

Natalie Gordon

From: Natalie Gordon
Sent: Monday, November 18, 2019 5:43 PM
To: Mike Bratcher (mike.bratcher@state.nm.us); Victoria Venegas (Victoria.Venegas@state.nm.us); Robert Hamlet (Robert.Hamlet@state.nm.us)
Cc: Johnson, Misti M. (MRO); Isaac Castro (icastro@marathonoil.com); Dennis Williams (DWilliams@vertex.ca); Dhugal Hanton (DHanton@vertex.ca)
Subject: 2RP-5499/2RP-5652: Trebuchet Fee 23 28 19 WXY # 010H 48-hr Sampling Notification - Marathon Oil

All:

Please accept this email as 48-hr notification that Vertex Resource Services Inc. has scheduled confirmation sampling to be conducted at Trebuchet Fee 23 28 19 WXY #010H for Incidents 2RP-5499 and 2RP-5652, DOR: 6/19/2019.

On November 21, 2019 beginning at 8:00 a.m., Vertex personnel will be onsite to complete remediation and collect confirmation samples for closure of the above referenced incidents. There is a chance that remediation and confirmation sampling may continue into November 22, 2019.

If you need assistance with directions to the site, or have any questions or concerns, please do not hesitate to contact me.

Thank you,
Natalie



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

July 19, 2019

Isaac Castro
Marathon Oil Company
4111 Tidwell Road
Carlsbad, NM 88220
TEL: (575) 297-0956
FAX

RE: Trebuchet Fec 23 28 19

OrderNo.: 1907601

Dear Isaac Castro:

Hall Environmental Analysis Laboratory received 20 sample(s) on 7/12/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-01 2'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 9:00:00 AM

Lab ID: 1907601-001

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/13/2019 3:49:20 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/13/2019 3:49:20 PM
Surr: DNOP	106	70-130		%Rec	1	7/13/2019 3:49:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 12:35:49 AM
Surr: BFB	91.2	73.8-119		%Rec	1	7/16/2019 12:35:49 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2019 12:35:49 AM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 12:35:49 AM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 12:35:49 AM
Xylenes, Total	ND	0.099		mg/Kg	1	7/16/2019 12:35:49 AM
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	7/16/2019 12:35:49 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2600	150		mg/Kg	50	7/17/2019 6:23:28 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-02 2'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 9:10:00 AM**Lab ID:** 1907601-002**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	7/13/2019 4:11:36 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/13/2019 4:11:36 PM
Surr: DNOP	108	70-130		%Rec	1	7/13/2019 4:11:36 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 1:47:00 AM
Surr: BFB	95.3	73.8-119		%Rec	1	7/16/2019 1:47:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2019 1:47:00 AM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 1:47:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 1:47:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	7/16/2019 1:47:00 AM
Surr: 4-Bromofluorobenzene	96.8	80-120		%Rec	1	7/16/2019 1:47:00 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	3800	150		mg/Kg	50	7/17/2019 6:35:53 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-03 4'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 9:15:00 AM**Lab ID:** 1907601-003**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	7/13/2019 4:33:58 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/13/2019 4:33:58 PM
Surr: DNOP	95.3	70-130		%Rec	1	7/13/2019 4:33:58 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 2:58:04 AM
Surr: BFB	97.1	73.8-119		%Rec	1	7/16/2019 2:58:04 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	7/16/2019 2:58:04 AM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 2:58:04 AM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 2:58:04 AM
Xylenes, Total	ND	0.098		mg/Kg	1	7/16/2019 2:58:04 AM
Surr: 4-Bromofluorobenzene	98.4	80-120		%Rec	1	7/16/2019 2:58:04 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1900	60		mg/Kg	20	7/17/2019 12:52:52 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-04 4'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 9:20:00 AM

Lab ID: 1907601-004

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/13/2019 4:56:24 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/13/2019 4:56:24 PM
Surr: DNOP	95.3	70-130		%Rec	1	7/13/2019 4:56:24 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 3:21:39 AM
Surr: BFB	93.7	73.8-119		%Rec	1	7/16/2019 3:21:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2019 3:21:39 AM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 3:21:39 AM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 3:21:39 AM
Xylenes, Total	ND	0.099		mg/Kg	1	7/16/2019 3:21:39 AM
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	1	7/16/2019 3:21:39 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2100	60		mg/Kg	20	7/17/2019 1:05:17 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-05 4'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 9:30:00 AM

Lab ID: 1907601-005

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/16/2019 3:45:03 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2019 3:45:03 AM
Surr: DNOP	86.3	70-130		%Rec	1	7/16/2019 3:45:03 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 3:45:18 AM
Surr: BFB	107	73.8-119		%Rec	1	7/16/2019 3:45:18 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2019 3:45:18 AM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 3:45:18 AM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 3:45:18 AM
Xylenes, Total	ND	0.098		mg/Kg	1	7/16/2019 3:45:18 AM
Surr: 4-Bromofluorobenzene	110	80-120		%Rec	1	7/16/2019 3:45:18 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1900	60		mg/Kg	20	7/17/2019 1:17:41 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-06 2'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 9:40:00 AM

Lab ID: 1907601-006

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/16/2019 4:07:29 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/16/2019 4:07:29 AM
Surr: DNOP	90.4	70-130		%Rec	1	7/16/2019 4:07:29 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/16/2019 4:09:04 AM
Surr: BFB	94.2	73.8-119		%Rec	1	7/16/2019 4:09:04 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2019 4:09:04 AM
Toluene	ND	0.050		mg/Kg	1	7/16/2019 4:09:04 AM
Ethylbenzene	ND	0.050		mg/Kg	1	7/16/2019 4:09:04 AM
Xylenes, Total	ND	0.099		mg/Kg	1	7/16/2019 4:09:04 AM
Surr: 4-Bromofluorobenzene	95.6	80-120		%Rec	1	7/16/2019 4:09:04 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	290	60		mg/Kg	20	7/17/2019 1:30:06 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-07 4'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 9:50:00 AM

Lab ID: 1907601-007

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/16/2019 4:29:38 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2019 4:29:38 AM
Surr: DNOP	91.6	70-130		%Rec	1	7/16/2019 4:29:38 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 4:32:47 AM
Surr: BFB	95.9	73.8-119		%Rec	1	7/16/2019 4:32:47 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2019 4:32:47 AM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 4:32:47 AM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 4:32:47 AM
Xylenes, Total	ND	0.099		mg/Kg	1	7/16/2019 4:32:47 AM
Surr: 4-Bromofluorobenzene	96.5	80-120		%Rec	1	7/16/2019 4:32:47 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1900	60		mg/Kg	20	7/17/2019 11:46:25 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-08 2'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 10:00:00 AM**Lab ID:** 1907601-008**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/16/2019 4:51:48 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2019 4:51:48 AM
Surr: DNOP	90.6	70-130		%Rec	1	7/16/2019 4:51:48 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 3:28:35 PM
Surr: BFB	108	73.8-119		%Rec	1	7/15/2019 3:28:35 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 3:28:35 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 3:28:35 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 3:28:35 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/15/2019 3:28:35 PM
Surr: 4-Bromofluorobenzene	95.1	80-120		%Rec	1	7/15/2019 3:28:35 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	62	60		mg/Kg	20	7/17/2019 11:58:49 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-09 4'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 10:10:00 AM

Lab ID: 1907601-009

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	7/16/2019 5:13:49 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	7/16/2019 5:13:49 AM
Surr: DNOP	89.2	70-130		%Rec	1	7/16/2019 5:13:49 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 3:51:25 PM
Surr: BFB	106	73.8-119		%Rec	1	7/15/2019 3:51:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 3:51:25 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 3:51:25 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 3:51:25 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/15/2019 3:51:25 PM
Surr: 4-Bromofluorobenzene	95.2	80-120		%Rec	1	7/15/2019 3:51:25 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2600	150		mg/Kg	50	7/18/2019 2:53:24 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-10 4'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 10:20:00 AM

Lab ID: 1907601-010

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.2		mg/Kg	1	7/16/2019 5:35:57 AM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	7/16/2019 5:35:57 AM
Surr: DNOP	92.4	70-130		%Rec	1	7/16/2019 5:35:57 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/15/2019 4:14:16 PM
Surr: BFB	107	73.8-119		%Rec	1	7/15/2019 4:14:16 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 4:14:16 PM
Toluene	ND	0.049		mg/Kg	1	7/15/2019 4:14:16 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/15/2019 4:14:16 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/15/2019 4:14:16 PM
Surr: 4-Bromofluorobenzene	94.7	80-120		%Rec	1	7/15/2019 4:14:16 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1600	60		mg/Kg	20	7/17/2019 12:23:37 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-11 4'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 10:30:00 AM**Lab ID:** 1907601-011**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	7/16/2019 5:58:16 AM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	7/16/2019 5:58:16 AM
Surr: DNOP	101	70-130		%Rec	1	7/16/2019 5:58:16 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 4:37:06 PM
Surr: BFB	105	73.8-119		%Rec	1	7/15/2019 4:37:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 4:37:06 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 4:37:06 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 4:37:06 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/15/2019 4:37:06 PM
Surr: 4-Bromofluorobenzene	94.0	80-120		%Rec	1	7/15/2019 4:37:06 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1700	60		mg/Kg	20	7/17/2019 12:36:02 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-12 4'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 10:40:00 AM**Lab ID:** 1907601-012**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.2		mg/Kg	1	7/16/2019 6:20:29 AM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	7/16/2019 6:20:29 AM
Surr: DNOP	83.8	70-130		%Rec	1	7/16/2019 6:20:29 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/16/2019 7:55:29 PM
Surr: BFB	100	73.8-119		%Rec	1	7/16/2019 7:55:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	7/16/2019 7:55:29 PM
Toluene	ND	0.049		mg/Kg	1	7/16/2019 7:55:29 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/16/2019 7:55:29 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/16/2019 7:55:29 PM
Surr: 4-Bromofluorobenzene	87.9	80-120		%Rec	1	7/16/2019 7:55:29 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1800	60		mg/Kg	20	7/18/2019 10:20:24 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-13 4'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 11:00:00 AM**Lab ID:** 1907601-014**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	7/16/2019 6:42:32 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/16/2019 6:42:32 AM
Surr: DNOP	84.3	70-130		%Rec	1	7/16/2019 6:42:32 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/15/2019 4:59:55 PM
Surr: BFB	104	73.8-119		%Rec	1	7/15/2019 4:59:55 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 4:59:55 PM
Toluene	ND	0.049		mg/Kg	1	7/15/2019 4:59:55 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/15/2019 4:59:55 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/15/2019 4:59:55 PM
Surr: 4-Bromofluorobenzene	91.6	80-120		%Rec	1	7/15/2019 4:59:55 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1900	60		mg/Kg	20	7/17/2019 12:48:26 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: TP19-14 4'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 11:10:00 AM

Lab ID: 1907601-015

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	7/16/2019 7:04:38 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	7/16/2019 7:04:38 AM
Surr: DNOP	84.5	70-130		%Rec	1	7/16/2019 7:04:38 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 5:22:43 PM
Surr: BFB	104	73.8-119		%Rec	1	7/15/2019 5:22:43 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 5:22:43 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 5:22:43 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 5:22:43 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/15/2019 5:22:43 PM
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	7/15/2019 5:22:43 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2300	150		mg/Kg	50	7/18/2019 3:05:49 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-15 4'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 11:20:00 AM**Lab ID:** 1907601-016**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/16/2019 7:26:47 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/16/2019 7:26:47 AM
Surr: DNOP	84.9	70-130		%Rec	1	7/16/2019 7:26:47 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/15/2019 5:45:29 PM
Surr: BFB	106	73.8-119		%Rec	1	7/15/2019 5:45:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 5:45:29 PM
Toluene	ND	0.049		mg/Kg	1	7/15/2019 5:45:29 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/15/2019 5:45:29 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/15/2019 5:45:29 PM
Surr: 4-Bromofluorobenzene	92.8	80-120		%Rec	1	7/15/2019 5:45:29 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2000	60		mg/Kg	20	7/17/2019 1:38:03 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** TP19-16 4'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 11:30:00 AM**Lab ID:** 1907601-017**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	7/16/2019 7:49:07 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	7/16/2019 7:49:07 AM
Surr: DNOP	84.2	70-130		%Rec	1	7/16/2019 7:49:07 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/15/2019 6:08:14 PM
Surr: BFB	107	73.8-119		%Rec	1	7/15/2019 6:08:14 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 6:08:14 PM
Toluene	ND	0.049		mg/Kg	1	7/15/2019 6:08:14 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/15/2019 6:08:14 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/15/2019 6:08:14 PM
Surr: 4-Bromofluorobenzene	94.3	80-120		%Rec	1	7/15/2019 6:08:14 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1800	60		mg/Kg	20	7/17/2019 1:50:27 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** SS19-17 0'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 11:40:00 AM**Lab ID:** 1907601-018**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/16/2019 8:33:41 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2019 8:33:41 AM
Surr: DNOP	93.9	70-130		%Rec	1	7/16/2019 8:33:41 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 6:30:58 PM
Surr: BFB	106	73.8-119		%Rec	1	7/15/2019 6:30:58 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 6:30:58 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 6:30:58 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 6:30:58 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/15/2019 6:30:58 PM
Surr: 4-Bromofluorobenzene	91.8	80-120		%Rec	1	7/15/2019 6:30:58 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	130	60		mg/Kg	20	7/17/2019 2:02:52 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**Date Reported: **7/19/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** SS19-18 0'**Project:** Trebuchet Fec 23 28 19**Collection Date:** 7/10/2019 11:50:00 AM**Lab ID:** 1907601-019**Matrix:** SOIL**Received Date:** 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	7/16/2019 8:55:53 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/16/2019 8:55:53 AM
Surr: DNOP	83.2	70-130		%Rec	1	7/16/2019 8:55:53 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 7:39:09 PM
Surr: BFB	107	73.8-119		%Rec	1	7/15/2019 7:39:09 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 7:39:09 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 7:39:09 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 7:39:09 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/15/2019 7:39:09 PM
Surr: 4-Bromofluorobenzene	96.3	80-120		%Rec	1	7/15/2019 7:39:09 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	87	60		mg/Kg	20	7/17/2019 2:15:16 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907601**

Date Reported: **7/19/2019**

CLIENT: Marathon Oil Company

Client Sample ID: SS19-19 0'

Project: Trebuchet Fec 23 28 19

Collection Date: 7/10/2019 12:00:00 PM

Lab ID: 1907601-020

Matrix: SOIL

Received Date: 7/12/2019 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/16/2019 9:18:10 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2019 9:18:10 AM
Surr: DNOP	89.6	70-130		%Rec	1	7/16/2019 9:18:10 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/15/2019 8:01:50 PM
Surr: BFB	104	73.8-119		%Rec	1	7/15/2019 8:01:50 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/15/2019 8:01:50 PM
Toluene	ND	0.050		mg/Kg	1	7/15/2019 8:01:50 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/15/2019 8:01:50 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/15/2019 8:01:50 PM
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	7/15/2019 8:01:50 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	290	60		mg/Kg	20	7/17/2019 2:27:40 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: MB-46214	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46214	RunNo: 61409
Prep Date: 7/16/2019	Analysis Date: 7/16/2019	SeqNo: 2082660 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46214	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46214	RunNo: 61409
Prep Date: 7/16/2019	Analysis Date: 7/16/2019	SeqNo: 2082661 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 93.8 90 110

Sample ID: MB-46223	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46223	RunNo: 61446
Prep Date: 7/17/2019	Analysis Date: 7/17/2019	SeqNo: 2083563 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46223	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46223	RunNo: 61446
Prep Date: 7/17/2019	Analysis Date: 7/17/2019	SeqNo: 2083564 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 94.1 90 110

Sample ID: MB-46246	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46246	RunNo: 61473
Prep Date: 7/18/2019	Analysis Date: 7/18/2019	SeqNo: 2084960 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46246	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46246	RunNo: 61473
Prep Date: 7/18/2019	Analysis Date: 7/18/2019	SeqNo: 2084961 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 93.1 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: LCS-46156	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 46156	RunNo: 61377								
Prep Date: 7/12/2019	Analysis Date: 7/13/2019	SeqNo: 2080458	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	57	10	50.00	0	115	63.9	124			
Surr: DNOP	5.4		5.000		108	70	130			

Sample ID: MB-46156	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 46156	RunNo: 61377								
Prep Date: 7/12/2019	Analysis Date: 7/13/2019	SeqNo: 2080459	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	13		10.00		127	70	130			

Sample ID: LCS-46194	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 46194	RunNo: 61390								
Prep Date: 7/16/2019	Analysis Date: 7/16/2019	SeqNo: 2081502	Units: %Rec							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.6		5.000		92.0	70	130			

Sample ID: MB-46194	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 46194	RunNo: 61390								
Prep Date: 7/16/2019	Analysis Date: 7/16/2019	SeqNo: 2081503	Units: %Rec							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.8		10.00		97.7	70	130			

Sample ID: 1907601-020AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: SS19-19 0'	Batch ID: 46167	RunNo: 61384								
Prep Date: 7/13/2019	Analysis Date: 7/16/2019	SeqNo: 2081604	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.5	47.26	2.198	101	57	142			
Surr: DNOP	3.8		4.726		80.3	70	130			

Sample ID: 1907601-020AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: SS19-19 0'	Batch ID: 46167	RunNo: 61384								
Prep Date: 7/13/2019	Analysis Date: 7/16/2019	SeqNo: 2081605	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	9.7	48.40	2.198	105	57	142	6.34	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: 1907601-020AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: SS19-19 0'	Batch ID: 46167	RunNo: 61384
Prep Date: 7/13/2019	Analysis Date: 7/16/2019	SeqNo: 2081605 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Surr: DNOP	4.2	4.840 87.5 70 130 0 0

Sample ID: LCS-46167	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 46167	RunNo: 61384
Prep Date: 7/13/2019	Analysis Date: 7/16/2019	SeqNo: 2081606 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	53	10 50.00 0 106 63.9 124
Surr: DNOP	4.2	5.000 84.4 70 130

Sample ID: MB-46167	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 46167	RunNo: 61384
Prep Date: 7/13/2019	Analysis Date: 7/16/2019	SeqNo: 2081607 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND	10
Motor Oil Range Organics (MRO)	ND	50
Surr: DNOP	9.2	10.00 91.6 70 130

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: MB-46155	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range
Client ID: PBS	Batch ID: 46155	RunNo: 61374
Prep Date: 7/12/2019	Analysis Date: 7/16/2019	SeqNo: 2080717 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	ND	5.0
Surr: BFB	940	1000 93.6 73.8 119

Sample ID: LCS-46155	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range
Client ID: LCSS	Batch ID: 46155	RunNo: 61374
Prep Date: 7/12/2019	Analysis Date: 7/15/2019	SeqNo: 2080718 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	21	5.0 25.00 0 84.5 80.1 123
Surr: BFB	1200	1000 119 73.8 119 S

Sample ID: 1907601-001AMS	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range
Client ID: TP19-01 2'	Batch ID: 46155	RunNo: 61374
Prep Date: 7/12/2019	Analysis Date: 7/16/2019	SeqNo: 2080721 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	18	4.9 24.44 0 74.0 69.1 142
Surr: BFB	1000	977.5 104 73.8 119

Sample ID: 1907601-001AMSD	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range
Client ID: TP19-01 2'	Batch ID: 46155	RunNo: 61374
Prep Date: 7/12/2019	Analysis Date: 7/16/2019	SeqNo: 2080722 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	19	4.9 24.68 0 76.5 69.1 142 4.28 20
Surr: BFB	1000	987.2 104 73.8 119 0 0

Sample ID: MB-46184	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range
Client ID: PBS	Batch ID: 46184	RunNo: 61408
Prep Date: 7/15/2019	Analysis Date: 7/16/2019	SeqNo: 2081931 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	ND	5.0
Surr: BFB	1100	1000 106 73.8 119

Sample ID: LCS-46184	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range
Client ID: LCSS	Batch ID: 46184	RunNo: 61408
Prep Date: 7/15/2019	Analysis Date: 7/16/2019	SeqNo: 2081932 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: LCS-46184	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 46184		RunNo: 61408							
Prep Date: 7/15/2019	Analysis Date: 7/16/2019		SeqNo: 2081932		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.5	80.1	123			
Surr: BFB	1200		1000		120	73.8	119			S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: MB-46155	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 46155	RunNo: 61374								
Prep Date: 7/12/2019	Analysis Date: 7/16/2019	SeqNo: 2080750			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.95		1.000		95.1	80	120			

Sample ID: LCS-46155	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 46155	RunNo: 61374								
Prep Date: 7/12/2019	Analysis Date: 7/15/2019	SeqNo: 2080751			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	1.000	0	98.8	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.0	0.10	3.000	0	100	80	120			
Surr: 4-Bromofluorobenzene	0.98		1.000		97.5	80	120			

Sample ID: 1907601-002AMS	SampType: MS	TestCode: EPA Method 8021B: Volatiles								
Client ID: TP19-02 2'	Batch ID: 46155	RunNo: 61374								
Prep Date: 7/12/2019	Analysis Date: 7/16/2019	SeqNo: 2080754			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.024	0.9785	0	91.3	63.9	127			
Toluene	0.94	0.049	0.9785	0.009566	95.1	69.9	131			
Ethylbenzene	0.95	0.049	0.9785	0	96.9	71	132			
Xylenes, Total	2.8	0.098	2.935	0	96.6	71.8	131			
Surr: 4-Bromofluorobenzene	0.96		0.9785		98.5	80	120			

Sample ID: 1907601-002AMSD	SampType: MSD	TestCode: EPA Method 8021B: Volatiles								
Client ID: TP19-02 2'	Batch ID: 46155	RunNo: 61374								
Prep Date: 7/12/2019	Analysis Date: 7/16/2019	SeqNo: 2080755			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.024	0.9766	0	84.0	63.9	127	8.44	20	
Toluene	0.91	0.049	0.9766	0.009566	92.0	69.9	131	3.42	20	
Ethylbenzene	0.92	0.049	0.9766	0	94.2	71	132	3.01	20	
Xylenes, Total	2.7	0.098	2.930	0	93.7	71.8	131	3.21	20	
Surr: 4-Bromofluorobenzene	0.97		0.9766		99.6	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907601

19-Jul-19

Client: Marathon Oil Company

Project: Trebuchet Fec 23 28 19

Sample ID: MB-46184	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 46184	RunNo: 61408								
Prep Date: 7/15/2019	Analysis Date: 7/16/2019	SeqNo: 2081946	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.92		1.000		92.3	80	120			

Sample ID: LCS-46184	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 46184	RunNo: 61408								
Prep Date: 7/15/2019	Analysis Date: 7/16/2019	SeqNo: 2081947	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	97.6	80	120			
Toluene	1.0	0.050	1.000	0	99.6	80	120			
Ethylbenzene	0.97	0.050	1.000	0	97.2	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.6	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		105	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: **MARATHON OIL COMPA**

Work Order Number: **1907601**

RcptNo: 1

Received By: **Desiree Dominguez** 7/12/2019 7:50:00 AM

Completed By: **Desiree Dominguez** 7/12/2019 9:37:44 AM

Reviewed By: **DAD 7/12/19**

ID2

ID2

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:
(<2 or ≤ 12 unless noted)

Adjusted?

Checked by: **ENM 7/12/19**

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☒ No ☐ NA ☒

Person Notified: **Dennis Williams**

Date: **7/12/19**

By Whom: **Erin Melendez**

Via: ☐ eMail ☒ Phone ☐ Fax ☐ In Person

Regarding: **-012 and -013 have same ID's and only 1 soil was submitted.**

Client Instructions:

16. Additional remarks:

- ENM 7/12/19

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.1	Good	Not Present			

Chain-of-Custody Record

Client: Marathon Oil

Mailing Address: 4111 S. Tidwell Road
Carlsbad, NM 88220
 Phone #: 575-988-0561
 email or Fax#: icastro@marathonoil.com

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Date	Time	Matrix	Sample Name
7-10-2014	10:50	S	TP19-12 4'
7-10-2014	11:00	S	TP19-13 4'
7-10-2014	11:10	S	TP19-14 4'
7-10-2014	11:20	S	TP19-15 4'
7-10-2014	11:30	S	TP19-16 4'
7-10-2014	11:40	S	SS19-17 0'
7-10-2014	11:50	S	SS19-18 0'
7-10-2014	12:00	S	SS19-19 0'

Relinquished by: [Signature]

Date: 7-11-2014 Time: 7:45am

Relinquished by: [Signature]

Date: 7/11/14 Time: 1300

Turn-Around Time: 5 day
☒ Standard ☐ Rush

Project Name: Trinchet Fee 23 28 14

Project #: 14E-02213

Project Manager: Dennis Williams
Permian@Vertex.ca

Isaac Castro icastro@marathonoil.com

Sampler: Taxon Crabtree

On Ice: ☒ Yes ☐ No

of Coolers: 1

Cooler Temp (including CF): 5.5-0.4 = 5.1°c

Container Type and # 1 Jar Preservative Type ice HEAL No. 1907601

Container Type and #	Preservative Type	HEAL No.
1 Jar	ice	-013
1 Jar	ice	-014
1 Jar	ice	-015
1 Jar	ice	-016
1 Jar	ice	-017
1 Jar	ice	-018
1 Jar	ice	-019
1 Jar	ice	-020

Received by: [Signature] Date: 7/11/19 Time: 0752

Received by: [Signature] Date: 7/11/19 Time: 1300



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

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*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

August 23, 2019

Dennis Williams
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX:

RE: Trebuchet Fee 23 28 19

OrderNo.: 1908977

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 49 sample(s) on 8/19/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-01 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:00:00 AM**Lab ID:** 1908977-001**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	8600	300		mg/Kg	100	8/21/2019 9:51:16 PM	46925
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/20/2019 10:22:29 AM	46909
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/20/2019 10:22:29 AM	46909
Surr: DNOP	98.1	70-130		%Rec	1	8/20/2019 10:22:29 AM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/20/2019 9:37:00 AM	46897
Surr: BFB	93.4	77.4-118		%Rec	1	8/20/2019 9:37:00 AM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/20/2019 9:37:00 AM	46897
Toluene	ND	0.050		mg/Kg	1	8/20/2019 9:37:00 AM	46897
Ethylbenzene	ND	0.050		mg/Kg	1	8/20/2019 9:37:00 AM	46897
Xylenes, Total	ND	0.099		mg/Kg	1	8/20/2019 9:37:00 AM	46897
Surr: 4-Bromofluorobenzene	94.5	80-120		%Rec	1	8/20/2019 9:37:00 AM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-02 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:05:00 AM**Lab ID:** 1908977-002**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	5300	300		mg/Kg	100	8/21/2019 10:03:38 PM	46925
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/20/2019 11:29:07 AM	46909
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/20/2019 11:29:07 AM	46909
Surr: DNOP	95.8	70-130		%Rec	1	8/20/2019 11:29:07 AM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/20/2019 10:47:22 AM	46897
Surr: BFB	93.1	77.4-118		%Rec	1	8/20/2019 10:47:22 AM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 10:47:22 AM	46897
Toluene	ND	0.047		mg/Kg	1	8/20/2019 10:47:22 AM	46897
Ethylbenzene	ND	0.047		mg/Kg	1	8/20/2019 10:47:22 AM	46897
Xylenes, Total	ND	0.094		mg/Kg	1	8/20/2019 10:47:22 AM	46897
Surr: 4-Bromofluorobenzene	95.8	80-120		%Rec	1	8/20/2019 10:47:22 AM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-03 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:10:00 AM**Lab ID:** 1908977-003**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	4900	300		mg/Kg	100	8/22/2019 6:29:39 AM	46925
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/20/2019 11:51:03 AM	46909
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/20/2019 11:51:03 AM	46909
Surr: DNOP	84.3	70-130		%Rec	1	8/20/2019 11:51:03 AM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 11:57:47 AM	46897
Surr: BFB	92.1	77.4-118		%Rec	1	8/20/2019 11:57:47 AM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/20/2019 11:57:47 AM	46897
Toluene	ND	0.049		mg/Kg	1	8/20/2019 11:57:47 AM	46897
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 11:57:47 AM	46897
Xylenes, Total	ND	0.098		mg/Kg	1	8/20/2019 11:57:47 AM	46897
Surr: 4-Bromofluorobenzene	93.5	80-120		%Rec	1	8/20/2019 11:57:47 AM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-04 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:15:00 AM**Lab ID:** 1908977-004**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	9700	300		mg/Kg	100	8/21/2019 10:40:39 PM	46925
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	8/20/2019 12:13:22 PM	46909
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/20/2019 12:13:22 PM	46909
Surr: DNOP	103	70-130		%Rec	1	8/20/2019 12:13:22 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 12:21:16 PM	46897
Surr: BFB	94.0	77.4-118		%Rec	1	8/20/2019 12:21:16 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 12:21:16 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 12:21:16 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 12:21:16 PM	46897
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 12:21:16 PM	46897
Surr: 4-Bromofluorobenzene	95.9	80-120		%Rec	1	8/20/2019 12:21:16 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-05 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:20:00 AM**Lab ID:** 1908977-005**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	5000	300		mg/Kg	100	8/21/2019 10:52:59 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/20/2019 12:35:27 PM	46909
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/20/2019 12:35:27 PM	46909
Surr: DNOP	77.5	70-130		%Rec	1	8/20/2019 12:35:27 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 12:44:49 PM	46897
Surr: BFB	94.1	77.4-118		%Rec	1	8/20/2019 12:44:49 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/20/2019 12:44:49 PM	46897
Toluene	ND	0.049		mg/Kg	1	8/20/2019 12:44:49 PM	46897
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 12:44:49 PM	46897
Xylenes, Total	ND	0.098		mg/Kg	1	8/20/2019 12:44:49 PM	46897
Surr: 4-Bromofluorobenzene	96.3	80-120		%Rec	1	8/20/2019 12:44:49 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-06 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:25:00 AM**Lab ID:** 1908977-006**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	5200	300		mg/Kg	100	8/21/2019 11:05:20 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	8/20/2019 12:57:34 PM	46909
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/20/2019 12:57:34 PM	46909
Surr: DNOP	82.3	70-130		%Rec	1	8/20/2019 12:57:34 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 1:08:22 PM	46897
Surr: BFB	101	77.4-118		%Rec	1	8/20/2019 1:08:22 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 1:08:22 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 1:08:22 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 1:08:22 PM	46897
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 1:08:22 PM	46897
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	8/20/2019 1:08:22 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-07 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:30:00 AM**Lab ID:** 1908977-007**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	6300	300		mg/Kg	100	8/21/2019 11:17:40 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	8/20/2019 1:19:41 PM	46909
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	8/20/2019 1:19:41 PM	46909
Surr: DNOP	80.7	70-130		%Rec	1	8/20/2019 1:19:41 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 1:31:56 PM	46897
Surr: BFB	97.4	77.4-118		%Rec	1	8/20/2019 1:31:56 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 1:31:56 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 1:31:56 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 1:31:56 PM	46897
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 1:31:56 PM	46897
Surr: 4-Bromofluorobenzene	98.9	80-120		%Rec	1	8/20/2019 1:31:56 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-08 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:35:00 AM**Lab ID:** 1908977-008**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	5200	300		mg/Kg	100	8/21/2019 11:30:01 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/20/2019 1:41:54 PM	46909
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/20/2019 1:41:54 PM	46909
Surr: DNOP	84.6	70-130		%Rec	1	8/20/2019 1:41:54 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/20/2019 1:55:34 PM	46897
Surr: BFB	95.2	77.4-118		%Rec	1	8/20/2019 1:55:34 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 1:55:34 PM	46897
Toluene	ND	0.047		mg/Kg	1	8/20/2019 1:55:34 PM	46897
Ethylbenzene	ND	0.047		mg/Kg	1	8/20/2019 1:55:34 PM	46897
Xylenes, Total	ND	0.094		mg/Kg	1	8/20/2019 1:55:34 PM	46897
Surr: 4-Bromofluorobenzene	96.3	80-120		%Rec	1	8/20/2019 1:55:34 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-09 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:40:00 AM**Lab ID:** 1908977-009**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	4200	150		mg/Kg	50	8/21/2019 11:42:22 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/20/2019 2:04:05 PM	46909
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/20/2019 2:04:05 PM	46909
Surr: DNOP	89.9	70-130		%Rec	1	8/20/2019 2:04:05 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/20/2019 2:19:08 PM	46897
Surr: BFB	94.4	77.4-118		%Rec	1	8/20/2019 2:19:08 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 2:19:08 PM	46897
Toluene	ND	0.047		mg/Kg	1	8/20/2019 2:19:08 PM	46897
Ethylbenzene	ND	0.047		mg/Kg	1	8/20/2019 2:19:08 PM	46897
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 2:19:08 PM	46897
Surr: 4-Bromofluorobenzene	94.6	80-120		%Rec	1	8/20/2019 2:19:08 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-021 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:45:00 AM**Lab ID:** 1908977-010**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	4000	150		mg/Kg	50	8/21/2019 11:54:43 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	19	8.8		mg/Kg	1	8/20/2019 2:26:19 PM	46909
Motor Oil Range Organics (MRO)	51	44		mg/Kg	1	8/20/2019 2:26:19 PM	46909
Surr: DNOP	94.6	70-130		%Rec	1	8/20/2019 2:26:19 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 2:42:43 PM	46897
Surr: BFB	94.7	77.4-118		%Rec	1	8/20/2019 2:42:43 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 2:42:43 PM	46897
Toluene	ND	0.049		mg/Kg	1	8/20/2019 2:42:43 PM	46897
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 2:42:43 PM	46897
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 2:42:43 PM	46897
Surr: 4-Bromofluorobenzene	95.5	80-120		%Rec	1	8/20/2019 2:42:43 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-022 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 8:50:00 AM**Lab ID:** 1908977-011**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	4300	150		mg/Kg	50	8/22/2019 12:07:03 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	44	9.6		mg/Kg	1	8/20/2019 2:48:22 PM	46909
Motor Oil Range Organics (MRO)	86	48		mg/Kg	1	8/20/2019 2:48:22 PM	46909
Surr: DNOP	107	70-130		%Rec	1	8/20/2019 2:48:22 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 4:17:24 PM	46897
Surr: BFB	93.9	77.4-118		%Rec	1	8/20/2019 4:17:24 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 4:17:24 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 4:17:24 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 4:17:24 PM	46897
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 4:17:24 PM	46897
Surr: 4-Bromofluorobenzene	94.4	80-120		%Rec	1	8/20/2019 4:17:24 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-023 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 8:55:00 AM

Lab ID: 1908977-012

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2400	150		mg/Kg	50	8/22/2019 12:19:24 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/20/2019 3:10:38 PM	46909
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/20/2019 3:10:38 PM	46909
Surr: DNOP	98.6	70-130		%Rec	1	8/20/2019 3:10:38 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 4:41:03 PM	46897
Surr: BFB	96.0	77.4-118		%Rec	1	8/20/2019 4:41:03 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 4:41:03 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 4:41:03 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 4:41:03 PM	46897
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 4:41:03 PM	46897
Surr: 4-Bromofluorobenzene	97.4	80-120		%Rec	1	8/20/2019 4:41:03 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-024 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:00:00 AM

Lab ID: 1908977-013

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2600	150		mg/Kg	50	8/22/2019 12:31:45 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/20/2019 3:32:47 PM	46909
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/20/2019 3:32:47 PM	46909
Surr: DNOP	106	70-130		%Rec	1	8/20/2019 3:32:47 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 5:04:39 PM	46897
Surr: BFB	91.7	77.4-118		%Rec	1	8/20/2019 5:04:39 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 5:04:39 PM	46897
Toluene	ND	0.049		mg/Kg	1	8/20/2019 5:04:39 PM	46897
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 5:04:39 PM	46897
Xylenes, Total	ND	0.098		mg/Kg	1	8/20/2019 5:04:39 PM	46897
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	8/20/2019 5:04:39 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-025 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:05:00 AM

Lab ID: 1908977-014

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3300	150		mg/Kg	50	8/22/2019 1:08:46 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	20	9.2		mg/Kg	1	8/20/2019 3:55:06 PM	46909
Motor Oil Range Organics (MRO)	110	46		mg/Kg	1	8/20/2019 3:55:06 PM	46909
Surr: DNOP	109	70-130		%Rec	1	8/20/2019 3:55:06 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/20/2019 5:28:22 PM	46897
Surr: BFB	94.6	77.4-118		%Rec	1	8/20/2019 5:28:22 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/20/2019 5:28:22 PM	46897
Toluene	ND	0.047		mg/Kg	1	8/20/2019 5:28:22 PM	46897
Ethylbenzene	ND	0.047		mg/Kg	1	8/20/2019 5:28:22 PM	46897
Xylenes, Total	ND	0.094		mg/Kg	1	8/20/2019 5:28:22 PM	46897
Surr: 4-Bromofluorobenzene	94.4	80-120		%Rec	1	8/20/2019 5:28:22 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-026 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:10:00 AM

Lab ID: 1908977-015

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3000	150		mg/Kg	50	8/22/2019 1:21:07 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	19	9.6		mg/Kg	1	8/20/2019 4:17:11 PM	46909
Motor Oil Range Organics (MRO)	190	48		mg/Kg	1	8/20/2019 4:17:11 PM	46909
Surr: DNOP	109	70-130		%Rec	1	8/20/2019 4:17:11 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 5:52:03 PM	46897
Surr: BFB	92.8	77.4-118		%Rec	1	8/20/2019 5:52:03 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 5:52:03 PM	46897
Toluene	ND	0.049		mg/Kg	1	8/20/2019 5:52:03 PM	46897
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 5:52:03 PM	46897
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 5:52:03 PM	46897
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	8/20/2019 5:52:03 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-027 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:15:00 AM

Lab ID: 1908977-016

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3400	150		mg/Kg	50	8/22/2019 1:33:26 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	20	9.0		mg/Kg	1	8/20/2019 4:39:27 PM	46909
Motor Oil Range Organics (MRO)	93	45		mg/Kg	1	8/20/2019 4:39:27 PM	46909
Surr: DNOP	97.2	70-130		%Rec	1	8/20/2019 4:39:27 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 6:15:40 PM	46897
Surr: BFB	93.0	77.4-118		%Rec	1	8/20/2019 6:15:40 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 6:15:40 PM	46897
Toluene	ND	0.049		mg/Kg	1	8/20/2019 6:15:40 PM	46897
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 6:15:40 PM	46897
Xylenes, Total	ND	0.098		mg/Kg	1	8/20/2019 6:15:40 PM	46897
Surr: 4-Bromofluorobenzene	93.5	80-120		%Rec	1	8/20/2019 6:15:40 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-028 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 9:20:00 AM**Lab ID:** 1908977-017**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3100	150		mg/Kg	50	8/22/2019 1:45:48 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/20/2019 5:01:31 PM	46909
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/20/2019 5:01:31 PM	46909
Surr: DNOP	96.7	70-130		%Rec	1	8/20/2019 5:01:31 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/20/2019 6:39:14 PM	46897
Surr: BFB	94.6	77.4-118		%Rec	1	8/20/2019 6:39:14 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/20/2019 6:39:14 PM	46897
Toluene	ND	0.046		mg/Kg	1	8/20/2019 6:39:14 PM	46897
Ethylbenzene	ND	0.046		mg/Kg	1	8/20/2019 6:39:14 PM	46897
Xylenes, Total	ND	0.092		mg/Kg	1	8/20/2019 6:39:14 PM	46897
Surr: 4-Bromofluorobenzene	94.8	80-120		%Rec	1	8/20/2019 6:39:14 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-029 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:25:00 AM

Lab ID: 1908977-018

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2400	150		mg/Kg	50	8/22/2019 1:58:08 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	8/20/2019 5:23:56 PM	46909
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/20/2019 5:23:56 PM	46909
Surr: DNOP	97.0	70-130		%Rec	1	8/20/2019 5:23:56 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 7:02:46 PM	46897
Surr: BFB	92.4	77.4-118		%Rec	1	8/20/2019 7:02:46 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 7:02:46 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 7:02:46 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 7:02:46 PM	46897
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 7:02:46 PM	46897
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	8/20/2019 7:02:46 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-030 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:30:00 AM

Lab ID: 1908977-019

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2200	60		mg/Kg	20	8/22/2019 2:10:28 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/20/2019 5:46:16 PM	46909
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/20/2019 5:46:16 PM	46909
Surr: DNOP	95.9	70-130		%Rec	1	8/20/2019 5:46:16 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/20/2019 7:26:14 PM	46897
Surr: BFB	90.7	77.4-118		%Rec	1	8/20/2019 7:26:14 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/20/2019 7:26:14 PM	46897
Toluene	ND	0.050		mg/Kg	1	8/20/2019 7:26:14 PM	46897
Ethylbenzene	ND	0.050		mg/Kg	1	8/20/2019 7:26:14 PM	46897
Xylenes, Total	ND	0.099		mg/Kg	1	8/20/2019 7:26:14 PM	46897
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	8/20/2019 7:26:14 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-031 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 9:35:00 AM**Lab ID:** 1908977-020**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3100	150		mg/Kg	50	8/22/2019 2:22:49 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/20/2019 6:08:42 PM	46909
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/20/2019 6:08:42 PM	46909
Surr: DNOP	91.6	70-130		%Rec	1	8/20/2019 6:08:42 PM	46909
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 7:49:44 PM	46897
Surr: BFB	98.8	77.4-118		%Rec	1	8/20/2019 7:49:44 PM	46897
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 7:49:44 PM	46897
Toluene	ND	0.048		mg/Kg	1	8/20/2019 7:49:44 PM	46897
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 7:49:44 PM	46897
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 7:49:44 PM	46897
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	8/20/2019 7:49:44 PM	46897

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-032 2'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 9:40:00 AM**Lab ID:** 1908977-021**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1700	60		mg/Kg	20	8/20/2019 10:06:15 PM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/20/2019 11:00:07 PM	46910
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/20/2019 11:00:07 PM	46910
Surr: DNOP	84.9	70-130		%Rec	1	8/20/2019 11:00:07 PM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 9:47:48 PM	46899
Surr: BFB	97.8	77.4-118		%Rec	1	8/20/2019 9:47:48 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 9:47:48 PM	46899
Toluene	ND	0.048		mg/Kg	1	8/20/2019 9:47:48 PM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 9:47:48 PM	46899
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 9:47:48 PM	46899
Surr: 4-Bromofluorobenzene	90.4	80-120		%Rec	1	8/20/2019 9:47:48 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-033 2'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:45:00 AM

Lab ID: 1908977-022

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3400	150		mg/Kg	50	8/22/2019 2:35:09 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/21/2019 12:07:14 AM	46910
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 12:07:14 AM	46910
Surr: DNOP	90.8	70-130		%Rec	1	8/21/2019 12:07:14 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/20/2019 10:56:47 PM	46899
Surr: BFB	98.9	77.4-118		%Rec	1	8/20/2019 10:56:47 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/20/2019 10:56:47 PM	46899
Toluene	ND	0.050		mg/Kg	1	8/20/2019 10:56:47 PM	46899
Ethylbenzene	ND	0.050		mg/Kg	1	8/20/2019 10:56:47 PM	46899
Xylenes, Total	ND	0.099		mg/Kg	1	8/20/2019 10:56:47 PM	46899
Surr: 4-Bromofluorobenzene	92.9	80-120		%Rec	1	8/20/2019 10:56:47 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-034 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:50:00 AM

Lab ID: 1908977-023

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3200	150		mg/Kg	50	8/22/2019 2:47:30 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/21/2019 12:29:48 AM	46910
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 12:29:48 AM	46910
Surr: DNOP	93.4	70-130		%Rec	1	8/21/2019 12:29:48 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2019 12:05:29 AM	46899
Surr: BFB	101	77.4-118		%Rec	1	8/21/2019 12:05:29 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/21/2019 12:05:29 AM	46899
Toluene	ND	0.047		mg/Kg	1	8/21/2019 12:05:29 AM	46899
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2019 12:05:29 AM	46899
Xylenes, Total	ND	0.093		mg/Kg	1	8/21/2019 12:05:29 AM	46899
Surr: 4-Bromofluorobenzene	93.9	80-120		%Rec	1	8/21/2019 12:05:29 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-035 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 9:55:00 AM

Lab ID: 1908977-024

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3500	150		mg/Kg	50	8/22/2019 2:59:51 AM	46926
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/21/2019 12:52:08 AM	46910
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/21/2019 12:52:08 AM	46910
Surr: DNOP	90.0	70-130		%Rec	1	8/21/2019 12:52:08 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/21/2019 12:28:23 AM	46899
Surr: BFB	100	77.4-118		%Rec	1	8/21/2019 12:28:23 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/21/2019 12:28:23 AM	46899
Toluene	ND	0.048		mg/Kg	1	8/21/2019 12:28:23 AM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/21/2019 12:28:23 AM	46899
Xylenes, Total	ND	0.096		mg/Kg	1	8/21/2019 12:28:23 AM	46899
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	8/21/2019 12:28:23 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-036 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:00:00 AM

Lab ID: 1908977-025

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3000	150		mg/Kg	50	8/22/2019 3:36:52 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/21/2019 1:14:21 AM	46910
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2019 1:14:21 AM	46910
Surr: DNOP	91.1	70-130		%Rec	1	8/21/2019 1:14:21 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2019 12:51:14 AM	46899
Surr: BFB	101	77.4-118		%Rec	1	8/21/2019 12:51:14 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/21/2019 12:51:14 AM	46899
Toluene	ND	0.049		mg/Kg	1	8/21/2019 12:51:14 AM	46899
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2019 12:51:14 AM	46899
Xylenes, Total	ND	0.098		mg/Kg	1	8/21/2019 12:51:14 AM	46899
Surr: 4-Bromofluorobenzene	92.2	80-120		%Rec	1	8/21/2019 12:51:14 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-037 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 10:05:00 AM**Lab ID:** 1908977-026**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2200	150		mg/Kg	50	8/22/2019 3:49:12 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 1:36:49 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 1:36:49 AM	46910
Surr: DNOP	89.8	70-130		%Rec	1	8/21/2019 1:36:49 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2019 1:14:13 AM	46899
Surr: BFB	101	77.4-118		%Rec	1	8/21/2019 1:14:13 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/21/2019 1:14:13 AM	46899
Toluene	ND	0.047		mg/Kg	1	8/21/2019 1:14:13 AM	46899
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2019 1:14:13 AM	46899
Xylenes, Total	ND	0.093		mg/Kg	1	8/21/2019 1:14:13 AM	46899
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	8/21/2019 1:14:13 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-038 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:10:00 AM

Lab ID: 1908977-027

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1700	61		mg/Kg	20	8/21/2019 12:35:10 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 1:59:10 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 1:59:10 AM	46910
Surr: DNOP	92.9	70-130		%Rec	1	8/21/2019 1:59:10 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2019 1:37:17 AM	46899
Surr: BFB	98.1	77.4-118		%Rec	1	8/21/2019 1:37:17 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/21/2019 1:37:17 AM	46899
Toluene	ND	0.049		mg/Kg	1	8/21/2019 1:37:17 AM	46899
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2019 1:37:17 AM	46899
Xylenes, Total	ND	0.099		mg/Kg	1	8/21/2019 1:37:17 AM	46899
Surr: 4-Bromofluorobenzene	89.6	80-120		%Rec	1	8/21/2019 1:37:17 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-039 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:15:00 AM

Lab ID: 1908977-028

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1200	61		mg/Kg	20	8/21/2019 12:47:34 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/21/2019 2:21:35 AM	46910
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/21/2019 2:21:35 AM	46910
Surr: DNOP	92.0	70-130		%Rec	1	8/21/2019 2:21:35 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/21/2019 2:00:13 AM	46899
Surr: BFB	105	77.4-118		%Rec	1	8/21/2019 2:00:13 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/21/2019 2:00:13 AM	46899
Toluene	ND	0.048		mg/Kg	1	8/21/2019 2:00:13 AM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/21/2019 2:00:13 AM	46899
Xylenes, Total	ND	0.097		mg/Kg	1	8/21/2019 2:00:13 AM	46899
Surr: 4-Bromofluorobenzene	95.4	80-120		%Rec	1	8/21/2019 2:00:13 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-040 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:20:00 AM

Lab ID: 1908977-029

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1800	61		mg/Kg	20	8/21/2019 12:59:59 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 2:43:55 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 2:43:55 AM	46910
Surr: DNOP	94.2	70-130		%Rec	1	8/21/2019 2:43:55 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/21/2019 2:23:14 AM	46899
Surr: BFB	103	77.4-118		%Rec	1	8/21/2019 2:23:14 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/21/2019 2:23:14 AM	46899
Toluene	ND	0.046		mg/Kg	1	8/21/2019 2:23:14 AM	46899
Ethylbenzene	ND	0.046		mg/Kg	1	8/21/2019 2:23:14 AM	46899
Xylenes, Total	ND	0.092		mg/Kg	1	8/21/2019 2:23:14 AM	46899
Surr: 4-Bromofluorobenzene	94.3	80-120		%Rec	1	8/21/2019 2:23:14 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-041 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/18/2019 10:25:00 AM**Lab ID:** 1908977-030**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2400	61		mg/Kg	20	8/21/2019 1:12:23 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/21/2019 3:06:16 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 3:06:16 AM	46910
Surr: DNOP	96.5	70-130		%Rec	1	8/21/2019 3:06:16 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/21/2019 2:46:19 AM	46899
Surr: BFB	101	77.4-118		%Rec	1	8/21/2019 2:46:19 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/21/2019 2:46:19 AM	46899
Toluene	ND	0.048		mg/Kg	1	8/21/2019 2:46:19 AM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/21/2019 2:46:19 AM	46899
Xylenes, Total	ND	0.095		mg/Kg	1	8/21/2019 2:46:19 AM	46899
Surr: 4-Bromofluorobenzene	91.5	80-120		%Rec	1	8/21/2019 2:46:19 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-042 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:30:00 AM

Lab ID: 1908977-031

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1900	60		mg/Kg	20	8/21/2019 1:24:48 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 3:28:28 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 3:28:28 AM	46910
Surr: DNOP	102	70-130		%Rec	1	8/21/2019 3:28:28 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 9:24:04 PM	46899
Surr: BFB	93.5	77.4-118		%Rec	1	8/20/2019 9:24:04 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 9:24:04 PM	46899
Toluene	ND	0.048		mg/Kg	1	8/20/2019 9:24:04 PM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 9:24:04 PM	46899
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 9:24:04 PM	46899
Surr: 4-Bromofluorobenzene	95.7	80-120		%Rec	1	8/20/2019 9:24:04 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-043 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:35:00 AM

Lab ID: 1908977-032

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3000	150		mg/Kg	50	8/22/2019 4:01:33 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/21/2019 3:50:44 AM	46910
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2019 3:50:44 AM	46910
Surr: DNOP	90.6	70-130		%Rec	1	8/21/2019 3:50:44 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 9:47:42 PM	46899
Surr: BFB	95.7	77.4-118		%Rec	1	8/20/2019 9:47:42 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 9:47:42 PM	46899
Toluene	ND	0.048		mg/Kg	1	8/20/2019 9:47:42 PM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 9:47:42 PM	46899
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 9:47:42 PM	46899
Surr: 4-Bromofluorobenzene	97.8	80-120		%Rec	1	8/20/2019 9:47:42 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-044 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:40:00 AM

Lab ID: 1908977-033

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2600	150		mg/Kg	50	8/22/2019 4:13:53 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/21/2019 4:13:00 AM	46910
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 4:13:00 AM	46910
Surr: DNOP	94.9	70-130		%Rec	1	8/21/2019 4:13:00 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 10:11:27 PM	46899
Surr: BFB	92.8	77.4-118		%Rec	1	8/20/2019 10:11:27 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 10:11:27 PM	46899
Toluene	ND	0.049		mg/Kg	1	8/20/2019 10:11:27 PM	46899
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 10:11:27 PM	46899
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 10:11:27 PM	46899
Surr: 4-Bromofluorobenzene	93.7	80-120		%Rec	1	8/20/2019 10:11:27 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-045 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:45:00 AM

Lab ID: 1908977-034

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2400	60		mg/Kg	20	8/21/2019 2:26:50 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/21/2019 4:35:20 AM	46910
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 4:35:20 AM	46910
Surr: DNOP	93.4	70-130		%Rec	1	8/21/2019 4:35:20 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 10:35:04 PM	46899
Surr: BFB	93.6	77.4-118		%Rec	1	8/20/2019 10:35:04 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 10:35:04 PM	46899
Toluene	ND	0.048		mg/Kg	1	8/20/2019 10:35:04 PM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 10:35:04 PM	46899
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 10:35:04 PM	46899
Surr: 4-Bromofluorobenzene	94.1	80-120		%Rec	1	8/20/2019 10:35:04 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Wall 19-01 3'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:50:00 AM

Lab ID: 1908977-035

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	610	60		mg/Kg	20	8/21/2019 3:04:03 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 5:19:38 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 5:19:38 AM	46910
Surr: DNOP	68.4	70-130	S	%Rec	1	8/21/2019 5:19:38 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 10:58:39 PM	46899
Surr: BFB	90.6	77.4-118		%Rec	1	8/20/2019 10:58:39 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 10:58:39 PM	46899
Toluene	ND	0.048		mg/Kg	1	8/20/2019 10:58:39 PM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 10:58:39 PM	46899
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 10:58:39 PM	46899
Surr: 4-Bromofluorobenzene	91.5	80-120		%Rec	1	8/20/2019 10:58:39 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Wall 19-02 3'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 10:55:00 AM

Lab ID: 1908977-036

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	440	60		mg/Kg	20	8/21/2019 3:16:27 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/21/2019 5:41:50 AM	46910
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2019 5:41:50 AM	46910
Surr: DNOP	49.5	70-130	S	%Rec	1	8/21/2019 5:41:50 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/20/2019 11:22:17 PM	46899
Surr: BFB	94.2	77.4-118		%Rec	1	8/20/2019 11:22:17 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/20/2019 11:22:17 PM	46899
Toluene	ND	0.046		mg/Kg	1	8/20/2019 11:22:17 PM	46899
Ethylbenzene	ND	0.046		mg/Kg	1	8/20/2019 11:22:17 PM	46899
Xylenes, Total	ND	0.093		mg/Kg	1	8/20/2019 11:22:17 PM	46899
Surr: 4-Bromofluorobenzene	95.6	80-120		%Rec	1	8/20/2019 11:22:17 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Wall 19-03 3'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 11:00:00 AM

Lab ID: 1908977-037

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2300	150		mg/Kg	50	8/22/2019 4:26:13 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 6:04:07 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 6:04:07 AM	46910
Surr: DNOP	47.1	70-130	S	%Rec	1	8/21/2019 6:04:07 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 11:45:46 PM	46899
Surr: BFB	92.9	77.4-118		%Rec	1	8/20/2019 11:45:46 PM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/20/2019 11:45:46 PM	46899
Toluene	ND	0.048		mg/Kg	1	8/20/2019 11:45:46 PM	46899
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 11:45:46 PM	46899
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 11:45:46 PM	46899
Surr: 4-Bromofluorobenzene	94.2	80-120		%Rec	1	8/20/2019 11:45:46 PM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Wall 19-04 3'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 11:05:00 AM

Lab ID: 1908977-038

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3600	150		mg/Kg	50	8/22/2019 4:38:34 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	84	9.6		mg/Kg	1	8/21/2019 6:26:11 AM	46910
Motor Oil Range Organics (MRO)	93	48		mg/Kg	1	8/21/2019 6:26:11 AM	46910
Surr: DNOP	69.3	70-130	S	%Rec	1	8/21/2019 6:26:11 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2019 12:09:16 AM	46899
Surr: BFB	89.9	77.4-118		%Rec	1	8/21/2019 12:09:16 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/21/2019 12:09:16 AM	46899
Toluene	ND	0.047		mg/Kg	1	8/21/2019 12:09:16 AM	46899
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2019 12:09:16 AM	46899
Xylenes, Total	ND	0.095		mg/Kg	1	8/21/2019 12:09:16 AM	46899
Surr: 4-Bromofluorobenzene	91.9	80-120		%Rec	1	8/21/2019 12:09:16 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Wall 19-05 3'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/18/2019 11:10:00 AM

Lab ID: 1908977-039

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	6600	300		mg/Kg	100	8/22/2019 4:50:55 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	140	9.5		mg/Kg	1	8/21/2019 6:48:26 AM	46910
Motor Oil Range Organics (MRO)	120	48		mg/Kg	1	8/21/2019 6:48:26 AM	46910
Surr: DNOP	64.1	70-130	S	%Rec	1	8/21/2019 6:48:26 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2019 12:32:47 AM	46899
Surr: BFB	90.9	77.4-118		%Rec	1	8/21/2019 12:32:47 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/21/2019 12:32:47 AM	46899
Toluene	ND	0.049		mg/Kg	1	8/21/2019 12:32:47 AM	46899
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2019 12:32:47 AM	46899
Xylenes, Total	ND	0.098		mg/Kg	1	8/21/2019 12:32:47 AM	46899
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	8/21/2019 12:32:47 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-11 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/16/2019 2:00:00 PM**Lab ID:** 1908977-040**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/21/2019 4:06:05 AM	46934
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2019 7:10:30 AM	46910
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 7:10:30 AM	46910
Surr: DNOP	49.5	70-130	S	%Rec	1	8/21/2019 7:10:30 AM	46910
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/21/2019 12:56:28 AM	46899
Surr: BFB	100	77.4-118		%Rec	1	8/21/2019 12:56:28 AM	46899
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/21/2019 12:56:28 AM	46899
Toluene	ND	0.050		mg/Kg	1	8/21/2019 12:56:28 AM	46899
Ethylbenzene	ND	0.050		mg/Kg	1	8/21/2019 12:56:28 AM	46899
Xylenes, Total	ND	0.10		mg/Kg	1	8/21/2019 12:56:28 AM	46899
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	8/21/2019 12:56:28 AM	46899

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-12 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/16/2019 2:05:00 PM**Lab ID:** 1908977-041**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2700	150		mg/Kg	50	8/22/2019 5:03:15 AM	46934
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 4:47:54 PM	46903
Surr: BFB	91.8	70-130		%Rec	1	8/20/2019 4:47:54 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/21/2019 6:41:53 PM	46911
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2019 6:41:53 PM	46911
Surr: DNOP	84.8	70-130		%Rec	1	8/21/2019 6:41:53 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 4:47:54 PM	46903
Toluene	ND	0.048		mg/Kg	1	8/20/2019 4:47:54 PM	46903
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 4:47:54 PM	46903
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 4:47:54 PM	46903
Surr: 1,2-Dichloroethane-d4	97.7	70-130		%Rec	1	8/20/2019 4:47:54 PM	46903
Surr: 4-Bromofluorobenzene	95.7	70-130		%Rec	1	8/20/2019 4:47:54 PM	46903
Surr: Dibromofluoromethane	106	70-130		%Rec	1	8/20/2019 4:47:54 PM	46903
Surr: Toluene-d8	97.1	70-130		%Rec	1	8/20/2019 4:47:54 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-13 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/16/2019 2:10:00 PM

Lab ID: 1908977-042

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1800	60		mg/Kg	20	8/21/2019 4:30:54 AM	46934
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/20/2019 6:14:34 PM	46903
Surr: BFB	93.8	70-130		%Rec	1	8/20/2019 6:14:34 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/21/2019 7:55:04 PM	46911
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/21/2019 7:55:04 PM	46911
Surr: DNOP	84.4	70-130		%Rec	1	8/21/2019 7:55:04 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 6:14:34 PM	46903
Toluene	ND	0.047		mg/Kg	1	8/20/2019 6:14:34 PM	46903
Ethylbenzene	ND	0.047		mg/Kg	1	8/20/2019 6:14:34 PM	46903
Xylenes, Total	ND	0.094		mg/Kg	1	8/20/2019 6:14:34 PM	46903
Surr: 1,2-Dichloroethane-d4	93.2	70-130		%Rec	1	8/20/2019 6:14:34 PM	46903
Surr: 4-Bromofluorobenzene	98.8	70-130		%Rec	1	8/20/2019 6:14:34 PM	46903
Surr: Dibromofluoromethane	101	70-130		%Rec	1	8/20/2019 6:14:34 PM	46903
Surr: Toluene-d8	97.3	70-130		%Rec	1	8/20/2019 6:14:34 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-14 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/16/2019 2:15:00 PM**Lab ID:** 1908977-043**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1900	60		mg/Kg	20	8/21/2019 4:43:18 AM	46934
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 7:40:59 PM	46903
Surr: BFB	90.8	70-130		%Rec	1	8/20/2019 7:40:59 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/21/2019 8:19:35 PM	46911
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2019 8:19:35 PM	46911
Surr: DNOP	86.2	70-130		%Rec	1	8/21/2019 8:19:35 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 7:40:59 PM	46903
Toluene	ND	0.048		mg/Kg	1	8/20/2019 7:40:59 PM	46903
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 7:40:59 PM	46903
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 7:40:59 PM	46903
Surr: 1,2-Dichloroethane-d4	95.4	70-130		%Rec	1	8/20/2019 7:40:59 PM	46903
Surr: 4-Bromofluorobenzene	96.4	70-130		%Rec	1	8/20/2019 7:40:59 PM	46903
Surr: Dibromofluoromethane	101	70-130		%Rec	1	8/20/2019 7:40:59 PM	46903
Surr: Toluene-d8	95.7	70-130		%Rec	1	8/20/2019 7:40:59 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-15 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/16/2019 2:20:00 PM**Lab ID:** 1908977-044**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2100	60		mg/Kg	20	8/21/2019 4:55:42 AM	46934
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/20/2019 8:09:44 PM	46903
Surr: BFB	94.0	70-130		%Rec	1	8/20/2019 8:09:44 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/21/2019 8:44:13 PM	46911
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2019 8:44:13 PM	46911
Surr: DNOP	86.1	70-130		%Rec	1	8/21/2019 8:44:13 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 8:09:44 PM	46903
Toluene	ND	0.049		mg/Kg	1	8/20/2019 8:09:44 PM	46903
Ethylbenzene	ND	0.049		mg/Kg	1	8/20/2019 8:09:44 PM	46903
Xylenes, Total	ND	0.097		mg/Kg	1	8/20/2019 8:09:44 PM	46903
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	8/20/2019 8:09:44 PM	46903
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	1	8/20/2019 8:09:44 PM	46903
Surr: Dibromofluoromethane	102	70-130		%Rec	1	8/20/2019 8:09:44 PM	46903
Surr: Toluene-d8	97.7	70-130		%Rec	1	8/20/2019 8:09:44 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-16 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/16/2019 2:25:00 PM

Lab ID: 1908977-045

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2600	150		mg/Kg	50	8/22/2019 5:15:35 AM	46945
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 8:38:33 PM	46903
Surr: BFB	92.7	70-130		%Rec	1	8/20/2019 8:38:33 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/21/2019 9:09:02 PM	46911
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 9:09:02 PM	46911
Surr: DNOP	86.4	70-130		%Rec	1	8/21/2019 9:09:02 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 8:38:33 PM	46903
Toluene	ND	0.048		mg/Kg	1	8/20/2019 8:38:33 PM	46903
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 8:38:33 PM	46903
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 8:38:33 PM	46903
Surr: 1,2-Dichloroethane-d4	96.9	70-130		%Rec	1	8/20/2019 8:38:33 PM	46903
Surr: 4-Bromofluorobenzene	98.2	70-130		%Rec	1	8/20/2019 8:38:33 PM	46903
Surr: Dibromofluoromethane	101	70-130		%Rec	1	8/20/2019 8:38:33 PM	46903
Surr: Toluene-d8	98.3	70-130		%Rec	1	8/20/2019 8:38:33 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-17 2'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/16/2019 2:30:00 PM

Lab ID: 1908977-046

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1200	60		mg/Kg	20	8/21/2019 10:37:28 AM	46945
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 9:07:19 PM	46903
Surr: BFB	90.8	70-130		%Rec	1	8/20/2019 9:07:19 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/21/2019 9:33:42 PM	46911
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 9:33:42 PM	46911
Surr: DNOP	71.0	70-130		%Rec	1	8/21/2019 9:33:42 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 9:07:19 PM	46903
Toluene	ND	0.048		mg/Kg	1	8/20/2019 9:07:19 PM	46903
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 9:07:19 PM	46903
Xylenes, Total	ND	0.095		mg/Kg	1	8/20/2019 9:07:19 PM	46903
Surr: 1,2-Dichloroethane-d4	96.2	70-130		%Rec	1	8/20/2019 9:07:19 PM	46903
Surr: 4-Bromofluorobenzene	96.3	70-130		%Rec	1	8/20/2019 9:07:19 PM	46903
Surr: Dibromofluoromethane	97.9	70-130		%Rec	1	8/20/2019 9:07:19 PM	46903
Surr: Toluene-d8	99.0	70-130		%Rec	1	8/20/2019 9:07:19 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**Date Reported: **8/23/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** Base 19-18 4'**Project:** Trebuchet Fee 23 28 19**Collection Date:** 8/16/2019 2:35:00 PM**Lab ID:** 1908977-047**Matrix:** SOIL**Received Date:** 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	4100	150		mg/Kg	50	8/22/2019 5:27:55 AM	46945
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/20/2019 9:36:04 PM	46903
Surr: BFB	91.7	70-130		%Rec	1	8/20/2019 9:36:04 PM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/21/2019 9:58:28 PM	46911
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/21/2019 9:58:28 PM	46911
Surr: DNOP	59.3	70-130	S	%Rec	1	8/21/2019 9:58:28 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/20/2019 9:36:04 PM	46903
Toluene	ND	0.048		mg/Kg	1	8/20/2019 9:36:04 PM	46903
Ethylbenzene	ND	0.048		mg/Kg	1	8/20/2019 9:36:04 PM	46903
Xylenes, Total	ND	0.096		mg/Kg	1	8/20/2019 9:36:04 PM	46903
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	8/20/2019 9:36:04 PM	46903
Surr: 4-Bromofluorobenzene	95.2	70-130		%Rec	1	8/20/2019 9:36:04 PM	46903
Surr: Dibromofluoromethane	102	70-130		%Rec	1	8/20/2019 9:36:04 PM	46903
Surr: Toluene-d8	99.4	70-130		%Rec	1	8/20/2019 9:36:04 PM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-19 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/16/2019 2:40:00 PM

Lab ID: 1908977-048

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	3100	150		mg/Kg	50	8/22/2019 6:04:58 AM	46945
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/22/2019 1:47:24 AM	46903
Surr: BFB	93.1	70-130		%Rec	1	8/22/2019 1:47:24 AM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	8/21/2019 10:23:08 PM	46911
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/21/2019 10:23:08 PM	46911
Surr: DNOP	63.0	70-130	S	%Rec	1	8/21/2019 10:23:08 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	8/22/2019 1:47:24 AM	46903
Toluene	ND	0.047		mg/Kg	1	8/22/2019 1:47:24 AM	46903
Ethylbenzene	ND	0.047		mg/Kg	1	8/22/2019 1:47:24 AM	46903
Xylenes, Total	ND	0.093		mg/Kg	1	8/22/2019 1:47:24 AM	46903
Surr: 1,2-Dichloroethane-d4	116	70-130		%Rec	1	8/22/2019 1:47:24 AM	46903
Surr: 4-Bromofluorobenzene	87.2	70-130		%Rec	1	8/22/2019 1:47:24 AM	46903
Surr: Dibromofluoromethane	119	70-130		%Rec	1	8/22/2019 1:47:24 AM	46903
Surr: Toluene-d8	94.5	70-130		%Rec	1	8/22/2019 1:47:24 AM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908977**

Date Reported: **8/23/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: Base 19-20 4'

Project: Trebuchet Fee 23 28 19

Collection Date: 8/16/2019 2:45:00 PM

Lab ID: 1908977-049

Matrix: SOIL

Received Date: 8/19/2019 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	2600	150		mg/Kg	50	8/22/2019 6:17:18 AM	46945
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/22/2019 2:17:16 AM	46903
Surr: BFB	95.5	70-130		%Rec	1	8/22/2019 2:17:16 AM	46903
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/21/2019 10:47:57 PM	46911
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/21/2019 10:47:57 PM	46911
Surr: DNOP	53.4	70-130	S	%Rec	1	8/21/2019 10:47:57 PM	46911
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	8/22/2019 2:17:16 AM	46903
Toluene	ND	0.047		mg/Kg	1	8/22/2019 2:17:16 AM	46903
Ethylbenzene	ND	0.047		mg/Kg	1	8/22/2019 2:17:16 AM	46903
Xylenes, Total	ND	0.095		mg/Kg	1	8/22/2019 2:17:16 AM	46903
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	8/22/2019 2:17:16 AM	46903
Surr: 4-Bromofluorobenzene	88.8	70-130		%Rec	1	8/22/2019 2:17:16 AM	46903
Surr: Dibromofluoromethane	112	70-130		%Rec	1	8/22/2019 2:17:16 AM	46903
Surr: Toluene-d8	99.2	70-130		%Rec	1	8/22/2019 2:17:16 AM	46903

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: MB-46925	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46925	RunNo: 62282
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116108 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46925	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46925	RunNo: 62282
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116109 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	15	1.5 15.00 0 96.9 90 110

Sample ID: MB-46926	SampType: MBLK	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46926	RunNo: 62288
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116492 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46926	SampType: LCS	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46926	RunNo: 62288
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116493 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 95.0 90 110

Sample ID: MB-46934	SampType: MBLK	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46934	RunNo: 62288
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116524 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46934	SampType: LCS	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46934	RunNo: 62288
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116525 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 94.4 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: MB-46945	SampType: MBLK	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 46945	RunNo: 62333
Prep Date: 8/21/2019	Analysis Date: 8/21/2019	SeqNo: 2118232 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-46945	SampType: LCS	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 46945	RunNo: 62333
Prep Date: 8/21/2019	Analysis Date: 8/21/2019	SeqNo: 2118233 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 94.5 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: LCS-46909	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 46909		RunNo: 62249							
Prep Date: 8/20/2019	Analysis Date: 8/20/2019		SeqNo: 2115158		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	10	50.00	0	105	63.9	124			
Surr: DNOP	4.8		5.000		95.5	70	130			

Sample ID: MB-46909	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 46909		RunNo: 62249							
Prep Date: 8/20/2019	Analysis Date: 8/20/2019		SeqNo: 2115159		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		101	70	130			

Sample ID: 1908977-001AMS	SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: Base 19-01 4'	Batch ID: 46909		RunNo: 62249							
Prep Date: 8/20/2019	Analysis Date: 8/20/2019		SeqNo: 2115340		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	9.6	48.08	0	108	57	142			
Surr: DNOP	4.6		4.808		95.8	70	130			

Sample ID: 1908977-001AMSD	SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: Base 19-01 4'	Batch ID: 46909		RunNo: 62249							
Prep Date: 8/20/2019	Analysis Date: 8/20/2019		SeqNo: 2115341		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	9.2	46.04	0	105	57	142	7.19	20	
Surr: DNOP	4.4		4.604		94.6	70	130	0	0	

Sample ID: 1908977-021AMS	SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: Base 19-032 2'	Batch ID: 46910		RunNo: 62249							
Prep Date: 8/20/2019	Analysis Date: 8/20/2019		SeqNo: 2115993		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.9	49.41	0	103	57	142			
Surr: DNOP	3.9		4.941		79.0	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: 1908977-021AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: Base 19-032 2'	Batch ID: 46910	RunNo: 62249
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2115994 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	48	9.5 47.35 0 101 57 142 6.55 20
Surr: DNOP	3.8	4.735 80.9 70 130 0 0

Sample ID: LCS-46910	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 46910	RunNo: 62249
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116014 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	54	10 50.00 0 108 63.9 124
Surr: DNOP	4.5	5.000 90.5 70 130

Sample ID: MB-46910	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 46910	RunNo: 62249
Prep Date: 8/20/2019	Analysis Date: 8/20/2019	SeqNo: 2116016 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND	10
Motor Oil Range Organics (MRO)	ND	50
Surr: DNOP	9.7	10.00 96.6 70 130

Sample ID: MB-46911	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 46911	RunNo: 62249
Prep Date: 8/20/2019	Analysis Date: 8/21/2019	SeqNo: 2117215 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND	10 50.00 0 0 63.9 124 S
Surr: DNOP	9.7	5.000 193 70 130 S

Sample ID: LCS-46911	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 46911	RunNo: 62249
Prep Date: 8/20/2019	Analysis Date: 8/21/2019	SeqNo: 2117217 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	60	10
Motor Oil Range Organics (MRO)	ND	50
Surr: DNOP	4.5	10.00 45.1 70 130 S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: 1908977-041AMS		SampType: MS			TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID: Base 19-12 4'		Batch ID: 46911			RunNo: 62286					
Prep Date: 8/20/2019		Analysis Date: 8/21/2019			SeqNo: 2117582		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	9.0	44.76	6.816	86.8	57	142			B
Surr: DNOP	3.4		4.476		76.3	70	130			

Sample ID: 1908977-041AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: Base 19-12 4'		Batch ID: 46911		RunNo: 62286						
Prep Date: 8/20/2019		Analysis Date: 8/21/2019		SeqNo: 2117583			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	9.5	47.35	6.816	89.3	57	142	7.18	20	B
Surr: DNOP	3.7		4.735		78.2	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: MB-46897	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115678			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		93.1	77.4	118			

Sample ID: LCS-46897	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115679			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	89.4	80	120			
Surr: BFB	1000		1000		104	77.4	118			

Sample ID: 1908977-001AMS	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: Base 19-01 4'	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115681			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	4.8	24.15	0	105	69.1	142			
Surr: BFB	1000		966.2		107	77.4	118			

Sample ID: 1908977-001AMSD	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: Base 19-01 4'	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115682			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	4.9	24.53	0	105	69.1	142	1.75	20	
Surr: BFB	1100		981.4		108	77.4	118	0	0	

Sample ID: MB-46899	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 46899	RunNo: 62279								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115781			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		101	77.4	118			

Sample ID: LCS-46899	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 46899	RunNo: 62279								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115782			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: LCS-46899	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 46899		RunNo: 62279							
Prep Date: 8/19/2019	Analysis Date: 8/20/2019		SeqNo: 2115782		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	91.2	80	120			
Surr: BFB	1200		1000		117	77.4	118			

Sample ID: 1908977-021AMS	SampType: MS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: Base 19-032 2'	Batch ID: 46899		RunNo: 62279							
Prep Date: 8/19/2019	Analysis Date: 8/20/2019		SeqNo: 2115784		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.7	23.30	0	99.7	69.1	142			
Surr: BFB	1100		932.0		117	77.4	118			

Sample ID: 1908977-021AMSD	SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: Base 19-032 2'	Batch ID: 46899		RunNo: 62279							
Prep Date: 8/19/2019	Analysis Date: 8/20/2019		SeqNo: 2115785		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	4.9	24.32	0	96.8	69.1	142	1.27	20	
Surr: BFB	1100		972.8		117	77.4	118	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: MB-46897	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115719			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.94		1.000		94.5	80	120			

Sample ID: LCS-46897	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115720			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	104	80	120			
Toluene	1.1	0.050	1.000	0	107	80	120			
Ethylbenzene	1.1	0.050	1.000	0	109	80	120			
Xylenes, Total	3.3	0.10	3.000	0	110	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: 1908977-002AMS	SampType: MS	TestCode: EPA Method 8021B: Volatiles								
Client ID: Base 19-02 4'	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115723			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9843	0	107	76	123			
Toluene	1.1	0.049	0.9843	0	111	80.3	127			
Ethylbenzene	1.1	0.049	0.9843	0	114	80.2	131			
Xylenes, Total	3.4	0.098	2.953	0.01668	114	78	133			
Surr: 4-Bromofluorobenzene	0.96		0.9843		97.9	80	120			

Sample ID: 1908977-002AMSD	SampType: MSD	TestCode: EPA Method 8021B: Volatiles								
Client ID: Base 19-02 4'	Batch ID: 46897	RunNo: 62278								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2115724			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.024	0.9671	0	118	76	123	7.87	20	
Toluene	1.2	0.048	0.9671	0	123	80.3	127	8.54	20	
Ethylbenzene	1.2	0.048	0.9671	0	125	80.2	131	7.60	20	
Xylenes, Total	3.6	0.097	2.901	0.01668	124	78	133	6.91	20	
Surr: 4-Bromofluorobenzene	0.93		0.9671		96.4	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: MB-46899		SampType: MBLK		TestCode: EPA Method 8021B: Volatiles						
Client ID: PBS		Batch ID: 46899		RunNo: 62279						
Prep Date: 8/19/2019		Analysis Date: 8/20/2019		SeqNo: 2115823			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.94		1.000		93.8	80	120			

Sample ID: LCS-46899		SampType: LCS			TestCode: EPA Method 8021B: Volatiles					
Client ID: LCSS		Batch ID: 46899			RunNo: 62279					
Prep Date: 8/19/2019		Analysis Date: 8/20/2019			SeqNo: 2115824		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	94.7	80	120			
Toluene	0.97	0.050	1.000	0	96.5	80	120			
Ethylbenzene	0.98	0.050	1.000	0	98.0	80	120			
Xylenes, Total	2.9	0.10	3.000	0	98.2	80	120			
Surr: 4-Bromofluorobenzene	0.99		1.000		99.1	80	120			

Sample ID: 1908977-022AMS		SampType: MS			TestCode: EPA Method 8021B: Volatiles					
Client ID: Base 19-033 2'		Batch ID: 46899			RunNo: 62279					
Prep Date: 8/19/2019		Analysis Date: 8/20/2019			SeqNo: 2115827		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.023	0.9337	0	102	76	123			
Toluene	1.0	0.047	0.9337	0	107	80.3	127			
Ethylbenzene	1.0	0.047	0.9337	0	112	80.2	131			
Xylenes, Total	3.1	0.093	2.801	0	112	78	133			
Surr: 4-Bromofluorobenzene	0.92		0.9337		98.5	80	120			

Sample ID: 1908977-022AMSD		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: Base 19-033 2'		Batch ID: 46899		RunNo: 62279						
Prep Date: 8/19/2019		Analysis Date: 8/20/2019		SeqNo: 2115828		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.023	0.9285	0	105	76	123	2.16	20	
Toluene	1.0	0.046	0.9285	0	109	80.3	127	1.19	20	
Ethylbenzene	1.0	0.046	0.9285	0	113	80.2	131	0.251	20	
Xylenes, Total	3.1	0.093	2.786	0	112	78	133	0.395	20	
Surr: 4-Bromofluorobenzene	0.95		0.9285		102	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: lcs-46903	SampType: LCS	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: LCSS	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116842			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	92.5	68	135			
Toluene	0.99	0.050	1.000	0	99.3	70	130			
Ethylbenzene	1.0	0.050	1.000	0	100	70	130			
Xylenes, Total	3.1	0.10	3.000	0	104	70	130			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		99.5	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		96.8	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		107	70	130			
Surr: Toluene-d8	0.49		0.5000		99.0	70	130			

Sample ID: mb-46903	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116843			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		100	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Surr: Dibromofluoromethane	0.54		0.5000		107	70	130			
Surr: Toluene-d8	0.49		0.5000		98.3	70	130			

Sample ID: 1908977-042AMS	SampType: MS	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: Base 19-13 4'	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116846			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.023	0.9363	0	102	57.1	141			
Toluene	1.1	0.047	0.9363	0	116	70	130			
Ethylbenzene	1.1	0.047	0.9363	0	119	70	130			
Xylenes, Total	3.4	0.094	2.809	0	123	70	130			
Surr: 1,2-Dichloroethane-d4	0.45		0.4682		96.1	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.4682		97.2	70	130			
Surr: Dibromofluoromethane	0.47		0.4682		101	70	130			
Surr: Toluene-d8	0.46		0.4682		99.1	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: 1908977-042AMSD		SampType: MSD		TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: Base 19-13 4'		Batch ID: 46903		RunNo: 62292						
Prep Date: 8/19/2019		Analysis Date: 8/20/2019		SeqNo: 2116847		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9823	0	109	57.1	141	11.4	20	
Toluene	1.1	0.049	0.9823	0	116	70	130	4.37	20	
Ethylbenzene	1.2	0.049	0.9823	0	119	70	130	5.04	0	
Xylenes, Total	3.7	0.098	2.947	0	124	70	130	5.98	0	
Surr: 1,2-Dichloroethane-d4	0.51		0.4912		104	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.49		0.4912		99.8	70	130	0	0	
Surr: Dibromofluoromethane	0.51		0.4912		104	70	130	0	0	
Surr: Toluene-d8	0.48		0.4912		98.7	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908977

23-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 23 28 19

Sample ID: Ics-46903	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116854 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	81.0	70	130			
Surr: BFB	460		500.0		92.4	70	130			

Sample ID: mb-46903	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116855 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	470		500.0		93.4	70	130			

Sample ID: 1908977-041ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: Base 19-12 4'	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116857 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	4.8	23.92	0	101	70	130			
Surr: BFB	460		478.5		95.8	70	130			

Sample ID: 1908977-041amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: Base 19-12 4'	Batch ID: 46903	RunNo: 62292								
Prep Date: 8/19/2019	Analysis Date: 8/20/2019	SeqNo: 2116858 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	4.9	24.51	0	98.5	70	130	0.0542	20	
Surr: BFB	450		490.2		92.7	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 1908977

RcptNo: 1

Received By: Erin Melendrez

8/19/2019 8:35:00 AM

UAG

Completed By: Leah Baca

8/19/2019 9:58:54 AM

Leah Baca

Reviewed By: *LB*

8/19/19

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted? +

Checked by: DAD 8/19/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: Dennis Williams

Date: 8/19/19

By Whom: Leah Baca

Via: ☐ eMail ☒ Phone ☐ Fax ☐ In Person

Regarding: sample name discrepancy between COC and sample label

Client Instructions: the sample label was correct

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.0	Good	Yes			

Chain-of-Custody Record

Client: Vertex Resource Group LTD
Marathon Oil
 Mailing Address:

213 S mesa street, Carlsbad NM 88580
 Phone #: 575 361 1137
 email or Fax#: dwilliams@vertexca
 QA/QC Package: Permian@Vertex-ca
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:

☐ Standard ☒ Rush

Project Name:

Fredbuck 232819

Project #:

19E-00614

Project Manager: Dennis Williams

Sampler: Dennis Williams

On Ice: ☒ Yes ☐ No

of Coolers:

Cooler Temp (including CP): 3.8 to 7.0°C = 40°C

Container Type and #

Preservative Type

HEAL No.

1908977

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
08/14	9:00	Soil	Base 19-24 4'	Glass Jar	Ice	-013	X				X			
	9:05		Base 19-25 4'			-014	X				X			
	9:10		Base 19-26 4'			-015	X				X			
	9:15		Base 19-27 4'			-016	X				X			
	9:20		Base 19-28 4'			-017	X				X			
	9:25		Base 19-29 4'			-018	X				X			
	9:30		Base 19-30 4'			-019	X				X			
	9:35		Base 19-31 4'			-020	X				X			
	9:40		Base 19-32 2'			-021	X				X			
	9:45		Base 19-33 2'			-022	X				X			
	9:50		Base 19-34 4'			-023	X				X			
	9:55		Base 19-35 4'			-024	X				X			

Analysis Request

Remarks:

Date: 08/14 Time: 12:00 Relinquished by: Dennis Williams
 Date: 8/19/19 Time: 0700 Relinquished by: [Signature]
 Received by: [Signature] Date: 8/18/19 Time: 2200
 Received by: [Signature] Date: 8/19/19 Time: 0835

Chain-of-Custody Record

Client: Monahan Oil / ~~Permian~~ Monahan oil

Vertex Resource Group LTD

Mailing Address:

213 S Mesa Street, Carlsbad, NM, 88520

Phone #: 575-361-1137

email or Fax#: Permian@Vertex.com, dwilliams@Vertex.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ AZ Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Sampler: Dennis Williams

On Ice: ☒ Yes ☐ No

of Coolers:

Cooler Temp (including CP): 3.8 (D) 2 (CE) = 4.0 (C)

Container Type and #

Preservative Type

HEAL No.

Sample Name

Date

Time

Matrix

Soil

Base 19-11 4'

Base 19-12 4'

Base 19-13 4'

Base 19-14 4'

Base 19-15 4'

Base 19-16 4'

Base 19-17 4'

Base 19-18 4'

Base 19-19 4'

Base 19-20 4'

Turn-Around Time:

☐ Standard ☒ Rush

Project Name:

Trebuchet Fee 23 28 19

Project #:

19E-00614

Project Manager:

Dennis Williams

Analysis Request

8081 Pesticides/8082 PCB's

EDB (Method 504.1)

PAHs by 8310 or 8270SIMS

RCRA 8 Metals

(C) F, Br, NO₃, NO₂, PO₄, SO₄

8260 (VOA)

8270 (Semi-VOA)

Total Coliform (Present/Absent)

MTBE / TMB's (8021)

(TPH) 8015D (GRO / DRO / MRO)

Remarks:

Received by:

Date

Time

Via:

8/18/19 2:00

Received by:

Date

Time

Via:

8/19/19 07:00

Relinquished by:

Dennis Williams

Relinquished by:

8/19/19 07:00

Relinquished by:

8/19/19 08:35

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

August 28, 2019

Dennis Williams
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX:

RE: Trebuchet 23 28 19

OrderNo.: 1908D34

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 22 sample(s) on 8/22/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-46**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-001**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1700	60		mg/Kg	20	8/23/2019 6:02:22 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/23/2019 11:47:39 AM	47011
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/23/2019 11:47:39 AM	47011
Surr: DNOP	110	70-130		%Rec	1	8/23/2019 11:47:39 AM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/24/2019 11:33:37 AM	47004
Surr: BFB	92.8	77.4-118		%Rec	1	8/24/2019 11:33:37 AM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 11:33:37 AM	47004
Toluene	ND	0.048		mg/Kg	1	8/24/2019 11:33:37 AM	47004
Ethylbenzene	ND	0.048		mg/Kg	1	8/24/2019 11:33:37 AM	47004
Xylenes, Total	ND	0.096		mg/Kg	1	8/24/2019 11:33:37 AM	47004
Surr: 4-Bromofluorobenzene	93.3	80-120		%Rec	1	8/24/2019 11:33:37 AM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-47**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-002**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1500	60		mg/Kg	20	8/23/2019 6:14:46 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/23/2019 12:12:03 PM	47011
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/23/2019 12:12:03 PM	47011
Surr: DNOP	109	70-130		%Rec	1	8/23/2019 12:12:03 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/24/2019 12:44:01 PM	47004
Surr: BFB	92.1	77.4-118		%Rec	1	8/24/2019 12:44:01 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 12:44:01 PM	47004
Toluene	ND	0.047		mg/Kg	1	8/24/2019 12:44:01 PM	47004
Ethylbenzene	ND	0.047		mg/Kg	1	8/24/2019 12:44:01 PM	47004
Xylenes, Total	ND	0.095		mg/Kg	1	8/24/2019 12:44:01 PM	47004
Surr: 4-Bromofluorobenzene	92.5	80-120		%Rec	1	8/24/2019 12:44:01 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-48**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-003**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1600	60		mg/Kg	20	8/23/2019 6:27:10 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/23/2019 12:36:29 PM	47011
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/23/2019 12:36:29 PM	47011
Surr: DNOP	112	70-130		%Rec	1	8/23/2019 12:36:29 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/24/2019 1:54:20 PM	47004
Surr: BFB	94.3	77.4-118		%Rec	1	8/24/2019 1:54:20 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 1:54:20 PM	47004
Toluene	ND	0.048		mg/Kg	1	8/24/2019 1:54:20 PM	47004
Ethylbenzene	ND	0.048		mg/Kg	1	8/24/2019 1:54:20 PM	47004
Xylenes, Total	ND	0.096		mg/Kg	1	8/24/2019 1:54:20 PM	47004
Surr: 4-Bromofluorobenzene	94.3	80-120		%Rec	1	8/24/2019 1:54:20 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-49**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-004**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2500	150		mg/Kg	50	8/26/2019 12:14:34 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/23/2019 1:00:49 PM	47011
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/23/2019 1:00:49 PM	47011
Surr: DNOP	111	70-130		%Rec	1	8/23/2019 1:00:49 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/24/2019 3:04:53 PM	47004
Surr: BFB	102	77.4-118		%Rec	1	8/24/2019 3:04:53 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 3:04:53 PM	47004
Toluene	ND	0.047		mg/Kg	1	8/24/2019 3:04:53 PM	47004
Ethylbenzene	ND	0.047		mg/Kg	1	8/24/2019 3:04:53 PM	47004
Xylenes, Total	ND	0.095		mg/Kg	1	8/24/2019 3:04:53 PM	47004
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	8/24/2019 3:04:53 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-50**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-005**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2400	60		mg/Kg	20	8/23/2019 8:06:26 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	8/23/2019 1:25:08 PM	47011
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/23/2019 1:25:08 PM	47011
Surr: DNOP	114	70-130		%Rec	1	8/23/2019 1:25:08 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/24/2019 3:28:25 PM	47004
Surr: BFB	93.2	77.4-118		%Rec	1	8/24/2019 3:28:25 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 3:28:25 PM	47004
Toluene	ND	0.049		mg/Kg	1	8/24/2019 3:28:25 PM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/24/2019 3:28:25 PM	47004
Xylenes, Total	ND	0.097		mg/Kg	1	8/24/2019 3:28:25 PM	47004
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	8/24/2019 3:28:25 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-51**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-006**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1900	60		mg/Kg	20	8/23/2019 8:18:50 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	8/23/2019 1:49:30 PM	47011
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/23/2019 1:49:30 PM	47011
Surr: DNOP	105	70-130		%Rec	1	8/23/2019 1:49:30 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/24/2019 3:51:59 PM	47004
Surr: BFB	92.3	77.4-118		%Rec	1	8/24/2019 3:51:59 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 3:51:59 PM	47004
Toluene	ND	0.049		mg/Kg	1	8/24/2019 3:51:59 PM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/24/2019 3:51:59 PM	47004
Xylenes, Total	ND	0.097		mg/Kg	1	8/24/2019 3:51:59 PM	47004
Surr: 4-Bromofluorobenzene	92.4	80-120		%Rec	1	8/24/2019 3:51:59 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**

Date Reported: **8/28/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS 19-52

Project: Trebuchet 23 28 19

Collection Date: 8/20/2019

Lab ID: 1908D34-007

Matrix: SOIL

Received Date: 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	660	60		mg/Kg	20	8/23/2019 8:31:15 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/23/2019 2:13:51 PM	47011
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/23/2019 2:13:51 PM	47011
Surr: DNOP	106	70-130		%Rec	1	8/23/2019 2:13:51 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/24/2019 4:15:32 PM	47004
Surr: BFB	93.4	77.4-118		%Rec	1	8/24/2019 4:15:32 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/24/2019 4:15:32 PM	47004
Toluene	ND	0.050		mg/Kg	1	8/24/2019 4:15:32 PM	47004
Ethylbenzene	ND	0.050		mg/Kg	1	8/24/2019 4:15:32 PM	47004
Xylenes, Total	ND	0.10		mg/Kg	1	8/24/2019 4:15:32 PM	47004
Surr: 4-Bromofluorobenzene	94.1	80-120		%Rec	1	8/24/2019 4:15:32 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-53**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-008**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	770	61		mg/Kg	20	8/23/2019 8:43:40 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	11	9.4		mg/Kg	1	8/23/2019 2:38:10 PM	47011
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/23/2019 2:38:10 PM	47011
Surr: DNOP	102	70-130		%Rec	1	8/23/2019 2:38:10 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/24/2019 4:39:04 PM	47004
Surr: BFB	91.3	77.4-118		%Rec	1	8/24/2019 4:39:04 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 4:39:04 PM	47004
Toluene	ND	0.049		mg/Kg	1	8/24/2019 4:39:04 PM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/24/2019 4:39:04 PM	47004
Xylenes, Total	ND	0.098		mg/Kg	1	8/24/2019 4:39:04 PM	47004
Surr: 4-Bromofluorobenzene	90.5	80-120		%Rec	1	8/24/2019 4:39:04 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-54**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-009**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1800	60		mg/Kg	20	8/23/2019 8:56:05 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/23/2019 3:02:28 PM	47011
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2019 3:02:28 PM	47011
Surr: DNOP	103	70-130		%Rec	1	8/23/2019 3:02:28 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/24/2019 5:02:36 PM	47004
Surr: BFB	92.3	77.4-118		%Rec	1	8/24/2019 5:02:36 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/24/2019 5:02:36 PM	47004
Toluene	ND	0.049		mg/Kg	1	8/24/2019 5:02:36 PM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/24/2019 5:02:36 PM	47004
Xylenes, Total	ND	0.099		mg/Kg	1	8/24/2019 5:02:36 PM	47004
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	8/24/2019 5:02:36 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-55**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-010**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1600	60		mg/Kg	20	8/23/2019 9:33:19 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/23/2019 3:26:55 PM	47011
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2019 3:26:55 PM	47011
Surr: DNOP	103	70-130		%Rec	1	8/23/2019 3:26:55 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/24/2019 5:26:06 PM	47004
Surr: BFB	101	77.4-118		%Rec	1	8/24/2019 5:26:06 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 5:26:06 PM	47004
Toluene	ND	0.047		mg/Kg	1	8/24/2019 5:26:06 PM	47004
Ethylbenzene	ND	0.047		mg/Kg	1	8/24/2019 5:26:06 PM	47004
Xylenes, Total	ND	0.095		mg/Kg	1	8/24/2019 5:26:06 PM	47004
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	8/24/2019 5:26:06 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-01 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-011**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1100	60		mg/Kg	20	8/23/2019 9:45:44 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	31	9.6		mg/Kg	1	8/23/2019 1:06:30 PM	47011
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2019 1:06:30 PM	47011
Surr: DNOP	103	70-130		%Rec	1	8/23/2019 1:06:30 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/24/2019 5:49:40 PM	47004
Surr: BFB	91.5	77.4-118		%Rec	1	8/24/2019 5:49:40 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/24/2019 5:49:40 PM	47004
Toluene	ND	0.046		mg/Kg	1	8/24/2019 5:49:40 PM	47004
Ethylbenzene	ND	0.046		mg/Kg	1	8/24/2019 5:49:40 PM	47004
Xylenes, Total	ND	0.092		mg/Kg	1	8/24/2019 5:49:40 PM	47004
Surr: 4-Bromofluorobenzene	90.9	80-120		%Rec	1	8/24/2019 5:49:40 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-02 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-012**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	540	59		mg/Kg	20	8/23/2019 9:58:08 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/23/2019 10:09:24 AM	47011
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/23/2019 10:09:24 AM	47011
Surr: DNOP	104	70-130		%Rec	1	8/23/2019 10:09:24 AM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/24/2019 6:13:14 PM	47004
Surr: BFB	92.7	77.4-118		%Rec	1	8/24/2019 6:13:14 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/24/2019 6:13:14 PM	47004
Toluene	ND	0.047		mg/Kg	1	8/24/2019 6:13:14 PM	47004
Ethylbenzene	ND	0.047		mg/Kg	1	8/24/2019 6:13:14 PM	47004
Xylenes, Total	ND	0.094		mg/Kg	1	8/24/2019 6:13:14 PM	47004
Surr: 4-Bromofluorobenzene	92.4	80-120		%Rec	1	8/24/2019 6:13:14 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-03 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-013**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1500	60		mg/Kg	20	8/23/2019 10:10:32 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	62	9.4		mg/Kg	1	8/23/2019 1:28:30 PM	47011
Motor Oil Range Organics (MRO)	120	47		mg/Kg	1	8/23/2019 1:28:30 PM	47011
Surr: DNOP	109	70-130		%Rec	1	8/23/2019 1:28:30 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/23/2019 9:58:16 PM	47004
Surr: BFB	95.7	77.4-118		%Rec	1	8/23/2019 9:58:16 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/23/2019 9:58:16 PM	47004
Toluene	ND	0.050		mg/Kg	1	8/23/2019 9:58:16 PM	47004
Ethylbenzene	ND	0.050		mg/Kg	1	8/23/2019 9:58:16 PM	47004
Xylenes, Total	ND	0.099		mg/Kg	1	8/23/2019 9:58:16 PM	47004
Surr: 4-Bromofluorobenzene	89.3	80-120		%Rec	1	8/23/2019 9:58:16 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-04 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-014**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	870	60		mg/Kg	20	8/23/2019 10:22:57 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/23/2019 1:50:45 PM	47011
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/23/2019 1:50:45 PM	47011
Surr: DNOP	105	70-130		%Rec	1	8/23/2019 1:50:45 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/23/2019 10:21:23 PM	47004
Surr: BFB	104	77.4-118		%Rec	1	8/23/2019 10:21:23 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2019 10:21:23 PM	47004
Toluene	ND	0.048		mg/Kg	1	8/23/2019 10:21:23 PM	47004
Ethylbenzene	ND	0.048		mg/Kg	1	8/23/2019 10:21:23 PM	47004
Xylenes, Total	ND	0.095		mg/Kg	1	8/23/2019 10:21:23 PM	47004
Surr: 4-Bromofluorobenzene	94.2	80-120		%Rec	1	8/23/2019 10:21:23 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**

Date Reported: **8/28/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS 19-05 1'

Project: Trebuchet 23 28 19

Collection Date: 8/20/2019

Lab ID: 1908D34-015

Matrix: SOIL

Received Date: 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	600	60		mg/Kg	20	8/23/2019 10:35:21 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	8/23/2019 2:12:51 PM	47011
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/23/2019 2:12:51 PM	47011
Surr: DNOP	104	70-130		%Rec	1	8/23/2019 2:12:51 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/23/2019 10:44:20 PM	47004
Surr: BFB	101	77.4-118		%Rec	1	8/23/2019 10:44:20 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/23/2019 10:44:20 PM	47004
Toluene	ND	0.049		mg/Kg	1	8/23/2019 10:44:20 PM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/23/2019 10:44:20 PM	47004
Xylenes, Total	ND	0.098		mg/Kg	1	8/23/2019 10:44:20 PM	47004
Surr: 4-Bromofluorobenzene	92.6	80-120		%Rec	1	8/23/2019 10:44:20 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**

Date Reported: **8/28/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS 19-06 1'

Project: Trebuchet 23 28 19

Collection Date: 8/20/2019

Lab ID: 1908D34-016

Matrix: SOIL

Received Date: 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1000	60		mg/Kg	20	8/23/2019 10:47:46 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/23/2019 10:31:33 AM	47011
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2019 10:31:33 AM	47011
Surr: DNOP	102	70-130		%Rec	1	8/23/2019 10:31:33 AM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/23/2019 11:07:12 PM	47004
Surr: BFB	99.1	77.4-118		%Rec	1	8/23/2019 11:07:12 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/23/2019 11:07:12 PM	47004
Toluene	ND	0.049		mg/Kg	1	8/23/2019 11:07:12 PM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/23/2019 11:07:12 PM	47004
Xylenes, Total	ND	0.099		mg/Kg	1	8/23/2019 11:07:12 PM	47004
Surr: 4-Bromofluorobenzene	90.0	80-120		%Rec	1	8/23/2019 11:07:12 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-07 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-017**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2100	60		mg/Kg	20	8/23/2019 11:00:10 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/23/2019 2:35:05 PM	47011
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2019 2:35:05 PM	47011
Surr: DNOP	105	70-130		%Rec	1	8/23/2019 2:35:05 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/23/2019 11:30:04 PM	47004
Surr: BFB	105	77.4-118		%Rec	1	8/23/2019 11:30:04 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/23/2019 11:30:04 PM	47004
Toluene	ND	0.050		mg/Kg	1	8/23/2019 11:30:04 PM	47004
Ethylbenzene	ND	0.050		mg/Kg	1	8/23/2019 11:30:04 PM	47004
Xylenes, Total	ND	0.099		mg/Kg	1	8/23/2019 11:30:04 PM	47004
Surr: 4-Bromofluorobenzene	96.1	80-120		%Rec	1	8/23/2019 11:30:04 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-08 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-018**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1000	60		mg/Kg	20	8/23/2019 11:12:35 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/23/2019 2:57:13 PM	47011
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/23/2019 2:57:13 PM	47011
Surr: DNOP	98.8	70-130		%Rec	1	8/23/2019 2:57:13 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/23/2019 11:52:57 PM	47004
Surr: BFB	105	77.4-118		%Rec	1	8/23/2019 11:52:57 PM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2019 11:52:57 PM	47004
Toluene	ND	0.047		mg/Kg	1	8/23/2019 11:52:57 PM	47004
Ethylbenzene	ND	0.047		mg/Kg	1	8/23/2019 11:52:57 PM	47004
Xylenes, Total	ND	0.094		mg/Kg	1	8/23/2019 11:52:57 PM	47004
Surr: 4-Bromofluorobenzene	94.9	80-120		%Rec	1	8/23/2019 11:52:57 PM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS 19-09 1'**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-019**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	770	60		mg/Kg	20	8/23/2019 11:25:00 PM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/23/2019 12:00:04 PM	47011
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/23/2019 12:00:04 PM	47011
Surr: DNOP	108	70-130		%Rec	1	8/23/2019 12:00:04 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/24/2019 12:15:50 AM	47004
Surr: BFB	102	77.4-118		%Rec	1	8/24/2019 12:15:50 AM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 12:15:50 AM	47004
Toluene	ND	0.049		mg/Kg	1	8/24/2019 12:15:50 AM	47004
Ethylbenzene	ND	0.049		mg/Kg	1	8/24/2019 12:15:50 AM	47004
Xylenes, Total	ND	0.097		mg/Kg	1	8/24/2019 12:15:50 AM	47004
Surr: 4-Bromofluorobenzene	92.6	80-120		%Rec	1	8/24/2019 12:15:50 AM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** WS 19-06**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-020**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/24/2019 12:02:13 AM	47019
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/23/2019 3:19:25 PM	47011
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/23/2019 3:19:25 PM	47011
Surr: DNOP	106	70-130		%Rec	1	8/23/2019 3:19:25 PM	47011
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/24/2019 12:38:51 AM	47004
Surr: BFB	101	77.4-118		%Rec	1	8/24/2019 12:38:51 AM	47004
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 12:38:51 AM	47004
Toluene	ND	0.047		mg/Kg	1	8/24/2019 12:38:51 AM	47004
Ethylbenzene	ND	0.047		mg/Kg	1	8/24/2019 12:38:51 AM	47004
Xylenes, Total	ND	0.094		mg/Kg	1	8/24/2019 12:38:51 AM	47004
Surr: 4-Bromofluorobenzene	91.3	80-120		%Rec	1	8/24/2019 12:38:51 AM	47004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**

Date Reported: **8/28/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS 19-07

Project: Trebuchet 23 28 19

Collection Date: 8/20/2019

Lab ID: 1908D34-021

Matrix: SOIL

Received Date: 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	750	60		mg/Kg	20	8/24/2019 6:02:07 AM	47025
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/26/2019 9:12:45 AM	47012
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/26/2019 9:12:45 AM	47012
Surr: DNOP	98.4	70-130		%Rec	1	8/26/2019 9:12:45 AM	47012
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/24/2019 10:46:35 AM	46998
Surr: BFB	93.2	77.4-118		%Rec	1	8/24/2019 10:46:35 AM	46998
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/24/2019 10:46:35 AM	46998
Toluene	ND	0.049		mg/Kg	1	8/24/2019 10:46:35 AM	46998
Ethylbenzene	ND	0.049		mg/Kg	1	8/24/2019 10:46:35 AM	46998
Xylenes, Total	ND	0.098		mg/Kg	1	8/24/2019 10:46:35 AM	46998
Surr: 4-Bromofluorobenzene	94.0	80-120		%Rec	1	8/24/2019 10:46:35 AM	46998

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908D34**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** WS 19-08**Project:** Trebuchet 23 28 19**Collection Date:** 8/20/2019**Lab ID:** 1908D34-022**Matrix:** SOIL**Received Date:** 8/22/2019 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2400	60		mg/Kg	20	8/24/2019 6:14:31 AM	47025
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/26/2019 9:37:05 AM	47012
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 9:37:05 AM	47012
Surr: DNOP	110	70-130		%Rec	1	8/26/2019 9:37:05 AM	47012
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/24/2019 11:10:07 AM	46998
Surr: BFB	91.3	77.4-118		%Rec	1	8/24/2019 11:10:07 AM	46998
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/24/2019 11:10:07 AM	46998
Toluene	ND	0.048		mg/Kg	1	8/24/2019 11:10:07 AM	46998
Ethylbenzene	ND	0.048		mg/Kg	1	8/24/2019 11:10:07 AM	46998
Xylenes, Total	ND	0.096		mg/Kg	1	8/24/2019 11:10:07 AM	46998
Surr: 4-Bromofluorobenzene	91.7	80-120		%Rec	1	8/24/2019 11:10:07 AM	46998

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47019	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 47019	RunNo: 62388								
Prep Date: 8/23/2019	Analysis Date: 8/23/2019	SeqNo: 2121517			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-47019	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 47019	RunNo: 62388								
Prep Date: 8/23/2019	Analysis Date: 8/23/2019	SeqNo: 2121519			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.7	90	110			

Sample ID: MB-47025	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 47025	RunNo: 62388								
Prep Date: 8/23/2019	Analysis Date: 8/24/2019	SeqNo: 2121577			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-47025	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 47025	RunNo: 62388								
Prep Date: 8/23/2019	Analysis Date: 8/24/2019	SeqNo: 2121579			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.8	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47011	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 47011	RunNo: 62327								
Prep Date: 8/23/2019	Analysis Date: 8/23/2019	SeqNo: 2119961			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		109	70	130			

Sample ID: LCS-47011	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 47011	RunNo: 62327								
Prep Date: 8/23/2019	Analysis Date: 8/23/2019	SeqNo: 2120619			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Diesel Range Organics (DRO)	47	10	50.00	0	93.5	63.9	124			
Surr: DNOP	4.8		5.000		95.2	70	130			

Sample ID: 1908D34-001AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS 19-46	Batch ID: 47011	RunNo: 62327								
Prep Date: 8/23/2019	Analysis Date: 8/23/2019	SeqNo: 2121050			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Diesel Range Organics (DRO)	47	9.7	48.45	0	97.8	57	142			
Surr: DNOP	5.0		4.845		102	70	130			

Sample ID: 1908D34-001AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS 19-46	Batch ID: 47011	RunNo: 62327								
Prep Date: 8/23/2019	Analysis Date: 8/23/2019	SeqNo: 2121051			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Diesel Range Organics (DRO)	46	9.6	47.89	0	96.8	57	142	2.17	20	
Surr: DNOP	4.8		4.789		100	70	130	0	0	

Sample ID: LCS-47012	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 47012	RunNo: 62411								
Prep Date: 8/23/2019	Analysis Date: 8/26/2019	SeqNo: 2121721			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Diesel Range Organics (DRO)	51	10	50.00	0	101	63.9	124			
Surr: DNOP	4.7		5.000		94.3	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47012	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 47012	RunNo: 62411
Prep Date: 8/23/2019	Analysis Date: 8/26/2019	SeqNo: 2121724 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND	10
Motor Oil Range Organics (MRO)	ND	50
Surr: DNOP	11	10.00 106 70 130

Sample ID: 1908D34-021AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: WS 19-07	Batch ID: 47012	RunNo: 62411
Prep Date: 8/23/2019	Analysis Date: 8/26/2019	SeqNo: 2121967 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	56	10 50.25 6.209 98.2 57 142
Surr: DNOP	3.8	5.025 76.6 70 130

Sample ID: 1908D34-021AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: WS 19-07	Batch ID: 47012	RunNo: 62411
Prep Date: 8/23/2019	Analysis Date: 8/26/2019	SeqNo: 2121968 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	54	9.5 47.26 6.209 101 57 142 2.53 20
Surr: DNOP	3.8	4.726 81.0 70 130 0 0

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-46998	SampType: MBLK			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: PBS	Batch ID: 46998			RunNo: 62392						
Prep Date: 8/22/2019	Analysis Date: 8/23/2019			SeqNo: 2120740		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	960		1000		95.9	77.4	118			

Sample ID: LCS-46998	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: LCSS	Batch ID: 46998			RunNo: 62392						
Prep Date: 8/22/2019	Analysis Date: 8/23/2019			SeqNo: 2120741		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	88.5	80	120			
Surr: BFB	1100		1000		105	77.4	118			

Sample ID: MB-47004	SampType: MBLK			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: PBS	Batch ID: 47004			RunNo: 62392						
Prep Date: 8/22/2019	Analysis Date: 8/23/2019			SeqNo: 2120755		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		94.1	77.4	118			

Sample ID: LCS-47004	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: LCSS	Batch ID: 47004			RunNo: 62392						
Prep Date: 8/22/2019	Analysis Date: 8/23/2019			SeqNo: 2120756		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.2	80	120			
Surr: BFB	1000		1000		104	77.4	118			

Sample ID: 1908D34-001AMS	SampType: MS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS 19-46	Batch ID: 47004			RunNo: 62394						
Prep Date: 8/22/2019	Analysis Date: 8/24/2019			SeqNo: 2120894		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	88.2	69.1	142			
Surr: BFB	1100		1000		109	77.4	118			

Sample ID: 1908D34-001AMSD	SampType: MSD			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS 19-46	Batch ID: 47004			RunNo: 62394						
Prep Date: 8/22/2019	Analysis Date: 8/24/2019			SeqNo: 2120895		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: 1908D34-001AMSD		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS 19-46		Batch ID: 47004		RunNo: 62394						
Prep Date: 8/22/2019		Analysis Date: 8/24/2019		SeqNo: 2120895		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.44	0	90.4	69.1	142	0.146	20	
Surr: BFB	1100		977.5		111	77.4	118	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-46998	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 46998	RunNo: 62392								
Prep Date: 8/22/2019	Analysis Date: 8/23/2019	SeqNo: 2120761			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.97		1.000		96.6	80	120			

Sample ID: LCS-46998	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 46998	RunNo: 62392								
Prep Date: 8/22/2019	Analysis Date: 8/23/2019	SeqNo: 2120762			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	98.3	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	102	80	120			
Xylenes, Total	3.1	0.10	3.000	0	102	80	120			
Surr: 4-Bromofluorobenzene	0.96		1.000		96.0	80	120			

Sample ID: MB-47004	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 47004	RunNo: 62392								
Prep Date: 8/22/2019	Analysis Date: 8/23/2019	SeqNo: 2120774			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.95		1.000		95.2	80	120			

Sample ID: LCS-47004	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 47004	RunNo: 62392								
Prep Date: 8/22/2019	Analysis Date: 8/23/2019	SeqNo: 2120775			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	100	80	120			
Toluene	1.0	0.050	1.000	0	103	80	120			
Ethylbenzene	1.0	0.050	1.000	0	104	80	120			
Xylenes, Total	3.1	0.10	3.000	0	105	80	120			
Surr: 4-Bromofluorobenzene	0.96		1.000		96.1	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908D34

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: 1908D34-002AMS		SampType: MS			TestCode: EPA Method 8021B: Volatiles					
Client ID: BS 19-47		Batch ID: 47004			RunNo: 62394					
Prep Date: 8/22/2019		Analysis Date: 8/24/2019			SeqNo: 2120933		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.024	0.9524	0	92.2	76	123			
Toluene	0.92	0.048	0.9524	0.008807	95.7	80.3	127			
Ethylbenzene	0.93	0.048	0.9524	0	97.4	80.2	131			
Xylenes, Total	2.8	0.095	2.857	0	97.8	78	133			
Surr: 4-Bromofluorobenzene	0.89		0.9524		93.1	80	120			

Sample ID: 1908D34-002AMSD		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: BS 19-47		Batch ID: 47004			RunNo: 62394					
Prep Date: 8/22/2019		Analysis Date: 8/24/2019			SeqNo: 2120934		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.024	0.9785	0	92.6	76	123	3.12	20	
Toluene	0.95	0.049	0.9785	0.008807	95.9	80.3	127	2.97	20	
Ethylbenzene	0.96	0.049	0.9785	0	98.6	80.2	131	3.91	20	
Xylenes, Total	2.9	0.098	2.935	0	99.0	78	133	3.92	20	
Surr: 4-Bromofluorobenzene	0.93		0.9785		95.3	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: **VERTEX CARLSBAD**

Work Order Number: **1908D34**

RcptNo: 1

Received By:

Daniel M

8/22/2019 8:45:00 AM

Completed By:

Yazmine Garduno

8/22/2019 12:43:09 PM

Reviewed By:

ENM
8/22/19
repaired

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐

4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐

5. Sample(s) in proper container(s)? Yes ☒ No ☐

6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐

7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐

8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐

9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒

10. Were any sample containers received broken? Yes ☐ No ☒

11. Does paperwork match bottle labels? Yes ☒ No ☐

(Note discrepancies on chain of custody)

12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐

13. Is it clear what analyses were requested? Yes ☒ No ☐

14. Were all holding times able to be met? Yes ☒ No ☐

(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by:

NR 8/22/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.3	Good				

www.hallenvironmental.com

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Vertera Resource Group
Marathon Oil
 Mailing Address:
213 S Mesa St, Carlsbad, NM, 88220
 Phone #: 575 361 1137
 email or Fax#: dwilliams@vertera.ca
 QA/QC Package: Permian@vertera.ca
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type) _____

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	Cooler Temp (including CF)	(°C)
08/20/13	13:44	SOIL	BS-19-01 1'	glass jar	1cc	1908D34	-011	
			BS-19-02 1'				-012	
			BS-19-03 1'				-013	
			BS-19-04 1'				-014	
			BS-19-05 1'				-015	
			BS-19-06 1'				-016	
			BS-19-07 1'				-017	
			BS-19-08 1'				-018	
			BS-19-09 1'				-019	

Date: 9/20/13 Time: 16:44 Relinquished by: Brandon Schaefer
 Date: 9/21/19 Time: 1900 Relinquished by: [Signature]

Turn-Around Time:
☐ Standard ☒ Rush 48 hours
 Project Name: *AST*
Freibucher 23 28 19
 Project #: 19E-00614

Project Manager:
Dennis Williams
 Sampler: Brandon Schaefer
 On Ice: ☐ Yes ☐ No
 # of Coolers: _____

Received by: Dennis Williams Date: 9/20/19 Time: 16:44
 Received by: DR Carver Date: 9/22/19 Time: 8:45

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

TPH/B015D (GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	CL, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
BTX (T, M, E) / MTBE / TMB's (8021)								
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			
X	X				X			

Remarks:

Page 2 of 3

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Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Chain-of-Custody Record				Turn-Around Time:		
Client: <u>Vertex Resource group</u>				<input type="checkbox"/> Standard <input checked="" type="checkbox"/> Rush <u>48 hours</u>		
Mailing Address: <u>Marathon Oil</u>						
Project Name: <u>on File</u>				Project #:		
Phone #: <u>on File</u>						
email or Fax#: <u>on File</u>				Project Manager:		
QAVQC Package: <input type="checkbox"/> Standard <input type="checkbox"/> Level 4 (Full Validation)						
Accreditation: <input type="checkbox"/> AZ Compliance				Sampler: <u>Brandon Schafer</u> On Ice: <input type="checkbox"/> Yes <input type="checkbox"/> No		
<input type="checkbox"/> NELAC <input type="checkbox"/> Other						
<input type="checkbox"/> EDD (Type) _____				# of Coolers:		
Cooler Temp (including CF): _____ (°C)						
Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No
08/19	3:00	Soil	W519-06	glass jar	1cc	1408 D34
↓	↓	↓	07	↓	↓	-020
↓	↓	↓	08	↓	↓	-021
Relinquished by: <u>Brandon Schafer</u>				Received by: <u>[Signature]</u>		Date Time: <u>8/21/11 1500</u>
Date: <u>9/20/11</u> Time: <u>17:28</u>				Date: <u>8/21/11</u> Time: <u>8:45</u>		
Relinquished by: <u>[Signature]</u>				Received by: <u>[Signature]</u>		
Date: <u>8/21/11</u> Time: <u>1900</u>				Date: <u>8/21/11</u> Time: <u>8:45</u>		

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

August 28, 2019

Dennis Williams
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX:

RE: Trebuchet 23 28 19

OrderNo.: 1908E43

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 13 sample(s) on 8/23/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-56 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-001**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/26/2019 5:24:47 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/26/2019 11:50:39 AM	47044
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/26/2019 11:50:39 AM	47044
Surr: DNOP	103	70-130		%Rec	1	8/26/2019 11:50:39 AM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.1		mg/Kg	1	8/26/2019 1:07:48 PM	A62419
Surr: BFB	93.2	77.4-118		%Rec	1	8/26/2019 1:07:48 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.020		mg/Kg	1	8/26/2019 1:07:48 PM	C62419
Toluene	ND	0.041		mg/Kg	1	8/26/2019 1:07:48 PM	C62419
Ethylbenzene	ND	0.041		mg/Kg	1	8/26/2019 1:07:48 PM	C62419
Xylenes, Total	ND	0.081		mg/Kg	1	8/26/2019 1:07:48 PM	C62419
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	8/26/2019 1:07:48 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-57 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-002**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2300	150		mg/Kg	50	8/27/2019 11:31:04 AM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/26/2019 12:14:36 PM	47044
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 12:14:36 PM	47044
Surr: DNOP	104	70-130		%Rec	1	8/26/2019 12:14:36 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.5		mg/Kg	1	8/26/2019 1:31:23 PM	A62419
Surr: BFB	92.3	77.4-118		%Rec	1	8/26/2019 1:31:23 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.022		mg/Kg	1	8/26/2019 1:31:23 PM	C62419
Toluene	ND	0.045		mg/Kg	1	8/26/2019 1:31:23 PM	C62419
Ethylbenzene	ND	0.045		mg/Kg	1	8/26/2019 1:31:23 PM	C62419
Xylenes, Total	ND	0.089		mg/Kg	1	8/26/2019 1:31:23 PM	C62419
Surr: 4-Bromofluorobenzene	93.2	80-120		%Rec	1	8/26/2019 1:31:23 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-58 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-003**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2400	150		mg/Kg	50	8/27/2019 2:37:14 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/26/2019 12:38:36 PM	47044
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/26/2019 12:38:36 PM	47044
Surr: DNOP	106	70-130		%Rec	1	8/26/2019 12:38:36 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/26/2019 1:55:06 PM	A62419
Surr: BFB	93.7	77.4-118		%Rec	1	8/26/2019 1:55:06 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/26/2019 1:55:06 PM	C62419
Toluene	ND	0.048		mg/Kg	1	8/26/2019 1:55:06 PM	C62419
Ethylbenzene	ND	0.048		mg/Kg	1	8/26/2019 1:55:06 PM	C62419
Xylenes, Total	ND	0.096		mg/Kg	1	8/26/2019 1:55:06 PM	C62419
Surr: 4-Bromofluorobenzene	94.8	80-120		%Rec	1	8/26/2019 1:55:06 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-59 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-004**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/26/2019 6:26:49 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/26/2019 1:02:38 PM	47044
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 1:02:38 PM	47044
Surr: DNOP	105	70-130		%Rec	1	8/26/2019 1:02:38 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.5		mg/Kg	1	8/26/2019 2:18:53 PM	A62419
Surr: BFB	96.4	77.4-118		%Rec	1	8/26/2019 2:18:53 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.022		mg/Kg	1	8/26/2019 2:18:53 PM	C62419
Toluene	ND	0.045		mg/Kg	1	8/26/2019 2:18:53 PM	C62419
Ethylbenzene	ND	0.045		mg/Kg	1	8/26/2019 2:18:53 PM	C62419
Xylenes, Total	ND	0.090		mg/Kg	1	8/26/2019 2:18:53 PM	C62419
Surr: 4-Bromofluorobenzene	97.3	80-120		%Rec	1	8/26/2019 2:18:53 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-60 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-005**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1600	60		mg/Kg	20	8/26/2019 6:39:14 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/26/2019 1:26:44 PM	47044
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 1:26:44 PM	47044
Surr: DNOP	105	70-130		%Rec	1	8/26/2019 1:26:44 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/26/2019 2:42:46 PM	A62419
Surr: BFB	95.9	77.4-118		%Rec	1	8/26/2019 2:42:46 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/26/2019 2:42:46 PM	C62419
Toluene	ND	0.046		mg/Kg	1	8/26/2019 2:42:46 PM	C62419
Ethylbenzene	ND	0.046		mg/Kg	1	8/26/2019 2:42:46 PM	C62419
Xylenes, Total	ND	0.091		mg/Kg	1	8/26/2019 2:42:46 PM	C62419
Surr: 4-Bromofluorobenzene	96.2	80-120		%Rec	1	8/26/2019 2:42:46 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-61 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-006**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/26/2019 7:16:27 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/26/2019 2:15:04 PM	47044
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/26/2019 2:15:04 PM	47044
Surr: DNOP	102	70-130		%Rec	1	8/26/2019 2:15:04 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.2		mg/Kg	1	8/26/2019 3:06:40 PM	A62419
Surr: BFB	93.1	77.4-118		%Rec	1	8/26/2019 3:06:40 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.021		mg/Kg	1	8/26/2019 3:06:40 PM	C62419
Toluene	ND	0.042		mg/Kg	1	8/26/2019 3:06:40 PM	C62419
Ethylbenzene	ND	0.042		mg/Kg	1	8/26/2019 3:06:40 PM	C62419
Xylenes, Total	ND	0.083		mg/Kg	1	8/26/2019 3:06:40 PM	C62419
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	8/26/2019 3:06:40 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-62 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-007**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1300	60		mg/Kg	20	8/26/2019 7:28:51 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/26/2019 2:39:20 PM	47044
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 2:39:20 PM	47044
Surr: DNOP	105	70-130		%Rec	1	8/26/2019 2:39:20 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/26/2019 3:30:29 PM	A62419
Surr: BFB	104	77.4-118		%Rec	1	8/26/2019 3:30:29 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/26/2019 3:30:29 PM	C62419
Toluene	ND	0.049		mg/Kg	1	8/26/2019 3:30:29 PM	C62419
Ethylbenzene	ND	0.049		mg/Kg	1	8/26/2019 3:30:29 PM	C62419
Xylenes, Total	ND	0.097		mg/Kg	1	8/26/2019 3:30:29 PM	C62419
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	8/26/2019 3:30:29 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-63 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-008**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1200	60		mg/Kg	20	8/26/2019 7:41:16 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/26/2019 3:03:38 PM	47044
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 3:03:38 PM	47044
Surr: DNOP	97.8	70-130		%Rec	1	8/26/2019 3:03:38 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/26/2019 3:54:20 PM	A62419
Surr: BFB	97.2	77.4-118		%Rec	1	8/26/2019 3:54:20 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/26/2019 3:54:20 PM	C62419
Toluene	ND	0.049		mg/Kg	1	8/26/2019 3:54:20 PM	C62419
Ethylbenzene	ND	0.049		mg/Kg	1	8/26/2019 3:54:20 PM	C62419
Xylenes, Total	ND	0.099		mg/Kg	1	8/26/2019 3:54:20 PM	C62419
Surr: 4-Bromofluorobenzene	97.8	80-120		%Rec	1	8/26/2019 3:54:20 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-64 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-009**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	1200	60		mg/Kg	20	8/26/2019 7:53:40 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/26/2019 3:27:54 PM	47044
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/26/2019 3:27:54 PM	47044
Surr: DNOP	94.7	70-130		%Rec	1	8/26/2019 3:27:54 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	8/26/2019 5:29:27 PM	A62419
Surr: BFB	97.8	77.4-118		%Rec	1	8/26/2019 5:29:27 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.019		mg/Kg	1	8/26/2019 5:29:27 PM	C62419
Toluene	ND	0.038		mg/Kg	1	8/26/2019 5:29:27 PM	C62419
Ethylbenzene	ND	0.038		mg/Kg	1	8/26/2019 5:29:27 PM	C62419
Xylenes, Total	ND	0.077		mg/Kg	1	8/26/2019 5:29:27 PM	C62419
Surr: 4-Bromofluorobenzene	98.1	80-120		%Rec	1	8/26/2019 5:29:27 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-65 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019**Lab ID:** 1908E43-010**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2100	60		mg/Kg	20	8/26/2019 8:06:05 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	8/26/2019 3:52:16 PM	47044
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	8/26/2019 3:52:16 PM	47044
Surr: DNOP	95.1	70-130		%Rec	1	8/26/2019 3:52:16 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.3		mg/Kg	1	8/26/2019 5:53:14 PM	A62419
Surr: BFB	92.8	77.4-118		%Rec	1	8/26/2019 5:53:14 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.016		mg/Kg	1	8/26/2019 5:53:14 PM	C62419
Toluene	ND	0.033		mg/Kg	1	8/26/2019 5:53:14 PM	C62419
Ethylbenzene	ND	0.033		mg/Kg	1	8/26/2019 5:53:14 PM	C62419
Xylenes, Total	ND	0.066		mg/Kg	1	8/26/2019 5:53:14 PM	C62419
Surr: 4-Bromofluorobenzene	92.3	80-120		%Rec	1	8/26/2019 5:53:14 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order **1908E43**

Date Reported: **8/28/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS19-10 4'

Project: Trebuchet 23 28 19

Collection Date: 8/21/2019

Lab ID: 1908E43-011

Matrix: MEOH (SOIL)

Received Date: 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	4500	150		mg/Kg	50	8/27/2019 2:49:39 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/26/2019 4:16:36 PM	47044
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/26/2019 4:16:36 PM	47044
Surr: DNOP	95.1	70-130		%Rec	1	8/26/2019 4:16:36 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/26/2019 6:16:54 PM	A62419
Surr: BFB	94.7	77.4-118		%Rec	1	8/26/2019 6:16:54 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/26/2019 6:16:54 PM	C62419
Toluene	ND	0.046		mg/Kg	1	8/26/2019 6:16:54 PM	C62419
Ethylbenzene	ND	0.046		mg/Kg	1	8/26/2019 6:16:54 PM	C62419
Xylenes, Total	ND	0.093		mg/Kg	1	8/26/2019 6:16:54 PM	C62419
Surr: 4-Bromofluorobenzene	94.0	80-120		%Rec	1	8/26/2019 6:16:54 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E43**

Date Reported: **8/28/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS19-11 4'

Project: Trebuchet 23 28 19

Collection Date: 8/21/2019

Lab ID: 1908E43-012

Matrix: MEOH (SOIL)

Received Date: 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	2400	150		mg/Kg	50	8/27/2019 3:02:04 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/26/2019 4:40:53 PM	47044
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/26/2019 4:40:53 PM	47044
Surr: DNOP	94.1	70-130		%Rec	1	8/26/2019 4:40:53 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.4		mg/Kg	1	8/26/2019 6:40:40 PM	A62419
Surr: BFB	91.5	77.4-118		%Rec	1	8/26/2019 6:40:40 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.022		mg/Kg	1	8/26/2019 6:40:40 PM	C62419
Toluene	ND	0.044		mg/Kg	1	8/26/2019 6:40:40 PM	C62419
Ethylbenzene	ND	0.044		mg/Kg	1	8/26/2019 6:40:40 PM	C62419
Xylenes, Total	ND	0.088		mg/Kg	1	8/26/2019 6:40:40 PM	C62419
Surr: 4-Bromofluorobenzene	90.6	80-120		%Rec	1	8/26/2019 6:40:40 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E43**Date Reported: **8/28/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** WS19-09 4'**Project:** Trebuchet 23 28 19**Collection Date:** 8/21/2019 4:00:00 PM**Lab ID:** 1908E43-013**Matrix:** MEOH (SOIL)**Received Date:** 8/23/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: CAS
Chloride	4200	150		mg/Kg	50	8/27/2019 3:14:28 PM	47059
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/26/2019 5:05:03 PM	47044
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2019 5:05:03 PM	47044
Surr: DNOP	97.7	70-130		%Rec	1	8/26/2019 5:05:03 PM	47044
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.6		mg/Kg	1	8/26/2019 7:04:22 PM	A62419
Surr: BFB	93.3	77.4-118		%Rec	1	8/26/2019 7:04:22 PM	A62419
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.028		mg/Kg	1	8/26/2019 7:04:22 PM	C62419
Toluene	ND	0.056		mg/Kg	1	8/26/2019 7:04:22 PM	C62419
Ethylbenzene	ND	0.056		mg/Kg	1	8/26/2019 7:04:22 PM	C62419
Xylenes, Total	ND	0.11		mg/Kg	1	8/26/2019 7:04:22 PM	C62419
Surr: 4-Bromofluorobenzene	92.7	80-120		%Rec	1	8/26/2019 7:04:22 PM	C62419

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908E43

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47059	SampType: MBLK	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 47059	RunNo: 62418
Prep Date: 8/26/2019	Analysis Date: 8/26/2019	SeqNo: 2122942 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-47059	SampType: LCS	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 47059	RunNo: 62418
Prep Date: 8/26/2019	Analysis Date: 8/26/2019	SeqNo: 2122943 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 93.1 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908E43

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47044	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 47044	RunNo: 62408								
Prep Date: 8/26/2019	Analysis Date: 8/26/2019	SeqNo: 2121954			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		101	70	130			

Sample ID: LCS-47044	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 47044	RunNo: 62408								
Prep Date: 8/26/2019	Analysis Date: 8/26/2019	SeqNo: 2121955			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.1	63.9	124			
Surr: DNOP	4.5		5.000		90.1	70	130			

Sample ID: 1908E43-001AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS19-56 4'	Batch ID: 47044	RunNo: 62408								
Prep Date: 8/26/2019	Analysis Date: 8/26/2019	SeqNo: 2122288			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	9.3	46.43	0	92.5	57	142			
Surr: DNOP	4.4		4.643		95.2	70	130			

Sample ID: 1908E43-001AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS19-56 4'	Batch ID: 47044	RunNo: 62408								
Prep Date: 8/26/2019	Analysis Date: 8/26/2019	SeqNo: 2122290			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	8.7	43.71	0	90.1	57	142	8.57	20	
Surr: DNOP	4.1		4.371		94.0	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908E43

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: RB	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: A62419		RunNo: 62419							
Prep Date:	Analysis Date: 8/26/2019		SeqNo: 2122213		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		101	77.4	118			

Sample ID: 2.5UG GRO LCS	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: A62419		RunNo: 62419							
Prep Date:	Analysis Date: 8/26/2019		SeqNo: 2122214		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	89.4	80	120			
Surr: BFB	1100		1000		109	77.4	118			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1908E43

28-Aug-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: RB	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: C62419	RunNo: 62419								
Prep Date:	Analysis Date: 8/26/2019	SeqNo: 2122257	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: 100NG BTEX LCS	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: C62419	RunNo: 62419								
Prep Date:	Analysis Date: 8/26/2019	SeqNo: 2122258	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	97.2	80	120			
Toluene	1.0	0.050	1.000	0	99.8	80	120			
Ethylbenzene	1.0	0.050	1.000	0	99.9	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	0.97		1.000		97.4	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 1908E43

RcptNo: 1

Received By: Yazmine Garduno 8/23/2019 9:40:00 AM

Completed By: Yazmine Garduno 8/24/2019 10:25:40 AM

Reviewed By: ENM

8/26/19

Yazmine Garduno

Yazmine Garduno

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: DAD 8/26/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:	_____	Date:	_____
By Whom:	_____	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	_____		
Client Instructions:	_____		

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.6	Good				
2	5.9	Good				
3	5.6	Good				
4	5.3	Good				

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Project Manager:

Dennis Williams

☐ Level 4 (Full Validation)

Sampler: Brandon Schaffer

On Ice: ☒ Yes ☐ No

of Coolers:

Cooler Temp (including CF): 27.1 (K) (°C)

Container Type and #	Preservative Type	HEAL No
9/455 JH	1CC	1908E 43
		-013

Received by:	Via:	Date	Time
		2/21/10	2:00

Received by: Wm carrier Date 5/21/16 Time 9:40

$$\begin{aligned} 5.1 + 0.5df &= 5.6 \\ 5.4 + 0.5df &= 5.9 \\ 5.1 + 0.5df &= 5.6 \\ 4.8 + 0.5df &= 5.3 \end{aligned}$$

Page 2 of 2

 $4.8 \div 0.50F = 5.30$

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-66 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:00:00 PM

Lab ID: 1908E44-001

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/26/2019 5:29:31 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/26/2019 5:29:31 PM
Surr: DNOP	96.1	70-130		%Rec	1	8/26/2019 5:29:31 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.5		mg/Kg	1	8/26/2019 7:28:06 PM
Surr: BFB	92.1	77.4-118		%Rec	1	8/26/2019 7:28:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.022		mg/Kg	1	8/26/2019 7:28:06 PM
Toluene	ND	0.045		mg/Kg	1	8/26/2019 7:28:06 PM
Ethylbenzene	ND	0.045		mg/Kg	1	8/26/2019 7:28:06 PM
Xylenes, Total	ND	0.090		mg/Kg	1	8/26/2019 7:28:06 PM
Surr: 4-Bromofluorobenzene	91.6	80-120		%Rec	1	8/26/2019 7:28:06 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1800	60		mg/Kg	20	8/26/2019 8:55:44 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-67 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:05:00 PM

Lab ID: 1908E44-002

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/26/2019 5:53:52 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/26/2019 5:53:52 PM
Surr: DNOP	98.0	70-130		%Rec	1	8/26/2019 5:53:52 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.2		mg/Kg	1	8/26/2019 7:51:40 PM
Surr: BFB	91.0	77.4-118		%Rec	1	8/26/2019 7:51:40 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.021		mg/Kg	1	8/26/2019 7:51:40 PM
Toluene	ND	0.042		mg/Kg	1	8/26/2019 7:51:40 PM
Ethylbenzene	ND	0.042		mg/Kg	1	8/26/2019 7:51:40 PM
Xylenes, Total	ND	0.084		mg/Kg	1	8/26/2019 7:51:40 PM
Surr: 4-Bromofluorobenzene	91.1	80-120		%Rec	1	8/26/2019 7:51:40 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/26/2019 9:08:08 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-68 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:10:00 PM

Lab ID: 1908E44-003

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/26/2019 6:18:09 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/26/2019 6:18:09 PM
Surr: DNOP	97.3	70-130		%Rec	1	8/26/2019 6:18:09 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.2		mg/Kg	1	8/26/2019 8:15:14 PM
Surr: BFB	91.1	77.4-118		%Rec	1	8/26/2019 8:15:14 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.026		mg/Kg	1	8/26/2019 8:15:14 PM
Toluene	ND	0.052		mg/Kg	1	8/26/2019 8:15:14 PM
Ethylbenzene	ND	0.052		mg/Kg	1	8/26/2019 8:15:14 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/26/2019 8:15:14 PM
Surr: 4-Bromofluorobenzene	90.8	80-120		%Rec	1	8/26/2019 8:15:14 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2300	150		mg/Kg	50	8/27/2019 3:51:41 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-69 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:15:00 PM

Lab ID: 1908E44-004

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/26/2019 6:42:33 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/26/2019 6:42:33 PM
Surr: DNOP	97.7	70-130		%Rec	1	8/26/2019 6:42:33 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/26/2019 8:38:48 PM
Surr: BFB	90.7	77.4-118		%Rec	1	8/26/2019 8:38:48 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/26/2019 8:38:48 PM
Toluene	ND	0.049		mg/Kg	1	8/26/2019 8:38:48 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/26/2019 8:38:48 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/26/2019 8:38:48 PM
Surr: 4-Bromofluorobenzene	90.1	80-120		%Rec	1	8/26/2019 8:38:48 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2200	60		mg/Kg	20	8/26/2019 10:22:35 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-70 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:20:00 PM

Lab ID: 1908E44-005

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	8/26/2019 7:06:44 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/26/2019 7:06:44 PM
Surr: DNOP	98.3	70-130		%Rec	1	8/26/2019 7:06:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.3		mg/Kg	1	8/26/2019 9:02:19 PM
Surr: BFB	91.2	77.4-118		%Rec	1	8/26/2019 9:02:19 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.026		mg/Kg	1	8/26/2019 9:02:19 PM
Toluene	ND	0.053		mg/Kg	1	8/26/2019 9:02:19 PM
Ethylbenzene	ND	0.053		mg/Kg	1	8/26/2019 9:02:19 PM
Xylenes, Total	ND	0.11		mg/Kg	1	8/26/2019 9:02:19 PM
Surr: 4-Bromofluorobenzene	91.0	80-120		%Rec	1	8/26/2019 9:02:19 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2500	150		mg/Kg	50	8/27/2019 4:04:06 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-71 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:25:00 PM

Lab ID: 1908E44-006

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/26/2019 7:30:51 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/26/2019 7:30:51 PM
Surr: DNOP	98.0	70-130		%Rec	1	8/26/2019 7:30:51 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	8/26/2019 10:13:03 PM
Surr: BFB	96.8	77.4-118		%Rec	1	8/26/2019 10:13:03 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.018		mg/Kg	1	8/26/2019 10:13:03 PM
Toluene	ND	0.037		mg/Kg	1	8/26/2019 10:13:03 PM
Ethylbenzene	ND	0.037		mg/Kg	1	8/26/2019 10:13:03 PM
Xylenes, Total	ND	0.074		mg/Kg	1	8/26/2019 10:13:03 PM
Surr: 4-Bromofluorobenzene	96.4	80-120		%Rec	1	8/26/2019 10:13:03 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2300	60		mg/Kg	20	8/26/2019 10:47:24 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-72 4'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:30:00 PM

Lab ID: 1908E44-007

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/26/2019 7:55:04 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/26/2019 7:55:04 PM
Surr: DNOP	98.5	70-130		%Rec	1	8/26/2019 7:55:04 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	8/26/2019 11:23:28 PM
Surr: BFB	91.2	77.4-118		%Rec	1	8/26/2019 11:23:28 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.019		mg/Kg	1	8/26/2019 11:23:28 PM
Toluene	ND	0.037		mg/Kg	1	8/26/2019 11:23:28 PM
Ethylbenzene	ND	0.037		mg/Kg	1	8/26/2019 11:23:28 PM
Xylenes, Total	ND	0.075		mg/Kg	1	8/26/2019 11:23:28 PM
Surr: 4-Bromofluorobenzene	91.9	80-120		%Rec	1	8/26/2019 11:23:28 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1500	60		mg/Kg	20	8/26/2019 10:59:49 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS19-12 3'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:35:00 PM

Lab ID: 1908E44-008

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/27/2019 9:25:49 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/27/2019 9:25:49 AM
Surr: DNOP	89.5	70-130		%Rec	1	8/27/2019 9:25:49 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.5		mg/Kg	1	8/27/2019 12:33:58 AM
Surr: BFB	91.5	77.4-118		%Rec	1	8/27/2019 12:33:58 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.022		mg/Kg	1	8/27/2019 12:33:58 AM
Toluene	ND	0.045		mg/Kg	1	8/27/2019 12:33:58 AM
Ethylbenzene	ND	0.045		mg/Kg	1	8/27/2019 12:33:58 AM
Xylenes, Total	ND	0.090		mg/Kg	1	8/27/2019 12:33:58 AM
Surr: 4-Bromofluorobenzene	91.3	80-120		%Rec	1	8/27/2019 12:33:58 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	150	60		mg/Kg	20	8/27/2019 6:26:27 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1908E44**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS19-13 3'

Project: Trebuchet 23 28 19

Collection Date: 8/22/2019 1:40:00 PM

Lab ID: 1908E44-009

Matrix: MEOH (SOIL)

Received Date: 8/24/2019 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	120	10		mg/Kg	1	8/27/2019 9:50:24 AM
Motor Oil Range Organics (MRO)	200	50		mg/Kg	1	8/27/2019 9:50:24 AM
Surr: DNOP	109	70-130		%Rec	1	8/27/2019 9:50:24 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.2		mg/Kg	1	8/27/2019 12:57:30 AM
Surr: BFB	87.4	77.4-118		%Rec	1	8/27/2019 12:57:30 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.026		mg/Kg	1	8/27/2019 12:57:30 AM
Toluene	ND	0.052		mg/Kg	1	8/27/2019 12:57:30 AM
Ethylbenzene	ND	0.052		mg/Kg	1	8/27/2019 12:57:30 AM
Xylenes, Total	ND	0.10		mg/Kg	1	8/27/2019 12:57:30 AM
Surr: 4-Bromofluorobenzene	87.5	80-120		%Rec	1	8/27/2019 12:57:30 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	3300	150		mg/Kg	50	8/27/2019 4:16:30 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

July 30, 2019

Dennis Williams
Marathon Oil Company
4111 Tidwell Road
Carlsbad, NM 88220
TEL: (575) 297-0956
FAX

RE: Trebuchet 23 28 19

OrderNo.: 1907E19

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 4 sample(s) on 7/27/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907E19**Date Reported: **7/30/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** BG19-17 (0')**Project:** Trebuchet 23 28 19**Collection Date:** 7/26/2019 9:30:00 AM**Lab ID:** 1907E19-001**Matrix:** MEOH (SOIL)**Received Date:** 7/27/2019 9:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	7/29/2019 9:47:35 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	7/29/2019 9:47:35 AM
Surr: DNOP	72.8	70-130		%Rec	1	7/29/2019 9:47:35 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	7/29/2019 10:35:35 AM
Surr: BFB	101	73.8-119		%Rec	1	7/29/2019 10:35:35 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.019		mg/Kg	1	7/29/2019 10:35:35 AM
Toluene	ND	0.037		mg/Kg	1	7/29/2019 10:35:35 AM
Ethylbenzene	ND	0.037		mg/Kg	1	7/29/2019 10:35:35 AM
Xylenes, Total	ND	0.075		mg/Kg	1	7/29/2019 10:35:35 AM
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	7/29/2019 10:35:35 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	7/29/2019 12:52:51 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907E19**Date Reported: **7/30/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** BG19-17 (2')**Project:** Trebuchet 23 28 19**Collection Date:** 7/26/2019 9:40:00 AM**Lab ID:** 1907E19-002**Matrix:** MEOH (SOIL)**Received Date:** 7/27/2019 9:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/29/2019 10:09:42 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/29/2019 10:09:42 AM
Surr: DNOP	76.7	70-130		%Rec	1	7/29/2019 10:09:42 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.2		mg/Kg	1	7/29/2019 10:58:59 AM
Surr: BFB	94.3	73.8-119		%Rec	1	7/29/2019 10:58:59 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.021		mg/Kg	1	7/29/2019 10:58:59 AM
Toluene	ND	0.042		mg/Kg	1	7/29/2019 10:58:59 AM
Ethylbenzene	ND	0.042		mg/Kg	1	7/29/2019 10:58:59 AM
Xylenes, Total	ND	0.084		mg/Kg	1	7/29/2019 10:58:59 AM
Surr: 4-Bromofluorobenzene	93.8	80-120		%Rec	1	7/29/2019 10:58:59 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	4500	150		mg/Kg	50	7/29/2019 2:44:32 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907E19**Date Reported: **7/30/2019****CLIENT:** Marathon Oil Company**Client Sample ID:** BG19-17 (4')**Project:** Trebuchet 23 28 19**Collection Date:** 7/26/2019 10:00:00 AM**Lab ID:** 1907E19-003**Matrix:** MEOH (SOIL)**Received Date:** 7/27/2019 9:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	7/29/2019 10:31:54 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	7/29/2019 10:31:54 AM
Surr: DNOP	77.1	70-130		%Rec	1	7/29/2019 10:31:54 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.1		mg/Kg	1	7/29/2019 11:22:25 AM
Surr: BFB	89.1	73.8-119		%Rec	1	7/29/2019 11:22:25 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.016		mg/Kg	1	7/29/2019 11:22:25 AM
Toluene	ND	0.031		mg/Kg	1	7/29/2019 11:22:25 AM
Ethylbenzene	ND	0.031		mg/Kg	1	7/29/2019 11:22:25 AM
Xylenes, Total	ND	0.062		mg/Kg	1	7/29/2019 11:22:25 AM
Surr: 4-Bromofluorobenzene	89.5	80-120		%Rec	1	7/29/2019 11:22:25 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1200	60		mg/Kg	20	7/29/2019 1:42:30 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1907E19**

Date Reported: **7/30/2019**

CLIENT: Marathon Oil Company

Client Sample ID: BG19-17 (6')

Project: Trebuchet 23 28 19

Collection Date: 7/26/2019 11:00:00 AM

Lab ID: 1907E19-004

Matrix: MEOH (SOIL)

Received Date: 7/27/2019 9:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: TOM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	7/29/2019 10:54:00 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/29/2019 10:54:00 AM
Surr: DNOP	81.1	70-130		%Rec	1	7/29/2019 10:54:00 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.5		mg/Kg	1	7/29/2019 11:45:59 AM
Surr: BFB	89.0	73.8-119		%Rec	1	7/29/2019 11:45:59 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.018		mg/Kg	1	7/29/2019 11:45:59 AM
Toluene	ND	0.035		mg/Kg	1	7/29/2019 11:45:59 AM
Ethylbenzene	ND	0.035		mg/Kg	1	7/29/2019 11:45:59 AM
Xylenes, Total	ND	0.070		mg/Kg	1	7/29/2019 11:45:59 AM
Surr: 4-Bromofluorobenzene	90.2	80-120		%Rec	1	7/29/2019 11:45:59 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	730	60		mg/Kg	20	7/29/2019 1:54:55 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907E19

30-Jul-19

Client: Marathon Oil Company

Project: Trebuchet 23 28 19

Sample ID: MB-46441	SampType: mbk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 46441	RunNo: 61714								
Prep Date: 7/29/2019	Analysis Date: 7/29/2019	SeqNo: 2092746	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-46441	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 46441	RunNo: 61714								
Prep Date: 7/29/2019	Analysis Date: 7/29/2019	SeqNo: 2092748	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.4	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907E19

30-Jul-19

Client: Marathon Oil Company

Project: Trebuchet 23 28 19

Sample ID: LCS-46437	SampType: LCS			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batch ID: 46437			RunNo: 61704						
Prep Date: 7/29/2019	Analysis Date: 7/29/2019			SeqNo: 2091574	Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	94.0	63.9	124			
Surr: DNOP	4.2		5.000		84.3	70	130			

Sample ID: MB-46437	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: PBS	Batch ID: 46437			RunNo: 61704						
Prep Date: 7/29/2019	Analysis Date: 7/29/2019			SeqNo: 2091575	Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.8		10.00		87.6	70	130			

Sample ID: LCS-46410	SampType: LCS			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batch ID: 46410			RunNo: 61704						
Prep Date: 7/26/2019	Analysis Date: 7/29/2019			SeqNo: 2092243	Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.9		5.000		118	70	130			

Sample ID: MB-46410	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: PBS	Batch ID: 46410			RunNo: 61704						
Prep Date: 7/26/2019	Analysis Date: 7/29/2019			SeqNo: 2092244	Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	12		10.00		123	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907E19

30-Jul-19

Client: Marathon Oil Company

Project: Trebuchet 23 28 19

Sample ID: MB-46422	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 46422	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092021			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	890		1000		89.3	73.8	119			

Sample ID: LCS-46422	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 46422	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092022			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.6	80.1	123			
Surr: BFB	1000		1000		104	73.8	119			

Sample ID: MB-46417	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 46417	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092033			Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	920		1000		92.0	73.8	119			

Sample ID: LCS-46417	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 46417	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092035			Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1000		1000		100	73.8	119			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1907E19

30-Jul-19

Client: Marathon Oil Company

Project: Trebuchet 23 28 19

Sample ID: MB-46422	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 46422	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092074			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.89		1.000		88.8	80	120			

Sample ID: LCS-46422	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 46422	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092075			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.2	80	120			
Toluene	1.0	0.050	1.000	0	101	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	0.96		1.000		95.7	80	120			

Sample ID: MB-46417	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 46417	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092081			Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.91		1.000		91.2	80	120			

Sample ID: LCS-46417	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 46417	RunNo: 61712								
Prep Date: 7/26/2019	Analysis Date: 7/29/2019	SeqNo: 2092082			Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.0		1.000		99.9	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: **MARATHON OIL COMPA**

Work Order Number: **1907E19**

RcptNo: 1

Received By: **Yazmine Garduno** 7/27/2019 9:07:00 AM

Completed By: **Yazmine Garduno** 7/27/2019 10:39:44 AM

Reviewed By: **DAD 7/29/19**

Yazmine Garduno

Yazmine Garduno

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by:

YG 7/27/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date:

By Whom:

Via:

☐ eMail

☐ Phone

☐ Fax

☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.9	Good	Yes			
2	2.5	Good	Yes			



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

September 12, 2019

Dennis Williams
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Trebuchet Fee 23 28 19 WXY 010H

OrderNo.: 1909316

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/7/2019 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued September 11, 2019.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", with a stylized flourish at the end.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1909316**Date Reported: **9/12/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** SS15-01**Project:** Trebuchet Fee 23 28 19 WXY 010H**Collection Date:** 9/6/2019 8:00:00 AM**Lab ID:** 1909316-001**Matrix:** MEOH (SOIL)**Received Date:** 9/7/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	47000	3000		mg/Kg	1E+	9/9/2019 11:18:04 AM	47343
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/9/2019 10:48:03 AM	47342
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/9/2019 10:48:03 AM	47342
Surr: DNOP	95.3	70-130		%Rec	1	9/9/2019 10:48:03 AM	47342
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	19		mg/Kg	5	9/9/2019 9:38:28 AM	G62762
Surr: BFB	95.7	77.4-118		%Rec	5	9/9/2019 9:38:28 AM	G62762
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.094		mg/Kg	5	9/9/2019 9:38:28 AM	B62762
Toluene	ND	0.19		mg/Kg	5	9/9/2019 9:38:28 AM	B62762
Ethylbenzene	ND	0.19		mg/Kg	5	9/9/2019 9:38:28 AM	B62762
Xylenes, Total	ND	0.38		mg/Kg	5	9/9/2019 9:38:28 AM	B62762
Surr: 4-Bromofluorobenzene	96.2	80-120		%Rec	5	9/9/2019 9:38:28 AM	B62762

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909316

12-Sep-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY 010H

Sample ID: MB-47343	SampType: MBLK	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 47343	RunNo: 62754								
Prep Date: 9/9/2019	Analysis Date: 9/9/2019	SeqNo: 2138648	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-47343	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 47343	RunNo: 62754								
Prep Date: 9/9/2019	Analysis Date: 9/9/2019	SeqNo: 2138649	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.7	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909316

12-Sep-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY 010H

Sample ID: LCS-47342	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 47342	RunNo: 62753								
Prep Date: 9/9/2019	Analysis Date: 9/9/2019	SeqNo: 2137494 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	101	63.9	124			
Surr: DNOP	4.0		5.000		80.3	70	130			

Sample ID: MB-47342	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 47342	RunNo: 62753								
Prep Date: 9/9/2019	Analysis Date: 9/9/2019	SeqNo: 2137495 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		91.1	70	130			

Sample ID: 1909316-001AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: SS15-01	Batch ID: 47342	RunNo: 62753								
Prep Date: 9/9/2019	Analysis Date: 9/9/2019	SeqNo: 2137639 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	9.7	48.26	0	102	57	142			
Surr: DNOP	4.4		4.826		90.3	70	130			

Sample ID: 1909316-001AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: SS15-01	Batch ID: 47342	RunNo: 62753								
Prep Date: 9/9/2019	Analysis Date: 9/9/2019	SeqNo: 2137641 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.7	48.64	0	103	57	142	1.49	20	
Surr: DNOP	4.4		4.864		89.9	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909316

12-Sep-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY 010H

Sample ID: RB	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: G62762		RunNo: 62762							
Prep Date:	Analysis Date: 9/9/2019		SeqNo: 2138121		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		93.2	77.4	118			

Sample ID: 2.5UG GRO LCS	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: G62762		RunNo: 62762							
Prep Date:	Analysis Date: 9/9/2019		SeqNo: 2138122		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	101	80	120			
Surr: BFB	1200		1000		116	77.4	118			

Sample ID: 1909316-001AMS	SampType: MS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: SS15-01	Batch ID: G62762		RunNo: 62762							
Prep Date:	Analysis Date: 9/9/2019		SeqNo: 2138124		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	91	19	93.99	0	97.2	69.1	142			
Surr: BFB	4000		3760		108	77.4	118			

Sample ID: 1909316-001AMSD	SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: SS15-01	Batch ID: G62762		RunNo: 62762							
Prep Date:	Analysis Date: 9/9/2019		SeqNo: 2138125		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	90	19	93.99	0	96.0	69.1	142	1.20	20	
Surr: BFB	3800		3760		101	77.4	118	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1909316

12-Sep-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY 010H

Sample ID: RB	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: B62762	RunNo: 62762								
Prep Date:	Analysis Date: 9/9/2019	SeqNo: 2138138 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.93		1.000		93.2	80	120			

Sample ID: 100NG BTEX LCS	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: B62762	RunNo: 62762								
Prep Date:	Analysis Date: 9/9/2019	SeqNo: 2138139 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	97.3	80	120			
Toluene	0.97	0.050	1.000	0	96.7	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.1	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.4	80	120			
Surr: 4-Bromofluorobenzene	0.98		1.000		98.0	80	120			

Sample ID: 1909316-001AMS	SampType: MS	TestCode: EPA Method 8021B: Volatiles								
Client ID: SS15-01	Batch ID: B62762	RunNo: 62762								
Prep Date:	Analysis Date: 9/9/2019	SeqNo: 2138141 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.7	0.094	3.760	0.05151	98.0	76	123			
Toluene	3.9	0.19	3.760	0.04850	102	80.3	127			
Ethylbenzene	3.8	0.19	3.760	0	102	80.2	131			
Xylenes, Total	12	0.38	11.28	0.07669	103	78	133			
Surr: 4-Bromofluorobenzene	3.8		3.760		102	80	120			

Sample ID: 1909316-001AMSD	SampType: MSD	TestCode: EPA Method 8021B: Volatiles								
Client ID: SS15-01	Batch ID: B62762	RunNo: 62762								
Prep Date:	Analysis Date: 9/9/2019	SeqNo: 2138142 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.6	0.094	3.760	0.05151	95.4	76	123	2.69	20	
Toluene	3.8	0.19	3.760	0.04850	99.1	80.3	127	2.54	20	
Ethylbenzene	3.8	0.19	3.760	0	100	80.2	131	1.78	20	
Xylenes, Total	11	0.38	11.28	0.07669	101	78	133	2.11	20	
Surr: 4-Bromofluorobenzene	3.7		3.760		97.2	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 1909316

RcptNo: 1

Received By: Yazmine Garduno

9/7/2019 9:30:00 AM

Yazmine Garduno

Completed By: Yazmine Garduno

9/7/2019 10:53:05 AM

Yazmine Garduno

Reviewed By: ENM

9/7/19

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.2	Good				
2	3.1	Good				
3	3.9	Good				

Analytical ReportLab Order: **1909531**

Date Reported:

Hall Environmental Analysis Laboratory, Inc.**CLIENT:** Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY 10H**Lab Order:** 1909531**Lab ID:** 1909531-001**Collection Date:** 9/10/2019 12:50:00 PM**Client Sample ID:** BG19-02 0'**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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EPA METHOD 300.0: ANIONSAnalyst: **SRM**

Chloride	ND	60		mg/Kg	20	9/12/2019 11:18:00 AM
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Lab ID: 1909531-002**Collection Date:** 9/10/2019 1:00:00 PM**Client Sample ID:** BG19-02 2'**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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EPA METHOD 300.0: ANIONSAnalyst: **SRM**

Chloride	2400	150		mg/Kg	50	9/12/2019 12:32:00 PM
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Lab ID: 1909531-003**Collection Date:** 9/10/2019 1:10:00 PM**Client Sample ID:** BG19-02 4'**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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EPA METHOD 300.0: ANIONSAnalyst: **SRM**

Chloride	3400	150		mg/Kg	50	9/12/2019 12:45:00 PM
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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Certificate of Analysis Summary 641285

Marathon Oil Company, Tulsa, OK

Project Name: Trebuchet Fee 23 28 19 WXY 3H

Project Id: 19E-03840
Contact: Isaac Castro
Project Location:

Date Received in Lab: Mon Oct-28-19 01:45 pm
Report Date: 30-OCT-19
Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	641285-001	641285-002	641285-003	641285-004	641285-005	641285-006
	<i>Field Id:</i>	BG-19-02	BG-19-02	BG-19-02	BG-19-02	BG-19-02	BG-19-02
	<i>Depth:</i>	0- ft	2- ft	4- ft	6- ft	8- ft	10- ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Oct-26-19 10:00	Oct-26-19 10:10	Oct-26-19 10:20	Oct-26-19 10:30	Oct-26-19 10:40	Oct-26-19 10:50
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-28-19 17:10	Oct-28-19 17:10	Oct-28-19 17:10	Oct-28-19 17:10	Oct-28-19 17:10	Oct-28-19 17:10
	<i>Analyzed:</i>	Oct-29-19 04:47	Oct-29-19 05:07	Oct-29-19 05:28	Oct-29-19 05:48	Oct-29-19 06:08	Oct-29-19 07:24
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00101 0.00101	<0.00101 0.00101	<0.000990 0.000990	<0.000998 0.000998	<0.00101 0.00101	<0.000994 0.000994
Toluene		<0.00101 0.00101	<0.00101 0.00101	<0.000990 0.000990	<0.000998 0.000998	<0.00101 0.00101	<0.000994 0.000994
Ethylbenzene		<0.00101 0.00101	<0.00101 0.00101	<0.000990 0.000990	<0.000998 0.000998	<0.00101 0.00101	<0.000994 0.000994
m,p-Xylenes		<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00199 0.00199
o-Xylene		<0.00101 0.00101	<0.00101 0.00101	<0.000990 0.000990	<0.000998 0.000998	<0.00101 0.00101	<0.000994 0.000994
Total Xylenes		<0.00101 0.00101	<0.00101 0.00101	<0.000990 0.000990	<0.000998 0.000998	<0.00101 0.00101	<0.000994 0.000994
Total BTEX		<0.00101 0.00101	<0.00101 0.00101	<0.000990 0.000990	<0.000998 0.000998	<0.00101 0.00101	<0.000994 0.000994
Inorganic Anions by EPA 300	<i>Extracted:</i>	Oct-29-19 08:10	Oct-29-19 08:10	Oct-29-19 08:10	Oct-29-19 08:10	Oct-29-19 08:10	Oct-29-19 08:10
	<i>Analyzed:</i>	Oct-29-19 08:34	Oct-29-19 08:54	Oct-29-19 09:01	Oct-29-19 09:08	Oct-29-19 09:14	Oct-29-19 09:35
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		34.4 10.1	865 198	1530 198	1300 202	138 D 9.98	416 200
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-28-19 16:00	Oct-28-19 16:00	Oct-28-19 16:00	Oct-28-19 16:00	Oct-28-19 16:00	Oct-28-19 16:00
	<i>Analyzed:</i>	Oct-28-19 19:27	Oct-28-19 19:46	Oct-28-19 19:46	Oct-28-19 20:06	Oct-28-19 20:06	Oct-28-19 20:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<50.1 50.1	<50.3 50.3	<50.3 50.3	<50.3 50.3	<50.0 50.0	<50.0 50.0
Diesel Range Organics (DRO)		<50.1 50.1	<50.3 50.3	<50.3 50.3	<50.3 50.3	<50.0 50.0	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<50.1 50.1	<50.3 50.3	<50.3 50.3	<50.3 50.3	<50.0 50.0	<50.0 50.0
Total TPH		<50.1 50.1	<50.3 50.3	<50.3 50.3	<50.3 50.3	<50.0 50.0	<50.0 50.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 641285

Marathon Oil Company, Tulsa, OK

Project Name: Trebuchet Fee 23 28 19 WXY 3H

Project Id: 19E-03840

Contact: Isaac Castro

Project Location:

Date Received in Lab: Mon Oct-28-19 01:45 pm

Report Date: 30-OCT-19

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	641285-007	641285-008				
	Field Id:	BG-19-02	BG-19-02				
	Depth:	12- ft	14- ft				
	Matrix:	SOIL	SOIL				
	Sampled:	Oct-26-19 11:00	Oct-26-19 11:10				
BTEX by EPA 8021B	Extracted:	Oct-28-19 17:10	Oct-28-19 17:10				
	Analyzed:	Oct-29-19 07:44	Oct-29-19 08:05				
	Units/RL:	mg/kg RL	mg/kg RL				
Benzene		<0.00100 0.00100	<0.000998 0.000998				
Toluene		<0.00100 0.00100	<0.000998 0.000998				
Ethylbenzene		<0.00100 0.00100	<0.000998 0.000998				
m,p-Xylenes		<0.00200 0.00200	<0.00200 0.00200				
o-Xylene		<0.00100 0.00100	<0.000998 0.000998				
Total Xylenes		<0.00100 0.00100	<0.000998 0.000998				
Total BTEX		<0.00100 0.00100	<0.000998 0.000998				
Inorganic Anions by EPA 300	Extracted:	Oct-29-19 08:10	Oct-29-19 08:10				
	Analyzed:	Oct-29-19 09:41	Oct-29-19 09:48				
	Units/RL:	mg/kg RL	mg/kg RL				
Chloride		423 200	354 99.2				
TPH by SW8015 Mod	Extracted:	Oct-28-19 16:00	Oct-28-19 16:00				
	Analyzed:	Oct-28-19 20:26	Oct-28-19 20:46				
	Units/RL:	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<50.3 50.3	<50.0 50.0				
Diesel Range Organics (DRO)		<50.3 50.3	<50.0 50.0				
Motor Oil Range Hydrocarbons (MRO)		<50.3 50.3	<50.0 50.0				
Total TPH		<50.3 50.3	<50.0 50.0				

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer
Project Assistant

Analytical Report 641285

for Marathon Oil Company

Project Manager: Isaac Castro

Trebuchet Fee 23 28 19 WXY 3H

19E-03840

30-OCT-19

Collected By: Client



**1089 N Canal Street
Carlsbad, NM 88220**

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Tampa: Florida (E87429), North Carolina (483)



30-OCT-19

Project Manager: **Isaac Castro**
Marathon Oil Company
P. O. Box 22164
Tulsa, OK 74121-2164

Reference: XENCO Report No(s): **641285**
Trebuchet Fee 23 28 19 WXY 3H
Project Address:

Isaac Castro:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 641285. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 641285 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer
Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BG-19-02	S	10-26-19 10:00	0 ft	641285-001
BG-19-02	S	10-26-19 10:10	2 ft	641285-002
BG-19-02	S	10-26-19 10:20	4 ft	641285-003
BG-19-02	S	10-26-19 10:30	6 ft	641285-004
BG-19-02	S	10-26-19 10:40	8 ft	641285-005
BG-19-02	S	10-26-19 10:50	10 ft	641285-006
BG-19-02	S	10-26-19 11:00	12 ft	641285-007
BG-19-02	S	10-26-19 11:10	14 ft	641285-008



CASE NARRATIVE

Client Name: Marathon Oil Company

Project Name: Trebuchet Fee 23 28 19 WXY 3H

Project ID: 19E-03840

Work Order Number(s): 641285

Report Date: 30-OCT-19

Date Received: 10/28/2019

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3105680 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3105684 TPH by SW8015 Mod

Surrogate 1-Chlorooctane recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7689068-1-BKS.



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-001

Matrix: Soil
Date Collected: 10.26.19 10.00

Date Received: 10.28.19 13.45
Sample Depth: 0 ft

Analytical Method: Inorganic Anions by EPA 300

Tech: MAB

Analyst: MAB

Seq Number: 3105764

Date Prep: 10.29.19 08.10

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	34.4	10.1	mg/kg	10.29.19 08.34		1

Analytical Method: TPH by SW8015 Mod

Tech: DTH

Analyst: DTH

Seq Number: 3105684

Date Prep: 10.28.19 16.00

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	10.28.19 19.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	10.28.19 19.27	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	10.28.19 19.27	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	10.28.19 19.27	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	120	%	70-135	10.28.19 19.27	
o-Terphenyl	84-15-1	109	%	70-135	10.28.19 19.27	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-001

Date Collected: 10.26.19 10.00

Sample Depth: 0 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00101	0.00101	mg/kg	10.29.19 04.47	U	1
Toluene	108-88-3	<0.00101	0.00101	mg/kg	10.29.19 04.47	U	1
Ethylbenzene	100-41-4	<0.00101	0.00101	mg/kg	10.29.19 04.47	U	1
m,p-Xylenes	179601-23-1	<0.00202	0.00202	mg/kg	10.29.19 04.47	U	1
o-Xylene	95-47-6	<0.00101	0.00101	mg/kg	10.29.19 04.47	U	1
Total Xylenes	1330-20-7	<0.00101	0.00101	mg/kg	10.29.19 04.47	U	1
Total BTEX		<0.00101	0.00101	mg/kg	10.29.19 04.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	122	%	70-130	10.29.19 04.47		
1,4-Difluorobenzene	540-36-3	103	%	70-130	10.29.19 04.47		



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-002

Matrix: Soil
Date Collected: 10.26.19 10.10

Date Received: 10.28.19 13.45
Sample Depth: 2 ft

Analytical Method: Inorganic Anions by EPA 300
Tech: MAB
Analyst: MAB
Seq Number: 3105764

Prep Method: E300P
% Moisture:
Date Prep: 10.29.19 08.10
Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	865	198	mg/kg	10.29.19 08.54		20

Analytical Method: TPH by SW8015 Mod
Tech: DTH
Analyst: DTH
Seq Number: 3105684

Prep Method: SW8015P
% Moisture:
Date Prep: 10.28.19 16.00
Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	10.28.19 19.46	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	10.28.19 19.46	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	10.28.19 19.46	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	10.28.19 19.46	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	110	%	70-135	10.28.19 19.46	
o-Terphenyl	84-15-1	111	%	70-135	10.28.19 19.46	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-002

Date Collected: 10.26.19 10.10

Sample Depth: 2 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00101	0.00101	mg/kg	10.29.19 05.07	U	1
Toluene	108-88-3	<0.00101	0.00101	mg/kg	10.29.19 05.07	U	1
Ethylbenzene	100-41-4	<0.00101	0.00101	mg/kg	10.29.19 05.07	U	1
m,p-Xylenes	179601-23-1	<0.00201	0.00201	mg/kg	10.29.19 05.07	U	1
o-Xylene	95-47-6	<0.00101	0.00101	mg/kg	10.29.19 05.07	U	1
Total Xylenes	1330-20-7	<0.00101	0.00101	mg/kg	10.29.19 05.07	U	1
Total BTEX		<0.00101	0.00101	mg/kg	10.29.19 05.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.29.19 05.07		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.29.19 05.07		



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-003

Matrix: Soil
Date Collected: 10.26.19 10.20

Date Received: 10.28.19 13.45
Sample Depth: 4 ft

Analytical Method: Inorganic Anions by EPA 300

Tech: MAB

Analyst: MAB

Seq Number: 3105764

Date Prep: 10.29.19 08.10

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1530	198	mg/kg	10.29.19 09.01		20

Analytical Method: TPH by SW8015 Mod

Tech: DTH

Analyst: DTH

Seq Number: 3105684

Date Prep: 10.28.19 16.00

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	10.28.19 19.46	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	10.28.19 19.46	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	10.28.19 19.46	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	10.28.19 19.46	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	102	%	70-135	10.28.19 19.46	
o-Terphenyl	84-15-1	106	%	70-135	10.28.19 19.46	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-003

Matrix: Soil
Date Collected: 10.26.19 10.20

Date Received: 10.28.19 13.45
Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Tech: MAB

Analyst: MAB

Seq Number: 3105680

Prep Method: SW5030B

% Moisture:

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000990	0.000990	mg/kg	10.29.19 05.28	U	1
Toluene	108-88-3	<0.000990	0.000990	mg/kg	10.29.19 05.28	U	1
Ethylbenzene	100-41-4	<0.000990	0.000990	mg/kg	10.29.19 05.28	U	1
m,p-Xylenes	179601-23-1	<0.00198	0.00198	mg/kg	10.29.19 05.28	U	1
o-Xylene	95-47-6	<0.000990	0.000990	mg/kg	10.29.19 05.28	U	1
Total Xylenes	1330-20-7	<0.000990	0.000990	mg/kg	10.29.19 05.28	U	1
Total BTEX		<0.000990	0.000990	mg/kg	10.29.19 05.28	U	1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	114		%	70-130	10.29.19 05.28	
1,4-Difluorobenzene	540-36-3	100		%	70-130	10.29.19 05.28	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-004

Matrix: Soil
Date Collected: 10.26.19 10.30

Date Received: 10.28.19 13.45
Sample Depth: 6 ft

Analytical Method: Inorganic Anions by EPA 300

Tech: MAB

Analyst: MAB

Seq Number: 3105764

Date Prep: 10.29.19 08.10

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1300	202	mg/kg	10.29.19 09.08		20

Analytical Method: TPH by SW8015 Mod

Tech: DTH

Analyst: DTH

Seq Number: 3105684

Date Prep: 10.28.19 16.00

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	10.28.19 20.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	10.28.19 20.06	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	10.28.19 20.06	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	10.28.19 20.06	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	104	%	70-135	10.28.19 20.06	
o-Terphenyl	84-15-1	104	%	70-135	10.28.19 20.06	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-004

Date Collected: 10.26.19 10.30

Sample Depth: 6 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000998	0.000998	mg/kg	10.29.19 05.48	U	1
Toluene	108-88-3	<0.000998	0.000998	mg/kg	10.29.19 05.48	U	1
Ethylbenzene	100-41-4	<0.000998	0.000998	mg/kg	10.29.19 05.48	U	1
m,p-Xylenes	179601-23-1	<0.00200	0.00200	mg/kg	10.29.19 05.48	U	1
o-Xylene	95-47-6	<0.000998	0.000998	mg/kg	10.29.19 05.48	U	1
Total Xylenes	1330-20-7	<0.000998	0.000998	mg/kg	10.29.19 05.48	U	1
Total BTEX		<0.000998	0.000998	mg/kg	10.29.19 05.48	U	1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	113		%	70-130	10.29.19 05.48	
1,4-Difluorobenzene	540-36-3	100		%	70-130	10.29.19 05.48	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-005

Matrix: Soil
Date Collected: 10.26.19 10.40

Date Received: 10.28.19 13.45
Sample Depth: 8 ft

Analytical Method: Inorganic Anions by EPA 300

Tech: MAB

Analyst: MAB

Seq Number: 3105764

Date Prep: 10.29.19 08.10

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	138	9.98	mg/kg	10.29.19 19.57	D	1

Analytical Method: TPH by SW8015 Mod

Tech: DTH

Analyst: DTH

Seq Number: 3105684

Date Prep: 10.28.19 16.00

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.28.19 20.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.28.19 20.06	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.28.19 20.06	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.28.19 20.06	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	108	%	70-135	10.28.19 20.06	
o-Terphenyl	84-15-1	112	%	70-135	10.28.19 20.06	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-005

Date Collected: 10.26.19 10.40

Sample Depth: 8 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00101	0.00101	mg/kg	10.29.19 06.08	U	1
Toluene	108-88-3	<0.00101	0.00101	mg/kg	10.29.19 06.08	U	1
Ethylbenzene	100-41-4	<0.00101	0.00101	mg/kg	10.29.19 06.08	U	1
m,p-Xylenes	179601-23-1	<0.00202	0.00202	mg/kg	10.29.19 06.08	U	1
o-Xylene	95-47-6	<0.00101	0.00101	mg/kg	10.29.19 06.08	U	1
Total Xylenes	1330-20-7	<0.00101	0.00101	mg/kg	10.29.19 06.08	U	1
Total BTEX		<0.00101	0.00101	mg/kg	10.29.19 06.08	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.29.19 06.08		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.29.19 06.08		



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-006

Date Collected: 10.26.19 10.50

Sample Depth: 10 ft

Analytical Method: Inorganic Anions by EPA 300

Prep Method: E300P

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.29.19 08.10

Basis: Wet Weight

Seq Number: 3105764

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	416	200	mg/kg	10.29.19 09.35		20

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DTH

% Moisture:

Analyst: DTH

Date Prep: 10.28.19 16.00

Basis: Wet Weight

Seq Number: 3105684

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.28.19 20.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.28.19 20.26	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.28.19 20.26	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.28.19 20.26	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	107	%	70-135	10.28.19 20.26	
o-Terphenyl	84-15-1	106	%	70-135	10.28.19 20.26	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-006

Date Collected: 10.26.19 10.50

Sample Depth: 10 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000994	0.000994	mg/kg	10.29.19 07.24	U	1
Toluene	108-88-3	<0.000994	0.000994	mg/kg	10.29.19 07.24	U	1
Ethylbenzene	100-41-4	<0.000994	0.000994	mg/kg	10.29.19 07.24	U	1
m,p-Xylenes	179601-23-1	<0.00199	0.00199	mg/kg	10.29.19 07.24	U	1
o-Xylene	95-47-6	<0.000994	0.000994	mg/kg	10.29.19 07.24	U	1
Total Xylenes	1330-20-7	<0.000994	0.000994	mg/kg	10.29.19 07.24	U	1
Total BTEX		<0.000994	0.000994	mg/kg	10.29.19 07.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.29.19 07.24		
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.29.19 07.24		



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**
Lab Sample Id: 641285-007

Matrix: Soil
Date Collected: 10.26.19 11.00

Date Received: 10.28.19 13.45
Sample Depth: 12 ft

Analytical Method: Inorganic Anions by EPA 300

Tech: MAB

Analyst: MAB

Seq Number: 3105764

Date Prep: 10.29.19 08.10

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	423	200	mg/kg	10.29.19 09.41		20

Analytical Method: TPH by SW8015 Mod

Tech: DTH

Analyst: DTH

Seq Number: 3105684

Date Prep: 10.28.19 16.00

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	10.28.19 20.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	10.28.19 20.26	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	10.28.19 20.26	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	10.28.19 20.26	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	107	%	70-135	10.28.19 20.26	
o-Terphenyl	84-15-1	108	%	70-135	10.28.19 20.26	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-007

Date Collected: 10.26.19 11.00

Sample Depth: 12 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00100	0.00100	mg/kg	10.29.19 07.44	U	1
Toluene	108-88-3	<0.00100	0.00100	mg/kg	10.29.19 07.44	U	1
Ethylbenzene	100-41-4	<0.00100	0.00100	mg/kg	10.29.19 07.44	U	1
m,p-Xylenes	179601-23-1	<0.00200	0.00200	mg/kg	10.29.19 07.44	U	1
o-Xylene	95-47-6	<0.00100	0.00100	mg/kg	10.29.19 07.44	U	1
Total Xylenes	1330-20-7	<0.00100	0.00100	mg/kg	10.29.19 07.44	U	1
Total BTEX		<0.00100	0.00100	mg/kg	10.29.19 07.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.29.19 07.44		
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.29.19 07.44		



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-008

Date Collected: 10.26.19 11.10

Sample Depth: 14 ft

Analytical Method: Inorganic Anions by EPA 300

Prep Method: E300P

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.29.19 08.10

Basis: Wet Weight

Seq Number: 3105764

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	354	99.2	mg/kg	10.29.19 09.48		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DTH

% Moisture:

Analyst: DTH

Date Prep: 10.28.19 16.00

Basis: Wet Weight

Seq Number: 3105684

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.28.19 20.46	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.28.19 20.46	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.28.19 20.46	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.28.19 20.46	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	104	%	70-135	10.28.19 20.46	
o-Terphenyl	84-15-1	105	%	70-135	10.28.19 20.46	



Certificate of Analytical Results 641285

Marathon Oil Company, Tulsa, OK

Trebuchet Fee 23 28 19 WXY 3H

Sample Id: **BG-19-02**

Matrix: Soil

Date Received: 10.28.19 13.45

Lab Sample Id: 641285-008

Date Collected: 10.26.19 11.10

Sample Depth: 14 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 10.28.19 17.10

Basis: Wet Weight

Seq Number: 3105680

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000998	0.000998	mg/kg	10.29.19 08.05	U	1
Toluene	108-88-3	<0.000998	0.000998	mg/kg	10.29.19 08.05	U	1
Ethylbenzene	100-41-4	<0.000998	0.000998	mg/kg	10.29.19 08.05	U	1
m,p-Xylenes	179601-23-1	<0.00200	0.00200	mg/kg	10.29.19 08.05	U	1
o-Xylene	95-47-6	<0.000998	0.000998	mg/kg	10.29.19 08.05	U	1
Total Xylenes	1330-20-7	<0.000998	0.000998	mg/kg	10.29.19 08.05	U	1
Total BTEX		<0.000998	0.000998	mg/kg	10.29.19 08.05	U	1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	114		%	70-130	10.29.19 08.05	
1,4-Difluorobenzene	540-36-3	102		%	70-130	10.29.19 08.05	

Flagging Criteria

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

SDL Sample Detection Limit

LOD Limit of Detection

PQL Practical Quantitation Limit

MQL Method Quantitation Limit

LOQ Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample

BLK

Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample

BKSD/LCSD

Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate

MS

Matrix Spike

MSD: Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



QC Summary 641285

Marathon Oil Company Trebuchet Fee 23 28 19 WXY 3H

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3105764

MB Sample Id: 7689120-1-BLK

Matrix: Solid

LCS Sample Id: 7689120-1-BKS

Prep Method: E300P

Date Prep: 10.29.19

LCSD Sample Id: 7689120-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	300	306	102	307	102	90-110	0	20	mg/kg	10.29.19 08:20	

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3105764

Parent Sample Id: 641285-001

Matrix: Soil

MS Sample Id: 641285-001 S

Prep Method: E300P

Date Prep: 10.29.19

MSD Sample Id: 641285-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	34.4	251	281	98	278	97	90-110	1	20	mg/kg	10.29.19 08:41	

Analytical Method: Inorganic Anions by EPA 300

Seq Number: 3105764

Parent Sample Id: 641338-003

Matrix: Soil

MS Sample Id: 641338-003 S

Prep Method: E300P

Date Prep: 10.29.19

MSD Sample Id: 641338-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	130	252	405	109	402	108	90-110	1	20	mg/kg	10.29.19 13:09	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3105684

MB Sample Id: 7689068-1-BLK

Matrix: Solid

LCS Sample Id: 7689068-1-BKS

Prep Method: SW8015P

Date Prep: 10.28.19

LCSD Sample Id: 7689068-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<50.0	1000	911	91	904	90	70-135	1	35	mg/kg	10.28.19 17:08	
Diesel Range Organics (DRO)	<50.0	1000	777	78	760	76	70-135	2	35	mg/kg	10.28.19 17:08	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	104		137	**	126		70-135	%	10.28.19 17:08
o-Terphenyl	104		119		119		70-135	%	10.28.19 17:08

Analytical Method: TPH by SW8015 Mod

Seq Number: 3105684

Matrix: Solid

MB Sample Id: 7689068-1-BLK

Prep Method: SW8015P

Date Prep: 10.28.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	10.28.19 17:08	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



QC Summary 641285

Marathon Oil Company Trebuchet Fee 23 28 19 WXY 3H

Analytical Method: TPH by SW8015 Mod

Seq Number: 3105684

Parent Sample Id: 641213-006

Matrix: Soil

MS Sample Id: 641213-006 S

Prep Method: SW8015P

Date Prep: 10.28.19

MSD Sample Id: 641213-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<50.3	1010	855	85	845	85	70-135	1	35	mg/kg	10.28.19 17:48	
Diesel Range Organics (DRO)	<50.3	1010	711	70	713	71	70-135	0	35	mg/kg	10.28.19 17:48	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	114		130		70-135	%	10.28.19 17:48
o-Terphenyl	111		112		70-135	%	10.28.19 17:48

Analytical Method: BTEX by EPA 8021B

Seq Number: 3105680

MB Sample Id: 7689078-1-BLK

Matrix: Solid

LCS Sample Id: 7689078-1-BKS

Prep Method: SW5030B

Date Prep: 10.28.19

LCSD Sample Id: 7689078-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00100	0.100	0.0977	98	0.0916	92	70-130	6	35	mg/kg	10.29.19 01:09	
Toluene	<0.00100	0.100	0.0963	96	0.0895	90	70-130	7	35	mg/kg	10.29.19 01:09	
Ethylbenzene	<0.00100	0.100	0.0988	99	0.0911	91	71-129	8	35	mg/kg	10.29.19 01:09	
m,p-Xylenes	<0.00200	0.200	0.198	99	0.183	92	70-135	8	35	mg/kg	10.29.19 01:09	
o-Xylene	<0.00100	0.100	0.0998	100	0.0936	94	71-133	6	35	mg/kg	10.29.19 01:09	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	100		101		100		70-130	%	10.29.19 01:09
4-Bromofluorobenzene	108		106		109		70-130	%	10.29.19 01:09

Analytical Method: BTEX by EPA 8021B

Seq Number: 3105680

Parent Sample Id: 641213-014

Matrix: Soil

MS Sample Id: 641213-014 S

Prep Method: SW5030B

Date Prep: 10.28.19

MSD Sample Id: 641213-014 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000996	0.0996	0.0901	90	0.0802	80	70-130	12	35	mg/kg	10.29.19 01:50	
Toluene	<0.000996	0.0996	0.0885	89	0.0783	78	70-130	12	35	mg/kg	10.29.19 01:50	
Ethylbenzene	<0.000996	0.0996	0.0903	91	0.0798	80	71-129	12	35	mg/kg	10.29.19 01:50	
m,p-Xylenes	<0.00199	0.199	0.181	91	0.160	80	70-135	12	35	mg/kg	10.29.19 01:50	
o-Xylene	<0.000996	0.0996	0.0909	91	0.0805	81	71-133	12	35	mg/kg	10.29.19 01:50	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	103		101		70-130	%	10.29.19 01:50
4-Bromofluorobenzene	115		113		70-130	%	10.29.19 01:50

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Work Order No: 1841285

Work Order Comments	
Program: UST/PST <input type="checkbox"/> PRP <input type="checkbox"/> Brownfields <input type="checkbox"/> RRC <input type="checkbox"/> Superfund <input type="checkbox"/>	
State of Project:	
Reporting Level II <input type="checkbox"/> Level III <input type="checkbox"/> PST/UST <input type="checkbox"/> RRP <input type="checkbox"/> Level IV <input type="checkbox"/>	
Deliverables: EDD <input type="checkbox"/> ADaPT <input type="checkbox"/> Other:	

SAMPLE RECEIPT		Temp Blank	Yes	No	Wet Ice	Yes	No
Temperature (°C):	4.0°C				Thermometer ID		
Received Intact:	Yes No				Correction Factor:		
Cooler Custody Seals:	Yes No				N/A		
Sample Custody Seals:	Yes No				N/A		
					Total Containers:		

Number of Containers

SW8021

SW8015




Side E300_CL

TAT starts the day received by the lab, if received by 4:30pm

[illegible]

Total	200.7 / 6010	200.8 / 6020:	
8RCRA	13PPM	Texas 11	AI Sb As Ba Be B Cd Ca Cl Cu Cr Fe Hg Mn Mo Ni Se Ag Ti U
TCLP / SPLP	6010:	8RCRA	Sb As Ba Be B Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U
			1631 / 245.1 / 7470 / 7471 : Hg

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenoco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenoco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of service. Xenoco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of service. A \$475.00 will be provided to each project and a charge of \$5 for each sample submitted to Xenoco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 		10/22/19 13:45	2		
3 			4		
			6		

Revised Date 05/11/19 Rev. 2011

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Marathon Oil Company

Date/ Time Received: 10.28.2019 01.45.00 PM

Work Order #: 641285

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : T-NM-007

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	4
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	Yes
#5 Custody Seals intact on sample bottles?	Yes
#6 *Custody Seals Signed and dated?	Yes
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	No

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by:



Jessica Kramer

Date: 10.29.2019

Checklist reviewed by:



Elizabeth McClellan

Date: 10.29.2019



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

October 11, 2019

Dennis Williams
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Trebuchet Fee 23 28 19 WXY

OrderNo.: 1910367

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 22 sample(s) on 10/6/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BG19-31 0'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 9:10:00 AM

Lab ID: 1910367-001

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/9/2019 12:13:11 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/9/2019 12:13:11 AM
Surr: DNOP	96.3	70-130		%Rec	1	10/9/2019 12:13:11 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/8/2019 2:49:18 PM
Surr: BFB	97.5	77.4-118		%Rec	1	10/8/2019 2:49:18 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 2:49:18 PM
Toluene	ND	0.048		mg/Kg	1	10/8/2019 2:49:18 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/8/2019 2:49:18 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/8/2019 2:49:18 PM
Surr: 4-Bromofluorobenzene	95.2	80-120		%Rec	1	10/8/2019 2:49:18 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	ND	59		mg/Kg	20	10/9/2019 2:51:27 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-31 2'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 9:20:00 AM

Lab ID: 1910367-002

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1800	60		mg/Kg	20	10/9/2019 3:03:52 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-31 4'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 9:30:00 AM

Lab ID: 1910367-003

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1400	59		mg/Kg	20	10/9/2019 3:16:17 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-31 6'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 9:40:00 AM**Lab ID:** 1910367-004**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/9/2019 10:39:43 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	10/9/2019 10:39:43 AM
Surr: DNOP	95.1	70-130		%Rec	1	10/9/2019 10:39:43 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/8/2019 4:20:28 PM
Surr: BFB	95.6	77.4-118		%Rec	1	10/8/2019 4:20:28 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 4:20:28 PM
Toluene	ND	0.048		mg/Kg	1	10/8/2019 4:20:28 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/8/2019 4:20:28 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/8/2019 4:20:28 PM
Surr: 4-Bromofluorobenzene	92.4	80-120		%Rec	1	10/8/2019 4:20:28 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	980	60		mg/Kg	20	10/9/2019 3:28:41 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-28 4'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 10:15:00 AM

Lab ID: 1910367-005

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1900	150		mg/Kg	50	10/10/2019 6:40:45 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-28 6'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 10:25:00 AM

Lab ID: 1910367-006

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1200	60		mg/Kg	20	10/9/2019 4:18:19 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-28 8'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 10:35:00 AM**Lab ID:** 1910367-007**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/9/2019 11:52:46 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/9/2019 11:52:46 AM
Surr: DNOP	92.6	70-130		%Rec	1	10/9/2019 11:52:46 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/8/2019 4:43:13 PM
Surr: BFB	96.9	77.4-118		%Rec	1	10/8/2019 4:43:13 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 4:43:13 PM
Toluene	ND	0.048		mg/Kg	1	10/8/2019 4:43:13 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/8/2019 4:43:13 PM
Xylenes, Total	ND	0.095		mg/Kg	1	10/8/2019 4:43:13 PM
Surr: 4-Bromofluorobenzene	94.1	80-120		%Rec	1	10/8/2019 4:43:13 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	590	60		mg/Kg	20	10/9/2019 4:30:44 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-30 8'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 11:30:00 AM**Lab ID:** 1910367-008**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/9/2019 12:17:08 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/9/2019 12:17:08 PM
Surr: DNOP	89.5	70-130		%Rec	1	10/9/2019 12:17:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/8/2019 5:06:00 PM
Surr: BFB	95.2	77.4-118		%Rec	1	10/8/2019 5:06:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	10/8/2019 5:06:00 PM
Toluene	ND	0.047		mg/Kg	1	10/8/2019 5:06:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/8/2019 5:06:00 PM
Xylenes, Total	ND	0.094		mg/Kg	1	10/8/2019 5:06:00 PM
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	10/8/2019 5:06:00 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	880	60		mg/Kg	20	10/9/2019 4:43:08 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-32 0'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 12:00:00 PM**Lab ID:** 1910367-009**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/9/2019 12:41:28 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/9/2019 12:41:28 PM
Surr: DNOP	117	70-130		%Rec	1	10/9/2019 12:41:28 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/8/2019 5:28:56 PM
Surr: BFB	92.1	77.4-118		%Rec	1	10/8/2019 5:28:56 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/8/2019 5:28:56 PM
Toluene	ND	0.049		mg/Kg	1	10/8/2019 5:28:56 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/8/2019 5:28:56 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/8/2019 5:28:56 PM
Surr: 4-Bromofluorobenzene	88.4	80-120		%Rec	1	10/8/2019 5:28:56 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	ND	60		mg/Kg	20	10/9/2019 4:55:33 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-32 2'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 12:10:00 PM

Lab ID: 1910367-010

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	510	60		mg/Kg	20	10/9/2019 5:57:36 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-32 4'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 12:20:00 PM

Lab ID: 1910367-011

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1200	60		mg/Kg	20	10/10/2019 7:17:58 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-32 6'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 12:30:00 PM**Lab ID:** 1910367-012**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/9/2019 1:05:57 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/9/2019 1:05:57 PM
Surr: DNOP	82.0	70-130		%Rec	1	10/9/2019 1:05:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/8/2019 5:51:43 PM
Surr: BFB	94.4	77.4-118		%Rec	1	10/8/2019 5:51:43 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 5:51:43 PM
Toluene	ND	0.048		mg/Kg	1	10/8/2019 5:51:43 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/8/2019 5:51:43 PM
Xylenes, Total	ND	0.096		mg/Kg	1	10/8/2019 5:51:43 PM
Surr: 4-Bromofluorobenzene	90.5	80-120		%Rec	1	10/8/2019 5:51:43 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	590	60		mg/Kg	20	10/9/2019 6:59:41 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-33 8'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 1:10:00 PM**Lab ID:** 1910367-013**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	10/9/2019 1:30:22 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/9/2019 1:30:22 PM
Surr: DNOP	83.6	70-130		%Rec	1	10/9/2019 1:30:22 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/8/2019 6:14:25 PM
Surr: BFB	94.6	77.4-118		%Rec	1	10/8/2019 6:14:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 6:14:25 PM
Toluene	ND	0.049		mg/Kg	1	10/8/2019 6:14:25 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/8/2019 6:14:25 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/8/2019 6:14:25 PM
Surr: 4-Bromofluorobenzene	90.0	80-120		%Rec	1	10/8/2019 6:14:25 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	520	60		mg/Kg	20	10/9/2019 7:24:30 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-20 0'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 2:00:00 PM

Lab ID: 1910367-014

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	6700	300		mg/Kg	100	10/10/2019 7:30:23 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-20 2'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 2:10:00 PM

Lab ID: 1910367-015

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2300	150		mg/Kg	50	10/10/2019 7:42:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-20 4'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 2:20:00 PM

Lab ID: 1910367-016

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1800	59		mg/Kg	20	10/9/2019 8:01:44 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-20 6'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 2:30:00 PM**Lab ID:** 1910367-017**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/9/2019 1:54:49 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/9/2019 1:54:49 PM
Surr: DNOP	82.3	70-130		%Rec	1	10/9/2019 1:54:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/8/2019 6:37:06 PM
Surr: BFB	94.1	77.4-118		%Rec	1	10/8/2019 6:37:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 6:37:06 PM
Toluene	ND	0.048		mg/Kg	1	10/8/2019 6:37:06 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/8/2019 6:37:06 PM
Xylenes, Total	ND	0.096		mg/Kg	1	10/8/2019 6:37:06 PM
Surr: 4-Bromofluorobenzene	90.2	80-120		%Rec	1	10/8/2019 6:37:06 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	760	60		mg/Kg	20	10/9/2019 8:14:08 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-21 0'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 2:50:00 PM

Lab ID: 1910367-018

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	8800	590		mg/Kg	200	10/10/2019 10:11:42 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-21 2'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 3:00:00 PM

Lab ID: 1910367-019

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1900	150		mg/Kg	50	10/10/2019 10:24:06 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-21 4'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 3:10:00 PM

Lab ID: 1910367-020

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	3400	150		mg/Kg	50	10/10/2019 7:55:11 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**

Date Reported: **10/11/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-21 6'

Project: Trebuchet Fee 23 28 19 WXY

Collection Date: 10/5/2019 3:20:00 PM

Lab ID: 1910367-021

Matrix: SOIL

Received Date: 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1200	60		mg/Kg	20	10/9/2019 9:28:34 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910367**Date Reported: **10/11/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-21 8'**Project:** Trebuchet Fee 23 28 19 WXY**Collection Date:** 10/5/2019 3:30:00 PM**Lab ID:** 1910367-022**Matrix:** SOIL**Received Date:** 10/6/2019 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	10/9/2019 2:19:12 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/9/2019 2:19:12 PM
Surr: DNOP	85.5	70-130		%Rec	1	10/9/2019 2:19:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/8/2019 6:59:51 PM
Surr: BFB	96.8	77.4-118		%Rec	1	10/8/2019 6:59:51 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/8/2019 6:59:51 PM
Toluene	ND	0.049		mg/Kg	1	10/8/2019 6:59:51 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/8/2019 6:59:51 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/8/2019 6:59:51 PM
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	10/8/2019 6:59:51 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	450	60		mg/Kg	20	10/9/2019 9:40:58 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910367

11-Oct-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY

Sample ID: MB-48035	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 48035	RunNo: 63533								
Prep Date: 10/9/2019	Analysis Date: 10/9/2019	SeqNo: 2171599 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-48035	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 48035	RunNo: 63533								
Prep Date: 10/9/2019	Analysis Date: 10/9/2019	SeqNo: 2171600 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	98.9	90	110			

Sample ID: MB-48052	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 48052	RunNo: 63533								
Prep Date: 10/9/2019	Analysis Date: 10/9/2019	SeqNo: 2171632 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-48052	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 48052	RunNo: 63533								
Prep Date: 10/9/2019	Analysis Date: 10/9/2019	SeqNo: 2171633 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	99.6	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910367

11-Oct-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY

Sample ID: LCS-47973	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 47973	RunNo: 63485								
Prep Date: 10/7/2019	Analysis Date: 10/8/2019	SeqNo: 2170017	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	90.8	63.9	124			
Surr: DNOP	4.9		5.000		98.6	70	130			

Sample ID: MB-47973	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 47973	RunNo: 63485								
Prep Date: 10/7/2019	Analysis Date: 10/8/2019	SeqNo: 2170018	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		105	70	130			

Sample ID: LCS-48012	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 48012	RunNo: 63525								
Prep Date: 10/8/2019	Analysis Date: 10/9/2019	SeqNo: 2170483	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	103	63.9	124			
Surr: DNOP	4.6		5.000		92.1	70	130			

Sample ID: MB-48012	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 48012	RunNo: 63525								
Prep Date: 10/8/2019	Analysis Date: 10/9/2019	SeqNo: 2170486	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.0		10.00		90.2	70	130			

Sample ID: 1910367-004AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BH19-31 6'	Batch ID: 48012	RunNo: 63525								
Prep Date: 10/8/2019	Analysis Date: 10/9/2019	SeqNo: 2170925	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	8.7	43.48	0	104	57	142			
Surr: DNOP	4.0		4.348		91.0	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910367

11-Oct-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY

Sample ID: 1910367-004AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: BH19-31 6'		Batch ID: 48012		RunNo: 63525						
Prep Date: 10/8/2019		Analysis Date: 10/9/2019		SeqNo: 2170927		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.5	47.53	0	93.2	57	142	1.97	20	
Surr: DNOP	3.8		4.753		79.5	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910367

11-Oct-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY

Sample ID: MB-47976	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 47976	RunNo: 63496								
Prep Date: 10/7/2019	Analysis Date: 10/8/2019	SeqNo: 2169919	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		102	77.4	118			

Sample ID: LCS-47976	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 47976	RunNo: 63496								
Prep Date: 10/7/2019	Analysis Date: 10/8/2019	SeqNo: 2169920	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	102	80	120			
Surr: BFB	1100		1000		114	77.4	118			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910367

11-Oct-19

Client: Vertex Resource Group Ltd.
Project: Trebuchet Fee 23 28 19 WXY

Sample ID: MB-47976	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 47976	RunNo: 63496								
Prep Date: 10/7/2019	Analysis Date: 10/8/2019	SeqNo: 2169939	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.98		1.000		98.4	80	120			

Sample ID: LCS-47976	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 47976	RunNo: 63496								
Prep Date: 10/7/2019	Analysis Date: 10/8/2019	SeqNo: 2169940	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	95.0	80	120			
Toluene	0.99	0.050	1.000	0	99.4	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.9	80	120			
Xylenes, Total	2.9	0.10	3.000	0	96.8	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		102	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 1910367

RcptNo: 1

Received By: Erin Melendrez 10/6/2019 12:15:00 PM

Completed By: Erin Melendrez 10/6/2019 1:41:21 PM

Reviewed By: IO 10/07/19

UAG

UAG

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: _____
(≤ 2 or >12 unless noted)

Adjusted? _____

Checked by: DAD 10/7/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:		Date:	
By Whom:		Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:			
Client Instructions:			

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.8	Good	Not Present			
2	4.0	Good	Not Present			

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Chain-of-Custody Record			
Client: <u>VERTEX</u>			
Mailing Address: <u>213 S Mesa St</u> <u>Coolsbad NM 88220</u>			
Phone #: <u>575 726 5001</u>			
email or Fax#: <u>PERMIAN@VERTX.CA</u>			
QA/QC Package: <input type="checkbox"/> Standard <input type="checkbox"/> Level 4 (Full Validation) Accreditation: <input type="checkbox"/> Az Compliance <input type="checkbox"/> NELAC <input type="checkbox"/> Other _____ <input type="checkbox"/> EDD (Type) _____			
Date	Time	Matrix	Sample Name
10/5	13:10	S	BH19-33 8'
	14:00		BH19-20 0'
	14:10		BH19-20 2'
	14:20		BH19-20 4'
	14:30		BH19-20 6'
	14:50		BH19-21 0'
	15:00		BH19-21 2'
	15:10		BH19-21 4'
	15:20		BH19-21 6'
	15:30		BH19-21 8'
Date:	Time:	Relinquished by:	Relinquished by:
10/5	14:30	[Signature]	[Signature]
Date:	Time:	Relinquished by:	Relinquished by:
10/6/9	0930	[Signature]	[Signature]

Turn-Around Time: <u>5-day turn around</u>	
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush	Project Name: <u>TREBUCHET FEE 23 2919 WXY</u>
Project #:	<u>19E-00614-009D</u>
Project Manager: <u>DENNIS WILLIAMS</u> <u>dwilliams@vertex.ca</u> <u>Arlington@vertex.ca</u>	
Sampler: <u>Shar Threestev</u>	
On Ice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	# of Coolers: <u>2</u>
Cooler Temp (including CF): <u>4.6 ± .2 (CF) = 4.8 (°C)</u> <u>3.8 ± 0.2 (CF) = 4.0</u>	
Container Type and #	Preservative Type HEAL No.
<u>Jar</u>	<u>VCE</u> <u>-013</u> <u>-014</u> <u>-015</u> <u>-016</u> <u>-017</u> <u>-018</u> <u>-019</u> <u>-020</u> <u>-021</u> <u>-022</u>
Received by: [Signature] Date: <u>10/5/9</u> Time: <u>1630</u>	
Received by: [Signature] Date: <u>10/6/9</u> Time: <u>1715</u>	

if necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-39 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:20:00 AM

Lab ID: 1910122-001

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	27	8.7		mg/Kg	1	10/4/2019 11:59:01 AM
Motor Oil Range Organics (MRO)	120	44		mg/Kg	1	10/4/2019 11:59:01 AM
Surr: DNOP	107	70-130		%Rec	1	10/4/2019 11:59:01 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/3/2019 2:53:03 PM
Surr: BFB	94.1	77.4-118		%Rec	1	10/3/2019 2:53:03 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 2:53:03 PM
Toluene	ND	0.049		mg/Kg	1	10/3/2019 2:53:03 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/3/2019 2:53:03 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/3/2019 2:53:03 PM
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	1	10/3/2019 2:53:03 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	68	60		mg/Kg	20	10/6/2019 7:51:14 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-39 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:30:00 AM

Lab ID: 1910122-002

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1100	59		mg/Kg	20	10/6/2019 9:13:19 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-39 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:40:00 AM

Lab ID: 1910122-003

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2600	150		mg/Kg	50	10/8/2019 7:08:50 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-39 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:50:00 AM

Lab ID: 1910122-004

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/4/2019 1:04:51 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/4/2019 1:04:51 PM
Surr: DNOP	100	70-130		%Rec	1	10/4/2019 1:04:51 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/3/2019 4:01:30 PM
Surr: BFB	92.9	77.4-118		%Rec	1	10/3/2019 4:01:30 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	10/3/2019 4:01:30 PM
Toluene	ND	0.047		mg/Kg	1	10/3/2019 4:01:30 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/3/2019 4:01:30 PM
Xylenes, Total	ND	0.094		mg/Kg	1	10/3/2019 4:01:30 PM
Surr: 4-Bromofluorobenzene	94.4	80-120		%Rec	1	10/3/2019 4:01:30 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	950	60		mg/Kg	20	10/6/2019 8:28:16 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-33 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:12:00 AM

Lab ID: 1910122-005

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/4/2019 1:26:49 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/4/2019 1:26:49 PM
Surr: DNOP	103	70-130		%Rec	1	10/4/2019 1:26:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/3/2019 5:09:48 PM
Surr: BFB	93.7	77.4-118		%Rec	1	10/3/2019 5:09:48 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/3/2019 5:09:48 PM
Toluene	ND	0.050		mg/Kg	1	10/3/2019 5:09:48 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/3/2019 5:09:48 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/3/2019 5:09:48 PM
Surr: 4-Bromofluorobenzene	93.7	80-120		%Rec	1	10/3/2019 5:09:48 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	540	59		mg/Kg	20	10/6/2019 8:40:36 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-33 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:22:00 AM

Lab ID: 1910122-006

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	5300	300		mg/Kg	100	10/8/2019 7:21:14 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-33 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:32:00 AM

Lab ID: 1910122-007

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2300	60		mg/Kg	20	10/6/2019 11:05:02 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-33 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 10:52:00 AM

Lab ID: 1910122-008

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1700	60		mg/Kg	20	10/6/2019 11:17:26 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-38 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 12:00:00 PM

Lab ID: 1910122-009

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	35	9.5		mg/Kg	1	10/4/2019 1:48:52 PM
Motor Oil Range Organics (MRO)	57	47		mg/Kg	1	10/4/2019 1:48:52 PM
Surr: DNOP	106	70-130		%Rec	1	10/4/2019 1:48:52 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/3/2019 5:32:36 PM
Surr: BFB	95.5	77.4-118		%Rec	1	10/3/2019 5:32:36 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 5:32:36 PM
Toluene	ND	0.048		mg/Kg	1	10/3/2019 5:32:36 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/3/2019 5:32:36 PM
Xylenes, Total	ND	0.096		mg/Kg	1	10/3/2019 5:32:36 PM
Surr: 4-Bromofluorobenzene	95.4	80-120		%Rec	1	10/3/2019 5:32:36 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	ND	60		mg/Kg	20	10/6/2019 8:52:56 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-38 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 12:10:00 PM

Lab ID: 1910122-010

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	620	60		mg/Kg	20	10/6/2019 11:29:50 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-38 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 12:20:00 PM

Lab ID: 1910122-011

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2900	150		mg/Kg	50	10/8/2019 7:33:39 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-38 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 12:30:00 PM

Lab ID: 1910122-012

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1800	60		mg/Kg	20	10/7/2019 12:19:30 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-38 8'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 12:50:00 PM

Lab ID: 1910122-013

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/4/2019 2:55:57 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/4/2019 2:55:57 PM
Surr: DNOP	102	70-130		%Rec	1	10/4/2019 2:55:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/3/2019 5:55:22 PM
Surr: BFB	96.8	77.4-118		%Rec	1	10/3/2019 5:55:22 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/3/2019 5:55:22 PM
Toluene	ND	0.049		mg/Kg	1	10/3/2019 5:55:22 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/3/2019 5:55:22 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/3/2019 5:55:22 PM
Surr: 4-Bromofluorobenzene	96.3	80-120		%Rec	1	10/3/2019 5:55:22 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	570	60		mg/Kg	20	10/6/2019 9:29:57 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-37 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:30:00 PM

Lab ID: 1910122-014

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	45	9.2		mg/Kg	1	10/4/2019 3:17:57 PM
Motor Oil Range Organics (MRO)	110	46		mg/Kg	1	10/4/2019 3:17:57 PM
Surr: DNOP	107	70-130		%Rec	1	10/4/2019 3:17:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/3/2019 6:18:03 PM
Surr: BFB	94.4	77.4-118		%Rec	1	10/3/2019 6:18:03 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 6:18:03 PM
Toluene	ND	0.048		mg/Kg	1	10/3/2019 6:18:03 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/3/2019 6:18:03 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/3/2019 6:18:03 PM
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	10/3/2019 6:18:03 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	140	60		mg/Kg	20	10/6/2019 9:42:17 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-37 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:40:00 PM

Lab ID: 1910122-015

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	310	61		mg/Kg	20	10/7/2019 12:31:54 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-37 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:50:00 PM

Lab ID: 1910122-016

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2300	60		mg/Kg	20	10/6/2019 10:15:23 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-37 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 2:00:00 PM

Lab ID: 1910122-017

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3700	150		mg/Kg	50	10/8/2019 7:46:04 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-37 8'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 2:20:00 PM

Lab ID: 1910122-018

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/4/2019 3:40:08 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/4/2019 3:40:08 PM
Surr: DNOP	102	70-130		%Rec	1	10/4/2019 3:40:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/3/2019 7:49:08 PM
Surr: BFB	97.7	77.4-118		%Rec	1	10/3/2019 7:49:08 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 7:49:08 PM
Toluene	ND	0.048		mg/Kg	1	10/3/2019 7:49:08 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/3/2019 7:49:08 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/3/2019 7:49:08 PM
Surr: 4-Bromofluorobenzene	97.7	80-120		%Rec	1	10/3/2019 7:49:08 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	490	61		mg/Kg	20	10/6/2019 10:19:19 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-30 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:10:00 PM

Lab ID: 1910122-019

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/4/2019 4:02:10 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/4/2019 4:02:10 PM
Surr: DNOP	89.9	70-130		%Rec	1	10/4/2019 4:02:10 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/3/2019 8:11:52 PM
Surr: BFB	98.9	77.4-118		%Rec	1	10/3/2019 8:11:52 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	10/3/2019 8:11:52 PM
Toluene	ND	0.047		mg/Kg	1	10/3/2019 8:11:52 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/3/2019 8:11:52 PM
Xylenes, Total	ND	0.093		mg/Kg	1	10/3/2019 8:11:52 PM
Surr: 4-Bromofluorobenzene	98.5	80-120		%Rec	1	10/3/2019 8:11:52 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	500	60		mg/Kg	20	10/6/2019 10:31:39 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-30 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:20:00 PM

Lab ID: 1910122-020

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	4300	150		mg/Kg	50	10/8/2019 7:58:28 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-30 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:30:00 PM

Lab ID: 1910122-021

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3600	150		mg/Kg	50	10/8/2019 8:10:54 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-30 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 1:40:00 PM

Lab ID: 1910122-022

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	980	60		mg/Kg	20	10/5/2019 12:31:36 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-28 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 3:00:00 PM

Lab ID: 1910122-023

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/4/2019 4:24:13 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/4/2019 4:24:13 PM
Surr: DNOP	110	70-130		%Rec	1	10/4/2019 4:24:13 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/3/2019 8:34:40 PM
Surr: BFB	93.8	77.4-118		%Rec	1	10/3/2019 8:34:40 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/3/2019 8:34:40 PM
Toluene	ND	0.049		mg/Kg	1	10/3/2019 8:34:40 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/3/2019 8:34:40 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/3/2019 8:34:40 PM
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	10/3/2019 8:34:40 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2400	150		mg/Kg	50	10/8/2019 8:23:18 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-28 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/30/2019 3:20:00 PM

Lab ID: 1910122-024

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2700	150		mg/Kg	50	10/8/2019 8:35:43 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-25 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 11:20:00 AM

Lab ID: 1910122-025

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	12	9.9		mg/Kg	1	10/4/2019 4:46:21 PM
Motor Oil Range Organics (MRO)	63	50		mg/Kg	1	10/4/2019 4:46:21 PM
Surr: DNOP	131	70-130	S	%Rec	1	10/4/2019 4:46:21 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/3/2019 8:57:30 PM
Surr: BFB	93.9	77.4-118		%Rec	1	10/3/2019 8:57:30 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/3/2019 8:57:30 PM
Toluene	ND	0.050		mg/Kg	1	10/3/2019 8:57:30 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/3/2019 8:57:30 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/3/2019 8:57:30 PM
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	10/3/2019 8:57:30 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	830	60		mg/Kg	20	10/6/2019 10:56:20 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-25 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 11:21:00 AM

Lab ID: 1910122-026

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	4100	150		mg/Kg	50	10/8/2019 9:12:58 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-25 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 2:16:00 PM

Lab ID: 1910122-027

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1500	60		mg/Kg	20	10/5/2019 1:58:02 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-25 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 2:30:00 PM

Lab ID: 1910122-028

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1100	59		mg/Kg	20	10/5/2019 2:35:04 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-25 8'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 2:45:00 PM

Lab ID: 1910122-029

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/4/2019 5:30:30 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/4/2019 5:30:30 PM
Surr: DNOP	102	70-130		%Rec	1	10/4/2019 5:30:30 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/3/2019 9:20:21 PM
Surr: BFB	93.9	77.4-118		%Rec	1	10/3/2019 9:20:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	10/3/2019 9:20:21 PM
Toluene	ND	0.047		mg/Kg	1	10/3/2019 9:20:21 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/3/2019 9:20:21 PM
Xylenes, Total	ND	0.094		mg/Kg	1	10/3/2019 9:20:21 PM
Surr: 4-Bromofluorobenzene	92.6	80-120		%Rec	1	10/3/2019 9:20:21 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	950	60		mg/Kg	20	10/6/2019 11:08:40 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-23 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 3:00:00 PM

Lab ID: 1910122-030

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	31000	1500		mg/Kg	500	10/8/2019 9:25:22 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-23 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 3:15:00 PM

Lab ID: 1910122-031

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	4600	150		mg/Kg	50	10/8/2019 9:37:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-23 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 3:30:00 PM

Lab ID: 1910122-032

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3400	150		mg/Kg	50	10/8/2019 9:50:12 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-23 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 3:35:00 PM

Lab ID: 1910122-033

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	10/4/2019 5:52:34 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/4/2019 5:52:34 PM
Surr: DNOP	103	70-130		%Rec	1	10/4/2019 5:52:34 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/3/2019 9:43:13 PM
Surr: BFB	94.3	77.4-118		%Rec	1	10/3/2019 9:43:13 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 9:43:13 PM
Toluene	ND	0.048		mg/Kg	1	10/3/2019 9:43:13 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/3/2019 9:43:13 PM
Xylenes, Total	ND	0.095		mg/Kg	1	10/3/2019 9:43:13 PM
Surr: 4-Bromofluorobenzene	92.5	80-120		%Rec	1	10/3/2019 9:43:13 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	540	59		mg/Kg	20	10/6/2019 11:21:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-22 0'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 4:00:00 PM

Lab ID: 1910122-034

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	40000	3000		mg/Kg	1000	10/8/2019 10:02:36 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-22 2'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 4:10:00 PM

Lab ID: 1910122-035

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1800	60		mg/Kg	20	10/5/2019 4:01:27 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-22 4'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 4:20:00 PM

Lab ID: 1910122-036

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1700	60		mg/Kg	20	10/5/2019 4:13:48 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-22 6'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 4:30:00 PM

Lab ID: 1910122-037

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2000	61		mg/Kg	20	10/5/2019 4:26:10 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-22 8'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 4:40:00 PM

Lab ID: 1910122-038

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1800	60		mg/Kg	20	10/5/2019 4:38:30 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910122**

Date Reported:

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-22 10'

Project: Trebuchet Fee 23 28 18

Collection Date: 9/27/2019 5:00:00 PM

Lab ID: 1910122-039

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	10/4/2019 11:31:58 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/4/2019 11:31:58 AM
Surr: DNOP	108	70-130		%Rec	1	10/4/2019 11:31:58 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/3/2019 10:06:09 PM
Surr: BFB	95.1	77.4-118		%Rec	1	10/3/2019 10:06:09 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 10:06:09 PM
Toluene	ND	0.048		mg/Kg	1	10/3/2019 10:06:09 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/3/2019 10:06:09 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/3/2019 10:06:09 PM
Surr: 4-Bromofluorobenzene	92.7	80-120		%Rec	1	10/3/2019 10:06:09 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1700	60		mg/Kg	20	10/6/2019 11:33:21 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

October 09, 2019

Dennis Williams
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Trebuchet 23 28 19

OrderNo.: 1910129

Dear Dennis Williams:

Hall Environmental Analysis Laboratory received 32 sample(s) on 10/2/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**Date Reported: **10/9/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-24 0'**Project:** Trebuchet 23 28 19**Collection Date:** 9/28/2019 8:25:00 AM**Lab ID:** 1910129-001**Matrix:** SOIL**Received Date:** 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/4/2019 11:55:54 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/4/2019 11:55:54 AM
Surr: DNOP	107	70-130		%Rec	1	10/4/2019 11:55:54 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/3/2019 10:52:32 PM
Surr: BFB	105	77.4-118		%Rec	1	10/3/2019 10:52:32 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/3/2019 10:52:32 PM
Toluene	ND	0.049		mg/Kg	1	10/3/2019 10:52:32 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/3/2019 10:52:32 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/3/2019 10:52:32 PM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	10/3/2019 10:52:32 PM
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	14000	600		mg/Kg	200	10/8/2019 1:23:08 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-24 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 8:40:00 AM

Lab ID: 1910129-002

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	4700	150		mg/Kg	50	10/8/2019 1:35:33 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-24 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 8:55:00 AM

Lab ID: 1910129-003

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	840	61		mg/Kg	20	10/7/2019 12:10:23 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-24 8'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 10:04:00 AM

Lab ID: 1910129-004

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/4/2019 12:19:57 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/4/2019 12:19:57 PM
Surr: DNOP	96.8	70-130		%Rec	1	10/4/2019 12:19:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/3/2019 11:15:34 PM
Surr: BFB	102	77.4-118		%Rec	1	10/3/2019 11:15:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/3/2019 11:15:34 PM
Toluene	ND	0.048		mg/Kg	1	10/3/2019 11:15:34 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/3/2019 11:15:34 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/3/2019 11:15:34 PM
Surr: 4-Bromofluorobenzene	96.9	80-120		%Rec	1	10/3/2019 11:15:34 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	460	60		mg/Kg	20	10/7/2019 12:47:24 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-26 0'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 10:21:00 AM

Lab ID: 1910129-005

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/4/2019 12:43:50 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/4/2019 12:43:50 PM
Surr: DNOP	98.2	70-130		%Rec	1	10/4/2019 12:43:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/4/2019 12:47:39 AM
Surr: BFB	96.7	77.4-118		%Rec	1	10/4/2019 12:47:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/4/2019 12:47:39 AM
Toluene	ND	0.050		mg/Kg	1	10/4/2019 12:47:39 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/4/2019 12:47:39 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/4/2019 12:47:39 AM
Surr: 4-Bromofluorobenzene	93.2	80-120		%Rec	1	10/4/2019 12:47:39 AM
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	24000	1500		mg/Kg	500	10/8/2019 1:47:58 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-26 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 10:40:00 AM

Lab ID: 1910129-006

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	4600	150		mg/Kg	50	10/8/2019 2:00:23 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-26 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 11:02:00 AM

Lab ID: 1910129-007

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1100	60		mg/Kg	20	10/7/2019 1:24:24 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-26 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 11:20:00 AM

Lab ID: 1910129-008

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	600	59		mg/Kg	20	10/6/2019 3:50:40 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-26 8'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 11:48:00 AM

Lab ID: 1910129-009

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/4/2019 1:08:01 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/4/2019 1:08:01 PM
Surr: DNOP	97.7	70-130		%Rec	1	10/4/2019 1:08:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/4/2019 1:10:39 AM
Surr: BFB	96.4	77.4-118		%Rec	1	10/4/2019 1:10:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	10/4/2019 1:10:39 AM
Toluene	ND	0.046		mg/Kg	1	10/4/2019 1:10:39 AM
Ethylbenzene	ND	0.046		mg/Kg	1	10/4/2019 1:10:39 AM
Xylenes, Total	ND	0.093		mg/Kg	1	10/4/2019 1:10:39 AM
Surr: 4-Bromofluorobenzene	92.2	80-120		%Rec	1	10/4/2019 1:10:39 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	440	60		mg/Kg	20	10/6/2019 4:03:05 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-24 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 9:10:00 AM

Lab ID: 1910129-010

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	530	60		mg/Kg	20	10/6/2019 4:15:29 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-27 0'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 12:45:00 PM

Lab ID: 1910129-011

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	10/6/2019 4:52:43 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-27 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 12:52:00 PM

Lab ID: 1910129-012

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2600	150		mg/Kg	50	10/8/2019 10:15:01 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-27 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 12:57:00 PM

Lab ID: 1910129-013

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1300	60		mg/Kg	20	10/6/2019 5:42:22 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-27 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 1:11:00 PM

Lab ID: 1910129-014

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	10/4/2019 1:32:11 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	10/4/2019 1:32:11 PM
Surr: DNOP	92.4	70-130		%Rec	1	10/4/2019 1:32:11 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/4/2019 1:33:32 AM
Surr: BFB	99.4	77.4-118		%Rec	1	10/4/2019 1:33:32 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/4/2019 1:33:32 AM
Toluene	ND	0.049		mg/Kg	1	10/4/2019 1:33:32 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/4/2019 1:33:32 AM
Xylenes, Total	ND	0.097		mg/Kg	1	10/4/2019 1:33:32 AM
Surr: 4-Bromofluorobenzene	94.6	80-120		%Rec	1	10/4/2019 1:33:32 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	930	60		mg/Kg	20	10/6/2019 5:54:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-36 0'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 2:00:00 PM

Lab ID: 1910129-015

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	6400	300		mg/Kg	100	10/8/2019 2:12:48 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-36 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 2:05:00 PM

Lab ID: 1910129-016

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	2900	150		mg/Kg	50	10/8/2019 2:25:13 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-36 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 2:09:00 PM

Lab ID: 1910129-017

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1800	60		mg/Kg	20	10/6/2019 1:41:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-36 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 2:21:00 PM

Lab ID: 1910129-018

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1100	60		mg/Kg	20	10/6/2019 1:53:21 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-35 0'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 3:00:00 PM

Lab ID: 1910129-019

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/4/2019 1:56:29 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/4/2019 1:56:29 PM
Surr: DNOP	49.5	70-130	S	%Rec	1	10/4/2019 1:56:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/4/2019 1:56:39 AM
Surr: BFB	96.1	77.4-118		%Rec	1	10/4/2019 1:56:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/4/2019 1:56:39 AM
Toluene	ND	0.048		mg/Kg	1	10/4/2019 1:56:39 AM
Ethylbenzene	ND	0.048		mg/Kg	1	10/4/2019 1:56:39 AM
Xylenes, Total	ND	0.096		mg/Kg	1	10/4/2019 1:56:39 AM
Surr: 4-Bromofluorobenzene	91.5	80-120		%Rec	1	10/4/2019 1:56:39 AM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1300	60		mg/Kg	20	10/6/2019 2:05:42 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-35 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 3:17:00 PM

Lab ID: 1910129-020

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	3700	150		mg/Kg	50	10/8/2019 2:37:38 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-35 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 3:22:00 PM

Lab ID: 1910129-021

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	2700	150		mg/Kg	50	10/8/2019 2:50:02 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-35 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 3:34:00 PM

Lab ID: 1910129-022

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	10/4/2019 2:20:44 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/4/2019 2:20:44 PM
Surr: DNOP	60.7	70-130	S	%Rec	1	10/4/2019 2:20:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/4/2019 12:11:20 PM
Surr: BFB	92.4	77.4-118		%Rec	1	10/4/2019 12:11:20 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/4/2019 12:11:20 PM
Toluene	ND	0.050		mg/Kg	1	10/4/2019 12:11:20 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/4/2019 12:11:20 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/4/2019 12:11:20 PM
Surr: 4-Bromofluorobenzene	89.0	80-120		%Rec	1	10/4/2019 12:11:20 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1500	60		mg/Kg	20	10/6/2019 3:07:24 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**Date Reported: **10/9/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-34 0'**Project:** Trebuchet 23 28 19**Collection Date:** 9/28/2019 4:11:00 PM**Lab ID:** 1910129-023**Matrix:** SOIL**Received Date:** 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	10/4/2019 2:44:57 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/4/2019 2:44:57 PM
Surr: DNOP	73.8	70-130		%Rec	1	10/4/2019 2:44:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/4/2019 1:19:56 PM
Surr: BFB	94.5	77.4-118		%Rec	1	10/4/2019 1:19:56 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/4/2019 1:19:56 PM
Toluene	ND	0.050		mg/Kg	1	10/4/2019 1:19:56 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/4/2019 1:19:56 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/4/2019 1:19:56 PM
Surr: 4-Bromofluorobenzene	92.2	80-120		%Rec	1	10/4/2019 1:19:56 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	ND	60		mg/Kg	20	10/6/2019 3:19:45 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-34 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 4:16:00 PM

Lab ID: 1910129-024

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2100	61		mg/Kg	20	10/6/2019 3:32:05 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-34 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 4:24:00 PM

Lab ID: 1910129-025

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Chloride	2500	150		mg/Kg	50	10/8/2019 3:02:26 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-34 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 4:31:00 PM

Lab ID: 1910129-026

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1400	60		mg/Kg	20	10/6/2019 3:56:45 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-34 8'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 4:41:00 PM

Lab ID: 1910129-027

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/4/2019 3:09:08 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/4/2019 3:09:08 PM
Surr: DNOP	71.4	70-130		%Rec	1	10/4/2019 3:09:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/4/2019 1:42:52 PM
Surr: BFB	95.1	77.4-118		%Rec	1	10/4/2019 1:42:52 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	10/4/2019 1:42:52 PM
Toluene	ND	0.046		mg/Kg	1	10/4/2019 1:42:52 PM
Ethylbenzene	ND	0.046		mg/Kg	1	10/4/2019 1:42:52 PM
Xylenes, Total	ND	0.092		mg/Kg	1	10/4/2019 1:42:52 PM
Surr: 4-Bromofluorobenzene	92.2	80-120		%Rec	1	10/4/2019 1:42:52 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	320	60		mg/Kg	20	10/6/2019 4:09:06 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-29 0'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 5:10:00 PM

Lab ID: 1910129-028

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/4/2019 3:33:31 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/4/2019 3:33:31 PM
Surr: DNOP	74.0	70-130		%Rec	1	10/4/2019 3:33:31 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/4/2019 2:05:47 PM
Surr: BFB	93.2	77.4-118		%Rec	1	10/4/2019 2:05:47 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/4/2019 2:05:47 PM
Toluene	ND	0.049		mg/Kg	1	10/4/2019 2:05:47 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/4/2019 2:05:47 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/4/2019 2:05:47 PM
Surr: 4-Bromofluorobenzene	89.4	80-120		%Rec	1	10/4/2019 2:05:47 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	4500	150		mg/Kg	50	10/8/2019 10:27:25 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-29 2'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 5:16:00 PM

Lab ID: 1910129-029

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3500	150		mg/Kg	50	10/8/2019 10:39:49 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-29 4'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 5:21:00 PM

Lab ID: 1910129-030

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1200	60		mg/Kg	20	10/6/2019 4:46:09 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-29 6'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 5:37:00 PM

Lab ID: 1910129-031

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	700	60		mg/Kg	20	10/6/2019 5:23:09 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910129**

Date Reported: **10/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-29 8'

Project: Trebuchet 23 28 19

Collection Date: 9/28/2019 5:40:00 PM

Lab ID: 1910129-032

Matrix: SOIL

Received Date: 10/2/2019 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	10/4/2019 3:57:50 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/4/2019 3:57:50 PM
Surr: DNOP	70.2	70-130		%Rec	1	10/4/2019 3:57:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/4/2019 2:28:41 PM
Surr: BFB	96.3	77.4-118		%Rec	1	10/4/2019 2:28:41 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	10/4/2019 2:28:41 PM
Toluene	ND	0.049		mg/Kg	1	10/4/2019 2:28:41 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/4/2019 2:28:41 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/4/2019 2:28:41 PM
Surr: 4-Bromofluorobenzene	92.3	80-120		%Rec	1	10/4/2019 2:28:41 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	380	60		mg/Kg	20	10/6/2019 5:35:29 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910129

09-Oct-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47966	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 47966	RunNo: 63454
Prep Date: 10/6/2019	Analysis Date: 10/6/2019	SeqNo: 2167361 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-47966	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 47966	RunNo: 63454
Prep Date: 10/6/2019	Analysis Date: 10/6/2019	SeqNo: 2167362 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 92.5 90 110

Sample ID: MB-47953	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 47953	RunNo: 63454
Prep Date: 10/4/2019	Analysis Date: 10/6/2019	SeqNo: 2167393 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-47953	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 47953	RunNo: 63454
Prep Date: 10/4/2019	Analysis Date: 10/6/2019	SeqNo: 2167394 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 93.6 90 110

Sample ID: MB-47964	SampType: MBLK	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 47964	RunNo: 63456
Prep Date: 10/6/2019	Analysis Date: 10/6/2019	SeqNo: 2167522 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-47964	SampType: LCS	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 47964	RunNo: 63456
Prep Date: 10/6/2019	Analysis Date: 10/6/2019	SeqNo: 2167523 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 93.9 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910129

09-Oct-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: LCS-47935	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 47935		RunNo: 63422							
Prep Date: 10/4/2019	Analysis Date: 10/4/2019		SeqNo: 2165732		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	10	50.00	0	106	63.9	124			
Surr: DNOP	4.9		5.000		97.6	70	130			

Sample ID: MB-47935	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 47935		RunNo: 63422							
Prep Date: 10/4/2019	Analysis Date: 10/4/2019		SeqNo: 2165733		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		99.7	70	130			

Sample ID: LCS-47905	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 47905		RunNo: 63422							
Prep Date: 10/3/2019	Analysis Date: 10/4/2019		SeqNo: 2166359		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	99.4	63.9	124			
Surr: DNOP	4.8		5.000		96.1	70	130			

Sample ID: MB-47905	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 47905		RunNo: 63422							
Prep Date: 10/3/2019	Analysis Date: 10/4/2019		SeqNo: 2166360		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	13		10.00		132	70	130			S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910129

09-Oct-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47891	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 47891	RunNo: 63411								
Prep Date: 10/2/2019	Analysis Date: 10/3/2019	SeqNo: 2165168 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	960		1000		96.3	77.4	118			

Sample ID: LCS-47891	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 47891	RunNo: 63411								
Prep Date: 10/2/2019	Analysis Date: 10/3/2019	SeqNo: 2165169 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.9	80	120			
Surr: BFB	1100		1000		106	77.4	118			

Sample ID: MB-47919	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 47919	RunNo: 63433								
Prep Date: 10/3/2019	Analysis Date: 10/4/2019	SeqNo: 2166815 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	980		1000		98.1	77.4	118			

Sample ID: LCS-47919	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 47919	RunNo: 63433								
Prep Date: 10/3/2019	Analysis Date: 10/4/2019	SeqNo: 2166816 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	105	80	120			
Surr: BFB	1100		1000		110	77.4	118			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910129

09-Oct-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: MB-47891	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 47891	RunNo: 63411								
Prep Date: 10/2/2019	Analysis Date: 10/3/2019	SeqNo: 2165206			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.95		1.000		95.5	80	120			

Sample ID: LCS-47891	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 47891	RunNo: 63411								
Prep Date: 10/2/2019	Analysis Date: 10/3/2019	SeqNo: 2165207			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	91.5	80	120			
Toluene	0.95	0.050	1.000	0	95.0	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.2	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.8	80	120			
Surr: 4-Bromofluorobenzene	0.94		1.000		93.8	80	120			

Sample ID: MB-47919	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 47919	RunNo: 63433								
Prep Date: 10/3/2019	Analysis Date: 10/4/2019	SeqNo: 2166837			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.96		1.000		95.5	80	120			

Sample ID: LCS-47919	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 47919	RunNo: 63433								
Prep Date: 10/3/2019	Analysis Date: 10/4/2019	SeqNo: 2166838			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.4	80	120			
Toluene	0.99	0.050	1.000	0	98.8	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.9	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.5	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1910129

09-Oct-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19

Sample ID: 1910129-022AMS	SampType: MS			TestCode: EPA Method 8021B: Volatiles						
Client ID: BH19-35 6'	Batch ID: 47919			RunNo: 63433						
Prep Date: 10/3/2019	Analysis Date: 10/4/2019			SeqNo: 2166840			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.79	0.023	0.9242	0.01022	84.6	76	123			
Toluene	0.83	0.046	0.9242	0.007946	88.9	80.3	127			
Ethylbenzene	0.84	0.046	0.9242	0	90.7	80.2	131			
Xylenes, Total	2.4	0.092	2.773	0.02787	87.0	78	133			
Surr: 4-Bromofluorobenzene	0.86		0.9242		93.6	80	120			

Sample ID: 1910129-022AMSD		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: BH19-35 6'		Batch ID: 47919		RunNo: 63433						
Prep Date: 10/3/2019		Analysis Date: 10/4/2019		SeqNo: 2166841		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	0.9960	0.01022	90.6	76	123	14.2	20	
Toluene	0.96	0.050	0.9960	0.007946	95.4	80.3	127	14.4	20	
Ethylbenzene	0.97	0.050	0.9960	0	97.1	80.2	131	14.3	20	
Xylenes, Total	2.9	0.10	2.988	0.02787	94.9	78	133	16.0	20	
Surr: 4-Bromofluorobenzene	0.97		0.9960		97.7	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 1910129

RcptNo: 1

Received By: JUAN ROJAS 10/2/2019 9:30:00 AM

Completed By: Yazmine Garduno 10/2/2019 11:24:13 AM

Reviewed By: DM 10/2/19

Yazmine Garduno

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:
(<2 or >12 unless noted)

Adjusted?

Checked by:

Y6 10/2/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good				

Chain-of-Custody Record

Client: Vertex Marathon

Mailing Address: on file

Phone #: on file

email or Fax#: on file

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 day

☐ Standard ☐ Rush

Project Name: Trebuchet 23 28 19

Project #: 19E-00614

Project Manager: Dennis Williams
Permin@Vertex.ca ; Isaac Castro
icastro@marathonoil.com

Sampler: Jason Crabtree

On Ice: ☒ Yes ☐ No

of Coolers: 1

Cooler Temp (including CF): 1.6-0.2 = 1.4 (°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No
09/28/2019	8:25	soil	BH19-24 0'	glass jar	ice	-001
	8:40	soil	BH19-24 2'	glass jar	ice	-002
	8:55	soil	BH19-24 4'	glass jar	ice	-003
	10:04	soil	BH19-24 8'	Glass Jar	ice	-004
	10:21	soil	11 26 0'	"	"	-005
	10:40	soil	11 26 2'	"	"	-006
	11:02	soil	11 26 4'	"	"	-007
	11:20	soil	11 26 6'	"	"	-008
	11:48	soil	11 26 8'	"	"	-009
	11:10	soil	BH19-24 6'	"	"	-010
	12:45	soil	BH19-27 0'	"	"	-011
	12:52	soil	BH19-27 2'	"	"	-012

Date: <u>9-28-19</u>	Time: <u>11:19</u>	Relinquished by: <u>[Signature]</u>	Received by: <u>[Signature]</u>	Date: <u>10/1/19</u>	Time: <u>0900</u>
Date: <u>10/1/19</u>	Time: <u>1900</u>	Relinquished by: <u>[Signature]</u>	Received by: <u>[Signature]</u>	Date: <u>10/2/19</u>	Time: <u>09:30</u>



www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
<input checked="" type="checkbox"/> BTEX	<input checked="" type="checkbox"/> MTBE / TMB's (8021)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

December 06, 2019

Natalie Gordon
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Trebuchet Fee 232819 WXY

OrderNo.: 1911C59

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 14 sample(s) on 11/27/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-37 4'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/21/2019**Lab ID:** 1911C59-001**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	12/3/2019 11:05:39 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/3/2019 11:05:39 AM
Surr: DNOP	130	70-130	S	%Rec	1	12/3/2019 11:05:39 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/2/2019 8:27:55 PM
Surr: BFB	81.4	77.4-118		%Rec	1	12/2/2019 8:27:55 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/2/2019 8:27:55 PM
Toluene	ND	0.049		mg/Kg	1	12/2/2019 8:27:55 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/2/2019 8:27:55 PM
Xylenes, Total	ND	0.098		mg/Kg	1	12/2/2019 8:27:55 PM
Surr: 4-Bromofluorobenzene	99.3	80-120		%Rec	1	12/2/2019 8:27:55 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	890	60		mg/Kg	20	12/4/2019 7:30:04 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-38 2'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/21/2019**Lab ID:** 1911C59-002**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	16	9.4		mg/Kg	1	12/3/2019 11:14:53 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/3/2019 11:14:53 AM
Surr: DNOP	94.4	70-130		%Rec	1	12/3/2019 11:14:53 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/2/2019 8:50:45 PM
Surr: BFB	78.9	77.4-118		%Rec	1	12/2/2019 8:50:45 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/2/2019 8:50:45 PM
Toluene	ND	0.047		mg/Kg	1	12/2/2019 8:50:45 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/2/2019 8:50:45 PM
Xylenes, Total	ND	0.095		mg/Kg	1	12/2/2019 8:50:45 PM
Surr: 4-Bromofluorobenzene	95.9	80-120		%Rec	1	12/2/2019 8:50:45 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1100	60		mg/Kg	20	12/4/2019 8:07:06 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**

Date Reported: **12/6/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-03 2'

Project: Trebuchet Fee 232819 WXY

Collection Date: 11/21/2019

Lab ID: 1911C59-003

Matrix: SOIL

Received Date: 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	30	10		mg/Kg	1	12/3/2019 11:24:05 AM
Motor Oil Range Organics (MRO)	65	50		mg/Kg	1	12/3/2019 11:24:05 AM
Surr: DNOP	83.3	70-130		%Rec	1	12/3/2019 11:24:05 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/2/2019 9:13:35 PM
Surr: BFB	79.3	77.4-118		%Rec	1	12/2/2019 9:13:35 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	12/2/2019 9:13:35 PM
Toluene	ND	0.049		mg/Kg	1	12/2/2019 9:13:35 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/2/2019 9:13:35 PM
Xylenes, Total	ND	0.099		mg/Kg	1	12/2/2019 9:13:35 PM
Surr: 4-Bromofluorobenzene	96.4	80-120		%Rec	1	12/2/2019 9:13:35 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	890	60		mg/Kg	20	12/4/2019 8:19:27 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-39 4'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/22/2019 11:35:00 AM**Lab ID:** 1911C59-004**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	12/3/2019 11:33:18 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/3/2019 11:33:18 AM
Surr: DNOP	94.0	70-130		%Rec	1	12/3/2019 11:33:18 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/2/2019 9:36:24 PM
Surr: BFB	79.3	77.4-118		%Rec	1	12/2/2019 9:36:24 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/2/2019 9:36:24 PM
Toluene	ND	0.048		mg/Kg	1	12/2/2019 9:36:24 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/2/2019 9:36:24 PM
Xylenes, Total	ND	0.095		mg/Kg	1	12/2/2019 9:36:24 PM
Surr: 4-Bromofluorobenzene	96.2	80-120		%Rec	1	12/2/2019 9:36:24 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1500	60		mg/Kg	20	12/4/2019 8:31:48 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**

Date Reported: **12/6/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS19-04 4'

Project: Trebuchet Fee 232819 WXY

Collection Date: 11/22/2019 1:45:00 PM

Lab ID: 1911C59-005

Matrix: SOIL

Received Date: 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	12/3/2019 11:42:29 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/3/2019 11:42:29 AM
Surr: DNOP	90.8	70-130		%Rec	1	12/3/2019 11:42:29 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/2/2019 9:59:10 PM
Surr: BFB	80.0	77.4-118		%Rec	1	12/2/2019 9:59:10 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	12/2/2019 9:59:10 PM
Toluene	ND	0.050		mg/Kg	1	12/2/2019 9:59:10 PM
Ethylbenzene	ND	0.050		mg/Kg	1	12/2/2019 9:59:10 PM
Xylenes, Total	ND	0.099		mg/Kg	1	12/2/2019 9:59:10 PM
Surr: 4-Bromofluorobenzene	96.5	80-120		%Rec	1	12/2/2019 9:59:10 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2400	60		mg/Kg	20	12/4/2019 8:44:09 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**

Date Reported: **12/6/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS19-05 4'

Project: Trebuchet Fee 232819 WXY

Collection Date: 11/22/2019 2:00:00 PM

Lab ID: 1911C59-006

Matrix: SOIL

Received Date: 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	12/3/2019 12:37:31 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/3/2019 12:37:31 PM
Surr: DNOP	90.2	70-130		%Rec	1	12/3/2019 12:37:31 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/2/2019 11:30:08 PM
Surr: BFB	79.4	77.4-118		%Rec	1	12/2/2019 11:30:08 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	12/2/2019 11:30:08 PM
Toluene	ND	0.047		mg/Kg	1	12/2/2019 11:30:08 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/2/2019 11:30:08 PM
Xylenes, Total	ND	0.093		mg/Kg	1	12/2/2019 11:30:08 PM
Surr: 4-Bromofluorobenzene	98.3	80-120		%Rec	1	12/2/2019 11:30:08 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2200	60		mg/Kg	20	12/4/2019 8:56:30 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-20 6'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/22/2019 2:50:00 PM**Lab ID:** 1911C59-007**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	12/3/2019 1:05:03 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/3/2019 1:05:03 PM
Surr: DNOP	87.8	70-130		%Rec	1	12/3/2019 1:05:03 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1100	60		mg/Kg	20	12/4/2019 9:08:51 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	12/2/2019 2:39:57 PM
Toluene	ND	0.048		mg/Kg	1	12/2/2019 2:39:57 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/2/2019 2:39:57 PM
Xylenes, Total	ND	0.095		mg/Kg	1	12/2/2019 2:39:57 PM
Surr: 1,2-Dichloroethane-d4	98.7	70-130		%Rec	1	12/2/2019 2:39:57 PM
Surr: 4-Bromofluorobenzene	91.3	70-130		%Rec	1	12/2/2019 2:39:57 PM
Surr: Dibromofluoromethane	115	70-130		%Rec	1	12/2/2019 2:39:57 PM
Surr: Toluene-d8	102	70-130		%Rec	1	12/2/2019 2:39:57 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/2/2019 2:39:57 PM
Surr: BFB	94.9	70-130		%Rec	1	12/2/2019 2:39:57 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** WS19-10 4'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/22/2019 4:55:00 PM**Lab ID:** 1911C59-008**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	12/3/2019 1:14:15 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/3/2019 1:14:15 PM
Surr: DNOP	138	70-130	S	%Rec	1	12/3/2019 1:14:15 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2400	150		mg/Kg	50	12/6/2019 1:41:43 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	12/2/2019 4:06:03 PM
Toluene	ND	0.049		mg/Kg	1	12/2/2019 4:06:03 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/2/2019 4:06:03 PM
Xylenes, Total	ND	0.098		mg/Kg	1	12/2/2019 4:06:03 PM
Surr: 1,2-Dichloroethane-d4	98.3	70-130		%Rec	1	12/2/2019 4:06:03 PM
Surr: 4-Bromofluorobenzene	90.2	70-130		%Rec	1	12/2/2019 4:06:03 PM
Surr: Dibromofluoromethane	115	70-130		%Rec	1	12/2/2019 4:06:03 PM
Surr: Toluene-d8	101	70-130		%Rec	1	12/2/2019 4:06:03 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/2/2019 4:06:03 PM
Surr: BFB	93.7	70-130		%Rec	1	12/2/2019 4:06:03 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** WS19-09 4'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/22/2019 5:05:00 PM**Lab ID:** 1911C59-009**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	12/3/2019 1:23:25 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/3/2019 1:23:25 PM
Surr: DNOP	95.9	70-130		%Rec	1	12/3/2019 1:23:25 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2700	150		mg/Kg	50	12/6/2019 1:54:04 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	12/2/2019 4:34:43 PM
Toluene	ND	0.050		mg/Kg	1	12/2/2019 4:34:43 PM
Ethylbenzene	ND	0.050		mg/Kg	1	12/2/2019 4:34:43 PM
Xylenes, Total	ND	0.099		mg/Kg	1	12/2/2019 4:34:43 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	12/2/2019 4:34:43 PM
Surr: 4-Bromofluorobenzene	91.1	70-130		%Rec	1	12/2/2019 4:34:43 PM
Surr: Dibromofluoromethane	117	70-130		%Rec	1	12/2/2019 4:34:43 PM
Surr: Toluene-d8	103	70-130		%Rec	1	12/2/2019 4:34:43 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/2/2019 4:34:43 PM
Surr: BFB	95.1	70-130		%Rec	1	12/2/2019 4:34:43 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-25 5'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/25/2019 3:53:00 PM**Lab ID:** 1911C59-010**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	12/3/2019 1:32:37 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/3/2019 1:32:37 PM
Surr: DNOP	120	70-130		%Rec	1	12/3/2019 1:32:37 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	530	60		mg/Kg	20	12/4/2019 10:10:36 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.023		mg/Kg	1	12/2/2019 5:03:27 PM
Toluene	ND	0.047		mg/Kg	1	12/2/2019 5:03:27 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/2/2019 5:03:27 PM
Xylenes, Total	ND	0.093		mg/Kg	1	12/2/2019 5:03:27 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/2/2019 5:03:27 PM
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	12/2/2019 5:03:27 PM
Surr: Dibromofluoromethane	118	70-130		%Rec	1	12/2/2019 5:03:27 PM
Surr: Toluene-d8	104	70-130		%Rec	1	12/2/2019 5:03:27 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/2/2019 5:03:27 PM
Surr: BFB	94.0	70-130		%Rec	1	12/2/2019 5:03:27 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-26 5'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/25/2019 4:45:00 PM**Lab ID:** 1911C59-011**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	12/3/2019 1:41:47 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	12/3/2019 1:41:47 PM
Surr: DNOP	96.0	70-130		%Rec	1	12/3/2019 1:41:47 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	660	60		mg/Kg	20	12/4/2019 10:22:56 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	12/2/2019 5:32:05 PM
Toluene	ND	0.048		mg/Kg	1	12/2/2019 5:32:05 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/2/2019 5:32:05 PM
Xylenes, Total	ND	0.096		mg/Kg	1	12/2/2019 5:32:05 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	12/2/2019 5:32:05 PM
Surr: 4-Bromofluorobenzene	89.7	70-130		%Rec	1	12/2/2019 5:32:05 PM
Surr: Dibromofluoromethane	119	70-130		%Rec	1	12/2/2019 5:32:05 PM
Surr: Toluene-d8	102	70-130		%Rec	1	12/2/2019 5:32:05 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/2/2019 5:32:05 PM
Surr: BFB	95.2	70-130		%Rec	1	12/2/2019 5:32:05 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-22 5'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/25/2019 4:50:00 PM**Lab ID:** 1911C59-012**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.3		mg/Kg	1	12/3/2019 1:50:59 PM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	12/3/2019 1:50:59 PM
Surr: DNOP	92.1	70-130		%Rec	1	12/3/2019 1:50:59 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	410	60		mg/Kg	20	12/4/2019 10:35:17 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	12/2/2019 6:00:40 PM
Toluene	ND	0.048		mg/Kg	1	12/2/2019 6:00:40 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/2/2019 6:00:40 PM
Xylenes, Total	ND	0.095		mg/Kg	1	12/2/2019 6:00:40 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	12/2/2019 6:00:40 PM
Surr: 4-Bromofluorobenzene	87.5	70-130		%Rec	1	12/2/2019 6:00:40 PM
Surr: Dibromofluoromethane	120	70-130		%Rec	1	12/2/2019 6:00:40 PM
Surr: Toluene-d8	102	70-130		%Rec	1	12/2/2019 6:00:40 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/2/2019 6:00:40 PM
Surr: BFB	92.3	70-130		%Rec	1	12/2/2019 6:00:40 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-34 5'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/25/2019 5:28:00 PM**Lab ID:** 1911C59-013**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/3/2019 2:00:13 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/3/2019 2:00:13 PM
Surr: DNOP	96.3	70-130		%Rec	1	12/3/2019 2:00:13 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	900	60		mg/Kg	20	12/4/2019 10:47:39 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.023		mg/Kg	1	12/2/2019 6:29:17 PM
Toluene	ND	0.047		mg/Kg	1	12/2/2019 6:29:17 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/2/2019 6:29:17 PM
Xylenes, Total	ND	0.094		mg/Kg	1	12/2/2019 6:29:17 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/2/2019 6:29:17 PM
Surr: 4-Bromofluorobenzene	89.6	70-130		%Rec	1	12/2/2019 6:29:17 PM
Surr: Dibromofluoromethane	120	70-130		%Rec	1	12/2/2019 6:29:17 PM
Surr: Toluene-d8	103	70-130		%Rec	1	12/2/2019 6:29:17 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/2/2019 6:29:17 PM
Surr: BFB	96.8	70-130		%Rec	1	12/2/2019 6:29:17 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911C59**Date Reported: **12/6/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-33 5'**Project:** Trebuchet Fee 232819 WXY**Collection Date:** 11/25/2019 5:35:00 PM**Lab ID:** 1911C59-014**Matrix:** SOIL**Received Date:** 11/27/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	12/3/2019 2:09:27 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/3/2019 2:09:27 PM
Surr: DNOP	95.3	70-130		%Rec	1	12/3/2019 2:09:27 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	600	60		mg/Kg	20	12/4/2019 11:00:00 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	12/2/2019 6:57:51 PM
Toluene	ND	0.049		mg/Kg	1	12/2/2019 6:57:51 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/2/2019 6:57:51 PM
Xylenes, Total	ND	0.098		mg/Kg	1	12/2/2019 6:57:51 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	12/2/2019 6:57:51 PM
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	12/2/2019 6:57:51 PM
Surr: Dibromofluoromethane	121	70-130		%Rec	1	12/2/2019 6:57:51 PM
Surr: Toluene-d8	102	70-130		%Rec	1	12/2/2019 6:57:51 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/2/2019 6:57:51 PM
Surr: BFB	94.1	70-130		%Rec	1	12/2/2019 6:57:51 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: MB-49160	SampType: mbk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 49160	RunNo: 64920
Prep Date: 12/4/2019	Analysis Date: 12/4/2019	SeqNo: 2227398 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-49160	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 49160	RunNo: 64920
Prep Date: 12/4/2019	Analysis Date: 12/4/2019	SeqNo: 2227400 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 95.4 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: LCS-49070	SampType: LCS			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batch ID: 49070			RunNo: 64876						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2224173		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	85.8	63.9	124			
Surr: DNOP	4.0		5.000		79.0	70	130			

Sample ID: MB-49070	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: PBS	Batch ID: 49070			RunNo: 64876						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2224174		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		105	70	130			

Sample ID: LCS-49089	SampType: LCS			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batch ID: 49089			RunNo: 64876						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2224924		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	10	50.00	0	88.9	63.9	124			
Surr: DNOP	4.1		5.000		82.7	70	130			

Sample ID: MB-49089	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: PBS	Batch ID: 49089			RunNo: 64876						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2224925		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.5		10.00		85.3	70	130			

Sample ID: 1911C59-006AMS	SampType: MS			TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: WS19-05 4'	Batch ID: 49089			RunNo: 64876						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225731		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.0	45.25	0	113	57	142			
Surr: DNOP	3.8		4.525		84.1	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: 1911C59-006AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: WS19-05 4'		Batch ID: 49089		RunNo: 64876						
Prep Date: 12/2/2019		Analysis Date: 12/3/2019		SeqNo: 2225732		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.40	0	88.9	57	142	12.9	20	
Surr: DNOP	4.1		5.040		80.6	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: MB-49063	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: 49063		RunNo: 64862							
Prep Date: 11/27/2019	Analysis Date: 12/2/2019		SeqNo: 2223698		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	840		1000		84.2	77.4	118			

Sample ID: LCS-49063	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 49063		RunNo: 64862							
Prep Date: 11/27/2019	Analysis Date: 12/2/2019		SeqNo: 2223699		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.6	80	120			
Surr: BFB	920		1000		91.5	77.4	118			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: MB-49063	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 49063	RunNo: 64862								
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2223746	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		107	80	120			

Sample ID: LCS-49063	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 49063	RunNo: 64862								
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2223747	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.5	80	120			
Toluene	0.97	0.050	1.000	0	96.5	80	120			
Ethylbenzene	0.97	0.050	1.000	0	97.1	80	120			
Xylenes, Total	2.9	0.10	3.000	0	96.7	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		104	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: lcs-49064	SampType: LCS	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: LCSS	Batch ID: 49064	RunNo: 64875								
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2224128	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	104	68	135			
Toluene	0.99	0.050	1.000	0	99.1	70	130			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		101	70	130			
Surr: 4-Bromofluorobenzene	0.43		0.5000		85.9	70	130			
Surr: Dibromofluoromethane	0.58		0.5000		116	70	130			
Surr: Toluene-d8	0.50		0.5000		99.5	70	130			

Sample ID: mb-49064	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 49064	RunNo: 64875								
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2224129	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.6	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.5000		89.2	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		110	70	130			
Surr: Toluene-d8	0.50		0.5000		99.4	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911C59

06-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet Fee 232819 WXY

Sample ID: 1911c59-007ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range
Client ID: BH19-20 6'	Batch ID: 49064	RunNo: 64875
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2224141 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	22	4.6 22.91 0 95.7 70 130
Surr: BFB	430	458.3 94.8 70 130

Sample ID: 1911c59-007amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range
Client ID: BH19-20 6'	Batch ID: 49064	RunNo: 64875
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2224143 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	25	5.0 24.95 0 99.2 70 130 12.1 20
Surr: BFB	490	499.0 97.8 70 130 0 0

Sample ID: lcs-49064	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range
Client ID: LCSS	Batch ID: 49064	RunNo: 64875
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2224171 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	22	5.0 25.00 0 87.4 70 130
Surr: BFB	470	500.0 94.5 70 130

Sample ID: mb-49064	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range
Client ID: PBS	Batch ID: 49064	RunNo: 64875
Prep Date: 11/27/2019	Analysis Date: 12/2/2019	SeqNo: 2224172 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	ND	5.0
Surr: BFB	470	500.0 93.0 70 130

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: **VERTEX CARLSBAD**

Work Order Number: **1911C59**

RcptNo: 1

Received By: *Juan Rojas* 11/27/2019 9:00:00 AM

Completed By: *Leah Baca* 11/27/2019 9:46:30 AM

Reviewed By: *nm 11/27/19*

Leah Baca

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:
(<2 or >12 unless noted)

Adjusted?

Checked by: *ENM 11/27/19*

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date

By Whom:

Via:

☐ eMail

☐ Phone

☐ Fax

☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.2	Good				
2	1.7	Good				

www.hallenvironmental.com

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

[illegible]

Send results to permian@vertex.ca
and ngordon@vertex.ca

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



*Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com*

December 09, 2019

Natalie Gordon
Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Trebuchet 23 28 19 Way 10H

OrderNo.: 1911D07

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 10 sample(s) on 11/30/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**Date Reported: **12/9/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** WS19-13**Project:** Trebuchet 23 28 19 Way 10H**Collection Date:** 11/26/2019 2:50:00 PM**Lab ID:** 1911D07-001**Matrix:** SOIL**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	20	9.9		mg/Kg	1	12/3/2019 7:04:49 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/3/2019 7:04:49 PM
Surr: DNOP	88.1	70-130		%Rec	1	12/3/2019 7:04:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/3/2019 6:35:00 PM
Surr: BFB	78.3	77.4-118		%Rec	1	12/3/2019 6:35:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	12/3/2019 6:35:00 PM
Toluene	ND	0.050		mg/Kg	1	12/3/2019 6:35:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	12/3/2019 6:35:00 PM
Xylenes, Total	ND	0.10		mg/Kg	1	12/3/2019 6:35:00 PM
Surr: 4-Bromofluorobenzene	94.4	80-120		%Rec	1	12/3/2019 6:35:00 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	1100	60		mg/Kg	20	12/5/2019 9:34:42 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**Date Reported: **12/9/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-04**Project:** Trebuchet 23 28 19 Way 10H**Collection Date:** 11/26/2019 3:55:00 PM**Lab ID:** 1911D07-002**Matrix:** SOIL**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	12/3/2019 7:13:58 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/3/2019 7:13:58 PM
Surr: DNOP	85.6	70-130		%Rec	1	12/3/2019 7:13:58 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/3/2019 6:57:55 PM
Surr: BFB	78.1	77.4-118		%Rec	1	12/3/2019 6:57:55 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 6:57:55 PM
Toluene	ND	0.048		mg/Kg	1	12/3/2019 6:57:55 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/3/2019 6:57:55 PM
Xylenes, Total	ND	0.097		mg/Kg	1	12/3/2019 6:57:55 PM
Surr: 4-Bromofluorobenzene	93.4	80-120		%Rec	1	12/3/2019 6:57:55 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	440	60		mg/Kg	20	12/5/2019 9:47:02 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**

Date Reported: **12/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-07

Project: Trebuchet 23 28 19 Way 10H

Collection Date: 11/26/2019 4:00:00 PM

Lab ID: 1911D07-003

Matrix: SOIL

Received Date: 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	7.9		mg/Kg	1	12/3/2019 7:23:05 PM
Motor Oil Range Organics (MRO)	ND	40		mg/Kg	1	12/3/2019 7:23:05 PM
Surr: DNOP	123	70-130		%Rec	1	12/3/2019 7:23:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/3/2019 7:20:37 PM
Surr: BFB	83.8	77.4-118		%Rec	1	12/3/2019 7:20:37 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 7:20:37 PM
Toluene	ND	0.047		mg/Kg	1	12/3/2019 7:20:37 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/3/2019 7:20:37 PM
Xylenes, Total	ND	0.095		mg/Kg	1	12/3/2019 7:20:37 PM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	12/3/2019 7:20:37 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	830	60		mg/Kg	20	12/5/2019 9:59:23 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**

Date Reported: **12/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-08

Project: Trebuchet 23 28 19 Way 10H

Collection Date: 11/26/2019 4:05:00 PM

Lab ID: 1911D07-004

Matrix: SOIL

Received Date: 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.2		mg/Kg	1	12/3/2019 7:32:09 PM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	12/3/2019 7:32:09 PM
Surr: DNOP	88.0	70-130		%Rec	1	12/3/2019 7:32:09 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/3/2019 7:43:31 PM
Surr: BFB	79.2	77.4-118		%Rec	1	12/3/2019 7:43:31 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 7:43:31 PM
Toluene	ND	0.049		mg/Kg	1	12/3/2019 7:43:31 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/3/2019 7:43:31 PM
Xylenes, Total	ND	0.098		mg/Kg	1	12/3/2019 7:43:31 PM
Surr: 4-Bromofluorobenzene	95.1	80-120		%Rec	1	12/3/2019 7:43:31 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	740	60		mg/Kg	20	12/5/2019 10:11:44 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**

Date Reported: **12/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-01

Project: Trebuchet 23 28 19 Way 10H

Collection Date: 11/26/2019 4:15:00 PM

Lab ID: 1911D07-005

Matrix: SOIL

Received Date: 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	12/3/2019 7:41:12 PM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	12/3/2019 7:41:12 PM
Surr: DNOP	76.5	70-130		%Rec	1	12/3/2019 7:41:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/3/2019 8:06:24 PM
Surr: BFB	79.3	77.4-118		%Rec	1	12/3/2019 8:06:24 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 8:06:24 PM
Toluene	ND	0.049		mg/Kg	1	12/3/2019 8:06:24 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/3/2019 8:06:24 PM
Xylenes, Total	ND	0.097		mg/Kg	1	12/3/2019 8:06:24 PM
Surr: 4-Bromofluorobenzene	95.4	80-120		%Rec	1	12/3/2019 8:06:24 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	680	60		mg/Kg	20	12/5/2019 10:48:49 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**

Date Reported: **12/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-03

Project: Trebuchet 23 28 19 Way 10H

Collection Date: 11/26/2019 4:20:00 PM

Lab ID: 1911D07-006

Matrix: SOIL

Received Date: 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	12/3/2019 7:50:14 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/3/2019 7:50:14 PM
Surr: DNOP	87.5	70-130		%Rec	1	12/3/2019 7:50:14 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	12/3/2019 8:29:17 PM
Surr: BFB	82.1	77.4-118		%Rec	1	12/3/2019 8:29:17 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	12/3/2019 8:29:17 PM
Toluene	ND	0.046		mg/Kg	1	12/3/2019 8:29:17 PM
Ethylbenzene	ND	0.046		mg/Kg	1	12/3/2019 8:29:17 PM
Xylenes, Total	ND	0.092		mg/Kg	1	12/3/2019 8:29:17 PM
Surr: 4-Bromofluorobenzene	97.6	80-120		%Rec	1	12/3/2019 8:29:17 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	960	59		mg/Kg	20	12/5/2019 11:01:11 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**

Date Reported: **12/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS19-05

Project: Trebuchet 23 28 19 Way 10H

Collection Date: 11/26/2019 4:25:00 PM

Lab ID: 1911D07-007

Matrix: SOIL

Received Date: 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	12/5/2019 7:46:42 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/5/2019 7:46:42 AM
Surr: DNOP	94.2	70-130		%Rec	1	12/5/2019 7:46:42 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/3/2019 12:11:34 PM
Surr: BFB	82.9	77.4-118		%Rec	1	12/3/2019 12:11:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 12:11:34 PM
Toluene	ND	0.048		mg/Kg	1	12/3/2019 12:11:34 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/3/2019 12:11:34 PM
Xylenes, Total	ND	0.096		mg/Kg	1	12/3/2019 12:11:34 PM
Surr: 4-Bromofluorobenzene	96.6	80-120		%Rec	1	12/3/2019 12:11:34 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	790	60		mg/Kg	20	12/5/2019 11:13:32 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**Date Reported: **12/9/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BS19-02**Project:** Trebuchet 23 28 19 Way 10H**Collection Date:** 11/26/2019 4:40:00 PM**Lab ID:** 1911D07-008**Matrix:** SOIL**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	12/5/2019 8:14:12 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	12/5/2019 8:14:12 AM
Surr: DNOP	93.6	70-130		%Rec	1	12/5/2019 8:14:12 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/3/2019 1:22:12 PM
Surr: BFB	81.4	77.4-118		%Rec	1	12/3/2019 1:22:12 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 1:22:12 PM
Toluene	ND	0.049		mg/Kg	1	12/3/2019 1:22:12 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/3/2019 1:22:12 PM
Xylenes, Total	ND	0.098		mg/Kg	1	12/3/2019 1:22:12 PM
Surr: 4-Bromofluorobenzene	94.5	80-120		%Rec	1	12/3/2019 1:22:12 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	450	60		mg/Kg	20	12/5/2019 11:25:53 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**Date Reported: **12/9/2019****CLIENT:** Vertex Resource Group Ltd.**Client Sample ID:** BH19-21a**Project:** Trebuchet 23 28 19 Way 10H**Collection Date:** 11/26/2019 4:45:00 PM**Lab ID:** 1911D07-009**Matrix:** SOIL**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	12/5/2019 8:23:20 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/5/2019 8:23:20 AM
Surr: DNOP	91.6	70-130		%Rec	1	12/5/2019 8:23:20 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/3/2019 2:33:06 PM
Surr: BFB	88.5	77.4-118		%Rec	1	12/3/2019 2:33:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 2:33:06 PM
Toluene	ND	0.048		mg/Kg	1	12/3/2019 2:33:06 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/3/2019 2:33:06 PM
Xylenes, Total	ND	0.096		mg/Kg	1	12/3/2019 2:33:06 PM
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	12/3/2019 2:33:06 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	3000	150		mg/Kg	50	12/6/2019 3:39:26 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1911D07**

Date Reported: **12/9/2019**

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH19-21b

Project: Trebuchet 23 28 19 Way 10H

Collection Date: 11/26/2019 4:50:00 PM

Lab ID: 1911D07-010

Matrix: SOIL

Received Date: 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	12/5/2019 8:32:27 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/5/2019 8:32:27 AM
Surr: DNOP	91.1	70-130		%Rec	1	12/5/2019 8:32:27 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/3/2019 2:56:30 PM
Surr: BFB	82.9	77.4-118		%Rec	1	12/3/2019 2:56:30 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	12/3/2019 2:56:30 PM
Toluene	ND	0.047		mg/Kg	1	12/3/2019 2:56:30 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/3/2019 2:56:30 PM
Xylenes, Total	ND	0.095		mg/Kg	1	12/3/2019 2:56:30 PM
Surr: 4-Bromofluorobenzene	97.4	80-120		%Rec	1	12/3/2019 2:56:30 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2900	150		mg/Kg	50	12/6/2019 3:51:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: MB-49183	SampType: mbk	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 49183	RunNo: 64987
Prep Date: 12/5/2019	Analysis Date: 12/5/2019	SeqNo: 2228990 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-49183	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 49183	RunNo: 64987
Prep Date: 12/5/2019	Analysis Date: 12/5/2019	SeqNo: 2228991 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 95.5 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: LCS-49093	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 49093	RunNo: 64876								
Prep Date: 12/2/2019	Analysis Date: 12/3/2019	SeqNo: 2225772 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	10	50.00	0	88.2	63.9	124			
Surr: DNOP	3.7		5.000		74.5	70	130			

Sample ID: MB-49093	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 49093	RunNo: 64876								
Prep Date: 12/2/2019	Analysis Date: 12/3/2019	SeqNo: 2225773 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	7.9		10.00		79.3	70	130			

Sample ID: 1911D07-007AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS19-05	Batch ID: 49112	RunNo: 64960								
Prep Date: 12/3/2019	Analysis Date: 12/5/2019	SeqNo: 2227794 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.7	48.69	0	105	57	142			
Surr: DNOP	5.2		4.869		106	70	130			

Sample ID: 1911D07-007AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS19-05	Batch ID: 49112	RunNo: 64960								
Prep Date: 12/3/2019	Analysis Date: 12/5/2019	SeqNo: 2227795 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	9.3	46.25	0	115	57	142	4.37	20	
Surr: DNOP	5.8		4.625		125	70	130	0	0	

Sample ID: LCS-49112	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 49112	RunNo: 64960								
Prep Date: 12/3/2019	Analysis Date: 12/5/2019	SeqNo: 2227817 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	58	10	50.00	0	117	63.9	124			
Surr: DNOP	5.2		5.000		105	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: MB-49112	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 49112	RunNo: 64960								
Prep Date: 12/3/2019	Analysis Date: 12/5/2019	SeqNo: 2227818	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		108	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: mb-49082	SampType: MBLK			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: PBS	Batch ID: 49082			RunNo: 64903						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225312		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	880		1000		88.3	77.4	118			

Sample ID: lcs-49082	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: LCSS	Batch ID: 49082			RunNo: 64903						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225313		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.2	80	120			
Surr: BFB	970		1000		96.8	77.4	118			

Sample ID: mb-49097	SampType: MBLK			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: PBS	Batch ID: 49097			RunNo: 64902						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225386		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		86.4	77.4	118			

Sample ID: lcs-49097	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: LCSS	Batch ID: 49097			RunNo: 64902						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225387		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	86.3	80	120			
Surr: BFB	960		1000		95.9	77.4	118			

Sample ID: 1911d07-007ams	SampType: MS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS19-05	Batch ID: 49097			RunNo: 64902						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225389		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.78	0	96.8	69.1	142			
Surr: BFB	920		991.1		92.9	77.4	118			

Sample ID: 1911d07-007amsd	SampType: MSD			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS19-05	Batch ID: 49097			RunNo: 64902						
Prep Date: 12/2/2019	Analysis Date: 12/3/2019			SeqNo: 2225390		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: 1911d07-007amsd		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS19-05		Batch ID: 49097		RunNo: 64902						
Prep Date: 12/2/2019		Analysis Date: 12/3/2019		SeqNo: 2225390		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.83	0	98.6	69.1	142	2.08	20	
Surr: BFB	930		993.0		93.6	77.4	118	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: mb-49082	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 49082	RunNo: 64903								
Prep Date: 12/2/2019	Analysis Date: 12/3/2019	SeqNo: 2225359 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		110	80	120			

Sample ID: LCS-49082	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 49082	RunNo: 64903								
Prep Date: 12/2/2019	Analysis Date: 12/3/2019	SeqNo: 2225360 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	98.4	80	120			
Toluene	0.98	0.050	1.000	0	97.7	80	120			
Ethylbenzene	0.98	0.050	1.000	0	98.4	80	120			
Xylenes, Total	3.0	0.10	3.000	0	99.1	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		110	80	120			

Sample ID: mb-49097	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 49097	RunNo: 64902								
Prep Date: 12/2/2019	Analysis Date: 12/3/2019	SeqNo: 2225412 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: LCS-49097	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 49097	RunNo: 64902								
Prep Date: 12/2/2019	Analysis Date: 12/3/2019	SeqNo: 2225413 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.0	80	120			
Toluene	0.95	0.050	1.000	0	94.8	80	120			
Ethylbenzene	0.95	0.050	1.000	0	94.5	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.1	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D07

09-Dec-19

Client: Vertex Resource Group Ltd.

Project: Trebuchet 23 28 19 Way 10H

Sample ID: 1911d07-008ams	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: BS19-02	Batch ID: 49097		RunNo: 64902							
Prep Date: 12/2/2019	Analysis Date: 12/3/2019		SeqNo: 2225416		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9940	0	104	76	123			
Toluene	1.1	0.050	0.9940	0.01106	107	80.3	127			
Ethylbenzene	1.1	0.050	0.9940	0	110	80.2	131			
Xylenes, Total	3.3	0.099	2.982	0.01595	111	78	133			
Surr: 4-Bromofluorobenzene	0.99		0.9940		99.4	80	120			

Sample ID: 1911d07-008amsd		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: BS19-02		Batch ID: 49097		RunNo: 64902						
Prep Date: 12/2/2019		Analysis Date: 12/3/2019		SeqNo: 2225417		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	0.9901	0	99.9	76	123	4.52	20	
Toluene	1.0	0.050	0.9901	0.01106	104	80.3	127	3.33	20	
Ethylbenzene	1.0	0.050	0.9901	0	106	80.2	131	4.12	20	
Xylenes, Total	3.2	0.099	2.970	0.01595	107	78	133	4.12	20	
Surr: 4-Bromofluorobenzene	0.95		0.9901		95.5	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: VERTEX CARLSBAD

Work Order Number: 1911D07

RcptNo: 1

Received By: Erin Melendrez

11/30/2019 11:10:00 AM

UAG

Completed By: Erin Melendrez

11/30/2019 2:37:14 PM

UAG

Reviewed By: ENM

12/2/19

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: JR #12/2/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:		Date:	
By Whom:		Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:			
Client Instructions:			

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.0	Good	Yes			
2	3.6	Good	Yes			

Chain-of-Custody Record

Client: VICTOR RESOURCE SERVICES

Mailing Address: ON FILE

Phone #: ON FILE

email or Fax#: ON FILE

QA/QC Package: ON FILE

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance ☐ Other

☐ NELAC ☐ Other

☐ EDD (Type)

Date	Time	Matrix	Sample Name
11/26	14:50	S	WS19-13
	15:55		BS19-04
	16:00		BS19-07
	16:05		BS19-08
	16:15		BS19-01
	16:20		BS19-03
	16:25		BS19-05
	16:40		BS19-02
	16:45		BH19-21a
	16:50		BH19-21b

Date:	Time:	Relinquished by:
11/27	14:45	<i>[Signature]</i>
Date:	Time:	Relinquished by:
11/27	17:00	<i>[Signature]</i>

Turn-Around Time: 5 day Turn

☒ Standard ☐ Rush

Project Name: TRUCKER 23 2819 WAY 104

Project #: 19E-03840-6051E

Project Manager: NATHALIE GORDON

Sampler: SARAH HANCOCK

On Ice: ☒ Yes ☐ No

of Coolers: 2

Cooler Temp (including CF): 3.0-0.000=3.0 (°C)

Container Type and # JAR

Preservative Type ICE

HEAL No. 111057

Container Type and # JAR

Preservative Type ICE

HEAL No. 111057

Container Type and # JAR

Preservative Type ICE

HEAL No. 111057

Container Type and # JAR

Preservative Type ICE

HEAL No. 111057

Received by:	Via:	Date	Time
<i>[Signature]</i>	FEDEX	11/27	14:50
Received by:	Via:	Date	Time
<i>[Signature]</i>	FEDEX	11/30/19	11:10



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

8081 Pesticides/8082 PCBs	
TPH:8015D(GRO / DRO / MRO)	
BTEX MTBE / TMBs (8021)	
EDB (Method 504.1)	
PAHs by 8310 or 8270SIMS	
RCRA 8 Metals	
Cl ⁻ , Br ⁻ , NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻	
8260 (VOA)	
8270 (Semi-VOA)	
Total Coliform (Present/Absent)	

Remarks: