



20 June 2018

Attention: Mr. Greg Paliouras (gpaliou@sears.ca)
Company: Sears Canada Inc.
Address: Department 702 C E Real Estate, 290 Yonge Street
Toronto, Ontario M5B 2C3

Supplemental Phase II Environmental Site Assessment - DRAFT
Hounsfield Heights – Briar Hill Community
Calgary, Alberta

File CG2430.1 E28

Sears Canada Inc. (Sears) was issued Environmental Protection Order (EPO) No. EPO-2018/01-SSR in March 2018 pertaining to the Hounsfield Heights and North Hill Mall, Calgary, Alberta (Site) historic gasoline plume. As part of this EPO, one of the requirements was obtaining complete delineation of the gasoline plume within the soil and groundwater at the Site. Based on previous investigations completed by Clifton Associates Ltd, delineation was still required in the southwestern portion of the Site.

This report documents the supplemental drilling completed in the southwestern corner of Hounsfield Heights in the road allowance extending 10th Avenue NW to the west. A Site and Surrounding Land Use map is provided as Figure 1 in Appendix A. A map of the Site and Surrounding Properties is provided as Figure 2. A Monitoring Well Location Plan is provided as Figure 3 (Appendix A). The purpose of drilling in this area of the Site was to fully delineate the gasoline plume in the soil and groundwater to the southwest, based on a previously identified data gap. Based on this new data, Clifton also updated the existing stratigraphic cross-sections in this area.

General Site Description

The Alberta Township System description of the Site is the northeast corner of Section 20, Township 24, Range 1, West of the 5th Meridian (NE ¼ 20-24-1 W5M). The Site occupies approximately 40 hectares (100 acres), and is currently a mixture of operating commercial properties, private residences, and parkland.

The Mall area is the portion of the Site located north of 14th Avenue NW, which includes the North Hill Shopping Centre, the former Sears property (now a Kal-Tire Automotive Centre located at 1614 – 14th Avenue NW), and a condominium complex. The Hounsfield Heights area is the portion of the Site south of 14th Avenue NW, including Lions Park, to 10th Avenue NW.

Site History

The location of the Kal-Tire was originally developed as a service station and automotive centre in 1958. The service station was located at the North Hill Shopping Centre on a property owned by Sears, and operated as a Sears Service Centre from 1958 to 1984. From 1984 to 1995, the location was operated under license as a Sunoco Service Station. An addition to the automotive centre building was constructed

in 1982, and a separate gas bar kiosk was added in 1989. The original USTs were replaced in 1984, and in October 1995, fuel storage and dispensing facilities at the gas bar were decommissioned. The former Sears Service Centre continues to operate under license to Kal-Tire.

Previous Environmental Investigations

Clifton has completed numerous historical environmental site assessments (ESAs) to characterize the petroleum hydrocarbon (PHC) impacts on-Site. A complete overview of the previous findings is available in the Clifton report entitled *2018 Second Quarter Groundwater Monitoring and Sampling Report, Hounsfeld Heights – Briar Hill Community, Calgary, Alberta* (09 May 2018).

The Clifton report *2016 Supplemental Drilling Report Hounsfeld Heights – Briar Hill Community, Calgary, AB* (05 July 2016) determined that additional drilling was required to vertically and laterally delineate the PHC plume, specifically benzene, at the southern extent of the plume.

Objective and Scope of Work

The objective of this investigation was to obtain complete delineation of the contaminants of potential concern (CoPC) in the soil and groundwater in the southwestern corner of the Site. A secondary objective was to update the existing stratigraphic cross-sections of the Site. These CoPCs have historically included benzene and 1,2-dichloroethane (1,2-DCA). To meet these objectives, the proposed scope of work included:

- Contacting Alberta One Call and a private utility locator to identify the locations of underground utilities/facilities prior to the drilling program;
- Advance three boreholes to a proposed maximum depth of 9.1 metres below ground surface (m bgs);
- Submit two soil samples from each borehole for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), PHC fractions F1 to F4, polyaromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs);
- Install up to three nested groundwater monitoring wells at each of the three borehole locations, each completed with a flush-mounted road box;
- Monitor and develop each of the newly-installed monitoring wells;
- Collect one groundwater sample from each of the monitoring wells and submit for laboratory analysis of BTEX, PHC fractions F1 and F2, PAHs, and VOCs;
- Survey the horizontal and vertical locations of all groundwater monitoring wells;
- Compare the laboratory analytical results from the soil and groundwater investigations to the applicable Alberta Environment and Parks (AEP) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* (AEP 2016 Tier 1 Guidelines);
- Prepare updated cross-sections based on the new data obtained from the drilling; and
- Prepare a report documenting the data collected during the soil and groundwater investigations.

Applicable Guidelines

The guidance document used to assess soil and groundwater analytical data from the Site was the AEP 2016 Tier 1 Guidelines. The AEP 2016 Tier 1 Guidelines specify a land use and a receptor pathway approach that formulates a specific standard for each different chemical parameter. Based on the current land use of the Site, the residential/parkland land use designation has been applied. For soil samples, the

applicable soil texture was the more stringent of either coarse- or fine-grained. For groundwater, the guideline for coarse-grained soil was used as it is the more restrictive guideline.

Intrusive Investigation

Soil Investigation

From 01 to 03 May 2018, Clifton personnel supervised the drilling of three boreholes (BH3001 to BH3003) and the installation of seven nested monitoring wells. The boreholes were advanced using a track-mounted, direct-push GeoProbe 8040 DT drill rig provided by All Service Drilling Inc. of Calgary, Alberta. All boreholes were initially completed to a depth of 6.1 m bgs. Borehole BH3003 was further advanced to a total depth of 9.1 m bgs and borehole BH3002 was deepened to 7.6 m bgs on 02 and 03 May 2018, respectively, using a hollow stem auger.

During completion of the boreholes, soil samples were collected by pushing a clear, acetate sampling core tube into the subsurface. The core tube was then extracted from the borehole and opened by the drilling crew. Clifton personnel described the recovered soil interval in the field for total recovery, composition, texture, colour, hardness, moisture content, and any other identifying features observed, including inclusions or alteration of the original material. Samples were measured, and identifying breaks in stratigraphy or soil type were noted by depth. The 1.5 m sample cores were split into a top and bottom interval with a composite sample collected from each interval. Soil was removed from the core tube with a stainless-steel putty knife, or by hand. All remaining soil cuttings were placed in a lined soil bag located on-Site. The borehole logs are attached in Appendix B along with Clifton's standard Symbols and Terms document.

Soil samples from the boreholes were selected for analysis based on volatile soil vapour field screening results using a RKI Eagle 2 combustible gas monitor (Eagle 2) with a photo ionization detector (PID). In total, thirteen soil samples (two samples per borehole and one duplicate sample) were submitted for laboratory analysis of BTEX, PHC fractions F1-F4, PAHs and VOCs. Samples were transported in ice-filled coolers, under chain-of-custody, to Maxxam Analytics in Calgary, Alberta.

Groundwater Investigation

Up to three groundwater monitoring wells were installed in each borehole, to varying depths. Three monitoring wells were installed at borehole BH3001 (BH3001A, B, and C), and two monitoring wells were installed at borehole BH3002 (BH3002A and BH3002B) and borehole BH3003 (BH3003A and BH3003B). The monitoring wells were constructed using 50 mm inner diameter (ID), Schedule 40 PVC. Solid PVC pipes of corresponding diameters were attached to screens. The solid pipe was capped with a J-Plug locking well cap. The annulus around the screen of the wells was backfilled with well-sorted, washed 10/20 filter sand placed from the bottom of the well to approximately 0.3 m above the screened interval. The well installation details are provided within the borehole logs in Appendix B.

Subsequently, the wells were sealed above the sand with a hydrated bentonite clay plug of at least 0.3 m in thickness. The annulus space around the pipe was filled with hydrated bentonite chips to just below the ground surface. Bentonite chips were hydrated with de-ionized water. Filter sand was placed above the hydrated bentonite chips. Flush-mounted, heavy-duty steel road boxes were installed to protect the monitoring wells. The road boxes were sealed into place above the sand with quick setting concrete.

On 03 May 2018, Clifton personnel re-visited the Site to conduct groundwater monitoring and sampling. The wells were monitored for total depth of well, LNAPL (if present), standpipe vapour concentration and water table depth; measurements were recorded in the field logs.

All monitoring wells were purged by removing three well volumes prior to sampling. Upon completion of the purging, a disposable bailer was used to obtain representative samples from each monitoring well for analysis of BTEX, PHC fractions F1 to F4, and VOCs. Samples were transported in ice-filled coolers, under chain-of-custody, to Maxxam Analytics in Calgary, Alberta.

Monitoring well locations were surveyed using an RTK GPS on 04 May 2018. The monitoring and sampling event is summarized in Table 1, Appendix C.

Quality Assurance / Quality Control

Various methods of QA/QC were implemented throughout the program including the collection and analysis of trip blank samples and field duplicate samples, as well as laboratory QA/QC procedures. One soil duplicate and one groundwater duplicate were collected during this investigation. The results of the field duplicate QA/QC program are presented in Table 2 to Table 4 in Appendix C.

Trip blank sample results were all below the laboratory detection limits, which are considered acceptable. The soil and groundwater trip blank results are presented in Table 5 (Appendix C).

See the laboratory reports in Appendix D for the detection limits, testing protocols, and QA/QC procedures.

Results

Soil Stratigraphy

The stratigraphy of the new boreholes was used to update the cross-sections provided in the Clifton report *2016 Supplementary Drilling Report Hounsfeld Heights – Briar Hill Community, Calgary, AB* (05 July 2016). All of the cross-sections, including updated and newly added sections, are included as Appendix D.

Soil Analytical Results

Seven soil samples from three boreholes were selected for laboratory analysis of BTEX, PHC fractions F1-F4, PAHs, and VOCs. One duplicate sample was submitted for laboratory analysis of VOCs only. All results were either below the laboratory detection limits or met the AEP 2016 Tier 1 Guidelines. The results are presented in Tables 6 through 8 (Appendix C).

The collected soil cuttings were analyzed for Class II Waste Characterization and met the applicable guidelines for Class II Waste characterization. The results are presented in Table 9 (Appendix C). Laboratory Certificates of Analysis can be found in Appendix E.

Groundwater Well Monitoring

A summary of groundwater field measurements, including depth to groundwater and total well depth, along with measured groundwater elevations, are provided in Table 1 (Appendix C). The groundwater elevation ranged from 1067.89 m (BH3001C) to 1072.12 m (BH3002A). The interpreted groundwater flow direction is

to the southwest. An updated potentiometric surface, incorporating these new wells, will be provided as part of the next semi-annual monitoring and sampling report.

Groundwater Investigation

Eight groundwater samples including one duplicate were collected from the newly installed groundwater monitoring wells on-Site. All samples were submitted for laboratory analysis of BTEX, PHC fractions F1 and F2, PAHs, and VOCs. All groundwater samples were below the laboratory detection limits. The results are presented in Tables 10 through 12. Laboratory Certificates of Analysis can be found in Appendix E.

Discussion

Soil Investigation

Previous soil samples indicated that there were VOC exceedances in the southwestern corner of the Site, north of the 3000 series boreholes. The objective of this investigation was to delineate BTEX, PHC fractions F1 to F4, and VOCs in the soil. All of the soil samples collected as part of this investigation had concentrations of BTEX, PHC fractions F1 to F4, and VOCs that were below the laboratory detection limits. There were detectable concentrations of PAHs reported in four of the samples. Three of the samples were collected between 5.33 and 6.10 m bgs. It is unclear if these are background concentrations. None of the samples exceeded the applicable guidelines.

Groundwater Investigation

Previous groundwater sampling events indicated that benzene and 1,2-DCA had not been delineated in Unit 3, the middle sandy silt, to the west. The objective of this investigation was to delineate these parameters in the groundwater. All of the groundwater samples collected during this investigation were below the laboratory detection limit for all CoPCs. Benzene and 1,2-DCA have, therefore, been delineated in the southwestern portion of the Site.

Conclusions

Based on the soil and groundwater laboratory results, the CoPCs for the Site have been delineated to the southwest.

Recommendations

Based on the results of this investigation, Clifton recommends that the monitoring wells be incorporated into the semi-annual monitoring and sampling program.

Closure

This report was prepared by Clifton Associates Ltd. for the account of Sears Canada Inc. The material in it reflects Clifton Associates Ltd. best judgment available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Clifton Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Our conclusions and recommendations are preliminary and based upon the information obtained from the referenced subsurface exploration. The Site monitoring and associated laboratory testing indicate subsurface, groundwater and chemical conditions only at the specific locations and times investigated, only

to the depth penetrated and only for the soil and chemical properties tested. The subsurface conditions may vary between the investigation points and with time. The subsurface interpretation provided is a professional opinion of conditions and not a certification of the site conditions. The nature and extent of subsurface variation may not become evident until construction or further investigation. If variations or other latent conditions do become evident, Clifton Associates Ltd. should be notified immediately so that we may re-evaluate our conclusions and recommendations.

This report has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty, expressed or implied is made.

No environmental site investigation or remediation can wholly eliminate uncertainty regarding environmental conditions in connection with a property. This investigation is intended to reduce, but not eliminate the uncertainty regarding environmental conditions. Conclusions regarding the condition of the site do not represent a warranty that all areas within the site and beneath structures are of the same quality as those sampled. Further, contamination could also exist in forms not indicated by the investigation. The work was based in part upon the environmental quality guidelines and regulations in effect when the work was begun. Future regulatory changes may require reassessment of the findings of this investigation.

Clifton Associates Ltd.



Terryn Kuzyk, PEng
Environmental Engineer



David Pritchard, PGeol
Senior Environmental Geoscientist

Association of Professional
Engineers and Geoscientists of Alberta
Permit to Practice P4823

Appendices:

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Appendices

Clifton Associates



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Appendix A

Clifton Associates Figures

Clifton Associates

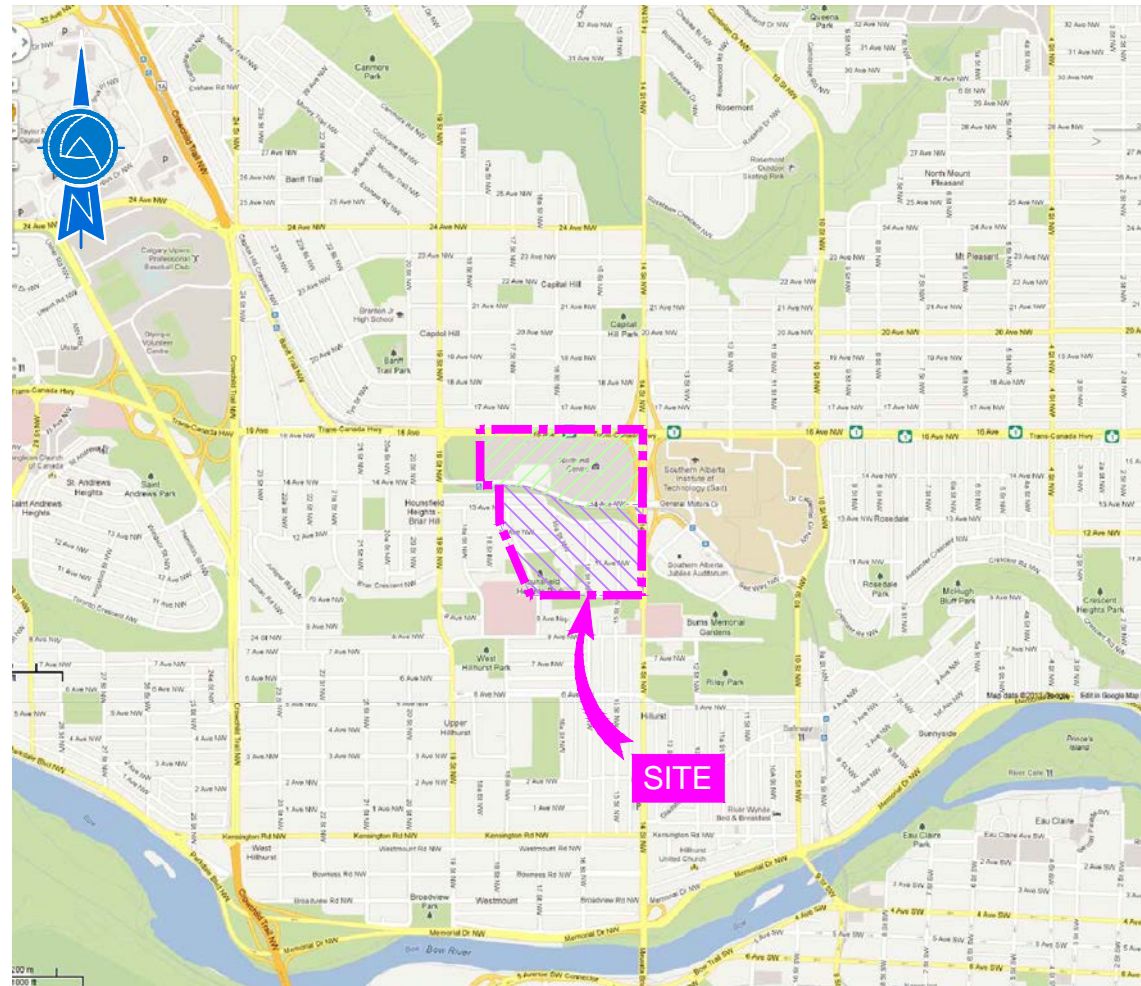


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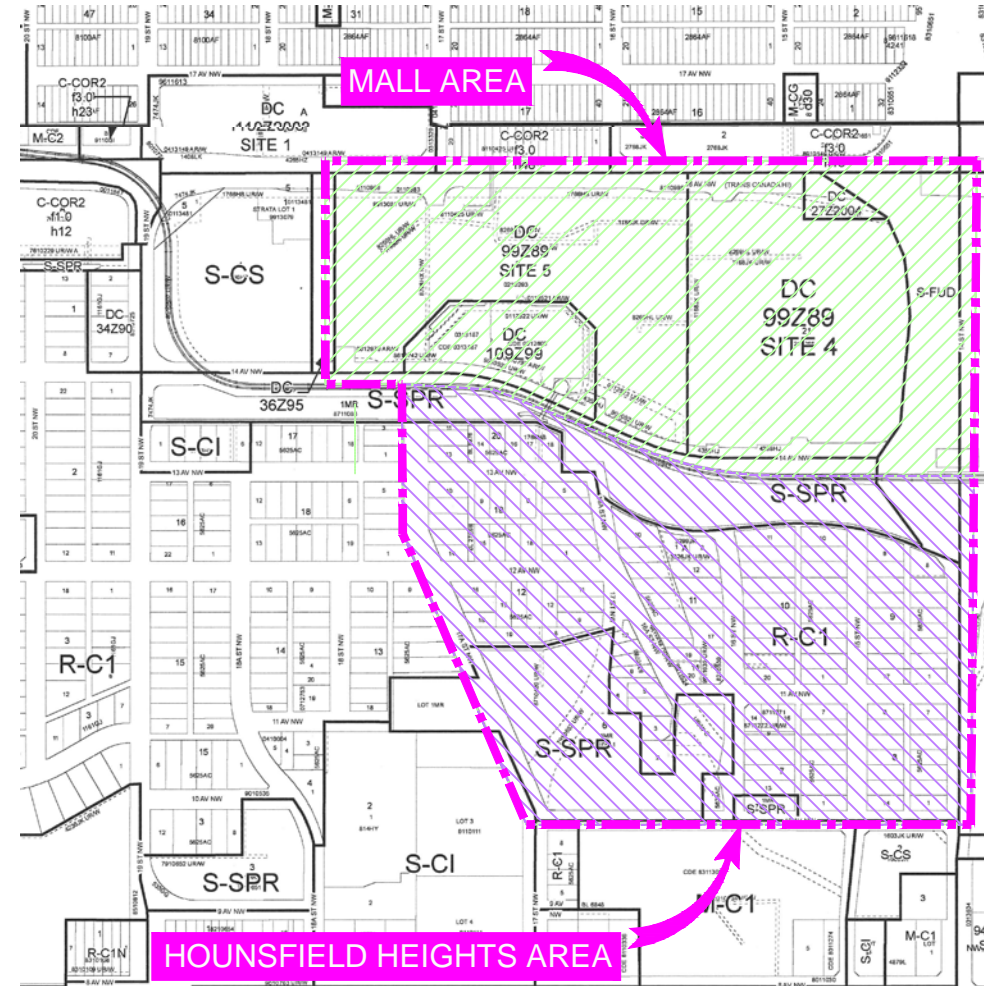
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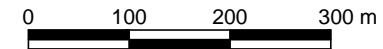
GENERAL SITE LOCATION

SCALE 1:30,000



SURROUNDING LAND USE

SCALE 1:7,500



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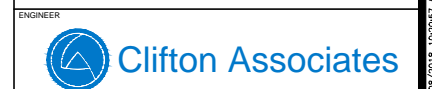
- SITE BOUNDARY
- MALL AREA
- HOUNSFELD HEIGHTS AREA
- CITY OF CALGARY BY-LAW ZONING

LAND USE DISTRICTS:

- RESIDENTIAL - CONTEXTUAL ONE DWELLING DISTRICT R-C1
- MULTI-RESIDENTIAL - CONTEXTUAL LOW-PROFILE DISTRICT MC-1
- MULTI-RESIDENTIAL - CONTEXTUAL GRADE-ORIENTED DISTRICT MC-G
- COMMERCIAL - CORRIDOR 2 DISTRICT C-COR2
- SPECIAL PURPOSE - SCHOOL, PARK, AND COMMUNITY RESERVE DISTRICT S-SPR
- SPECIAL PURPOSE - COMMUNITY INSTITUTION DISTRICT S-CI
- SPECIAL PURPOSE - COMMUNITY SERVICE DISTRICT S-CS
- SPECIAL PURPOSE - FUTURE URBAN DEVELOPMENT DISTRICT S-FUD
- DIRECT CONTROL DISTRICT DC

NOTES:

1. CITY OF CALGARY ROAD MAP PROVIDED BY CANADIAN CARTOGRAPHICS CORPORATION, 2012.
2. LAND USE MAP PROVIDED BY THE CITY OF CALGARY.



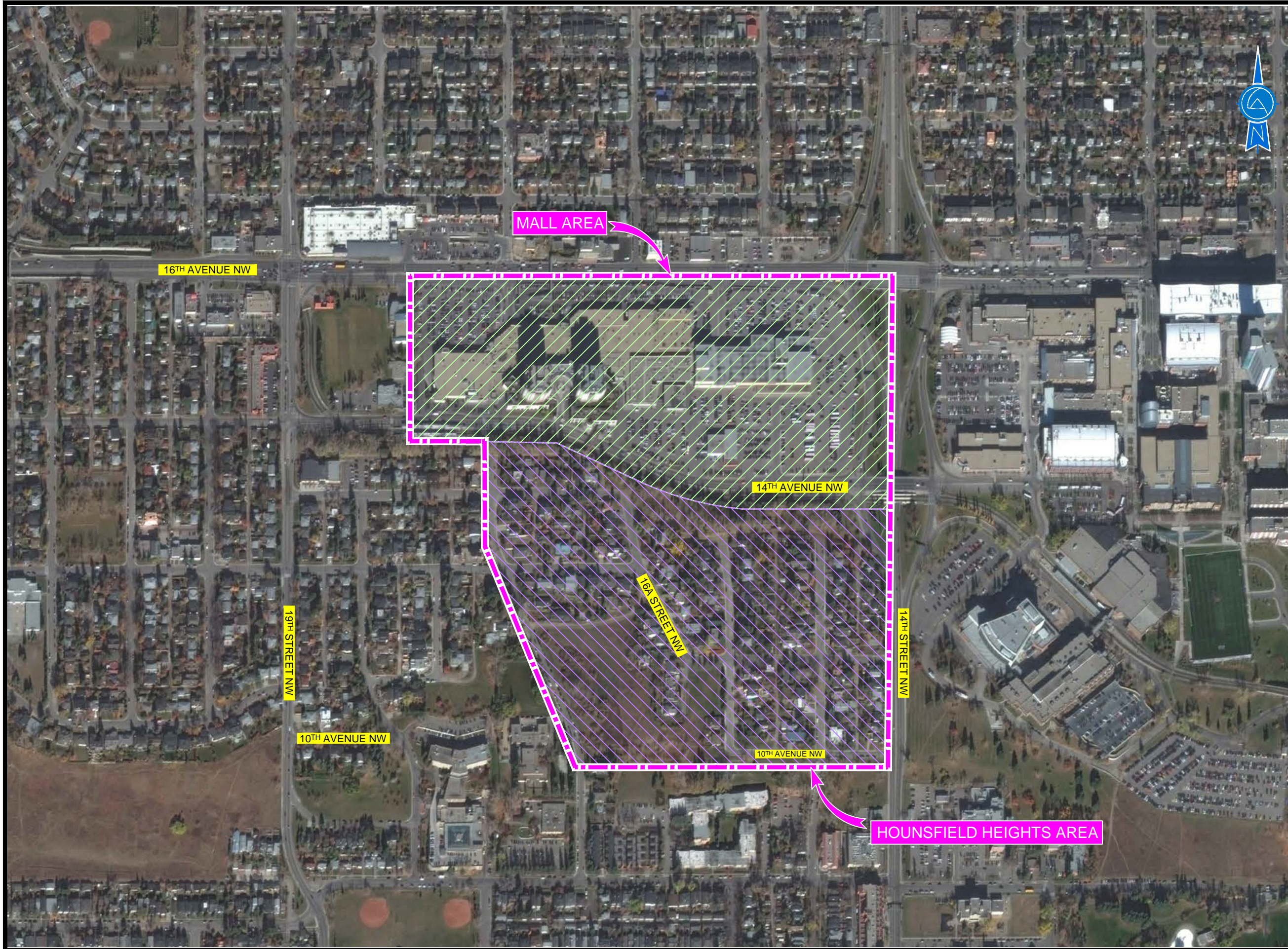
CLIENT **SEARS**

PROJECT SUPPLEMENTAL PHASE II ESA
HOUNSFELD HEIGHTS - BRIAR HILL COMMUNITY
CALGARY, ALBERTA

TITLE **SITE LOCATION AND
SURROUNDING LAND USE**

DESIGNED	SCALE	AS SHOWN	DATE	2018-06-08	
DRAWN	RD	PROJECT NO.	CG2430.1 E28	FIG.	1
CHECKED		FILE NO.	CG2430.1-E28-04		

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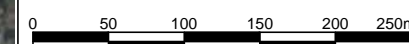
SITE BOUNDARY 

MALL AREA 

HOUNSFELD HEIGHTS AREA 

NOTES:

1. AERIAL PHOTOGRAPH PROVIDED BY GOOGLE EARTH PRO. AIR PHOTO DATE: OCT 23, 2015.



ENGINEER  Clifton Associates

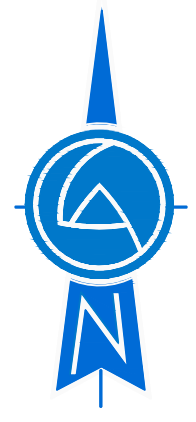
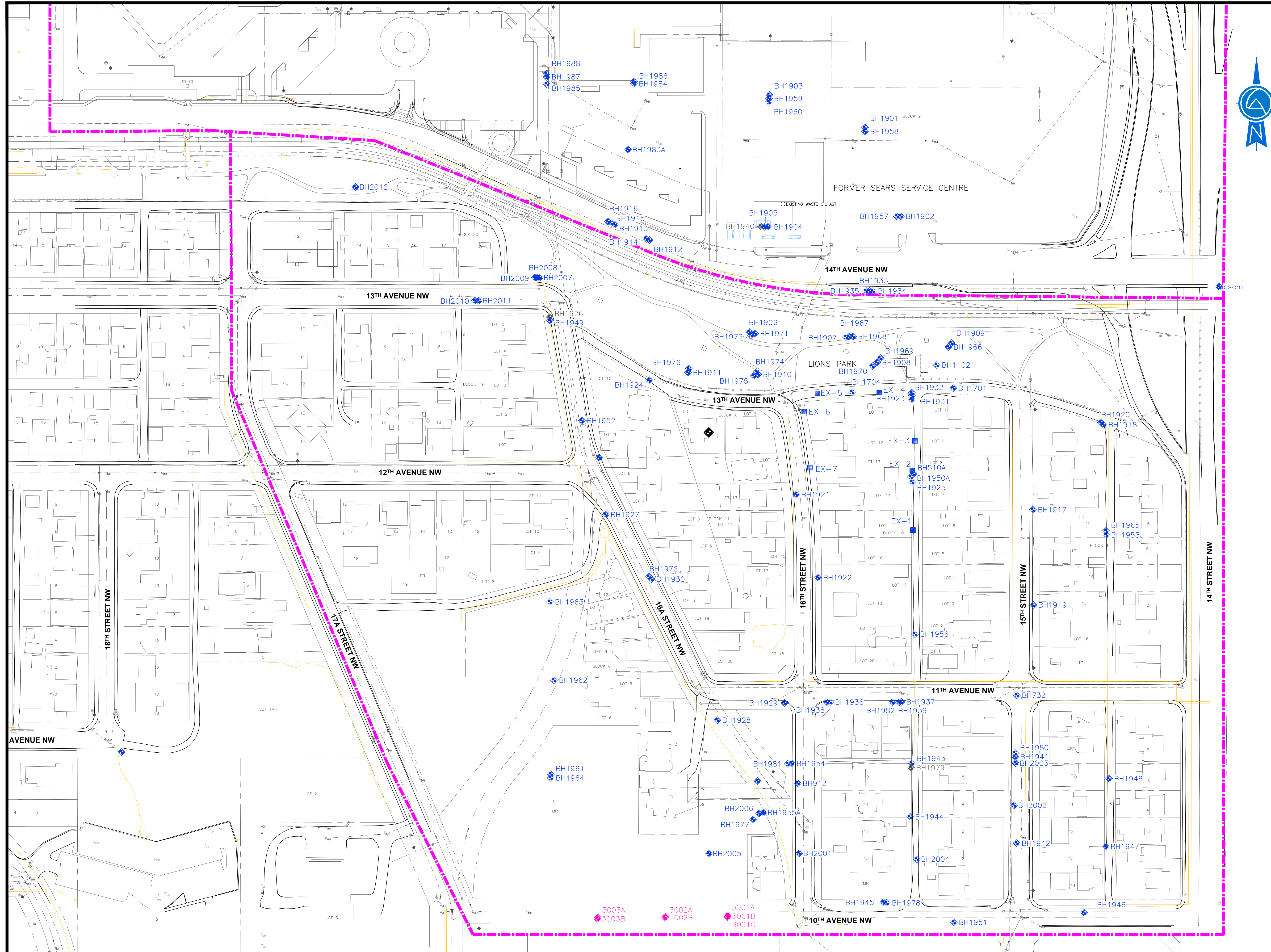
CLIENT **SEARS** 

PROJECT SUPPLEMENTAL PHASE II ESA
HOUNSFELD HEIGHTS - BRIAR HILL COMMUNITY
CALGARY, ALBERTA

TITLE **SITE AND SURROUNDING PROPERTIES**

DESIGNED	SCALE	1:5000	DATE	2018-06-08
DRAWN	RD	PROJECT NO.	CG2430.1 E28	FIG.
CHECKED	FILE NO.	CG2430.1-E28-05		2

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LEGEND

- SITE BOUNDARY ---
- EXTRACTION WELL ◆
- LRT TRACKS
- FENCE LINE
- LEGAL LINE
- FORMER FACILITY/FEATURE
- BUILDING
- EXISTING GROUNDWATER MONITORING WELL ◆
- NEWLY INSTALLED MONITORING WELL ◆

UTILITY LINES & SYMBOLS

- NATURAL GAS LINE
- SANITARY SEWER
- STORM SEWER
- WATER
- CATCH BASIN
- FIRE HYDRANT ●
- LIGHT STANDARD ○
- MANHOLE ○
- UTILITY POLE ○

NOTES:
 1. DRAWING COMPILED FROM PLANIMETRIC FILES SUPPLIED BY THE CITY OF CALGARY (INCLUDING UG UTILITIES) & FROM SITE ASSESSMENT INFORMATION. ADDITIONAL REFERENCES FROM SEACOR ENVIRONMENTAL ENGINEERING INC., DRAWINGS 149-5A11.DWG, 149-5A6.DWG.



CLIENT
SEARS
 PROJECT
 SUPPLEMENTAL PHASE II ESA
 HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY
 CALGARY, ALBERTA

TITLE
MONITORING WELL LOCATION PLAN

DESIGNED	SCALE	DATE
DRAWN	PROJECT NO.	FIG.
CHECKED	FILE NO.	
TK	CG2430.1-E28-06	3

Appendix B

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Borehole Logs

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BOREHOLE LOG

Borehole: BH3001A

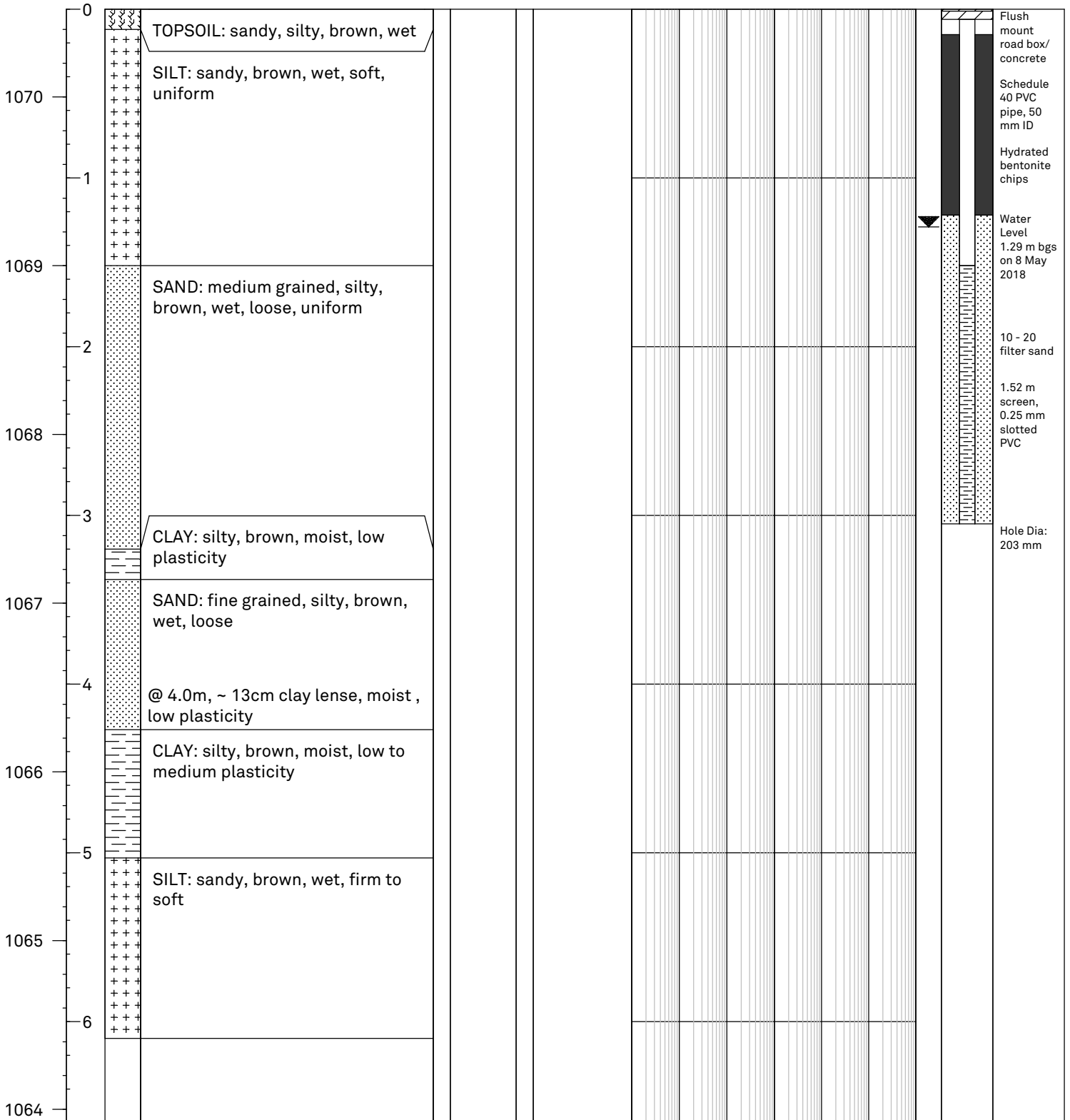
Page: 1 of 1

Client: Sears Canada Inc.
 Project: Sears Site Management
 Location: Hounsfield Heights Park, Calgary
 Project No.: CG2430.1 E28

Northing: 5658327.96 m
 Easting: -6903.60 m
 Ground Elev.: 1070.52 m
 Top Casing Elev.: 1070.46 m

Date: 1 May 2018
 Driller: All Service Drilling
 Method: HSA
 Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail
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BOREHOLE LOG

Borehole: BH3001B

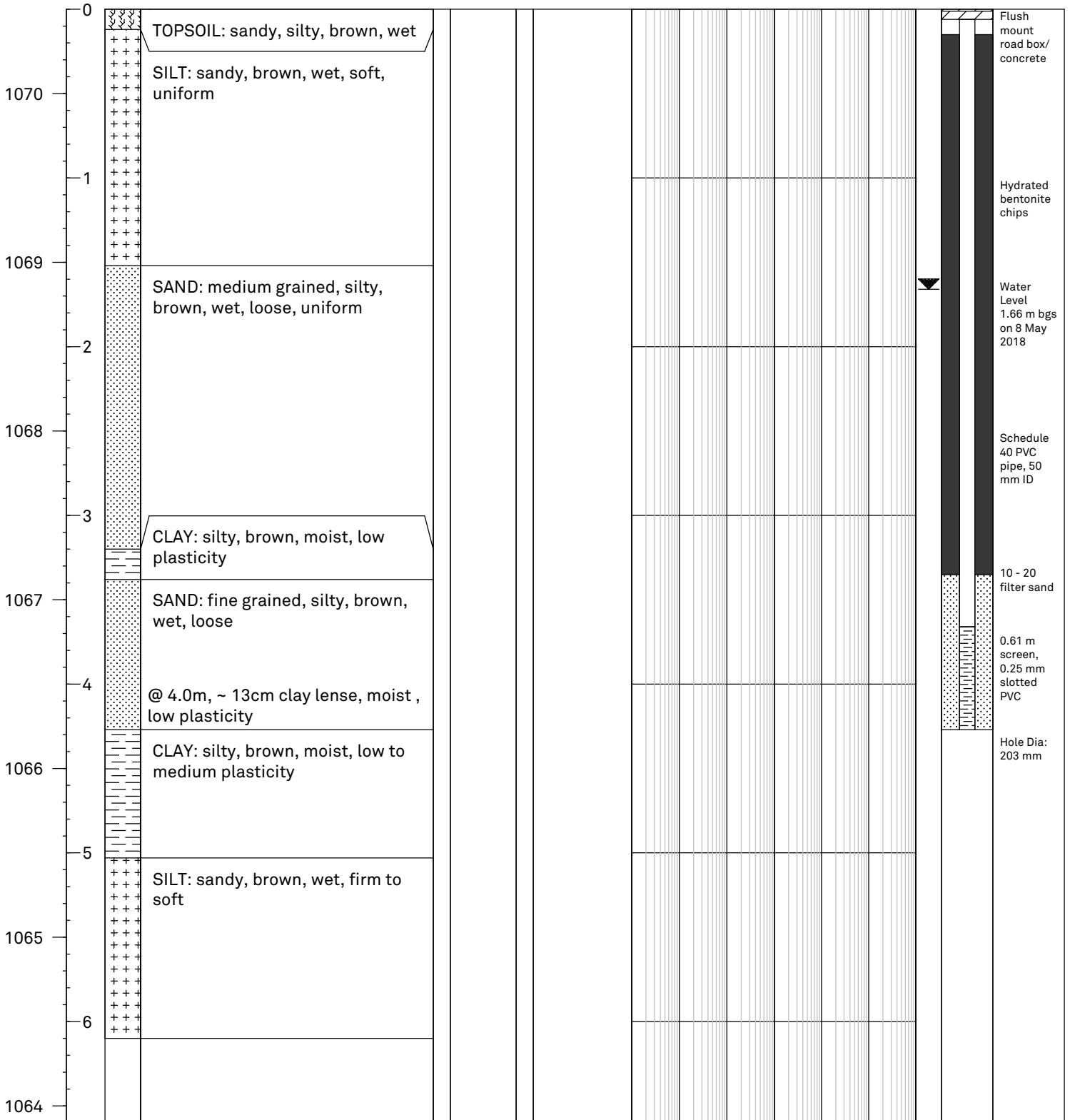
Page: 1 of 1

Client: Sears Canada Inc.
 Project: Sears Site Management
 Location: Hounsfield Heights Park, Calgary
 Project No.: CG2430.1 E28

Northing: 5658327.54 m
 Easting: -6903.44 m
 Ground Elev.: 1070.50 m
 Top Casing Elev.: 1070.43 m

Date: 1 May 2018
 Driller: All Service Drilling
 Method: HSA
 Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail
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BOREHOLE LOG

Borehole: BH3001C

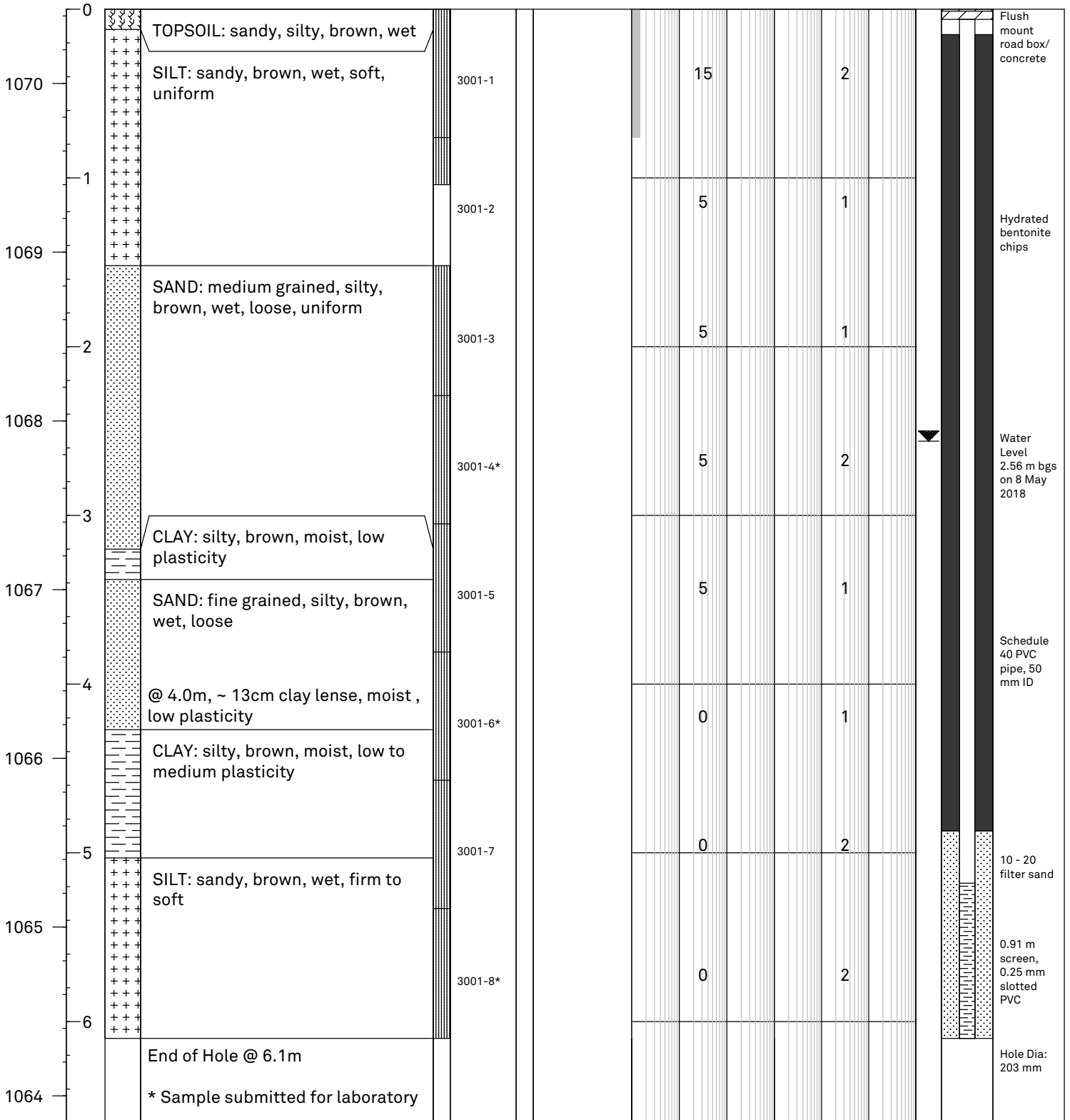
Page: 1 of 1

Client: Sears Canada Inc.
 Project: Sears Site Management
 Location: Hounsfield Heights Park, Calgary
 Project No.: CG2430.1 E28

Northing: 5658326.96 m
 Easting: -6903.45 m
 Ground Elev.: 1070.44 m
 Top Casing Elev.: 1070.35 m

Date: 1 May 2018
 Driller: All Service Drilling
 Method: DP/HSA
 Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail	
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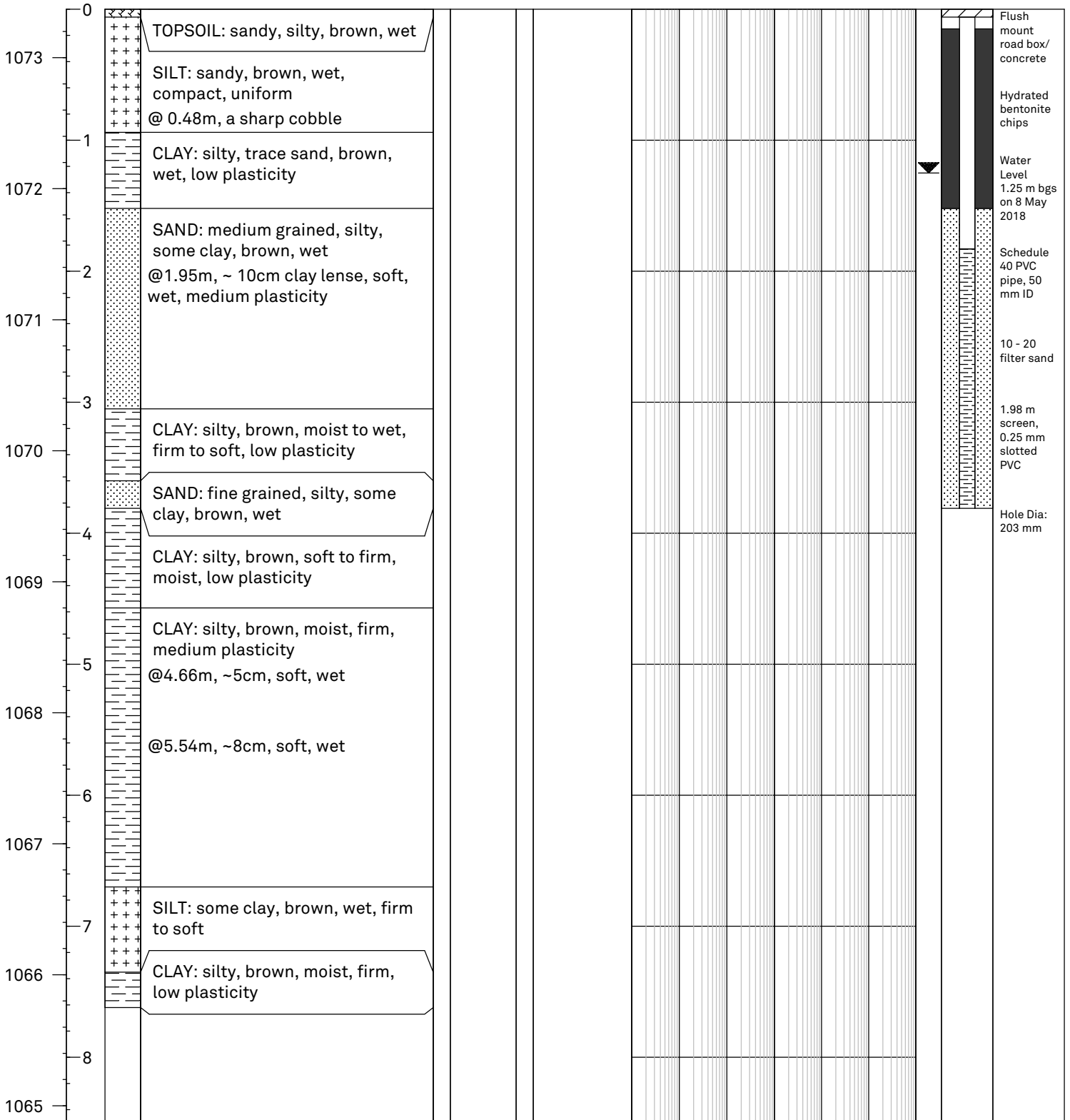


Client: Sears Canada Inc.
 Project: Sears Site Management
 Location: Hounsfield Heights Park, Calgary
 Project No.: CG2430.1 E28

Northing: 5658327.23 m
 Easting: -6938.54 m
 Ground Elev.: 1073.37 m
 Top Casing Elev.: 1073.25 m

Date: 3 May 2018
 Driller: All Service Drilling
 Method: HSA
 Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail	
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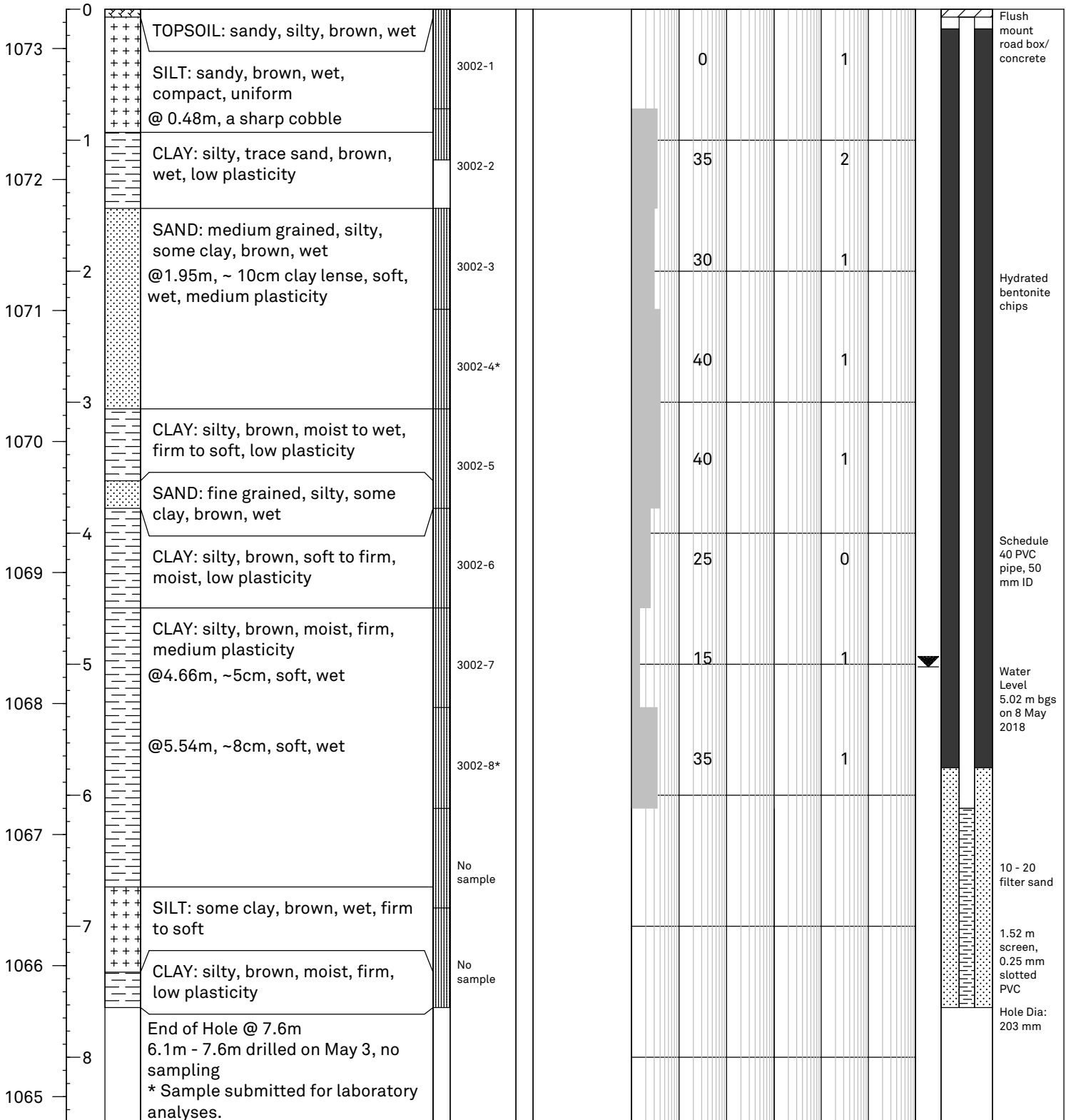
BOREHOLE LOG

Borehole: BH3002B

Page: 1 of 1

Client: Sears Canada Inc.	Northing: 5658326.69 m	Date: 1 May 2018
Project: Sears Site Management	Easting: -6938.52 m	Driller: All Service Drilling
Location: Hounsfield Heights Park, Calgary	Ground Elev.: 1073.30 m	Method: DP/HSA
Project No.: CG2430.1 E28	Top Casing Elev.: 1073.22 m	Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail
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BOREHOLE LOG

Borehole: BH3003A

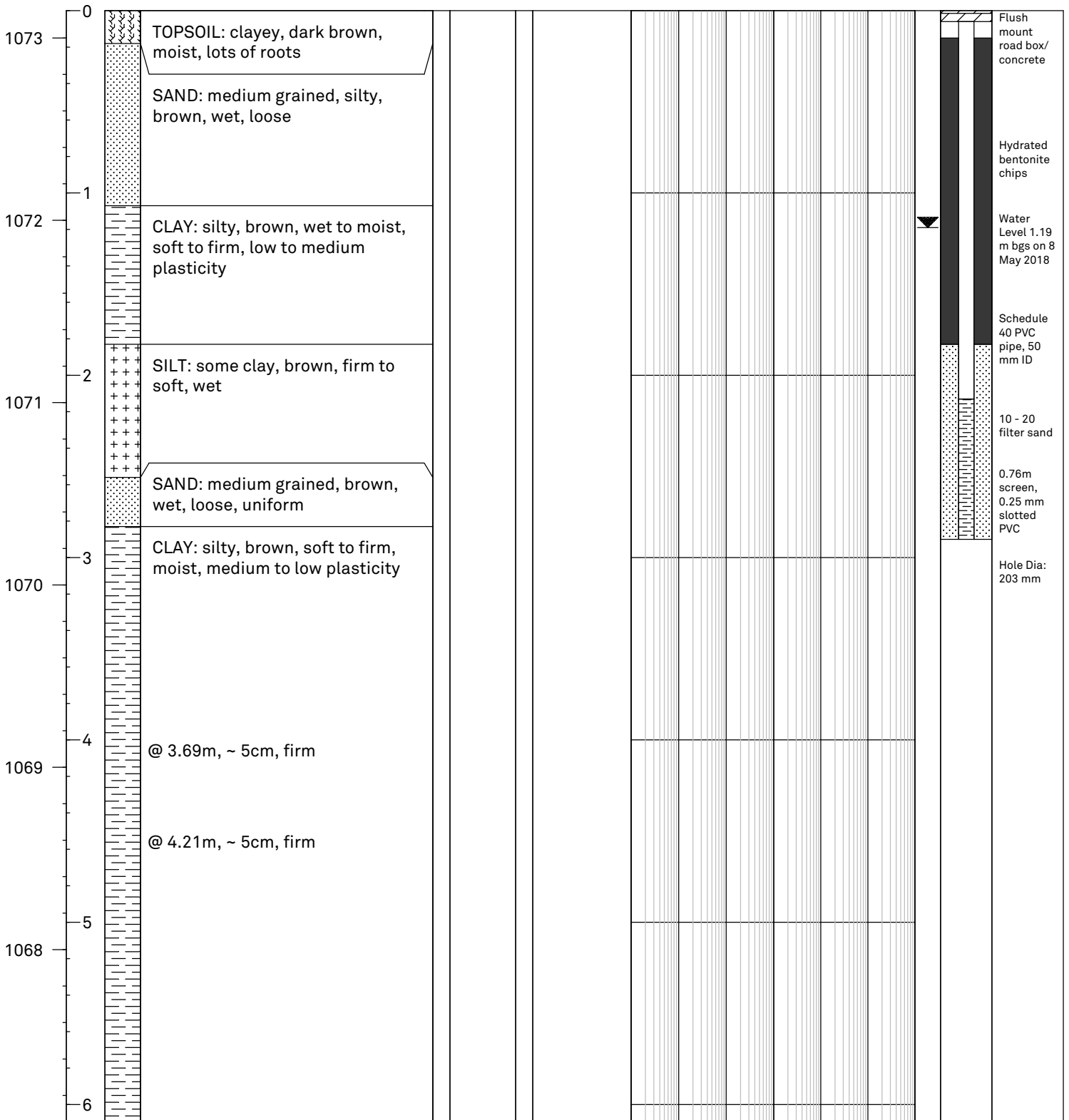
Page: 1 of 1

Client: Sears Canada Inc.
 Project: Sears Site Management
 Location: Hounsfield Heights Park, Calgary
 Project No.: CG2430.1 E28

Northing: 5658326.71 m
 Easting: -6976.19 m
 Ground Elev.: 1073.15 m
 Top Casing Elev.: 1073.08 m

Date: 2 May 2018
 Driller: All Service Drilling
 Method: HSA
 Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail
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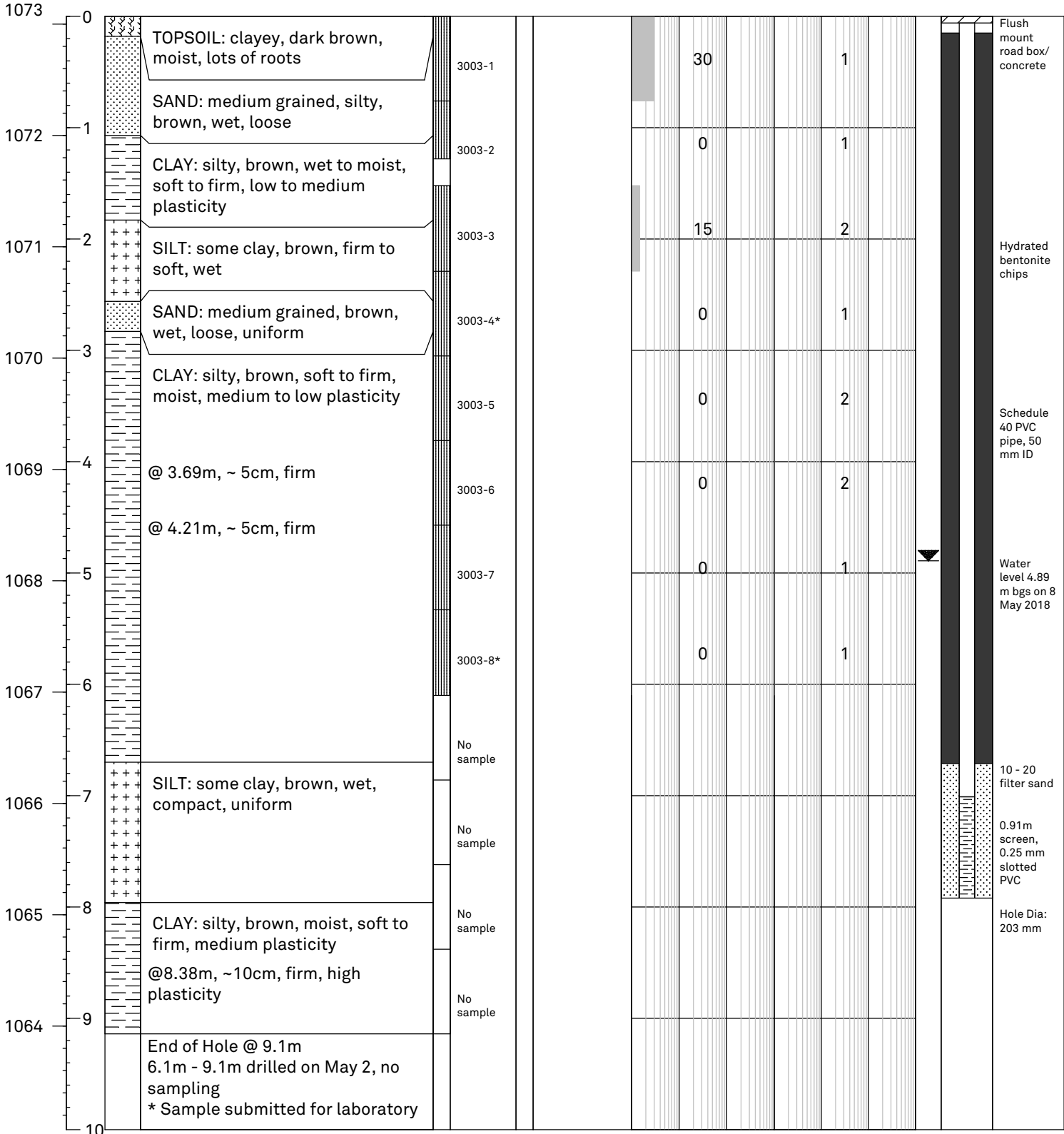
BOREHOLE LOG

Borehole: BH3003B

Page: 1 of 1

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Project: Sears Site Management	Easting: -6976.54 m	Driller: All Service Drilling
Location: Hounsfield Heights Park, Calgary	Ground Elev.: 1073.07 m	Method: DP/HSA
Project No.: CG2430.1 E28	Top Casing Elev.: 1072.95 m	Logged by: Austin

Elev.(masl) Depth (m)	Symbol	Soil Description	Sample		EC Reading		OVA		PID		Monitoring Well Construction Detail
			Type	No.	SPT 'N'	dS/m		ppm		ppm	
					0	20	10	10000	10	10000	



Appendix C

Clifton Associates Tables

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Table 1 - Summary of Well Monitoring

Monitor Well	Screened Unit	Monitor Date (dd-mmm-yy)	Top of PVC Pipe Elevation (masl ¹)	Ground Surface Elevation (masl ²)	Total Depth bTOP ³ (m)	Depth to Water bTOP (m)	Depth to Water BGS ⁴ (m)	Water Elevation (m asl)	Monitor Well Vapour Concentration ⁵ HEX/IBL (ppm)
BH3001A	3	3-May-18	1070.46	1070.52	2.79	1.21	1.27	1069.25	
BH3001B	3	3-May-18	1070.43	1070.50	4.28	1.57	1.64	1068.86	
BH3001C	4	3-May-18	1070.35	1070.44	5.95	2.46	2.55	1067.89	
BH3002A	3	3-May-18	1073.25	1073.37	3.69	1.14	1.25	1072.12	
BH3002B	4	3-May-18	1073.22	1073.30	7.50	4.93	5.00	1068.30	
BH3003A	3	3-May-18	1073.08	1073.15	2.89	1.11	1.18	1071.97	
BH3003B	4	3-May-18	1072.95	1073.07	7.74	4.77	4.89	1068.18	

Notes:

- 1 Meter above sea level
- 2 Ground surface elevation based on survey completed in May 2018 by Clifton Associates Ltd.
- 3 Below top of pipe
- 4 Below ground surface
- 5 Vapour concentrations measured in monitoring wells with an RKI Eagle gas portable monitor with PID.

HEX/IBL Hexane/Isobutylene
- not measured

Table 2 - Summary of Soil Laboratory Analyses QA / QC - Field Duplicates - VOCs

Sample ID	RDL ¹	BH3001-8	BH3901-8	RPD % ²
Sample Date		1-May-2018		
1,1,1,2-Tetrachloroethane	0.10	<0.10	<0.10	NC
1,1,1-Trichloroethane	0.020	<0.020	<0.020	NC
1,1,2,2-Tetrachloroethane	0.050	<0.050	<0.050	NC
1,1,2-Trichloroethane	0.020	<0.020	<0.020	NC
1,1-Dichloroethane	0.020	<0.020	<0.020	NC
1,1-Dichloroethylene	0.020	<0.020	<0.020	NC
1,2,3-Trichlorobenzene	0.040	<0.040	<0.040	NC
1,2,4-Trichlorobenzene	0.040	<0.040	<0.040	NC
1,2,4-Trimethylbenzene	0.50	<0.50	<0.50	NC
1,2-Dibromoethane	0.0020	<0.0020	<0.0020	NC
1,2-Dichlorobenzene	0.020	<0.020	<0.020	NC
1,2-Dichloroethane	0.0020	<0.0020	<0.0020	NC
1,2-Dichloropropane	0.020	<0.020	<0.020	NC
1,3,5-Trichlorobenzene	0.040	<0.040	<0.040	NC
1,3,5-Trimethylbenzene	0.50	<0.50	<0.50	NC
1,3-Dichlorobenzene	0.020	<0.020	<0.020	NC
1,4-Dichlorobenzene	0.020	<0.020	<0.020	NC
Bromodichloromethane	0.030	<0.030	<0.030	NC
Bromoform	0.050	<0.050	<0.050	NC
Bromomethane	0.020	<0.020	<0.020	NC
Carbon Tetrachloride	0.00050	<0.00050	<0.00050	NC
Chlorobenzene	0.0010	<0.0010	<0.0010	NC
Chlorodibromomethane	0.020	<0.020	<0.020	NC
Chloroethane	0.020	<0.020	<0.020	NC
Chloroform	0.00080	<0.00080	<0.00080	NC
Chloromethane	0.030	<0.030	<0.030	NC
cis- 1,2-Dichloroethylene	0.020	<0.020	<0.020	NC
cis-1,3-Dichloropropene	0.020	<0.020	<0.020	NC
Dichloromethane	0.030	<0.030	<0.030	NC
Methyl Methacrylate	0.040	<0.040	<0.040	NC
Methyl tert-butyl ether	0.030	<0.030	<0.030	NC
Styrene	0.020	<0.020	<0.020	NC
Tetrachloroethene	0.010	<0.010	<0.010	NC
trans- 1,2-dichloroethylene	0.020	<0.020	<0.020	NC
trans-1,3-Dichloropropene	0.020	<0.020	<0.020	NC
Trichloroethylene	0.010	<0.010	<0.010	NC
Trichlorofluoromethane	0.020	<0.020	<0.020	NC
Vinyl Chloride	0.00030	<0.00030	<0.00030	NC

Notes:

- 1 Reportable detection limits.
 - 2 Relative percent difference.
- NC Not calculated
All results in mg/kg unless otherwise noted.
Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 3 - Summary of Groundwater Laboratory Analyses
QA/QC - Field Duplicates - BTEX, PHC fractions F1 - F2, and PAHs**

Sample ID	RDL ¹	BH3002B	BH3902B	RPD ² (%)
Sample Date		8-May-18		
BTEX and PHC fractions F1 - F2				
Benzene	0.00040	<0.00040	<0.00040	NC
Toluene	0.00040	<0.00040	<0.00040	NC
Ethylbenzene	0.00040	<0.00040	<0.00040	NC
Xylenes (Total)	0.00089	<0.00089	<0.00089	NC
F1 minus BTEX (C6 - C10)	0.10	<0.10	<0.10	NC
F2 (C10 - C16)	0.10	<0.10	<0.10	NC
PAHs				
1-Methylnaphthalene	0.00010	<0.00010	<0.00010	NC
2-Methylnaphthalene	0.00010	<0.00010	<0.00010	NC
Acenaphthene	0.00010	<0.00010	<0.00010	NC
Acenaphthylene	0.00010	<0.00010	<0.00010	NC
Acridine	0.00020	<0.000050	<0.000050	NC
Anthracene	0.00010	<0.00010	<0.00010	NC
Benzo(a)anthracene	0.000085	<0.000085	<0.000085	NC
Benzo(a)pyrene	0.000075	<0.000075	<0.000075	NC
Benzo(b&j)fluoranthene	0.000085	<0.000085	<0.000085	NC
Benzo(c)phenanthrene	0.000050	<0.000050	<0.000050	NC
Benzo(g,h,i)perylene	0.000085	<0.000085	<0.000085	NC
Benzo(k)fluoranthene	0.000085	<0.000085	<0.000085	NC
Benzo[a]pyrene equivalency	0.000010	<0.000010	<0.000010	NC
Benzo[e]pyrene	0.000050	<0.000050	<0.000050	NC
Chrysene	0.000085	<0.000085	<0.000085	NC
Dibenz(a,h)anthracene	0.000075	<0.000075	<0.000075	NC
Fluoranthene	0.000010	<0.000010	<0.000010	NC
Fluorene	0.000050	<0.000050	<0.000050	NC
Indeno(1,2,3-cd)pyrene	0.000085	<0.000085	<0.000085	NC
Naphthalene	0.00010	<0.00010	<0.00010	NC
Perylene	0.000050	<0.000050	<0.000050	NC
Phenanthrene	0.000050	<0.000050	<0.000050	NC
Pyrene	0.000020	<0.000020	<0.000020	NC
Quinoline	0.00020	<0.00020	<0.00020	NC

Notes:

1 Reportable detection limit.

2 Relative percent difference.

NC Not calculated.

All results in mg/L unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta

Table 4 - Summary of Groundwater Laboratory Analyses QA/QC - Field Duplicates - VOCs

Sample ID	RDL ¹	BH3002B	BH3902B	RPD ² (%)
Sample Date		8-May-18		
1,1,1,2-tetrachloroethane	0.0010	<0.0010	<0.0010	NC
1,1,1-trichloroethane	0.00050	<0.00050	<0.00050	NC
1,1,2,2-tetrachloroethane	0.0020	<0.0020	<0.0020	NC
1,1,2-trichloroethane	0.00050	<0.00050	<0.00050	NC
1,1-dichloroethane	0.00050	<0.00050	<0.00050	NC
1,1-dichloroethene	0.00050	<0.00050	<0.00050	NC
1,2,3-trichlorobenzene	0.0010	<0.0010	<0.0010	NC
1,2,4-trichlorobenzene	0.0010	<0.0010	<0.0010	NC
1,2,4-trimethylbenzene	0.00050	<0.00050	<0.00050	NC
1,2-dibromoethane	0.00020	<0.00020	<0.00020	NC
1,2-dichlorobenzene	0.00050	<0.00050	<0.00050	NC
1,2-dichloroethane	0.00050	<0.00050	<0.00050	NC
1,2-dichloropropane	0.00050	<0.00050	<0.00050	NC
1,3,5-trichlorobenzene	0.00050	<0.00050	<0.00050	NC
1,3,5-trimethylbenzene	0.00050	<0.00050	<0.00050	NC
1,3-dichlorobenzene	0.00050	<0.00050	<0.00050	NC
1,4-dichlorobenzene	0.00050	<0.00050	<0.00050	NC
Bromodichloromethane	0.00050	<0.00050	<0.00050	NC
Bromoform	0.00050	<0.00050	<0.00050	NC
Bromomethane	0.0020	<0.0020	<0.0020	NC
Carbon tetrachloride	0.00050	<0.00050	<0.00050	NC
Chlorobenzene	0.00050	<0.00050	<0.00050	NC
Chlorodibromomethane	0.0010	<0.0010	<0.0010	NC
Chloroethane	0.0010	<0.0010	<0.0010	NC
Chloroform	0.00050	<0.00050	<0.00050	NC
Chloromethane	0.0020	<0.0020	<0.0020	NC
cis-1,2-dichloroethene	0.00050	<0.00050	<0.00050	NC
cis-1,3-dichloropropene	0.00050	<0.00050	<0.00050	NC
Dichloromethane	0.0020	<0.0020	<0.0020	NC
Methyl methacrylate	0.00050	<0.00050	<0.00050	NC
Methyl-tert-butylether (MTBE)	0.00050	<0.00050	<0.00050	NC
Styrene	0.00050	<0.00050	<0.00050	NC
Tetrachloroethene	0.00050	<0.00050	<0.00050	NC
Total Trihalomethanes	0.0013	<0.0013	<0.0013	NC
trans-1,2-dichloroethene	0.00050	<0.00050	<0.00050	NC
trans-1,3-dichloropropene	0.00050	<0.00050	<0.00050	NC
Trichloroethene	0.00050	<0.00050	<0.00050	NC
Trichlorofluoromethane	0.00050	<0.00050	<0.00050	NC
Vinyl chloride	0.00050	<0.00050	<0.00050	NC

Notes:

1 Reportable detection limit.

2 Relative percent difference.

NC Not calculated.

All results in mg/L unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta

**Table 5 - Summary of Groundwater Laboratory Analyses
QA/QC - Trip Blank - VOCs**

Sample ID	TRIP BLANK	RDL ¹	Sample ID	TRIP BLANK	RDL ¹
Sample Date	1-May-2018		Sample Date	8-May-2018	
1,1,1,2-Tetrachloroethane	<0.10	0.1	1,1,1,2-tetrachloroethane	<0.0010	0.0010
1,1,1-Trichloroethane	<0.020	0.02	1,1,1-trichloroethane	<0.00050	0.00050
1,1,2,2-Tetrachloroethane	<0.050	0.05	1,1,2,2-tetrachloroethane	<0.0020	0.0020
1,1,2-Trichloroethane	<0.020	0.02	1,1,2-trichloroethane	<0.00050	0.00050
1,1-Dichloroethane	<0.020	0.02	1,1-dichloroethane	<0.00050	0.00050
1,1-Dichloroethene	<0.020	0.02	1,1-dichloroethene	<0.00050	0.00050
1,2,3-Trichlorobenzene	<0.040	0.04	1,2,3-trichlorobenzene	<0.0010	0.0010
1,2,4-Trichlorobenzene	<0.040	0.04	1,2,4-trichlorobenzene	<0.0010	0.0010
1,2,4-Trimethylbenzene	<0.50	0.5	1,2,4-trimethylbenzene	<0.00050	0.00050
1,2-Dibromoethane	<0.0020	0.002	1,2-dibromoethane	<0.00020	0.00020
1,2-Dichlorobenzene	<0.020	0.02	1,2-dichlorobenzene	<0.00050	0.00050
1,2-Dichloroethane	<0.0020	0.002	1,2-dichloroethane	<0.00050	0.00050
1,2-Dichloropropane	<0.020	0.02	1,2-dichloropropane	<0.00050	0.00050
1,3,5-Trichlorobenzene	<0.040	0.04	1,3,5-trichlorobenzene	<0.00050	0.00050
1,3,5-Trimethylbenzene	<0.50	0.5	1,3,5-trimethylbenzene	<0.00050	0.00050
1,3-Dichlorobenzene	<0.020	0.02	1,3-dichlorobenzene	<0.00050	0.00050
1,4-Dichlorobenzene	<0.020	0.02	1,4-dichlorobenzene	<0.00050	0.00050
Benzene	<0.0050	0.005	Bromodichloromethane	<0.00050	0.00050
Bromodichloromethane	<0.030	0.03	Bromoform	<0.00050	0.00050
Bromoform	<0.050	0.05	Bromomethane	<0.0020	0.0020
Bromomethane	<0.020	0.02	Carbon tetrachloride	<0.00050	0.00050
Carbon Tetrachloride	<0.00050	0.0005	Chlorobenzene	<0.00050	0.00050
Chlorobenzene	<0.0010	0.001	Chlorodibromomethane	<0.0010	0.0010
Chlorodibromomethane	<0.020	0.02	Chloroethane	<0.0010	0.0010
Chloroethane	<0.020	0.02	Chloroform	<0.00050	0.00050
Chloroform	<0.00080	0.0008	Chloromethane	<0.0020	0.0020
Chloromethane	<0.030	0.03	cis-1,2-dichloroethene	<0.00050	0.00050
cis-1,2-Dichloroethene	<0.020	0.02	cis-1,3-dichloropropene	<0.00050	0.00050
cis-1,3-Dichloropropene	<0.020	0.02	Dichloromethane	<0.0020	0.0020
Dichloromethane	<0.030	0.03	Methyl methacrylate	<0.00050	0.00050
Ethylbenzene	<0.010	0.01	Methyl-tert-butylether (MTBE)	<0.00050	0.00050
m & p-Xylene	<0.040	0.04	Styrene	<0.00050	0.00050
Methyl Methacrylate	<0.040	0.04	Tetrachloroethene	<0.00050	0.00050
Methyl-tert-butylether (MTBE)	<0.030	0.03	Total Trihalomethanes	<0.0013	0.0013
o-Xylene	<0.020	0.02	trans-1,2-dichloroethene	<0.00050	0.00050
Styrene	<0.020	0.02	trans-1,3-dichloropropene	<0.00050	0.00050
Tetrachloroethene	<0.010	0.01	Trichloroethene	<0.00050	0.00050
Toluene	<0.020	0.02	Trichlorofluoromethane	<0.00050	0.00050
trans-1,2-Dichloroethene	<0.020	0.02	Vinyl chloride	<0.00050	0.00050
trans-1,3-Dichloropropene	<0.020	0.02			
Trichloroethene	<0.010	0.01			
Trichlorofluoromethane	<0.020	0.02			
Vinyl Chloride	<0.00030	0.0003			
Xylenes (Total)	<0.040	0.04			

Notes:

1 Reportable detection limits.

All results in mg/L unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 6 - Summary of Soil Laboratory Analyses
BTEX and PHC fractions F1-F4**

Sample ID	BH3001-4	BH3001-6	BH3001-8	BH3002-4	BH3002-8	BH3003-4	BH3003-8	Guideline ¹	Guideline ²
Depth (m bgs)	2.29-3.05	3.81-4.57	5.33-6.10	2.29-3.05	5.33-6.10	2.29-3.05	5.33-6.10		
Sample Date	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018		
Benzene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.073	0.046
Toluene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.12	0.52
Ethylbenzene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.14	0.073
Xylenes (Total)	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	1.9	0.99
F1 minus BTEX (C6 - C10)	<10	<10	<10	<10	<10	<10	<10	24	210
F2 (C10 - C16)	<10	<10	<10	<10	<10	<10	<10	130	150
F3 (C16 - C34)	<50	<50	<50	<50	<50	<50	<50	300	1,300
F4 (C34 - C50)	<50	<50	<50	<50	<50	<50	<50	2,800	5,600

Notes:

1 AEP 2016 Tier 1 Guidelines for residential land use of coarse-grained subsoil (> 3.0 m bgs).

2 AEP 2016 Tier 1 Guidelines for residential land use of fine-grained subsoil (> 3.0 m bgs).

m bgs meters below grade surface.

All results are expressed as mg/kg unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 7 - Summary of Soil Laboratory Analyses
PAHs**

Sample ID	BH3001-4	BH3001-6	BH3001-8	BH3002-4	BH3002-8	BH3003-4	BH3003-8	Guideline ¹	Guideline ²
Depth (m bgs)	2.29-3.05	3.81-4.57	5.33-6.10	2.29-3.05	5.33-6.10	2.29-3.05	5.33-6.10		
Sample Date	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018		
1-Methylnaphthalene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
2-Methylnaphthalene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Acenaphthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.38	0.32
Acenaphthylene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Acridine	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NG	NG
Anthracene	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0056	0.0046
Benzo(a)anthracene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo(a)pyrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.083	0.070
Benzo(b&j)fluoranthene	<0.0050	<0.0050	0.0082	0.0065	0.0069	<0.0050	0.0088	0.77	0.70
Benzo(c)phenanthrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo(g,h,i)perylene	<0.0050	<0.0050	<0.0050	0.0082	0.0094	<0.0050	0.013	NG	NG
Benzo(k)fluoranthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo[a]pyrene equivalency	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	NG	NG
Benzo[e]pyrene	<0.0050	<0.0050	0.0066	0.0086	0.0075	<0.0050	0.012	NG	NG
Chrysene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Dibenz(a,h)anthracene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Fluoranthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.039	0.032
Fluorene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.34	0.29
Indeno(1,2,3-cd)pyrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Naphthalene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.017	0.014
Perylene	<0.0050	<0.0050	<0.0050	0.015	0.027	<0.0050	0.019	NG	NG
Phenanthrene	<0.0050	<0.0050	0.0070	<0.0050	0.0065	<0.0050	<0.0050	0.061	0.051
Pyrene	<0.0050	<0.0050	<0.0050	0.0072	<0.0050	<0.0050	<0.0050	0.040	0.034
Quinoline	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NG	NG

Notes:

1 AEP 2016 Tier 1 Guidelines for residential land use of coarse-grained subsoil (> 3.0 m bgs).

2 AEP 2016 Tier 1 Guidelines for residential land use of fine-grained subsoil (> 3.0 m bgs).

m bgs meters below grade surface.

NG No Specified Guideline Value.

All results are expressed as mg/kg unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 8 - Summary of Soil Laboratory Analyses
VOCs**

Sample ID	BH3001-4	BH3001-6	BH3001-8	BH3901-8 (dup of BH3001-8)	BH3002-4	BH3002-8	BH3003-4	BH3003-8	Guideline ¹	Guideline ²
Depth (m bgs)	2.29-3.05	3.81-4.57	5.33-6.10	5.33-6.10	2.29-3.05	5.33-6.10	2.29-3.05	5.33-6.10		
Sample Date	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018	1-May-2018		
1,1,1,2-Tetrachloroethane	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	NG	NG
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,1,2,2-Tetrachloroethane	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	NG	NG
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	0.15
1,2,3-Trichlorobenzene	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.26	0.26
1,2,4-Trichlorobenzene	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.78	0.23
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG
1,2-Dibromoethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NG	NG
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.097	0.18
1,2-Dichloroethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0027	0.025
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,3,5-Trichlorobenzene	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	1.9	0.13
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.051	0.098
Bromodichloromethane	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	NG	NG
Bromoform	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	NG	NG
Bromomethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Carbon Tetrachloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00057	0.013
Chlorobenzene	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.39	0.018
Chlorodibromomethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.27	0.91
Chloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Chloroform	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.0030	0.0029
Chloromethane	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	NG	NG
cis- 1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
cis-1,3-Dichloropropene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Dichloromethane	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.095	0.10
Methyl Methacrylate	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	1.3	0.10
Methyl tert-butyl ether	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.044	0.046
Styrene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.68	0.80
Tetrachloroethane	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	0.26
trans- 1,2-dichloroethylene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
trans-1,3-Dichloropropene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Trichloroethylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.054
Trichlorofluoromethane	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Vinyl Chloride	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00034	0.0083

Notes:

1 AEP 2016 Tier 1 Guidelines for residential land use of coarse-grained subsoil (> 3.0 m bgs).

2 AEP 2016 Tier 1 Guidelines for residential land use of fine-grained subsoil (> 3.0 m bgs).

m bgs meters below grade surface.

NG No Specified Guideline Value.

All results are expressed as mg/kg unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

Table 9 - Summary of Soil Laboratory Analyses Class II Landfill Analysis

Sample ID	SOIL CUTTINGS	Guideline ¹
Sample Date	1-May-2018	
Soluble (1:1) pH	7.87	2.0 - 12.5
Closed Cup Flash point (deg C)	>61	> 61 deg C
Leachable Antimony	<1.0	500
Leachable Arsenic	<0.50	5.0
Leachable Barium	3.1	100
Leachable Beryllium	<0.50	5.0
Leachable Boron	<1.0	500
Leachable Cadmium	<0.10	1.0
Leachable Chromium	<0.50	5.0
Leachable Cobalt	<1.0	100
Leachable Copper	<1.0	100
Leachable Iron	1.0	1,000
Leachable Lead	<0.50	5.0
Leachable Mercury	<0.020	0.2
Leachable Nickel	<0.50	5.0
Leachable Selenium	<0.10	1.0
Leachable Silver	<0.50	5.0
Leachable Thallium	<0.50	5.0
Leachable Uranium	<0.20	2.0
Leachable Vanadium	<1.0	100
Leachable Zinc	<1.0	500
Leachable Zirconium	<1.0	500
Leachable Benzene	<0.010	0.5
Leachable Toluene	<0.010	0.5
Leachable Ethylbenzene	<0.010	0.5
Leachable Xylenes (Total)	<0.020	0.5

Notes:

1 1996 Alberta User Guide for Waste Managers, Part 4
m bgs meters below grade surface.

All results are expressed as mg/L unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 10 - Summary of Groundwater Laboratory Analyses
BTEX and PHC fractions F1-F2**

Sample ID	Land Use ¹	Screened Interval (m bgs)	Sample Date	Unit	Benzene	Toluene	Ethylbenzene	Xylenes (Total)	F1 minus BTEX (C6 - C10)	F2 (C10 - C16)
BH3001A	R	1.52 - 3.05	8-May-18	3	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3001B	R	3.66 - 4.28	8-May-18	3	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3001C	R	5.18 - 6.10	8-May-18	4	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3002A	R	1.83 - 3.81	8-May-18	3	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3002B	R	6.10 - 7.62	8-May-18	4	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3902B (dup of BH3002B)	R	6.10 - 7.62	8-May-18	4	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3003A	R	2.13 - 2.90	8-May-18	3	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
BH3003B	R	7.01 - 7.92	8-May-18	4	<0.00040	<0.00040	<0.00040	<0.00089	<0.10	<0.10
Guideline²					0.005	0.021	0.0016	0.02	0.81	1.1

Notes:

1 Land Use abbreviations: C=Commercial; R=Residential; I=Industrial; N=Natural.

2 AEP 2016 Tier 1 Guidelines for residential land use and coarse-grained soil.

m bgs Meters below ground surface

All results in mg/L unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 11 - Summary of Groundwater Laboratory Analyses
PAHs**

Sample ID	BH3001A	BH3001B	BH3001C	BH3002A	BH3002B	BH3902B (dup of BH3002B)	BH3003A	BH3003B	Guideline ¹
Land Use ²	R	R	R	R	R	R	R	R	
Screened Interval (m bgs)	1.52 - 3.05	3.66 - 4.28	5.18 - 6.10	1.83 - 3.81	6.10 - 7.62	6.10 - 7.62	2.13 - 2.90	7.01 - 7.92	
Sample Date	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	
Unit	3	3	4	3	4	4	3	4	
1-Methylnaphthalene	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	NG
2-Methylnaphthalene	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	NG
Acenaphthene	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0058
Acenaphthylene	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	NG
Acridine	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	NG
Anthracene	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000012
Benzo[a]pyrene equivalency	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001
Benzo(a)anthracene	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.000018
Benzo(a)pyrene	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.000015
Benzo(b+j)fluoranthene	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	NG
Benzo(c)phenanthrene	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	NG
Benzo(g,h,i)perylene	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	NG
Benzo(k)fluoranthene	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	NG
Benzo[e]pyrene	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	NG
Chrysene	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	NG
Dibenz(a,h)anthracene	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	NG
Fluoranthene	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00004
Fluorene	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.003
Indeno(1,2,3-cd) pyrene	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	NG
Naphthalene	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.001
Perylene	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	NG
Phenanthrene	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.0004
Pyrene	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000025
Quinoline	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	NG

Notes:

- 1 AEP 2016 Tier 1 Guidelines for residential land use and coarse-grained soil.
- 2 Land Use abbreviations: C=Commercial; R=Residential; I=Industrial; N=Natural.
- Bulk Bulk sample collected using a dedicated, disposable bailer.
- m bgs Meters below ground surface
- All results in mg/L unless otherwise noted.
- Testing was conducted by Maxxam Analytics, Calgary, Alberta.

Table 12 - Summary of Groundwater Laboratory Analyses VOCs

Sample ID	BH3001A	BH3001B	BH3001C	BH3002A	BH3002B	BH3902B (dup of BH3002B)	BH3003A	BH3003B	Guideline ¹
Land Use ²	R	R	R	R	R	R	R	R	
Screened Interval (m bgs)	1.52 - 3.05	3.66 - 4.28	5.18 - 6.10	1.83 - 3.81	6.10 - 7.62	6.10 - 7.62	2.13 - 2.90	7.01 - 7.92	
Sample Date	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	8-May-18	
Unit	3	3	4	3	4	4	3	4	
1,1,1,2-tetrachloroethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	NG
1,1,1-trichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,1,2,2-tetrachloroethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NG
1,1,2-trichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,1-dichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,1-dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.014
1,2,3-trichlorobenzene	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.008
1,2,4-trichlorobenzene	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.015
1,2,4-trimethylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,2-dibromoethane	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	NG
1,2-dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0007
1,2-dichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.005
1,2-dichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,3,5-trichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.014
1,3,5-trimethylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,3-dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
1,4-dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.001
Bromodichloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
Bromoform	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
Bromomethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NG
Carbon tetrachloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00057
Chlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0013
Chlorodibromomethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.19
Chloroethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	NG
Chloroform	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0018
Chloromethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NG
cis-1,2-dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
cis-1,3-dichloropropene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
Dichloromethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.05
Methyl methacrylate	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.47
Methyl-tert-butyl-ether (MTBE)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.015
Styrene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.072
Tetrachloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.01
Total Trihalomethanes	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.1
trans-1,2-dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
trans-1,3-dichloropropene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
Trichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.005
Trichlorofluoromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NG
Vinyl chloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0011

Notes:

1 AEP 2016 Tier 1 Guidelines for residential land use and coarse-grained soil.

2 Land Use abbreviations: C=Commercial; R=Residential; I=Industrial; N=Natural.

Bulk Bulk sample collected using a dedicated, disposable bailer.

m bgs Meters below ground surface

All results in mg/L unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

Appendix D

Clifton Associates

Lithologic Sections

Clifton Associates

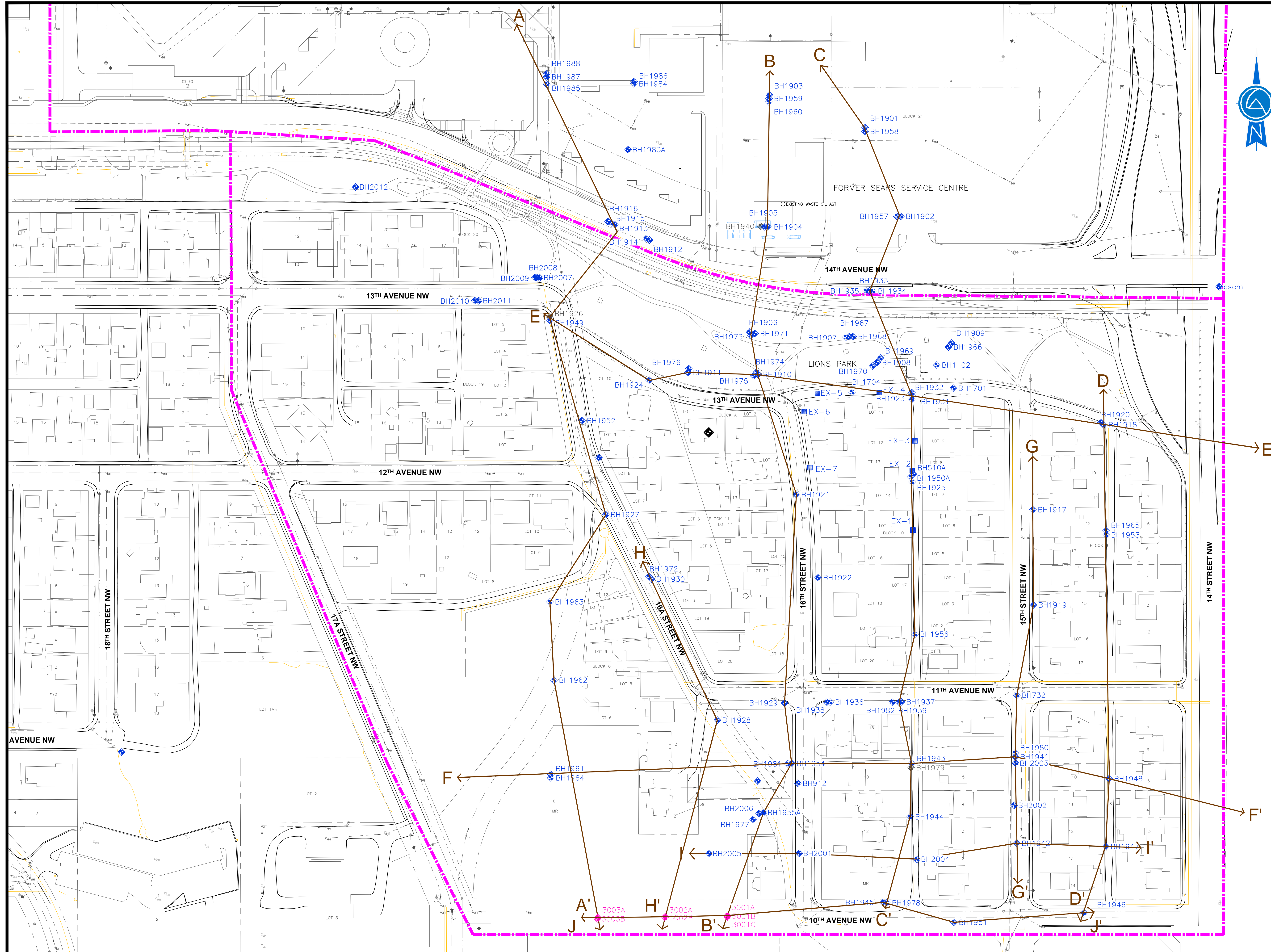


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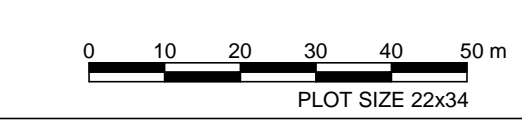
LEGEND

- SITE BOUNDARY
- EXTRACTION WELL
- LRT TRACKS
- FENCE LINE
- LEGAL LINE
- FORMER FACILITY/FEATURE
- BUILDING
- EXISTING GROUNDWATER MONITORING WELL
- BOREHOLE SURVEYED ON MAY 05, 2016

UTILITY LINES & SYMBOLS

- NATURAL GAS LINE
- SANITARY SEWER
- STORM SEWER
- WATER
- CATCH BASIN
- FIRE HYDRANT
- LIGHT STANDARD
- MANHOLE
- UTILITY POLE

NOTES:
 1 DRAWING COMPILED FROM PLANIMETRIC FILES SUPPLIED BY THE CITY OF CALGARY (INCLUDING UG UTILITIES) & FROM SITE ASSESSMENT INFORMATION. ADDITIONAL REFERENCES FROM SEACOR ENVIRONMENTAL ENGINEERING INC., DRAWINGS 149-5A11.DWG, 149-5A6.DWG.



ENGINEER: **Clifton Associates**

CLIENT: **SEARS**

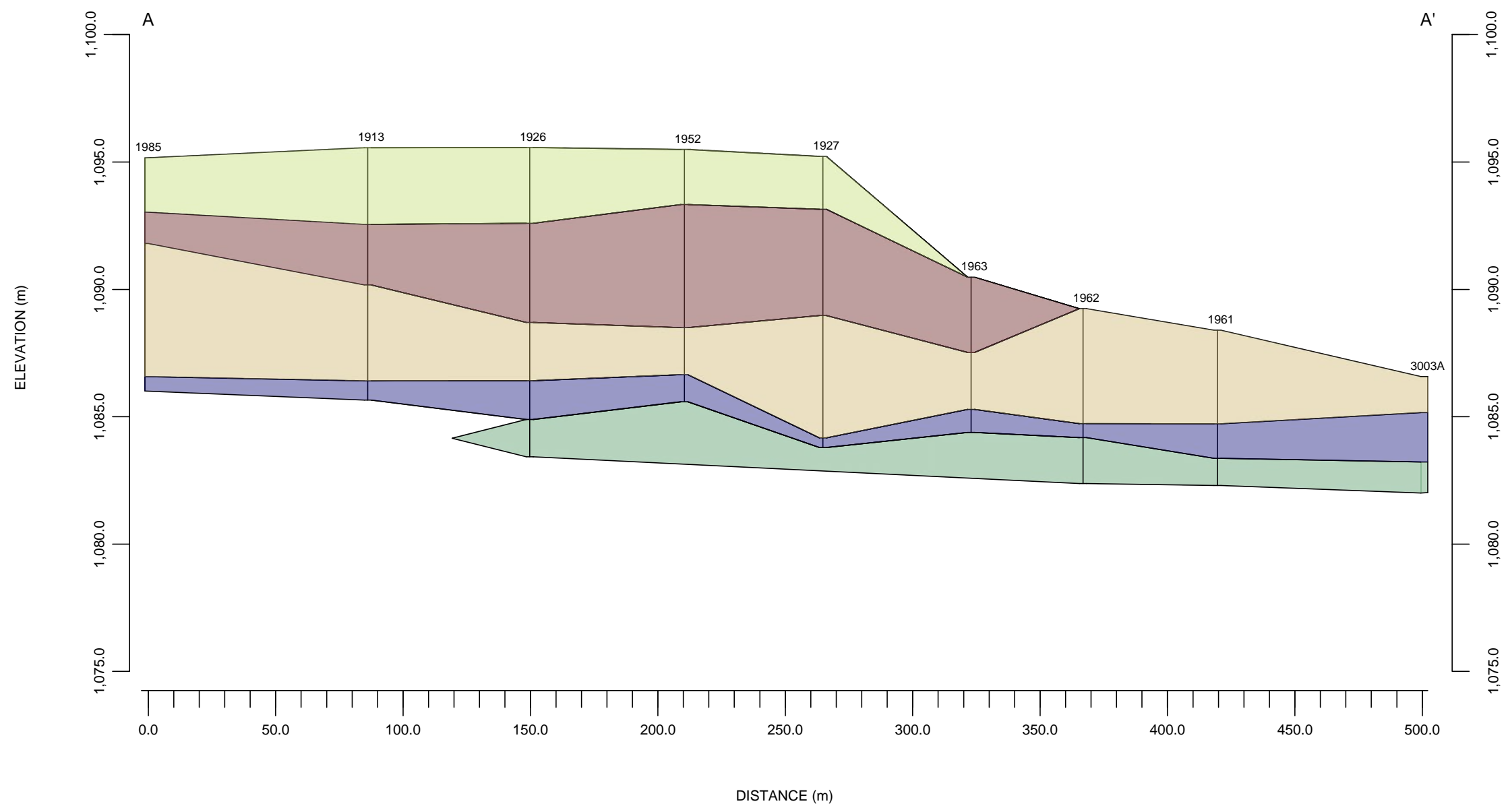
PROJECT: SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA

TITLE: SECTION PLAN

DESIGNED	SCALE	DATE
DRAWN	PROJECT NO.	1:1000 2018-06-08
CHECKED	FILE NO.	CG2430.1 E28 D-1



CROSS SECTION A-A'



LEGEND:

UNIT 1 - UPPER SILTY SAND	
UNIT 2 - UPPER CLAYEY SILT	
UNIT 3 - MIDDLE SANDY SILT	
UNIT 4 - LOWER CLAYEY SILT	
UNIT 5 - LOWER SILT SAND AND GRAVEL	
UNIT 6 - UNDEFINED	

NOTES:

1. VERTICAL EXAGGERATION OF 5

0 50 100 m
SCALE 1:2000 PLOT SIZE 11x17

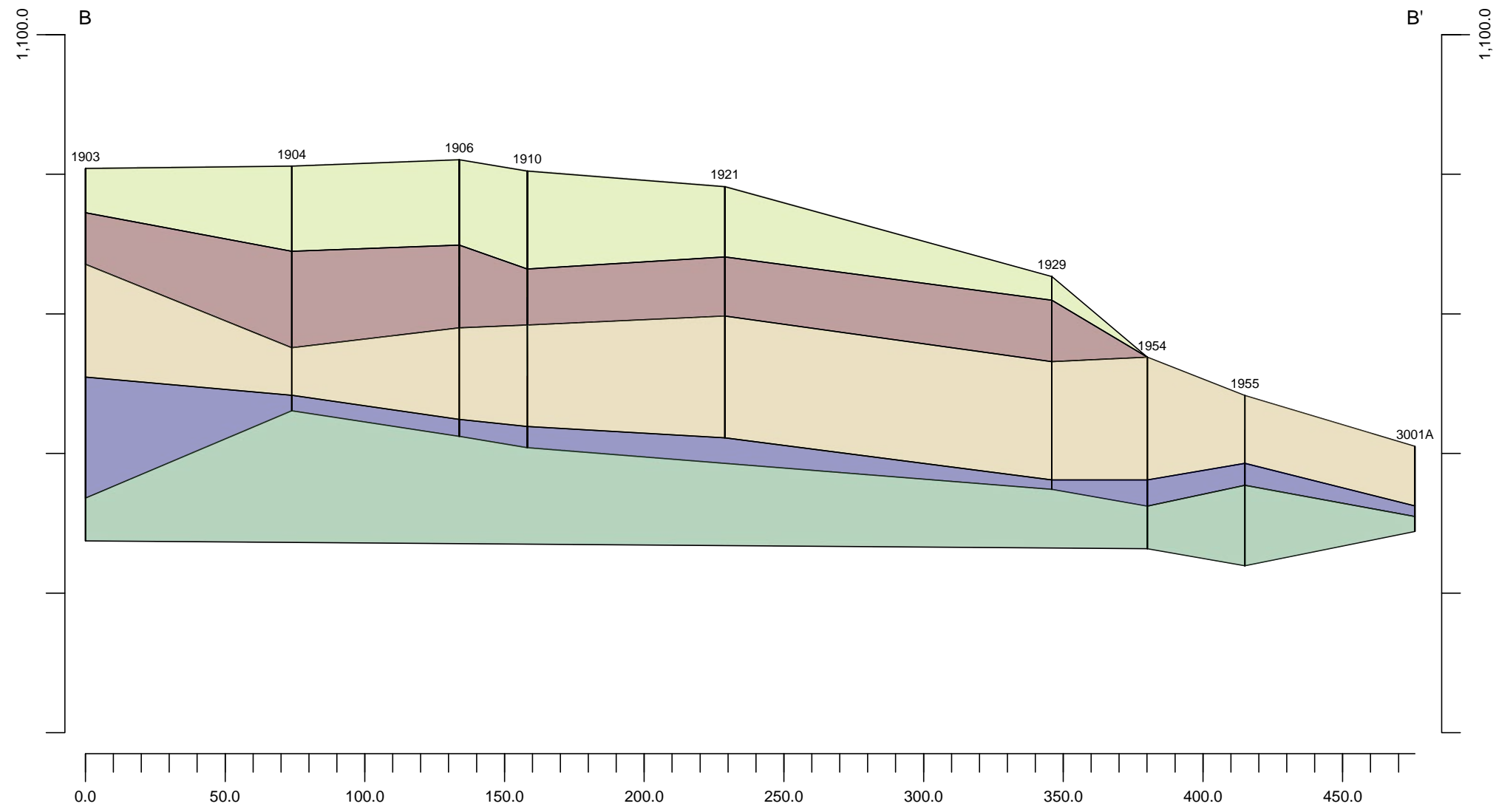
0 5 10 15 m
SCALE 1:400 PLOT SIZE 11x17

SEARS		
PROJECT SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA		
TITLE CROSS SECTION A-A'		
DESIGNED	SCALE	DATE
DRAWN	PROJECT NO.	FIG.
CHECKED	FILE NO.	
		D-2

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CROSS SECTION B-B'

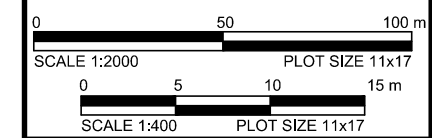


LEGEND:

UNIT 1 - UPPER SILTY SAND	
UNIT 2 - UPPER CLAYEY SILT	
UNIT 3 - MIDDLE SANDY SILT	
UNIT 4 - LOWER CLAYEY SILT	
UNIT 5 - LOWER SILT SAND AND GRAVEL	
UNIT 6 - UNDEFINED	

NOTES:

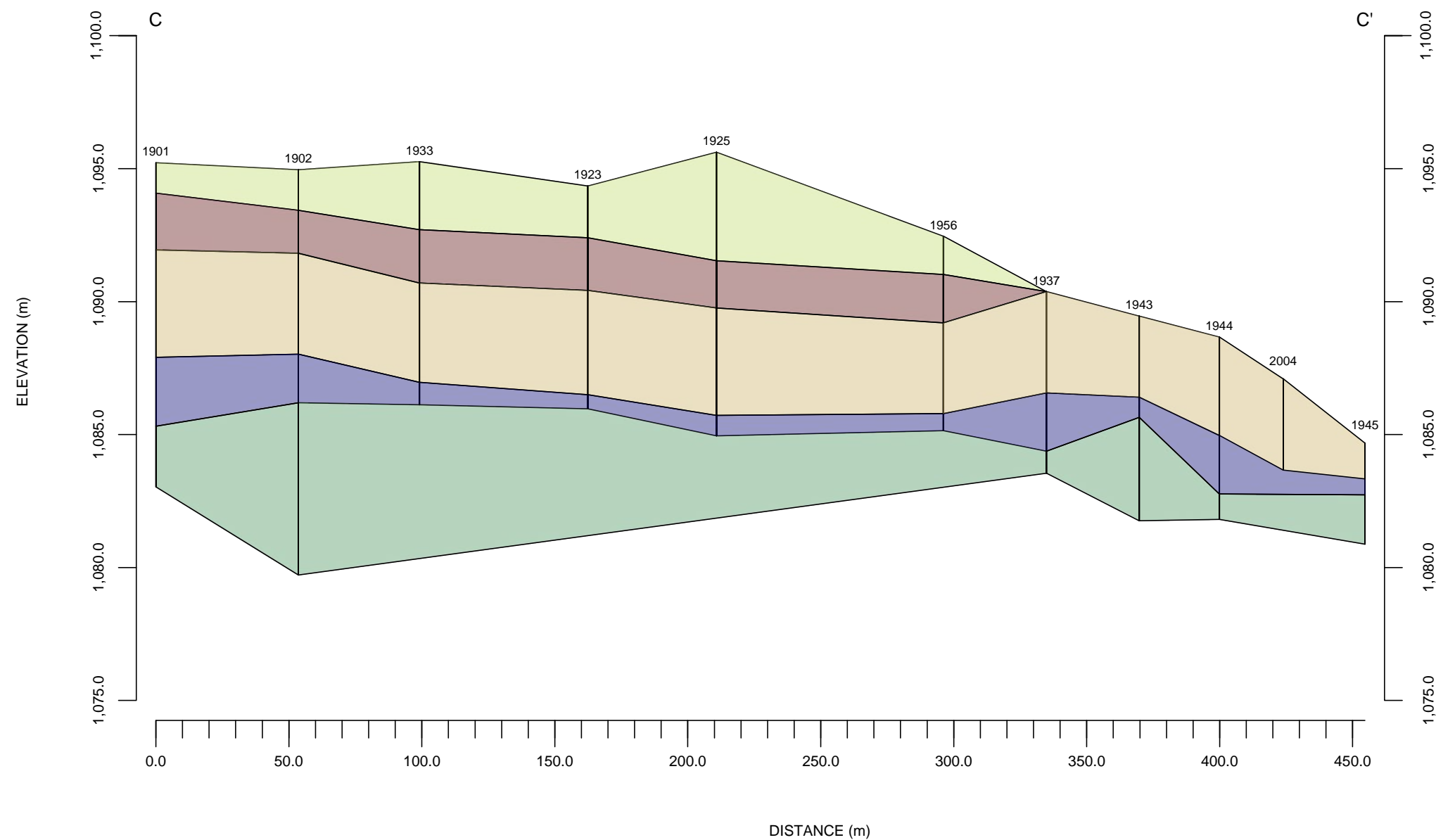
1. VERTICAL EXAGGERATION OF 5



SEARS		
SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA		
CROSS SECTION B-B'		
DESIGNED	SCALE	DATE
DRAWN	PROJECT NO.	FIG.
CHECKED	FILE NO.	

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CROSS SECTION C-C'

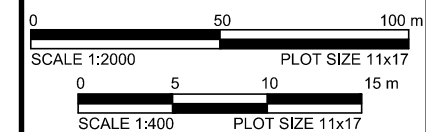


LEGEND:

- UNIT 1 - UPPER SILTY SAND
- UNIT 2 - UPPER CLAYEY SILT
- UNIT 3 - MIDDLE SANDY SILT
- UNIT 4 - LOWER CLAYEY SILT
- UNIT 5 - LOWER SILT SAND AND GRAVEL
- UNIT 5 - UNDEFINED

NOTES:

- VERTICAL EXAGGERATION OF 5



SEARS

SUPPLEMENTAL PHASE II ESA
HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY
CALGARY, ALBERTA

CROSS SECTION C-C'

DESIGNED	SCALE	1:2000	DATE	2018-06-08	
DRAWN	RD	PROJECT NO.	CG2430.1 E28	FIG.	D-4
CHECKED	TK	FILE NO.	CG2430.1-E28-D4		

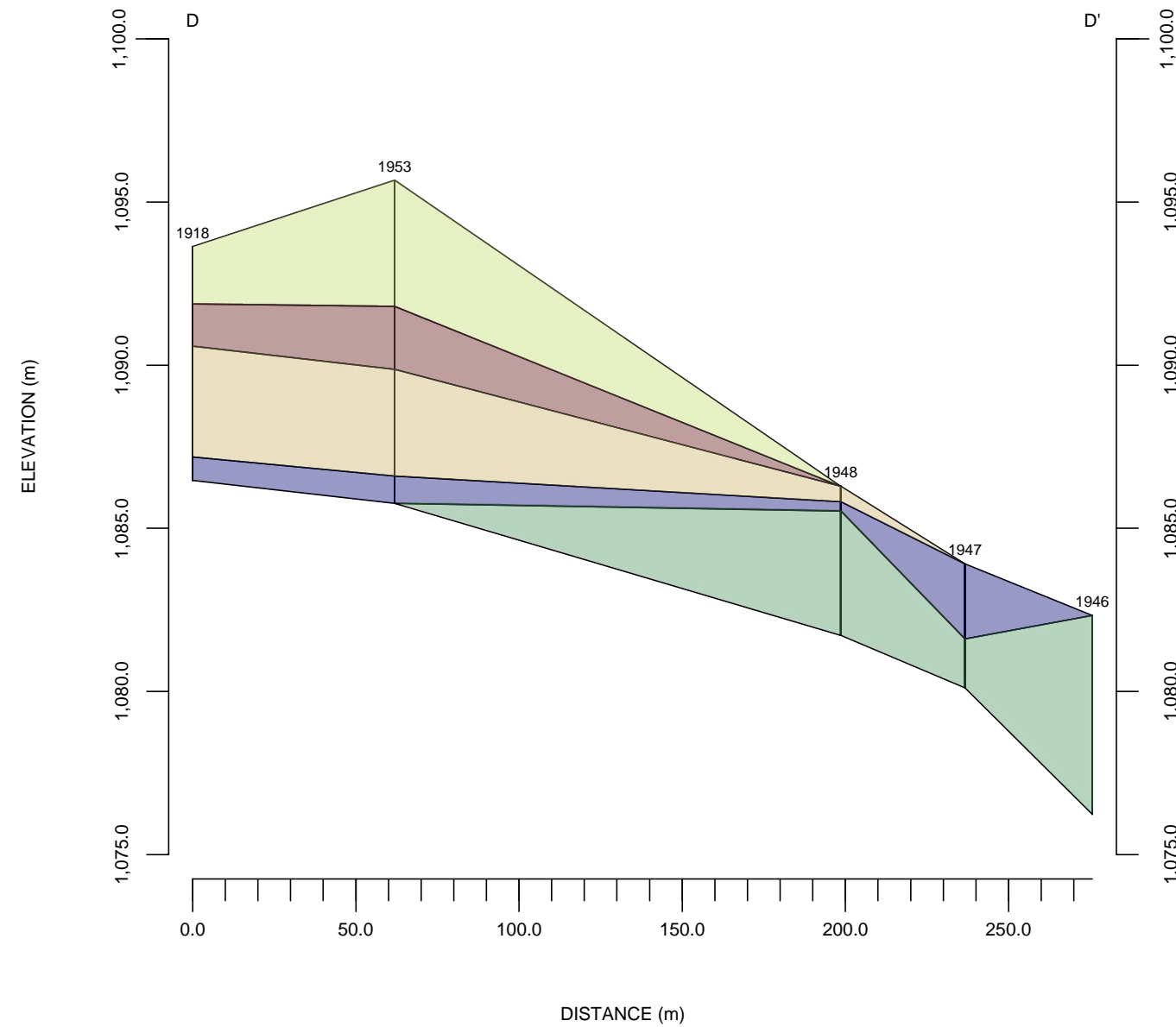
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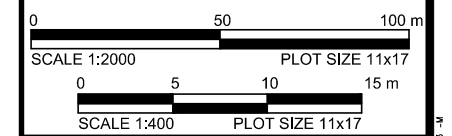
UNIT 1 - UPPER SILTY SAND	
UNIT 2 - UPPER CLAYEY SILT	
UNIT 3 - MIDDLE SANDY SILT	
UNIT 4 - LOWER CLAYEY SILT	
UNIT 5 - LOWER SILT SAND AND GRAVEL	
UNIT 5 - UNDEFINED	

CROSS SECTION D-D'



NOTES:

1. VERTICAL EXAGGERATION OF 5

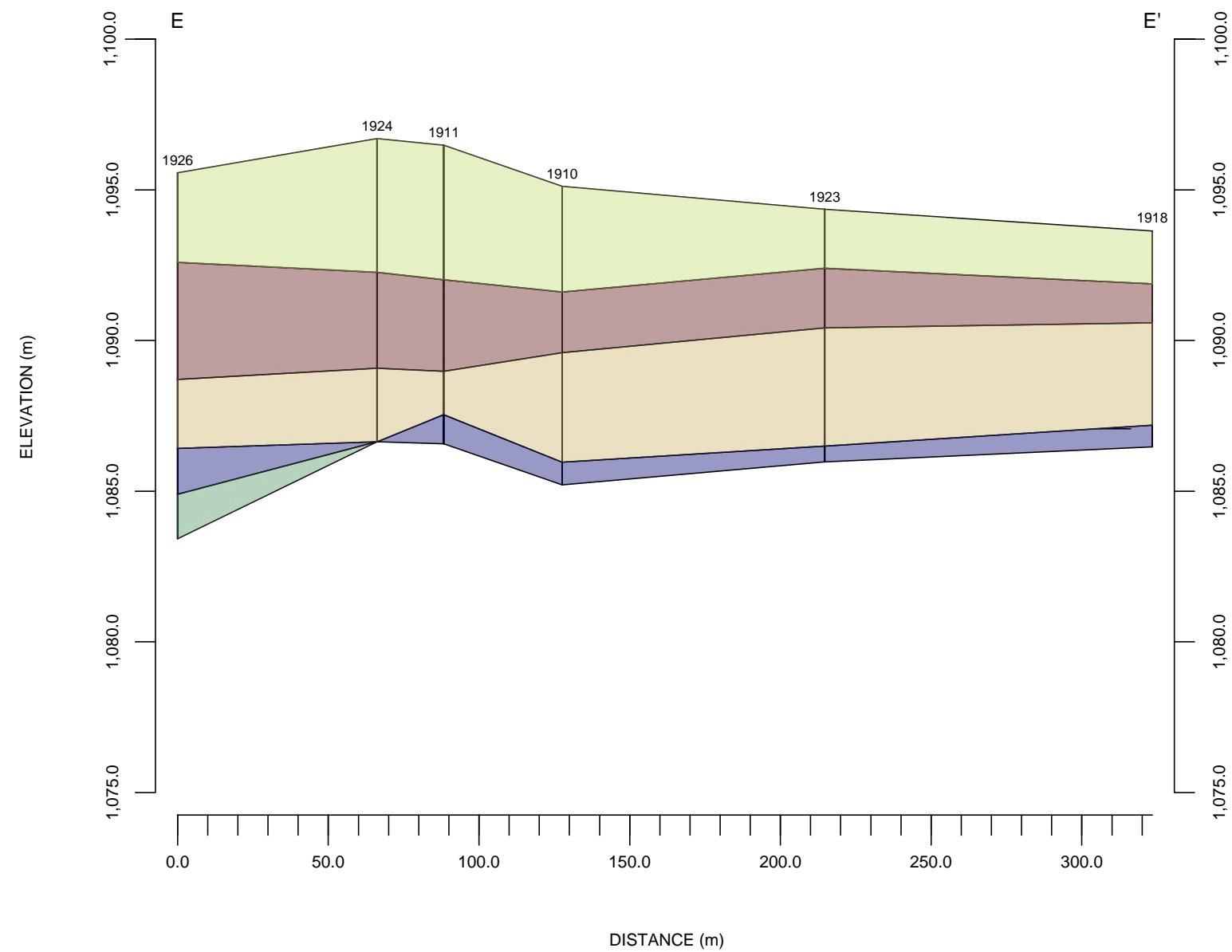


ENGINEER			
CLIENT		SEARS	
PROJECT		SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA	
TITLE		CROSS SECTION D-D'	
DESIGNED	SCALE	DATE	1:2000 2018-06-08
DRAWN	PROJECT NO.	FIG.	RD CG2430.1 E28 D-5
CHECKED	FILE NO.		TK CG2430.1-E28-D5

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CROSS SECTION E-E'

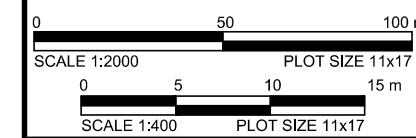


LEGEND:

- UNIT 1 - UPPER SILTY SAND
- UNIT 2 - UPPER CLAYEY SILT
- UNIT 3 - MIDDLE SANDY SILT
- UNIT 4 - LOWER CLAYEY SILT
- UNIT 5 - LOWER SILT SAND AND GRAVEL
- UNIT 5 - UNDEFINED

NOTES:

1. VERTICAL EXAGGERATION OF 5



CLIENT
SEARS

PROJECT
SUPPLEMENTAL PHASE II ESA
HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY
CALGARY, ALBERTA

TITLE
CROSS SECTION E-E'

DESIGNED	SCALE	DATE
DRAWN	PROJECT NO.	FIG.
CHECKED	FILE NO.	

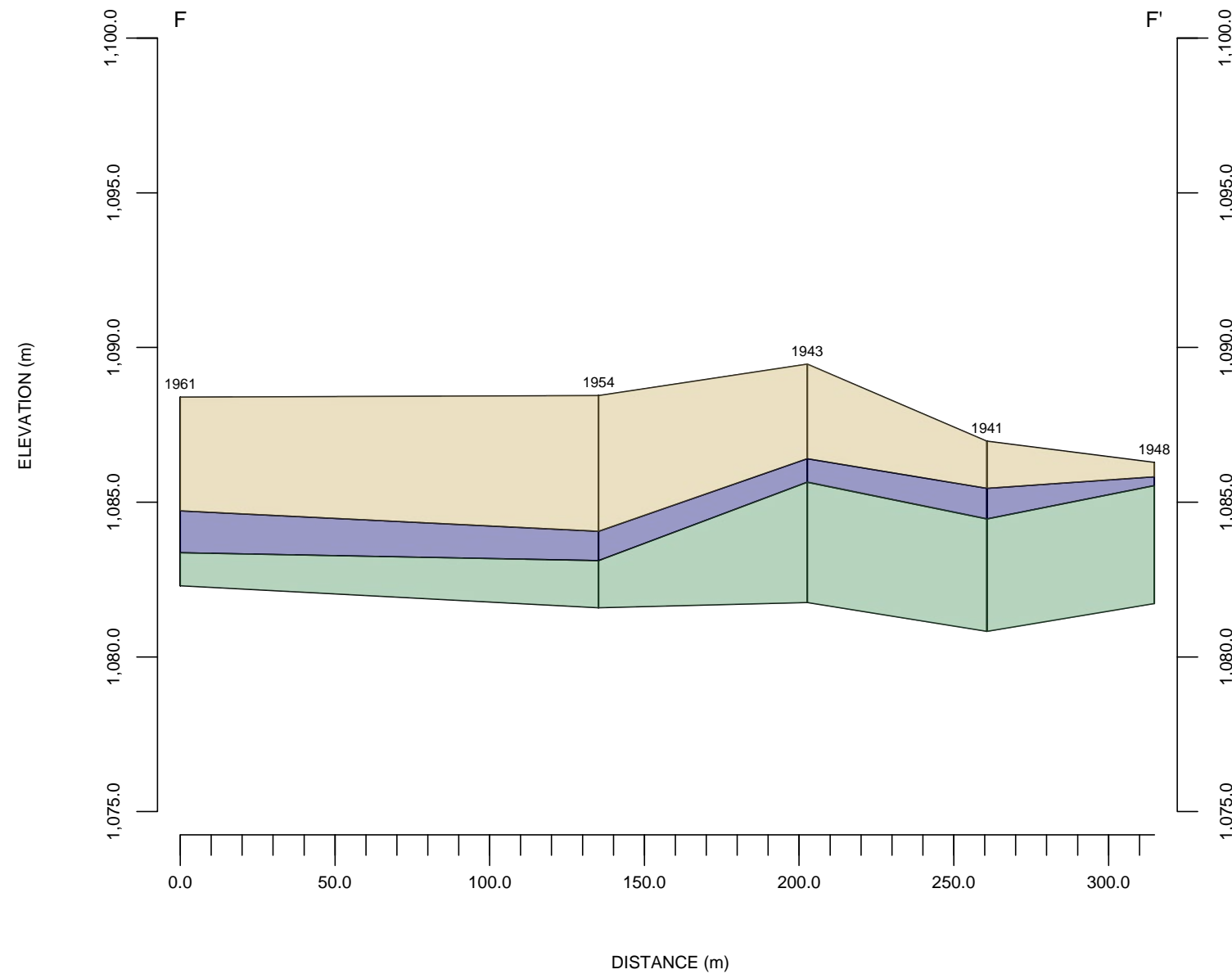
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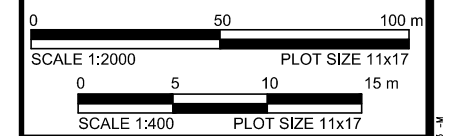
- UNIT 1 - UPPER SILTY SAND
- UNIT 2 - UPPER CLAYEY SILT
- UNIT 3 - MIDDLE SANDY SILT
- UNIT 4 - LOWER CLAYEY SILT
- UNIT 5 - LOWER SILT SAND AND GRAVEL
- UNIT 5 - UNDEFINED

CROSS SECTION F-F'



NOTES:

1. VERTICAL EXAGGERATION OF 5



Clifton Associates		
SEARS		
<small>SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA</small>		
CROSS SECTION F-F'		
DESIGNED	SCALE 1:2000	DATE 2018-06-08
DRAWN RD	PROJECT NO. CG2430.1 E28	FIG. D-7
CHECKED TK	FILE NO. CG2430.1-E28-D7	

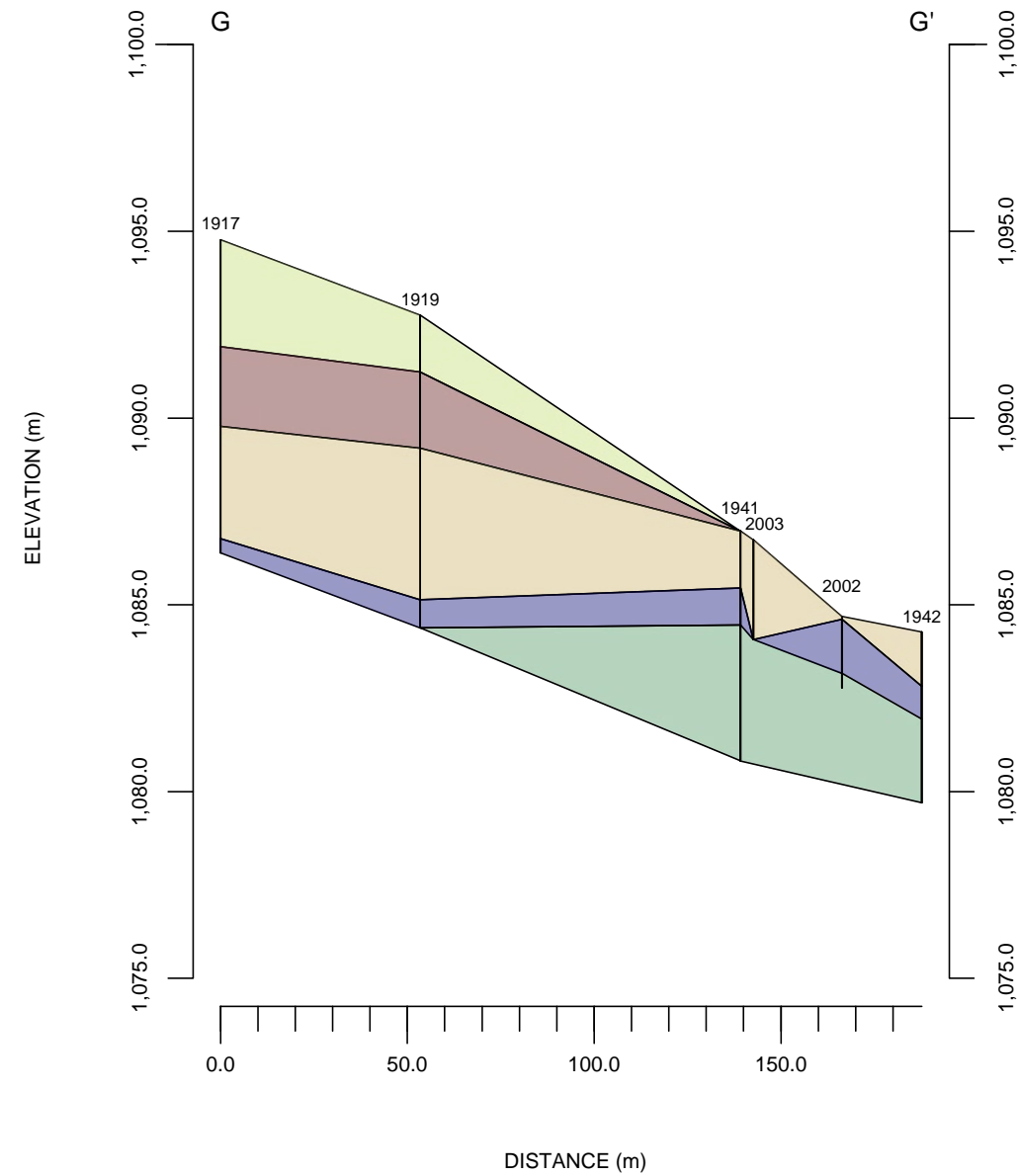
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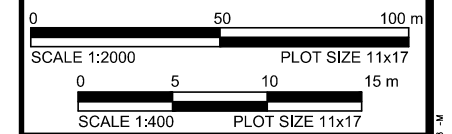
UNIT 1 - UPPER SILTY SAND	
UNIT 2 - UPPER CLAYEY SILT	
UNIT 3 - MIDDLE SANDY SILT	
UNIT 4 - LOWER CLAYEY SILT	
UNIT 5 - LOWER SILT SAND AND GRAVEL	
UNIT 5 - UNDEFINED	

CROSS SECTION G-G'



NOTES:

1. VERTICAL EXAGGERATION OF 5



SEARS		
SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA		
CROSS SECTION G-G'		
DESIGNED	SCALE	DATE
	1:2000	2018-06-08
DRAWN	PROJECT NO.	FIG.
RD	CG2430.1 E28	D-8
CHECKED	FILE NO.	
TK	CG2430.1-E28-D8	

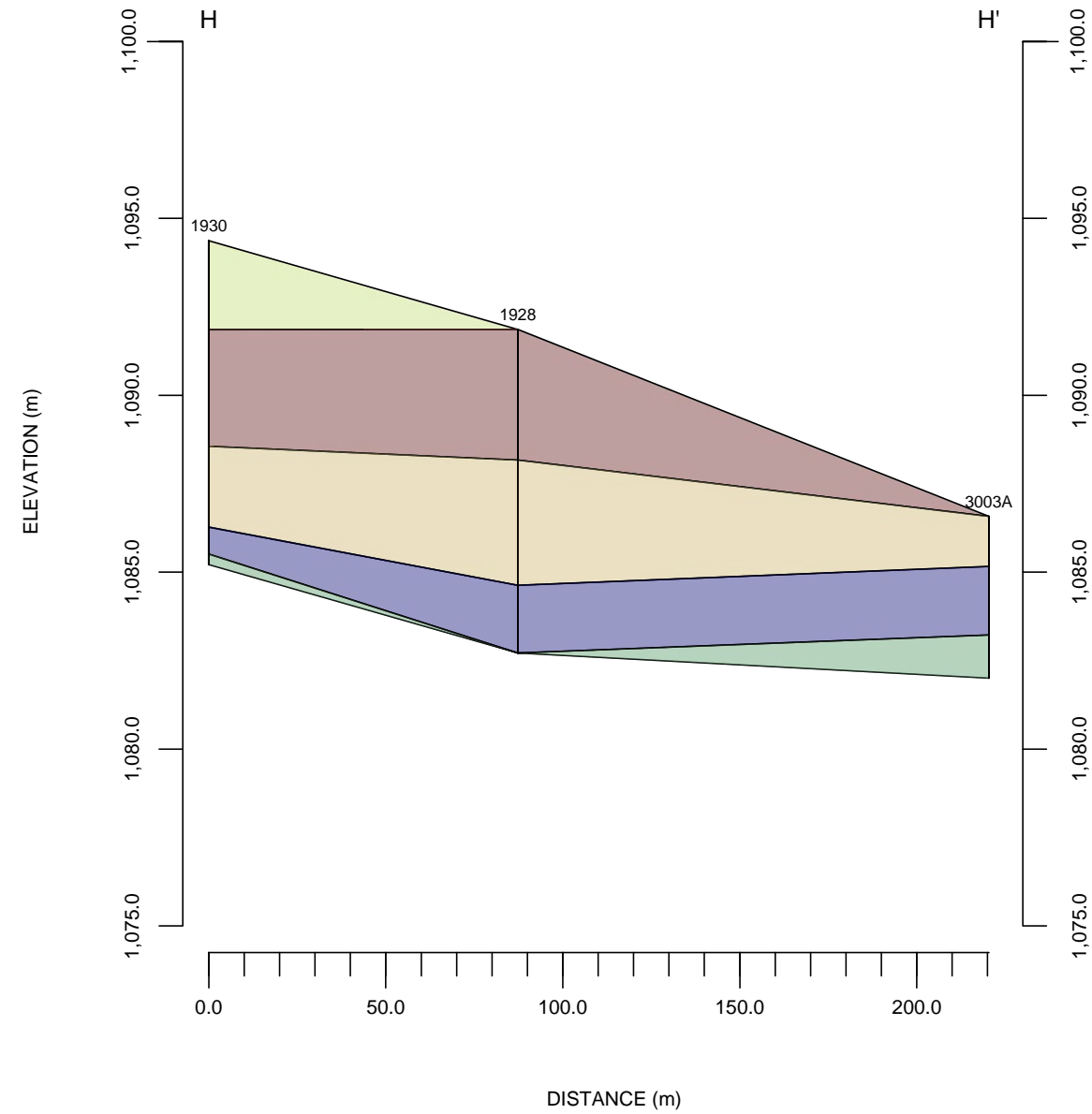
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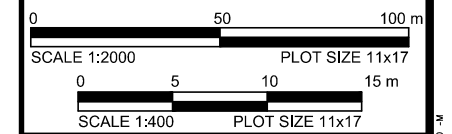
- UNIT 1 - UPPER SILTY SAND
- UNIT 2 - UPPER CLAYEY SILT
- UNIT 3 - MIDDLE SANDY SILT
- UNIT 4 - LOWER CLAYEY SILT
- UNIT 5 - LOWER SILT SAND AND GRAVEL
- UNIT 5 - UNDEFINED

CROSS SECTION H-H'



NOTES:

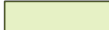





1. VERTICAL EXAGGERATION OF 5



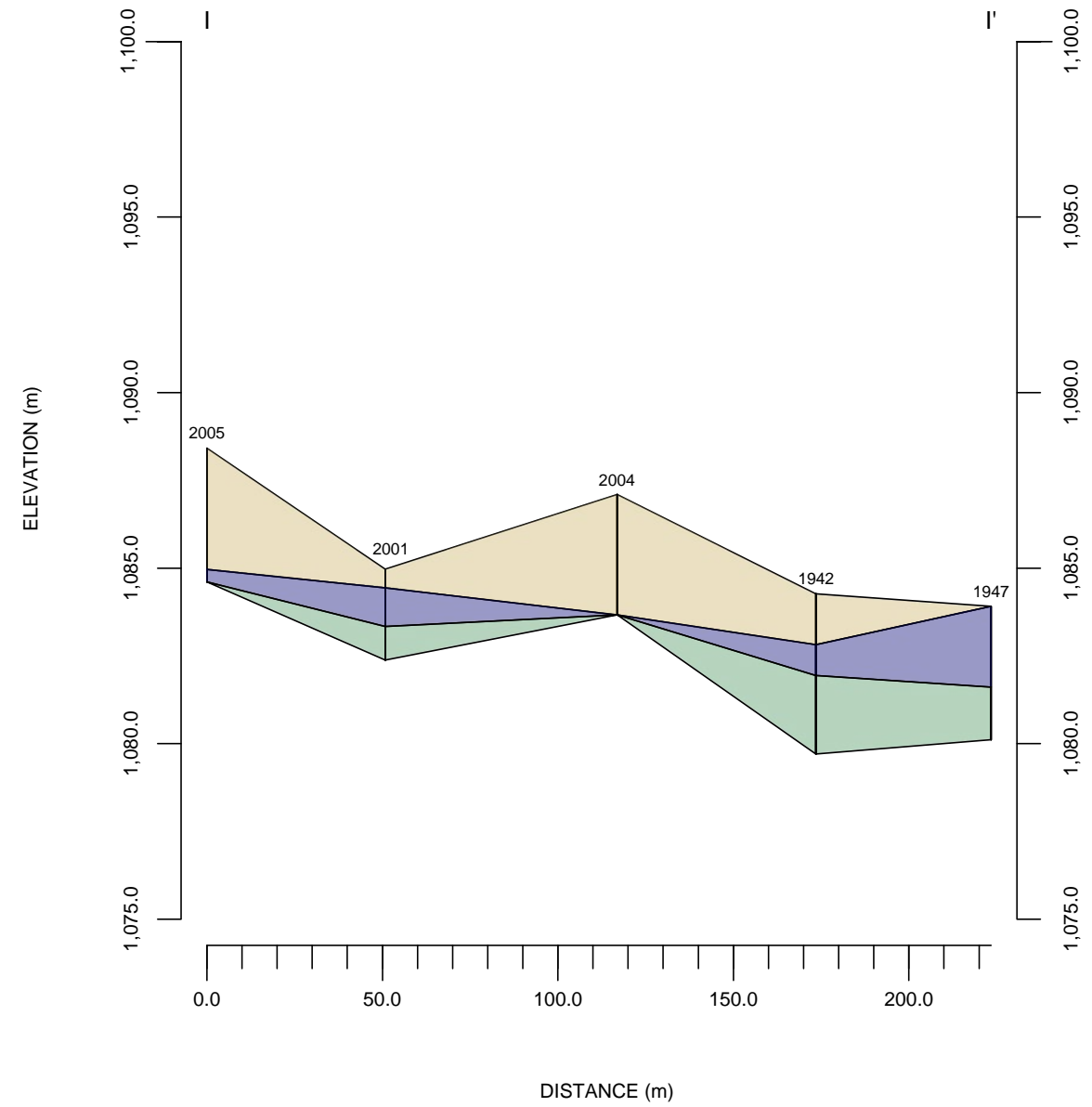
Clifton Associates		
SEARS		
PROJECT: SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA		
CROSS SECTION H-H'		
DESIGNED	SCALE: 1:2000	DATE: 2018-06-08
DRAWN: RD	PROJECT NO.: CG2430.1 E28	FIG.: D-9
CHECKED: TK	FILE NO.: CG2430.1-E28-D9	

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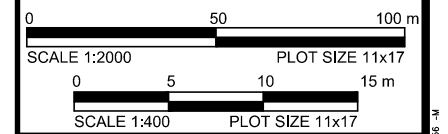
UNIT 1 - UPPER SILTY SAND	
UNIT 2 - UPPER CLAYEY SILT	
UNIT 3 - MIDDLE SANDY SILT	
UNIT 4 - LOWER CLAYEY SILT	
UNIT 5 - LOWER SILT SAND AND GRAVEL	
UNIT 5 - UNDEFINED	

CROSS SECTION I-I'



NOTES:

1. VERTICAL EXAGGERATION OF 5



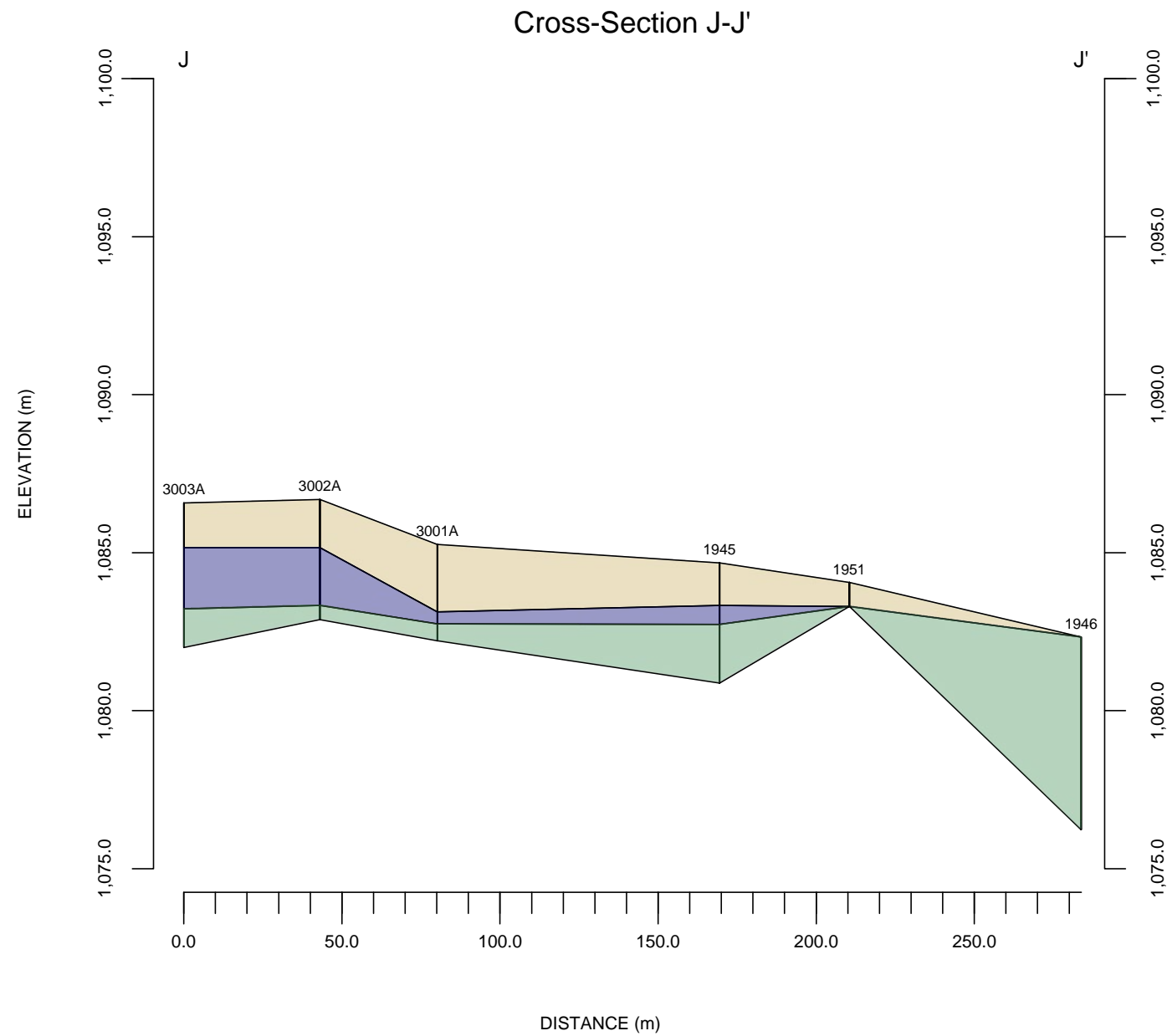
CLIENT
SEARS

PROJECT
SUPPLEMENTAL PHASE II ESA
HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY
CALGARY, ALBERTA

TITLE
CROSS SECTION I-I'

DESIGNED	SCALE	1:2000	DATE	2018-06-08	
DRAWN	RD	PROJECT NO.	CG2430.1 E28	FIG.	D-10
CHECKED		FILE NO.	CG2430.1-E28-D10		

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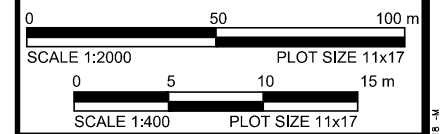


LEGEND:

- UNIT 1 - UPPER SILTY SAND
- UNIT 2 - UPPER CLAYEY SILT
- UNIT 3 - MIDDLE SANDY SILT
- UNIT 4 - LOWER CLAYEY SILT
- UNIT 5 - LOWER SILT SAND AND GRAVEL
- UNIT 5 - UNDEFINED

NOTES:

1. VERTICAL EXAGGERATION OF 5



Clifton Associates		
SEARS		
<small>PROJECT</small> SUPPLEMENTAL PHASE II ESA HOUNSFIELD HEIGHTS - BRIAR HILL COMMUNITY CALGARY, ALBERTA		
<small>TITLE</small> CROSS SECTION J-J'		
<small>DESIGNED</small>	<small>SCALE</small> 1:2000	<small>DATE</small> 2018-06-08
<small>DRAWN</small> RD	<small>PROJECT NO.</small> CG2430.1 E28	<small>FIG.</small> D-11
<small>CHECKED</small> TK	<small>FILE NO.</small> CG2430.1-E28-D11	

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Appendix E

Clifton Associates

Laboratory Certificates of Analysis

Clifton Associates



Calgary Office

2222 30th Avenue NE
Calgary, Alberta T2E 7K9

T (403) 263 2556
F (403) 234 9033

calgary@clifton.ca
www.clifton.ca

Your Project #: CG2430.1 E28
Your C.O.C. #: m070647

Attention: STEPHEN DABADIE

CLIFTON ASSOCIATES LTD.
2222 30TH AVENUE NE
CALGARY, AB
CANADA T2E 7K9

Report Date: 2018/05/11
Report #: R2553084
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B833548

Received: 2018/05/03, 17:10

Sample Matrix: Soil
Samples Received: 10

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	7	N/A	2018/05/07	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2018/05/07	AB SOP-00039	Auto Calc
BTEX in Leachates by HS GC/MS/FID (2)	1	2018/05/07	2018/05/08	AB SOP-00039	EPA 8260d m
CCME Hydrocarbons (F2-F4 in soil) (3)	7	2018/05/05	2018/05/06	AB SOP-00036	CCME PHC-CWS m
Flash Point	1	N/A	2018/05/08	AB SOP-00062	ASTM D3828-16a/ A m
ICPMS Metals on TCLP Leachate (2)	1	2018/05/07	2018/05/09	AB SOP-00043	EPA 200.8 R5.4 m
Moisture	8	N/A	2018/05/05	AB SOP-00002	CCME PHC-CWS m
Benzo[a]pyrene Equivalency	7	N/A	2018/05/07	AB SOP-00003	Auto Calc
PAH in Soil by GC/MS	7	2018/05/05	2018/05/05	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
Free Liquid (Paint filter)	1	N/A	2018/05/08	AB SOP-00047	EPA 9095B R2 m
TCLP pH Measurements	1	2018/05/07	2018/05/09	AB SOP-00006	SM 22 4500 H+B m
pH @25C (1:1 extract, solid waste)	1	2018/05/05	2018/05/05	AB SOP-00033 / AB SOP-00006	SM 22 4500 H+B m
VOCs in Soil by HS GC/MS (Std List) (1)	9	N/A	2018/05/08	AB SOP-00056	EPA 5021a/8260d m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

Your Project #: CG2430.1 E28
Your C.O.C. #: m070647

Attention: STEPHEN DABADIE

CLIFTON ASSOCIATES LTD.
2222 30TH AVENUE NE
CALGARY, AB
CANADA T2E 7K9

Report Date: 2018/05/11
Report #: R2553084
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B833548

Received: 2018/05/03, 17:10

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) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.

(2) Samples were extracted as per EPA 1311 unless otherwise noted in the report.

(3) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam 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.

Leanne Cameron, C.E.T., Senior Project Manager

Email: LCameron@maxxam.ca

Phone# (403) 291-3077

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

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		TJ2514	TJ2515	TJ2516	TJ2516	TJ2518	TJ2519		
Sampling Date		2018/05/01 10:55	2018/05/01 11:00	2018/05/01 11:10	2018/05/01 11:10	2018/05/01 15:10	2018/05/01 15:20		
COC Number		m070647	m070647	m070647	m070647	m070647	m070647		
	UNITS	3001-4	3001-6	3001-8	3001-8 Lab-Dup	3002-4	3002-8	RDL	QC Batch

Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	<10	10	8979588
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	8979588
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	8979588
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	8979588

Physical Properties									
Moisture	%	23	25	20	N/A	17	18	0.30	8979540

Volatiles									
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	N/A	<0.045	<0.045	0.045	8978635
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	N/A	<10	<10	10	8978635

Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	N/A	<0.0050	<0.0050	0.0050	8979625
Toluene	mg/kg	<0.020	<0.020	<0.020	N/A	<0.020	<0.020	0.020	8979625
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	N/A	<0.010	<0.010	0.010	8979625
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	N/A	<0.040	<0.040	0.040	8979625
o-Xylene	mg/kg	<0.020	<0.020	<0.020	N/A	<0.020	<0.020	0.020	8979625
F1 (C6-C10)	mg/kg	<10	<10	<10	N/A	<10	<10	10	8979625

Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	99	96	N/A	98	96	N/A	8979625
4-Bromofluorobenzene (sur.)	%	98	98	99	N/A	98	98	N/A	8979625
D10-o-Xylene (sur.)	%	107	105	110	N/A	107	88	N/A	8979625
D4-1,2-Dichloroethane (sur.)	%	90	89	96	N/A	90	98	N/A	8979625
O-TERPHENYL (sur.)	%	112	110	102	104	102	100	N/A	8979588

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

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		TJ2519	TJ2520	TJ2521		
Sampling Date		2018/05/01 15:20	2018/05/01 16:30	2018/05/01 16:40		
COC Number		m070647	m070647	m070647		
	UNITS	3002-8 Lab-Dup	3003-4	3003-8	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	N/A	<10	<10	10	8979588
F3 (C16-C34 Hydrocarbons)	mg/kg	N/A	<50	<50	50	8979588
F4 (C34-C50 Hydrocarbons)	mg/kg	N/A	<50	<50	50	8979588
Reached Baseline at C50	mg/kg	N/A	Yes	Yes	N/A	8979588
Physical Properties						
Moisture	%	19	19	19	0.30	8979540
Volatiles						
Xylenes (Total)	mg/kg	N/A	<0.045	<0.045	0.045	8978635
F1 (C6-C10) - BTEX	mg/kg	N/A	<10	<10	10	8978635
Field Preserved Volatiles						
Benzene	mg/kg	N/A	<0.0050	<0.0050	0.0050	8979625
Toluene	mg/kg	N/A	<0.020	<0.020	0.020	8979625
Ethylbenzene	mg/kg	N/A	<0.010	<0.010	0.010	8979625
m & p-Xylene	mg/kg	N/A	<0.040	<0.040	0.040	8979625
o-Xylene	mg/kg	N/A	<0.020	<0.020	0.020	8979625
F1 (C6-C10)	mg/kg	N/A	<10	<10	10	8979625
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	N/A	98	101	N/A	8979625
4-Bromofluorobenzene (sur.)	%	N/A	98	97	N/A	8979625
D10-o-Xylene (sur.)	%	N/A	75	102	N/A	8979625
D4-1,2-Dichloroethane (sur.)	%	N/A	89	90	N/A	8979625
O-TERPHENYL (sur.)	%	N/A	103	101	N/A	8979588
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable						

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

BASIC CLASS II LANDFILL PACKAGE (SOIL)

Maxxam ID		TJ2523		
Sampling Date		2018/05/01		
COC Number		m070647		
	UNITS	CUTTING	RDL	QC Batch
Soluble Parameters				
Soluble (1:1) pH	pH	7.87	N/A	8979687
Physical Properties				
Closed Cup Flash Point	deg. C	>61	N/A	8982305
Free Liquid	N/A	PASS	N/A	8982307
Elements				
Leachable Antimony (Sb)	mg/L	<1.0	1.0	8983069
Leachable Arsenic (As)	mg/L	<0.50	0.50	8983069
Leachable Barium (Ba)	mg/L	3.1	1.0	8983069
Leachable Beryllium (Be)	mg/L	<0.50	0.50	8983069
Leachable Boron (B)	mg/L	<1.0	1.0	8983069
Leachable Cadmium (Cd)	mg/L	<0.10	0.10	8983069
Leachable Chromium (Cr)	mg/L	<0.50	0.50	8983069
Leachable Cobalt (Co)	mg/L	<1.0	1.0	8983069
Leachable Copper (Cu)	mg/L	<1.0	1.0	8983069
Leachable Iron (Fe)	mg/L	1.0	1.0	8983069
Leachable Lead (Pb)	mg/L	<0.50	0.50	8983069
Leachable Mercury (Hg)	mg/L	<0.020	0.020	8983069
Leachable Nickel (Ni)	mg/L	<0.50	0.50	8983069
Leachable Selenium (Se)	mg/L	<0.10	0.10	8983069
Leachable Silver (Ag)	mg/L	<0.50	0.50	8983069
Leachable Thallium (Tl)	mg/L	<0.50	0.50	8983069
Leachable Uranium (U)	mg/L	<0.20	0.20	8983069
Leachable Vanadium (V)	mg/L	<1.0	1.0	8983069
Leachable Zinc (Zn)	mg/L	<1.0	1.0	8983069
Leachable Zirconium (Zr)	mg/L	<1.0	1.0	8983069
Volatiles				
Leachable (ZH) Benzene	mg/L	<0.010	0.010	8981305
Leachable (ZH) Toluene	mg/L	<0.010	0.010	8981305
Leachable (ZH) Ethylbenzene	mg/L	<0.010	0.010	8981305
Leachable (ZH) o-Xylene	mg/L	<0.010	0.010	8981305
Leachable (ZH) m & p-Xylene	mg/L	<0.020	0.020	8981305
Leachable (ZH) Xylenes (Total)	mg/L	<0.020	0.020	8981305
RDL = Reportable Detection Limit N/A = Not Applicable				

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

BASIC CLASS II LANDFILL PACKAGE (SOIL)

Maxxam ID		TJ2523		
Sampling Date		2018/05/01		
COC Number		m070647		
	UNITS	CUTTING	RDL	QC Batch
Surrogate Recovery (%)				
Leachable (ZH) 1,4-Difluorobenzene (sur.)	%	102	N/A	8981305
Leachable (ZH) 4-Bromofluorobenzene (sur.)	%	95	N/A	8981305
Leachable (ZH) D4-1,2-Dichloroethane (sur.)	%	97	N/A	8981305
RDL = Reportable Detection Limit				
N/A = Not Applicable				

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		TJ2523	
Sampling Date		2018/05/01	
COC Number		m070647	
	UNITS	CUTTING	QC Batch
Misc. Inorganics			
Leachable Initial pH of Sample	pH	8.66	8981230
Leachable pH after HCl	pH	2.31	8981230
Leachable Final pH of Leachate	pH	6.20	8981230

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

PHYSICAL TESTING (SOIL)

Maxxam ID		TJ2517		
Sampling Date		2018/05/01 11:10		
COC Number		m070647		
	UNITS	3901-8	RDL	QC Batch
Physical Properties				
Moisture	%	20	0.30	8979540
RDL = Reportable Detection Limit				

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TJ2514	TJ2515	TJ2516	TJ2516	TJ2518	TJ2519		
Sampling Date		2018/05/01 10:55	2018/05/01 11:00	2018/05/01 11:10	2018/05/01 11:10	2018/05/01 15:10	2018/05/01 15:20		
COC Number		m070647	m070647	m070647	m070647	m070647	m070647		
	UNITS	3001-4	3001-6	3001-8	3001-8 Lab-Dup	3002-4	3002-8	RDL	QC Batch

Polycyclic Aromatics									
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Benzo[a]pyrene equivalency	mg/kg	<0.0071	<0.0071	<0.0071	N/A	<0.0071	<0.0071	0.0071	8978817
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	8979582
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	8979582
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Benzo(b&j)fluoranthene	mg/kg	<0.0050	<0.0050	0.0082	0.0088	0.0065	0.0069	0.0050	8979582
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	0.0058	0.0082	0.0094	0.0050	8979582
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Benzo[e]pyrene	mg/kg	<0.0050	<0.0050	0.0066	0.0076	0.0086	0.0075	0.0050	8979582
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	8979582
Phenanthrene	mg/kg	<0.0050	<0.0050	0.0070	0.0070	<0.0050	0.0065	0.0050	8979582
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.015	0.027	0.0050	8979582
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0072	<0.0050	0.0050	8979582
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	8979582

Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	85	84	84	83	85	84	N/A	8979582
D8-ACENAPHTHYLENE (sur.)	%	83	82	82	81	84	83	N/A	8979582
D8-NAPHTHALENE (sur.)	%	82	81	81	79	82	80	N/A	8979582
TERPHENYL-D14 (sur.)	%	91	90	90	89	92	89	N/A	8979582

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

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TJ2520	TJ2521		
Sampling Date		2018/05/01 16:30	2018/05/01 16:40		
COC Number		m070647	m070647		
	UNITS	3003-4	3003-8	RDL	QC Batch
Polycyclic Aromatics					
Acenaphthene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Benzo[a]pyrene equivalency	mg/kg	<0.0071	<0.0071	0.0071	8978817
Acenaphthylene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Acridine	mg/kg	<0.010	<0.010	0.010	8979582
Anthracene	mg/kg	<0.0040	<0.0040	0.0040	8979582
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Benzo(b&j)fluoranthene	mg/kg	<0.0050	0.0088	0.0050	8979582
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.013	0.0050	8979582
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Benzo[e]pyrene	mg/kg	<0.0050	0.012	0.0050	8979582
Chrysene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Fluorene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	0.0050	8979582
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	0.0050	8979582
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Naphthalene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Phenanthrene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Perylene	mg/kg	<0.0050	0.019	0.0050	8979582
Pyrene	mg/kg	<0.0050	<0.0050	0.0050	8979582
Quinoline	mg/kg	<0.010	<0.010	0.010	8979582
Surrogate Recovery (%)					
D10-ANTHRACENE (sur.)	%	86	83	N/A	8979582
D8-ACENAPHTHYLENE (sur.)	%	84	82	N/A	8979582
D8-NAPHTHALENE (sur.)	%	82	80	N/A	8979582
TERPHENYL-D14 (sur.)	%	92	88	N/A	8979582
RDL = Reportable Detection Limit N/A = Not Applicable					

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TJ2514	TJ2515	TJ2516	TJ2517	TJ2518		
Sampling Date		2018/05/01 10:55	2018/05/01 11:00	2018/05/01 11:10	2018/05/01 11:10	2018/05/01 15:10		
COC Number		m070647	m070647	m070647	m070647	m070647		
	UNITS	3001-4	3001-6	3001-8	3901-8	3002-4	RDL	QC Batch

Field Preserved Volatiles								
Benzene	mg/kg	N/A	N/A	N/A	<0.0050	N/A	0.0050	8980670
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	8980670
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8980670
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8980670
Chlorobenzene	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8980670
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Chloroform	mg/kg	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8980670
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	8980670
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8980670
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8980670
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	8980670
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Ethylbenzene	mg/kg	N/A	N/A	N/A	<0.010	N/A	0.010	8980670
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	8980670
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	8980670
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,1,1,2-tetrachloroethane	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8980670
1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8980670
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	8980670
Toluene	mg/kg	N/A	N/A	N/A	<0.020	N/A	0.020	8980670

RDL = Reportable Detection Limit

N/A = Not Applicable

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TJ2514	TJ2515	TJ2516	TJ2517	TJ2518		
Sampling Date		2018/05/01 10:55	2018/05/01 11:00	2018/05/01 11:10	2018/05/01 11:10	2018/05/01 15:10		
COC Number		m070647	m070647	m070647	m070647	m070647		
	UNITS	3001-4	3001-6	3001-8	3901-8	3002-4	RDL	QC Batch
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	8980670
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	8980670
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	8980670
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	8980670
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	8980670
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	8980670
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	8980670
Xylenes (Total)	mg/kg	N/A	N/A	N/A	<0.040	N/A	0.040	8980670
m & p-Xylene	mg/kg	N/A	N/A	N/A	<0.040	N/A	0.040	8980670
o-Xylene	mg/kg	N/A	N/A	N/A	<0.020	N/A	0.020	8980670
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	98	98	98	98	N/A	8980670
4-Bromofluorobenzene (sur.)	%	98	102	98	99	97	N/A	8980670
D10-o-Xylene (sur.)	%	103	99	101	138 (1)	98	N/A	8980670
D4-1,2-Dichloroethane (sur.)	%	116	104	102	103	118	N/A	8980670
RDL = Reportable Detection Limit N/A = Not Applicable (1) Surrogate recovery exceeds acceptance criteria (high recovery). As results are non-detect, there is no impact on data quality.								

Maxxam Job #: B833548
Report Date: 2018/05/11

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TJ2519	TJ2520	TJ2521	TJ2522		
Sampling Date		2018/05/01 15:20	2018/05/01 16:30	2018/05/01 16:40	2018/05/01		
COC Number		m070647	m070647	m070647	m070647		
	UNITS	3002-8	3003-4	3003-8	TRIP BLANK	RDL	QC Batch

Field Preserved Volatiles							
Benzene	mg/kg	N/A	N/A	N/A	<0.0050	0.0050	8980670
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030	8980670
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	8980670
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8980670
Chlorobenzene	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8980670
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Chloroform	mg/kg	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8980670
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030	8980670
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8980670
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8980670
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030	8980670
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Ethylbenzene	mg/kg	N/A	N/A	N/A	<0.010	0.010	8980670
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	8980670
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	0.030	8980670
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,1,1,2-tetrachloroethane	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	8980670
1,1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	8980670
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	8980670
Toluene	mg/kg	N/A	N/A	N/A	<0.020	0.020	8980670

RDL = Reportable Detection Limit

N/A = Not Applicable

Maxxam Job #: B833548
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		TJ2519	TJ2520	TJ2521	TJ2522		
Sampling Date		2018/05/01 15:20	2018/05/01 16:30	2018/05/01 16:40	2018/05/01		
COC Number		m070647	m070647	m070647	m070647		
	UNITS	3002-8	3003-4	3003-8	TRIP BLANK	RDL	QC Batch
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	8980670
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	8980670
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	8980670
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	8980670
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	8980670
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	8980670
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	8980670
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	8980670
Xylenes (Total)	mg/kg	N/A	N/A	N/A	<0.040	0.040	8980670
m & p-Xylene	mg/kg	N/A	N/A	N/A	<0.040	0.040	8980670
o-Xylene	mg/kg	N/A	N/A	N/A	<0.020	0.020	8980670
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	99	99	98	98	N/A	8980670
4-Bromofluorobenzene (sur.)	%	99	97	98	99	N/A	8980670
D10-o-Xylene (sur.)	%	87	90	101	100	N/A	8980670
D4-1,2-Dichloroethane (sur.)	%	105	109	104	100	N/A	8980670
RDL = Reportable Detection Limit N/A = Not Applicable							

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CLIFTON ASSOCIATES LTD.
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GENERAL COMMENTS

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

Package 1	4.0°C
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Results relate only to the items tested.

Maxxam Job #: B833548
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	8979540	KSA	Method Blank	Moisture	2018/05/05	<0.30		%	
	8979540	KSA	RPD [TJ2519-01]	Moisture	2018/05/05	5.3		%	20
	8979582	LZ3	Matrix Spike [TJ2516-01]	D10-ANTHRACENE (sur.)	2018/05/05		86	%	50 - 130
				D8-ACENAPHTHYLENE (sur.)	2018/05/05		85	%	50 - 130
				D8-NAPHTHALENE (sur.)	2018/05/05		83	%	50 - 130
				TERPHENYL-D14 (sur.)	2018/05/05		88	%	50 - 130
				Acenaphthene	2018/05/05		88	%	50 - 130
				Acenaphthylene	2018/05/05		83	%	50 - 130
				Acridine	2018/05/05		54	%	50 - 130
				Anthracene	2018/05/05		81	%	50 - 130
				Benzo(a)anthracene	2018/05/05		89	%	50 - 130
				Benzo(b&j)fluoranthene	2018/05/05		82	%	50 - 130
				Benzo(k)fluoranthene	2018/05/05		87	%	50 - 130
				Benzo(g,h,i)perylene	2018/05/05		78	%	50 - 130
				Benzo(c)phenanthrene	2018/05/05		85	%	50 - 130
				Benzo(a)pyrene	2018/05/05		86	%	50 - 130
				Benzo[e]pyrene	2018/05/05		83	%	50 - 130
				Chrysene	2018/05/05		92	%	50 - 130
				Dibenz(a,h)anthracene	2018/05/05		82	%	50 - 130
				Fluoranthene	2018/05/05		93	%	50 - 130
				Fluorene	2018/05/05		86	%	50 - 130
				Indeno(1,2,3-cd)pyrene	2018/05/05		79	%	50 - 130
				1-Methylnaphthalene	2018/05/05		87	%	50 - 130
				2-Methylnaphthalene	2018/05/05		82	%	50 - 130
				Naphthalene	2018/05/05		82	%	50 - 130
				Phenanthrene	2018/05/05		85	%	50 - 130
				Perylene	2018/05/05		77	%	50 - 130
				Pyrene	2018/05/05		90	%	50 - 130
				Quinoline	2018/05/05		99	%	50 - 130
	8979582	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/05/05		87	%	50 - 130
				D8-ACENAPHTHYLENE (sur.)	2018/05/05		86	%	50 - 130
				D8-NAPHTHALENE (sur.)	2018/05/05		85	%	50 - 130
				TERPHENYL-D14 (sur.)	2018/05/05		91	%	50 - 130
				Acenaphthene	2018/05/05		86	%	50 - 130
				Acenaphthylene	2018/05/05		82	%	50 - 130
				Acridine	2018/05/05		56	%	50 - 130
				Anthracene	2018/05/05		81	%	50 - 130
				Benzo(a)anthracene	2018/05/05		89	%	50 - 130
				Benzo(b&j)fluoranthene	2018/05/05		83	%	50 - 130
				Benzo(k)fluoranthene	2018/05/05		104	%	50 - 130
				Benzo(g,h,i)perylene	2018/05/05		85	%	50 - 130
				Benzo(c)phenanthrene	2018/05/05		84	%	50 - 130
				Benzo(a)pyrene	2018/05/05		89	%	50 - 130
				Benzo[e]pyrene	2018/05/05		84	%	50 - 130
				Chrysene	2018/05/05		94	%	50 - 130
				Dibenz(a,h)anthracene	2018/05/05		85	%	50 - 130
				Fluoranthene	2018/05/05		92	%	50 - 130
				Fluorene	2018/05/05		85	%	50 - 130
				Indeno(1,2,3-cd)pyrene	2018/05/05		83	%	50 - 130
				1-Methylnaphthalene	2018/05/05		85	%	50 - 130
				2-Methylnaphthalene	2018/05/05		79	%	50 - 130
				Naphthalene	2018/05/05		79	%	50 - 130
				Phenanthrene	2018/05/05		84	%	50 - 130
				Perylene	2018/05/05		81	%	50 - 130

Maxxam Job #: B833548
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits			
8979582	LZ3	Method Blank	Pyrene	2018/05/05		89	%	50 - 130			
			Quinoline	2018/05/05		94	%	50 - 130			
			D10-ANTHRACENE (sur.)	2018/05/05		85	%	50 - 130			
			D8-ACENAPHTHYLENE (sur.)	2018/05/05		84	%	50 - 130			
			D8-NAPHTHALENE (sur.)	2018/05/05		84	%	50 - 130			
			TERPHENYL-D14 (sur.)	2018/05/05		93	%	50 - 130			
			Acenaphthene	2018/05/05	<0.0050		mg/kg				
			Acenaphthylene	2018/05/05	<0.0050		mg/kg				
			Acridine	2018/05/05	<0.010		mg/kg				
			Anthracene	2018/05/05	<0.0040		mg/kg				
			Benzo(a)anthracene	2018/05/05	<0.0050		mg/kg				
			Benzo(b&j)fluoranthene	2018/05/05	<0.0050		mg/kg				
			Benzo(k)fluoranthene	2018/05/05	<0.0050		mg/kg				
			Benzo(g,h,i)perylene	2018/05/05	<0.0050		mg/kg				
			Benzo(c)phenanthrene	2018/05/05	<0.0050		mg/kg				
			Benzo(a)pyrene	2018/05/05	<0.0050		mg/kg				
			Benzo[e]pyrene	2018/05/05	<0.0050		mg/kg				
			Chrysene	2018/05/05	<0.0050		mg/kg				
			Dibenz(a,h)anthracene	2018/05/05	<0.0050		mg/kg				
			Fluoranthene	2018/05/05	<0.0050		mg/kg				
			Fluorene	2018/05/05	<0.0050		mg/kg				
			Indeno(1,2,3-cd)pyrene	2018/05/05	<0.0050		mg/kg				
			1-Methylnaphthalene	2018/05/05	<0.0050		mg/kg				
			2-Methylnaphthalene	2018/05/05	<0.0050		mg/kg				
			Naphthalene	2018/05/05	<0.0050		mg/kg				
			Phenanthrene	2018/05/05	<0.0050		mg/kg				
Perylene	2018/05/05	<0.0050		mg/kg							
Pyrene	2018/05/05	<0.0050		mg/kg							
Quinoline	2018/05/05	<0.010		mg/kg							
8979582	LZ3	RPD [TJ2516-01]	Acenaphthene	2018/05/05	NC		%	50			
			Acenaphthylene	2018/05/05	NC		%	50			
			Acridine	2018/05/05	NC		%	50			
			Anthracene	2018/05/05	NC		%	50			
			Benzo(a)anthracene	2018/05/05	NC		%	50			
			Benzo(b&j)fluoranthene	2018/05/05	7.3		%	50			
			Benzo(k)fluoranthene	2018/05/05	NC		%	50			
			Benzo(g,h,i)perylene	2018/05/05	14		%	50			
			Benzo(c)phenanthrene	2018/05/05	NC		%	50			
			Benzo(a)pyrene	2018/05/05	NC		%	50			
			Benzo[e]pyrene	2018/05/05	14		%	50			
			Chrysene	2018/05/05	NC		%	50			
			Dibenz(a,h)anthracene	2018/05/05	NC		%	50			
			Fluoranthene	2018/05/05	NC		%	50			
			Fluorene	2018/05/05	NC		%	50			
			Indeno(1,2,3-cd)pyrene	2018/05/05	NC		%	50			
			1-Methylnaphthalene	2018/05/05	NC		%	50			
			2-Methylnaphthalene	2018/05/05	NC		%	50			
			Naphthalene	2018/05/05	NC		%	50			
			Phenanthrene	2018/05/05	0		%	50			
			Perylene	2018/05/05	NC		%	50			
			Pyrene	2018/05/05	NC		%	50			
			Quinoline	2018/05/05	NC		%	50			
			8979588	MHF	Matrix Spike [TJ2516-01]	O-TERPHENYL (sur.)	2018/05/07		96	%	60 - 140
						F2 (C10-C16 Hydrocarbons)	2018/05/07		87	%	60 - 130

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8979588	MHF	Spiked Blank	F3 (C16-C34 Hydrocarbons)	2018/05/07		95	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2018/05/07		94	%	60 - 130
			O-TERPHENYL (sur.)	2018/05/07		126	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/05/07		115	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2018/05/07		124	%	70 - 130
8979588	MHF	Method Blank	F4 (C34-C50 Hydrocarbons)	2018/05/07		121	%	70 - 130
			O-TERPHENYL (sur.)	2018/05/06		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/05/06	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/05/06	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/05/06	<50		mg/kg	
8979588	MHF	RPD [TJ2516-01]	F2 (C10-C16 Hydrocarbons)	2018/05/06	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2018/05/06	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/05/06	NC		%	40
8979625	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/05/07		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/05/07		99	%	50 - 140
			D10-o-Xylene (sur.)	2018/05/07		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/05/07		91	%	50 - 140
			Benzene	2018/05/07		86	%	50 - 140
			Toluene	2018/05/07		91	%	50 - 140
			Ethylbenzene	2018/05/07		93	%	50 - 140
			m & p-Xylene	2018/05/07		95	%	50 - 140
			o-Xylene	2018/05/07		91	%	50 - 140
			F1 (C6-C10)	2018/05/07		75	%	60 - 140
			1,4-Difluorobenzene (sur.)	2018/05/07		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/05/07		100	%	50 - 140
			D10-o-Xylene (sur.)	2018/05/07		95	%	50 - 140
D4-1,2-Dichloroethane (sur.)	2018/05/07		93	%	50 - 140			
Benzene	2018/05/07		96	%	60 - 130			
Toluene	2018/05/07		103	%	60 - 130			
Ethylbenzene	2018/05/07		104	%	60 - 130			
m & p-Xylene	2018/05/07		107	%	60 - 130			
o-Xylene	2018/05/07		104	%	60 - 130			
F1 (C6-C10)	2018/05/07		117	%	60 - 140			
8979625	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/05/07		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/05/07		97	%	50 - 140
			D10-o-Xylene (sur.)	2018/05/07		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/05/07		91	%	50 - 140
			Benzene	2018/05/07	<0.0050		mg/kg	
			Toluene	2018/05/07	<0.020		mg/kg	
			Ethylbenzene	2018/05/07	<0.010		mg/kg	
			m & p-Xylene	2018/05/07	<0.040		mg/kg	
			o-Xylene	2018/05/07	<0.020		mg/kg	
			F1 (C6-C10)	2018/05/07	<10		mg/kg	
8979625	DO1	RPD	Benzene	2018/05/07	NC		%	50
			Toluene	2018/05/07	NC		%	50
			Ethylbenzene	2018/05/07	NC		%	50
			m & p-Xylene	2018/05/07	NC		%	50
			o-Xylene	2018/05/07	NC		%	50
			F1 (C6-C10)	2018/05/07	NC		%	30
8979687	EH2	QC Standard	Soluble (1:1) pH	2018/05/05		98	%	98 - 102
8979687	EH2	Spiked Blank	Soluble (1:1) pH	2018/05/05		99	%	97 - 103
8979687	EH2	RPD	Soluble (1:1) pH	2018/05/05	0.82		%	N/A
8980670	RSU	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/05/08		109	%	60 - 140
			4-Bromofluorobenzene (sur.)	2018/05/08		99	%	60 - 140

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Client Project #: CG2430.1 E28
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D10-o-Xylene (sur.)	2018/05/08		96	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2018/05/08		104	%	60 - 140
			Benzene	2018/05/08		99	%	60 - 140
			Bromodichloromethane	2018/05/08		121	%	60 - 140
			Bromoform	2018/05/08		140	%	60 - 140
			Bromomethane	2018/05/08		88	%	60 - 140
			Carbon tetrachloride	2018/05/08		96	%	60 - 140
			Chlorobenzene	2018/05/08		93	%	60 - 140
			Chlorodibromomethane	2018/05/08		118	%	60 - 140
			Chloroethane	2018/05/08		56 (1)	%	60 - 140
			Chloroform	2018/05/08		103	%	60 - 140
			Chloromethane	2018/05/08		67	%	60 - 140
			1,2-dibromoethane	2018/05/08		114	%	60 - 140
			1,2-dichlorobenzene	2018/05/08		106	%	60 - 140
			1,3-dichlorobenzene	2018/05/08		95	%	60 - 140
			1,4-dichlorobenzene	2018/05/08		97	%	60 - 140
			1,1-dichloroethane	2018/05/08		100	%	60 - 140
			1,2-dichloroethane	2018/05/08		119	%	60 - 140
			1,1-dichloroethene	2018/05/08		95	%	60 - 140
			cis-1,2-dichloroethene	2018/05/08		112	%	60 - 140
			trans-1,2-dichloroethene	2018/05/08		99	%	60 - 140
			Dichloromethane	2018/05/08		97	%	60 - 140
			1,2-dichloropropane	2018/05/08		120	%	60 - 140
			cis-1,3-dichloropropene	2018/05/08		139	%	60 - 140
			trans-1,3-dichloropropene	2018/05/08		143 (1)	%	60 - 140
			Ethylbenzene	2018/05/08		88	%	60 - 140
			Methyl methacrylate	2018/05/08		144 (1)	%	60 - 140
			Methyl-tert-butylether (MTBE)	2018/05/08		103	%	60 - 140
			Styrene	2018/05/08		95	%	60 - 140
			1,1,1,2-tetrachloroethane	2018/05/08		99	%	60 - 140
			1,1,2,2-tetrachloroethane	2018/05/08		136	%	60 - 140
			Tetrachloroethene	2018/05/08		83	%	60 - 140
			Toluene	2018/05/08		93	%	60 - 140
			1,2,3-trichlorobenzene	2018/05/08		110	%	60 - 140
			1,2,4-trichlorobenzene	2018/05/08		103	%	60 - 140
			1,3,5-trichlorobenzene	2018/05/08		95	%	60 - 140
			1,1,1-trichloroethane	2018/05/08		99	%	60 - 140
			1,1,2-trichloroethane	2018/05/08		127	%	60 - 140
			Trichloroethene	2018/05/08		104	%	60 - 140
			Trichlorofluoromethane	2018/05/08		83	%	60 - 140
			1,2,4-trimethylbenzene	2018/05/08		89	%	60 - 140
			1,3,5-trimethylbenzene	2018/05/08		85	%	60 - 140
			Vinyl chloride	2018/05/08		75	%	60 - 140
			m & p-Xylene	2018/05/08		89	%	60 - 140
			o-Xylene	2018/05/08		92	%	60 - 140
8980670	RSU	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/05/08		102	%	60 - 140
			4-Bromofluorobenzene (sur.)	2018/05/08		103	%	60 - 140
			D10-o-Xylene (sur.)	2018/05/08		91	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2018/05/08		86	%	60 - 140
			Benzene	2018/05/08		85	%	60 - 130
			Bromodichloromethane	2018/05/08		90	%	60 - 130
			Bromoform	2018/05/08		96	%	60 - 130
			Bromomethane	2018/05/08		70	%	60 - 130
			Carbon tetrachloride	2018/05/08		90	%	60 - 130

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorobenzene	2018/05/08		85	%	60 - 130
			Chlorodibromomethane	2018/05/08		94	%	60 - 130
			Chloroethane	2018/05/08		102	%	60 - 130
			Chloroform	2018/05/08		85	%	60 - 130
			Chloromethane	2018/05/08		102	%	60 - 130
			1,2-dibromoethane	2018/05/08		90	%	60 - 130
			1,2-dichlorobenzene	2018/05/08		90	%	60 - 130
			1,3-dichlorobenzene	2018/05/08		90	%	60 - 130
			1,4-dichlorobenzene	2018/05/08		88	%	60 - 130
			1,1-dichloroethane	2018/05/08		89	%	60 - 130
			1,2-dichloroethane	2018/05/08		90	%	60 - 130
			1,1-dichloroethene	2018/05/08		101	%	60 - 130
			cis-1,2-dichloroethene	2018/05/08		94	%	60 - 130
			trans-1,2-dichloroethene	2018/05/08		93	%	60 - 130
			Dichloromethane	2018/05/08		83	%	60 - 130
			1,2-dichloropropane	2018/05/08		96	%	60 - 130
			cis-1,3-dichloropropene	2018/05/08		71	%	60 - 130
			trans-1,3-dichloropropene	2018/05/08		63	%	60 - 130
			Ethylbenzene	2018/05/08		88	%	60 - 130
			Methyl methacrylate	2018/05/08		90	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/05/08		86	%	60 - 130
			Styrene	2018/05/08		85	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/05/08		86	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/05/08		90	%	60 - 130
			Tetrachloroethene	2018/05/08		89	%	60 - 130
			Toluene	2018/05/08		94	%	60 - 130
			1,2,3-trichlorobenzene	2018/05/08		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/05/08		86	%	60 - 130
			1,3,5-trichlorobenzene	2018/05/08		88	%	60 - 130
			1,1,1-trichloroethane	2018/05/08		92	%	60 - 130
			1,1,2-trichloroethane	2018/05/08		86	%	60 - 130
			Trichloroethene	2018/05/08		92	%	60 - 130
			Trichlorofluoromethane	2018/05/08		99	%	60 - 130
			1,2,4-trimethylbenzene	2018/05/08		95	%	60 - 130
			1,3,5-trimethylbenzene	2018/05/08		94	%	60 - 130
			Vinyl chloride	2018/05/08		101	%	60 - 130
			m & p-Xylene	2018/05/08		88	%	60 - 130
			o-Xylene	2018/05/08		87	%	60 - 130
8980670	RSU	Method Blank	1,4-Difluorobenzene (sur.)	2018/05/08		99	%	60 - 140
			4-Bromofluorobenzene (sur.)	2018/05/08		98	%	60 - 140
			D10-o-Xylene (sur.)	2018/05/08		96	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2018/05/08		101	%	60 - 140
			Benzene	2018/05/08	<0.0050		mg/kg	
			Bromodichloromethane	2018/05/08	<0.030		mg/kg	
			Bromoform	2018/05/08	<0.050		mg/kg	
			Bromomethane	2018/05/08	<0.020		mg/kg	
			Carbon tetrachloride	2018/05/08	<0.00050		mg/kg	
			Chlorobenzene	2018/05/08	<0.0010		mg/kg	
			Chlorodibromomethane	2018/05/08	<0.020		mg/kg	
			Chloroethane	2018/05/08	<0.020		mg/kg	
			Chloroform	2018/05/08	<0.00080		mg/kg	
			Chloromethane	2018/05/08	<0.030		mg/kg	
			1,2-dibromoethane	2018/05/08	<0.0020		mg/kg	
			1,2-dichlorobenzene	2018/05/08	<0.020		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,3-dichlorobenzene	2018/05/08	<0.020		mg/kg	
			1,4-dichlorobenzene	2018/05/08	<0.020		mg/kg	
			1,1-dichloroethane	2018/05/08	<0.020		mg/kg	
			1,2-dichloroethane	2018/05/08	<0.0020		mg/kg	
			1,1-dichloroethene	2018/05/08	<0.020		mg/kg	
			cis-1,2-dichloroethene	2018/05/08	<0.020		mg/kg	
			trans-1,2-dichloroethene	2018/05/08	<0.020		mg/kg	
			Dichloromethane	2018/05/08	<0.030		mg/kg	
			1,2-dichloropropane	2018/05/08	<0.020		mg/kg	
			cis-1,3-dichloropropene	2018/05/08	<0.020		mg/kg	
			trans-1,3-dichloropropene	2018/05/08	<0.020		mg/kg	
			Ethylbenzene	2018/05/08	<0.010		mg/kg	
			Methyl methacrylate	2018/05/08	<0.040		mg/kg	
			Methyl-tert-butylether (MTBE)	2018/05/08	<0.030		mg/kg	
			Styrene	2018/05/08	<0.020		mg/kg	
			1,1,1,2-tetrachloroethane	2018/05/08	<0.10		mg/kg	
			1,1,2,2-tetrachloroethane	2018/05/08	<0.050		mg/kg	
			Tetrachloroethene	2018/05/08	<0.010		mg/kg	
			Toluene	2018/05/08	<0.020		mg/kg	
			1,2,3-trichlorobenzene	2018/05/08	<0.040		mg/kg	
			1,2,4-trichlorobenzene	2018/05/08	<0.040		mg/kg	
			1,3,5-trichlorobenzene	2018/05/08	<0.040		mg/kg	
			1,1,1-trichloroethane	2018/05/08	<0.020		mg/kg	
			1,1,2-trichloroethane	2018/05/08	<0.020		mg/kg	
			Trichloroethene	2018/05/08	<0.010		mg/kg	
			Trichlorofluoromethane	2018/05/08	<0.020		mg/kg	
			1,2,4-trimethylbenzene	2018/05/08	<0.50		mg/kg	
			1,3,5-trimethylbenzene	2018/05/08	<0.50		mg/kg	
			Vinyl chloride	2018/05/08	<0.00030		mg/kg	
			Xylenes (Total)	2018/05/08	<0.040		mg/kg	
			m & p-Xylene	2018/05/08	<0.040		mg/kg	
			o-Xylene	2018/05/08	<0.020		mg/kg	
8980670	RSU	RPD	Bromodichloromethane	2018/05/08	NC		%	50
			Bromoform	2018/05/08	NC		%	50
			Bromomethane	2018/05/08	NC		%	50
			Carbon tetrachloride	2018/05/08	NC		%	50
			Chlorobenzene	2018/05/08	NC		%	50
			Chlorodibromomethane	2018/05/08	NC		%	50
			Chloroethane	2018/05/08	NC		%	50
			Chloroform	2018/05/08	NC		%	50
			Chloromethane	2018/05/08	NC		%	50
			1,2-dibromoethane	2018/05/08	NC		%	50
			1,2-dichlorobenzene	2018/05/08	NC		%	50
			1,3-dichlorobenzene	2018/05/08	NC		%	50
			1,4-dichlorobenzene	2018/05/08	NC		%	50
			1,1-dichloroethane	2018/05/08	NC		%	50
			1,2-dichloroethane	2018/05/08	NC		%	50
			1,1-dichloroethene	2018/05/08	NC		%	50
			cis-1,2-dichloroethene	2018/05/08	NC		%	50
			trans-1,2-dichloroethene	2018/05/08	NC		%	50
			Dichloromethane	2018/05/08	NC		%	50
			1,2-dichloropropane	2018/05/08	NC		%	50
			cis-1,3-dichloropropene	2018/05/08	NC		%	50
			trans-1,3-dichloropropene	2018/05/08	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl methacrylate	2018/05/08	NC		%	50
			Methyl-tert-butylether (MTBE)	2018/05/08	NC		%	50
			Styrene	2018/05/08	NC		%	50
			1,1,1,2-tetrachloroethane	2018/05/08	NC		%	50
			1,1,2,2-tetrachloroethane	2018/05/08	NC		%	50
			Tetrachloroethene	2018/05/08	NC		%	50
			1,2,3-trichlorobenzene	2018/05/08	NC		%	50
			1,2,4-trichlorobenzene	2018/05/08	NC		%	50
			1,3,5-trichlorobenzene	2018/05/08	NC		%	50
			1,1,1-trichloroethane	2018/05/08	NC		%	50
			1,1,2-trichloroethane	2018/05/08	NC		%	50
			Trichloroethene	2018/05/08	NC		%	50
			Trichlorofluoromethane	2018/05/08	NC		%	50
			1,2,4-trimethylbenzene	2018/05/08	NC		%	50
			1,3,5-trimethylbenzene	2018/05/08	NC		%	50
			Vinyl chloride	2018/05/08	NC		%	50
8981230	LQ1	Spiked Blank	Leachable Initial pH of Sample	2018/05/09		100	%	97 - 103
			Leachable pH after HCl	2018/05/09		99	%	97 - 103
			Leachable Final pH of Leachate	2018/05/09		100	%	97 - 103
8981230	LQ1	RPD	Leachable Initial pH of Sample	2018/05/09	1.4		%	N/A
			Leachable pH after HCl	2018/05/09	2.7		%	N/A
			Leachable Final pH of Leachate	2018/05/09	0.16		%	N/A
8981305	WZ0	Matrix Spike	Leachable (ZH) 1,4-Difluorobenzene (sur.)	2018/05/08		104	%	50 - 140
			Leachable (ZH) 4-Bromofluorobenzene (sur.)	2018/05/08		95	%	50 - 140
			Leachable (ZH) D4-1,2-Dichloroethane (sur.)	2018/05/08		93	%	50 - 140
			Leachable (ZH) Benzene	2018/05/08		75	%	70 - 130
			Leachable (ZH) Toluene	2018/05/08		79	%	70 - 130
			Leachable (ZH) Ethylbenzene	2018/05/08		81	%	70 - 130
			Leachable (ZH) o-Xylene	2018/05/08		81	%	70 - 130
			Leachable (ZH) m & p-Xylene	2018/05/08		83	%	70 - 130
8981305	WZ0	Spiked Blank	Leachable (ZH) 1,4-Difluorobenzene (sur.)	2018/05/08		102	%	50 - 140
			Leachable (ZH) 4-Bromofluorobenzene (sur.)	2018/05/08		96	%	50 - 140
			Leachable (ZH) D4-1,2-Dichloroethane (sur.)	2018/05/08		96	%	50 - 140
			Leachable (ZH) Benzene	2018/05/08		72	%	70 - 130
			Leachable (ZH) Toluene	2018/05/08		76	%	70 - 130
			Leachable (ZH) Ethylbenzene	2018/05/08		77	%	70 - 130
			Leachable (ZH) o-Xylene	2018/05/08		78	%	70 - 130
			Leachable (ZH) m & p-Xylene	2018/05/08		80	%	70 - 130
8981305	WZ0	Method Blank	Leachable (ZH) 1,4-Difluorobenzene (sur.)	2018/05/08		104	%	50 - 140
			Leachable (ZH) 4-Bromofluorobenzene (sur.)	2018/05/08		94	%	50 - 140
			Leachable (ZH) D4-1,2-Dichloroethane (sur.)	2018/05/08		92	%	50 - 140
			Leachable (ZH) Benzene	2018/05/08	<0.010		mg/L	
			Leachable (ZH) Toluene	2018/05/08	<0.010		mg/L	
			Leachable (ZH) Ethylbenzene	2018/05/08	<0.010		mg/L	
			Leachable (ZH) o-Xylene	2018/05/08	<0.010		mg/L	
			Leachable (ZH) m & p-Xylene	2018/05/08	<0.020		mg/L	
			Leachable (ZH) Xylenes (Total)	2018/05/08	<0.020		mg/L	
8981305	WZ0	RPD	Leachable (ZH) Benzene	2018/05/08	NC		%	30
8982305	HE1	RPD	Closed Cup Flash Point	2018/05/08	NC		%	35
8983069	LQ1	Matrix Spike	Leachable Antimony (Sb)	2018/05/09		121	%	75 - 125
			Leachable Arsenic (As)	2018/05/09		120	%	75 - 125
			Leachable Barium (Ba)	2018/05/09		NC	%	75 - 125
			Leachable Beryllium (Be)	2018/05/09		108	%	75 - 125
			Leachable Boron (B)	2018/05/09		101	%	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachable Cadmium (Cd)	2018/05/09		119	%	75 - 125
			Leachable Chromium (Cr)	2018/05/09		119	%	75 - 125
			Leachable Cobalt (Co)	2018/05/09		118	%	75 - 125
			Leachable Copper (Cu)	2018/05/09		115	%	75 - 125
			Leachable Iron (Fe)	2018/05/09		96	%	75 - 125
			Leachable Lead (Pb)	2018/05/09		114	%	75 - 125
			Leachable Mercury (Hg)	2018/05/09		108	%	75 - 125
			Leachable Nickel (Ni)	2018/05/09		114	%	75 - 125
			Leachable Selenium (Se)	2018/05/09		109	%	75 - 125
			Leachable Silver (Ag)	2018/05/09		116	%	75 - 125
			Leachable Thallium (Tl)	2018/05/09		116	%	75 - 125
			Leachable Uranium (U)	2018/05/09		120	%	75 - 125
			Leachable Vanadium (V)	2018/05/09		123	%	75 - 125
			Leachable Zinc (Zn)	2018/05/09		119	%	75 - 125
			Leachable Zirconium (Zr)	2018/05/09		127 (1)	%	75 - 125
8983069	LQ1	Spiked Blank	Leachable Antimony (Sb)	2018/05/09		113	%	80 - 120
			Leachable Arsenic (As)	2018/05/09		108	%	80 - 120
			Leachable Barium (Ba)	2018/05/09		114	%	80 - 120
			Leachable Beryllium (Be)	2018/05/09		104	%	80 - 120
			Leachable Boron (B)	2018/05/09		97	%	80 - 120
			Leachable Cadmium (Cd)	2018/05/09		111	%	80 - 120
			Leachable Chromium (Cr)	2018/05/09		111	%	80 - 120
			Leachable Cobalt (Co)	2018/05/09		109	%	80 - 120
			Leachable Copper (Cu)	2018/05/09		107	%	80 - 120
			Leachable Iron (Fe)	2018/05/09		107	%	80 - 120
			Leachable Lead (Pb)	2018/05/09		107	%	80 - 120
			Leachable Mercury (Hg)	2018/05/09		102	%	80 - 120
			Leachable Nickel (Ni)	2018/05/09		108	%	80 - 120
			Leachable Selenium (Se)	2018/05/09		103	%	80 - 120
			Leachable Silver (Ag)	2018/05/09		107	%	80 - 120
			Leachable Thallium (Tl)	2018/05/09		108	%	80 - 120
			Leachable Uranium (U)	2018/05/09		111	%	80 - 120
			Leachable Vanadium (V)	2018/05/09		112	%	80 - 120
			Leachable Zinc (Zn)	2018/05/09		109	%	80 - 120
			Leachable Zirconium (Zr)	2018/05/09		115	%	80 - 120
8983069	LQ1	Method Blank	Leachable Antimony (Sb)	2018/05/09	<1.0		mg/L	
			Leachable Arsenic (As)	2018/05/09	<0.50		mg/L	
			Leachable Barium (Ba)	2018/05/09	<1.0		mg/L	
			Leachable Beryllium (Be)	2018/05/09	<0.50		mg/L	
			Leachable Boron (B)	2018/05/09	<1.0		mg/L	
			Leachable Cadmium (Cd)	2018/05/09	<0.10		mg/L	
			Leachable Chromium (Cr)	2018/05/09	<0.50		mg/L	
			Leachable Cobalt (Co)	2018/05/09	<1.0		mg/L	
			Leachable Copper (Cu)	2018/05/09	<1.0		mg/L	
			Leachable Iron (Fe)	2018/05/09	<1.0		mg/L	
			Leachable Lead (Pb)	2018/05/09	<0.50		mg/L	
			Leachable Mercury (Hg)	2018/05/09	<0.020		mg/L	
			Leachable Nickel (Ni)	2018/05/09	<0.50		mg/L	
			Leachable Selenium (Se)	2018/05/09	<0.10		mg/L	
			Leachable Silver (Ag)	2018/05/09	<0.50		mg/L	
			Leachable Thallium (Tl)	2018/05/09	<0.50		mg/L	
			Leachable Uranium (U)	2018/05/09	<0.20		mg/L	
			Leachable Vanadium (V)	2018/05/09	<1.0		mg/L	
			Leachable Zinc (Zn)	2018/05/09	<1.0		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8983069	LQ1	RPD	Leachable Zirconium (Zr)	2018/05/09	<1.0		mg/L	
			Leachable Antimony (Sb)	2018/05/09	NC		%	35
			Leachable Arsenic (As)	2018/05/09	NC		%	35
			Leachable Barium (Ba)	2018/05/09	0.28		%	35
			Leachable Beryllium (Be)	2018/05/09	NC		%	35
			Leachable Boron (B)	2018/05/09	NC		%	35
			Leachable Cadmium (Cd)	2018/05/09	NC		%	35
			Leachable Chromium (Cr)	2018/05/09	NC		%	35
			Leachable Cobalt (Co)	2018/05/09	NC		%	35
			Leachable Copper (Cu)	2018/05/09	NC		%	35
			Leachable Iron (Fe)	2018/05/09	NC		%	35
			Leachable Lead (Pb)	2018/05/09	NC		%	35
			Leachable Mercury (Hg)	2018/05/09	NC		%	35
			Leachable Nickel (Ni)	2018/05/09	NC		%	35
			Leachable Selenium (Se)	2018/05/09	NC		%	35
			Leachable Silver (Ag)	2018/05/09	NC		%	35
			Leachable Thallium (Tl)	2018/05/09	NC		%	35
			Leachable Uranium (U)	2018/05/09	NC		%	35
			Leachable Vanadium (V)	2018/05/09	NC		%	35
			Leachable Zinc (Zn)	2018/05/09	NC		%	35
			Leachable Zirconium (Zr)	2018/05/09	NC		%	35

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 <= 2x 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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NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

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VALIDATION SIGNATURE PAGE

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



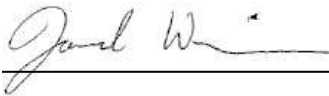
Dennis Ngundu, B.Sc., P.Chem., QP, Supervisor, Organics



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



Janet Gao, B.Sc., QP, Supervisor, Organics



Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics



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

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: <u>Clifton Associates</u>	Company:	Quotation #:	<input checked="" type="checkbox"/> 5-7 Days Regular (Most analyses)
Contact Name: <u>Stephen d'Abadie</u>	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: <u>2222 - 30 Ave NE</u> <u>Calgary, AB. T2E 7K9</u>	Address:	Project #: <u>CG2430.1 E28</u>	Rush TAT (Surcharges will be applied)
Phone: <u>403-263-2556</u>	Phone:	Site Location:	<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days
Email: <u>stephen-dabadie@clifton.ca</u>	Email:	Site #:	<input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days
Copies: <u>terryn_kuzyk@clifton.ca</u>	Copies:	Sampled By: <u>Austin Mei</u>	Date Required: _____
			Rush Confirmation #: _____

Laboratory Use Only				Analysis Requested												Regulatory Criteria			
Seal Present	YES	NO	Cooler ID	Depot Reception												HOLD - DO NOT ANALYZE	<input checked="" type="checkbox"/> AT1 <input type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:		
Seal Intact	<input checked="" type="checkbox"/>		Temp																
Cooling Media			0 5 7																
Seal Present	YES	NO	Cooler ID													Special Instructions			
Seal Intact			Temp																
Cooling Media																			
Seal Present	YES	NO	Cooler ID													Special Instructions			
Seal Intact			Temp																
Cooling Media																			
Sample Identification	Depth (Unit) (m)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1	VOC	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals - Tot	Diss	Mercury	Total	Salinity	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	PAHs
1	3001-4	2.29-3.05	2018/05/01	10:55	Soil	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
2	3001-6	3.81-4.57		11:00		5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
3	3001-8	5.33-6.1		11:10		5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
4	3901-8	5.33-6.1		11:10		3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
5	3002-4	2.29-3.05		15:10		5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
6	3002-8	5.33-6.1		15:20		5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
7	3003-4	2.29-3.05		16:30		5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
8	3003-8	5.33-6.1		16:40	Soil	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
9	Tip Blank		2018/05/01		W	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
10	Cutting		2018/05/01		Soil	3													<input checked="" type="checkbox"/>
Please indicate Filtered, Preserved or Both (F, P, F/P)																			
Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)		DATE (YYYY/MM/DD)	Time (HH:MM)													
<u>Austin Mei</u>	2018/05/03	17:10	<u>SARAH BLOCK</u>		2018/05/03	17:10													

03-May-18 17:10
Leanne Cameron
B833548
JZ8 INS-0197

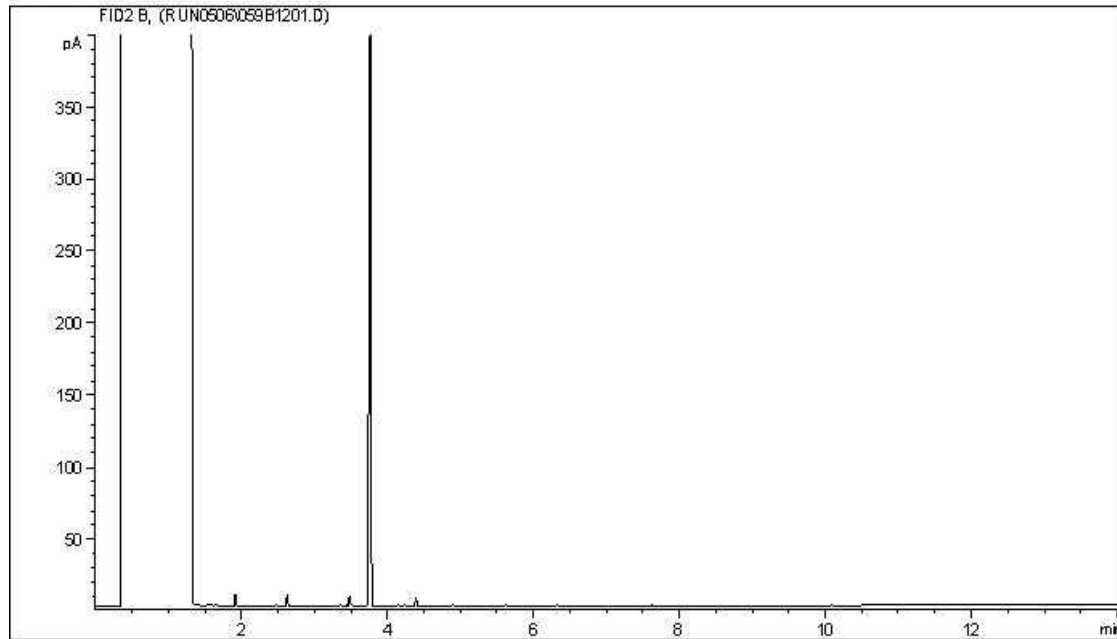
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required							
Company: <u>Clifton Associates</u>		Company: _____		Quotation #: _____		<input checked="" type="checkbox"/> 5-7 Days Regular (Most analyses)							
Contact Name: <u>Stephen dAbadie</u>		Contact Name: _____		P.O. #/ AFEB: _____		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS							
Address: <u>2222-30 Ave NE</u> <u>Calgary, AB. T2E 7K9</u>		Address: _____		Project #: <u>CG2430.1 E28</u>		Rush TAT (Surcharges will be applied)							
Phone: <u>403-263-2556</u>		Phone: _____		Site Location: _____		<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days							
Email: <u>stephen-dabadie@clifton.ca</u>		Email: _____		Site #: _____		<input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days							
Copies: <u>terryn_kuzyk@clifton.ca</u>		Copies: _____		Sampled By: <u>Austin</u>		Date Required: _____							
Copies: _____		Copies: _____		Copies: _____		Rush Confirmation #: _____							
Laboratory Use Only				Analysis Requested				Regulatory Criteria					
Seal Present	YES NO	Cooler ID	Depot Reception				<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> Dissolved	<input type="checkbox"/> AT1				
Seal Intact	<input checked="" type="checkbox"/>	Temp								5	6	5	<input type="checkbox"/> CCME
Cooling Media	<input checked="" type="checkbox"/>												<input type="checkbox"/> Drinking Water
Seal Present	YES NO	Cooler ID	# of containers				<input type="checkbox"/> Total	<input type="checkbox"/> Sieve (75 micron)	<input type="checkbox"/> Saskatchewan				
Seal Intact		Temp											<input type="checkbox"/> D50 (Drilling Waste)
Cooling Media													<input type="checkbox"/> Saskatchewan
Seal Present	YES NO	Cooler ID	BTEX F1 <input type="checkbox"/> VOC				<input type="checkbox"/> Routine Water	<input type="checkbox"/> Mercury	<input type="checkbox"/> Other:				
Seal Intact		Temp											<input type="checkbox"/> Basic Class II Landfill
Cooling Media													
Sample Identification		Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	HOLD - DO NOT ANALYZE							
1	<u>3901-8</u>	<u>5.33-6.1</u>	<u>2018/05/04</u>	<u>11:00</u>	<u>Soil</u>	Methanol vials already submitted on May 03 COC # 070647							
2													
3													
4													
5													
6													
7													
8													
9													
10													
Please indicate Filtered, Preserved or Both (F, P, F/P)													
Relinquished by: (Signature/ Print)		DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)		DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #					
<u>Austin Mei</u>		<u>2018/05/04</u>	<u>15:50</u>	<u>Amrita Sharma</u>		<u>2018/05/04</u>	<u>15:52</u>	<u>8833548</u>					

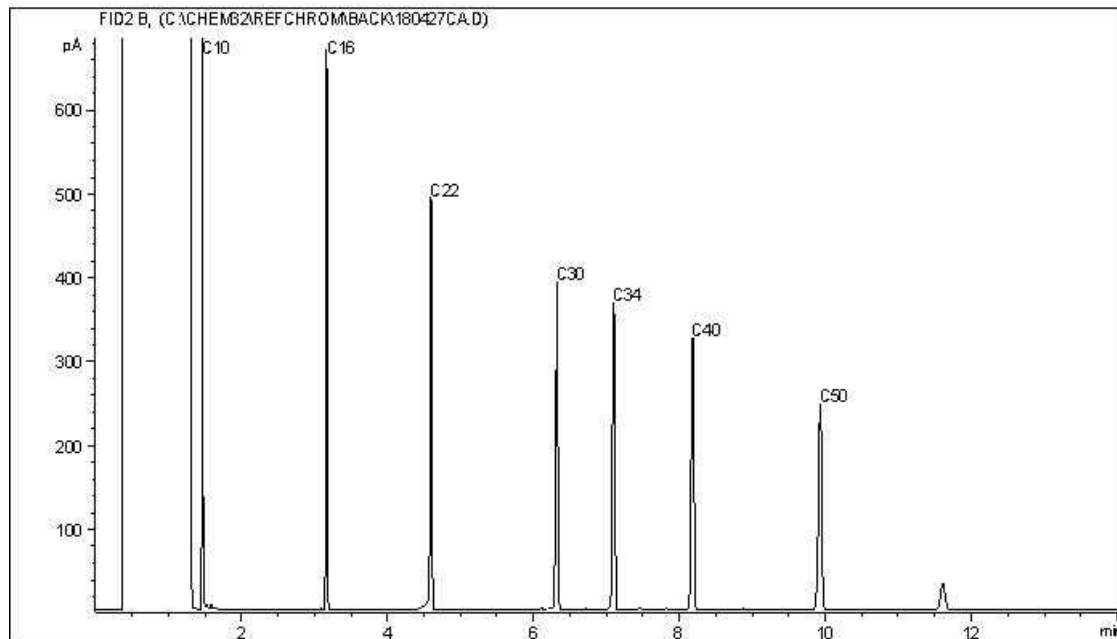
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



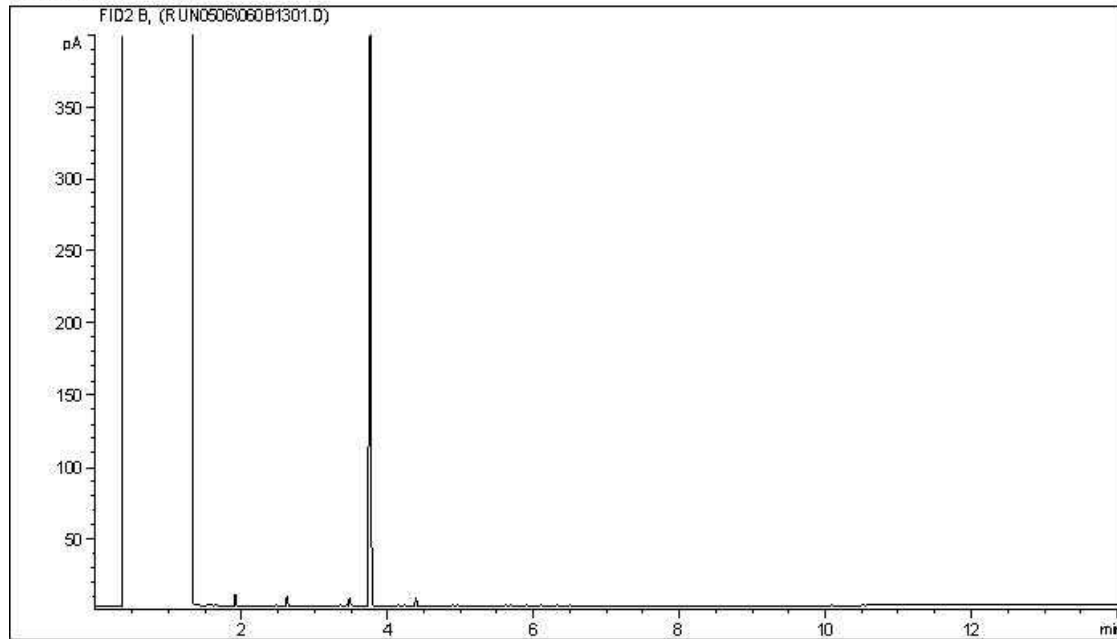
TYPICAL PRODUCT CARBON NUMBER RANGES

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

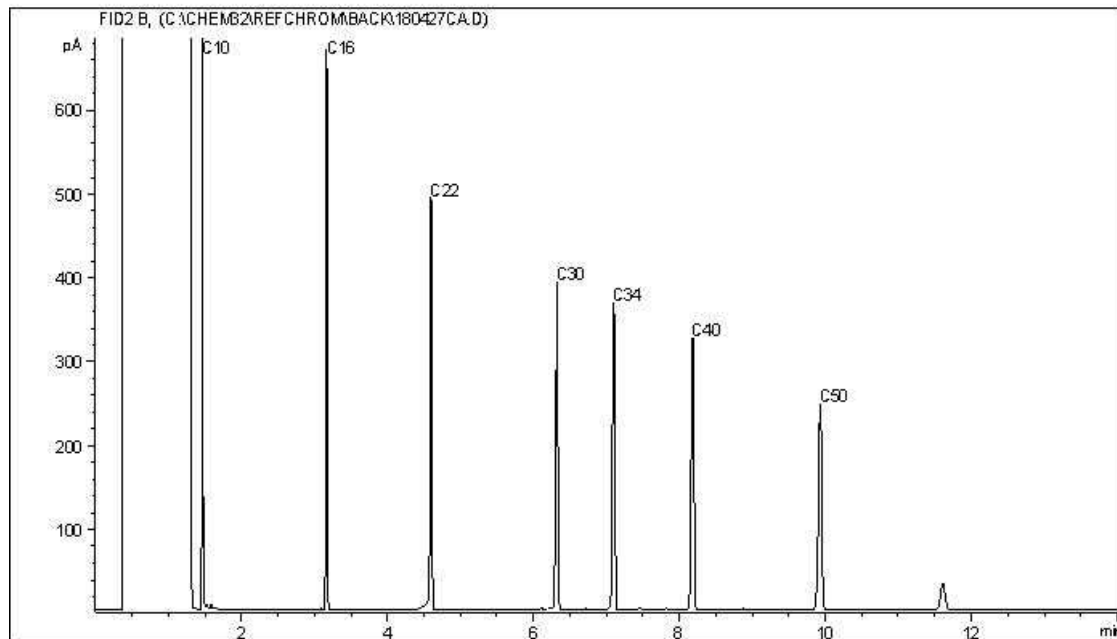
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



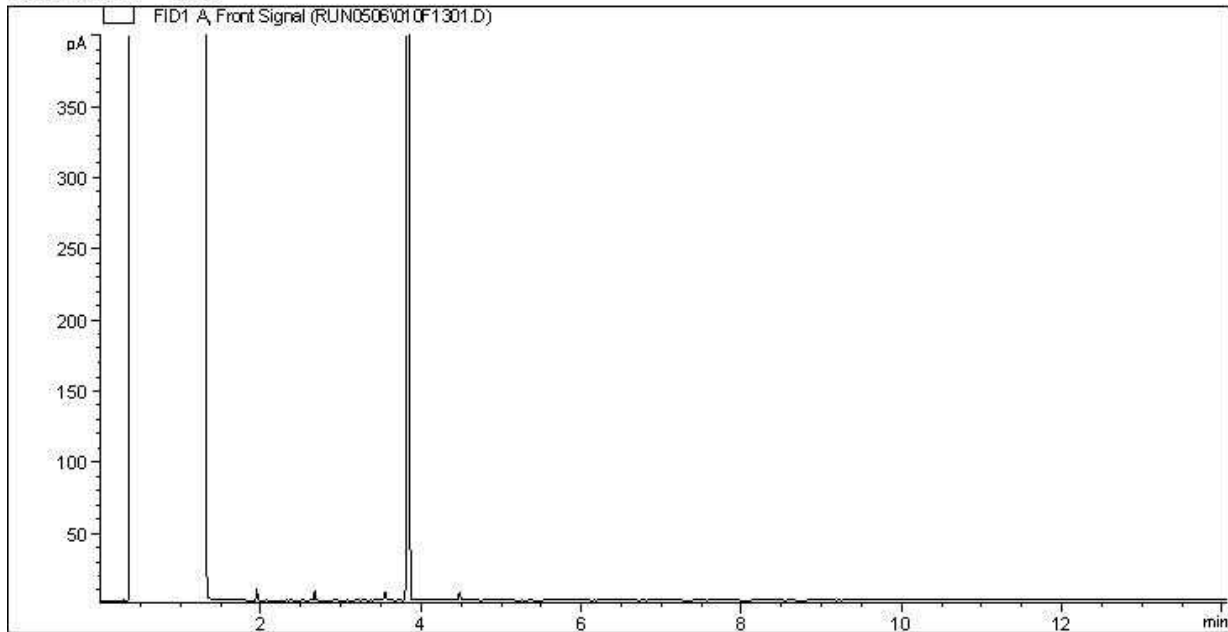
TYPICAL PRODUCT CARBON NUMBER RANGES

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

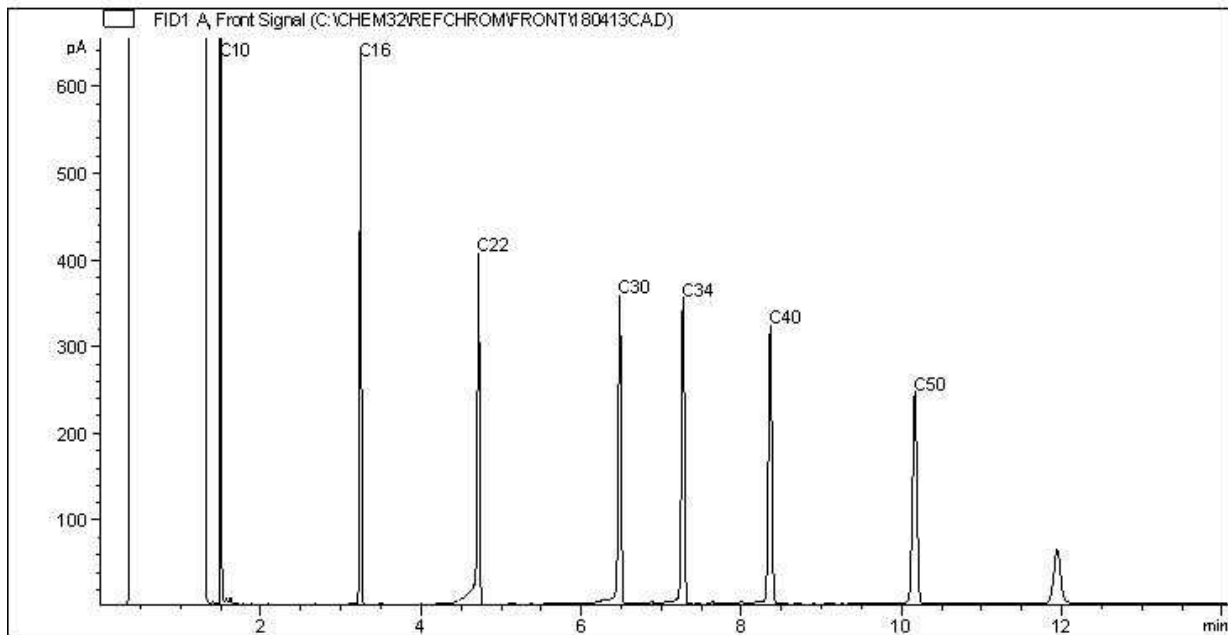
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



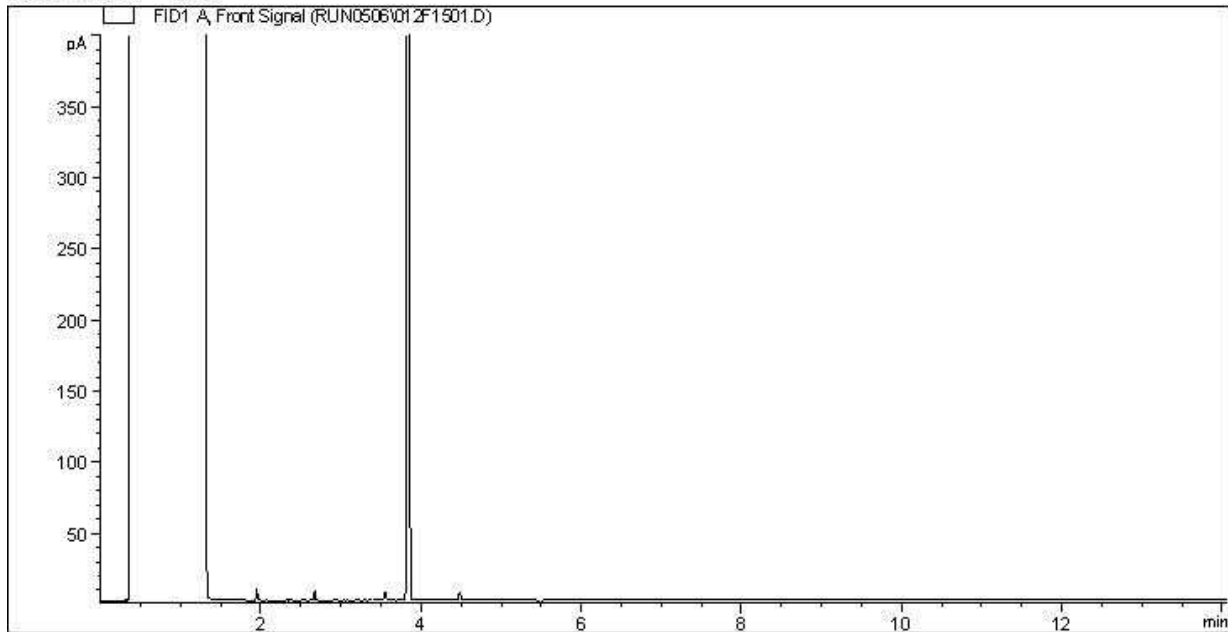
TYPICAL PRODUCT CARBON NUMBER RANGES

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

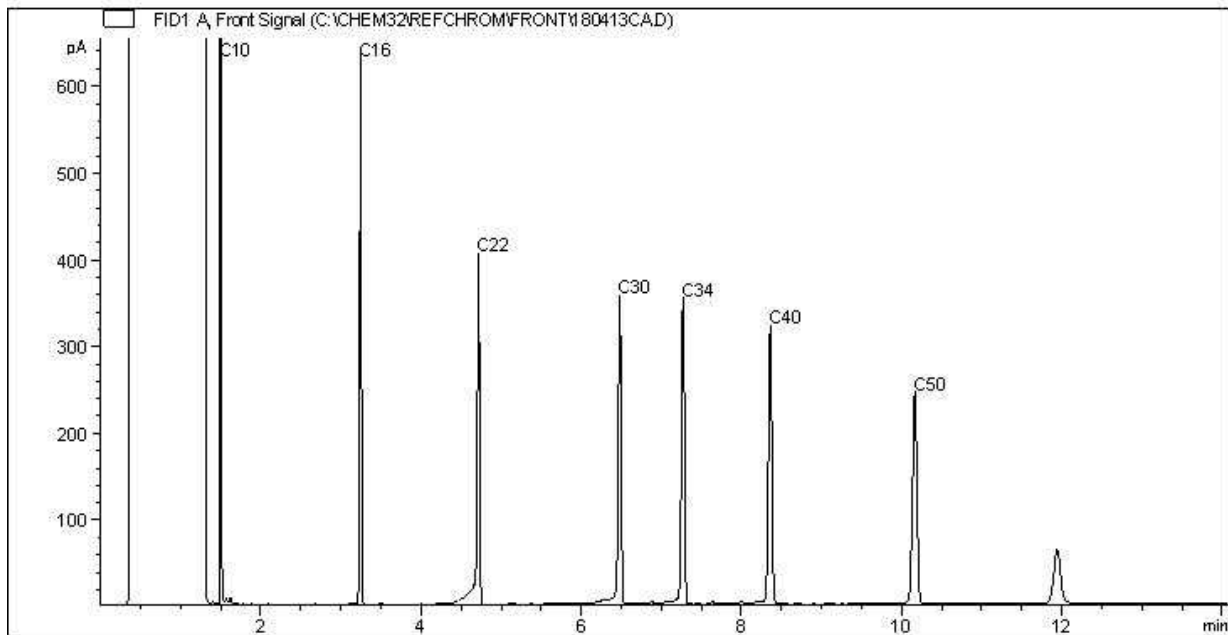
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



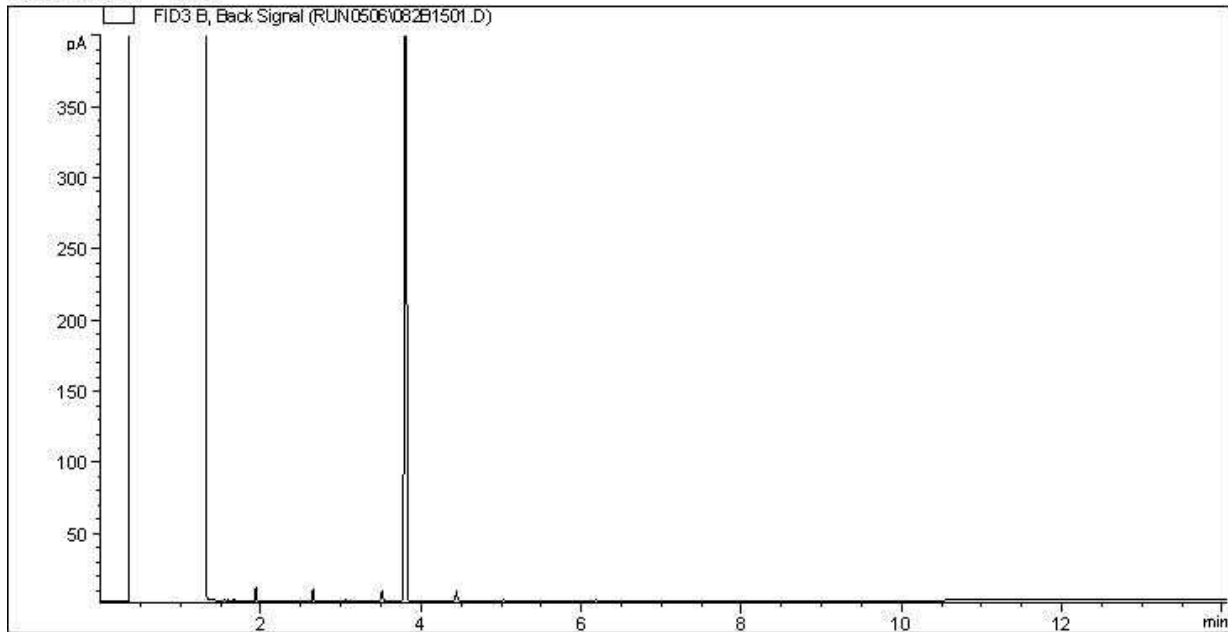
TYPICAL PRODUCT CARBON NUMBER RANGES

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

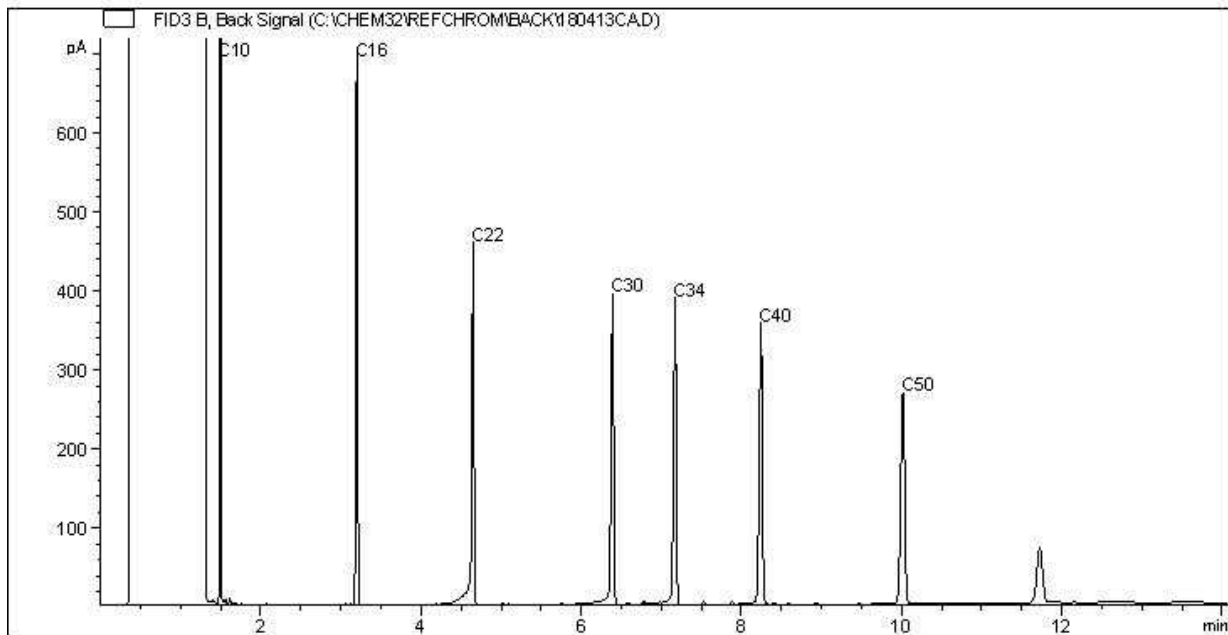
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



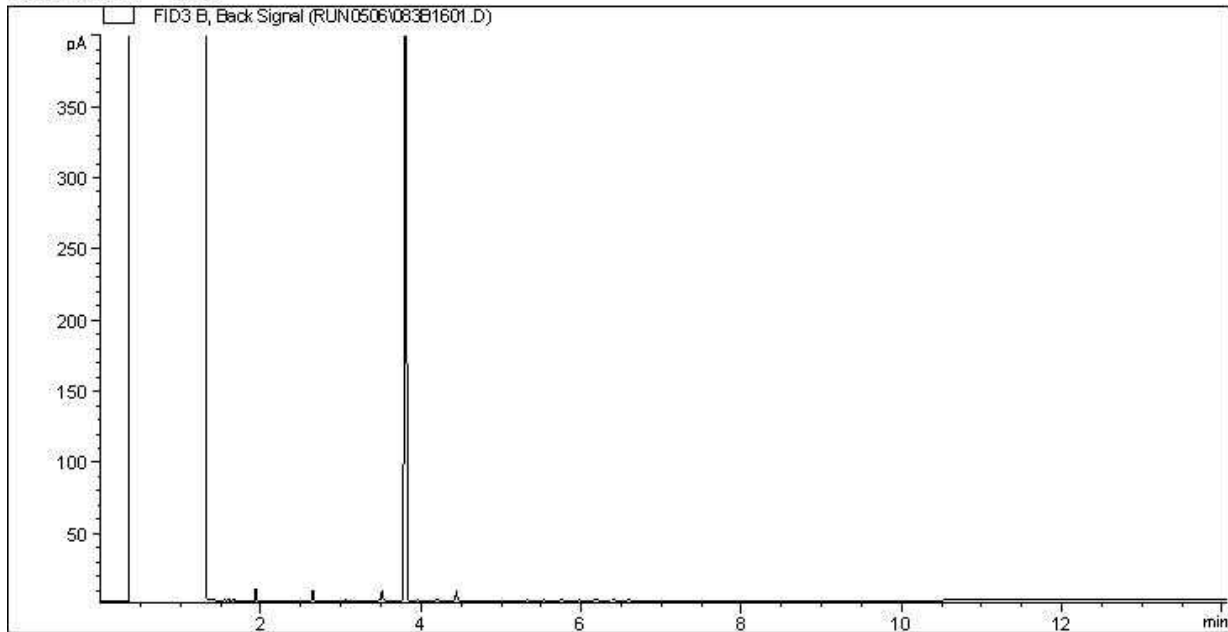
TYPICAL PRODUCT CARBON NUMBER RANGES

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

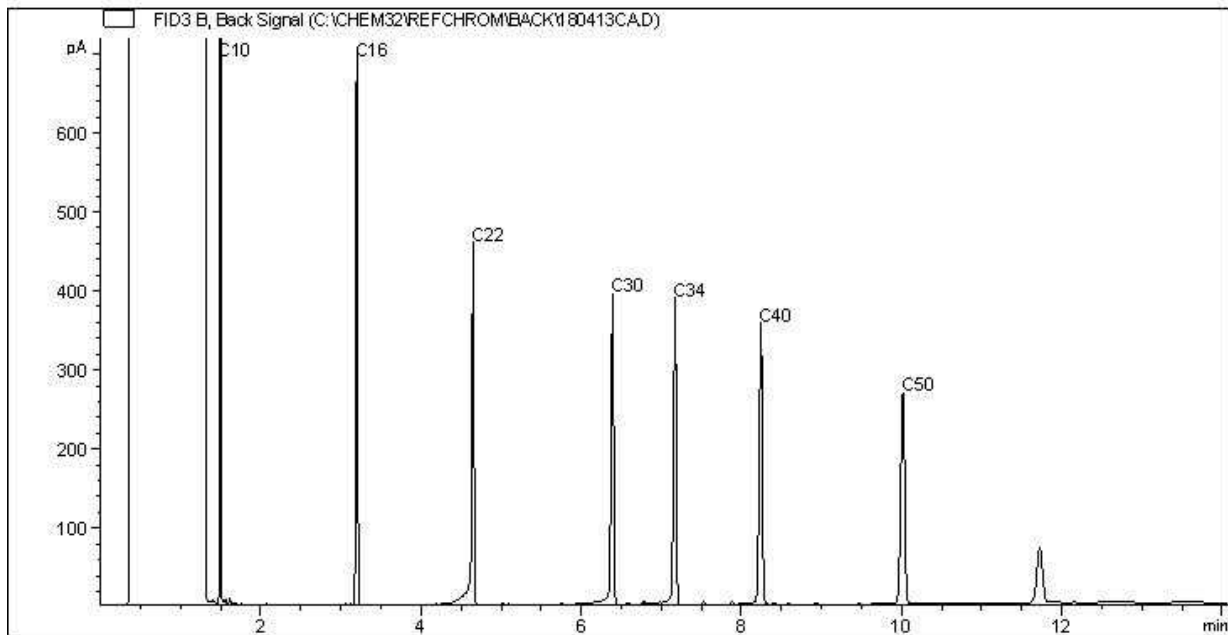
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



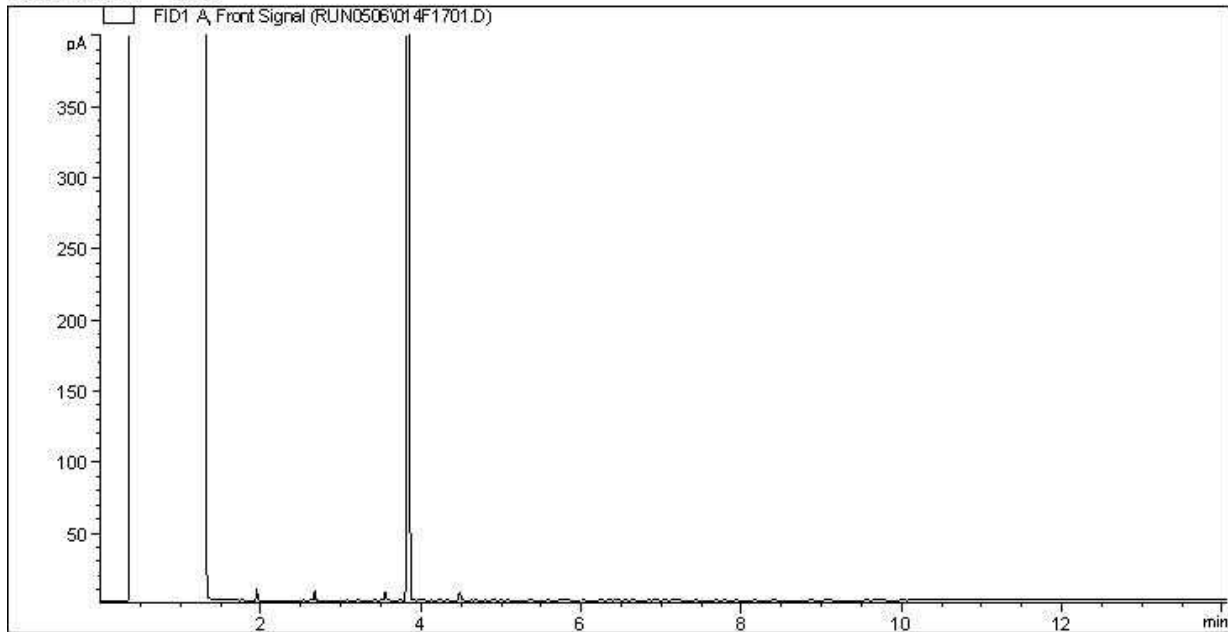
TYPICAL PRODUCT CARBON NUMBER RANGES

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

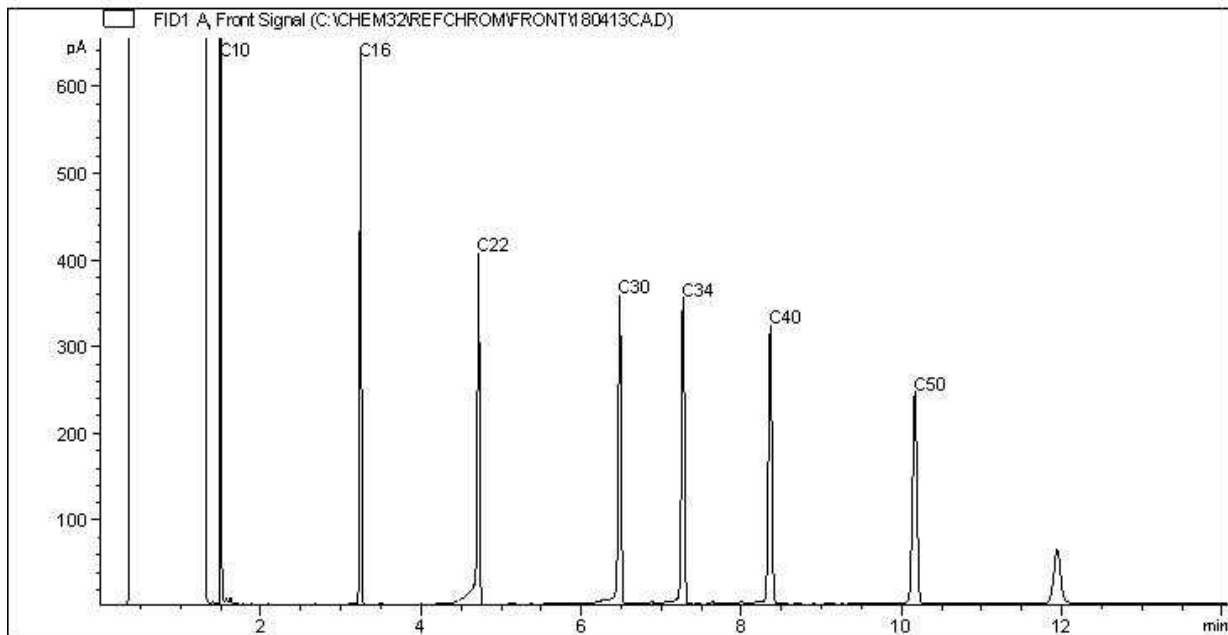
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



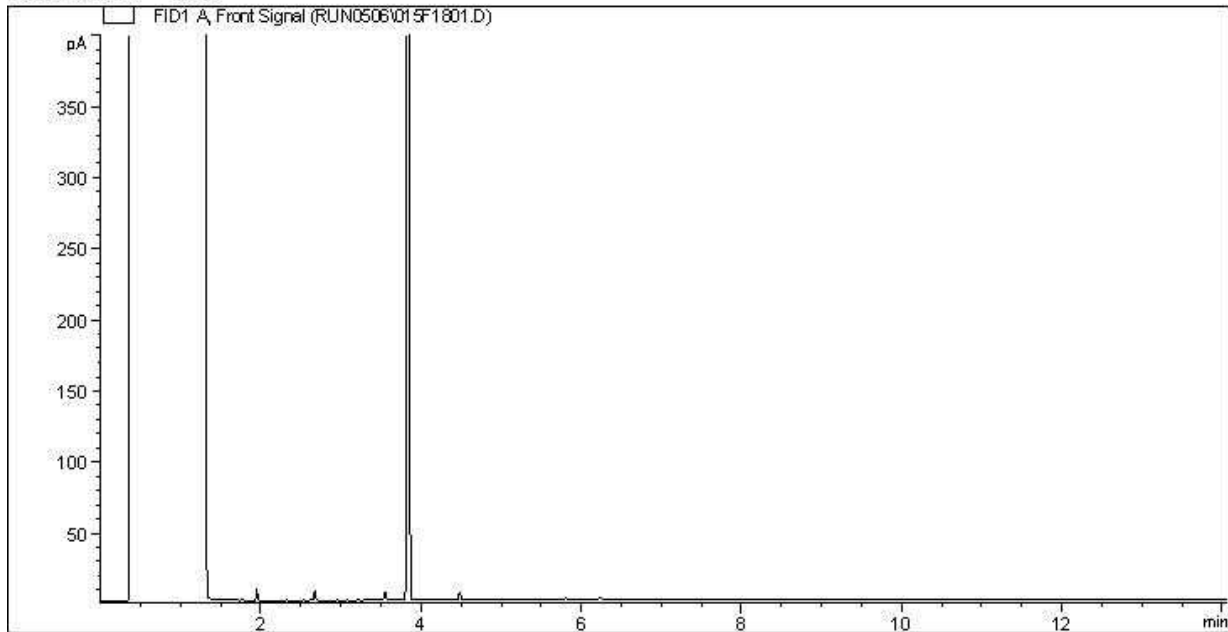
TYPICAL PRODUCT CARBON NUMBER RANGES

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

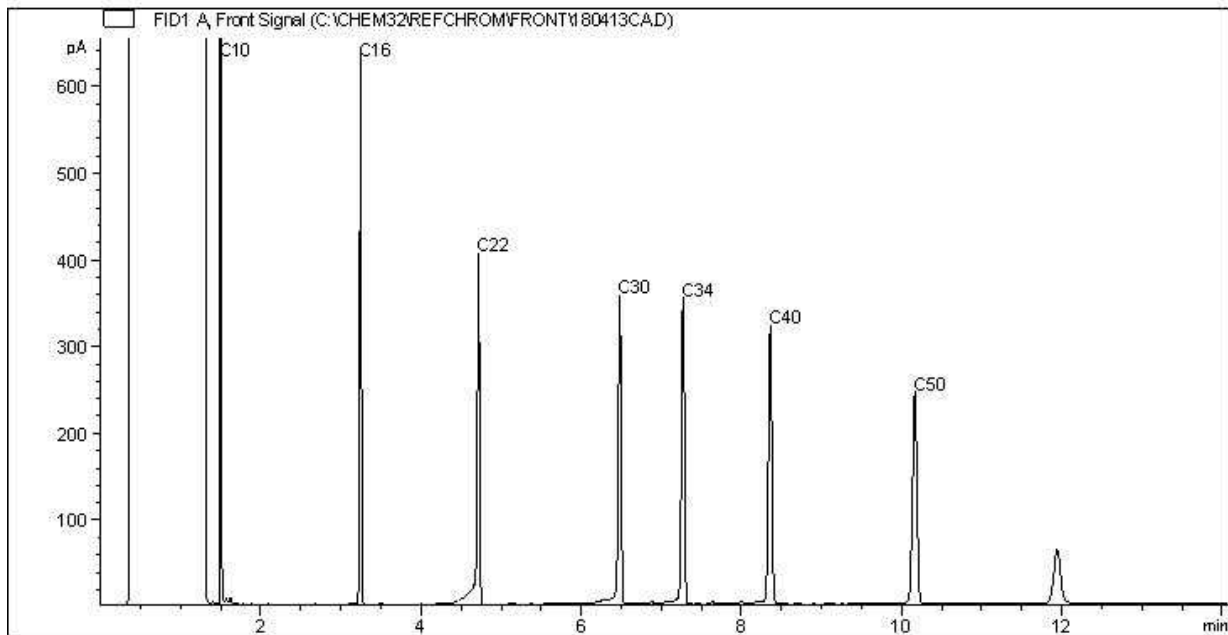
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC15



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.

Your Project #: CG2430.1 E28
Your C.O.C. #: 1 OF 1

Attention: STEPHEN DABADIE

CLIFTON ASSOCIATES LTD.
2222 30TH AVENUE NE
CALGARY, AB
CANADA T2E 7K9

Report Date: 2018/05/14
Report #: R2553728
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B835165

Received: 2018/05/08, 16:46

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2018/05/11	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2018/05/11	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/05/10	2018/05/10	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/05/10	2018/05/11	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	8	N/A	2018/05/14	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	8	2018/05/10	2018/05/11	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	9	N/A	2018/05/11	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	9	N/A	2018/05/11	AB SOP-00056	EPA 5021a/8260d m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

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) Silica gel clean up employed.

(2) 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.

Your Project #: CG2430.1 E28
Your C.O.C. #: 1 OF 1

Attention: STEPHEN DABADIE

CLIFTON ASSOCIATES LTD.
2222 30TH AVENUE NE
CALGARY, AB
CANADA T2E 7K9

Report Date: 2018/05/14
Report #: R2553728
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B835165
Received: 2018/05/08, 16:46

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Leanne Cameron, C.E.T., Senior Project Manager
Email: LCameron@maxxam.ca
Phone# (403) 291-3077

=====
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TK0386	TK0387	TK0388	TK0389	TK0390	TK0391		
Sampling Date									
COC Number		1 OF 1	1 OF 1	1 OF 1	1 OF 1	1 OF 1	1 OF 1		
	UNITS	3001 A	3001 B	3001 C	3002 A	3002 B	3003 A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8984138
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8983030
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8983030
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8983030
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8983030
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8983030
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	0.00089	8983927
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8983927
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8983030
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	85	81	95	84	91	90	N/A	8983030
4-Bromofluorobenzene (sur.)	%	100	102	98	101	98	98	N/A	8983030
D4-1,2-Dichloroethane (sur.)	%	104	114	88	107	93	94	N/A	8983030
O-TERPHENYL (sur.)	%	94	92	88	97	89	100	N/A	8984138
RDL = Reportable Detection Limit N/A = Not Applicable									

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TK0392	TK0393		
Sampling Date					
COC Number		1 OF 1	1 OF 1		
	UNITS	3003 B	3902 B	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	8984138
Volatiles					
Benzene	mg/L	<0.00040	<0.00040	0.00040	8983030
Toluene	mg/L	<0.00040	<0.00040	0.00040	8983030
Ethylbenzene	mg/L	<0.00040	<0.00040	0.00040	8983030
m & p-Xylene	mg/L	<0.00080	<0.00080	0.00080	8983030
o-Xylene	mg/L	<0.00040	<0.00040	0.00040	8983030
Xylenes (Total)	mg/L	<0.00089	<0.00089	0.00089	8983927
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	0.10	8983927
F1 (C6-C10)	mg/L	<0.10	<0.10	0.10	8983030
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	96	95	N/A	8983030
4-Bromofluorobenzene (sur.)	%	99	97	N/A	8983030
D4-1,2-Dichloroethane (sur.)	%	88	87	N/A	8983030
O-TERPHENYL (sur.)	%	88	90	N/A	8984138
RDL = Reportable Detection Limit N/A = Not Applicable					

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TK0386	TK0387	TK0388	TK0389	TK0390		
Sampling Date								
COC Number		1 OF 1	1 OF 1	1 OF 1	1 OF 1	1 OF 1		
	UNITS	3001 A	3001 B	3001 C	3002 A	3002 B	RDL	QC Batch

Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8983439
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8984110
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8984110
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	8984110
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8984110
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	8984110
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	8984110
Benzo(e)pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	8984110
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	8984110
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	8984110
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8984110
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	8984110
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	8984110
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8984110
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8984110
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8984110
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	8984110
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	8984110
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	8984110
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8984110

Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	94	99	95	100	96	N/A	8984110
D8-ACENAPHTHYLENE (sur.)	%	82	86	88	94	90	N/A	8984110
D8-NAPHTHALENE (sur.)	%	70	77	77	78	80	N/A	8984110
TERPHENYL-D14 (sur.)	%	102	112	106	111	107	N/A	8984110

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TK0391		TK0392	TK0393		
Sampling Date							
COC Number		1 OF 1		1 OF 1	1 OF 1		
	UNITS	3003 A	QC Batch	3003 B	3902 B	RDL	QC Batch
Polycyclic Aromatics							
Benzo[a]pyrene equivalency	mg/L	<0.000010	8983439	<0.000010	<0.000010	0.000010	8984168
Acenaphthene	mg/L	<0.00010	8984110	<0.00010	<0.00010	0.00010	8984110
Acenaphthylene	mg/L	<0.00010	8984110	<0.00010	<0.00010	0.00010	8984110
Acridine	mg/L	<0.000050	8984110	<0.000050	<0.000050	0.000050	8984110
Anthracene	mg/L	<0.000010	8984110	<0.000010	<0.000010	0.000010	8984110
Benzo(a)anthracene	mg/L	<0.0000085	8984110	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(b&j)fluoranthene	mg/L	<0.0000085	8984110	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(k)fluoranthene	mg/L	<0.0000085	8984110	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(g,h,i)perylene	mg/L	<0.0000085	8984110	<0.0000085	<0.0000085	0.0000085	8984110
Benzo(c)phenanthrene	mg/L	<0.000050	8984110	<0.000050	<0.000050	0.000050	8984110
Benzo(a)pyrene	mg/L	<0.0000075	8984110	<0.0000075	<0.0000075	0.0000075	8984110
Benzo[e]pyrene	mg/L	<0.000050	8984110	<0.000050	<0.000050	0.000050	8984110
Chrysene	mg/L	<0.0000085	8984110	<0.0000085	<0.0000085	0.0000085	8984110
Dibenz(a,h)anthracene	mg/L	<0.0000075	8984110	<0.0000075	<0.0000075	0.0000075	8984110
Fluoranthene	mg/L	<0.000010	8984110	<0.000010	<0.000010	0.000010	8984110
Fluorene	mg/L	<0.000050	8984110	<0.000050	<0.000050	0.000050	8984110
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	8984110	<0.0000085	<0.0000085	0.0000085	8984110
1-Methylnaphthalene	mg/L	<0.00010	8984110	<0.00010	<0.00010	0.00010	8984110
2-Methylnaphthalene	mg/L	<0.00010	8984110	<0.00010	<0.00010	0.00010	8984110
Naphthalene	mg/L	<0.00010	8984110	<0.00010	<0.00010	0.00010	8984110
Phenanthrene	mg/L	<0.000050	8984110	<0.000050	<0.000050	0.000050	8984110
Perylene	mg/L	<0.000050	8984110	<0.000050	<0.000050	0.000050	8984110
Pyrene	mg/L	<0.000020	8984110	<0.000020	<0.000020	0.000020	8984110
Quinoline	mg/L	<0.00020	8984110	<0.00020	<0.00020	0.00020	8984110
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	96	8984110	96	93	N/A	8984110
D8-ACENAPHTHYLENE (sur.)	%	83	8984110	88	82	N/A	8984110
D8-NAPHTHALENE (sur.)	%	73	8984110	81	76	N/A	8984110
TERPHENYL-D14 (sur.)	%	108	8984110	107	105	N/A	8984110
RDL = Reportable Detection Limit N/A = Not Applicable							

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TK0385	TK0386	TK0387	TK0388	TK0389		
Sampling Date								
COC Number		1 OF 1	1 OF 1	1 OF 1	1 OF 1	1 OF 1		
	UNITS	TRIP BLANK	3001 A	3001 B	3001 C	3002 A	RDL	QC Batch
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	8983209
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8982556
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8982556
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8982556
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8982556
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8982556
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8982556
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8982556
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8982556
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8982556
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8982556
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
RDL = Reportable Detection Limit								

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TK0385	TK0386	TK0387	TK0388	TK0389		
Sampling Date								
COC Number		1 OF 1	1 OF 1	1 OF 1	1 OF 1	1 OF 1		
	UNITS	TRIP BLANK	3001 A	3001 B	3001 C	3002 A	RDL	QC Batch
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8982556
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	98	97	98	98	98	N/A	8982556
4-Bromofluorobenzene (sur.)	%	93	93	93	93	92	N/A	8982556
D4-1,2-Dichloroethane (sur.)	%	102	104	104	104	104	N/A	8982556
RDL = Reportable Detection Limit N/A = Not Applicable								

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TK0390		TK0391		TK0392	TK0393		
Sampling Date									
COC Number		1 OF 1		1 OF 1		1 OF 1	1 OF 1		
	UNITS	3002 B	RDL	3003 A	RDL	3003 B	3902 B	RDL	QC Batch

Volatiles									
Total Trihalomethanes	mg/L	<0.0013	0.0013	<0.0013	0.0013	<0.0013	<0.0013	0.0013	8983209
Bromodichloromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Bromoform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Bromomethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	8982556
Carbon tetrachloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Chlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Chlorodibromomethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8982556
Chloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8982556
Chloroform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Chloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	8982556
1,2-dibromoethane	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	<0.00020	0.00020	8982556
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,1-dichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,2-dichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,1-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Dichloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	8982556
1,2-dichloropropane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Methyl methacrylate	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	<0.00070 (1)	0.00070	<0.00050	<0.00050	0.00050	8982556
Styrene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8982556
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	8982556
Tetrachloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8982556
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8982556
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556

RDL = Reportable Detection Limit

(1) Detection limit raised due to interferent.

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TK0390		TK0391		TK0392	TK0393		
Sampling Date									
COC Number		1 OF 1		1 OF 1		1 OF 1	1 OF 1		
	UNITS	3002 B	RDL	3003 A	RDL	3003 B	3902 B	RDL	QC Batch
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Trichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Trichlorofluoromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Vinyl chloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	8982556
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	97	N/A	98	N/A	98	98	N/A	8982556
4-Bromofluorobenzene (sur.)	%	93	N/A	92	N/A	92	92	N/A	8982556
D4-1,2-Dichloroethane (sur.)	%	105	N/A	101	N/A	104	105	N/A	8982556
RDL = Reportable Detection Limit N/A = Not Applicable									

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

GENERAL COMMENTS

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

Package 1	6.7°C
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Results relate only to the items tested.

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

QUALITY ASSURANCE REPORT

QA/QC		QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
Batch	Init							
8982556	RSU	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/05/11		97	%	70 - 130
			4-Bromofluorobenzene (sur.)	2018/05/11		97	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2018/05/11		106	%	70 - 130
			Bromodichloromethane	2018/05/11		123	%	70 - 130
			Bromoform	2018/05/11		116	%	70 - 130
			Bromomethane	2018/05/11		127	%	70 - 130
			Carbon tetrachloride	2018/05/11		119	%	70 - 130
			Chlorobenzene	2018/05/11		114	%	70 - 130
			Chlorodibromomethane	2018/05/11		120	%	70 - 130
			Chloroethane	2018/05/11		128	%	70 - 130
			Chloroform	2018/05/11		116	%	70 - 130
			Chloromethane	2018/05/11		133 (1)	%	70 - 130
			1,2-dibromoethane	2018/05/11		122	%	70 - 130
			1,2-dichlorobenzene	2018/05/11		124	%	70 - 130
			1,3-dichlorobenzene	2018/05/11		108	%	70 - 130
			1,4-dichlorobenzene	2018/05/11		107	%	70 - 130
			1,1-dichloroethane	2018/05/11		113	%	70 - 130
			1,2-dichloroethane	2018/05/11		127	%	70 - 130
			1,1-dichloroethene	2018/05/11		125	%	70 - 130
			cis-1,2-dichloroethene	2018/05/11		121	%	70 - 130
			trans-1,2-dichloroethene	2018/05/11		116	%	70 - 130
			Dichloromethane	2018/05/11		105	%	70 - 130
			1,2-dichloropropane	2018/05/11		126	%	70 - 130
			cis-1,3-dichloropropene	2018/05/11		129	%	70 - 130
			trans-1,3-dichloropropene	2018/05/11		139 (1)	%	70 - 130
			Methyl methacrylate	2018/05/11		125	%	70 - 130
			Methyl-tert-butylether (MTBE)	2018/05/11		115	%	70 - 130
			Styrene	2018/05/11		109	%	70 - 130
			1,1,1,2-tetrachloroethane	2018/05/11		110	%	70 - 130
			1,1,2,2-tetrachloroethane	2018/05/11		114	%	70 - 130
			Tetrachloroethene	2018/05/11		103	%	70 - 130
			1,2,3-trichlorobenzene	2018/05/11		103	%	70 - 130
			1,2,4-trichlorobenzene	2018/05/11		96	%	70 - 130
			1,3,5-trichlorobenzene	2018/05/11		99	%	70 - 130
1,1,1-trichloroethane	2018/05/11		119	%	70 - 130			
1,1,2-trichloroethane	2018/05/11		120	%	70 - 130			
Trichloroethene	2018/05/11		124	%	70 - 130			
Trichlorofluoromethane	2018/05/11		128	%	70 - 130			
1,2,4-trimethylbenzene	2018/05/11		117	%	70 - 130			
1,3,5-trimethylbenzene	2018/05/11		111	%	70 - 130			
Vinyl chloride	2018/05/11		135 (1)	%	70 - 130			
8982556	RSU	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/05/11		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2018/05/11		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2018/05/11		103	%	70 - 130
			Bromodichloromethane	2018/05/11		113	%	70 - 130
			Bromoform	2018/05/11		110	%	70 - 130
			Bromomethane	2018/05/11		76	%	70 - 130
			Carbon tetrachloride	2018/05/11		108	%	70 - 130
			Chlorobenzene	2018/05/11		110	%	70 - 130
			Chlorodibromomethane	2018/05/11		114	%	70 - 130
			Chloroethane	2018/05/11		93	%	70 - 130
			Chloroform	2018/05/11		107	%	70 - 130
			Chloromethane	2018/05/11		61 (1)	%	70 - 130
			1,2-dibromoethane	2018/05/11		114	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-dichlorobenzene	2018/05/11		125	%	70 - 130
			1,3-dichlorobenzene	2018/05/11		108	%	70 - 130
			1,4-dichlorobenzene	2018/05/11		106	%	70 - 130
			1,1-dichloroethane	2018/05/11		101	%	70 - 130
			1,2-dichloroethane	2018/05/11		110	%	70 - 130
			1,1-dichloroethene	2018/05/11		102	%	70 - 130
			cis-1,2-dichloroethene	2018/05/11		109	%	70 - 130
			trans-1,2-dichloroethene	2018/05/11		98	%	70 - 130
			Dichloromethane	2018/05/11		91	%	70 - 130
			1,2-dichloropropane	2018/05/11		116	%	70 - 130
			cis-1,3-dichloropropene	2018/05/11		98	%	70 - 130
			trans-1,3-dichloropropene	2018/05/11		102	%	70 - 130
			Methyl methacrylate	2018/05/11		118	%	70 - 130
			Methyl-tert-butylether (MTBE)	2018/05/11		105	%	70 - 130
			Styrene	2018/05/11		106	%	70 - 130
			1,1,1,2-tetrachloroethane	2018/05/11		108	%	70 - 130
			1,1,2,2-tetrachloroethane	2018/05/11		109	%	70 - 130
			Tetrachloroethene	2018/05/11		99	%	70 - 130
			1,2,3-trichlorobenzene	2018/05/11		120	%	70 - 130
			1,2,4-trichlorobenzene	2018/05/11		108	%	70 - 130
			1,3,5-trichlorobenzene	2018/05/11		107	%	70 - 130
			1,1,1-trichloroethane	2018/05/11		107	%	70 - 130
			1,1,2-trichloroethane	2018/05/11		110	%	70 - 130
			Trichloroethene	2018/05/11		112	%	70 - 130
			Trichlorofluoromethane	2018/05/11		97	%	70 - 130
			1,2,4-trimethylbenzene	2018/05/11		111	%	70 - 130
			1,3,5-trimethylbenzene	2018/05/11		110	%	70 - 130
			Vinyl chloride	2018/05/11		87	%	70 - 130
8982556	RSU	Method Blank	1,4-Difluorobenzene (sur.)	2018/05/11		97	%	70 - 130
			4-Bromofluorobenzene (sur.)	2018/05/11		93	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2018/05/11		102	%	70 - 130
			Bromodichloromethane	2018/05/11	<0.00050		mg/L	
			Bromoform	2018/05/11	<0.00050		mg/L	
			Bromomethane	2018/05/11	<0.0020		mg/L	
			Carbon tetrachloride	2018/05/11	<0.00050		mg/L	
			Chlorobenzene	2018/05/11	<0.00050		mg/L	
			Chlorodibromomethane	2018/05/11	<0.0010		mg/L	
			Chloroethane	2018/05/11	<0.0010		mg/L	
			Chloroform	2018/05/11	<0.00050		mg/L	
			Chloromethane	2018/05/11	<0.0020		mg/L	
			1,2-dibromoethane	2018/05/11	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/05/11	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/05/11	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/05/11	<0.00050		mg/L	
			1,1-dichloroethane	2018/05/11	<0.00050		mg/L	
			1,2-dichloroethane	2018/05/11	<0.00050		mg/L	
			1,1-dichloroethene	2018/05/11	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/05/11	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/05/11	<0.00050		mg/L	
			Dichloromethane	2018/05/11	<0.0020		mg/L	
			1,2-dichloropropane	2018/05/11	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/05/11	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/05/11	<0.00050		mg/L	
			Methyl methacrylate	2018/05/11	<0.00050		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl-tert-butylether (MTBE)	2018/05/11	<0.00050		mg/L	
			Styrene	2018/05/11	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/05/11	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/05/11	<0.0020		mg/L	
			Tetrachloroethene	2018/05/11	<0.00050		mg/L	
			1,2,3-trichlorobenzene	2018/05/11	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/05/11	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/05/11	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/05/11	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/05/11	<0.00050		mg/L	
			Trichloroethene	2018/05/11	<0.00050		mg/L	
			Trichlorofluoromethane	2018/05/11	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/05/11	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/05/11	<0.00050		mg/L	
			Vinyl chloride	2018/05/11	<0.00050		mg/L	
8982556	RSU	RPD	Bromodichloromethane	2018/05/11	NC		%	30
			Bromoform	2018/05/11	NC		%	30
			Bromomethane	2018/05/11	NC		%	30
			Carbon tetrachloride	2018/05/11	NC		%	30
			Chlorobenzene	2018/05/11	NC		%	30
			Chlorodibromomethane	2018/05/11	NC		%	30
			Chloroethane	2018/05/11	NC		%	30
			Chloroform	2018/05/11	NC		%	30
			Chloromethane	2018/05/11	NC		%	30
			1,2-dibromoethane	2018/05/11	NC		%	30
			1,2-dichlorobenzene	2018/05/11	NC		%	30
			1,3-dichlorobenzene	2018/05/11	NC		%	30
			1,4-dichlorobenzene	2018/05/11	NC		%	30
			1,1-dichloroethane	2018/05/11	NC		%	30
			1,2-dichloroethane	2018/05/11	NC		%	30
			1,1-dichloroethene	2018/05/11	NC		%	30
			cis-1,2-dichloroethene	2018/05/11	NC		%	30
			trans-1,2-dichloroethene	2018/05/11	NC		%	30
			Dichloromethane	2018/05/11	NC		%	30
			1,2-dichloropropane	2018/05/11	NC		%	30
			cis-1,3-dichloropropene	2018/05/11	NC		%	30
			trans-1,3-dichloropropene	2018/05/11	NC		%	30
			Methyl methacrylate	2018/05/11	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/05/11	NC		%	30
			Styrene	2018/05/11	NC		%	30
			1,1,1,2-tetrachloroethane	2018/05/11	NC		%	30
			1,1,2,2-tetrachloroethane	2018/05/11	NC		%	30
			Tetrachloroethene	2018/05/11	NC		%	30
			1,2,3-trichlorobenzene	2018/05/11	NC		%	30
			1,2,4-trichlorobenzene	2018/05/11	NC		%	30
			1,3,5-trichlorobenzene	2018/05/11	NC		%	30
			1,1,1-trichloroethane	2018/05/11	NC		%	30
			1,1,2-trichloroethane	2018/05/11	NC		%	30
			Trichloroethene	2018/05/11	NC		%	30
			Trichlorofluoromethane	2018/05/11	NC		%	30
			1,2,4-trimethylbenzene	2018/05/11	NC		%	30
			1,3,5-trimethylbenzene	2018/05/11	NC		%	30
			Vinyl chloride	2018/05/11	NC		%	30
8983030	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/05/11		87	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits			
8983030	DO1	Spiked Blank	4-Bromofluorobenzene (sur.)	2018/05/11		102	%	50 - 140			
			D4-1,2-Dichloroethane (sur.)	2018/05/11		88	%	50 - 140			
			Benzene	2018/05/11		83	%	50 - 140			
			Toluene	2018/05/11		78	%	50 - 140			
			Ethylbenzene	2018/05/11		84	%	50 - 140			
			m & p-Xylene	2018/05/11		77	%	50 - 140			
			o-Xylene	2018/05/11		82	%	50 - 140			
			F1 (C6-C10)	2018/05/11		76	%	60 - 140			
			1,4-Difluorobenzene (sur.)	2018/05/11		90	%	50 - 140			
			4-Bromofluorobenzene (sur.)	2018/05/11		101	%	50 - 140			
			D4-1,2-Dichloroethane (sur.)	2018/05/11		85	%	50 - 140			
			Benzene	2018/05/11		86	%	60 - 130			
			Toluene	2018/05/11		81	%	60 - 130			
			Ethylbenzene	2018/05/11		89	%	60 - 130			
			8983030	DO1	Method Blank	m & p-Xylene	2018/05/11		81	%	60 - 130
o-Xylene	2018/05/11					96	%	60 - 130			
F1 (C6-C10)	2018/05/11					85	%	60 - 140			
1,4-Difluorobenzene (sur.)	2018/05/11					90	%	50 - 140			
4-Bromofluorobenzene (sur.)	2018/05/11					99	%	50 - 140			
D4-1,2-Dichloroethane (sur.)	2018/05/11					93	%	50 - 140			
Benzene	2018/05/11	<0.00040					mg/L				
Toluene	2018/05/11	<0.00040					mg/L				
Ethylbenzene	2018/05/11	<0.00040					mg/L				
m & p-Xylene	2018/05/11	<0.00080					mg/L				
o-Xylene	2018/05/11	<0.00040					mg/L				
F1 (C6-C10)	2018/05/11	<0.10					mg/L				
8983030	DO1	RPD				Benzene	2018/05/11	NC		%	30
						Toluene	2018/05/11	NC		%	30
						Ethylbenzene	2018/05/11	NC		%	30
			m & p-Xylene	2018/05/11	NC		%	30			
			o-Xylene	2018/05/11	NC		%	30			
			F1 (C6-C10)	2018/05/11	NC		%	30			
8984110	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/05/11		101	%	50 - 130			
			D8-ACENAPHTHYLENE (sur.)	2018/05/11		97	%	50 - 130			
			D8-NAPHTHALENE (sur.)	2018/05/11		84	%	50 - 130			
			TERPHENYL-D14 (sur.)	2018/05/11		111	%	50 - 130			
			Acenaphthene	2018/05/11		97	%	50 - 130			
			Acenaphthylene	2018/05/11		96	%	50 - 130			
			Acridine	2018/05/11		88	%	50 - 130			
			Anthracene	2018/05/11		86	%	50 - 130			
			Benzo(a)anthracene	2018/05/11		97	%	50 - 130			
			Benzo(b&j)fluoranthene	2018/05/11		85	%	50 - 130			
			Benzo(k)fluoranthene	2018/05/11		82	%	50 - 130			
			Benzo(g,h,i)perylene	2018/05/11		74	%	50 - 130			
			Benzo(c)phenanthrene	2018/05/11		93	%	50 - 130			
			Benzo(a)pyrene	2018/05/11		76	%	50 - 130			
			Benzo[e]pyrene	2018/05/11		77	%	50 - 130			
			Chrysene	2018/05/11		91	%	50 - 130			
			Dibenz(a,h)anthracene	2018/05/11		82	%	50 - 130			
			Fluoranthene	2018/05/11		105	%	50 - 130			
			Fluorene	2018/05/11		98	%	50 - 130			
			Indeno(1,2,3-cd)pyrene	2018/05/11		76	%	50 - 130			
1-Methylnaphthalene	2018/05/11		95	%	50 - 130						
2-Methylnaphthalene	2018/05/11		88	%	50 - 130						

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8984110	LZ3	Spiked Blank	Naphthalene	2018/05/11		92	%	50 - 130
			Phenanthrene	2018/05/11		96	%	50 - 130
			Perylene	2018/05/11		73	%	50 - 130
			Pyrene	2018/05/11		100	%	50 - 130
			Quinoline	2018/05/11		107	%	50 - 130
			D10-ANTHRACENE (sur.)	2018/05/11		97	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/05/11		90	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/05/11		76	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/05/11		108	%	50 - 130
			Acenaphthene	2018/05/11		93	%	50 - 130
			Acenaphthylene	2018/05/11		93	%	50 - 130
			Acridine	2018/05/11		87	%	50 - 130
			Anthracene	2018/05/11		90	%	50 - 130
			Benzo(a)anthracene	2018/05/11		116	%	50 - 130
			Benzo(b&j)fluoranthene	2018/05/11		103	%	50 - 130
			Benzo(k)fluoranthene	2018/05/11		101	%	50 - 130
			Benzo(g,h,i)perylene	2018/05/11		93	%	50 - 130
			Benzo(c)phenanthrene	2018/05/11		106	%	50 - 130
			Benzo(a)pyrene	2018/05/11		95	%	50 - 130
			Benzo[e]pyrene	2018/05/11		97	%	50 - 130
			Chrysene	2018/05/11		111	%	50 - 130
			Dibenz(a,h)anthracene	2018/05/11		104	%	50 - 130
			Fluoranthene	2018/05/11		120	%	50 - 130
			Fluorene	2018/05/11		96	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/05/11		96	%	50 - 130
			1-Methylnaphthalene	2018/05/11		92	%	50 - 130
			2-Methylnaphthalene	2018/05/11		85	%	50 - 130
8984110	LZ3	Method Blank	Naphthalene	2018/05/11		89	%	50 - 130
			Phenanthrene	2018/05/11		97	%	50 - 130
			Perylene	2018/05/11		92	%	50 - 130
			Pyrene	2018/05/11		109	%	50 - 130
			Quinoline	2018/05/11		104	%	50 - 130
			D10-ANTHRACENE (sur.)	2018/05/11		98	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/05/11		89	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/05/11		75	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/05/11		107	%	50 - 130
			Acenaphthene	2018/05/11	<0.00010		mg/L	
			Acenaphthylene	2018/05/11	<0.00010		mg/L	
			Acridine	2018/05/11	<0.000050		mg/L	
			Anthracene	2018/05/11	<0.000010		mg/L	
			Benzo(a)anthracene	2018/05/11	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/05/11	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/05/11	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/05/11	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/05/11	<0.000050		mg/L	
			Benzo(a)pyrene	2018/05/11	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/05/11	<0.000050		mg/L	
			Chrysene	2018/05/11	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/05/11	<0.0000075		mg/L	
			Fluoranthene	2018/05/11	<0.000010		mg/L	
			Fluorene	2018/05/11	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/05/11	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/05/11	<0.00010		mg/L	
			2-Methylnaphthalene	2018/05/11	<0.00010		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8984110	LZ3	RPD	Naphthalene	2018/05/11	<0.00010		mg/L	
			Phenanthrene	2018/05/11	<0.000050		mg/L	
			Perylene	2018/05/11	<0.000050		mg/L	
			Pyrene	2018/05/11	<0.000020		mg/L	
			Quinoline	2018/05/11	<0.00020		mg/L	
			Acenaphthene	2018/05/11	NC		%	30
			Acenaphthylene	2018/05/11	NC		%	30
			Acridine	2018/05/11	NC		%	30
			Anthracene	2018/05/11	NC		%	30
			Benzo(a)anthracene	2018/05/11	NC		%	30
			Benzo(b&j)fluoranthene	2018/05/11	NC		%	30
			Benzo(k)fluoranthene	2018/05/11	NC		%	30
			Benzo(g,h,i)perylene	2018/05/11	NC		%	30
			Benzo(c)phenanthrene	2018/05/11	NC		%	30
			Benzo(a)pyrene	2018/05/11	NC		%	30
			Benzo[e]pyrene	2018/05/11	NC		%	30
			Chrysene	2018/05/11	NC		%	30
			Dibenz(a,h)anthracene	2018/05/11	NC		%	30
			Fluoranthene	2018/05/11	NC		%	30
			Fluorene	2018/05/11	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/05/11	NC		%	30
			1-Methylnaphthalene	2018/05/11	NC		%	30
			2-Methylnaphthalene	2018/05/11	NC		%	30
			Naphthalene	2018/05/11	NC		%	30
			Phenanthrene	2018/05/11	NC		%	30
			Perylene	2018/05/11	NC		%	30
			Pyrene	2018/05/11	NC		%	30
Quinoline	2018/05/11	NC		%	30			
8984138	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/05/10		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/05/10		115	%	60 - 130
8984138	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/05/10		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/05/10		110	%	70 - 130
8984138	VP4	Method Blank	O-TERPHENYL (sur.)	2018/05/10		91	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/05/10	<0.10		mg/L	
8984138	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/05/10	14		%	30

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).

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

Maxxam Job #: B835165
Report Date: 2018/05/14

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Job #: B835165
Report Date: 2018/05/14

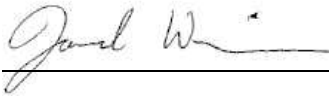
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E28
Sampler Initials: AM

VALIDATION SIGNATURE PAGE

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



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



Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics

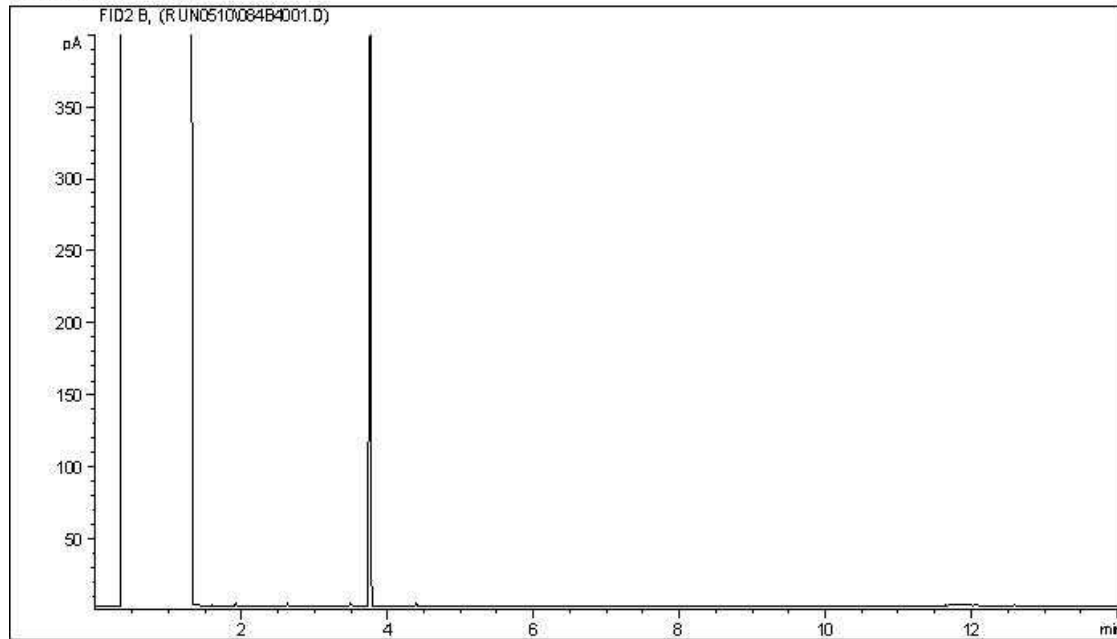


Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

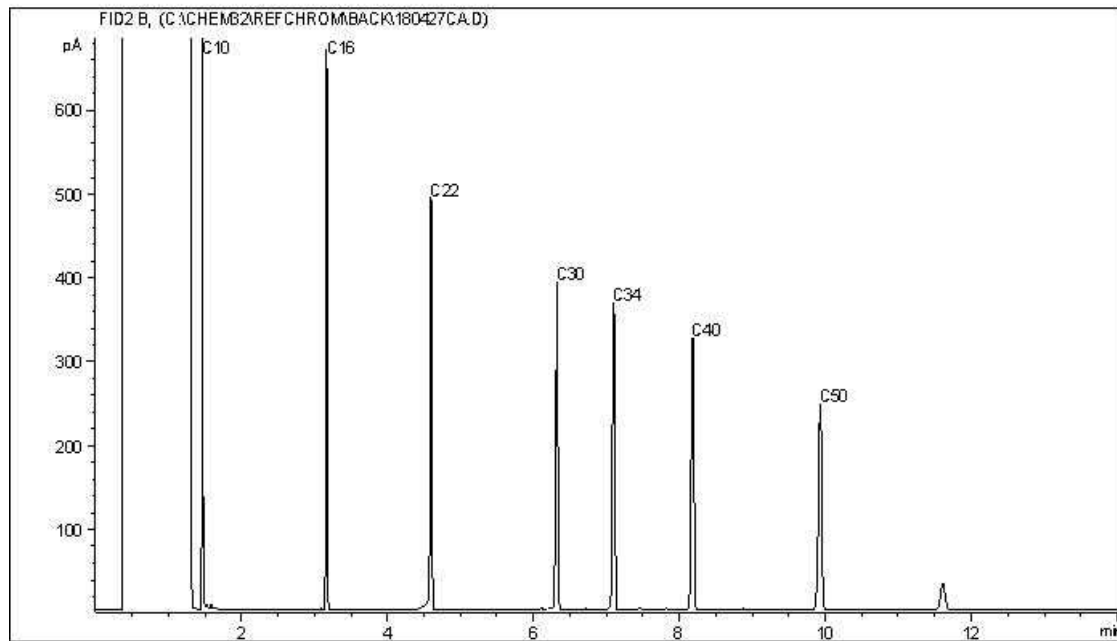
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



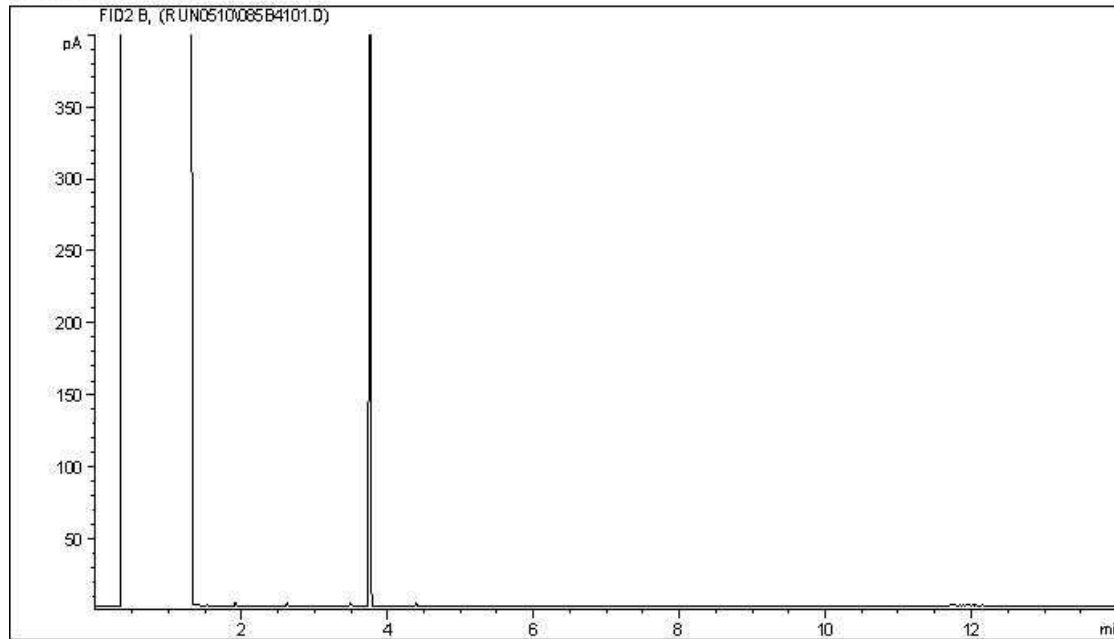
TYPICAL PRODUCT CARBON NUMBER RANGES

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

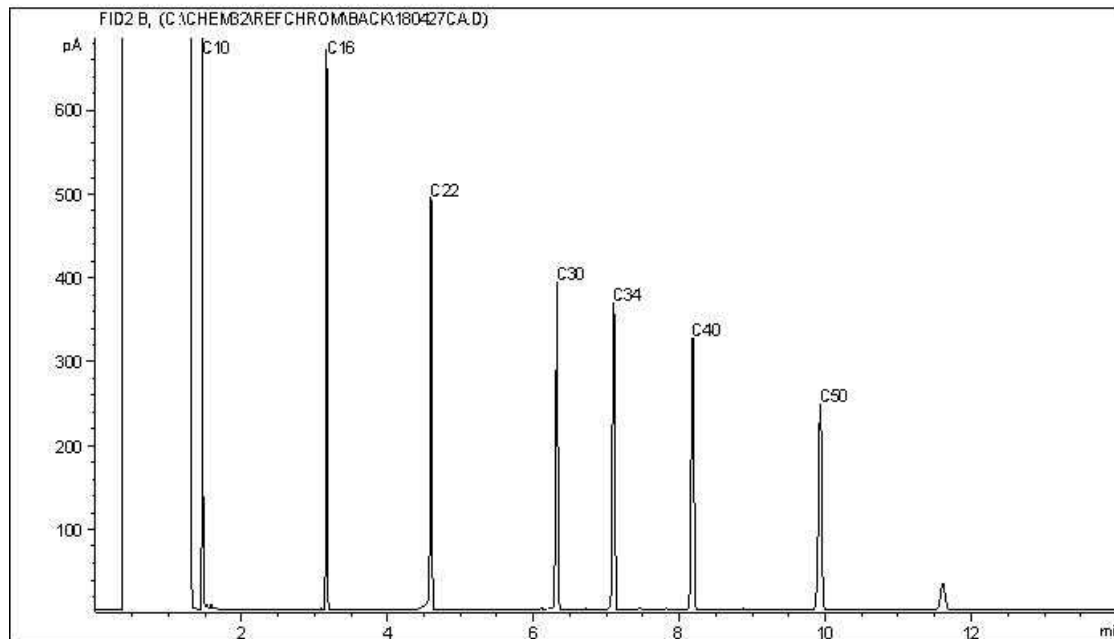
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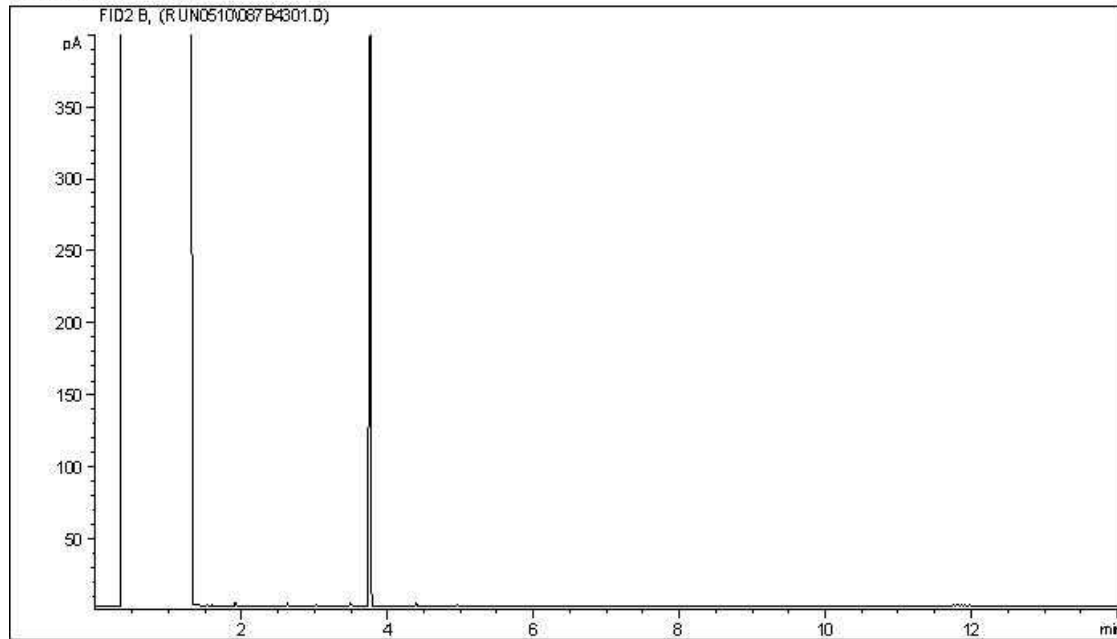
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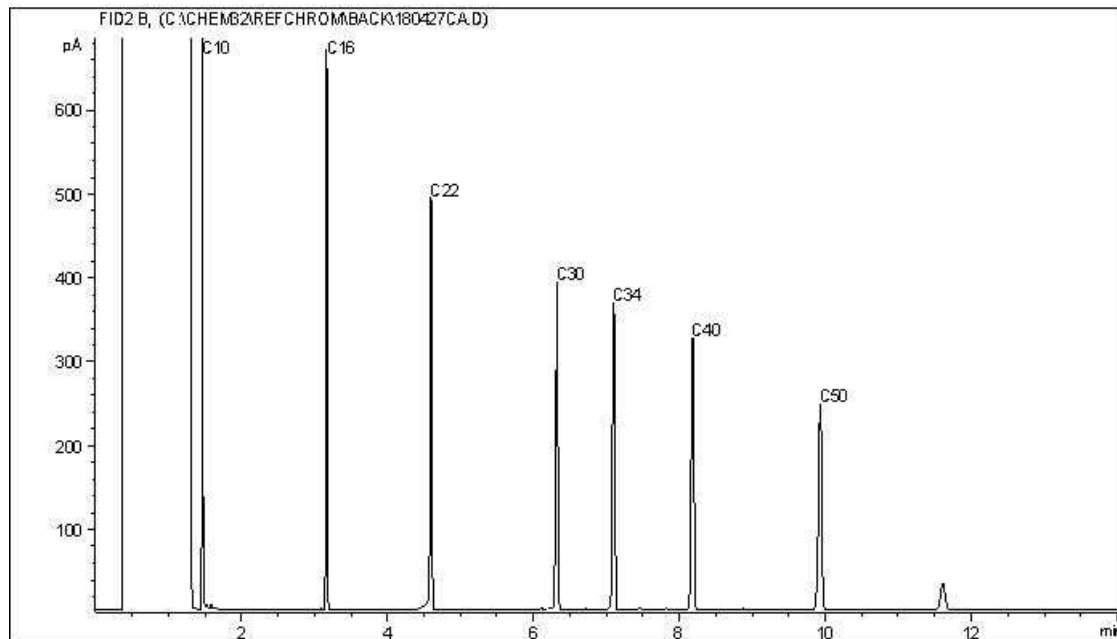
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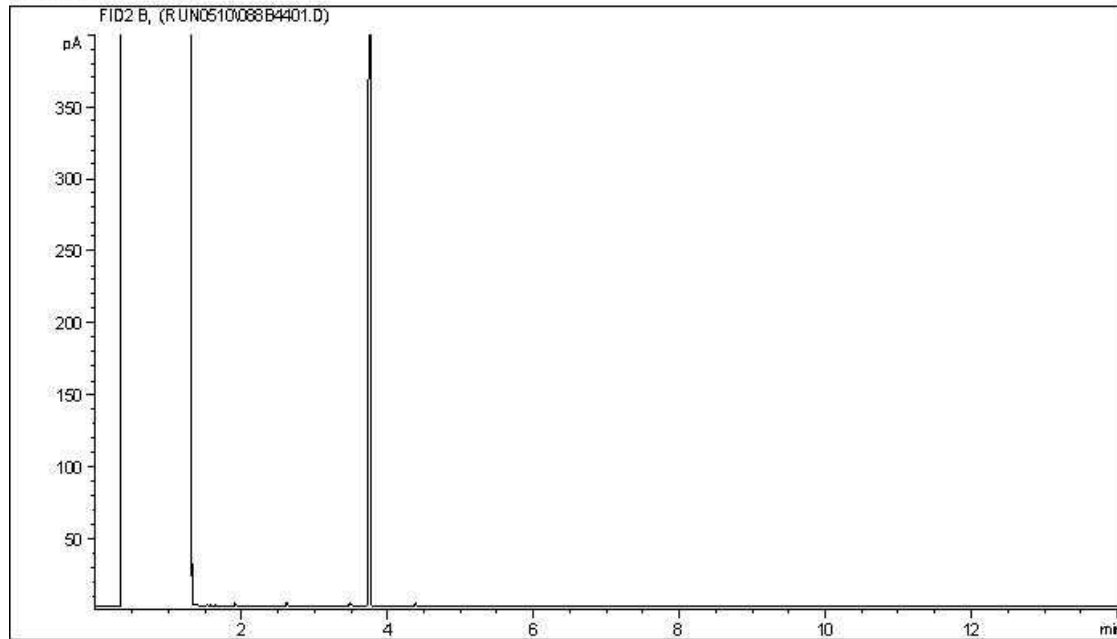
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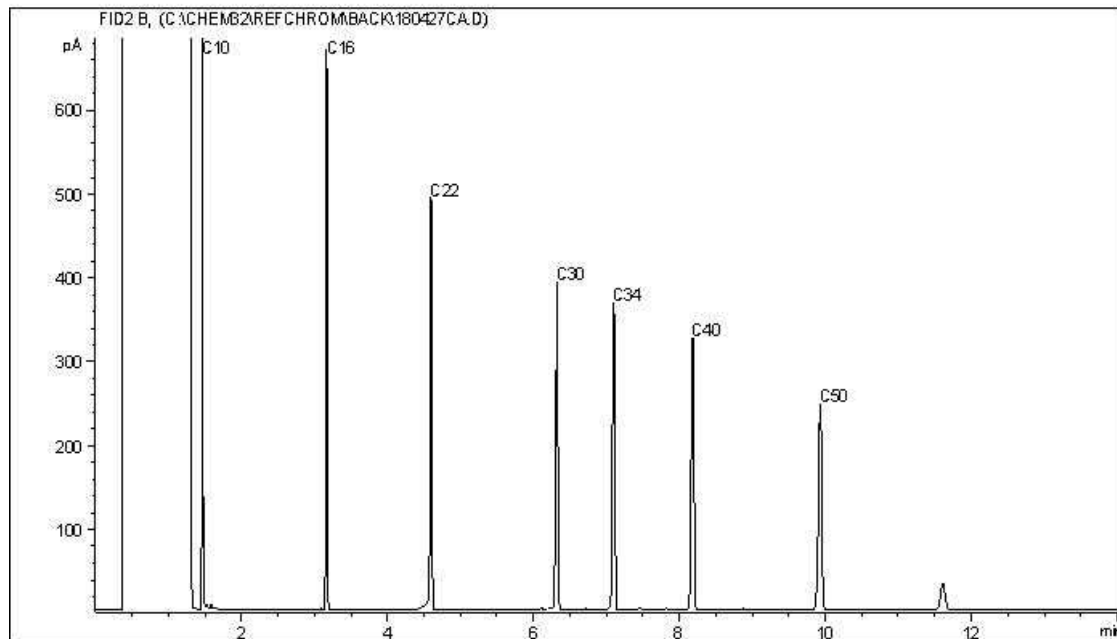
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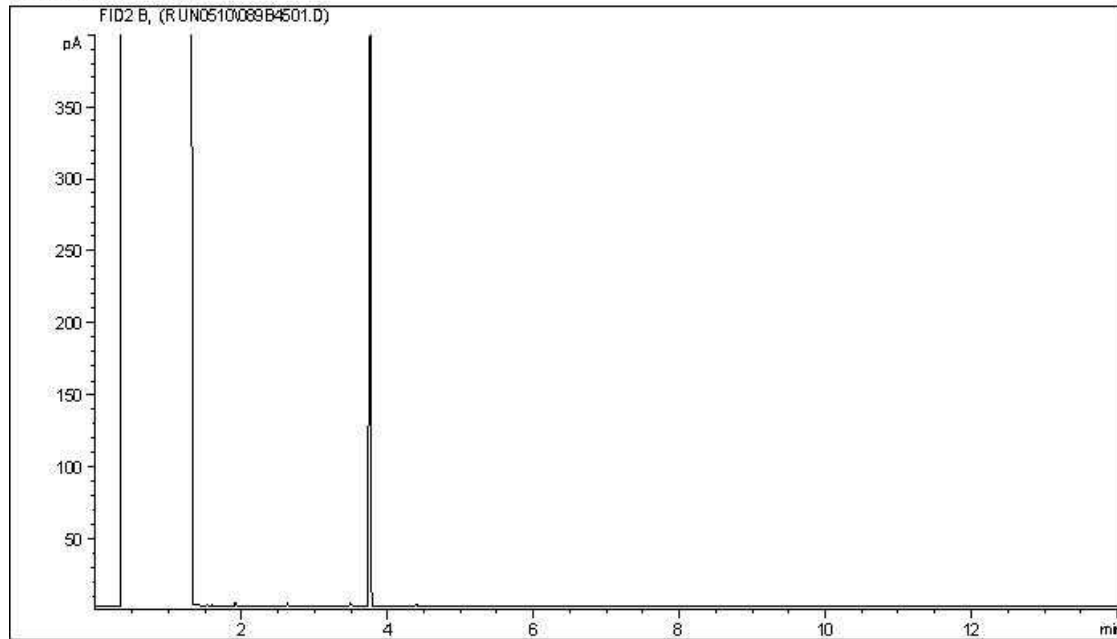
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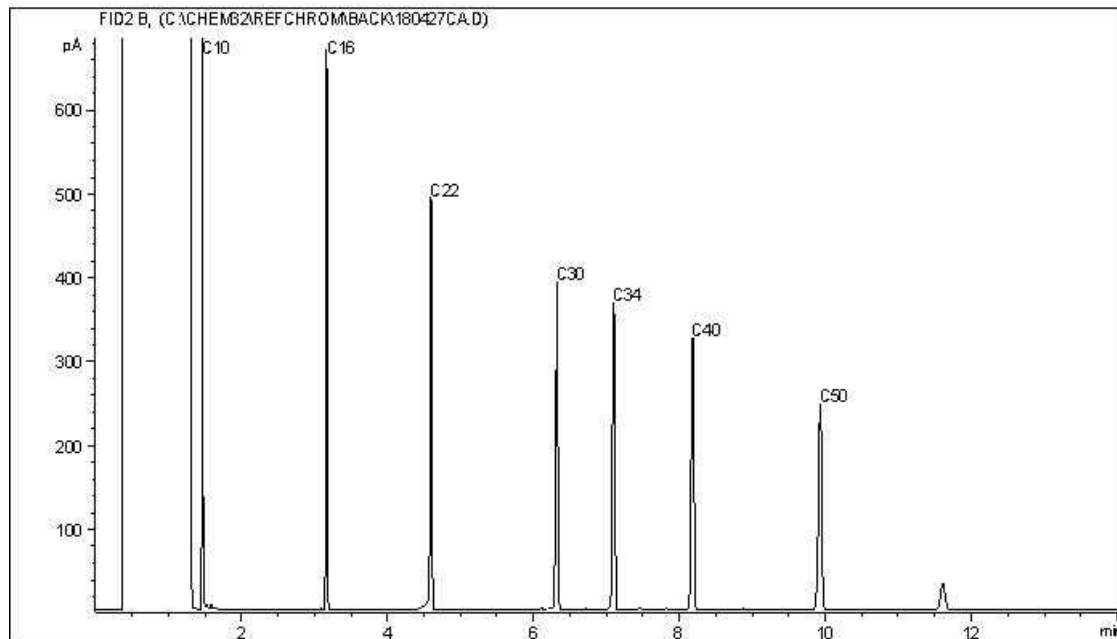
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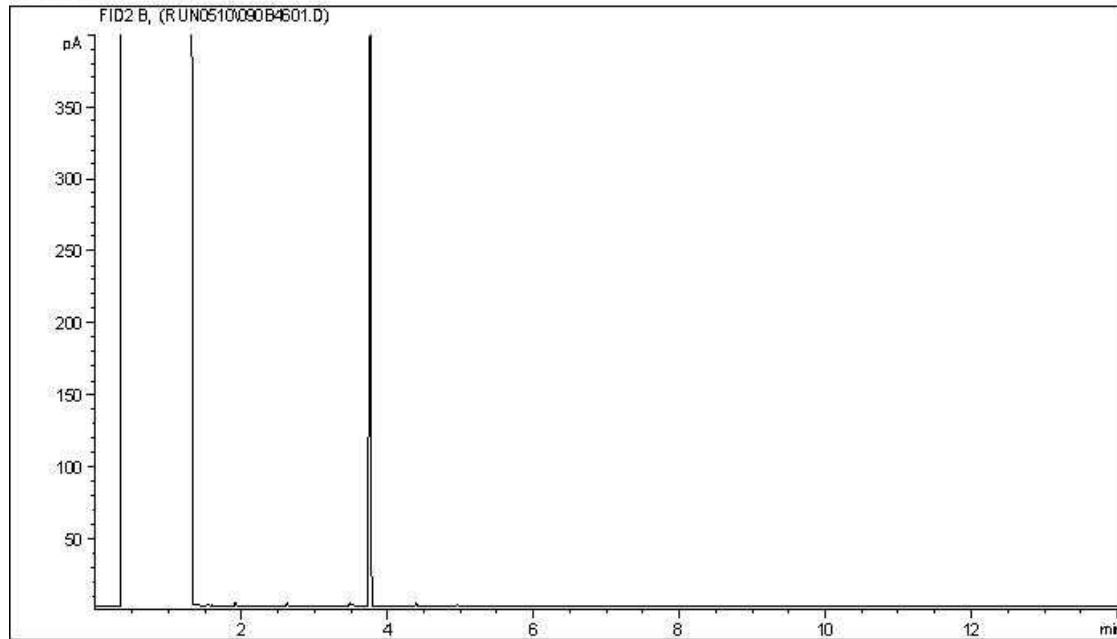
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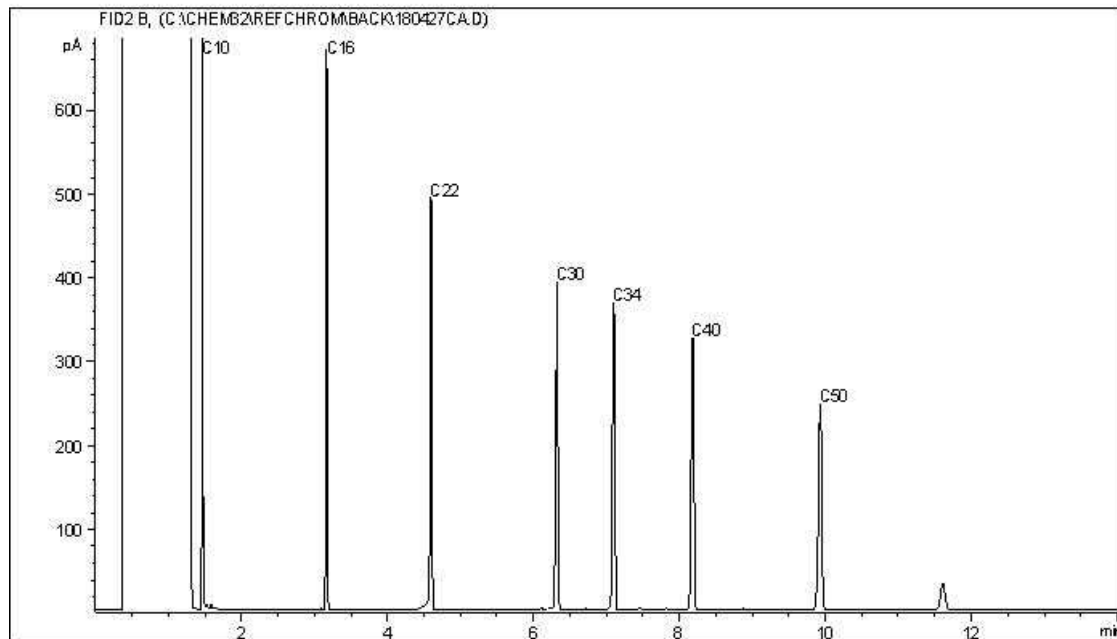
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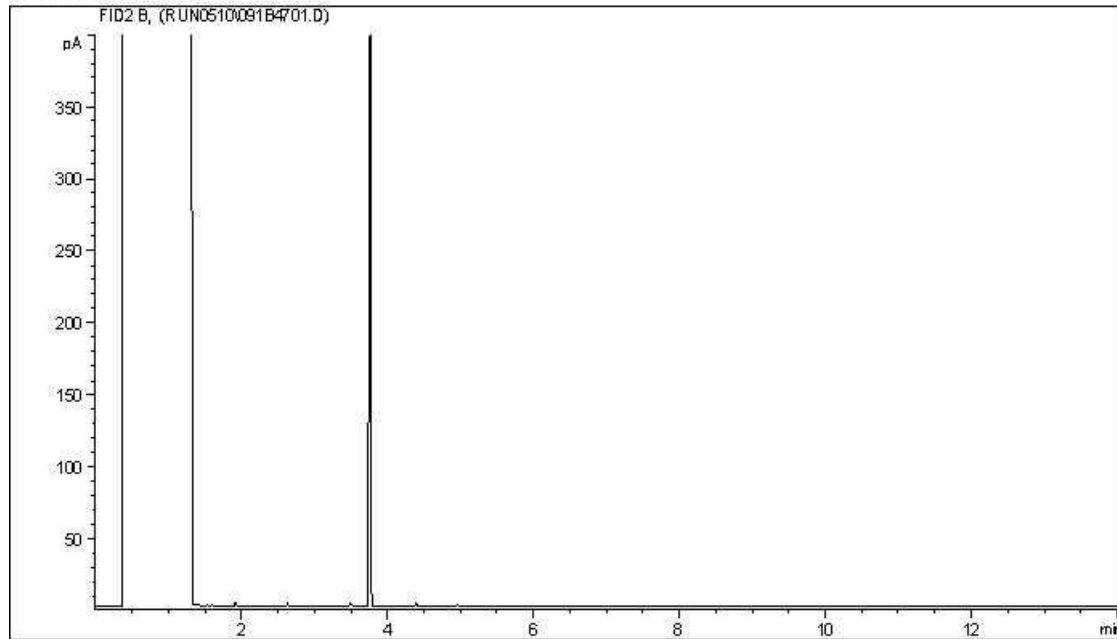
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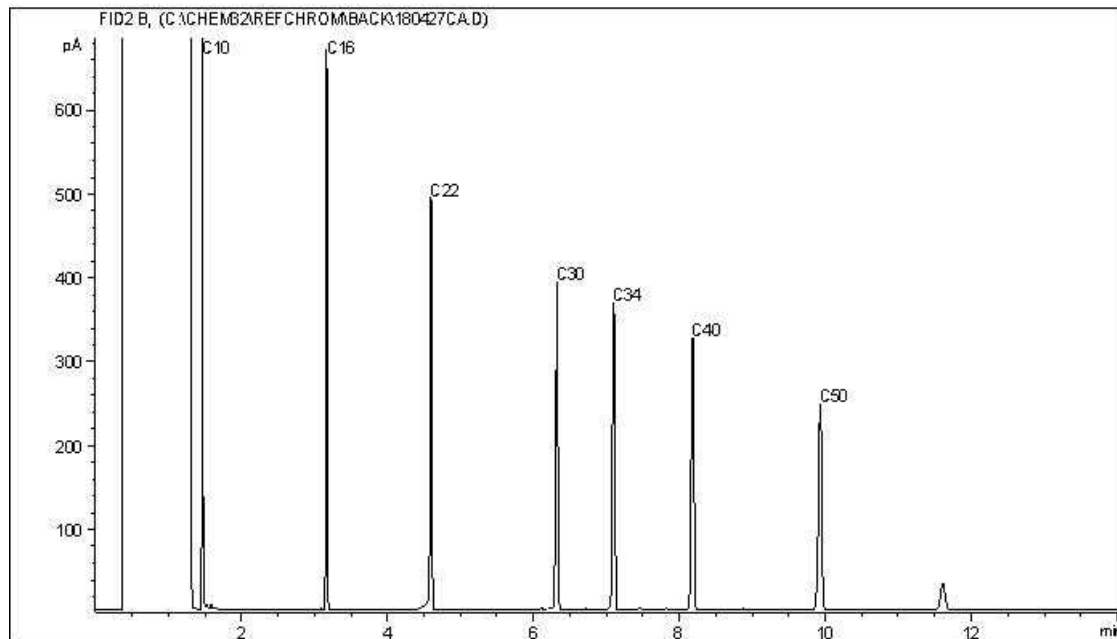
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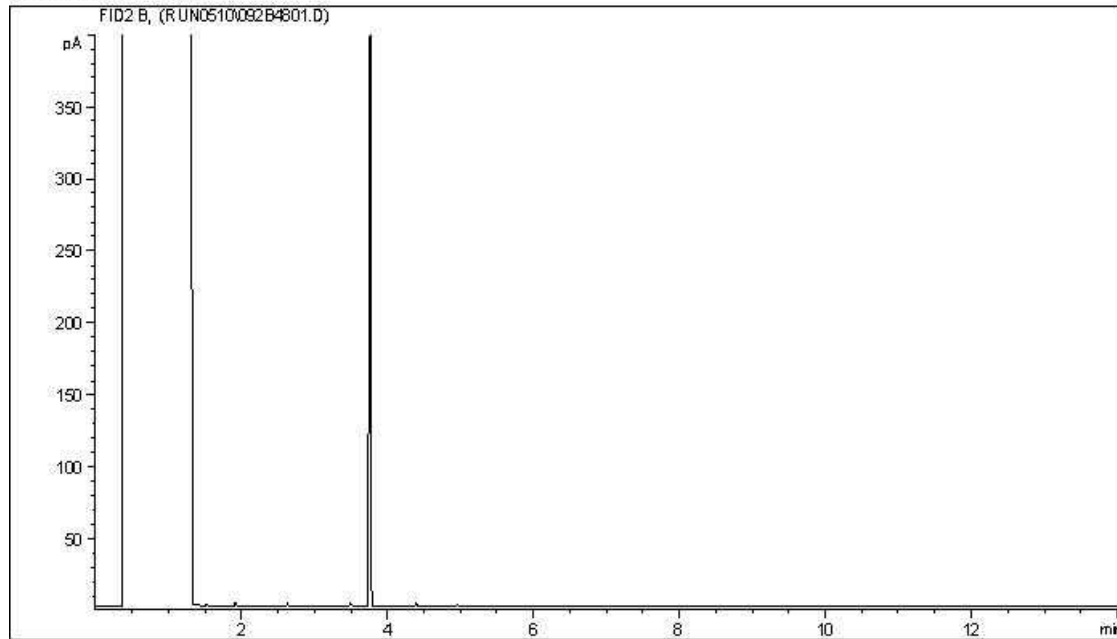
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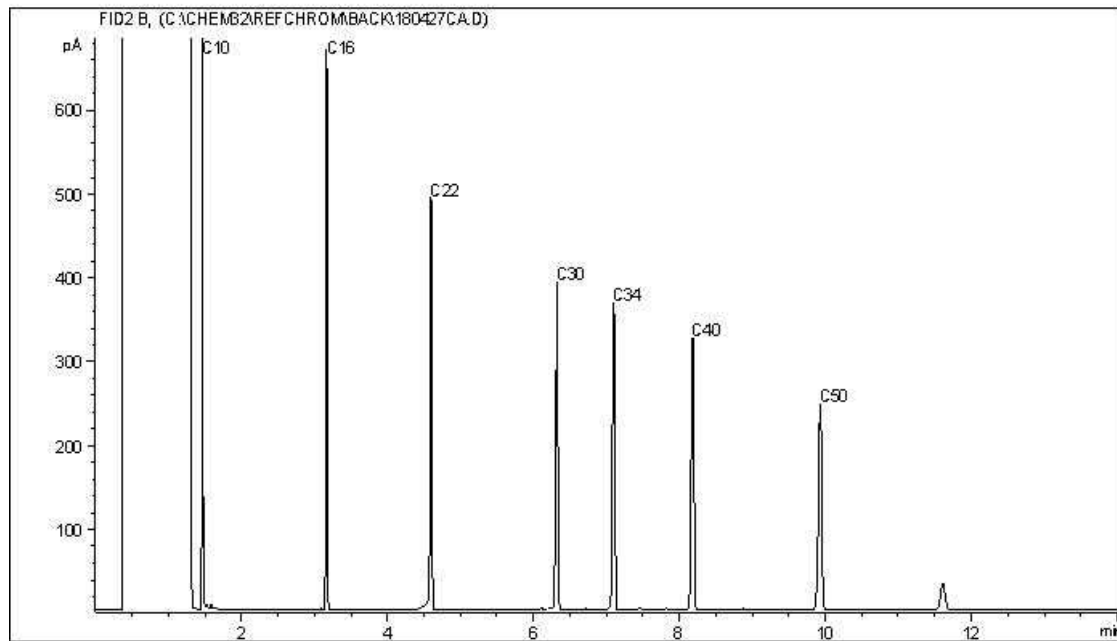
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