50-140	0	0-30
366251	Dichloroethane, 1,2-	<0.2 ug/L	105	60-130	93	50-140	0	0-30
366251	Dichloropropane, 1,2-	<0.5 ug/L	103	60-130	88	50-140	0	0-30
366251	Dichlorobenzene, 1,3-	<0.4 ug/L	94	60-130	89	50-140	0	0-30
366251	Dichlorobenzene, 1,4-	<0.4 ug/L	95	60-130	90	50-140	0	0-30
366251	Benzene	<0.5 ug/L	98	60-130	84	50-140	0	0-30
366251	Bromodichloromethane	<0.3 ug/L	100	60-130	84	50-140	0	0-30
366251	Bromoform	<0.4 ug/L	101	60-130	84	50-140	0	0-30
366251	Bromomethane	<0.5 ug/L	71	60-130	69	50-140	0	0-30
366251	Dichloroethylene, 1,2-cis-	<0.4 ug/L	99	60-130	85	50-140	0	0-30
366251	Dichloropropene,1,3-cis-	<0.2 ug/L	90	60-130	77	50-140	0	0-30
366251	Carbon Tetrachloride	<0.2 ug/L	97	60-130	92	50-140	0	0-30
366251	Chloroform	<0.5 ug/L	96	60-130	82	50-140	0	0-30
366251	Dibromochloromethane	<0.3 ug/L	99	60-130	83	50-140	0	0-30
366251	Dichlorodifluoromethane	<0.5 ug/L	105	60-130	123	50-140	0	0-30
366251	Methylene Chloride	<4.0 ug/L	114	60-130	89	50-140	0	0-30
366251	Ethylbenzene	<0.5 ug/L	100	60-130	86	50-140	0	0-30
366251	Ethylene dibromide	<0.2 ug/L	104	60-130		50-140		0-30
366251	PHC's F1	<20 ug/L	99	60-140	120	60-140	0	0-30
366251	Hexane (n)	<5 ug/L	90	60-130	79	50-140	0	0-30
366251	Xylene, m/p-	<0.4 ug/L	103	60-130	90	50-140	0	0-30
366251	Chlorobenzene	<0.5 ug/L	95	60-130	84	50-140	0	0-30
366251	Xylene, o-	<0.4 ug/L	100	60-130	88	50-140	0	0-30
366251	Styrene	<0.5 ug/L	94	60-130	81	50-140	0	0-30

Quality Assurance Summary

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Certificate of Analysis

Environment Testing

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	Mississauga, ON
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Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
366251	Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130	81	50-140	0	0-30
366251	Dichloropropene,1,3-trans-	<0.2 ug/L	89	60-130	77	50-140	0	0-30
366251	Tetrachloroethylene	<0.3 ug/L	90	60-130	79	50-140	0	0-30
366251	Toluene	<0.5 ug/L	97	60-130	85	50-140	0	0-30
366251	Trichloroethylene	<0.3 ug/L	96	60-130	85	50-140	0	0-30
366251	Trichlorofluoromethane	<0.5 ug/L	95	60-130	83	50-140	0	0-30
366251	Vinyl Chloride	<0.2 ug/L	95	60-130	88	50-140	0	0-30
366252	Xylene Mixture							
366253	PHC's F1-BTEX							
366442	Dichloropropene,1,3-							
366442	Acetone	<30 ug/L		60-130	101	50-140	0	0-30
366442	Methyl Ethyl Ketone	<10 ug/L	100	60-130	115	50-140	0	0-30
366442	Methyl Isobutyl Ketone	<10 ug/L		60-130	92	50-140	0	0-30
366442	Methyl tert-Butyl Ether (MTBE)	<2 ug/L	80	60-130	80	50-140	0	0-30

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
366160	PHC's F2	GC/FID	2019-05-23	2019-05-24	C_M	CCME O.Reg 153/04
366160	PHC's F3	GC/FID	2019-05-23	2019-05-24	C_M	CCME O.Reg 153/04
366160	PHC's F4	GC/FID	2019-05-23	2019-05-24	C_M	CCME O.Reg 153/04
366251	Tetrachloroethane, 1,1,1,2-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Trichloroethane, 1,1,1-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Tetrachloroethane, 1,1,2,2-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Trichloroethane, 1,1,2-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloroethane, 1,1-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloroethylene, 1,1-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichlorobenzene, 1,2-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloroethane, 1,2-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloropropane, 1,2-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichlorobenzene, 1,3-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichlorobenzene, 1,4-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Benzene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Bromodichloromethane	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Bromoform	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Bromomethane	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloroethylene, 1,2-cis-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloropropene,1,3-cis-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Carbon Tetrachloride	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Chloroform	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dibromochloromethane	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichlorodifluoromethane	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Methylene Chloride	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Ethylbenzene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Ethylene dibromide	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	PHC's F1	GC/FID	2019-05-27	2019-05-27	TJB	CCME O.Reg 153/04
366251	Hexane (n)	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Xylene, m/p-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Chlorobenzene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Xylene, o-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Styrene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260

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Certificate of Analysis

Environment Testing

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
366251	Dichloroethylene, 1,2-trans-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Dichloropropene,1,3-trans-	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Tetrachloroethylene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Toluene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Trichloroethylene	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Trichlorofluoromethane	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366251	Vinyl Chloride	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366252	Xylene Mixture	GC-MS	2019-05-27	2019-05-27	TJB	EPA 8260
366253	PHC's F1-BTEX	GC/FID	2019-05-27	2019-05-27	TJB	CCME O.Reg 153/04
366442	Dichloropropene,1,3-	GC-MS	2019-05-29	2019-05-29	TJB	EPA 8260
366442	Acetone	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366442	Methyl Ethyl Ketone	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366442	Methyl Isobutyl Ketone	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260
366442	Methyl tert-Butyl Ether (MTBE)	GC-MS	2019-05-21	2019-05-23	TJB	EPA 8260

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STANDARD CHAIN-OF-CUSTODY

203176

Eurofins Workorder #

C

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

CLIENT INFORMATION								INVOIO	E INFO	RMAT	ION (SA	ME AS	CLIENT INF	ORMATIO	I: YES		
company: Safetie	h Ennhormental L.	+2						Company	r:								£
Contact: Dernief						-		Contact:			(aro	lyn (Car			
Address: 3045 Southcrick Roed, Mississanger								Address:									
Telephone: 416 200 8218 Fax:							Telephor	ie:				1.50	Fax:				
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	nee Jurin nove	COY	~ /								u	- J	(<u> </u>	Loncon	0110	· UV-	
Email: #2:	118 /607018							Email:		#2:							
								PO #:	AROUN	ID TINA	E			Quo	te #:		
REGULATION/GUIDELINE REQUIRED			ODWSOG	1					1 Day* (10			2 Day** (5	50%)	3-5 Days (25%	X	5-7 Days (Standard	d)
Storm Sewer, City:			PWQO												~	bly to rush service.	
0. Reg 153, Table:, Type:	Industrial/Competer		O. Reg 34	7/558				12									00%, after 12:00 - 50%.
Excess Soil, Table:, Type:	/		Other:					**If the r	esults are i	reported t	the day aft	er the rus	sh due date, the	following surcha	irges will aj	pply: before 12:00 - 5	50%, after 12:00 - 25%.
		San	nple Det	ails					Sample	e Analy:	sis Requi	ired			Fie	ld Parameters	
The optimal temperature conditions during tra cannot be frozen, unless otherwise indicated o		File	d Filtered	>		-									-		RN# (Lab Use Only)
that this COC is not to be used for drinking wat	er samples. The COC must be complete				ganics	8, CrVI)											· · · ·
upon submission of the samples, there will be a missing (required fields are shaded in grey).	a \$25 surcharge if required information is	Matrix	lesample? ' = Yes N = No	alnen	id Inor	x. Hg,			4	an ann			-				· · · · · · · · · · · · · · · · · · ·
		nple N	sampl Yes N	of Contain	tals ar	tais (e	ä	0	PHC F1-F4								1
Sample ID	Date/Time Collected	Sar		*	Me	Me	BTEX	voc	H					1.(-	1-60		001010
BH/MW	05/16/14	GW	N	3				X	X		Arrive			140	XXX	\$	6.06918
BH/MWIA	03/16/19	GW	N	5				$\mid >$	X						5		607018
MW8	05/16/19	64	N	3				DX	\succ						0	\$	606918
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PRINT					DATE/TIME TE					TEMP (°C)	COMMENTS						
Dest	Tom		19	MMA	18/1	Tr	in		05	1-	7/10						
	WIT A		pl	-00	00	100	- 4 4		1	/ / /	1 1	(~*
Relinquished By:														CUSTODY SE	AL: YES		
Received By: 401 Magenetic Drive, Uni	it #1, North York, ON, M3J 3H9 - Telephone:	416-661-	5287 •	380 Van	sickle Ro	ad, Unit	#630, St.	Catharine	, ON, L2S	085 - Tel	ephone: 9	905-680-8	8887 • 608 N			K7P 2R9 - Telephor	ne: 613-634-9307