

November 02, 2020

Report to:
Randall Miller
North Park Engineering & Consulting, Inc
P.O. Box 395
Walden, CO 80480

Bill to:
Randall Miller
North Park Engineering & Consulting, Inc
P.O. Box 395
Walden, CO 80480

cc: Mark Brown

Project ID: Marcus Production
ACZ Project ID: L62134

Randall Miller:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 13, 2020. This project has been assigned to ACZ's project number, L62134. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L62134. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after December 02, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



North Park Engineering & Consulting, IncProject ID: Marcus Production
Sample ID: STATE 1-36 PIT BOTTOMACZ Sample ID: **L62134-01**
Date Sampled: 10/09/20 10:50
Date Received: 10/13/20
Sample Matrix: Soil**Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3546****Workgroup:** WG507714Analyst: jmm
Extract Date: 10/15/20 15:31
Analysis Date: 10/20/20 19:56

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		370		0.143	*	mg/Kg	14.3	71.3
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	76.6		0.143	*	%	60	115

Arizona license number: **AZ0102**

North Park Engineering & Consulting, IncProject ID: Marcus Production
Sample ID: STATE 1-36 MIX PILE 1ACZ Sample ID: **L62134-02**
Date Sampled: 10/09/20 11:30
Date Received: 10/13/20
Sample Matrix: Soil**Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3546****Workgroup:** WG507714

Analyst: jmm

Extract Date: 10/15/20 15:33

Analysis Date: 10/20/20 20:19

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		100		0.16	*	mg/Kg	16	80
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	10.48		0.16	*	%	60	115

Arizona license number: **AZ0102**

North Park Engineering & Consulting, IncProject ID: Marcus Production
Sample ID: STATE 1-36 MIX PILE 2ACZ Sample ID: **L62134-03**
Date Sampled: 10/09/20 11:40
Date Received: 10/13/20
Sample Matrix: Soil**Diesel Range Organics (C10-C28)**Analysis Method: **M8015D GC/FID**
Extract Method: **M3546****Workgroup:** WG507714Analyst: jmm
Extract Date: 10/15/20 15:35
Analysis Date: 10/20/20 20:42

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		33	J	0.0998	*	mg/Kg	9.98	49.9
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	67.88		0.0998	*	%	60	115

Arizona license number: **AZ0102**

Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>LCL</i>	Lower Control Limit
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #4) Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>UCL</i>	Upper Control Limit
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>SURR</i>	Surrogate	<i>LFB</i>	Laboratory Fortified Blank
<i>INTS</i>	Internal Standard	<i>LFM</i>	Laboratory Fortified Matrix
<i>AS</i>	Analytical Spike (Post Digestion)	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>DUP</i>	Sample Duplicate	<i>MS/MSD</i>	Matrix Spike/Matrix Spike Duplicate
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBS</i>	Prep Blank - Soil
<i>LCSW</i>	Laboratory Control Sample - Water	<i>PBW</i>	Prep Blank - Water

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.

ACZ Qualifiers (Qual)

O	Analyte concentration is estimated due to result exceeding calibration range.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
J	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
- (3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Excluding Oil & Grease, solid & biological matrices for organic analyses are reported on a wet weight basis.
- (3) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (4) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

North Park Engineering & Consulting, Inc

ACZ Project ID: **L62134**

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Diesel Range Organics (C10-C28)

M8015D GC/FID

WG507714

MS		Sample ID: L62092-02MS		PCN/SCN: OPTPH200904-2				Analyzed: 10/29/20 15:14			
Compound	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
TPH C10 TO C28	2504	1960	2128.27	mg/Kg	101.0	70	130				
OTP (surr)				%	79.8	60	115				

MSD		Sample ID: L62092-02MSD		PCN/SCN: OPTPH200904-2				Analyzed: 10/29/20 15:37			
Compound	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
TPH C10 TO C28	2504	1960	2436.11	mg/Kg	285.0	70	130	13	20	M1	
OTP (surr)				%	97.4	60	115				

DUP		Sample ID: L62092-07DUP						Analyzed: 10/29/20 17:10			
Compound	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
TPH C10 TO C28		1190	2021	mg/Kg				52	20	RD	
OTP (surr)				%	69.8	60	115				

LCSS		Sample ID: WG507351LCSS		PCN/SCN: OPTPH200904-2				Analyzed: 10/20/20 14:07			
Compound	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
TPH C10 TO C28	2504		72.724	mg/Kg	87.0	70	130				
OTP (surr)				%	84.1	60	115				

LCSSD		Sample ID: WG507351LCSSD		PCN/SCN: OPTPH200904-2				Analyzed: 10/20/20 14:30			
Compound	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
TPH C10 TO C28	2504		77.175	mg/Kg	92.0	70	130	6	20		
OTP (surr)				%	86.6	60	115				

PBS		Sample ID: WG507351PBS						Analyzed: 10/20/20 13:43			
Compound	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
TPH C10 TO C28			U	mg/Kg		-16.7	16.7				
OTP (surr)				%	82.6	60	115				

ACZ Project ID: **L62134**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L62134-01	WG507714	*All Compounds* TPH C10 to C28	M8015D GC/FID	Q6	Sample was received above recommended temperature.
			M8015D GC/FID	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M8015D GC/FID	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L62134-02	WG507714	*All Compounds* OTP TPH C10 to C28	M8015D GC/FID	Q6	Sample was received above recommended temperature.
			M8015D GC/FID	S7	Surrogate recovery was below laboratory and method acceptance limits. Unable to confirm matrix effect.
			M8015D GC/FID	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M8015D GC/FID	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.
L62134-03	WG507714	*All Compounds* TPH C10 to C28	M8015D GC/FID	Q6	Sample was received above recommended temperature.
			M8015D GC/FID	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M8015D GC/FID	RD	For a solid matrix, the duplicate RPD (spike or matrix) exceeded the control limit, which is attributable to the non-homogeneity of the sample.

No certification qualifiers associated with this analysis

North Park Engineering & Consulting, Inc
 Marcus Production

ACZ Project ID: L62134
 Date Received: 10/13/2020 11:27
 Received By:
 Date Printed: 10/14/2020

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2) Is the Chain of Custody form or other directive shipping papers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) Does this project require special handling procedures such as CLP protocol?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4) Are any samples NRC licensable material?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5) If samples are received past hold time, proceed with requested short hold time analyses?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6) Is the Chain of Custody form complete and accurate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9) Are all labels on containers and are they intact and legible?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11) For preserved bottle types, was the pH checked and within limits? ¹	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12) Is there sufficient sample volume to perform all requested work?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13) Is the custody seal intact on all containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14) Are samples that require zero headspace acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15) Are all sample containers appropriate for analytical requirements?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16) Is there an Hg-1631 trip blank present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17) Is there a VOA trip blank present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
18) Were all samples received within hold time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
6048	11.5	NA	15	N/A

Was ice present in the shipment container(s)?

Yes - Gel ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

North Park Engineering & Consulting, Inc
Marcus Production

ACZ Project ID: L62134
Date Received: 10/13/2020 11:27
Received By:
Date Printed: 10/14/2020

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

