



LEGEND

 Site Location



Figure 1
Location Site Map
August 27, 2019 LBK

Guttersen Ranch 64N63W9SWNW
Location ID: 310292
SWNW, Sec 9, T4N, R63W, 6th PM
Weld County, Colorado



Aerial photograph courtesy of Google Earth Pro

LEGEND

- Sample Location
- - Excavation



Figure 2
Site Map

August 27, 2019 LBK

**Guttersen Ranch 64N63W9SWNW
Location ID: 310292
SWNW, Sec 9, T4N, R63W, 6th PM
Weld County, Colorado**

TABLE 1
SOIL ANALYTICAL RESULTS
GUTTERSEN RANCH 64N63W9SWNW
WELD COUNTY, COLORADO
BONANZA CREEK ENERGY OPERATING COMPANY LLC.

Parameters		COGCC Table 910-1 Concentration Level	SS01
Sample Date		XXXXXXXXXX	8/5/2019
Sample Depth (feet)		XXXXXXXXXX	4.5-5
BTEX	Benzene	0.17	<0.002
	Toluene	85	<0.002
	Ethylbenzene	100	<0.002
	Total Xylenes	175	<0.002
TPH	DRO	--	<50
	GRO	--	<50
	Total	500	<50
Inorganics	EC (mmhos/cm)	<4	0.2160
	SAR	<12	5.86
	pH (unitless)	6 - 9	7.21

Notes:

COGCC - Colorado Oil and Gas Conservation Commission

-- - no concentration level is available

BTEX - benzene, toluene, ethylbenzene, xylenes (total)

DRO - diesel range organics

GRO - gasoline range organics

TPH - total petroleum hydrocarbons

EC - electrical conductivity

mmhos/cm - millimhos per centimeter

SAR - sodium adsorption ratio

All results are in mg/kg unless stated otherwise.



September 10, 2019

Bonanza Creek Energy, Inc.

Brian Dodek

410 17th St, Suite 1400

Denver CO 80211

Project Name - Guttersen Ranch 64N63W 9SWNW Project Number - [none]

Attached are your analytical results for Guttersen Ranch 64N63W 9SWNW received by Origins Laboratory, Inc. August 06, 2019. This project is associated with Origins project number Y908069-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Bonanza Creek Energy, Inc.
410 17th St, Suite 1400
Denver CO 80211

Brian Dodek
Project Number: [none]
Project: Guttersen Ranch 64N63W 9SWNW

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01 4.5-5'	Y908069-01	Soil	August 5, 2019 15:00	08/06/2019 07:45

Per the email from Luke on 09/05/2019, the project name was changed to Guttersen Ranch 64N63W 9SWNW.

Origins Laboratory, Inc.



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Bonanza Creek Energy, Inc.

410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: y908069 Client: BCEI
 Checklist Completed by: JG Client Project ID: Guttersen 9A
 Date/time completed: 8/6/19 Shipped Via: HD
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: N/A
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 Cooler Number/Temperature: 7, 11.6 °C _____ °C _____ °C _____ °C (Describe)
 Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCl, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) MD

Date/Time Reviewed 8/7/19

Origins Laboratory, Inc.



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Bonanza Creek Energy, Inc.

410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

SS01 4.5-5'

8/5/2019 3:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y908069-01 (Soil)

BTEX by EPA 8260D

Benzene	ND	0.002	mg/kg	1	B9H0601	KDK	08/06/2019	08/08/2019	U
Toluene	ND	0.002	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.002	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.002	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	95.6 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.3 %	70-130			"	"	"	"	

GRO (TVPH)/DRO (TEPH) by EPA 8015D

Gasoline (C6-C10)	ND	50.0	mg/kg	1	B9H0602	KDK	08/06/2019	08/07/2019	U
Diesel (C10-C28)	ND	50.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl	79.8 %	50-150			"	"	"	"	
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Metals (Saturated Paste Prep)

Calcium	9.69		me/L	1	[none]		08/07/2019	08/09/2019	
Magnesium	3.94		"	"	"		"	"	
Sodium	15.29		"	"	"		"	"	

pH in Soil by EPA 9045D

pH	7.21		pH Units	1	B9H0610	OLAB	08/06/2019	08/06/2019	
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Bonanza Creek Energy, Inc.

410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

SS01 4.5-5'

8/5/2019 3:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y908069-01 (Soil)

SAR by 20B Saturated Paste

SAR	5.86			1	[none]		08/07/2019	08/09/2019	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.216	0.00500	mmhos/cm	1	B9H0611	DJL	08/06/2019	08/06/2019	
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Origins Laboratory, Inc.



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Bonanza Creek Energy, Inc.

410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0601 - EPA 5030 (soil)

Blank (B9H0601-BLK1)

Prepared: 08/06/2019 Analyzed: 08/06/2019

Benzene	ND	0.002	mg/kg							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.14</i>		<i>"</i>	<i>0.125</i>		<i>108</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.12</i>		<i>"</i>	<i>0.125</i>		<i>97.4</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.12</i>		<i>"</i>	<i>0.125</i>		<i>98.0</i>	<i>70-130</i>			

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Bonanza Creek Energy, Inc.

410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Gutteresen Ranch 64N63W 9SWNW

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0601 - EPA 5030 (soil)

LCS (B9H0601-BS1)

Prepared: 08/06/2019 Analyzed: 08/06/2019

Benzene	0.108	0.002	mg/kg	0.100		108	70-130			
Toluene	0.098	0.002	"	0.100		98.5	70-130			
Ethylbenzene	0.097	0.002	"	0.100		97.2	70-130			
m,p-Xylene	0.203	0.004	"	0.200		102	70-130			
o-Xylene	0.099	0.002	"	0.100		99.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		108	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		94.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		98.2	70-130			

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410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0601 - EPA 5030 (soil)

Matrix Spike (B9H0601-MS1)	Source: Y908054-01			Prepared: 08/06/2019 Analyzed: 08/06/2019						
Benzene	0.035	0.002	mg/kg	0.100	ND	34.5	70-130			QM-07
Toluene	0.023	0.002	"	0.100	ND	22.6	70-130			QM-07
Ethylbenzene	0.010	0.002	"	0.100	ND	10.4	70-130			QM-07
m,p-Xylene	0.019	0.004	"	0.200	ND	9.26	70-130			QM-07
o-Xylene	0.011	0.002	"	0.100	ND	11.3	70-130			QM-07
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		111	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.2	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		99.8	70-130			

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Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0601 - EPA 5030 (soil)

Matrix Spike Dup (B9H0601-MSD1)	Source: Y908054-01			Prepared: 08/06/2019 Analyzed: 08/06/2019						
Benzene	0.014	0.002	mg/kg	0.100	ND	14.4	70-130	82.1	20	QM-07, QR-03
Toluene	0.008	0.002	"	0.100	ND	7.52	70-130	100	20	QM-07, QR-03
Ethylbenzene	0.002	0.002	"	0.100	ND	2.36	70-130	126	20	QM-07, QR-03
m,p-Xylene	0.004	0.004	"	0.200	ND	1.96	70-130	130	20	QM-07, QR-03
o-Xylene	0.003	0.002	"	0.100	ND	2.56	70-130	126	20	QM-07, QR-03
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		106	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.5	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	70-130			

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410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9H0602 - EPA 3580										
Blank (B9H0602-BLK1)										
					Prepared: 08/06/2019 Analyzed: 08/07/2019					
Gasoline (C6-C10)	ND	50.0	mg/kg							U
Diesel (C10-C28)	ND	50.0	"							U
Surrogate: o-Terphenyl	42		"	50.0		83.3	50-150			

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410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Gutteresen Ranch 64N63W 9SWNW

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0602 - EPA 3580

LCS (B9H0602-BS1)

Prepared: 08/06/2019 Analyzed: 08/07/2019

Gasoline (C6-C10)	940	50.0	mg/kg	1000		94.0	70-130			
Diesel (C10-C28)	1100	50.0	"	1000		110	70-130			
Surrogate: o-Terphenyl	51		"	50.0		101	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Bonanza Creek Energy, Inc.

410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0602 - EPA 3580

Matrix Spike (B9H0602-MS1)	Source: Y908054-01			Prepared: 08/06/2019 Analyzed: 08/07/2019						
Gasoline (C6-C10)	883	50.0	mg/kg	1000	23.0	86.0	70-130			
Diesel (C10-C28)	1040	50.0	"	1000	ND	104	70-130			
Surrogate: o-Terphenyl	44		"	50.0		88.8	50-150			

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410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0602 - EPA 3580

Matrix Spike Dup (B9H0602-MSD1)	Source: Y908054-01		Prepared: 08/06/2019 Analyzed: 08/07/2019							
Gasoline (C6-C10)	877	50.0	mg/kg	1000	23.0	85.4	70-130	0.761	35	
Diesel (C10-C28)	1070	50.0	"	1000	ND	107	70-130	3.09	35	
Surrogate: o-Terphenyl	44		"	50.0		88.8	50-150			

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410 17th St, Suite 1400

Denver CO 80211

Brian Dodek

Project Number: [none]

Project: Guttersen Ranch 64N63W 9SWNW

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9H0610 - NO PREP

Duplicate (B9H0610-DUP1)

Source: Y908068-01

Prepared: 08/06/2019 Analyzed: 08/06/2019

pH	7.03		pH Units		7.18			2.11	25	
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Batch B9H0611 - NO PREP

Blank (B9H0611-BLK1)

Prepared: 08/06/2019 Analyzed: 08/06/2019

Specific Conductance (EC)	0.00140	0.00500	mmhos/cm							
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Duplicate (B9H0611-DUP1)

Source: Y908068-01

Prepared: 08/06/2019 Analyzed: 08/06/2019

Specific Conductance (EC)	1.46	0.00505	mmhos/cm		1.77			19.5	25	
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Bonanza Creek Energy, Inc.
410 17th St, Suite 1400
Denver CO 80211

Brian Dodek
Project Number: [none]
Project: Guttersen Ranch 64N63W 9SWNW

Notes and Definitions

U Sample is Non-Detect.

QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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