



**Environmental Baseline Assessment Report
Nunavut Excavating 2007 Inc. Soil and Water Treatment Facility
Cambridge Bay Nunavut**



Prepared by
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Prepared for:
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SUMMARY

Northtown Engineering Inc. (NTE) was retained by Nunavut Excavating 2007 Inc. (NE2007) to establish an Environmental Baseline Assessment of the soil and groundwater conditions for the soil and water treatment facility located in Cambridge Bay, Nunavut. The soil and water treatment facility consists of a piece of land approximately one hectare in area and it is located on the south side of R49 Road, west of Cambridge Bay Sewage Facility. The Environmental Baseline Assessment included chemical analyses of soils within the facility and groundwater within and down-gradient of the facility at a Canadian Certified Accredited Laboratory.

The objective of the Environmental Baseline Assessment of the soil and groundwater was to establish an environmental baseline of the existing soil conditions of the facility and groundwater conditions within and down-gradient of the facility. The chemical analysis of the soil and groundwater results were compared to that of the Nunavut Water Board (NWB) approved limits, CCME Guidelines. In the absence of CCME Guidelines, particularly for Petroleum Hydrocarbons (PHC, F1 to F4) for water, *Alberta Environmental Quality Guidelines for Alberta Surface Water* was used as a guideline to compare F1 and F2 in groundwater concerning the facility.

Generally, soil samples have indicated higher pH values than the recommended CCME guideline limit. All other parameters of the tested soil samples have indicated lower than the Soil Quality Guidelines set by NWB.

All groundwater samples tested parameters indicated lower than the Water Quality Guidelines set by CCME for marine and livestock and Alberta Environmental Quality Guidelines for Alberta Surface Water concerning Petroleum Hydrocarbons (PHC, F1 to F4) in water.

Annual water quality monitoring program shall be conducted in accordance with the approved Nunavut Water Board water licence conditions. Treated water at the discharge location shall be tested before releasing into the natural pond located down-gradient, south of the facility. The quality of groundwater up-gradient and down-gradient of the facility shall be monitored annually through monitoring wells. Quality of surface water from the ponds down-gradient, south of the facility, shall be monitored twice a year during early summer and early fall of each year while the facility is operational.

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1. INTRODUCTION

Northtown Engineering Inc. (NTE) was retained by Nunavut Excavating 2007 Inc. (NE2007) to conduct an Environmental Baseline Assessment (EBA) of the soil and groundwater of the soil and water treatment facility located in Cambridge Bay, Nunavut. NTE is pleased to present the EBA report for the soil and water treatment facility located adjacent to the Hamlet of Cambridge Bay sewage lagoon as shown in Figure 1 in Appendix B.

1.1 Purpose

The purpose of the Environmental Baseline Assessment for the soil and groundwater was to establish the current environmental condition of the soil within the soil and water treatment facility and groundwater within, up-gradient and down-gradient of the soil and water treatment facility. The purpose of the EBA was also to establish a baseline reading of the soil and groundwater parameters as regulated by the Nunavut Water Board (NWB). Canadian Council of Ministers of the Environment (CCME), Canadian Environmental Quality Guidelines (CCME 1991) were used as reference to establish the environmental baseline condition. The tested parameters of the soil and groundwater were then compared to CCME limits and were also recorded for future comparison for the soil and groundwater concerning the soil and water treatment facility.

1.2 Methodology

The scope of work was developed in accordance with the *Baseline Conditions Assessment, Environmental Monitoring, Reclamation and Post-closure Plan Cambridge Bay Soil and Water Treatment Facility* prepared by GEMTEC Consulting Engineers and Scientists Ltd., in May of 2019 and approved by NWB as part of NWB New Water Licence No. IBR-SWT1924. The methodology was used as a guideline and consisted of the following:

- ◆ Plan for soil and groundwater testing of the Facility according to the above plan;
- ◆ Determined the soil and groundwater parameters to be tested based on CCME guidelines;
- ◆ Ordered soil and groundwater containers from a Canadian Certified Accredited Laboratory (CCAL);
- ◆ Obtained representative soil samples from throughout the soil and water treatment facility and performed chemical analyses at a CCAL for predetermined parameters;
- ◆ Obtained representative groundwater samples within and down-gradient of the soil and water treatment facility and performed chemical analyses at a CCAL for predetermined parameters;
- ◆ Compared the chemical analyses results to CCME limits;
- ◆ Establish a baseline assessment of the soil and groundwater conditions for the soil and water treatment facility; and
- ◆ Continue monitoring groundwater annually up-gradient and down-gradient of the soil and water treatment facility and compare them to established baseline analytical results and/or

CCME and other applicable guidelines. Continue monitoring surface water twice annually located down-gradient of the soil and water treatment facility.

2. SITE DESCRIPTION

The subject soil and water treatment facility is located in Hamlet of Cambridge Bay, Nunavut. The soil and water treatment facility is within the following location:

- ◆ Latitude: 69° 07' 40.5624" N Longitude: 105° 02' 54.0847" W
- ◆ Latitude: 69° 07' 41.6604" N Longitude: 105° 02' 44.0280" W
- ◆ Latitude: 69° 07' 39.2088" N Longitude: 105° 02' 44.0229" W
- ◆ Latitude: 69° 07' 37.7076" N Longitude: 105° 02' 54.0847" W

The site location map is shown in Figure 1 and the soil and water treatment facility boundary is shown in Figure 2 in Appendix B. A field survey of the above coordinates has been performed and the coordinates were staked by Nunavut Excavating 2007 Inc prior to collecting soil and groundwater samples as part of Environmental Baseline Assessment.

The soil and water treatment facility is accessible via Road R49 north of the site. The site is higher in elevation on the north end, along the R49 Road, and lower elevation on the south end of the site, near the pond. The surface and groundwater run from the north to south direction into the adjacent pond located south of the soil and water treatment facility. Refer to Figure 1 in Appendix B and photographs in Appendix C. At the time of NTE's visit, there was a recently placed soil on the northeast corner of the facility with an approximate area of 1000 square meters, refer to Figure 2 in Appendix B.

3. PHYSICAL AND GEOLOGICAL SETTING

The subject site is located in Cambridge Bay, Nunavut on the northern shore of Anderson Bay. Cambridge Bay is located in Victoria Island, within Kitikmeot Region of Nunavut, Canada. The Cambridge Bay region is underlain by Pre-Cambrian volcanic and sedimentary bedrocks. The surface bedrock may be irregular, slightly to highly weathered and the overburden thickness varies throughout the region. Generally, the overburden in the area comprises glacial till and marine sediment mixture.

3.1 Topographical Map

A review of available geological information and observation of the test pits conducted as part of the soil and groundwater sampling indicate that the overburden at the subject site consists of marine sediment deposits. The overburden is mainly glacial till mainly composed of silty sand / sandy silt with gravel, cobbles and occasional boulders. The thickness of this stratum varies in the area. The marine deposits and till is anticipated to be underlain by volcanic and sedimentary bedrock. The depth of bedrock may vary significantly throughout the site.

3.2 Active layer and Permafrost depth

Based on the available information and observation during environmental sampling from the test pits, the active layer thickness or permafrost depth is estimated between 1.5 and 2.5 mbgs. It is important to note the depth of permafrost governs the groundwater flow and consequently the contamination depth and leachate.

4. SOIL AND GROUNDWATER SAMPLING

The soil and groundwater sampling program was conducted on July 21, 2020. The soil samples were obtained from nine test pits at an approximate depth of 0.5 m and groundwater samples were obtained from five test pits from an approximate depth of 1.0 to 2.5 meter below ground surface (mbgs). The soil and groundwater sampling program is based on an environmental monitoring plan prepared by GEMTEC in May 2019 under the title of “Baseline Conditions Assessment, Environmental Monitoring, Reclamation and Post-closure Plan Cambridge Bay Soil and Water Treatment Facility” approved by NWB. The baseline assessment test pit location, future annual groundwater and surface water test location concerning the soil and water treatment facility can be referenced using Figure 2 in Appendix B. Photographs of the test pits are included in Appendix C.

4.1 Methodology of soil and groundwater sampling

Collected samples were placed into an appropriate laboratory supplied containers immediately upon retrieval. Soil samples were collected in accordance with applicable federal guidelines and industry standard practices. A separate nitrile disposable gloves were used to collect soil and groundwater samples from each test pit location to avoid cross-contamination. Soil samples were classified in accordance with the Canadian Foundation Engineering Manual (CFEM) standards. Upon collection, soil samples were placed in a cooler packed with ice. A chain of custody form accompanied all soil and groundwater samples at all points of handling. The test pits conducted for groundwater samples were waited for 10 to 15 minutes before collecting groundwater samples.

4.2 Sample Handling and Chain of Custody

All laboratory analyses were completed by Bureau Veritas (formerly known as Maxxam Analytics Inc.) location in Calgary, Alberta. Bureau Veritas is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or the Standards Council of Canada (SCC) for the required analyses. The field program also included the collection of duplicate soil samples, which were analyzed for the contaminants of potential concern (COPCs) to evaluate if the field/laboratory handling and analysis has an influence on the sample results. One QA/QC duplicate soil sample was collected from one of the soil sampling locations. The samples were submitted as duplicates of the original samples for laboratory analysis of the contaminants of potential concern to establish the baseline environmental assessment of the soil and water treatment facility.

4.3 Soil and Groundwater Description

The soil was visually described in accordance with the Canadian Foundation Engineering Manual 4th edition. There is an approximately 50 to 100 mm thick surficial organic soil underlain by sand and gravel in some area of the site. The soil can generally be described as fine to coarse-grained sand with some silt content. The soil also contained some gravel, cobbles and occasional boulders. The soil was grey to brown and damp to moist. The soil and groundwater had no visible staining or obvious odour. No sheen was observed in any of the test pits conducted for groundwater sampling. No hydrocarbons staining was observed in any of the test pit conducted for soil and groundwater sampling. Photographs of the test pits are included in Appendix C.

5. ANNUAL WATER QUALITY MONITORING

Annual water quality monitoring shall be in accordance with the NWB's Licence No. 1BR-SWT1924. Treated water, groundwater and surface water quality monitoring program is indicated in the following section. The locations of water quality monitoring are provided in Figure 2 in Appendix B.

5.1 Annual water monitoring at the discharge location

Treated water at the discharge location from the soil and water treatment facility will be collected during summer in accordance with the approved NWB water licence conditions and shall be tested at a Canadian Certified Accredited Laboratory. The approximate location of the treated water at the discharge point is provided in Figure 2 in Appendix B.

5.2 Annual groundwater monitoring

Annual groundwater concerning the up-gradient and down-gradient of the soil and water treatment facility will be collected from monitoring wells during summer in accordance with the approved NWB water licence conditions and shall be tested at a Canadian Certified Accredited Laboratory. The locations of the proposed annual groundwater monitoring wells are provided in Figure 2 in Appendix B.

5.3 Annual surface water monitoring

Annual surface water concerning natural ponds located down-gradient of the soil and water treatment facility will be collected during spring freshet and late summer or early fall in accordance with the approved NWB water licence conditions and shall be tested at a Canadian Certified Accredited Laboratory. The proposed annual surface water locations are provided in Figure 2 in Appendix B.

6. ENVIRONMENTAL BASELINE ASSESSMENT RESULTS

The environment baseline assessment is established through testing of the soil from within the soil and water treatment facility and groundwater from within, up-gradient and down-gradient of the soil and water treatment facility.

6.1 Soil and groundwater chemical analysis results

A total of 10 soil samples including a field blank sample and a total of six groundwater samples including a field blank sample were collected from 14 different test pits. The soil and groundwater samples were sent to the Bureau Veritas Laboratory Calgary, Alberta location for chemical analysis. The soil samples were obtained by conducting nine test pits spread throughout the facility from an approximate depth of 0.3 to 1.0 meter below ground surface (mbgs) as planned. The groundwater samples were obtained by conducting five test pits; two within the facility and three down-gradient of the facility. The test pits for groundwater were excavated between 1.0 to 2.5 mbgs to obtain groundwater samples. Refer to Figure 2 in Appendix B for the location of the test pits and Appendix C for photographs of the test pits.

6.2 Reference Guidelines

The soil and groundwater test results from the analytical baseline assessment were compared to applicable federal criteria in accordance with the NWB requirement. All soil samples were considered as grained-soil. All groundwater samples were sampled without any filter. CCME guidelines were used for soil and groundwater as following:

- ◆ CCME “Canadian Environmental Quality Guidelines” 1999, Revised in part 2007. Chapter 7: Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, coarse textured soil, industrial land-use criteria;
- ◆ Canada-Wide Standards for Petroleum Hydrocarbons in Soil (CCME, 2008);
- ◆ Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 2007); and
- ◆ Government of Alberta “Alberta Environmental Quality Guidelines for Alberta Surface Water” March 2018, Water Policy Branch, Alberta Environment and Parks

In the absence of CCME guidelines particularly for Petroleum Hydrocarbons (PHC, F1 to F4) in water, the Alberta Environmental Quality Guidelines for Surface Water was used to compare the groundwater test results for the facility.

6.3 Soil Analytical Results

The test results of the soil samples analyses and their respective evaluation criteria are presented in Table 1 through Table 4, in Appendix D. The soil has indicated a higher pH value in 12 out of 15 soil samples compared to the recommended limit by CCME Guidelines. No other exceedance of soil was noted with respect to the CCME soil quality guidelines for industrial. Please refer to Appendix D for analytical soil test results and to Appendix E for the original laboratory data received from Bureau Vertias Laboratory test results.

6.4 Groundwater Analytical Results

The test results of the groundwater samples analyses and their respective evaluation criteria are presented in Table 5 through Table 8, in Appendix D. No exceedance of groundwater was noted with respect to the CCME water quality guideline for marine and livestock and Alberta Environmental Quality Guidelines for Alberta Surface Water. Please refer to Appendix D for

analytical groundwater test results and to Appendix E for the original laboratory data received from Bureau Vertias Laboratory test results.

7. CONCLUSION

Northtown Engineering Inc. (NTE) has conducted the Environmental Baseline Assessment in accordance with the scope of work as approved by Nunavut Water Board on behalf of Nunavut Excavating 2007 Inc. This report establishes the environmental baseline conditions of the soil and water treatment facility. Generally, the soil samples have indicated a higher pH value than the guidelines set by CCME. All other soil and groundwater sample parameters are within the CCME Guideline limits for soil and water.

Annual groundwater chemical analyses results will be compared to that of the baseline results established in this report and to the NWB and other applicable guidelines to identify exceedance in any parameters in the groundwater up-gradient and down-gradient of the soil and water treatment facility.

8. CLOSURE

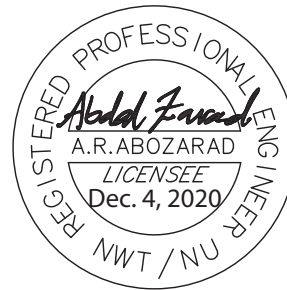
A description of limitations which are inherent in the compilation of this Environmental Baseline Assessment report is provided in Appendix A and it is an integral part of this report. We trust this report meets your present requirements.

Should you have any questions, please do not hesitate to contact our office.
Sincerely,

Northtown Engineering Inc.



Shahab Nowrozi, P. Eng.
Geotechnical Project Manager



Abdal Abozarad, P.Eng.
Senior Project Manager

APPENDIX A
LIMITATIONS OF REPORT

LIMITATIONS OF REPORT

The information presented in this report are based on a scope of work with according to the “Baseline Conditions Assessment, Environmental Monitoring, Reclamation and Post-closure Plan Cambridge Bay Soil and Water Treatment Facility” prepared by GEMTEC on behalf Nunavut Excavating Ltd., and approved by Nunavut Water Board.

Any results from an analytical laboratory or other subcontractors reported herein have been carried out by others, and NTE cannot warranty their accuracy. Similarly, NTE cannot warranty the accuracy of information supplied by the Client or obtained from available environmental reports and geological information.

The factual information and recommendations presented in this report are based on a scope of work authorized by the Client. It should be noted that no scope of work can identify all conditions below ground, no matter how exhaustive. Subsurface and groundwater conditions beyond the test pits locations may differ from those encountered at the specific locations tested, and conditions may become apparent during annual groundwater monitoring program and any future soil assessments.

A site visit of the facility and visual observation of the soil and groundwater was performed to document conditions as viewed on the days of assessment. The site visit was intended to collect soil samples and groundwater samples in order to establish a baseline assessment of the existing conditions of the subject site. This assessment does not guarantee that the sites are free of hazardous or potentially hazardous material or conditions, or that latent or undiscovered conditions will not become evident in the future.

The site activities are beyond NTE’s control and can change at any time after the completion of this assessment, the observations, findings, and opinions can be considered valid as of the date hereof. This report is intended and restricted for the sole use of our client stated in this report. Any use, interpretation, or reliance on this report/assessment by anyone other than client is at the sole risk of that party.

The conclusions and recommendations of the Environmental Baseline Assessment regarding to the probability of contaminant effects on the subject site are based on our observations and chemical analyses at the selected locations. However, there is a probability that environmental conditions may be encountered at the subject site may be different than results presented in this report.

APPENDIX B
SITE LOCATION MAP
SITE BOUNDARY & TEST LOCATIONS



 NorthTown Engineering Inc. 212-430 Hazeldean Road, Kanata, ON. K2L 1T9 Tel: 613-709-4691 www.norhtowneng.com	TITLE: Site Location Map Environmental Baseline Assessment of Soil and Groundwater Nunavut Excavating 2007 Inc. Soil and Water Treatment Facility Cambridge Bay, NU	DATE: November 2020 PROJECT NO.: NTE-20200721	FIGURE NO.: 1
	REFERENCE: Natural Resource Canada Maps 2011 & Imagery © 2020 Google Earth	DRAWN BY: SN	SCALE: As Shown



- TP20-1 to TP20-9: Test pit location for soil sampling
- TP20-10 to TP20-14 Test pit for groundwater sampling
- * Duplicate soil sample
- ** Duplicate groundwater sample

- Annual groundwater and surface water sampling location
- GMW – Groundwater monitoring well
- SW – Surface water monitoring
- TDW – Treated water discharge



 NorthTown Engineering Inc. 212-430 Hazeldean Road, Kanata, ON. K2L 1T9 Tel: 613-709-4691 www.norhtowneng.com	TITLE: Soil and Water Test Location Nunavut Excavating 2007 Inc. Soil and Water Treatment Facility Cambridge Bay, NU	DATE: NOVEMBER 2020	FIGURE NO.: 2
	REFERENCE: Google Earth Satellite Imagery © 2020 Google	PROJECT NO.: NTE-20200721	
		DRAWN BY: SN	SCALE: As Shown

APPENDIX C
PHOTOGRAPHS OF TEST PITS



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.
Photograph No.	1	Date:	21. Jul. 2020
Description:	Soil sampling from Test Pit No.	1	

Northtown Engineering Inc.
212-430 Hazeldean Road
Kanata, ON K2L 1T9



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	2	Date:	21. Jul. 2020	
Description:	Soil sampling from Test Pit No.	2		



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.
Photograph No.	3	Date:	21. Jul. 2020
Description:	Soil sampling from Test Pit No. 3		

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Kanata, ON K2L 1T9



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.
Photograph No.	4	Date:	21. Jul. 2020
Description:	Soil sampling from Test Pit No. 4		

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Kanata, ON K2L 1T9



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	5	Date:	21. Jul. 2020	
Description:	Soil sampling from Test Pit No. 5			



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	6	Date:	21. Jul. 2020	
Description:	Soil sampling from Test Pit No. 6			



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.
Photograph No.	7	Date:	21. Jul. 2020
Description:	Soil sampling from Test Pit No. 7		

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Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.
Photograph No.	8	Date:	21. Jul. 2020
Description:	Soil sampling from Test Pit No. 8		

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Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.
Photograph No.	9	Date:	21. Jul. 2020
Description:	Soil sampling from Test Pit No. 9		

Northtown Engineering Inc.
212-430 Hazeldean Road
Kanata, ON K2L 1T9



Environment Baseline Assessment
Nunavut Excavating Soil and Water Treatment Facility
Cambridge Bay, Nunavut



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	10	Date:	21. Jul. 2020	
Description:	Groundwater sampling from Test Pit No.	10		



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Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	11	Date:	21. Jul. 2020	
Description:	Groundwater sampling from Test Pit No.	11		



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Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	12	Date:	21. Jul. 2020	
Description:	Groundwater sampling from Test Pit No.	12		



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Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	13	Date:	21. Jul. 2020	
Description:	Groundwater sampling from Test Pit No.	13		



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Cambridge Bay, Nunavut**



Project No.	NTE-20200721	Client:	Nunavut Construction Ltd.	Northtown Engineering Inc. 212-430 Hazeldean Road Kanata, ON K2L 1T9
Photograph No.	14	Date:	21. Jul. 2020	
Description:	Groundwater sampling from Test Pit No.	14		

APPENDIX D
Analytical Laboratory Test Results

Table 1 – Physical Properties, Solubility, Hydrocarbon, BTEX and F1-F4 of soils

Physical Properties	UNITS	TP20-01	TP20-02	TP20-02 Lab-Dup	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	TP20-06B Field-Blank	TP20-07	TP20-08	TP20-09	TP20-09 Lab-Dup	TP20-10	TP20-11	TP20-12	TP20-13	TP20-14	RDL	CCME SQG (Industrial)
Moisture	%	11		N/A	11	7.2	7.8	13	5.2	5.7	8.6	5.7	6.6	N/A	7.8	5.9	9.6	13	10	0.30	-
Soluble Parameters																					
Soluble Conductivity	dS/m	1.8	N/A	N/A	N/A	0.30	N/A	N/A	0.34	N/A	N/A	N/A	0.47	-	N/A	N/A	N/A	N/A	N/A	N/A	4
Soluble pH	pH	7.95	7.97	8.39	8.01	8.32	8.06	8.37	8.34	8.34	8.34	8.22	8.34	-	8.28	8.28	8.16	7.91	8.25	N/A	'6 - 8
Saturation %	%	23	24	28	30	16	27	16	14	14	14	17	18	-	17	18	18	21	25	20	-
Ext. Pet. Hydrocarbon																					
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	<10	<10	<10	10	320
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	260
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	N/A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	N/A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	3300
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	-
Volatiles																					
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	N/A	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	11
Field Preserved Volatiles																					
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	N/A	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.03
Toluene	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	N/A	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	0.37
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	N/A	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.82
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	N/A	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	N/A	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	11
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	<10	<10	<10	10	320
Surrogate Recovery (%)																					
1,4-Difluorobenzene (sur.)	%	103	103	102	105	104	103	104	104	105	105	106	103	N/A	106	107	106	104	105	N/A	-
4-Bromofluorobenzene (sur.)	%	97	96	97	97	96	95	96	96	93	92	92	93	N/A	93	93	94	94	94	N/A	-
D10-o-Xylene (sur.)	%	132	133	129	120	125	141 (1)	126	131	131	125	131	116	N/A	129	134	122	134	130	N/A	-
D4-1,2-Dichloroethane (sur.)	%	101	100	100	101	100	101	101	101	102	103	102	99	N/A	101	104	103	101	101	N/A	-
O-TERPHENYL (sur.)	%	103	N/A	104	95	104	115	102	102	108	109	101	100	96	109	113	105	102	99	N/A	-

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

Parameters exceed CCME limits

Table 2 – Semi-volatile organic properties of soils

Polycyclic Aromatics	UNITS	TP20-01	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	TP20-06B Field-Blank	TP20-07	TP20-08	TP20-09	TP20-09 L	TP20-10	TP20-11	TP20-12	TP20-13	TP20-14	RDL	CCME SQG (Industrial)
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Bi[a]p TPE Total Potency Equivalents	mg/kg	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	N/A	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	0.0071	ND
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	320
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	ND
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	32
Benzo[a]anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	10
Benzo[b&f]fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	10
Benzo[k]fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	10
Benzo[g,h,i]perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Benzo[c]phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Benzo[a]pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	72
Benzo[e]pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Dibenz[a,h]anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	10
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	180
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Indeno[1,2,3-cd]pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	10
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	22
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	50
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	ND
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	100
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	ND
Surrogate Recovery (%)																			
D10-ANTHRACENE (sur.)	%	88	83	84	82	82	88	87	84	89	87	85	86	87	86	74	87	N/A	-
D8-ACENAPHTHYLENE (sur.)	%	80	81	75	74	80	79	96	85	90	85	86	76	85	78	82	84	N/A	-
D8-NAPHTHALENE (sur.)	%	83	84	82	83	89	77	92	91	88	67	72	75	101	82	73	87	N/A	-
TERPHENYL-D14 (sur.)	%	82	69	55	68	61	69	101	72	84	90	62	89	70	81	67	70	N/A	-

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

Parameters exceed CCME limits

ND = No data available from CCME Soil Quality Guidelines for Industrial

Table 3 – Metals content in soils

Elements	UNITS	TP20-01	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	TP20-06B Field-Blank	TP20-07	TP20-08	TP20-09	TP20-10	TP20-11	TP20-12	TP20-13	TP20-14	RDL	CCME SQG (Industrial)
Total Antimony (Sb)	mg/kg	1.5	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	0.62	<0.50	<0.50	<0.50	0.50	40
Total Arsenic (As)	mg/kg	6.9	5.9	2.4	1.8	4.8	1.7	1.6	1.5	1.7	1.7	1.9	2.3	1.6	7.4	1.6	1.0	12
Total Barium (Ba)	mg/kg	40	53	66	79	66	48	38	34	50	44	39	46	43	60	39	1.0	2000
Total Beryllium (Be)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.43	<0.40	0.40	8
Total Cadmium (Cd)	mg/kg	0.057	0.075	<0.050	<0.050	0.097	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.061	<0.050	0.050	22
Total Chromium (Cr)	mg/kg	20	25	6.8	29	37	24	15	19	22	15	19	27	13	20	17	1.0	87
Total Cobalt (Co)	mg/kg	3.4	4.6	1.7	2.6	3.4	2.5	2.1	2.2	2.8	2.4	2.1	2.5	2.7	5.3	2.7	0.50	300
Total Copper (Cu)	mg/kg	6.8	8.6	3.5	5.3	7.2	5.3	5.1	5.6	5.8	5.4	4.8	4.7	5.2	11	4.2	1.0	91
Total Lead (Pb)	mg/kg	4.2	5.3	3.0	4.4	4.4	3.9	4.2	4.0	4.4	4.0	4.2	4.6	4.1	5.3	4.2	0.50	600
Total Molybdenum (Mo)	mg/kg	0.98	1.3	<0.40	0.75	1.1	0.61	0.48	0.57	0.57	0.58	0.61	0.71	0.45	0.65	0.70	0.40	40
Total Nickel (Ni)	mg/kg	13	15	4.3	15	18	12	18	11	13	9.9	11	14	9.2	16	11	1.0	89
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	2.9
Total Silver (Ag)	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	40
Total Thallium (Tl)	mg/kg	0.14	0.13	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.18	<0.10	0.10	1
Total Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	300
Total Uranium (U)	mg/kg	0.79	0.80	0.76	0.63	0.68	0.66	0.65	0.67	0.65	0.65	0.62	0.66	0.75	0.86	0.76	0.20	300
Total Vanadium (V)	mg/kg	20	22	12	12	22	11	9.5	11	12	11	9.8	12	12	26	10	1.0	130
Total Zinc (Zn)	mg/kg	13	14	<10	<10	17	<10	<10	<10	<10	<10	<10	<10	<10	21	<10	10	410

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

Parameters exceed CCME limits

Table 4 – Volatile organic contents in soils

Field Preserved Volatiles	UNITS	TP20-01	TP20-02	TP20-02 Lab-Dup	TP20-03	TP20-04	TP20-05	TP20-06	TP20-06B Field-Blank	TP20-07	TP20-08	TP20-09	TP20-10	TP20-11	TP20-12	TP20-13	TP20-14	RDL	CCME SQG (Industrial)
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	10
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	ND
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	ND
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	50
Chlorobenzene	mg/kg	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	NA
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	NA
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
Chloroform	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	50
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	50
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	ND
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	10
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	10
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	10
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	50
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	50
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	ND
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	ND
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
1,1,1,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	ND
1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	50
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	50
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	10
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	10
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	10
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	50
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	ND
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	ND
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	ND
Surrogate Recovery (%)																			
4-Difluorobenzene (sur.)	%	99	99	99	99	99	99	99	99	98	99	99	99	99	97	99	99	N/A	-
4-Bromofluorobenzene (sur.)	%	97	99	99	100	99	98	100	101	100	100	100	100	100	100	99	100	N/A	-
D10-o-Xylene (sur.)	%	107	113	119	109	104	120	109	105	102	105	105	101	106	99	110	109	N/A	-
D4-1,2-Dichloroethane (sur.)	%	115	103	94	98	94	94	92	98	109	95	101	103	95	121	94	94	N/A	-

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

Parameters exceed CCME limits

ND = No data available from CCME Soil Quality Guidelines for Industrial

Table 5 – pH , Hydrocarbon, BTEX and F1-F4 properties of Groundwater

	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B Field-Blank	TP20-14	TP20-14 Lab-Dup	RDL	CCME ISQG (Marine)	Alberta SWEQG
pH	-	7.96	8.06	7.96	7.94	7.99	7.97	-	-	7.0 – 8.7	
Ext. Pet. Hydrocarbon											
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	<100	<100	N/A	100	ND	-
F1 (C6-C10)	ug/L	<100	<100	<100	<100	<100	<100	N/A	100	ND	150
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	ND	0.11
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	ND	ND
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	ND	ND
Volatiles											
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40	110	-
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40	215	-
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40	25	-
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	N/A	0.80	ND	-
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40	ND	-
Xylenes (Total)	ug/L	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	N/A	0.89	ND	13100
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	102	101	102	102	101	101	N/A	N/A	-	
4-Bromofluorobenzene (sur.)	%	95	93	93	93	92	91	N/A	N/A	-	
D4-1,2-Dichloroethane (sur.)	%	101	100	100	104	100	100	N/A	N/A	-	
O-TERPHENYL (sur.)	%	93	93	95	94	94	98	98	N/A	-	

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

Parameters exceed CCME limits

ND = No data available from CCME Water Quality Guidelines

Alberta SWEQG = Surface water environmental quality guidelines for the protection of freshwater aquatic life

Table 6 – Semi-volatile organic properties of Groundwater

Polycyclic Aromatics	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B Field-Blank	TP20-14	TP20-14 Lab- Dup	RDL	CCME ISQG (Marine)	CCME ISQG (Freshwater)	Alberta SWEQG
B[a]P TPE Total Potency Equivalents	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	N/A	0.010	ND	ND	ND
Acenaphthene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6.7	-	6.71
Acenaphthylene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	5.9	-	5.87
Acridine	ug/L	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	ND	4.4	4.4
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	46.9	-	0.1
Benzo(a)anthracene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	74.8	-	0.2
Benzo(b&j)fluoranthene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	ND	-	0.1
Benzo(k)fluoranthene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	ND	-	ND
Benzo(g,h,i)perylene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	ND	-	ND
Benzo(c)phenanthrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	ND	-	ND
Benzo(a)pyrene	ug/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	88.8	-	31.9
Benzo(e)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	ND	-	ND
Chrysene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	108	-	57.1
Dibenz(a,h)anthracene	ug/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	6.2	-	ND
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	113	-	111
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	21.2	-	21.2
Indeno(1,2,3-cd)pyrene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	ND	-	0.2
1-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	ND	-	-
2-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	20.2	-	-
Naphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	34.6	-	-
Phenanthrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	86.7	-	41.9
Perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	ND	-	-
Pyrene	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	153	-	53
Quinoline	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	ND	3.4	3.4
Surrogate Recovery (%)												
D10-ANTHRACENE (sur.)	%	106	102	110	114	113	105	104	N/A	-	-	-
D8-ACENAPHTHYLENE (sur.)	%	96	84	104	111	103	97	93	N/A	-	-	-
D8-NAPHTHALENE (sur.)	%	77	74	72	89	76	86	72	N/A	-	-	-
TERPHENYL-D14 (sur.)	%	117	104	90	97	95	93	103	N/A	-	-	-

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

ND = No data available from CCME Water Quality Guidelines

Parameters exceed CCME limits

Alberta SWEQG = Surface water environmental quality guidelines for the protection of freshwater aquatic life

Table 7 – Metals content in Groundwater

Elements	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B Field-Blank	TP20-14	RDL	CCME ISQG (Marine)	CCME ISQG (livestock)	CCME ISQG (Freshwater)	Alberta SWEQG
Total Aluminum (Al)	mg/L	4.6	6.1	9.9	16	12	8.7	0.0030	ND	5000	-	ND
Total Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	ND	-	-	ND
Total Arsenic (As)	mg/L	0.0043	0.0037	0.0089	0.011	0.0096	0.0092	0.00020	7240	-	-	5900
Total Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	ND	ND	ND	100
Total Cadmium (Cd)	mg/L	0.000024	0.000059	0.00032	0.00013	0.00015	0.00015	0.000020	700	-	-	-
Total Chromium (Cr)	mg/L	0.0091	0.013	0.021	0.035	0.027	0.020	0.0010	ND	-	-	-
Total Cobalt (Co)	mg/L	0.0076	0.0057	0.011	0.011	0.0094	0.013	0.00030	1000	-	-	-
Total Copper (Cu)	mg/L	0.014	0.016	0.029	0.025	0.024	0.028	0.00020	ND	17800	-	-
Total Lead (Pb)	mg/L	0.0098	0.0096	0.011	0.011	0.010	0.023	0.00020	30200	-	-	-
Total Molybdenum (Mo)	mg/L	0.0032	0.0082	0.0025	0.0062	0.0045	0.0043	0.00020	ND	500	-	-
Total Nickel (Ni)	mg/L	0.037	0.014	0.029	0.037	0.032	0.031	0.00050	1000	-	-	-
Total Selenium (Se)	mg/L	<0.00020	0.00021	0.00061	0.00042	0.00034	0.00056	0.00020	50	-	-	-
Total Silver (Ag)	mg/L	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	0.00010	7.5	-	-	-
Total Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	0.00038	0.00030	<0.00020	0.00020	ND	ND	ND	800
Total Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	ND	ND	ND	-
Total Titanium (Ti)	mg/L	0.20	0.30	0.45	0.82	0.61	0.41	0.0010	ND	ND	15	-
Total Uranium (U)	mg/L	0.0058	0.0048	0.0038	0.0053	0.0051	0.011	0.00010	ND	200	-	-
Total Vanadium (V)	mg/L	0.014	0.020	0.035	0.048	0.038	0.033	0.0010	100	-	-	-
Total Zinc (Zn)	mg/L	0.089	0.15	0.097	0.082	0.099	0.071	0.0030	124000	-	-	-

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Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

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Parameters exceed CCME limits

Alberta SWEQG = Surface water environmental quality guidelines for the protection of freshwater aquatic life

Table 8 – Volatile organic contents in Groundwater

Volatiles	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B Field-Blank	TP20-14	RDL	CCME IWQG (Freshwater)	CCME ISQG (Marine)	CCME ISQG (Livestock)
Total Trihalomethanes	ug/L	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.3	ND	ND	ND
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	100
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	ND	ND	ND
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	5
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	25	-	-
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	ND	ND	ND
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	ND	ND	ND
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	100
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	ND	ND	ND
1,2-dibromoethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	ND	ND	ND
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	42	-	-
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	150	-	-
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	26	-	-
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	100	-	-
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	98	-	-
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	10000	-	-
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	72	-	-
1,1,1,2-tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	ND	ND	ND
1,1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	ND	ND	ND
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	8	-	-
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	24	-	-
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	5
1,1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	50
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	ND	ND	ND

RDL = Reportable Detection Limit

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Field-Blank = Field duplicate sample from same location

N/A = Not Applicable

ND = No data available from CCME Water Quality Guidelines

Parameters exceed CCME limits

APPENDIX E
Bureau Veritas Laboratory Data



Your Project #: NET-20200721
 Site#: FACILITY BASELINE ENV.TESTING
 Your C.O.C. #: 780762-01-01, 780762-05-01

Attention: Shahab Nowrozi

NorthTown Engineering
 AB
 Canada

Report Date: 2020/08/02
 Report #: R2910401
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C051850

Received: 2020/07/23, 08:20

Sample Matrix: Soil
 # Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 2)	15	N/A	2020/07/31	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	15	N/A	2020/08/01		Auto Calc
Conductivity @25C (Soluble) (1)	4	2020/07/30	2020/07/30	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
CCME Hydrocarbons (F2-F4 in soil) (1, 3)	11	2020/07/28	2020/07/29	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1, 3)	4	2020/07/28	2020/07/30	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils (1)	15	2020/07/29	2020/07/30	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Moisture (1)	15	N/A	2020/07/29	AB SOP-00002	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (1)	15	N/A	2020/07/30		Auto Calc
PAH in Soil by GC/MS (1)	13	2020/07/28	2020/07/29	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
PAH in Soil by GC/MS (1)	2	2020/07/28	2020/07/30	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
pH @25C (Soluble) (1)	15	2020/07/29	2020/07/29	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
Soluble Paste (1)	15	2020/07/29	2020/07/29	AB SOP-00033	Carter 2nd ed 15.2 m
VOCs in Soil by HS GC/MS (Std List) (1, 2)	15	N/A	2020/07/30	AB SOP-00056	EPA 5021a/8260d m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope



Your Project #: NET-20200721
Site#: FACILITY BASELINE ENV.TESTING
Your C.O.C. #: 780762-01-01, 780762-05-01

Attention: Shahab Nowrozi

NorthTown Engineering
AB
Canada

Report Date: 2020/08/02
Report #: R2910401
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C051850

Received: 2020/07/23, 08:20

dilution methods.

Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by BV Labs Calgary Environmental

(2) No lab extraction date is given for F1BTX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.

(3) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Customer Solutions, Western Canada Customer Experience Team

Email: customersolutionswest@bvlabs.com

Phone# (780) 577-7100

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This report has been generated and distributed using a secure automated process.

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		YD4180	YD4180	YD4181	YD4182	YD4183	YD4184	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	
	UNITS	TP20-01	TP20-01 Lab-Dup	TP20-02	TP20-03	TP20-04	TP20-05	RDL
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	N/A	<10	<10	<10	<10	10
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	N/A	<50	<50	<50	<50	50
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	N/A	<50	<50	<50	<50	50
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	Yes	Yes	Yes	N/A
Physical Properties								
Moisture	%	11	N/A	11	7.2	7.8	13	0.30
Volatiles								
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	<0.045	<0.045	<0.045	0.045
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	<10	<10	<10	<10	10
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Toluene	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	10
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	103	103	102	105	104	103	N/A
4-Bromofluorobenzene (sur.)	%	97	96	97	97	96	95	N/A
D10-o-Xylene (sur.)	%	132	133	129	120	125	141 (1)	N/A
D4-1,2-Dichloroethane (sur.)	%	101	100	100	101	100	101	N/A
O-TERPHENYL (sur.)	%	103	N/A	104	95	104	115	N/A
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable (1) Surrogate recovery exceeds acceptance criteria (high recovery). As results are non-detect, there is no impact on data quality.								



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BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

BV Labs ID		YD4184	YD4185	YD4186	YD4187	YD4188	YD4189	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	
	UNITS	TP20-05 Lab-Dup	TP20-06	TP20-06B	TP20-07	TP20-08	TP20-09	RDL
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	N/A	<10	<10	<10	<10	<10	10
F3 (C16-C34 Hydrocarbons)	mg/kg	N/A	<50	<50	<50	<50	<50	50
F4 (C34-C50 Hydrocarbons)	mg/kg	N/A	<50	<50	<50	<50	<50	50
Reached Baseline at C50	mg/kg	N/A	Yes	Yes	Yes	Yes	Yes	N/A
Physical Properties								
Moisture	%	12	5.2	5.7	8.6	5.7	6.6	0.30
Volatiles								
Xylenes (Total)	mg/kg	N/A	<0.045	<0.045	<0.045	<0.045	<0.045	0.045
F1 (C6-C10) - BTEX	mg/kg	N/A	<10	<10	<10	<10	<10	10
Field Preserved Volatiles								
Benzene	mg/kg	N/A	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Toluene	mg/kg	N/A	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ethylbenzene	mg/kg	N/A	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
m & p-Xylene	mg/kg	N/A	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
o-Xylene	mg/kg	N/A	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
F1 (C6-C10)	mg/kg	N/A	<10	<10	<10	<10	<10	10
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	N/A	104	105	105	106	103	N/A
4-Bromofluorobenzene (sur.)	%	N/A	96	93	92	92	93	N/A
D10-o-Xylene (sur.)	%	N/A	126	131	125	131	116	N/A
D4-1,2-Dichloroethane (sur.)	%	N/A	101	102	103	102	99	N/A
O-TERPHENYL (sur.)	%	N/A	102	108	109	101	100	N/A
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable								

**AT1 BTEX AND F1-F4 IN SOIL (VIALS)**

BV Labs ID		YD4189	YD4190	YD4191	YD4192	YD4193	YD4194	
Sampling Date								
COC Number		780762-01-01	780762-05-01	780762-05-01	780762-05-01	780762-05-01	780762-05-01	
	UNITS	TP20-09 Lab-Dup	TP20-10	TP20-11	TP20-12	TP20-13	TP20-14	RDL
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	<10	10
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A
Physical Properties								
Moisture	%	N/A	7.8	5.9	9.6	13	10	0.30
Volatiles								
Xylenes (Total)	mg/kg	N/A	<0.045	<0.045	<0.045	<0.045	<0.045	0.045
F1 (C6-C10) - BTEX	mg/kg	N/A	<10	<10	<10	<10	<10	10
Field Preserved Volatiles								
Benzene	mg/kg	N/A	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Toluene	mg/kg	N/A	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ethylbenzene	mg/kg	N/A	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
m & p-Xylene	mg/kg	N/A	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
o-Xylene	mg/kg	N/A	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
F1 (C6-C10)	mg/kg	N/A	<10	<10	<10	<10	<10	10
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	N/A	106	107	106	104	105	N/A
4-Bromofluorobenzene (sur.)	%	N/A	93	93	94	94	94	N/A
D10-o-Xylene (sur.)	%	N/A	129	134	122	134	130	N/A
D4-1,2-Dichloroethane (sur.)	%	N/A	101	104	103	101	101	N/A
O-TERPHENYL (sur.)	%	96	109	113	105	102	99	N/A
RDL = Reportable Detection Limit								
Lab-Dup = Laboratory Initiated Duplicate								
N/A = Not Applicable								



RESULTS OF CHEMICAL ANALYSES OF SOIL

BV Labs ID		YD4180		YD4180	YD4181	YD4182		YD4183	YD4184
Sampling Date									
COC Number		780762-01-01		780762-01-01	780762-01-01	780762-01-01		780762-01-01	780762-01-01
	UNITS	TP20-01	RDL	TP20-01 Lab-Dup	TP20-02	TP20-03	RDL	TP20-04	TP20-05

Soluble Parameters

Soluble Conductivity	dS/m	1.8	0.020	N/A	N/A	0.30	0.020	N/A	N/A
Soluble pH	pH	7.95	N/A	7.97	8.39	8.01	N/A	8.32	8.06
Saturation %	%	23	N/A	24	28	30	N/A	16	27

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

BV Labs ID		YD4185		YD4186	YD4187	YD4188		YD4189	YD4190
Sampling Date									
COC Number		780762-01-01		780762-01-01	780762-01-01	780762-01-01		780762-01-01	780762-05-01
	UNITS	TP20-06	RDL	TP20-06B	TP20-07	TP20-08	RDL	TP20-09	TP20-10

Soluble Parameters

Soluble Conductivity	dS/m	0.34	0.020	N/A	N/A	0.47	0.020	N/A	N/A
Soluble pH	pH	8.37	N/A	8.34	8.22	8.24	N/A	8.34	8.28
Saturation %	%	16	N/A	14	17	18	N/A	17	18

RDL = Reportable Detection Limit

N/A = Not Applicable

BV Labs ID		YD4191	YD4192	YD4193	YD4194
Sampling Date					
COC Number		780762-05-01	780762-05-01	780762-05-01	780762-05-01
	UNITS	TP20-11	TP20-12	TP20-13	TP20-14
Soluble Parameters					
Soluble pH	pH	8.28	8.16	7.91	8.25
Saturation %	%	18	21	25	20



SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4180	YD4181	YD4182	YD4183	YD4184	YD4185	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	
	UNITS	TP20-01	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	RDL
Polycyclic Aromatics								
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	0.0071
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(b&j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(e)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	88	83	84	82	82	88	N/A
D8-ACENAPHTHYLENE (sur.)	%	80	81	75	74	80	79	N/A
D8-NAPHTHALENE (sur.)	%	83	84	82	83	89	77	N/A
TERPHENYL-D14 (sur.)	%	82	69	55	68	61	69	N/A
RDL = Reportable Detection Limit								
N/A = Not Applicable								



BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4186	YD4187	YD4188	YD4189	YD4189	YD4190	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-05-01	
	UNITS	TP20-06B	TP20-07	TP20-08	TP20-09	TP20-09 Lab-Dup	TP20-10	RDL
Polycyclic Aromatics								
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	<0.0071	<0.0071	<0.0071	N/A	<0.0071	0.0071
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(b&j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(e)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	87	84	89	87	85	86	N/A
D8-ACENAPHTHYLENE (sur.)	%	96	85	90	85	86	76	N/A
D8-NAPHTHALENE (sur.)	%	92	91	88	67	72	75	N/A
TERPHENYL-D14 (sur.)	%	101	72	84	90	62	89	N/A
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable								



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BV Labs Job #: C051850

Report Date: 2020/08/02

NorthTown Engineering

Client Project #: NET-20200721

Sampler Initials: SN

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4191	YD4192	YD4193	YD4194	
Sampling Date						
COC Number		780762-05-01	780762-05-01	780762-05-01	780762-05-01	
	UNITS	TP20-11	TP20-12	TP20-13	TP20-14	RDL
Polycyclic Aromatics						
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	<0.0071	<0.0071	<0.0071	0.0071
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	0.0040
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(b&j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Benzo(e)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010
Surrogate Recovery (%)						
D10-ANTHRACENE (sur.)	%	87	86	74	87	N/A
D8-ACENAPHTHYLENE (sur.)	%	85	78	82	84	N/A
D8-NAPHTHALENE (sur.)	%	101	82	73	87	N/A
TERPHENYL-D14 (sur.)	%	70	81	67	70	N/A
RDL = Reportable Detection Limit						
N/A = Not Applicable						



BUREAU
VERITAS

BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		YD4180	YD4181	YD4182	YD4183	YD4184	YD4185	YD4186	
Sampling Date									
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	
	UNITS	TP20-01	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	TP20-06B	RDL
Elements									
Total Antimony (Sb)	mg/kg	1.5	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	0.50
Total Arsenic (As)	mg/kg	6.9	5.9	2.4	1.8	4.8	1.7	1.6	1.0
Total Barium (Ba)	mg/kg	40	53	66	79	66	48	38	1.0
Total Beryllium (Be)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40
Total Cadmium (Cd)	mg/kg	0.057	0.075	<0.050	<0.050	0.097	<0.050	<0.050	0.050
Total Chromium (Cr)	mg/kg	20	25	6.8	29	37	24	15	1.0
Total Cobalt (Co)	mg/kg	3.4	4.6	1.7	2.6	3.4	2.5	2.1	0.50
Total Copper (Cu)	mg/kg	6.8	8.6	3.5	5.3	7.2	5.3	5.1	1.0
Total Lead (Pb)	mg/kg	4.2	5.3	3.0	4.4	4.4	3.9	4.2	0.50
Total Molybdenum (Mo)	mg/kg	0.98	1.3	<0.40	0.75	1.1	0.61	0.48	0.40
Total Nickel (Ni)	mg/kg	13	15	4.3	15	18	12	18	1.0
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Total Silver (Ag)	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
Total Thallium (Tl)	mg/kg	0.14	0.13	<0.10	<0.10	0.12	<0.10	<0.10	0.10
Total Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Total Uranium (U)	mg/kg	0.79	0.80	0.76	0.63	0.68	0.66	0.65	0.20
Total Vanadium (V)	mg/kg	20	22	12	12	22	11	9.5	1.0
Total Zinc (Zn)	mg/kg	13	14	<10	<10	17	<10	<10	10
RDL = Reportable Detection Limit									



BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		YD4187	YD4188	YD4189	YD4190	YD4191	YD4192	YD4193	
Sampling Date									
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-05-01	780762-05-01	780762-05-01	780762-05-01	
	UNITS	TP20-07	TP20-08	TP20-09	TP20-10	TP20-11	TP20-12	TP20-13	RDL
Elements									
Total Antimony (Sb)	mg/kg	<0.50	<0.50	<0.50	0.87	0.62	<0.50	<0.50	0.50
Total Arsenic (As)	mg/kg	1.5	1.7	1.7	1.9	2.3	1.6	7.4	1.0
Total Barium (Ba)	mg/kg	34	50	44	39	46	43	60	1.0
Total Beryllium (Be)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.43	0.40
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.061	0.050
Total Chromium (Cr)	mg/kg	19	22	15	19	27	13	20	1.0
Total Cobalt (Co)	mg/kg	2.2	2.8	2.4	2.1	2.5	2.7	5.3	0.50
Total Copper (Cu)	mg/kg	5.6	5.8	5.4	4.8	4.7	5.2	11	1.0
Total Lead (Pb)	mg/kg	4.0	4.4	4.0	4.2	4.6	4.1	5.3	0.50
Total Molybdenum (Mo)	mg/kg	0.57	0.57	0.58	0.61	0.71	0.45	0.65	0.40
Total Nickel (Ni)	mg/kg	11	13	9.9	11	14	9.2	16	1.0
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Total Silver (Ag)	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
Total Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.18	0.10
Total Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Total Uranium (U)	mg/kg	0.67	0.65	0.65	0.62	0.66	0.75	0.86	0.20
Total Vanadium (V)	mg/kg	11	12	11	9.8	12	12	26	1.0
Total Zinc (Zn)	mg/kg	<10	<10	<10	<10	<10	<10	21	10
RDL = Reportable Detection Limit									



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BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		YD4194	
Sampling Date			
COC Number		780762-05-01	
	UNITS	TP20-14	RDL
Elements			
Total Antimony (Sb)	mg/kg	<0.50	0.50
Total Arsenic (As)	mg/kg	1.6	1.0
Total Barium (Ba)	mg/kg	39	1.0
Total Beryllium (Be)	mg/kg	<0.40	0.40
Total Cadmium (Cd)	mg/kg	<0.050	0.050
Total Chromium (Cr)	mg/kg	17	1.0
Total Cobalt (Co)	mg/kg	2.7	0.50
Total Copper (Cu)	mg/kg	4.2	1.0
Total Lead (Pb)	mg/kg	4.2	0.50
Total Molybdenum (Mo)	mg/kg	0.70	0.40
Total Nickel (Ni)	mg/kg	11	1.0
Total Selenium (Se)	mg/kg	<0.50	0.50
Total Silver (Ag)	mg/kg	<0.20	0.20
Total Thallium (Tl)	mg/kg	<0.10	0.10
Total Tin (Sn)	mg/kg	<1.0	1.0
Total Uranium (U)	mg/kg	0.76	0.20
Total Vanadium (V)	mg/kg	10	1.0
Total Zinc (Zn)	mg/kg	<10	10
RDL = Reportable Detection Limit			



BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4180	YD4181	YD4181	YD4182	YD4183	YD4184	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	
	UNITS	TP20-01	TP20-02	TP20-02 Lab-Dup	TP20-03	TP20-04	TP20-05	RDL

Field Preserved Volatiles								
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050
Chlorobenzene	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate



BUREAU
VERITAS

BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4180	YD4181	YD4181	YD4182	YD4183	YD4184	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	
	UNITS	TP20-01	TP20-02	TP20-02 Lab-Dup	TP20-03	TP20-04	TP20-05	RDL
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	99	99	99	99	99	N/A
4-Bromofluorobenzene (sur.)	%	97	99	99	100	99	98	N/A
D10-o-Xylene (sur.)	%	107	113	119	109	104	120	N/A
D4-1,2-Dichloroethane (sur.)	%	115	103	94	98	94	94	N/A
RDL = Reportable Detection Limit								
Lab-Dup = Laboratory Initiated Duplicate								
N/A = Not Applicable								



BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4185	YD4186	YD4187	YD4188	YD4189	YD4190	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-05-01	
	UNITS	TP20-06	TP20-06B	TP20-07	TP20-08	TP20-09	TP20-10	RDL
Field Preserved Volatiles								
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050
Chlorobenzene	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.030
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
RDL = Reportable Detection Limit								



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VERITAS

BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4185	YD4186	YD4187	YD4188	YD4189	YD4190	
Sampling Date								
COC Number		780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-01-01	780762-05-01	
	UNITS	TP20-06	TP20-06B	TP20-07	TP20-08	TP20-09	TP20-10	RDL
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	99	99	98	99	99	N/A
4-Bromofluorobenzene (sur.)	%	100	101	97	100	100	100	N/A
D10-o-Xylene (sur.)	%	109	105	102	105	105	101	N/A
D4-1,2-Dichloroethane (sur.)	%	92	98	109	95	101	103	N/A
RDL = Reportable Detection Limit								
N/A = Not Applicable								



BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4191	YD4192	YD4193	YD4194	
Sampling Date						
COC Number		780762-05-01	780762-05-01	780762-05-01	780762-05-01	
	UNITS	TP20-11	TP20-12	TP20-13	TP20-14	RDL
Field Preserved Volatiles						
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	0.00050
Chlorobenzene	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050
1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
RDL = Reportable Detection Limit						



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BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YD4191	YD4192	YD4193	YD4194	
Sampling Date						
COC Number		780762-05-01	780762-05-01	780762-05-01	780762-05-01	
	UNITS	TP20-11	TP20-12	TP20-13	TP20-14	RDL
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	0.00030
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	99	97	99	99	N/A
4-Bromofluorobenzene (sur.)	%	100	100	99	100	N/A
D10-o-Xylene (sur.)	%	106	99	110	109	N/A
D4-1,2-Dichloroethane (sur.)	%	95	121	94	94	N/A
RDL = Reportable Detection Limit						
N/A = Not Applicable						



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.1°C
Package 2	6.5°C
Package 3	5.2°C
Package 4	5.2°C

Results relate only to the items tested.



BV Labs Job #: C051850
Report Date: 2020/08/02

QUALITY ASSURANCE REPORT

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9938460	D10-ANTHRACENE (sur.)	2020/07/29	83	50 - 130	82	50 - 130	92	%				
9938460	D8-ACENAPHTHYLENE (sur.)	2020/07/29	86	50 - 130	88	50 - 130	90	%				
9938460	D8-NAPHTHALENE (sur.)	2020/07/29	74	50 - 130	100	50 - 130	77	%				
9938460	TERPHENYL-D14 (sur.)	2020/07/29	71	50 - 130	81	50 - 130	84	%				
9938466	O-TERPHENYL (sur.)	2020/07/29	97	60 - 140	116	60 - 140	114	%				
9940165	1,4-Difluorobenzene (sur.)	2020/07/31	102	50 - 140	101	50 - 140	102	%				
9940165	4-Bromofluorobenzene (sur.)	2020/07/31	95	50 - 140	99	50 - 140	99	%				
9940165	D10-o-Xylene (sur.)	2020/07/31	127	50 - 140	123	50 - 140	124	%				
9940165	D4-1,2-Dichloroethane (sur.)	2020/07/31	100	50 - 140	98	50 - 140	101	%				
9940223	1,4-Difluorobenzene (sur.)	2020/07/30	102	50 - 140	102	50 - 140	99	%				
9940223	4-Bromofluorobenzene (sur.)	2020/07/30	104	50 - 140	102	50 - 140	97	%				
9940223	D10-o-Xylene (sur.)	2020/07/30	112	50 - 140	100	50 - 140	112	%				
9940223	D4-1,2-Dichloroethane (sur.)	2020/07/30	111	50 - 140	106	50 - 140	98	%				
9938012	Moisture	2020/07/29					<0.30	%	2.1	20		
9938017	Moisture	2020/07/29					<0.30	%	8.1	20		
9938460	1-Methylnaphthalene	2020/07/29	79	50 - 130	92	50 - 130	<0.0050	mg/kg	NC	50		
9938460	2-Methylnaphthalene	2020/07/29	76	50 - 130	87	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Acenaphthene	2020/07/29	76	50 - 130	85	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Acenaphthylene	2020/07/29	78	50 - 130	80	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Acridine	2020/07/29	66	50 - 130	63	50 - 130	<0.010	mg/kg	NC	50		
9938460	Anthracene	2020/07/29	62	50 - 130	60	50 - 130	<0.0040	mg/kg	NC	50		
9938460	Benzo(a)anthracene	2020/07/29	89	50 - 130	75	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Benzo(a)pyrene	2020/07/29	79	50 - 130	82	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Benzo(b&j)fluoranthene	2020/07/29	86	50 - 130	62	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Benzo(c)phenanthrene	2020/07/29	87	50 - 130	68	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Benzo(e)pyrene	2020/07/29	78	50 - 130	73	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Benzo(g,h,i)perylene	2020/07/29	86	50 - 130	79	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Benzo(k)fluoranthene	2020/07/29	90	50 - 130	71	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Chrysene	2020/07/29	89	50 - 130	78	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Dibenz(a,h)anthracene	2020/07/29	87	50 - 130	84	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Fluoranthene	2020/07/29	66	50 - 130	84	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Fluorene	2020/07/29	73	50 - 130	101	50 - 130	<0.0050	mg/kg	NC	50		



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QUALITY ASSURANCE REPORT(CONT'D)

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9938460	Indeno(1,2,3-cd)pyrene	2020/07/29	86	50 - 130	81	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Naphthalene	2020/07/29	69	50 - 130	95	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Perylene	2020/07/29	75	50 - 130	77	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Phenanthrene	2020/07/29	78	50 - 130	76	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Pyrene	2020/07/29	63	50 - 130	81	50 - 130	<0.0050	mg/kg	NC	50		
9938460	Quinoline	2020/07/29	103	50 - 130	104	50 - 130	<0.010	mg/kg	NC	50		
9938466	F2 (C10-C16 Hydrocarbons)	2020/07/29	88	60 - 140	108	60 - 140	<10	mg/kg	NC	40		
9938466	F3 (C16-C34 Hydrocarbons)	2020/07/29	89	60 - 140	108	60 - 140	<50	mg/kg	NC	40		
9938466	F4 (C34-C50 Hydrocarbons)	2020/07/29	86	60 - 140	104	60 - 140	<50	mg/kg	NC	40		
9939880	Saturation %	2020/07/29							3.1	12	102	75 - 125
9940165	Benzene	2020/07/31	97	50 - 140	100	60 - 130	<0.0050	mg/kg	NC	50		
9940165	Ethylbenzene	2020/07/31	100	50 - 140	107	60 - 130	<0.010	mg/kg	NC	50		
9940165	F1 (C6-C10)	2020/07/31	92	60 - 140	83	60 - 140	<10	mg/kg	NC	30		
9940165	m & p-Xylene	2020/07/31	100	50 - 140	105	60 - 130	<0.040	mg/kg	NC	50		
9940165	o-Xylene	2020/07/31	98	50 - 140	105	60 - 130	<0.020	mg/kg	NC	50		
9940165	Toluene	2020/07/31	98	50 - 140	102	60 - 130	<0.050	mg/kg	NC	50		
9940223	1,1,1,2-tetrachloroethane	2020/07/30	81	50 - 140	93	60 - 130	<0.050	mg/kg	NC	50		
9940223	1,1,1-trichloroethane	2020/07/30	86	50 - 140	95	60 - 130	<0.020	mg/kg	NC	50		
9940223	1,1,2,2-tetrachloroethane	2020/07/30	77	50 - 140	104	60 - 130	<0.050	mg/kg	NC	50		
9940223	1,1,2-trichloroethane	2020/07/30	81	50 - 140	105	60 - 130	<0.020	mg/kg	NC	50		
9940223	1,1-dichloroethane	2020/07/30	83	50 - 140	92	60 - 130	<0.020	mg/kg	NC	50		
9940223	1,1-dichloroethene	2020/07/30	79	50 - 140	87	60 - 130	<0.020	mg/kg	NC	50		
9940223	1,2,3-trichlorobenzene	2020/07/30	72	50 - 140	86	60 - 130	<0.040	mg/kg	NC	50		
9940223	1,2,4-trichlorobenzene	2020/07/30	75	50 - 140	89	60 - 130	<0.040	mg/kg	NC	50		
9940223	1,2,4-trimethylbenzene	2020/07/30	82	50 - 140	87	60 - 130	<0.50	mg/kg	NC	50		
9940223	1,2-dibromoethane	2020/07/30	79	50 - 140	102	60 - 130	<0.0020	mg/kg	NC	50		
9940223	1,2-dichlorobenzene	2020/07/30	78	50 - 140	91	60 - 130	<0.020	mg/kg	NC	50		
9940223	1,2-dichloroethane	2020/07/30	80	50 - 140	101	60 - 130	<0.0020	mg/kg	NC	50		
9940223	1,2-dichloropropane	2020/07/30	83	50 - 140	99	60 - 130	<0.020	mg/kg	NC	50		
9940223	1,3,5-trichlorobenzene	2020/07/30	80	50 - 140	91	60 - 130	<0.040	mg/kg	NC	50		
9940223	1,3,5-trimethylbenzene	2020/07/30	85	50 - 140	88	60 - 130	<0.50	mg/kg	NC	50		
9940223	1,3-dichlorobenzene	2020/07/30	80	50 - 140	90	60 - 130	<0.020	mg/kg	NC	50		



BV Labs Job #: C051850
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QUALITY ASSURANCE REPORT(CONT'D)

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9940223	1,4-dichlorobenzene	2020/07/30	78	50 - 140	89	60 - 130	<0.020	mg/kg	NC	50		
9940223	Bromodichloromethane	2020/07/30	87	50 - 140	104	60 - 130	<0.030	mg/kg	NC	50		
9940223	Bromoform	2020/07/30	81	50 - 140	110	60 - 130	<0.050	mg/kg	NC	50		
9940223	Bromomethane	2020/07/30	63	50 - 140	92	60 - 130	<0.020	mg/kg	NC	50		
9940223	Carbon tetrachloride	2020/07/30	83	50 - 140	92	60 - 130	<0.00050	mg/kg	NC	50		
9940223	Chlorobenzene	2020/07/30	77	50 - 140	87	60 - 130	<0.0010	mg/kg	NC	50		
9940223	Chlorodibromomethane	2020/07/30	89	50 - 140	110	60 - 130	<0.020	mg/kg	NC	50		
9940223	Chloroethane	2020/07/30	69	50 - 140	71	60 - 130	<0.020	mg/kg	NC	50		
9940223	Chloroform	2020/07/30	81	50 - 140	91	60 - 130	<0.010	mg/kg	NC	50		
9940223	Chloromethane	2020/07/30	58	50 - 140	67	60 - 130	<0.030	mg/kg	NC	50		
9940223	cis-1,2-dichloroethene	2020/07/30	83	50 - 140	97	60 - 130	<0.020	mg/kg	NC	50		
9940223	cis-1,3-dichloropropene	2020/07/30	72	50 - 140	111	60 - 130	<0.020	mg/kg	NC	50		
9940223	Dichloromethane	2020/07/30	70	50 - 140	83	60 - 130	<0.030	mg/kg	NC	50		
9940223	Methyl methacrylate	2020/07/30	88	50 - 140	122	60 - 130	<0.040	mg/kg	NC	50		
9940223	Methyl-tert-butylether (MTBE)	2020/07/30	82	50 - 140	95	60 - 130	<0.030	mg/kg	NC	50		
9940223	Styrene	2020/07/30	79	50 - 140	92	60 - 130	<0.020	mg/kg	NC	50		
9940223	Tetrachloroethene	2020/07/30	78	50 - 140	87	60 - 130	<0.010	mg/kg	NC	50		
9940223	trans-1,2-dichloroethene	2020/07/30	74	50 - 140	85	60 - 130	<0.020	mg/kg	NC	50		
9940223	trans-1,3-dichloropropene	2020/07/30	60	50 - 140	105	60 - 130	<0.020	mg/kg	NC	50		
9940223	Trichloroethene	2020/07/30	84	50 - 140	98	60 - 130	<0.010	mg/kg	NC	50		
9940223	Trichlorofluoromethane	2020/07/30	77	50 - 140	80	60 - 130	<0.020	mg/kg	NC	50		
9940223	Vinyl chloride	2020/07/30	68	50 - 140	73	60 - 130	<0.00030	mg/kg	NC	50		
9940312	Total Antimony (Sb)	2020/07/30	99	75 - 125	99	80 - 120	<0.50	mg/kg	NC	30	137	15 - 182
9940312	Total Arsenic (As)	2020/07/30	111	75 - 125	102	80 - 120	<1.0	mg/kg	0.067	30	103	53 - 147
9940312	Total Barium (Ba)	2020/07/30	NC	75 - 125	101	80 - 120	<1.0	mg/kg	0.33	35	102	80 - 119
9940312	Total Beryllium (Be)	2020/07/30	114	75 - 125	101	80 - 120	<0.40	mg/kg	NC	30		
9940312	Total Cadmium (Cd)	2020/07/30	111	75 - 125	100	80 - 120	<0.050	mg/kg	NC	30	109	72 - 128
9940312	Total Chromium (Cr)	2020/07/30	124	75 - 125	99	80 - 120	<1.0	mg/kg	4.0	30	93	59 - 141
9940312	Total Cobalt (Co)	2020/07/30	109	75 - 125	98	80 - 120	<0.50	mg/kg	1.5	30	94	58 - 142
9940312	Total Copper (Cu)	2020/07/30	110	75 - 125	98	80 - 120	<1.0	mg/kg	0.31	30	96	83 - 117
9940312	Total Lead (Pb)	2020/07/30	112	75 - 125	102	80 - 120	<0.50	mg/kg	9.8	35	107	79 - 121
9940312	Total Molybdenum (Mo)	2020/07/30	113	75 - 125	100	80 - 120	<0.40	mg/kg	12	35	105	67 - 133



QUALITY ASSURANCE REPORT(CONT'D)

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9940312	Total Nickel (Ni)	2020/07/30	113	75 - 125	96	80 - 120	<1.0	mg/kg	9.8	30	101	79 - 121
9940312	Total Selenium (Se)	2020/07/30	111	75 - 125	103	80 - 120	<0.50	mg/kg	NC	30		
9940312	Total Silver (Ag)	2020/07/30	112	75 - 125	102	80 - 120	<0.20	mg/kg	NC	35	87	47 - 153
9940312	Total Thallium (Tl)	2020/07/30	109	75 - 125	100	80 - 120	<0.10	mg/kg	8.8	30		
9940312	Total Tin (Sn)	2020/07/30	104	75 - 125	83	80 - 120	<1.0	mg/kg	NC	35	107	67 - 133
9940312	Total Uranium (U)	2020/07/30	104	75 - 125	99	80 - 120	<0.20	mg/kg	3.3	30	106	77 - 123
9940312	Total Vanadium (V)	2020/07/30	131 (1)	75 - 125	100	80 - 120	<1.0	mg/kg	1.3	30	101	79 - 121
9940312	Total Zinc (Zn)	2020/07/30	115	75 - 125	112	80 - 120	<10	mg/kg	2.6	30	99	79 - 121
9940348	Soluble pH	2020/07/29			100	97 - 103			0.25	N/A	99	98 - 102
9941496	Soluble Conductivity	2020/07/30			101	90 - 110	<0.020	dS/m	1.7	20	113	75 - 125

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times \text{RDL}$).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



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BV Labs Job #: C051850
Report Date: 2020/08/02

NorthTown Engineering
Client Project #: NET-20200721
Sampler Initials: SN

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Dennis Ngandu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

Harry (Peng) Liang, Senior Analyst

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN-OF-CUSTODY RECORD

[illegible]

RECEIVED BY (SIGN & PRINT)	DATE (YYYY/MM/DD)	TIME (HH:MM)
Jesse M. Adams	2020/07/23	8:20 AM

ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

[illegible]

RECEIVED BY (SIGN & PRINT)	DATE (YYYY/MM/DD)	TIME (HH:MM)
<i>[Signature]</i>	08/11/2020	00:51



Bureau Veritas Laboratories
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CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		LABORATORY USE ONLY:	
Company Name: #28364 Private Clients	Company Name: Nunavut Excavating Ltd.	Quotation #: NTE-20200721	Project: Cambridge Bay Soil and Water	Project Manager: Patrick Huph	Project Manager: Patrick Huph	Project Manager: Patrick Huph	Project Manager: Patrick Huph
Attention: Shahab Nowrozi	Attention: Shahab Nowrozi	Project Name: Cambridge Bay Soil and Water	Project Name: Cambridge Bay Soil and Water	Project Name: Cambridge Bay Soil and Water	Project Name: Cambridge Bay Soil and Water	Project Name: Cambridge Bay Soil and Water	Project Name: Cambridge Bay Soil and Water
Address: Kanata ON K2L 1T9	Address: 1875 Federal Rd. - Nunavut	Site #: 1875-975-7900 Fax	Site #: 1875-975-7900 Fax	Site #: 1875-975-7900 Fax	Site #: 1875-975-7900 Fax	Site #: 1875-975-7900 Fax	Site #: 1875-975-7900 Fax
Tel: (613) 913-9979	Tel: (613) 913-9979	Tel: (613) 913-9979	Tel: (613) 913-9979	Tel: (613) 913-9979	Tel: (613) 913-9979	Tel: (613) 913-9979	Tel: (613) 913-9979
Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com	Email: snnowrozi@northtowneng.com

MOE/REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY		ANALYSIS REQUESTED (PLEASE BE SPECIFIC)		TUMORAL TIME (TAT) REQUIRED:	
Regulation 153 (2011)		Regulation 153 (2011)		Regular (Standard) TAT:	
Table 1: ☐ Res/Park ☐ Medium/Fine ☐ CCME ☒ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ☐ PHQO ☐ Reg 405 Table ☐ Other: Nunavut	Table 2: ☐ Res/Park ☐ Medium/Fine ☐ CCME ☒ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ☐ PHQO ☐ Reg 405 Table ☐ Other: Nunavut	Table 3: ☐ Res/Park ☐ Medium/Fine ☐ CCME ☒ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ☐ PHQO ☐ Reg 405 Table ☐ Other: Nunavut	Table 4: ☐ Res/Park ☐ Medium/Fine ☐ CCME ☒ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ☐ PHQO ☐ Reg 405 Table ☐ Other: Nunavut	Regular (Standard) TAT: (will be applied if Rush TAT is not specified)	
Include Criteria on Certificate of Analysis (Y/N)?		Include Criteria on Certificate of Analysis (Y/N)?		Please provide advance notice for rush process	
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Comments
1 TP20-01	Cambridge Bay NU	2020-7-21	AM	SOIL	Regular turnaround
2 TP20-02	"	2020-7-21	AM	SOIL	
3 TP20-03	"	2020-7-21	AM	SOIL	
4 TP20-04	"	2020-7-21	AM	SOIL	
5 TP20-05	"	2020-7-21	AM	SOIL	
6 TP20-06	"	2020-7-21	AM	SOIL	Received in Yellowknife By: J. M. D. C. 8:30
7 TP20-06B (Duck Pond)	"	2020-7-21	AM	SOIL	JUL 23 2020
8 TP20-07	Cambridge Bay NU	2020-7-21	AM	SOIL	Temp: 1-1
9 TP20-08	"	2020-7-21	AM	SOIL	PS: see ACTR
10 TP20-09	"	2020-7-21	AM	SOIL	

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	LABORATORY USE ONLY	
SHAHAB NOWROZI		2020/7/22	AM	SHAHAB NOWROZI	2020/7/24	1500	# jars used and not submitted	Temperature (°C) on Receipt
							Time Sensitive	Custody Seal Present
							Intact	Yes No
							Whiter: BV Labs	Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

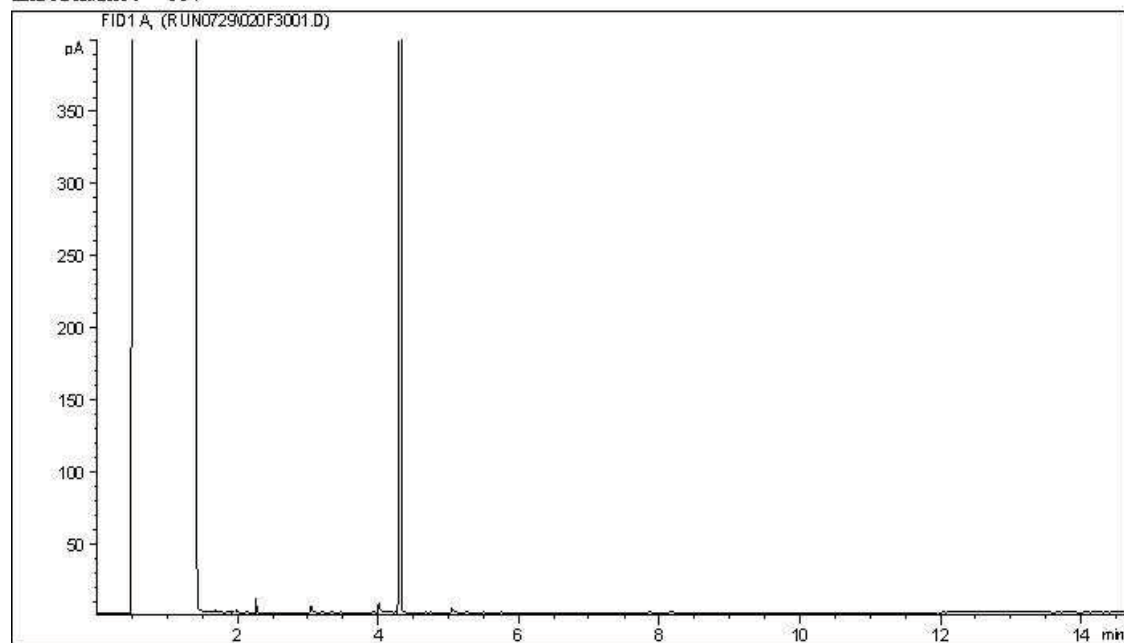
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

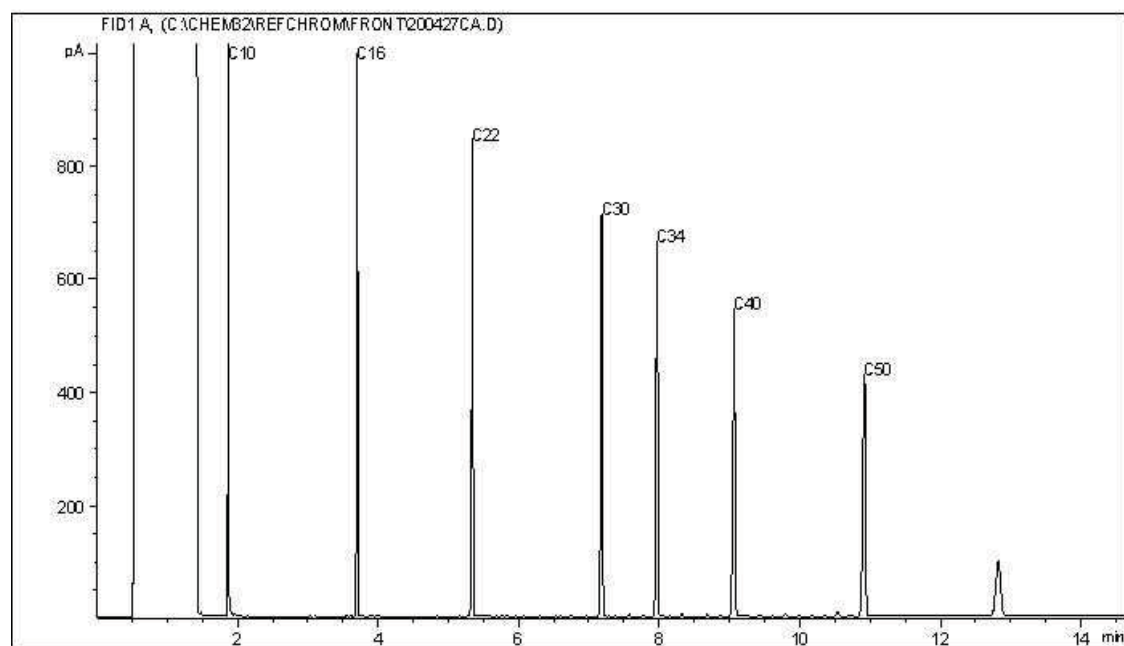
Bureau Veritas Canada (2019) Inc.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



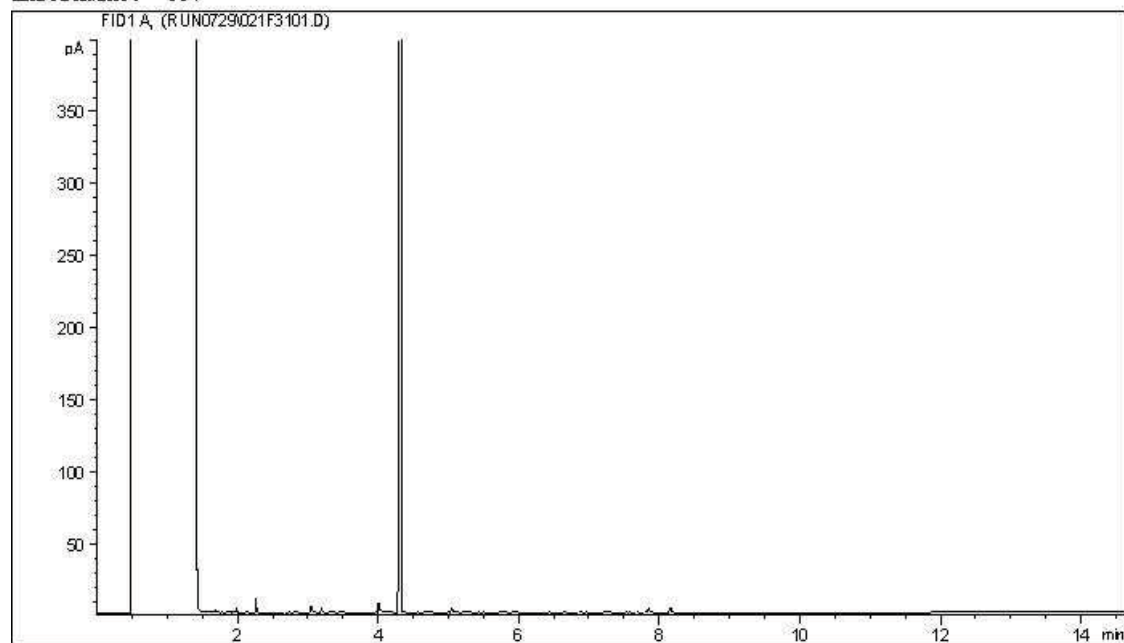
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

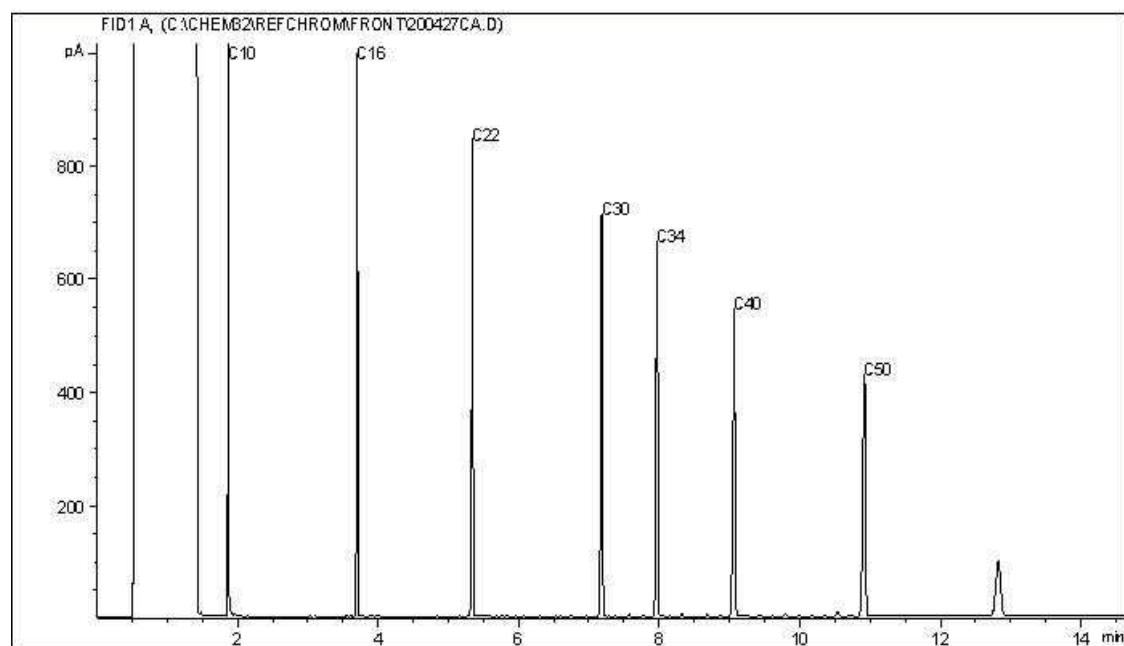
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



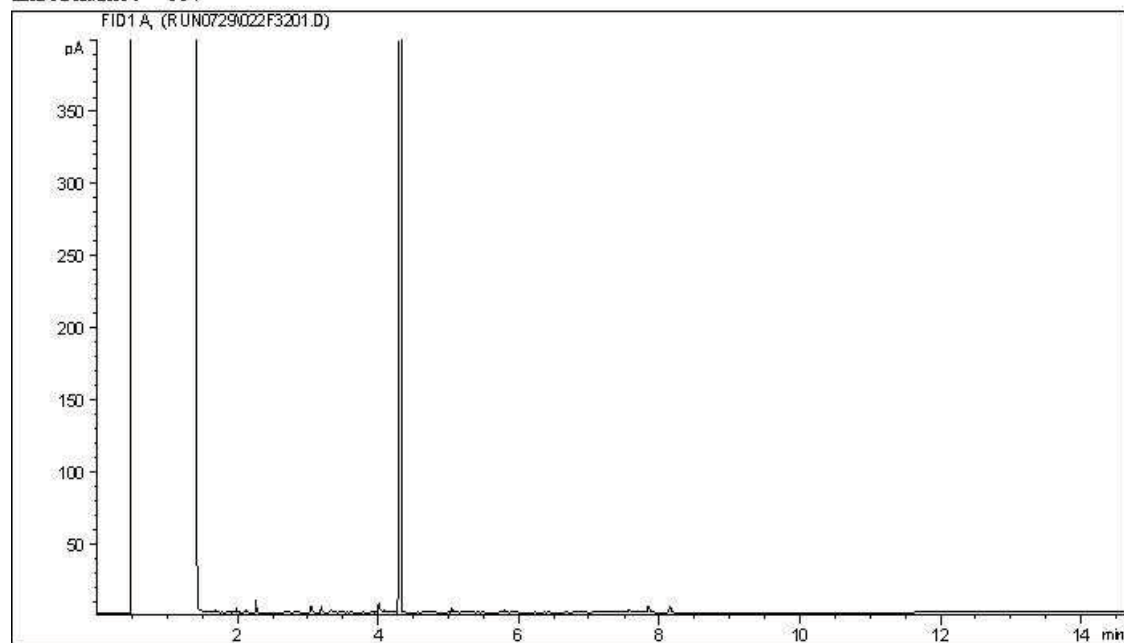
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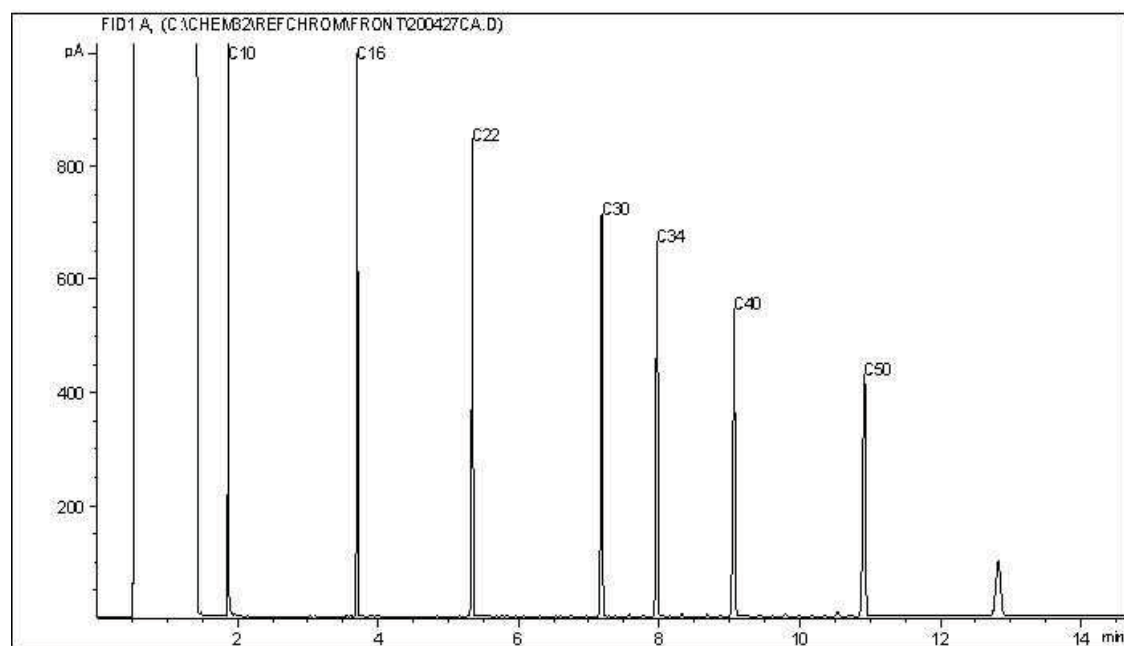
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Carbon Range Distribution - Reference Chromatogram



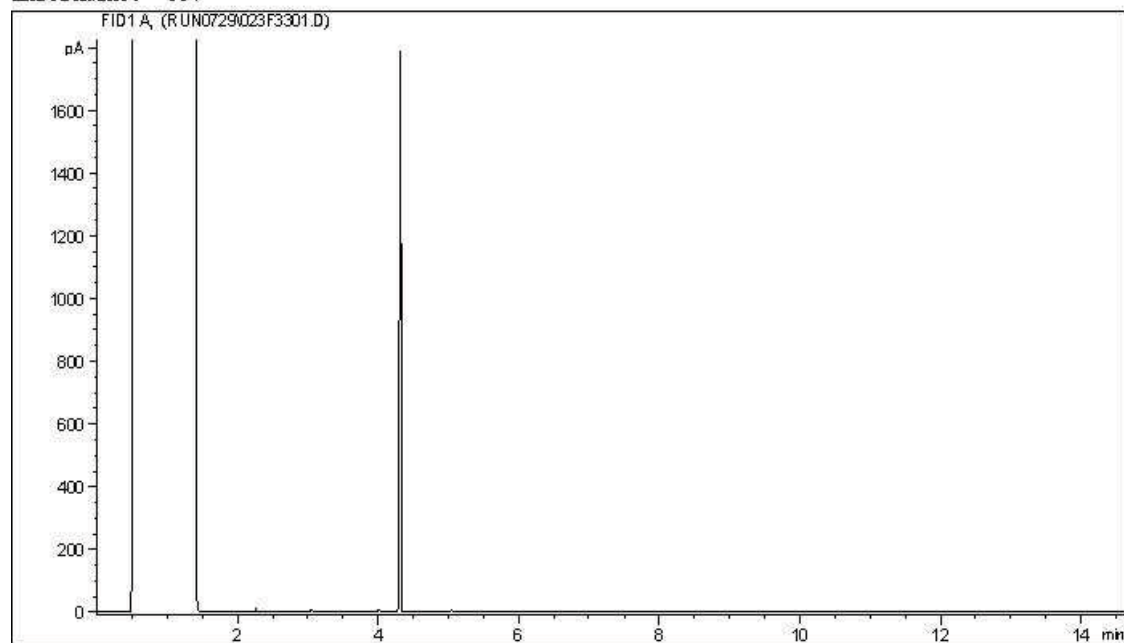
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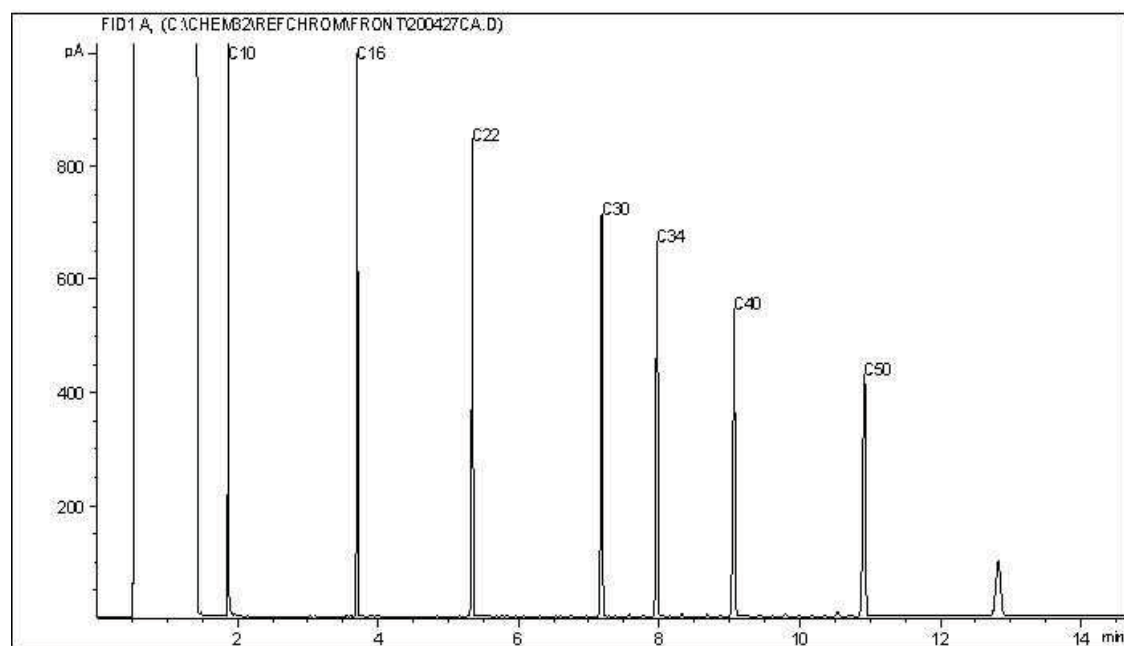
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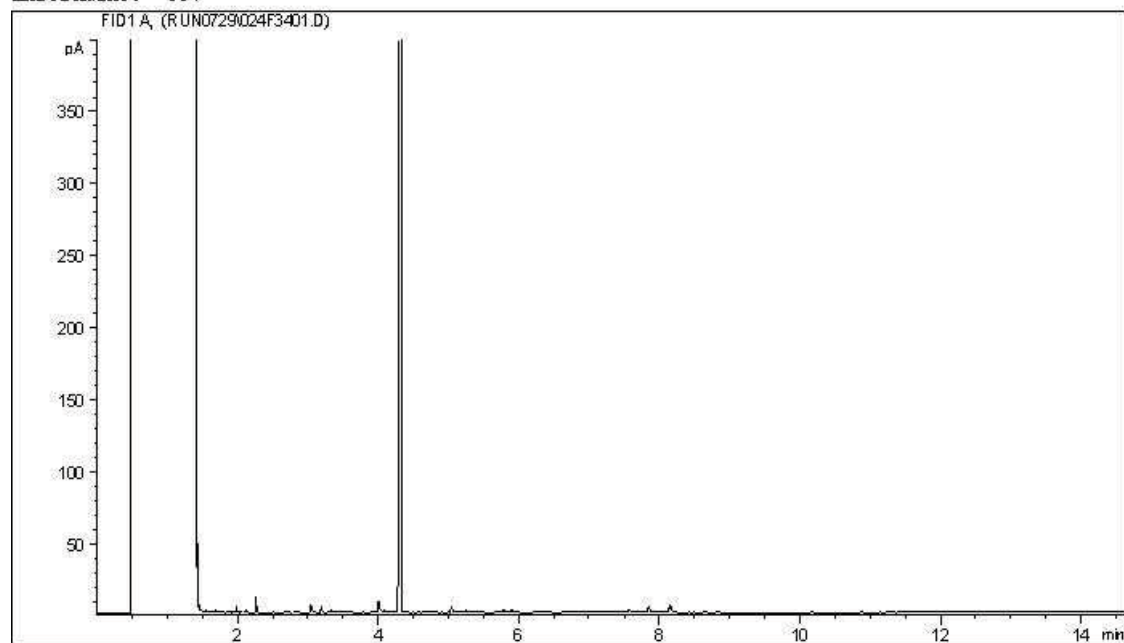
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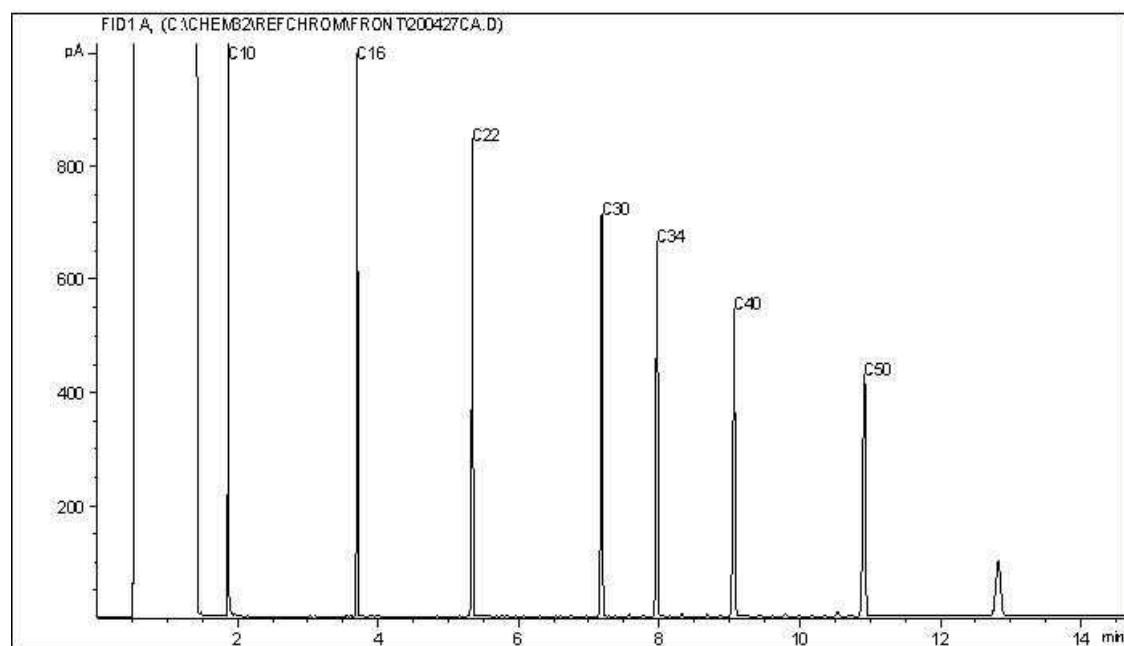
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Carbon Range Distribution - Reference Chromatogram



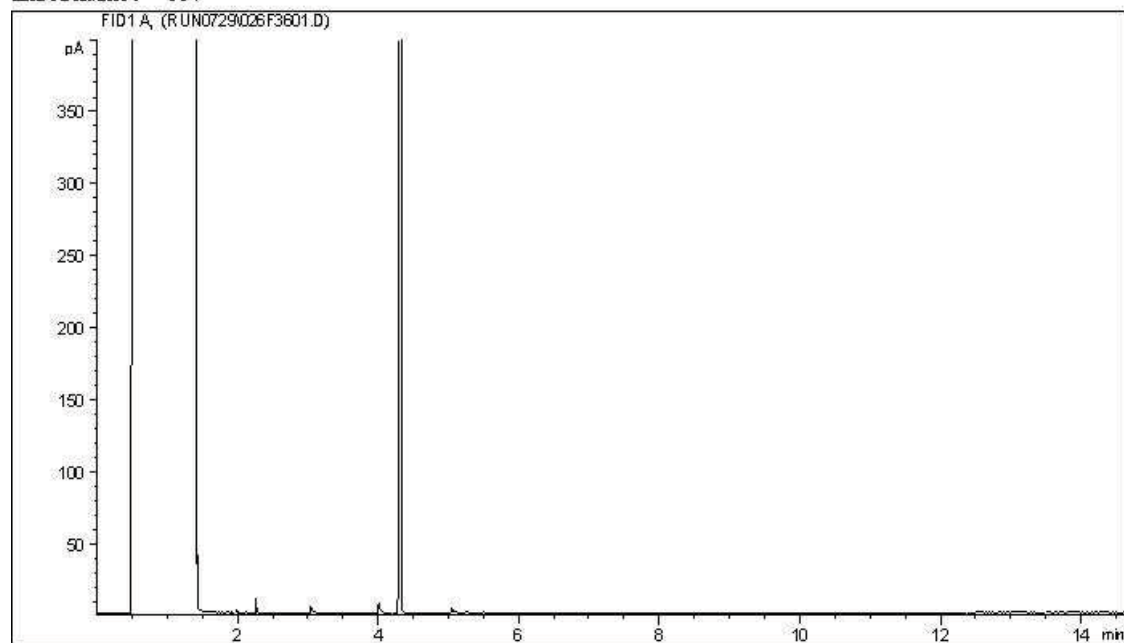
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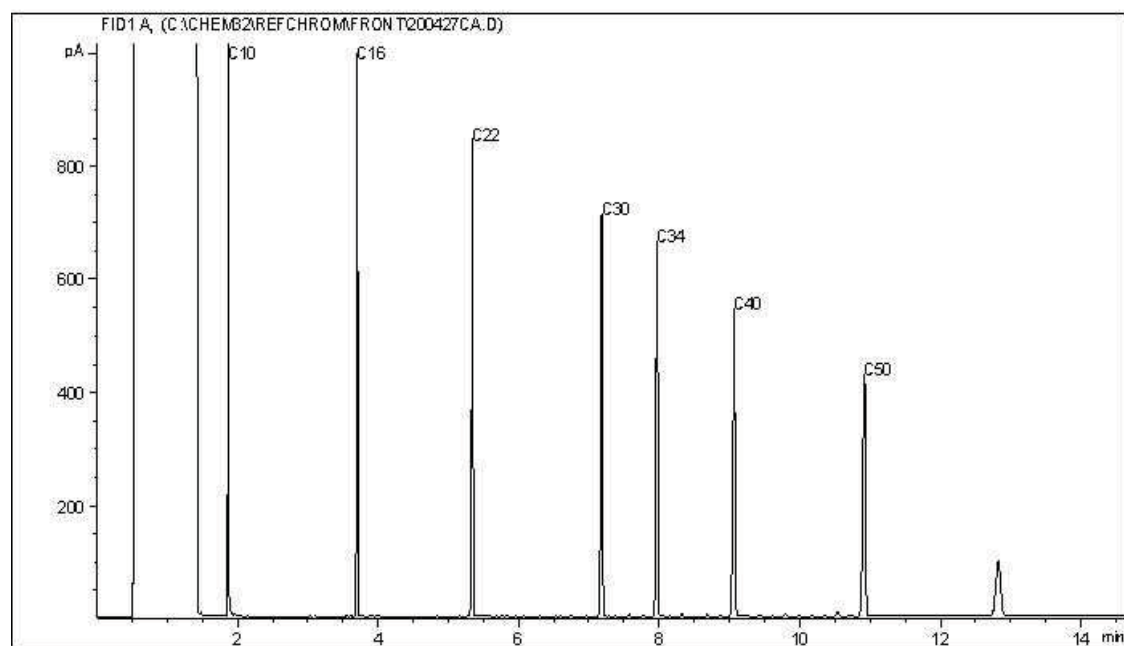
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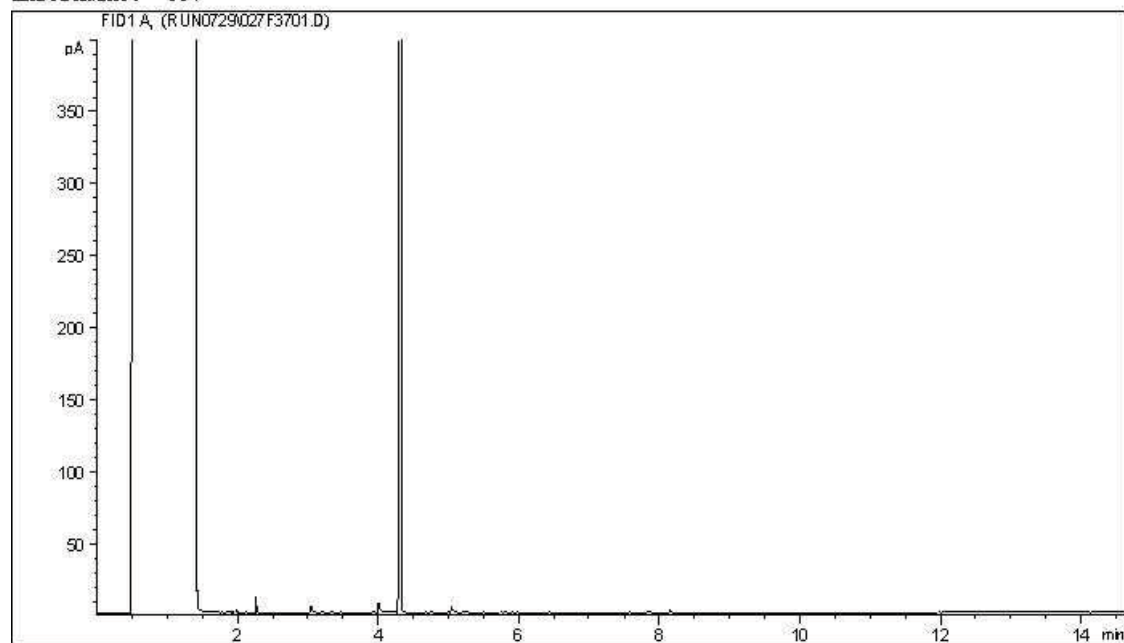
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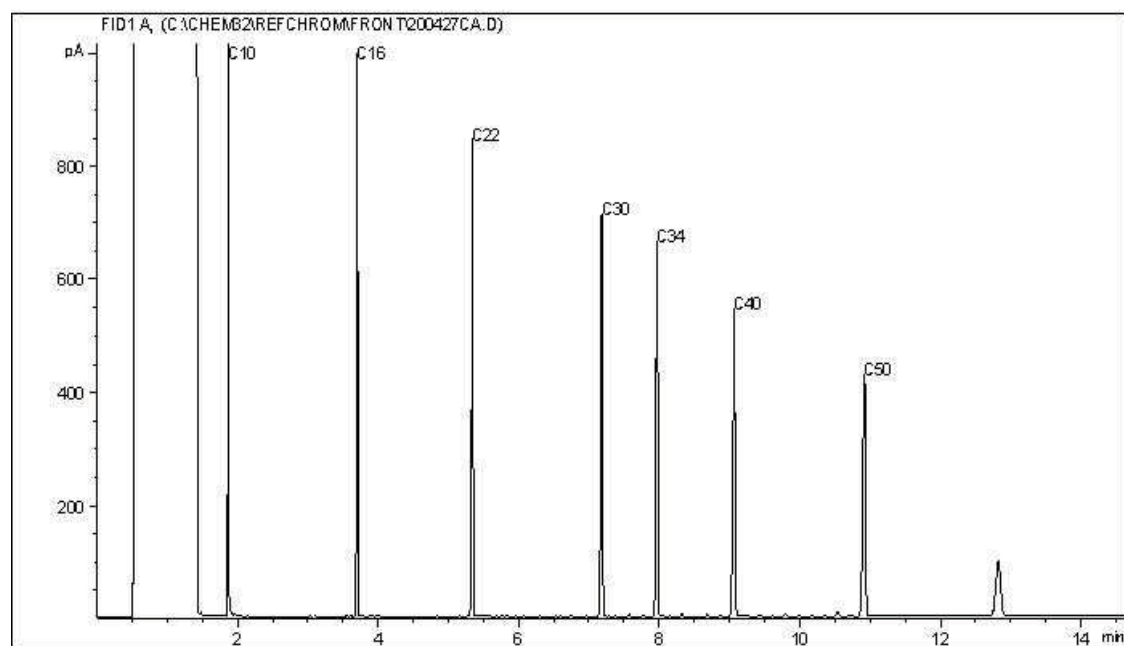
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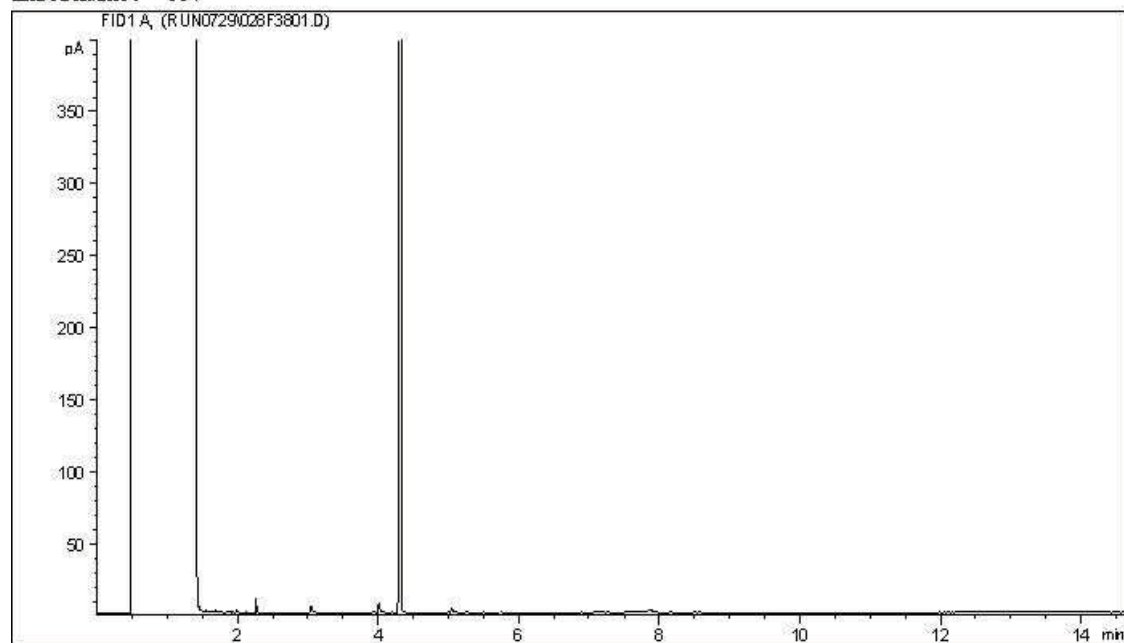
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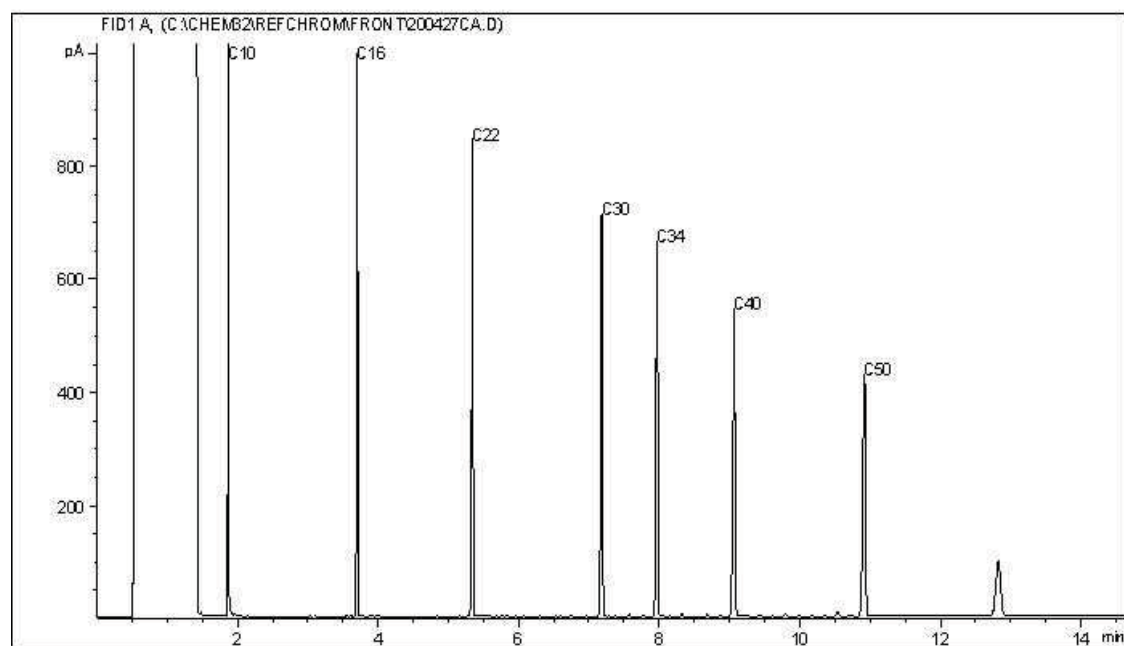
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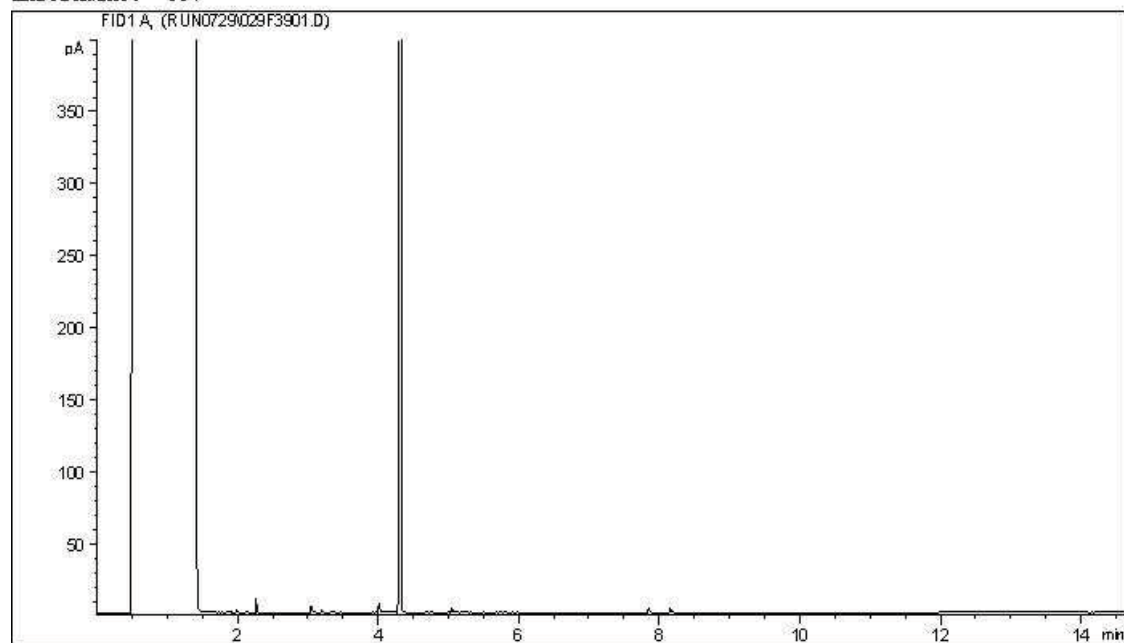
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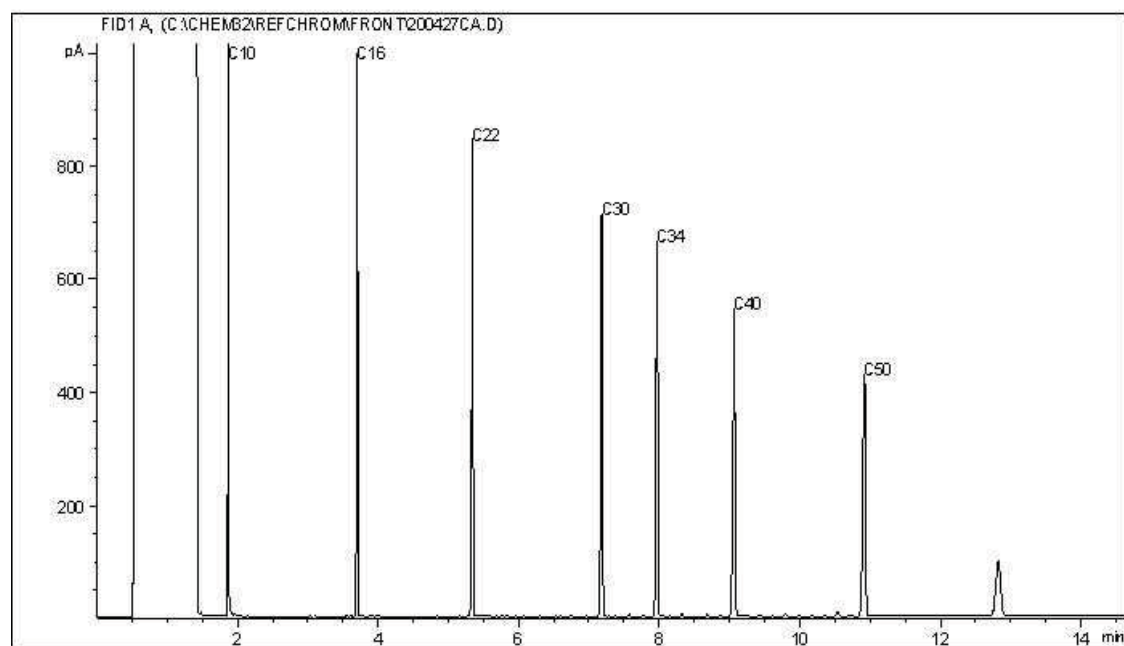
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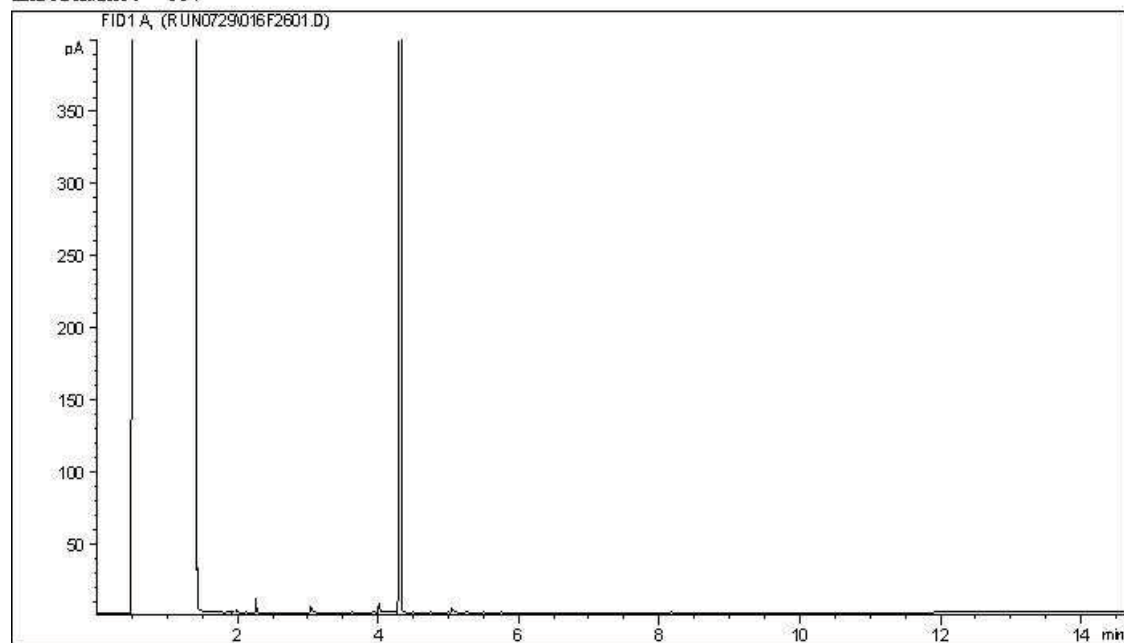
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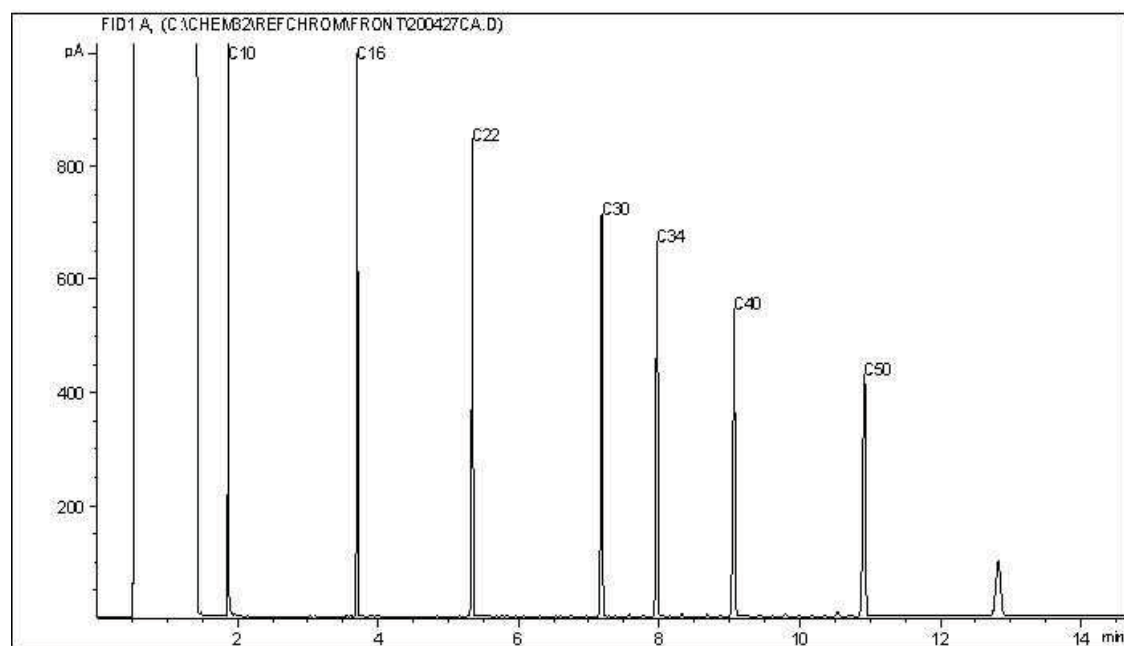
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Carbon Range Distribution - Reference Chromatogram



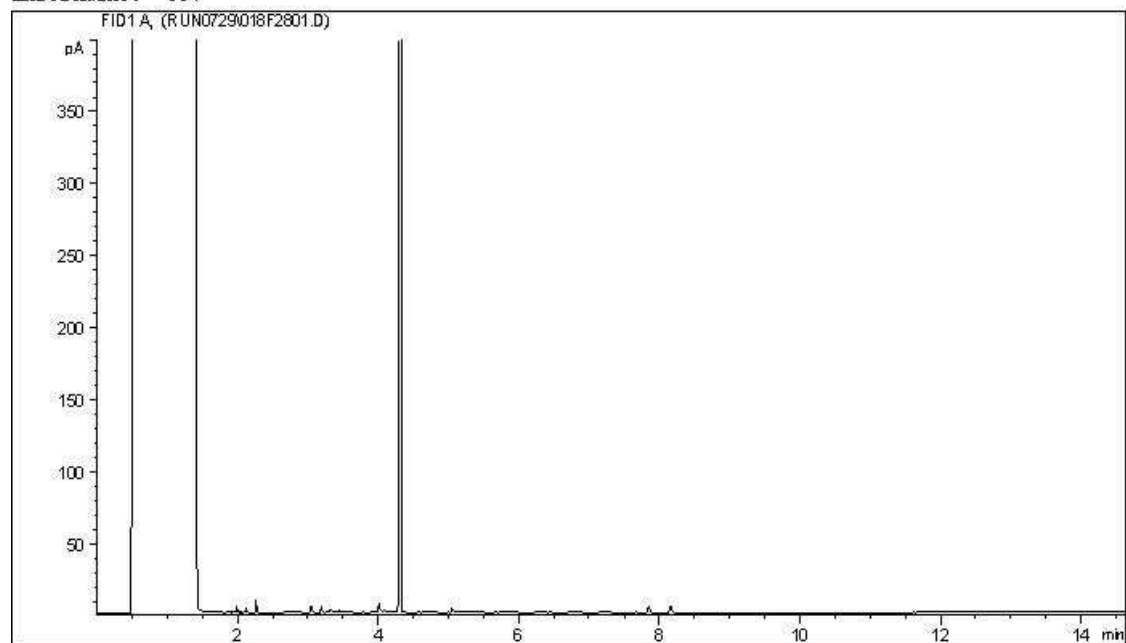
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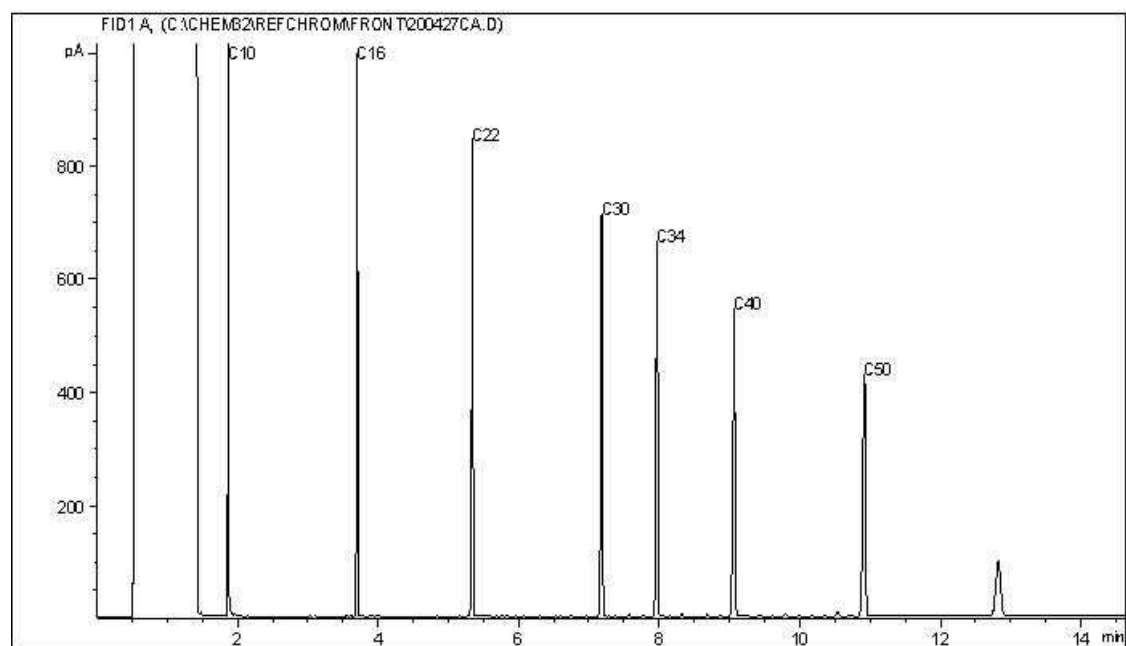
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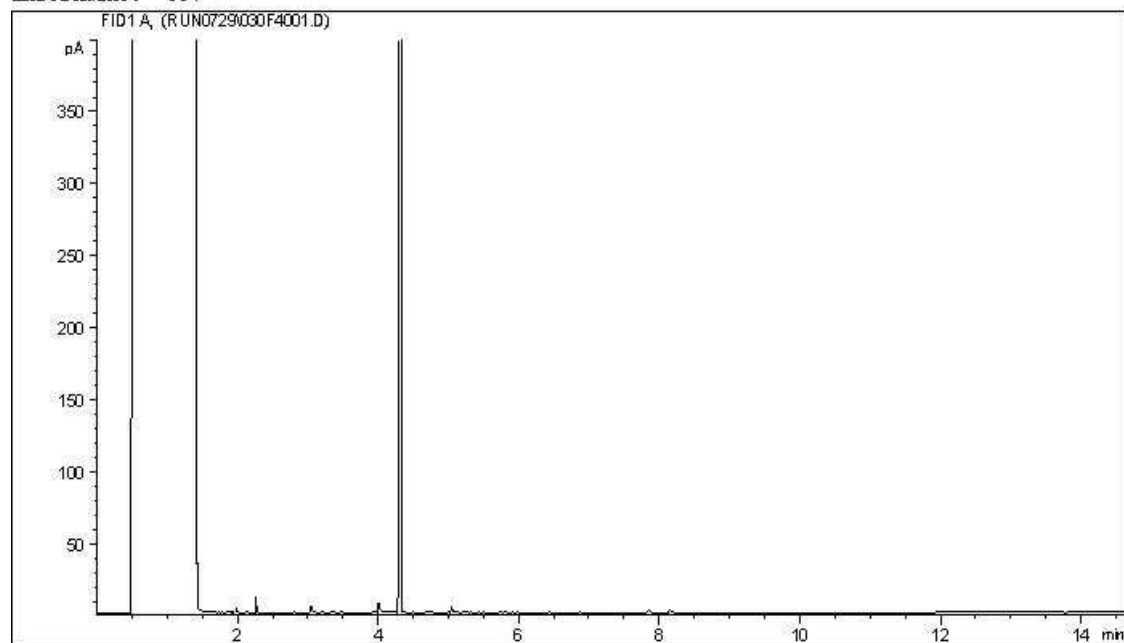
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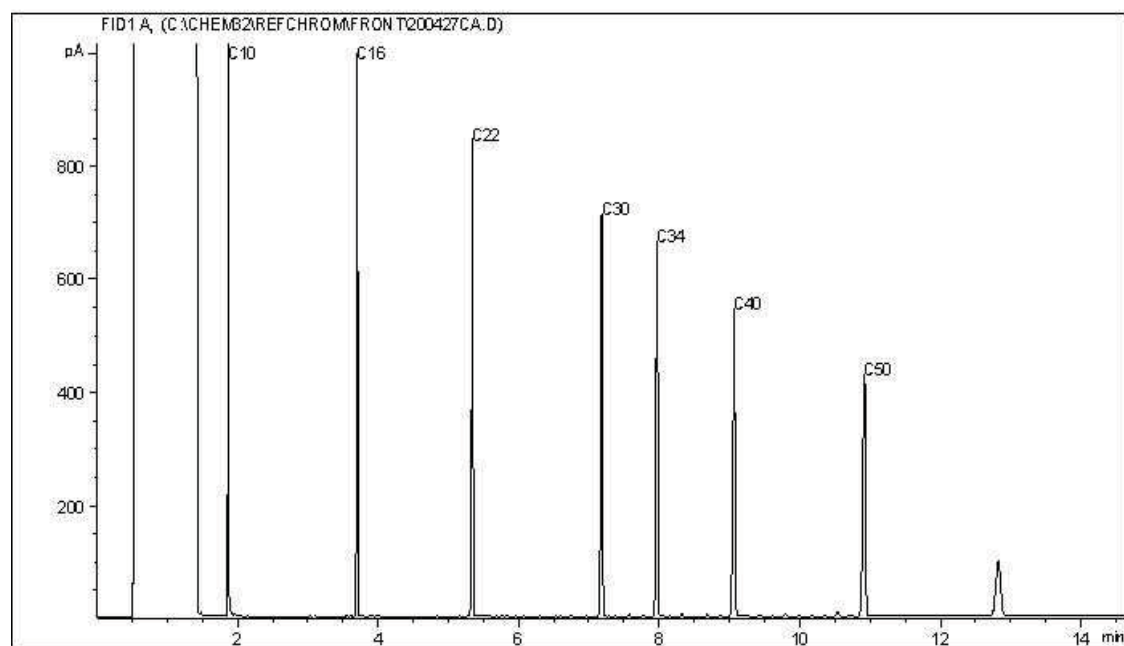
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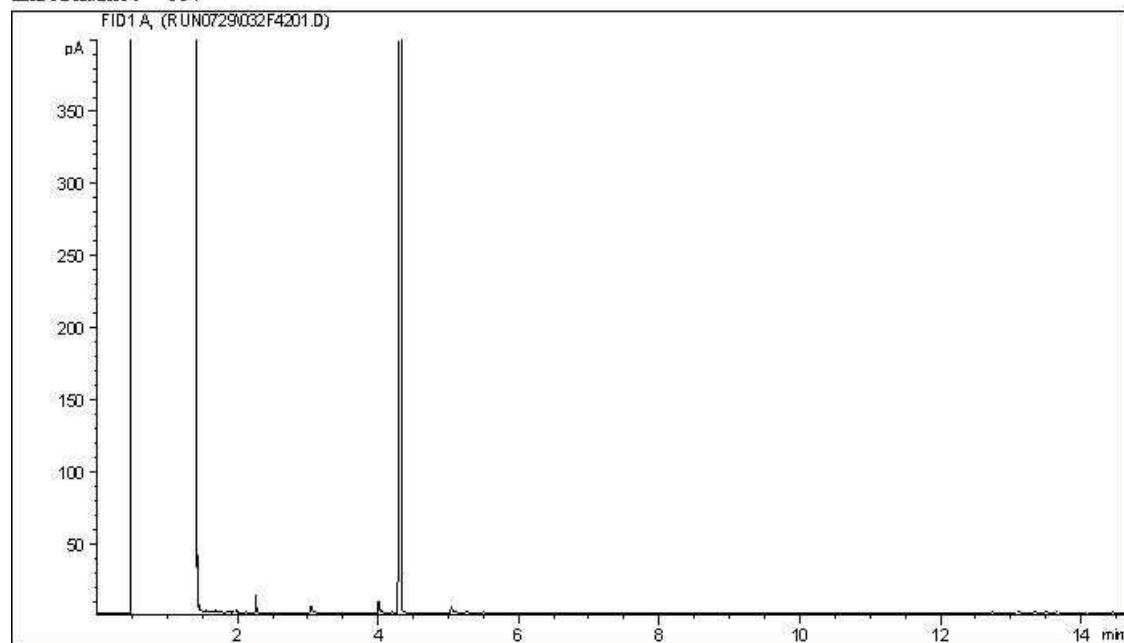
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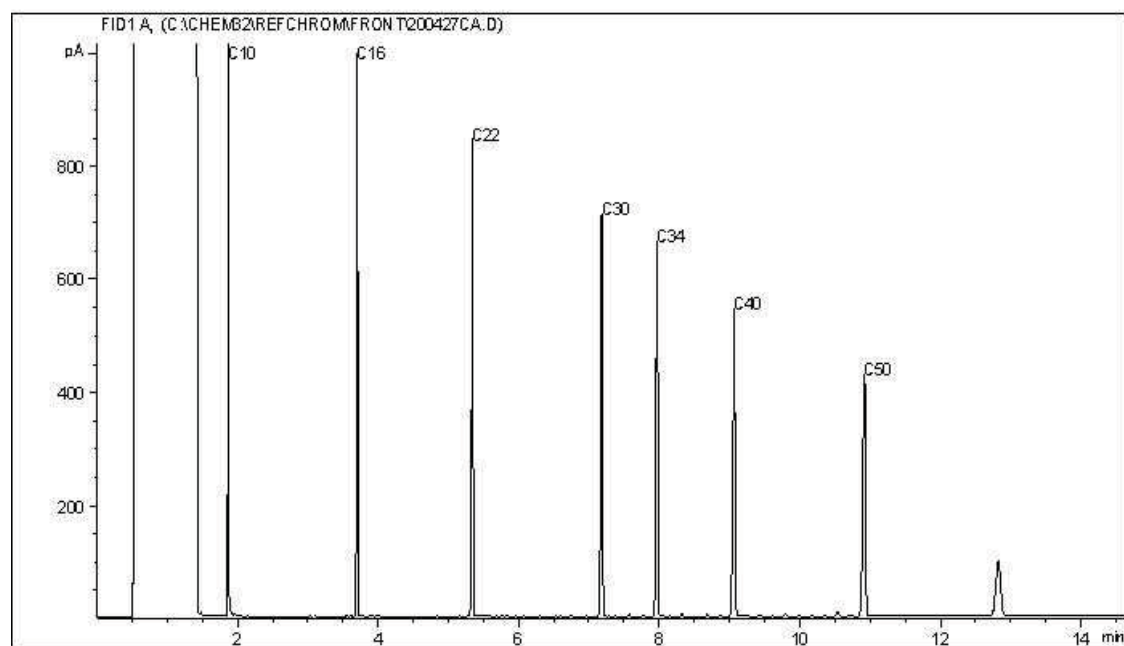
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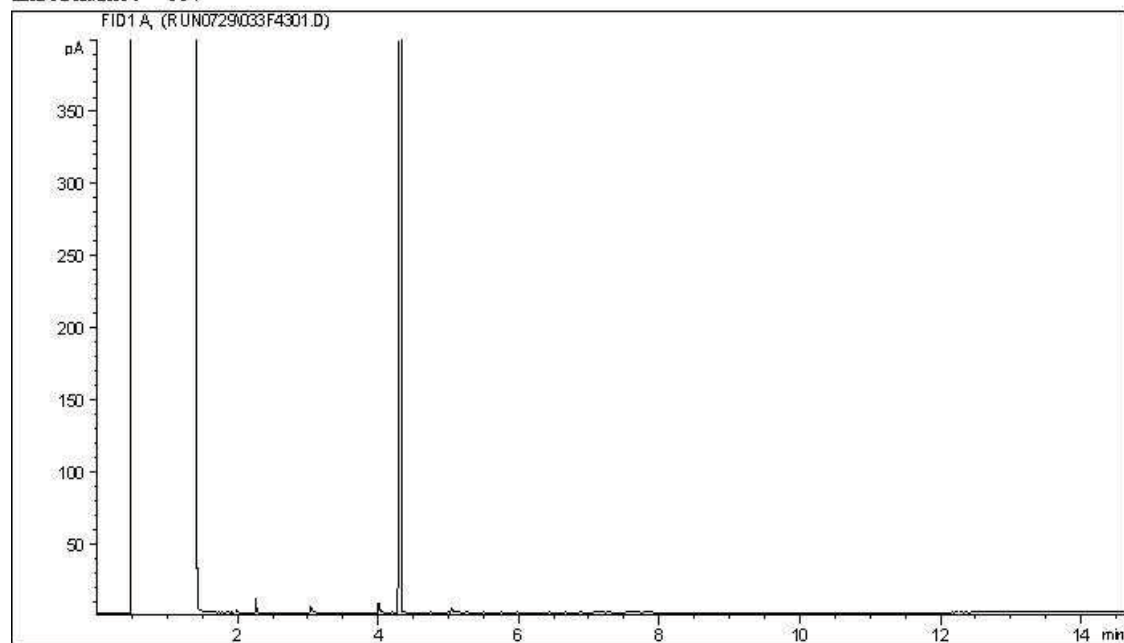
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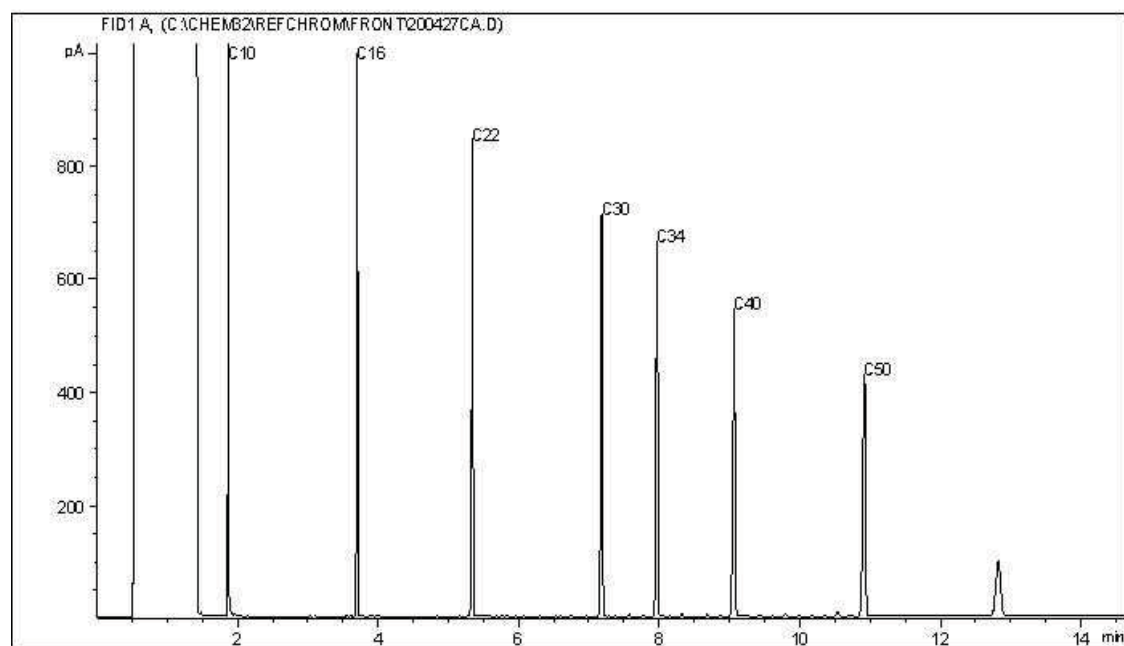
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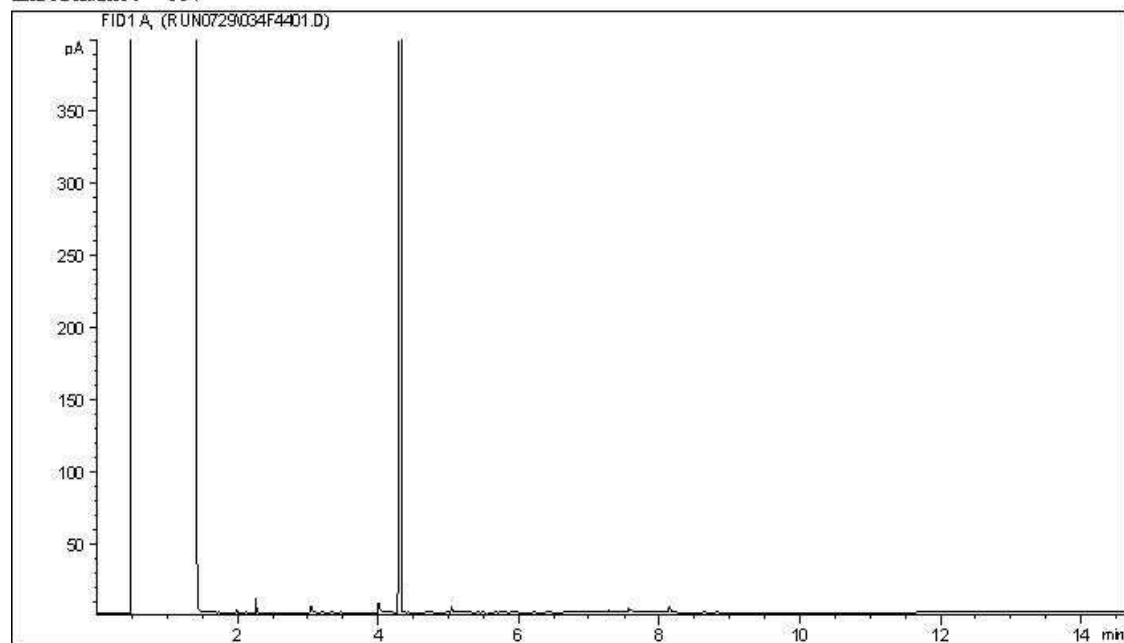
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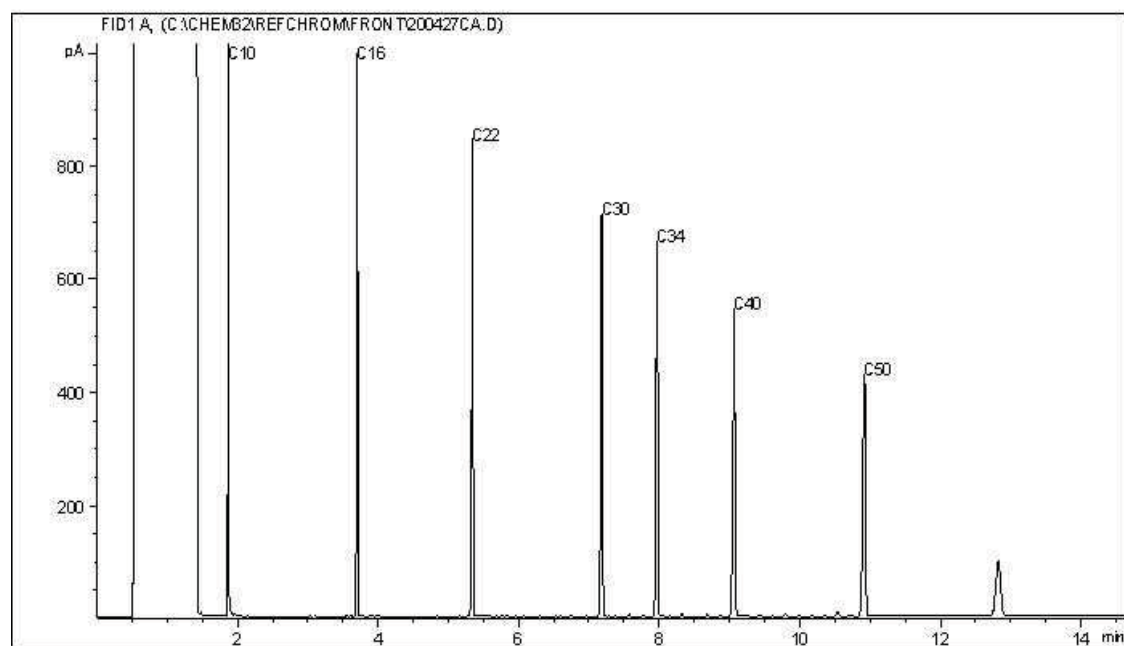
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Carbon Range Distribution - Reference Chromatogram



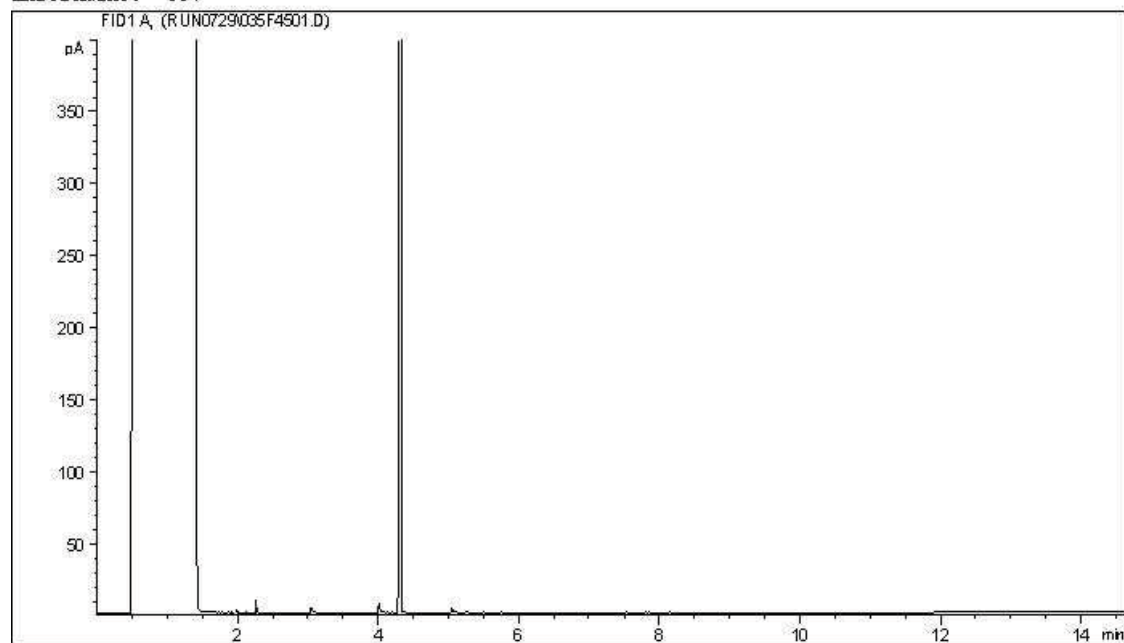
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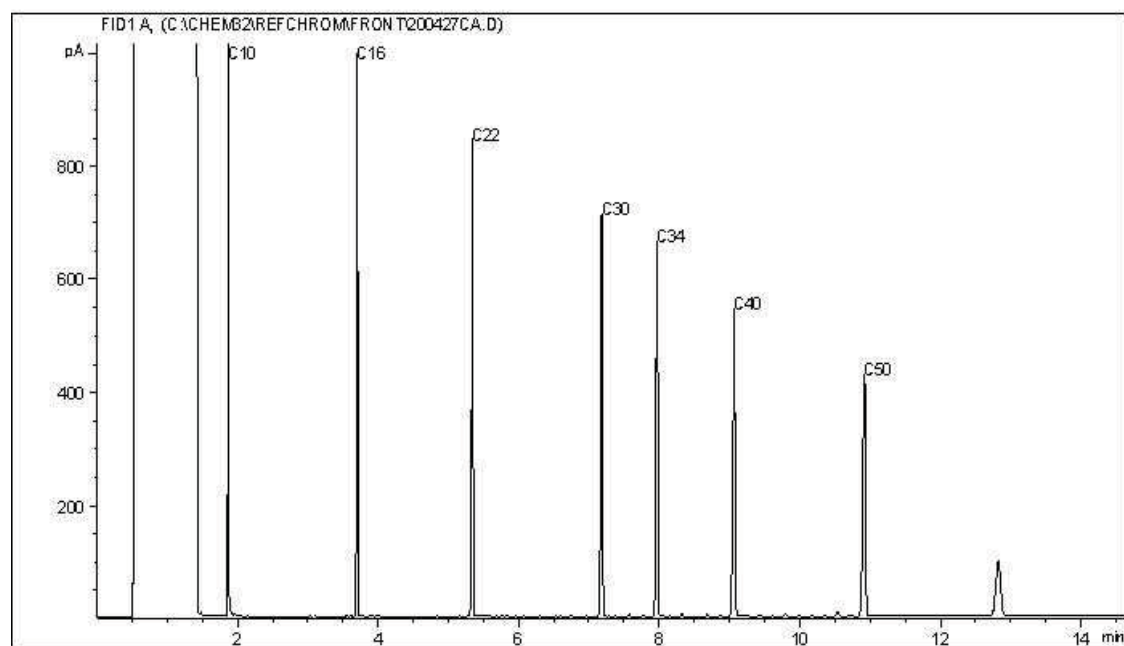
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Your Project #: NTE-20200721
 Site#: FACILITY BASELINE ENV TESTING
 Your C.O.C. #: 780762-03-01

Attention: Shahab Nowrozi

NorthTown Engineering
 AB
 Canada

Report Date: 2020/07/31
 Report #: R2910192
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C051851

Received: 2020/07/23, 08:20

Sample Matrix: Water
 # Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID (1)	6	N/A	2020/07/28	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	6	N/A	2020/07/29		Auto Calc
CCME Hydrocarbons (F2-F4 in water) (1, 2)	1	2020/07/29	2020/07/29	AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in water) (1, 2)	5	2020/07/29	2020/07/30	AB SOP-00037	CCME PHC-CWS m
Elements by ICPMS - Total (1)	6	2020/07/30	2020/07/31	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m
Benzo[a]pyrene Equivalency (1, 3)	6	N/A	2020/07/30		Auto Calc
PAH in Water by GC/MS (1)	6	2020/07/29	2020/07/30	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
pH @25°C (1, 4)	6	N/A	2020/07/28	AB SOP-00005	SM 23 4500-H+B m
Total Trihalomethanes Calculation (1)	6	N/A	2020/07/28		Auto Calc
VOCs in Water by HS GC/MS (Std List) (1)	6	N/A	2020/07/27	AB SOP-00056	EPA 5021a/8260d m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by BV Labs Calgary Environmental

(2) Silica gel clean up employed.



Your Project #: NTE-20200721
Site#: FACILITY BASELINE ENV TESTING
Your C.O.C. #: 780762-03-01

Attention: Shahab Nowrozi

NorthTown Engineering
AB
Canada

Report Date: 2020/07/31
Report #: R2910192
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C051851

Received: 2020/07/23, 08:20

- (3) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
(4) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas Laboratories endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bvlabs.com
Phone# (780) 577-7100

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

AT1 BTEX AND F1-F4 IN WATER (WATER)

BV Labs ID		YD4195	YD4196	YD4197	YD4198	YD4199	YD4200	YD4200	
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	
COC Number		780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	
	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B	TP20-14	TP20-14 Lab-Dup	RDL

Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
Volatiles									
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	N/A	0.80
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	N/A	0.40
Xylenes (Total)	ug/L	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	N/A	0.89
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	<100	<100	N/A	100
F1 (C6-C10)	ug/L	<100	<100	<100	<100	<100	<100	N/A	100
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	101	102	102	101	101	N/A	N/A
4-Bromofluorobenzene (sur.)	%	95	93	93	93	92	91	N/A	N/A
D4-1,2-Dichloroethane (sur.)	%	101	100	100	104	100	100	N/A	N/A
O-TERPHENYL (sur.)	%	93	93	95	94	94	98	98	N/A

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		YD4195	YD4196	YD4197	YD4198	YD4199	YD4200
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21
COC Number		780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01
	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B	TP20-14
Misc. Inorganics							
pH	pH	7.96	8.06	7.96	7.94	7.99	7.97



BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		YD4195	YD4196	YD4197	YD4198	YD4199	YD4200	
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	
COC Number		780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	
	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B	TP20-14	RDL
Polycyclic Aromatics								
B[a]P TPE Total Potency Equivalents	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Acenaphthene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Acenaphthylene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Acridine	ug/L	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Benzo(a)anthracene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085
Benzo(b&j)fluoranthene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085
Benzo(k)fluoranthene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085
Benzo(g,h,i)perylene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085
Benzo(c)phenanthrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Benzo(a)pyrene	ug/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075
Benzo(e)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Chrysene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085
Dibenz(a,h)anthracene	ug/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Indeno(1,2,3-cd)pyrene	ug/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085
1-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
2-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Naphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Phenanthrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Pyrene	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020
Quinoline	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	106	102	110	114	113	105	N/A
D8-ACENAPHTHYLENE (sur.)	%	96	84	104	111	103	97	N/A
D8-NAPHTHALENE (sur.)	%	77	74	72	89	76	86	N/A
TERPHENYL-D14 (sur.)	%	117	104	90	97	95	93	N/A
RDL = Reportable Detection Limit								
N/A = Not Applicable								

**SEMIVOLATILE ORGANICS BY GC-MS (WATER)**

BV Labs ID		YD4200	
Sampling Date		2020/07/21	
COC Number		780762-03-01	
	UNITS	TP20-14 Lab-Dup	RDL
Polycyclic Aromatics			
Acenaphthene	ug/L	<0.10	0.10
Acenaphthylene	ug/L	<0.10	0.10
Acridine	ug/L	<0.040	0.040
Anthracene	ug/L	<0.010	0.010
Benzo(a)anthracene	ug/L	<0.0085	0.0085
Benzo(b&j)fluoranthene	ug/L	<0.0085	0.0085
Benzo(k)fluoranthene	ug/L	<0.0085	0.0085
Benzo(g,h,i)perylene	ug/L	<0.0085	0.0085
Benzo(c)phenanthrene	ug/L	<0.050	0.050
Benzo(a)pyrene	ug/L	<0.0075	0.0075
Benzo(e)pyrene	ug/L	<0.050	0.050
Chrysene	ug/L	<0.0085	0.0085
Dibenz(a,h)anthracene	ug/L	<0.0075	0.0075
Fluoranthene	ug/L	<0.010	0.010
Fluorene	ug/L	<0.050	0.050
Indeno(1,2,3-cd)pyrene	ug/L	<0.0085	0.0085
1-Methylnaphthalene	ug/L	<0.10	0.10
2-Methylnaphthalene	ug/L	<0.10	0.10
Naphthalene	ug/L	<0.10	0.10
Phenanthrene	ug/L	<0.050	0.050
Perylene	ug/L	<0.050	0.050
Pyrene	ug/L	<0.020	0.020
Quinoline	ug/L	<0.20	0.20
Surrogate Recovery (%)			
D10-ANTHRACENE (sur.)	%	104	N/A
D8-ACENAPHTHYLENE (sur.)	%	93	N/A
D8-NAPHTHALENE (sur.)	%	72	N/A
TERPHENYL-D14 (sur.)	%	103	N/A
RDL = Reportable Detection Limit			
Lab-Dup = Laboratory Initiated Duplicate			
N/A = Not Applicable			



BUREAU
VERITAS

BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		YD4195	YD4196	YD4197	YD4198	YD4199	YD4200	
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	
COC Number		780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	
	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B	TP20-14	RDL
Elements								
Total Aluminum (Al)	mg/L	4.6	6.1	9.9	16	12	8.7	0.0030
Total Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060
Total Arsenic (As)	mg/L	0.0043	0.0037	0.0089	0.011	0.0096	0.0092	0.00020
Total Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
Total Cadmium (Cd)	mg/L	0.000024	0.000059	0.00032	0.00013	0.00015	0.00015	0.000020
Total Chromium (Cr)	mg/L	0.0091	0.013	0.021	0.035	0.027	0.020	0.0010
Total Cobalt (Co)	mg/L	0.0076	0.0057	0.011	0.011	0.0094	0.013	0.00030
Total Copper (Cu)	mg/L	0.014	0.016	0.029	0.025	0.024	0.028	0.00020
Total Lead (Pb)	mg/L	0.0098	0.0096	0.011	0.011	0.010	0.023	0.00020
Total Molybdenum (Mo)	mg/L	0.0032	0.0082	0.0025	0.0062	0.0045	0.0043	0.00020
Total Nickel (Ni)	mg/L	0.037	0.014	0.029	0.037	0.032	0.031	0.00050
Total Selenium (Se)	mg/L	<0.00020	0.00021	0.00061	0.00042	0.00034	0.00056	0.00020
Total Silver (Ag)	mg/L	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	0.00010
Total Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	0.00038	0.00030	<0.00020	0.00020
Total Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
Total Titanium (Ti)	mg/L	0.20	0.30	0.45	0.82	0.61	0.41	0.0010
Total Uranium (U)	mg/L	0.0058	0.0048	0.0038	0.0053	0.0051	0.011	0.00010
Total Vanadium (V)	mg/L	0.014	0.020	0.035	0.048	0.038	0.033	0.0010
Total Zinc (Zn)	mg/L	0.089	0.15	0.097	0.082	0.099	0.071	0.0030
RDL = Reportable Detection Limit								



BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		YD4195	YD4196	YD4197	YD4198	YD4199	YD4200	
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	
COC Number		780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	
	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B	TP20-14	RDL
Volatiles								
Total Trihalomethanes	ug/L	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.3
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0
1,2-dibromoethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,1,1,2-tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
RDL = Reportable Detection Limit								



BUREAU
VERITAS

BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		YD4195	YD4196	YD4197	YD4198	YD4199	YD4200	
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	
COC Number		780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	780762-03-01	
	UNITS	TP20-10	TP20-11	TP20-12	TP20-13	TP20-13B	TP20-14	RDL
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	96	96	95	96	96	96	N/A
4-Bromofluorobenzene (sur.)	%	94	94	94	93	95	94	N/A
D4-1,2-Dichloroethane (sur.)	%	114	113	115	114	115	111	N/A
RDL = Reportable Detection Limit								
N/A = Not Applicable								



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.1°C
Package 2	6.5°C
Package 3	5.2°C
Package 4	5.2°C

Results relate only to the items tested.



BV Labs Job #: C051851
Report Date: 2020/07/31

QUALITY ASSURANCE REPORT

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9936791	1,4-Difluorobenzene (sur.)	2020/07/28	103	50 - 140	105	50 - 140	101	%		
9936791	4-Bromofluorobenzene (sur.)	2020/07/28	94	50 - 140	98	50 - 140	94	%		
9936791	D4-1,2-Dichloroethane (sur.)	2020/07/28	101	50 - 140	100	50 - 140	100	%		
9936793	1,4-Difluorobenzene (sur.)	2020/07/27	103	50 - 140	104	50 - 140	97	%		
9936793	4-Bromofluorobenzene (sur.)	2020/07/27	107	50 - 140	106	50 - 140	94	%		
9936793	D4-1,2-Dichloroethane (sur.)	2020/07/27	120	50 - 140	118	50 - 140	107	%		
9937456	D10-ANTHRACENE (sur.)	2020/07/30	111	50 - 130	103	50 - 130	105	%		
9937456	D8-ACENAPHTHYLENE (sur.)	2020/07/30	102	50 - 130	94	50 - 130	88	%		
9937456	D8-NAPHTHALENE (sur.)	2020/07/30	76	50 - 130	73	50 - 130	58	%		
9937456	TERPHENYL-D14 (sur.)	2020/07/30	110	50 - 130	100	50 - 130	103	%		
9937463	O-TERPHENYL (sur.)	2020/07/29	100	60 - 140	104	60 - 140	99	%		
9936791	Benzene	2020/07/28	96	50 - 140	91	60 - 130	<0.40	ug/L	4.7	30
9936791	Ethylbenzene	2020/07/28	93	50 - 140	90	60 - 130	<0.40	ug/L	NC	30
9936791	F1 (C6-C10)	2020/07/28	105	60 - 140	82	60 - 140	<100	ug/L	NC	30
9936791	m & p-Xylene	2020/07/28	92	50 - 140	89	60 - 130	<0.80	ug/L	NC	30
9936791	o-Xylene	2020/07/28	93	50 - 140	89	60 - 130	<0.40	ug/L	NC	30
9936791	Toluene	2020/07/28	95	50 - 140	90	60 - 130	<0.40	ug/L	NC	30
9936793	1,1,1,2-tetrachloroethane	2020/07/27	89	50 - 140	97	60 - 130	<1.0	ug/L		
9936793	1,1,1-trichloroethane	2020/07/27	92	50 - 140	105	60 - 130	<0.50	ug/L		
9936793	1,1,2,2-tetrachloroethane	2020/07/27	99	50 - 140	101	60 - 130	<2.0	ug/L		
9936793	1,1,2-trichloroethane	2020/07/27	112	50 - 140	111	60 - 130	<0.50	ug/L		
9936793	1,1-dichloroethane	2020/07/27	93	50 - 140	103	60 - 130	<0.50	ug/L		
9936793	1,1-dichloroethene	2020/07/27	85	50 - 140	96	60 - 130	<0.50	ug/L		
9936793	1,2,3-trichlorobenzene	2020/07/27	90	50 - 140	96	60 - 130	<1.0	ug/L		
9936793	1,2,4-trichlorobenzene	2020/07/27	86	50 - 140	93	60 - 130	<1.0	ug/L		
9936793	1,2,4-trimethylbenzene	2020/07/27	87	50 - 140	96	60 - 130	<0.50	ug/L		
9936793	1,2-dibromoethane	2020/07/27	95	50 - 140	96	60 - 130	<0.20	ug/L	NC	30
9936793	1,2-dichlorobenzene	2020/07/27	98	50 - 140	103	60 - 130	<0.50	ug/L		
9936793	1,2-dichloroethane	2020/07/27	108	50 - 140	113	60 - 130	<0.50	ug/L	NC	30
9936793	1,2-dichloropropane	2020/07/27	102	50 - 140	110	60 - 130	<0.50	ug/L		
9936793	1,3,5-trichlorobenzene	2020/07/27	84	50 - 140	93	60 - 130	<0.50	ug/L		
9936793	1,3,5-trimethylbenzene	2020/07/27	89	50 - 140	98	60 - 130	<0.50	ug/L		



BV Labs Job #: C051851
Report Date: 2020/07/31

QUALITY ASSURANCE REPORT(CONT'D)

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9936793	1,3-dichlorobenzene	2020/07/27	92	50 - 140	98	60 - 130	<0.50	ug/L		
9936793	1,4-dichlorobenzene	2020/07/27	95	50 - 140	101	60 - 130	<0.50	ug/L		
9936793	Bromodichloromethane	2020/07/27	107	50 - 140	116	60 - 130	<0.50	ug/L		
9936793	Bromoform	2020/07/27	104	50 - 140	107	60 - 130	<0.50	ug/L		
9936793	Bromomethane	2020/07/27	87	50 - 140	98	60 - 130	<2.0	ug/L		
9936793	Carbon tetrachloride	2020/07/27	91	50 - 140	104	60 - 130	<0.50	ug/L		
9936793	Chlorobenzene	2020/07/27	88	50 - 140	97	60 - 130	<0.50	ug/L		
9936793	Chlorodibromomethane	2020/07/27	105	50 - 140	110	60 - 130	<1.0	ug/L		
9936793	Chloroethane	2020/07/27	74	50 - 140	82	60 - 130	<1.0	ug/L		
9936793	Chloroform	2020/07/27	92	50 - 140	100	60 - 130	<0.50	ug/L		
9936793	Chloromethane	2020/07/27	80	50 - 140	90	60 - 130	<2.0	ug/L		
9936793	cis-1,2-dichloroethene	2020/07/27	94	50 - 140	103	60 - 130	<0.50	ug/L		
9936793	cis-1,3-dichloropropene	2020/07/27	102	50 - 140	113	60 - 130	<0.50	ug/L		
9936793	Dichloromethane	2020/07/27	90	50 - 140	97	60 - 130	<2.0	ug/L		
9936793	Methyl methacrylate	2020/07/27	110	50 - 140	112	60 - 130	<0.50	ug/L		
9936793	Methyl-tert-butylether (MTBE)	2020/07/27	93	50 - 140	102	60 - 130	<0.50	ug/L		
9936793	Styrene	2020/07/27	77	50 - 140	92	60 - 130	<0.50	ug/L		
9936793	Tetrachloroethene	2020/07/27	73	50 - 140	83	60 - 130	<0.50	ug/L		
9936793	trans-1,2-dichloroethene	2020/07/27	80	50 - 140	90	60 - 130	<0.50	ug/L		
9936793	trans-1,3-dichloropropene	2020/07/27	129	50 - 140	117	60 - 130	<0.50	ug/L		
9936793	Trichloroethene	2020/07/27	98	50 - 140	110	60 - 130	<0.50	ug/L		
9936793	Trichlorofluoromethane	2020/07/27	80	50 - 140	92	60 - 130	<0.50	ug/L		
9936793	Vinyl chloride	2020/07/27	76	50 - 140	86	60 - 130	<0.50	ug/L		
9937045	pH	2020/07/28			101	97 - 103			1.9	N/A
9937456	1-Methylnaphthalene	2020/07/30	86	50 - 130	84	50 - 130	<0.10	ug/L	NC	30
9937456	2-Methylnaphthalene	2020/07/30	82	50 - 130	80	50 - 130	<0.10	ug/L	NC	30
9937456	Acenaphthene	2020/07/30	89	50 - 130	86	50 - 130	<0.10	ug/L	NC	30
9937456	Acenaphthylene	2020/07/30	88	50 - 130	86	50 - 130	<0.10	ug/L	NC	30
9937456	Acridine	2020/07/30	80	50 - 130	87	50 - 130	<0.040	ug/L	NC	30
9937456	Anthracene	2020/07/30	68	50 - 130	68	50 - 130	<0.010	ug/L	NC	30
9937456	Benzo(a)anthracene	2020/07/30	84	50 - 130	94	50 - 130	<0.0085	ug/L	NC	30
9937456	Benzo(a)pyrene	2020/07/30	84	50 - 130	96	50 - 130	<0.0075	ug/L	NC	30



BV Labs Job #: C051851
Report Date: 2020/07/31

QUALITY ASSURANCE REPORT(CONT'D)

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9937456	Benzo(b&j)fluoranthene	2020/07/30	78	50 - 130	89	50 - 130	<0.0085	ug/L	NC	30
9937456	Benzo(c)phenanthrene	2020/07/30	85	50 - 130	91	50 - 130	<0.050	ug/L	NC	30
9937456	Benzo(e)pyrene	2020/07/30	82	50 - 130	93	50 - 130	<0.050	ug/L	NC	30
9937456	Benzo(g,h,i)perylene	2020/07/30	74	50 - 130	97	50 - 130	<0.0085	ug/L	NC	30
9937456	Benzo(k)fluoranthene	2020/07/30	83	50 - 130	95	50 - 130	<0.0085	ug/L	NC	30
9937456	Chrysene	2020/07/30	83	50 - 130	92	50 - 130	<0.0085	ug/L	NC	30
9937456	Dibenz(a,h)anthracene	2020/07/30	75	50 - 130	98	50 - 130	<0.0075	ug/L	NC	30
9937456	Fluoranthene	2020/07/30	88	50 - 130	105	50 - 130	<0.010	ug/L	NC	30
9937456	Fluorene	2020/07/30	91	50 - 130	91	50 - 130	<0.050	ug/L	NC	30
9937456	Indeno(1,2,3-cd)pyrene	2020/07/30	79	50 - 130	104	50 - 130	<0.0085	ug/L	NC	30
9937456	Naphthalene	2020/07/30	88	50 - 130	83	50 - 130	<0.10	ug/L	NC	30
9937456	Perylene	2020/07/30	77	50 - 130	89	50 - 130	<0.050	ug/L	NC	30
9937456	Phenanthrene	2020/07/30	92	50 - 130	89	50 - 130	<0.050	ug/L	NC	30
9937456	Pyrene	2020/07/30	88	50 - 130	105	50 - 130	<0.020	ug/L	NC	30
9937456	Quinoline	2020/07/30	102	50 - 130	98	50 - 130	<0.20	ug/L	NC	30
9937463	F2 (C10-C16 Hydrocarbons)	2020/07/29	93	60 - 140	90	60 - 140	<0.10	mg/L	NC	30
9937463	F3 (C16-C34 Hydrocarbons)	2020/07/29	94	60 - 140	91	60 - 140	<0.10	mg/L	NC	30
9937463	F4 (C34-C50 Hydrocarbons)	2020/07/29	86	60 - 140	85	60 - 140	<0.20	mg/L	NC	30
9941497	Total Aluminum (Al)	2020/07/30	97	80 - 120	97	80 - 120	<0.0030	mg/L	6.5	20
9941497	Total Antimony (Sb)	2020/07/30	107	80 - 120	108	80 - 120	<0.00060	mg/L	NC	20
9941497	Total Arsenic (As)	2020/07/30	93	80 - 120	95	80 - 120	<0.00020	mg/L	18	20
9941497	Total Beryllium (Be)	2020/07/30	97	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20
9941497	Total Cadmium (Cd)	2020/07/31	98	80 - 120	98	80 - 120	<0.000020	mg/L		
9941497	Total Chromium (Cr)	2020/07/30	94	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20
9941497	Total Cobalt (Co)	2020/07/30	96	80 - 120	96	80 - 120	<0.00030	mg/L	4.9	20
9941497	Total Copper (Cu)	2020/07/30	96	80 - 120	96	80 - 120	<0.00020	mg/L	13	20
9941497	Total Lead (Pb)	2020/07/30	97	80 - 120	100	80 - 120	<0.00020	mg/L	16	20
9941497	Total Molybdenum (Mo)	2020/07/30	101	80 - 120	99	80 - 120	<0.00020	mg/L	NC	20
9941497	Total Nickel (Ni)	2020/07/30	90	80 - 120	101	80 - 120	<0.00050	mg/L	1.2	20
9941497	Total Selenium (Se)	2020/07/30	99	80 - 120	98	80 - 120	<0.00020	mg/L	NC	20
9941497	Total Silver (Ag)	2020/07/30	97	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
9941497	Total Thallium (Tl)	2020/07/30	97	80 - 120	100	80 - 120	<0.00020	mg/L	NC	20



QUALITY ASSURANCE REPORT(CONT'D)

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9941497	Total Tin (Sn)	2020/07/30	98	80 - 120	99	80 - 120	<0.0010	mg/L	NC	20
9941497	Total Titanium (Ti)	2020/07/30	102	80 - 120	94	80 - 120	<0.0010	mg/L	NC	20
9941497	Total Uranium (U)	2020/07/30	97	80 - 120	98	80 - 120	<0.00010	mg/L	1.0	20
9941497	Total Vanadium (V)	2020/07/30	98	80 - 120	97	80 - 120	<0.0010	mg/L	2.7	20
9941497	Total Zinc (Zn)	2020/07/30	93	80 - 120	95	80 - 120	<0.0030	mg/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).



BUREAU
VERITAS

BV Labs Job #: C051851
Report Date: 2020/07/31

NorthTown Engineering
Client Project #: NTE-20200721
Sampler Initials: SN

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Dennis Ngandu, B.Sc., P.Chem., QP, Supervisor, Organics

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam
A Bureau Veritas Group Company

CHAIN-OF-CUSTODY RECORD

[illegible]



Bureau Veritas Laboratories
6740 Campello Road, Mississauga, Ontario Canada L5N 2L8
Tel: (905) 817-5700 Toll-free 800-563-6266 Fax: (905) 817-5777 www.bvlab.com

CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:

Company Name: #28344 Private Clients
Attention: Shahab Nowrozi
Address: Northtown Engineering Inc. 430 Hazledene Road, Suite Kanata ON K2L 1T9
(613) 913-9979
Tel: snowrozi@northtowneng.com
Fax:

REPORT TO:

Company Name:
Attention:
Address:
Tel:
Email:

PROJECT INFORMATION:

Quotation #: NTE-20200722-1
P.O. #: 780762
Project: Cambridge Bay NW 1/4
Project Name: Fertility Declared for Farm
COC #: 051851
Site #: 051851
Sampled By: Shahab Nowrozi
Bottle Order #: 780762
Project Manager: Patrick Huynh
Turnaround Time (TAT): Required: 780762-03-01

Laboratory Use Only:

BV Labs Job #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)

Table 1 ☐ Res/Park ☐ Medium/Fine ☒ CME ☐ Sanitary Sewer Bylaw
Table 2 ☐ Ind/Comm ☐ Coarse ☐ Reg 556 ☐ Storm Sewer Bylaw
Table 3 ☐ Agri/Other ☐ For RSC ☐ MISA ☐ Municipality
Table ☐ PWQO ☐ Reg 406 Table ☐ Other ☐ Private

Include Criteria on Certificate of Analysis (Y/N)?

Sample Barcode Label Sample (Location) Identification Date Sampled Time Sampled Matrix

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

CMCME PAFHs	CMCME VOC F1-F4 (sol)	CMCME ICPMS Metals	Field Filtered (please circle):	Metals / Hg / Cr / VI	CMCME ICPMS Metals for CMCME CEGQ	CMCME VOCs & F1-F4 + Gas/Diesel	CMCME PAFHs (Water)	Dissolved Oxygen	pH	Conductivity
✓	✓	✓	NO		✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	
✓	✓	✓			✓	✓	✓	✓	✓	

RECEIVED BY: (Signature/Print)
Shahab Nowrozi

Date: (YY/MM/DD)
2020/7/22

Time
AM

RECEIVED BY: (Signature/Print)
Shahab Nowrozi

Date: (YY/MM/DD)
2020/7/22

Time
PM

*** RELINQUISHED BY: (Signature/Print)**
Shahab Nowrozi

Date: (YY/MM/DD)
2020/7/22

Time
AM

*** RELINQUISHED BY: (Signature/Print)**
Shahab Nowrozi

Date: (YY/MM/DD)
2020/7/22

Time
PM

LABORATORY USE ONLY

Temperature (°C) on Receipt: 20.0

Time Sensitive: See note

Custody Seal: See note

Project: See note

White: BV Labs Yellow: Client

LABORATORY USE ONLY

Temperature (°C) on Receipt: 20.0

Time Sensitive: See note

Custody Seal: See note

Project: See note

White: BV Labs Yellow: Client

UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

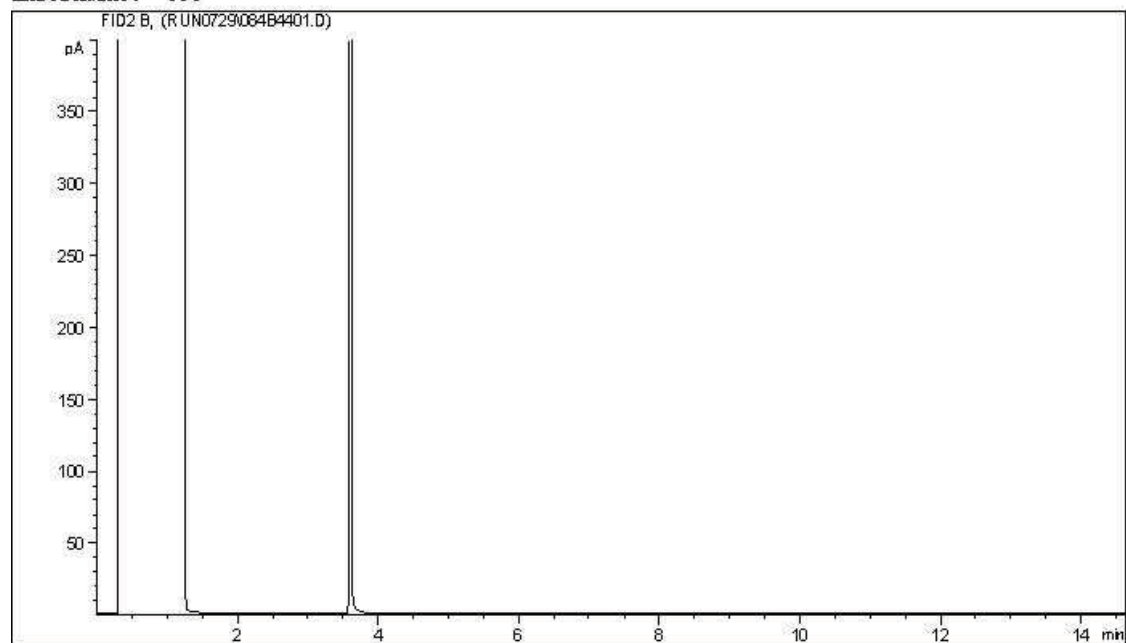
White: BV Labs Yellow: Client

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

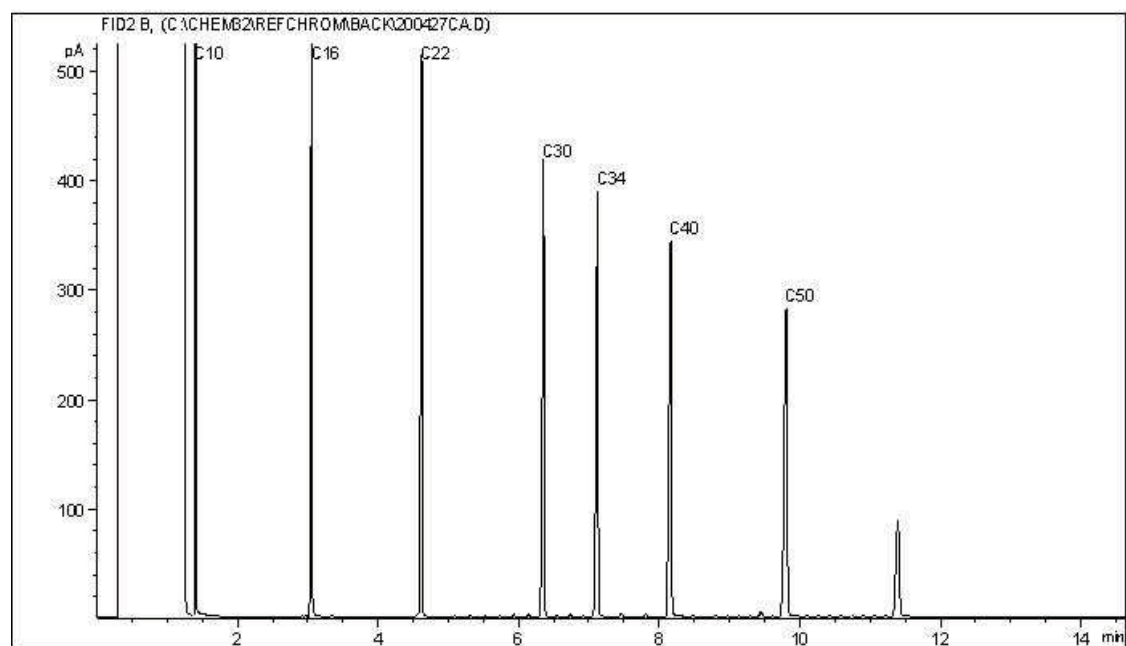
Bureau Veritas Canada (2019) Inc.

CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



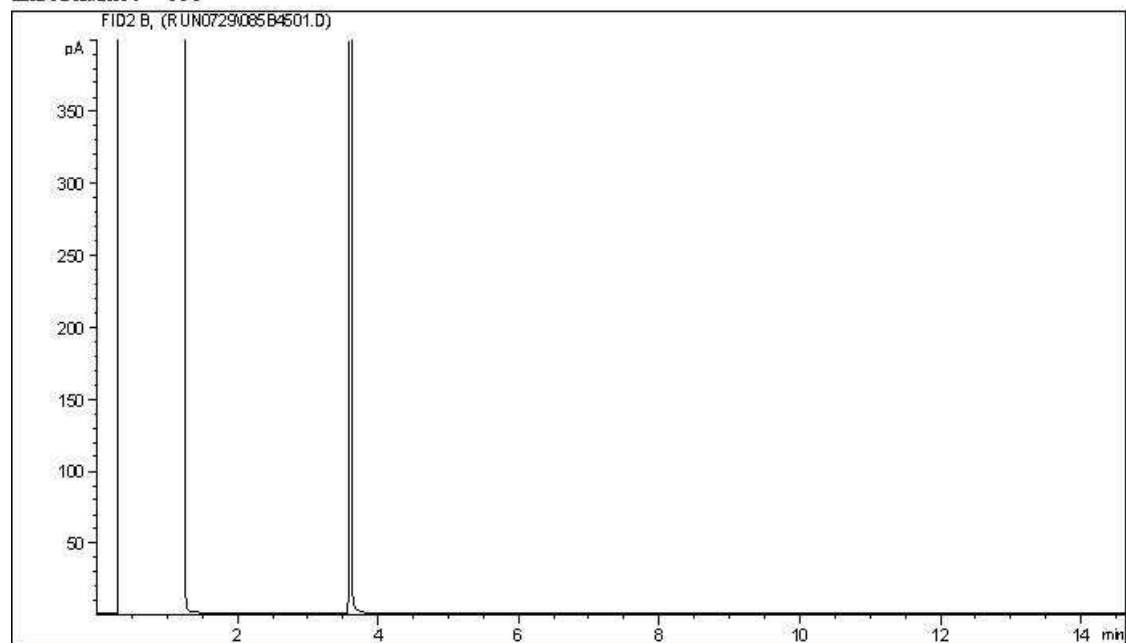
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

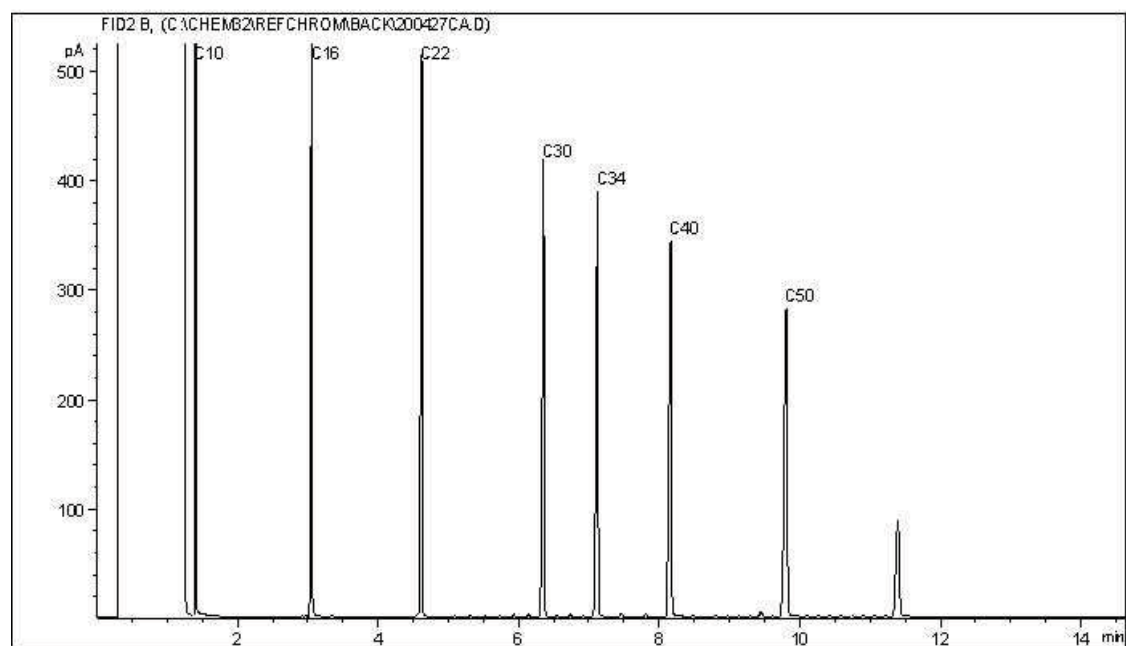
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



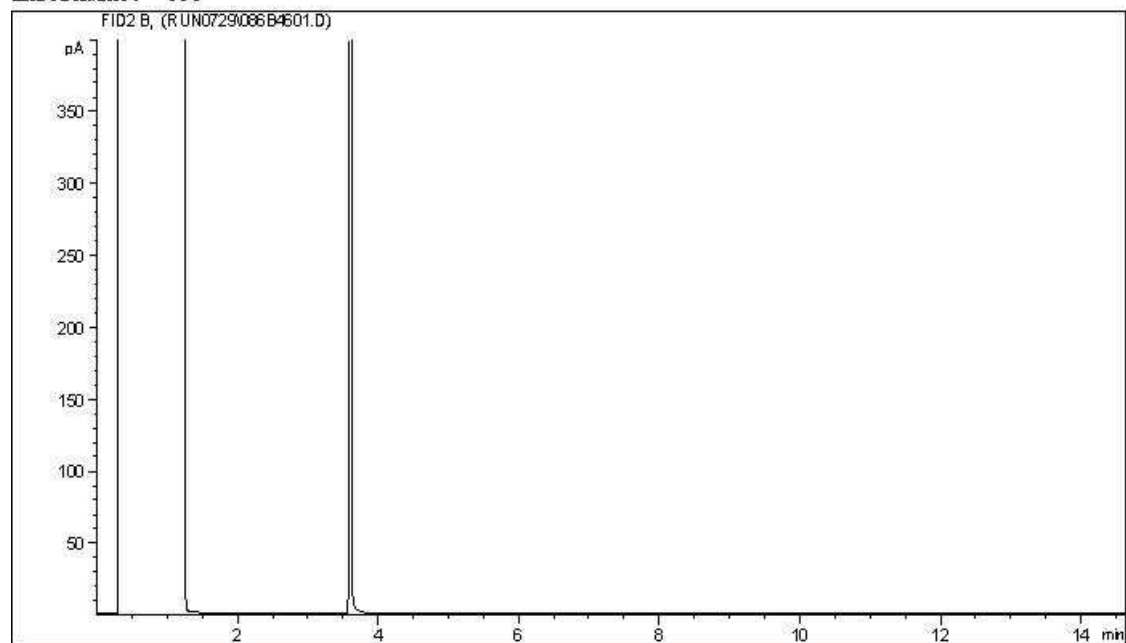
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

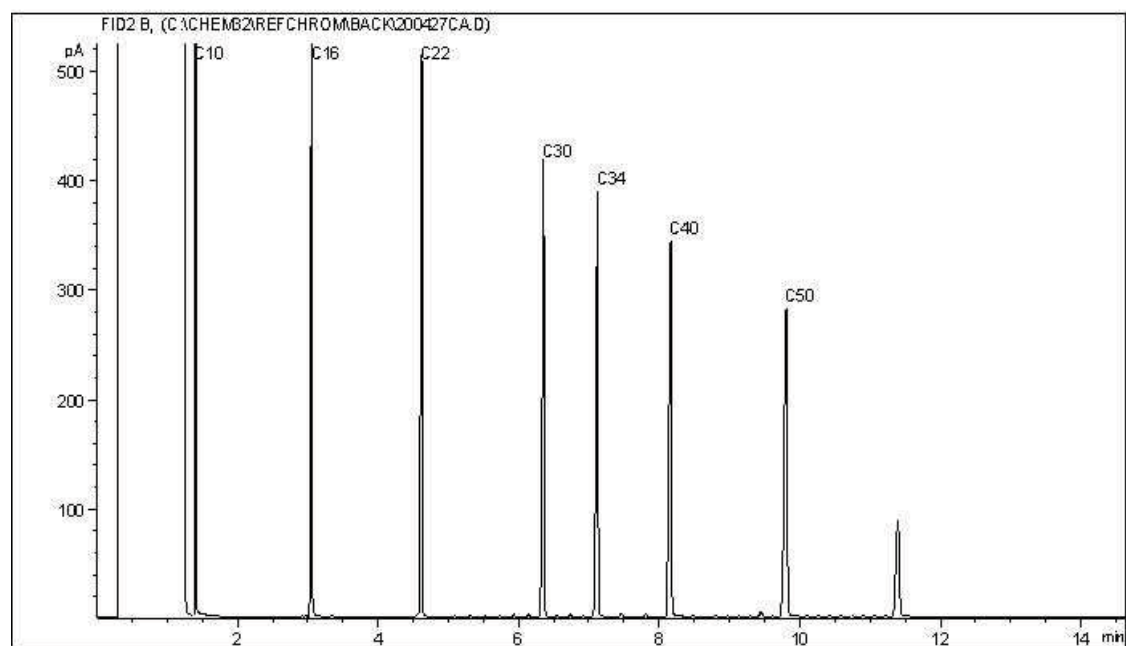
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CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



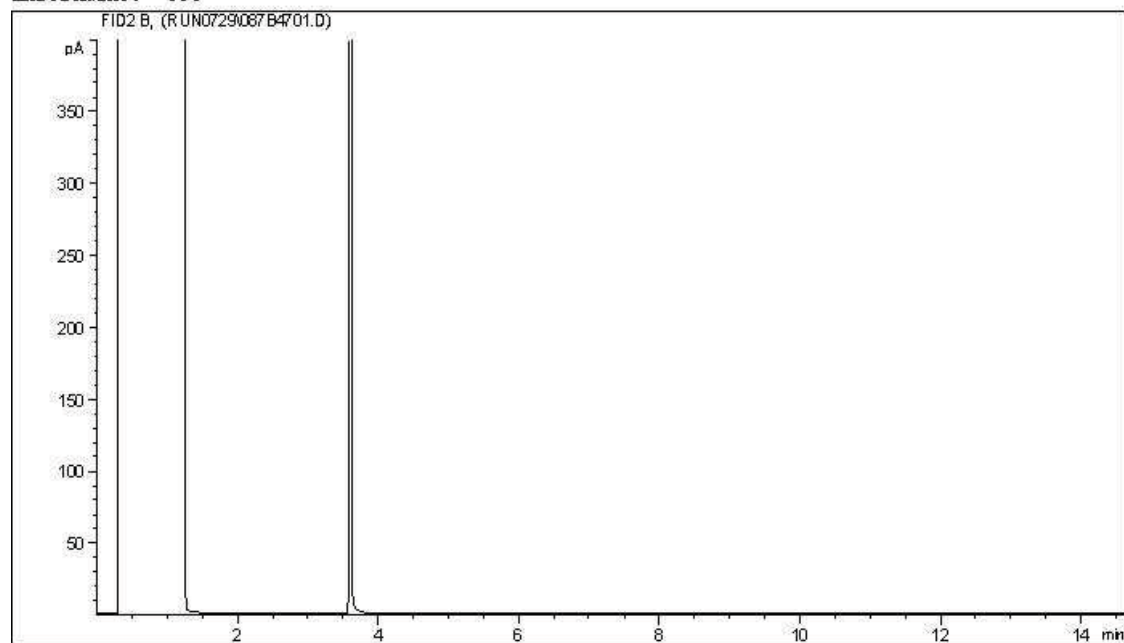
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

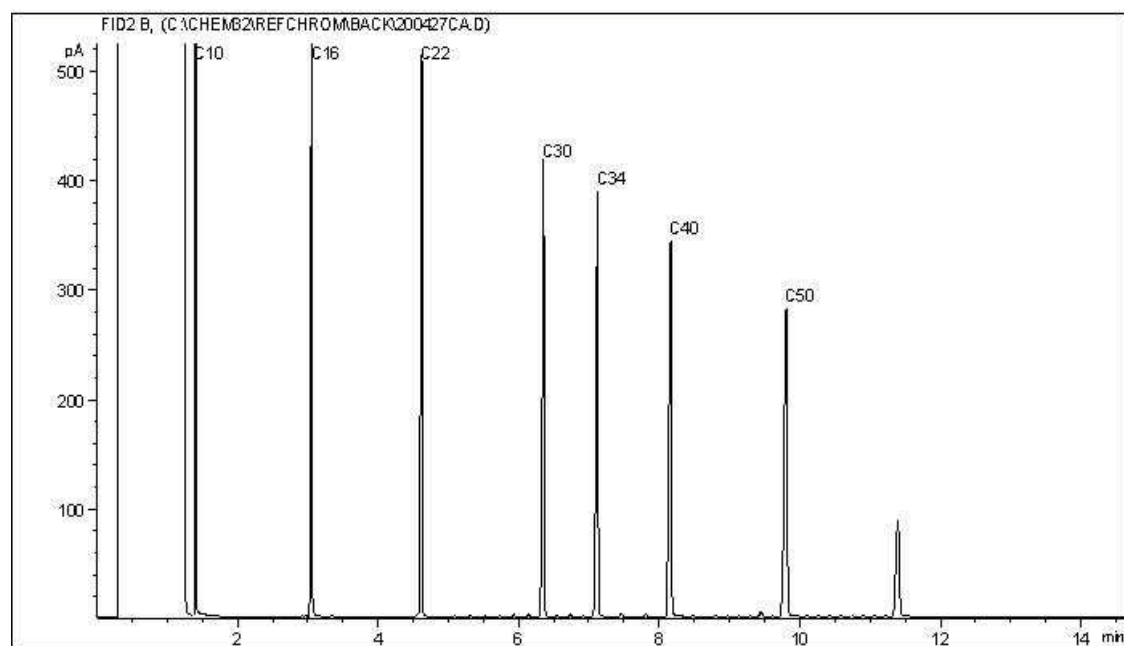
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CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



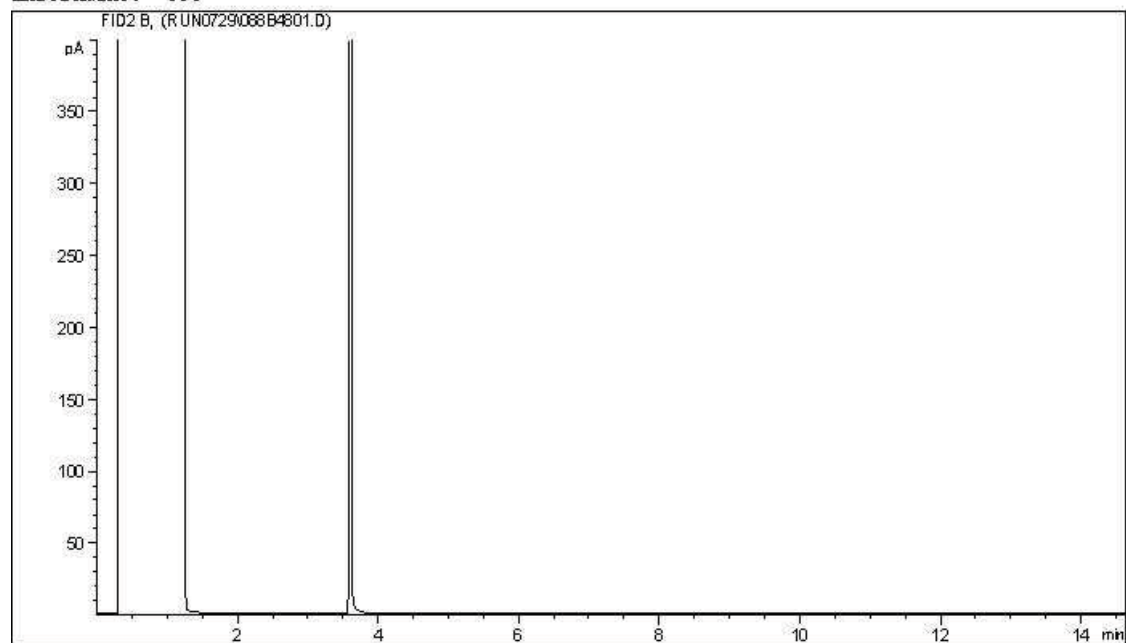
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

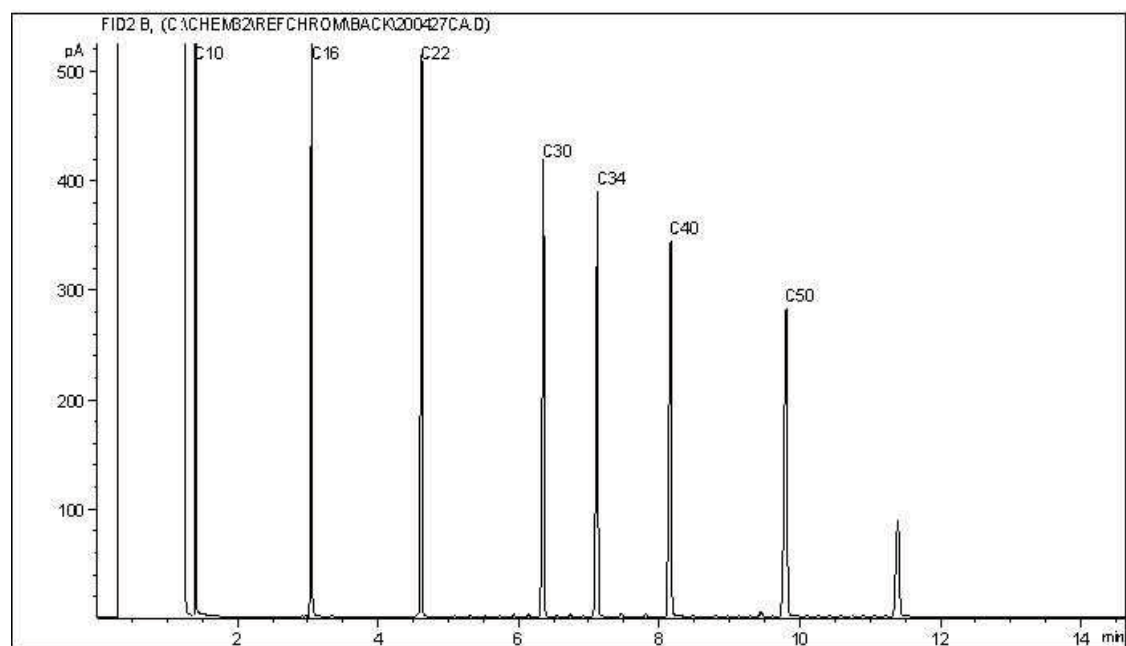
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CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



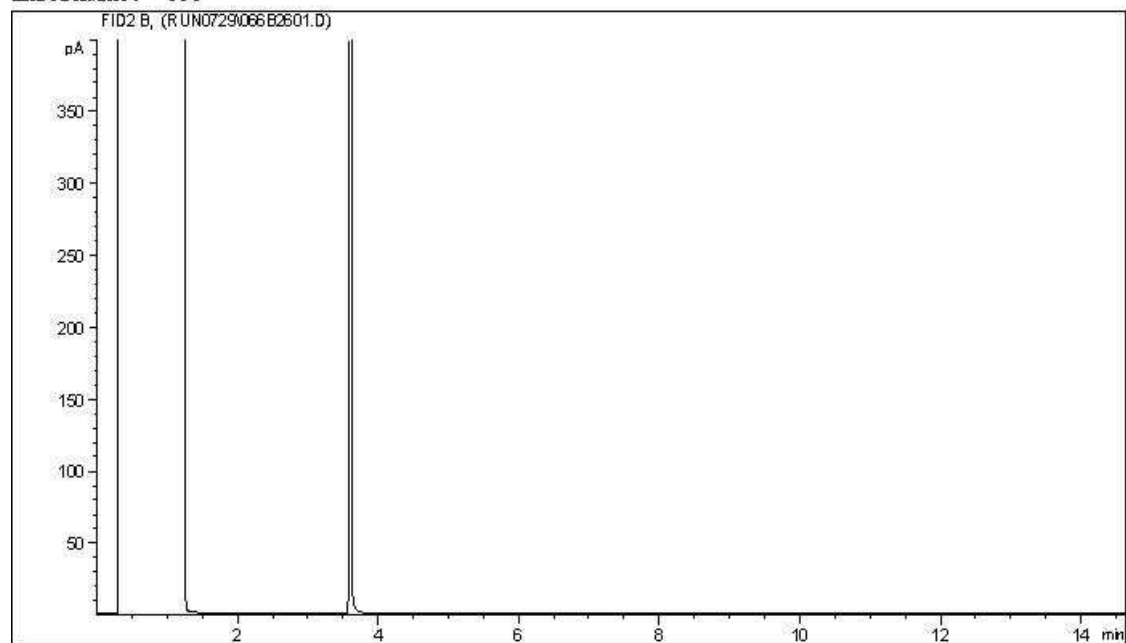
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

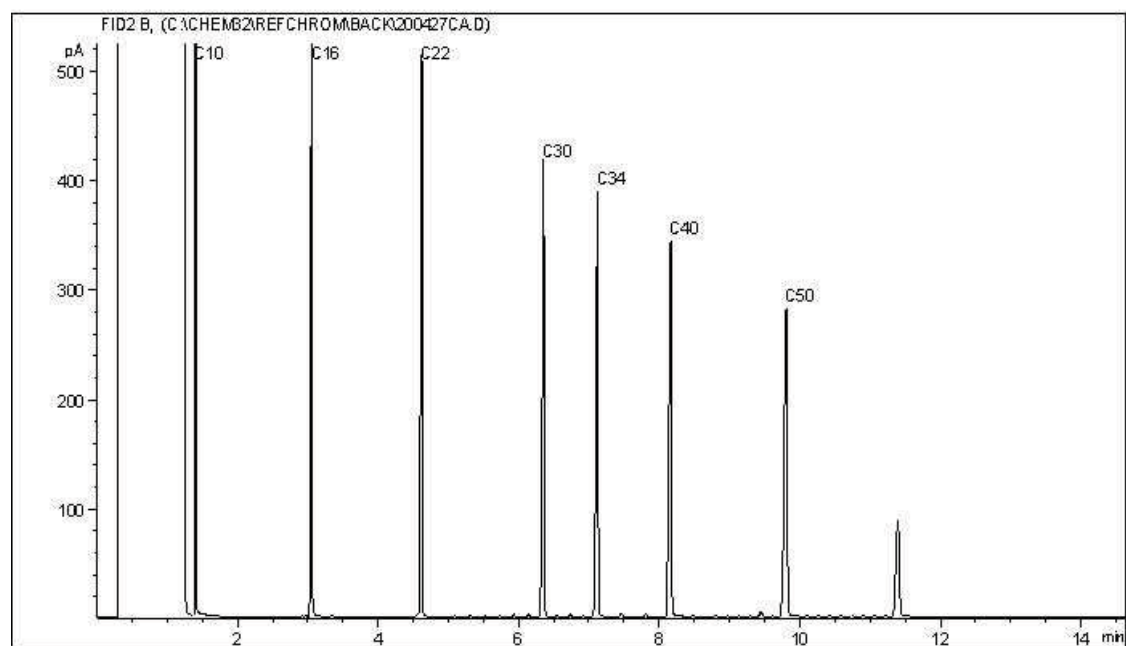
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CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



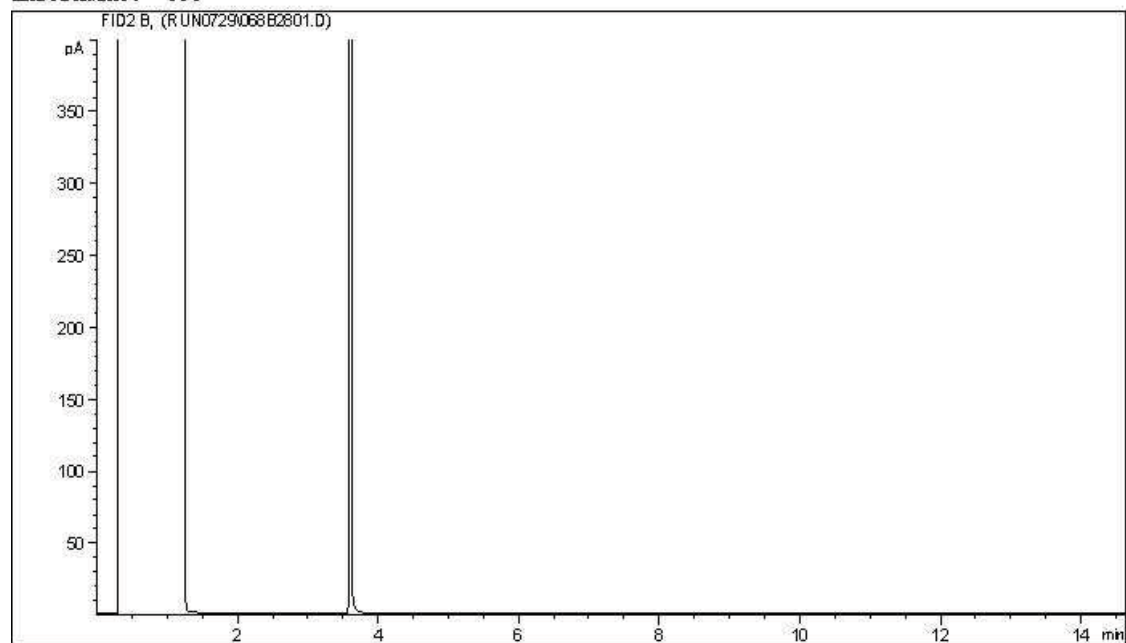
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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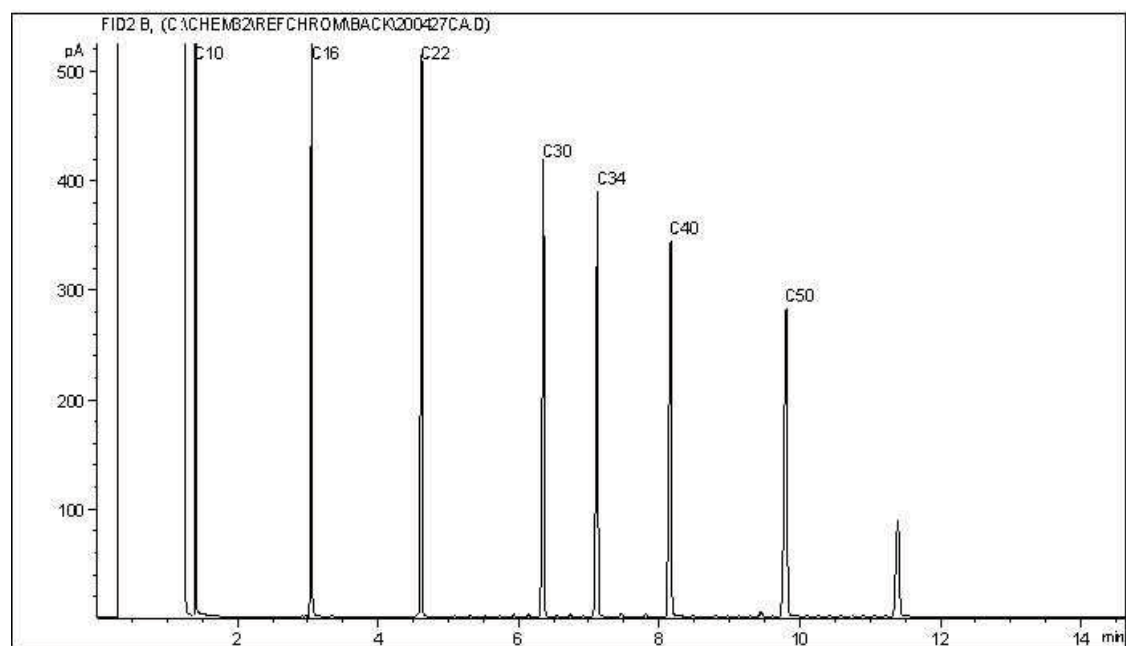
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CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.