



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

December 19, 2019

Vernon Marcum
MARATHON
92 Giant Crossing Rd
Gallup, NM 87301
TEL:
FAX:

RE: Carbon Canister

OrderNo.: 1912712

Dear Vernon Marcum:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/13/2019 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 in a cursive style.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1912712

Date Reported: 12/19/2019

CLIENT: MARATHON

Client Sample ID: North Carbon Canister

Project: Carbon Canister

Collection Date: 12/12/2019 8:00:00 AM

Lab ID: 1912712-001

Matrix: AQUEOUS

Received Date: 12/13/2019 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE								
Analyst: BRM								
Diesel Range Organics (DRO)	ND	0.71	1.0		mg/L	1	12/16/2019 2:02:53 PM	49337
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/16/2019 2:02:53 PM	49337
Surr: DNOP	101	0	70-130		%Rec	1	12/16/2019 2:02:53 PM	49337
EPA METHOD 300.0: ANIONS								
Analyst: CJS								
Fluoride	7.3	0.23	1.0	*	mg/L	10	12/16/2019 6:23:18 PM	R65223
Chloride	160	2.5	5.0		mg/L	10	12/16/2019 6:23:18 PM	R65223
Bromide	ND	0.50	1.0		mg/L	10	12/16/2019 6:23:18 PM	R65223
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	12/16/2019 6:23:18 PM	R65223
Sulfate	400	2.5	5.0	*	mg/L	10	12/16/2019 6:23:18 PM	R65223
Nitrate+Nitrite as N	4.9	0.24	2.0		mg/L	10	12/16/2019 7:00:32 PM	R65223
EPA METHOD 200.7: METALS								
Analyst: bcv								
Calcium	63	0.062	1.0		mg/L	1	12/17/2019 12:51:58 P	49357
Magnesium	13	0.050	1.0		mg/L	1	12/17/2019 12:51:58 P	49357
Potassium	25	0.16	1.0		mg/L	1	12/17/2019 12:51:58 P	49357
Sodium	280	2.4	5.0		mg/L	5	12/17/2019 2:10:38 PM	49357
EPA METHOD 8260: VOLATILES SHORT LIST								
Analyst: JMR								
Benzene	ND	3.3	10		µg/L	20	12/13/2019 7:07:57 PM	SL6518
Toluene	ND	7.0	20		µg/L	20	12/13/2019 7:07:57 PM	SL6518
Ethylbenzene	ND	2.6	20		µg/L	20	12/13/2019 7:07:57 PM	SL6518
Methyl tert-butyl ether (MTBE)	ND	9.1	20		µg/L	20	12/13/2019 7:07:57 PM	SL6518
Xylenes, Total	ND	9.1	30		µg/L	20	12/13/2019 7:07:57 PM	SL6518
Surr: 1,2-Dichloroethane-d4	115	0	70-130		%Rec	20	12/13/2019 7:07:57 PM	SL6518
Surr: 4-Bromofluorobenzene	97.3	0	70-130		%Rec	20	12/13/2019 7:07:57 PM	SL6518
Surr: Dibromofluoromethane	115	0	70-130		%Rec	20	12/13/2019 7:07:57 PM	SL6518
Surr: Toluene-d8	109	0	70-130		%Rec	20	12/13/2019 7:07:57 PM	SL6518
SM2510B: SPECIFIC CONDUCTANCE								
Analyst: JRR								
Conductivity	2600	5.0	5.0		µmhos/c	1	12/17/2019 10:40:47 A	R65231
SM4500-H+B / 9040C: PH								
Analyst: JRR								
pH	8.11			H	pH units	1	12/17/2019 10:40:47 A	R65231

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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: **MB-49357** SampType: **MBLK** TestCode: **EPA Method 200.7: Metals**
 Client ID: **PBW** Batch ID: **49357** RunNo: **65246**
 Prep Date: **12/16/2019** Analysis Date: **12/17/2019** SeqNo: **2240430** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: **LLCS-49357** SampType: **LCSLL** TestCode: **EPA Method 200.7: Metals**
 Client ID: **BatchQC** Batch ID: **49357** RunNo: **65246**
 Prep Date: **12/16/2019** Analysis Date: **12/17/2019** SeqNo: **2240431** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.51	1.0	0.5000	0	101	50	150			J
Magnesium	0.50	1.0	0.5000	0	99.3	50	150			J
Potassium	0.49	1.0	0.5000	0	98.4	50	150			J
Sodium	0.55	1.0	0.5000	0	109	50	150			J

Sample ID: **LCS-49357** SampType: **LCS** TestCode: **EPA Method 200.7: Metals**
 Client ID: **LCSW** Batch ID: **49357** RunNo: **65246**
 Prep Date: **12/16/2019** Analysis Date: **12/17/2019** SeqNo: **2240432** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	97.4	85	115			
Magnesium	49	1.0	50.00	0	97.1	85	115			
Potassium	48	1.0	50.00	0	95.9	85	115			
Sodium	48	1.0	50.00	0	95.3	85	115			

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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R65223	RunNo: 65223								
Prep Date:	Analysis Date: 12/16/2019	SeqNo: 2239314 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P)	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID: LCS	SampType: ics	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R65223	RunNo: 65223								
Prep Date:	Analysis Date: 12/16/2019	SeqNo: 2239315 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.49	0.10	0.5000	0	98.3	90	110			
Chloride	4.7	0.50	5.000	0	93.0	90	110			
Bromide	2.4	0.10	2.500	0	95.5	90	110			
Phosphorus, Orthophosphate (As P)	4.5	0.50	5.000	0	90.2	90	110			
Sulfate	9.4	0.50	10.00	0	94.4	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	96.0	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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: LCS-49337	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range								
Client ID: LCSW	Batch ID: 49337	RunNo: 65199								
Prep Date: 12/13/2019	Analysis Date: 12/16/2019	SeqNo: 2238587	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.3	1.0	5.000	0	106	71.8	135			
Surr: DNOP	0.49		0.5000		97.0	70	130			

Sample ID: MB-49337	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range								
Client ID: PBW	Batch ID: 49337	RunNo: 65199								
Prep Date: 12/13/2019	Analysis Date: 12/16/2019	SeqNo: 2238588	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.2		1.000		121	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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: 100ng lcs	SampType: LCS	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: LCSW	Batch ID: SL65186	RunNo: 65186								
Prep Date:	Analysis Date: 12/13/2019	SeqNo: 2237459	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.3	70	130			
Toluene	19	1.0	20.00	0	96.2	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		112	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.9	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Sample ID: 1912712-001a ms	SampType: MS	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: North Carbon Canis	Batch ID: SL65186	RunNo: 65186								
Prep Date:	Analysis Date: 12/13/2019	SeqNo: 2237480	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	430	20	400.0	0	106	70	130			
Toluene	400	20	400.0	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	220		200.0		111	70	130			
Surr: 4-Bromofluorobenzene	200		200.0		99.4	70	130			
Surr: Dibromofluoromethane	230		200.0		115	70	130			
Surr: Toluene-d8	210		200.0		107	70	130			

Sample ID: 1912712-001a msd	SampType: MSD	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: North Carbon Canis	Batch ID: SL65186	RunNo: 65186								
Prep Date:	Analysis Date: 12/13/2019	SeqNo: 2237482	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	400	20	400.0	0	100	70	130	6.16	20	
Toluene	370	20	400.0	0	92.1	70	130	8.94	20	
Surr: 1,2-Dichloroethane-d4	220		200.0		111	70	130	0	0	
Surr: 4-Bromofluorobenzene	190		200.0		96.9	70	130	0	0	
Surr: Dibromofluoromethane	220		200.0		112	70	130	0	0	
Surr: Toluene-d8	210		200.0		105	70	130	0	0	

Sample ID: rb1	SampType: MBLK	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: PBW	Batch ID: SL65186	RunNo: 65186								
Prep Date:	Analysis Date: 12/13/2019	SeqNo: 2237484	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								

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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: rb1	SampType: MBLK		TestCode: EPA Method 8260: Volatiles Short List							
Client ID: PBW	Batch ID: SL65186		RunNo: 65186							
Prep Date:	Analysis Date: 12/13/2019		SeqNo: 2237484		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		113	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		97.6	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: Ics-1 99.9uS eC	SampType: Ics	TestCode: SM2510B: Specific Conductance								
Client ID: LCSW	Batch ID: R65231	RunNo: 65231								
Prep Date:	Analysis Date: 12/17/2019	SeqNo: 2239876			Units: µmhos/cm					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	98	5.0	99.90	0	98.5	85	115			

Sample ID: 1912712-001c dup	SampType: dup	TestCode: SM2510B: Specific Conductance								
Client ID: North Carbon Canis	Batch ID: R65231	RunNo: 65231								
Prep Date:	Analysis Date: 12/17/2019	SeqNo: 2239878			Units: µmhos/cm					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	2600	5.0						0.333	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#: 1912712

19-Dec-19

Client: MARATHON
Project: Carbon Canister

Sample ID: 1912712-001c dup	SampType: dup	TestCode: SM4500-H+B / 9040C: pH								
Client ID: North Carbon Canis	Batch ID: R65231	RunNo: 65231								
Prep Date:	Analysis Date: 12/17/2019	SeqNo: 2239895 Units: pH units								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	8.11									H

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 GALLUP**

Work Order Number: **1912712**

RcptNo: **1**

Received By: **Yazmine Garduno** **12/12/2019 8:00:00 AM** *Yazmine Garduno*

Completed By: **Leah Baca** **12/13/2019 10:28:09 AM** *Leah Baca*

Reviewed By: *LB* **12/13/19**

Chain of Custody

1. Is Chain of Custody sufficiently 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. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes No NA
 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
 (2 or >12 unless noted)
 Adjusted? NO
 Checked by: ENM 12/13/19

Special Handling (if applicable)

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

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good	Yes			

Chain-of-Custody Record

Client: **MARATHON**

Gallup Refinery

Mailing Address:
 92 GIANT CROSSING RD, GALLUP, NM 87301

Phone #: 505-722-3833
 email or Fax#: 505-863-0930

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

Accreditation:
 NELAP Other _____

On Ice: Yes No

Sample Temperature: 23.01 = 2.2

Turn-Around Time:
 Standard Rush

Project Name: **CARBON CANISTER**

Project #: **WWTP - BWON**

Project Manager: VMARCUM@MARATHONPETROLEUM.COM

Sampler: **C. JOHNSON**

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
12-12-19	8:00	Aqueous	<u>NOTA</u> Carbon Canister	MISC	MISC	1912712 -001
		Aqueous	Carbon Canister	MISC	MISC	
		Aqueous	Carbon Canister	MISC	MISC	
		Aqueous	Carbon Canister	MISC	MISC	

8260+MTBE (SHORT LIST)	SPEC COND: Ph	8015B (DRO)	CATIONS	ANIONS	Air Bubbles (Y or N)
X	X	X	X	X	
X	X	X	X	X	
X	X	X	X	X	

Received by: *[Signature]* Date: 12-12-19 Time: 11:00

Relinquished by: *[Signature]*

Received by: *MJ Courier* Date: 12/13/19 Time: 09:05

Analysis Request

Remarks:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax: 505-345-4107

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.