

# **FREMONT ENVIRONMENTAL INC.**

April 16, 2020

Mr. Jacob Evans  
Noble Energy Inc.  
1625 Broadway, Suite 2000  
Denver, CO 80202

Subject:     **Groundwater Monitoring Report**  
              Weezer G3-22 (Wellhead)  
              API # 05-123-25720  
              Weld County, Colorado  
              Fremont Project No. C019-078  
              Facility #336707, Remediation # 14376

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Groundwater Monitoring Report for the Weezer G3-22 wellhead site in Weld County, Colorado. The enclosed report describes monitoring and sampling efforts to assess ground water quality at the site. Please contact me at (303) 956-8714 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

Sincerely,  
**FREMONT ENVIRONMENTAL INC.**



Paul V. Henehan, P.E.  
Senior Consultant

Enclosure

**GROUNDWATER MONITORING REPORT**

**NOBLE ENERGY INC.**

**WEEZER G3-22 WELLHEAD**

**WELD COUNTY, COLORADO**

**FREMONT PROJECT NO. C019-078**

**FACILITY #336707, REMEDIATION #14376**

**Prepared by:**

**Fremont Environmental Inc.  
1759 Redwing Lane  
Broomfield, CO 80020  
(303) 956-8714**

**April 16, 2020**

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# **GROUNDWATER MONITORING REPORT**

**NOBLE ENERGY INC.**

**WEEZER G3-22 WELLHEAD**

**WELD COUNTY, COLORADO**

**FREMONT PROJECT NO. C019-078**

**FACILITY #336707, REMEDIATION #14376**

## **1.0 INTRODUCTION**

The purpose of this document is to present surface water and groundwater quality data collected at the Weezer G3-22 wellhead site. Impacted soil and ground water were identified at this location during plugging and abandonment of this well. Five monitoring wells were installed at this site on October 21, 2019 to delineate the magnitude and extent of subsurface impacts.

## **2.0 BACKGROUND INFORMATION**

### **2.1 Site Location**

The Weezer G3-22 wellhead site is located approximately four miles southeast of La Salle, Colorado in Weld County as shown on Figure 1. The site is in a rural and agricultural area 0.3 miles east of the intersection of Weld County Road 43 and Weld County Road 48. The location is further described as the SE  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  of Section 3, Township 4N, Range 65W.

### **2.2 Site History**

The site consists of the area adjacent to the former Weezer G3-22 wellhead. The Weezer G3-22 well was drilled in 2008 to a depth of 7,182 feet. On October 2, 2019, soil impacts were identified at the location while the Weezer G3-22 was being plugged and abandoned.

During the well abandonment, a limited excavation to remediate the source impacts was undertaken. One groundwater sample and five soil samples were collected from the excavation sidewalls and floor which were analyzed for petroleum constituents. The laboratory analyses of the soil and groundwater samples indicated that petroleum constituent concentrations of total petroleum hydrocarbons (TPH) were greater than the Colorado Oil and Gas Conservation Commission's (COGCC's) Table 910-1 limits in two of the samples. Therefore, a site investigation to determine the extent of subsurface impacts was conducted. Five monitoring wells were installed in October 2019.

### **3.0 GROUND WATER MONITORING ACTIVITIES**

#### **3.1 Ground Water Level Measurements**

Ground water levels were measured in the five monitoring wells on March 17, 2020. The water level data are summarized in Table 1. Water table contours inferred from the March 2020 data are illustrated on Figure 3.

Based on these data, ground water is inferred to flow to the southeast. The water table gradient was calculated at approximately 0.0001 feet per foot (ft/ft) for the March 2020 data.

#### **3.2 Ground Water Sampling and Analysis**

Ground water samples were collected from the five monitoring wells on March 17, 2020. The samples were collected using a low flow sampling technique. A Geotech peristaltic pump was used to remove groundwater from each monitoring well. An In-Situ AutoTroll was used to monitor the groundwater's temperature, specific conductivity, pH, oxygen reduction potential (ORP), dissolved oxygen and turbidity. When these parameters

stabilized, groundwater samples were collected and placed in an ice filled cooler. The field data showing the stabilization of these parameters is provided in Appendix B.

The groundwater samples were submitted to Origins Laboratory, Inc. in Denver, Colorado for analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260D and dissolved gasses by method RSK 175. The ground water chemistry is illustrated on Figure 4 and summarized in Table 1.

Surface water samples were collected from four of the adjacent wellheads by Apex Companies on December 17, 2019. These data are summarized on Table 1 and shown on Figure 4.

A copy of all laboratory reports, quality control data, and chain-of-custody documentation are presented in Appendix A.

Dissolved concentrations of BTEX for the December 2019 and March 2020 sampling events were all less than their respective COGCC Table 910-1 limits. However, detectable concentrations of methane were present in each of the surface and groundwater samples. The lowest methane concentration (141 ug/L) was observed in monitoring well MW-3 and the highest concentration (16,400 ug/L) was detected in the surface water sample adjacent to the Weezer G2-32 wellhead.

#### **4.0 DISCUSSION**

Due to a release from the flow line near the wellhead of the Weezer G3-22 well, groundwater monitoring was conducted in March 2020. Ground water samples were collected from the five monitoring wells; BTEX concentrations were below the COGCC Table 910-1 levels in all five wells though dissolved methane was present in each of them.

Surface water sampling conducted in December 2019 from four adjacent wellheads also indicated that BTEX concentrations were below the COGCC Table 910-1 limits. Further, methane, ethane and propane were present in each of the four water samples.

Noble will continue to sample the ground water on a quarterly basis to monitor the ground water quality at this location.

### **5.0 REMARKS**

The discussion and conclusions contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by **FREMONT ENVIRONMENTAL INC.**



4/16/20

Date \_\_\_\_\_

\_\_\_\_\_  
Paul V. Henehan, P.E.

Senior Consultant

**TABLE**

**TABLE 1**  
**SUMMARY OF GROUND WATER ELEVATION DATA AND CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**WEEZER G3-22 (WELLHEAD), WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C019-078**

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	METHANE (µg/L)	ETHANE (µg/L)	PROPANE (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-1	10/21/19	<1.0	<1.0	<1.0	<2.0	NA	NA	NA	100.00	2.98	97.02	NP
	03/17/20	<4.00	<4.00	<4.00	<4.00	2070	51.1	<20.0		3.27	96.73	NP
MW-2	10/21/19	<1.0	<1.0	<1.0	<2.0	NA	NA	NA	100.06	3.03	97.03	NP
	03/17/20	<4.00	<4.00	<4.00	<4.00	287	<10.0	<20.0		3.32	96.74	NP
MW-3	10/21/19	<1.0	<1.0	<1.0	<2.0	NA	NA	NA	99.80	2.83	96.97	NP
	03/17/20	<4.00	<4.00	<4.00	<4.00	141	<10.0	<20.0		3.07	96.73	NP
MW-4	10/21/19	<1.0	<1.0	<1.0	<2.0	NA	NA	NA	99.94	2.97	96.97	NP
	03/17/20	<4.00	<4.00	<4.00	<4.00	8960	1690	24.2		3.21	96.73	NP
MW-5	10/21/19	<1.0	<1.0	<1.0	<2.0	NA	NA	NA	99.87	2.88	96.99	NP
	03/17/20	<4.00	<4.00	<4.00	<4.00	9710	4310	733		3.13	96.74	NP
Weezer G3-21 (surface)	12/17/19	<4.00	<4.00	<4.00	<4.00	14200	6070	2850	NAP	NAP	NAP	NAP
Weezer G2-32 (surface)	12/17/19	<4.00	<4.00	<4.00	<4.00	16400	6750	3180	NAP	NAP	NAP	NAP
Weezer G3-24 (surface)	12/17/19	<4.00	<4.00	<4.00	<4.00	3320	1020	437	NAP	NAP	NAP	NAP
Weezer G3-33 (surface)	12/17/19	<4.00	<4.00	<4.00	<4.00	12400	5500	2580	NAP	NAP	NAP	NAP
Table 910-1 Limits		5	560	700	1,400							

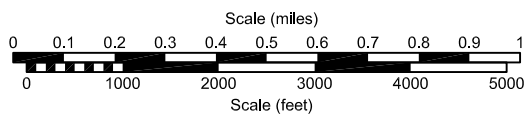
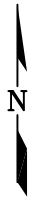
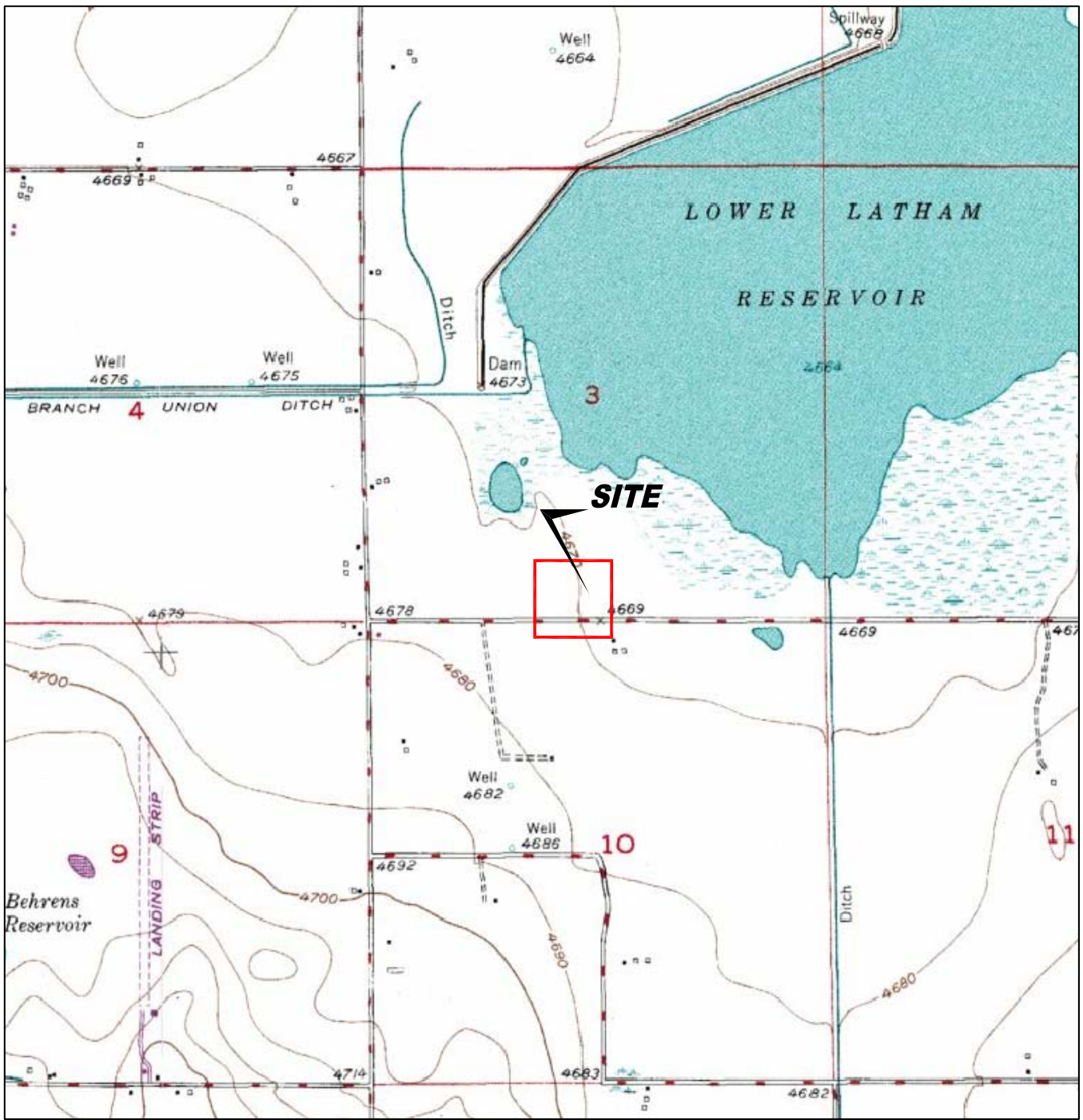
Bold face values exceed the COGCC limits

NP - No Free Product

NA - Not Analyzed

NAP - Not Applicable

## FIGURES



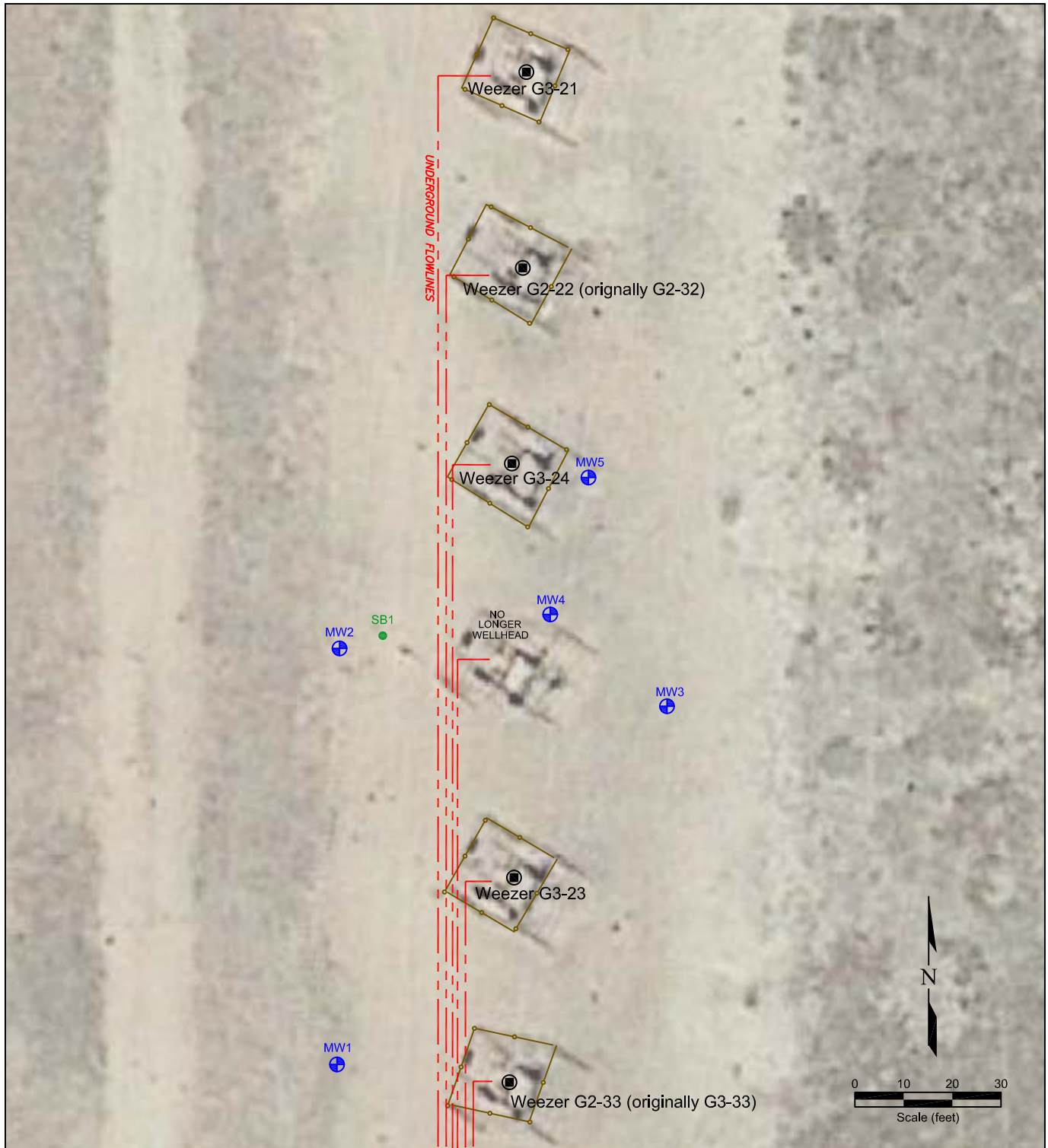
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

**NOBLE ENERGY, INC. ~ WEEZER G02-32**  
 SESW Section 3, T4N, R65W ~ 40.33602°, -104.65135°  
 Weld County, Colorado

Project No. <b>C019-078</b>	Prepared by	Drawn by <b>TDA</b>
Date <b>4/1/20</b>	Reviewed by <b>PH</b>	Filename <b>19078T</b>





**LEGEND**

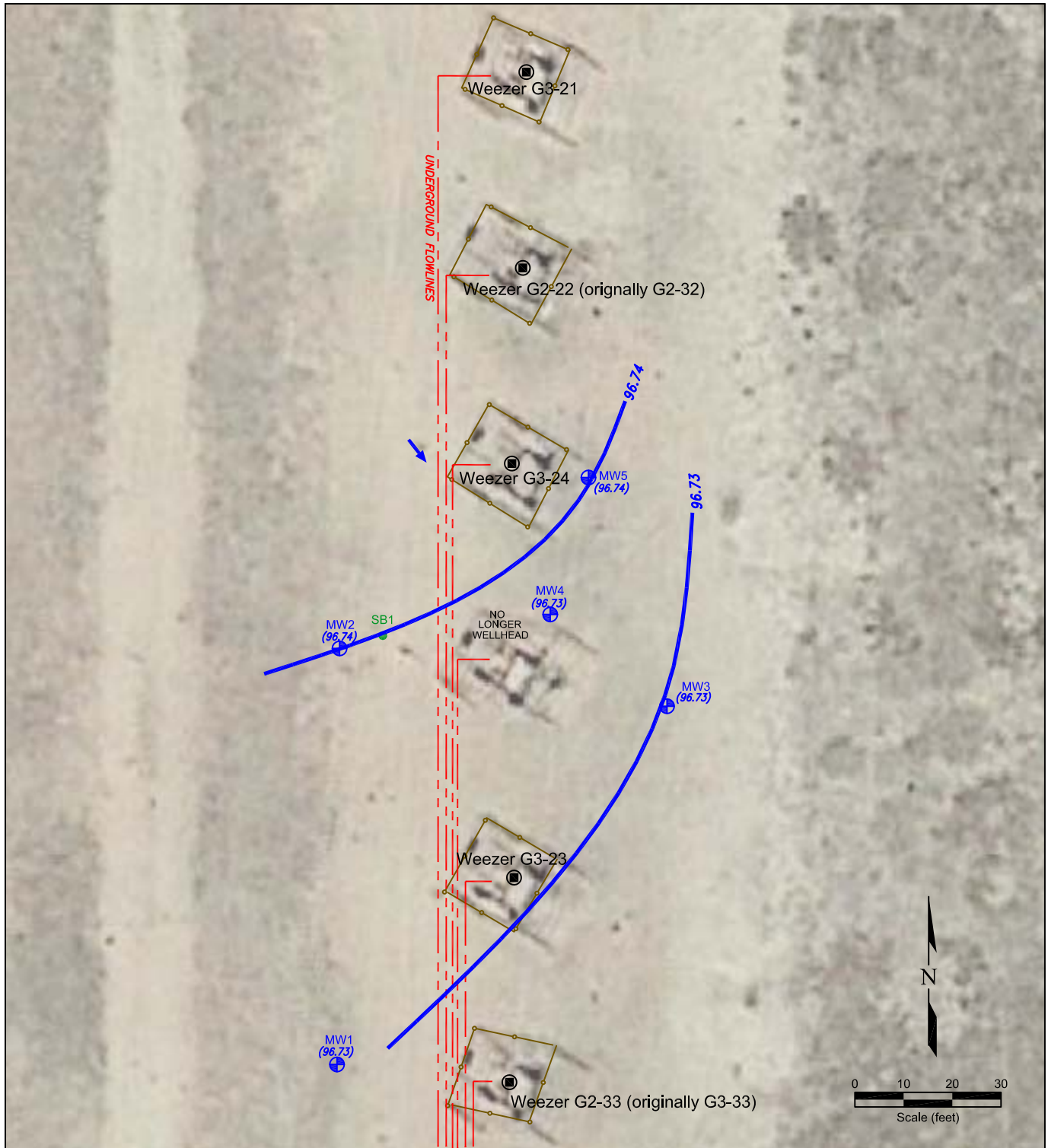
- SOIL BORING
- WELL HEAD LOCATION
- ⊕ MONITORING WELL
- - - UNDERGROUND FLOW LINE
- - - FENCE LINE

**Figure 2  
SITE MAP**

**NOBLE ENERGY, INC. ~ WEEZER G02-32**  
 SESW Section 3, T4N, R65W ~ 40.33602°, -104.65135°  
 Weld County, Colorado

Project No. <b>C019-078</b>	Prepared by <b>TDA</b>	Drawn by <b>TDA</b>
Date <b>4/1/20</b>	Reviewed by <b>PH</b>	Filename <b>19078Q</b>





**LEGEND**

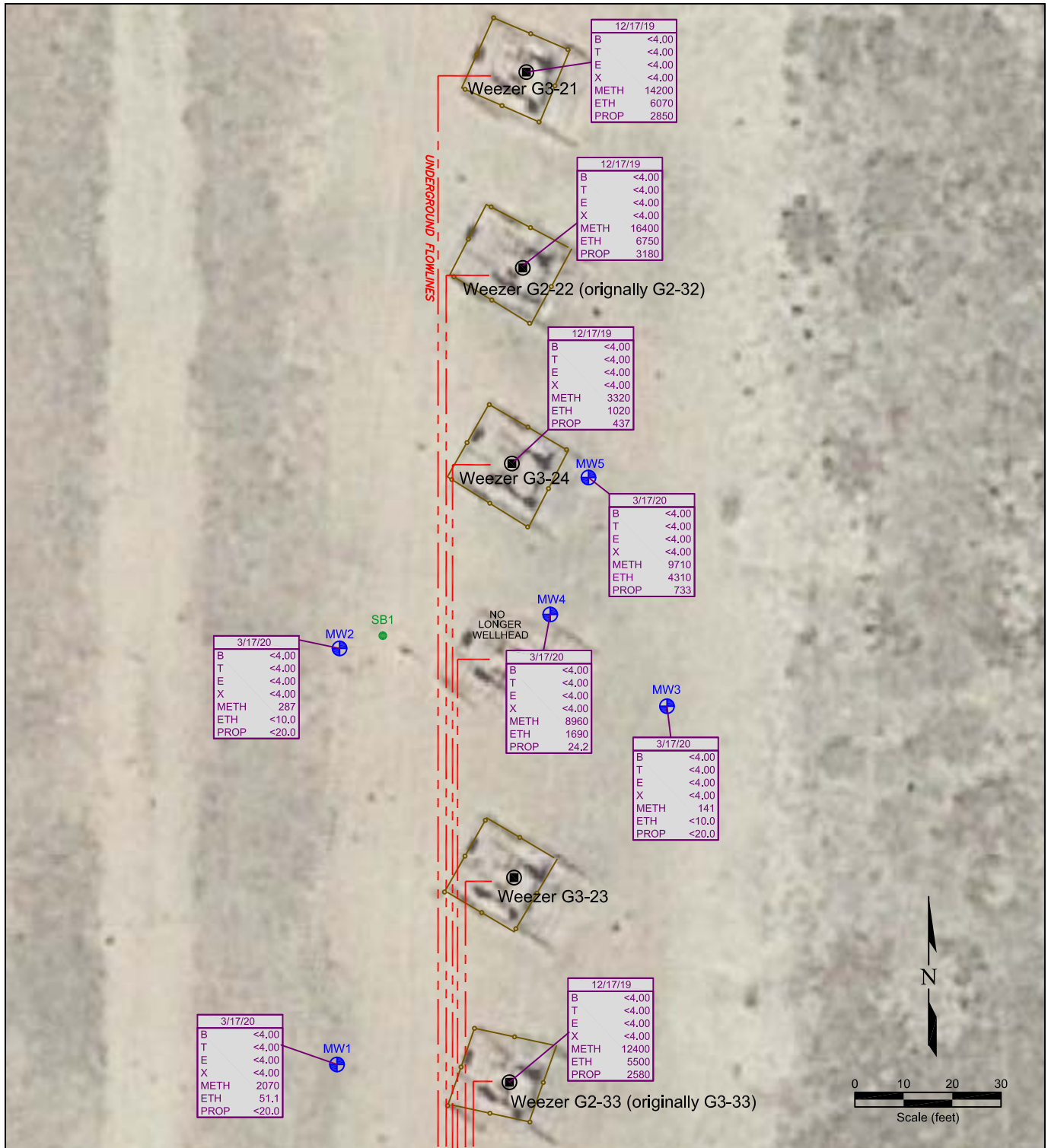
- SOIL BORING
- WELL HEAD LOCATION
- ⊕ MONITORING WELL
- - - UNDERGROUND FLOW LINE
- FENCE LINE
- (98.22) GROUND WATER ELEVATION 6/2/08  
(feet above mean sea level)
- (97.00) WATER TABLE CONTOUR  
(feet above mean sea level)
- INFERRED GROUND WATER FLOW DIRECTION

Figure 3  
**INFERRED GROUND WATER CONTOUR MAP**  
March 17, 2020

**NOBLE ENERGY, INC. ~ WEEZER G02-32**  
SESW Section 3, T4N, R65W ~ 40.33602°, -104.65135°  
Weld County, Colorado

Project No. <b>C019-078</b>	Prepared by	Drawn by <b>TDA</b>
Date <b>4/1/20</b>	Reviewed by <b>PH</b>	Filename <b>19078Q</b>





**LEGEND**

- SOIL BORING
- ⊙ WELL HEAD LOCATION
- ⊕ MONITORING WELL
- UNDERGROUND FLOW LINE
- FENCE LINE

DATE SAMPLED	
3/17/20	BENZENE (ug/L)
<4.00	TOLUENE (ug/L)
<4.00	ETHYL BENZENE (ug/L)
<4.00	TOTAL XYLENES (ug/L)
<4.00	METHANE (ug/L)
2070	ETHANE (ug/L)
51.1	PROPANE (ug/L)
<20.0	

**Figure 4**  
**GROUND WATER CHEMISTRY**  
 December 17, 2019 and March 17, 2020

**NOBLE ENERGY, INC. ~ WEEZER G02-32**  
 SESW Section 3, T4N, R65W ~ 40.33602°, -104.65135°  
 Weld County, Colorado

Project No. <b>C019-078</b>	Prepared by <b>TDA</b>	Drawn by <b>TDA</b>
Date <b>4/1/20</b>	Reviewed by <b>PH</b>	Filename <b>19078Q</b>

APPENDIX A

LABORATORY DOCUMENTATION

March 20, 2020

**Fremont Environmental**

**Paul Henehan**

**8305 6th St, PO Box 1289**

**Wellington CO 80549**

**Project Name - Noble - Weezer G3-22**

**Project Number - C019-078**

Attached are your analytical results for Noble - Weezer G3-22 received by Origins Laboratory, Inc. March 17, 2020. This project is associated with Origins project number Y003334-01.

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



Fremont Environmental  
8305 6th St, PO Box 1289  
Wellington CO 80549

Paul Henehan  
Project Number: C019-078  
Project: Noble - Weezer G3-22

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	Y003334-01	Water	March 17, 2020 11:00	03/17/2020 16:08
MW-2	Y003334-02	Water	March 17, 2020 12:00	03/17/2020 16:08
MW-3	Y003334-03	Water	March 17, 2020 13:00	03/17/2020 16:08
MW-4	Y003334-04	Water	March 17, 2020 14:30	03/17/2020 16:08
MW-5	Y003334-05	Water	March 17, 2020 13:45	03/17/2020 16:08

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

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

**Sample Receipt Checklist**

Origins Work Order: Y003334 Client: Fremont  
 Client Project ID: Weezer G3-22

Checklist Completed by: JG Shipped Via: HS  
 Date/time completed: 3/17/20 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: N/A

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1138 °C 1 °C 1 °C (Describe) \_\_\_\_\_ °C  
 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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)		<input checked="" type="checkbox"/>		
Additional Comments (if any):				

<sup>(1)</sup>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) JG Date/Time Reviewed 3/18/20

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**MW-1**

**3/17/2020 11:00:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

**Origins Laboratory, Inc.**  
**Y003334-01 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	BOC1305	KDK	03/17/2020	03/18/2020	U
Toluene	ND	4.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	4.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	4.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	106 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.6 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	51.1	10.0	ug/L	1	11111		03/17/2020	03/19/2020	
Methane	2070	10.0	"	"	"		"	"	
n-Propane	ND	20.0	"	"	"		"	"	

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**MW-2**

**3/17/2020 12:00:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y003334-02 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B0C1305	KDK	03/17/2020	03/18/2020	U
Toluene	ND	4.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	4.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	4.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	118 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.3 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	ND	10.0	ug/L	1	11111		03/17/2020	03/19/2020	
Methane	287	10.0	"	"	"		"	"	
n-Propane	ND	20.0	"	"	"		"	"	

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**MW-3**

**3/17/2020 1:00:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

**Origins Laboratory, Inc.**  
**Y003334-03 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B0C1305	KDK	03/17/2020	03/18/2020	U
Toluene	ND	4.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	4.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	4.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	98.3 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	105 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	99.0 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	ND	10.0	ug/L	1	11111		03/17/2020	03/19/2020	
Methane	141	10.0	"	"	"		"	"	
n-Propane	ND	20.0	"	"	"		"	"	

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**MW-4**

**3/17/2020 2:30:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

**Origins Laboratory, Inc.**  
**Y003334-04 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B0C1305	KDK	03/17/2020	03/18/2020	U
Toluene	ND	4.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	4.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	4.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	106 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	<b>1690</b>	10.0	ug/L	1	11111		03/17/2020	03/19/2020	
Methane	<b>8960</b>	10.0	"	"	"		"	"	
n-Propane	<b>24.2</b>	20.0	"	"	"		"	"	

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**MW-5**

**3/17/2020 1:45:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

**Origins Laboratory, Inc.**  
**Y003334-05 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B0C1305	KDK	03/17/2020	03/18/2020	U
Toluene	ND	4.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	4.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	4.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	103 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	102 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	99.8 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	<b>4310</b>	10.0	ug/L	1	11111		03/17/2020	03/19/2020	
Methane	<b>9710</b>	10.0	"	"	"		"	"	
n-Propane	<b>733</b>	20.0	"	"	"		"	"	

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**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 B0C1305 - EPA 5030B (Water)**

**Blank (B0C1305-BLK1)**

Prepared: 03/13/2020 Analyzed: 03/18/2020

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		90.7	70-130			

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**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 B0C1305 - EPA 5030B (Water)**

**LCS (B0C1305-BS1)**

Prepared: 03/13/2020 Analyzed: 03/18/2020

Benzene	53.3	1.00	ug/L	50.0		107	70-130			
Toluene	58.8	1.00	"	50.0		118	70-130			
Ethylbenzene	55.5	1.00	"	50.0		111	70-130			
m,p-Xylene	108	2.00	"	100		108	70-130			
o-Xylene	51.6	1.00	"	50.0		103	70-130			
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		103	70-130			
Surrogate: Toluene-d8	72		"	62.5		115	70-130			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		108	70-130			

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**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 B0C1305 - EPA 5030B (Water)**

<b>Matrix Spike (B0C1305-MS1)</b>	<b>Source: Y003237-01</b>			<b>Prepared: 03/13/2020 Analyzed: 03/18/2020</b>						
Benzene	28.8	1.00	ug/L	50.0	0.210	57.2	70-130			QM-07
Toluene	31.4	1.00	"	50.0	ND	62.7	70-130			QM-07
Ethylbenzene	28.3	1.00	"	50.0	0.090	56.3	70-130			QM-07
m,p-Xylene	55.6	2.00	"	100	ND	55.6	70-130			QM-07
o-Xylene	27.9	1.00	"	50.0	ND	55.7	70-130			QM-07
Surrogate: 1,2-Dichloroethane-d4	69		"	62.5		111	70-130			
Surrogate: Toluene-d8	67		"	62.5		107	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.3	70-130			

Origins Laboratory, Inc.



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Fremont Environmental  
 8305 6th St, PO Box 1289  
 Wellington CO 80549

Paul Henehan  
 Project Number: C019-078  
 Project: Noble - Weezer G3-22

**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 B0C1305 - EPA 5030B (Water)**

Matrix Spike Dup (B0C1305-MSD1)	Source: Y003237-01			Prepared: 03/13/2020 Analyzed: 03/18/2020						
Benzene	60.3	1.00	ug/L	50.0	0.210	120	70-130	70.7	20	QR-03
Toluene	73.1	1.00	"	50.0	ND	146	70-130	79.9	20	QM-07, QR-03
Ethylbenzene	62.0	1.00	"	50.0	0.090	124	70-130	74.7	20	QR-03
m,p-Xylene	120	2.00	"	100	ND	120	70-130	73.3	20	QR-03
o-Xylene	57.9	1.00	"	50.0	ND	116	70-130	70.1	20	QR-03
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		106	70-130			
Surrogate: Toluene-d8	76		"	62.5		121	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.7	70-130			

Origins Laboratory, Inc.



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Fremont Environmental  
8305 6th St, PO Box 1289  
Wellington CO 80549

Paul Henehan  
Project Number: C019-078  
Project: Noble - Weezer G3-22

---

### 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.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

---

Jen Pellegrini For Noelle Doyle Mathis, President

December 23, 2019

**Noble Energy Inc. - Greeley**

**Heather Shideman**

**2115 117th Avenue**

**Greeley CO 80631**

**Project Name - Oil\_Gas/GWA\_Weezer\_Investigation Project Number - 540.1910.01**  
**n**

Attached are your analytical results for Oil\_Gas/GWA\_Weezer\_Investigation received by Origins Laboratory, Inc. December 17, 2019. This project is associated with Origins project number Y912305-01.

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



Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OG_Weezer_G_2_32	Y912305-01	Water	December 17, 2019 16:15	12/17/2019 17:35

Legal: SESW\_3\_4N\_65W

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

www.originslaboratory.com page 1 of 1

12305

Client: Noble Energy, Inc (NBL)  
 Address: 2115 117th Avenue Greeley, CO 80634

Project Manager: Heather Shideman  
 Project Name: Oil\_Gas/GWA\_Weezer\_Investigation

Telephone Number: 307-620-0117  
 Email Address: Heather.Shideman@apexccs.com; Kobi.Olson@apexccs.com; Rochelle.Carliste@apexccs.com

Project Number: 540.1910.01  
 Samples Collected By: K. WORTHINGTON

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa #			Other
OG_Weezer_G_2_32	12-17-19	1615	8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			FacID 295410	1
SESW_3_4N_65W												Sample Freq: SP	2
Temperature, field		degrees C											3
pH, field		s.u.											4
Conductivity, field		us/cm											5
Oxidation Reduction Potential, field		mV											6
Dissolved Oxygen, field		mg/L											7
Turbidity, field		NTU											8
													9
													10
Relinquished By:	Date: 12-17-19	Time: 1735	Time: 1735	Received By:	Date: 12-17-19	Time: 1735	Time: 1735	Received By:	Date: 12-17-19	Time: 1735	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24-Hr <input type="checkbox"/> 48-Hr <input type="checkbox"/> 72-Hr <input type="checkbox"/>	Standard <input checked="" type="checkbox"/>	
Relinquished By:	Date:	Time:	Time:	Received By:	Date:	Time:	Time:	Received By:	Date:	Time:			

Date Recult: N/A

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

Origins Laboratory, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: 412305

Client: Noble Energy

Checklist Completed by: D. L. L.

Client Project ID: Oil Gas/GWA Weezer Investigation

Date/time completed: 12-18-19

Shipped Via: UPS  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: 512

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 11.0 °C \_\_\_\_\_ °C \_\_\_\_\_ °C \_\_\_\_\_ °C (Describe)

Thermometer ID: 1003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)?</sup>	<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 <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)?</sup>		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)?</sup>	<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 <sup>(1)?</sup> (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup> 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) [Signature]

Date/Time Reviewed 12/18/19

Origins Laboratory, Inc.

[Signature]

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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**OG Weezer G 2 32**  
**12/17/2019 4:15:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y912305-01 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B9L1801	ZZZ	12/18/2019	12/18/2019	U
Toluene	ND	4.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	4.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	4.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	114 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	94.6 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	100 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	<b>6750</b>	13.0	ug/L	1	11111		12/20/2019	12/20/2019	
Methane	<b>16400</b>	100.0	"	10	"		"	12/21/2019	
n-Propane	<b>3180</b>	18.6	"	1	"		"	12/20/2019	

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**Blank (B9L1801-BLK1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	73		"	62.5		116	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**LCS (B9L1801-BS1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	54.3	1.00	ug/L	50.0		109	70-130			
Toluene	52.5	1.00	"	50.0		105	70-130			
Ethylbenzene	51.2	1.00	"	50.0		102	70-130			
m,p-Xylene	105	2.00	"	100		105	70-130			
o-Xylene	54.4	1.00	"	50.0		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	77		"	62.5		123	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

Matrix Spike (B9L1801-MS1)	Source: Y912270-21			Prepared: 12/18/2019 Analyzed: 12/18/2019						
Benzene	53.5	1.00	ug/L	50.0	ND	107	70-130			
Toluene	50.1	1.00	"	50.0	0.110	100	70-130			
Ethylbenzene	49.4	1.00	"	50.0	0.090	98.6	70-130			
m,p-Xylene	100	2.00	"	100	0.220	100	70-130			
o-Xylene	50.8	1.00	"	50.0	0.080	101	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

Matrix Spike Dup (B9L1801-MSD1)	Source: Y912270-21			Prepared: 12/18/2019 Analyzed: 12/18/2019						
Benzene	51.3	1.00	ug/L	50.0	ND	103	70-130	4.08	20	
Toluene	47.7	1.00	"	50.0	0.110	95.1	70-130	4.97	20	
Ethylbenzene	46.7	1.00	"	50.0	0.090	93.3	70-130	5.60	20	
m,p-Xylene	94.6	2.00	"	100	0.220	94.4	70-130	5.98	20	
o-Xylene	48.4	1.00	"	50.0	0.080	96.6	70-130	4.84	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.5	70-130			

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

---

**Notes and Definitions**

U Sample is Non-Detect.

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.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

---

Jen Pellegrini, Project Manager

December 23, 2019

**Noble Energy Inc. - Greeley**

**Heather Shideman**

**2115 117th Avenue**

**Greeley CO 80631**

**Project Name - Oil\_Gas/GWA\_Weezer\_Investigation Project Number - 540.1910.01**  
**n**

Attached are your analytical results for Oil\_Gas/GWA\_Weezer\_Investigation received by Origins Laboratory, Inc. December 17, 2019. This project is associated with Origins project number Y912296-01.

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



Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OG_Weezer_G_3_33	Y912296-01	Water	December 17, 2019 15:38	12/17/2019 17:35

Legal: SESW\_3\_4N\_65W

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

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page 1 of 1

417296

Client: Noble Energy, Inc (NBL)  
 Address: 2115 117th Avenue Greeley, CO 80634

Project Manager: Heather Shideman  
 Project Name: Oil\_Gas/GWA\_Weezer\_Investigation

Project Number: 540.1910.01  
 Samples Collected By: K. Worthington

Telephone Number:  
 Email Address: Heather.Shideman@apexcos.com;  
 Kobi.Olson@apexcos.com;  
 Rochelle.Carlisie@apexcos.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix		Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil		
OG_Weezer_G_3_33	12-17-19	1538	8	X				Y			FailID 285499
SESW_3_4N_65W											Sample Freq: SP
Temperature, field											
pH, field											
Conductivity, field											
Oxidation Reduction Potential, field											
Dissolved Oxygen, field											
Turbidity, field											
Relinquished By:	Date: 12-17-19	Time: 1735	Time: 1735	Received By:	Date: 12-19-19	Time: 1735	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>				
Relinquished By:	Date:	Time:	Time:	Received By:	Date:	Time:					

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

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: 4912296

Client: Noble Energy

Client Project ID: Oil Gas/GWA Weezer Investigation

Checklist Completed by: D. Lu

Shipped Via: HD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 12-18-19

Airbill #: 419

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1/110 °C 1 °C 1 °C 1 °C (Describe)

Thermometer ID: 1023

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup>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) [Signature]

Date/Time Reviewed 12/18/19

Origins Laboratory, Inc.

[Signature: Jen Pellegrini]

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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**OG Weezer G 3 33**  
**12/17/2019 3:38:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y912296-01 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B9L1801	ZZZ	12/18/2019	12/18/2019	U
Toluene	ND	4.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	4.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	4.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	93.6 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.3 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	<b>5500</b>	13.0	ug/L	1	11111		12/20/2019	12/20/2019	
Methane	<b>12400</b>	100.0	"	10	"		"	"	
n-Propane	<b>2580</b>	18.6	"	1	"		"	"	

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**Blank (B9L1801-BLK1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	73		"	62.5		116	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**LCS (B9L1801-BS1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	54.3	1.00	ug/L	50.0		109	70-130			
Toluene	52.5	1.00	"	50.0		105	70-130			
Ethylbenzene	51.2	1.00	"	50.0		102	70-130			
m,p-Xylene	105	2.00	"	100		105	70-130			
o-Xylene	54.4	1.00	"	50.0		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	77		"	62.5		123	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

<b>Matrix Spike (B9L1801-MS1)</b>	<b>Source: Y912270-21</b>			<b>Prepared: 12/18/2019 Analyzed: 12/18/2019</b>						
Benzene	53.5	1.00	ug/L	50.0	ND	107	70-130			
Toluene	50.1	1.00	"	50.0	0.110	100	70-130			
Ethylbenzene	49.4	1.00	"	50.0	0.090	98.6	70-130			
m,p-Xylene	100	2.00	"	100	0.220	100	70-130			
o-Xylene	50.8	1.00	"	50.0	0.080	101	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

<b>Matrix Spike Dup (B9L1801-MSD1)</b>	<b>Source: Y912270-21</b>			<b>Prepared: 12/18/2019 Analyzed: 12/18/2019</b>						
Benzene	51.3	1.00	ug/L	50.0	ND	103	70-130	4.08	20	
Toluene	47.7	1.00	"	50.0	0.110	95.1	70-130	4.97	20	
Ethylbenzene	46.7	1.00	"	50.0	0.090	93.3	70-130	5.60	20	
m,p-Xylene	94.6	2.00	"	100	0.220	94.4	70-130	5.98	20	
o-Xylene	48.4	1.00	"	50.0	0.080	96.6	70-130	4.84	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.5	70-130			

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

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**Notes and Definitions**

U Sample is Non-Detect.

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.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

---

Jen Pellegrini, Project Manager

December 23, 2019

**Noble Energy Inc. - Greeley**

**Heather Shideman**

**2115 117th Avenue**

**Greeley CO 80631**

**Project Name - Oil\_Gas/GWA\_Weezer\_Investigation Project Number - 540.1910.01**  
**n**

Attached are your analytical results for Oil\_Gas/GWA\_Weezer\_Investigation received by Origins Laboratory, Inc. December 17, 2019. This project is associated with Origins project number Y912303-01.

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



Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OG_Weezer_G_3_21	Y912303-01	Water	December 17, 2019 14:45	12/17/2019 17:35

Legal: SESW\_3\_4N\_65W

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation



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page 1 of 1

Client: Noble Energy, Inc (NBL)  
 Address: 2115 117th Avenue Greeley, CO 80634

Project Manager: Heather Shideman  
 Project Name: Oil\_Gas/GWA\_Weezer\_Investigation  
 Project Number: 540.1910.01  
 Samples Collected By: K. Wanthongkha

Telephone Number: 378-620-0117  
 Email Address: Heather.Shideman@apexcos.com;  
 Kolbi.Olson@apexcos.com;  
 Rochelle.Carls@apexcos.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Conister #			Other
OG_Weezer_G_3_21	7/20/14	1445	8	X				X				RSK 175 Methane, Ethane, Propane; NG1 (soflask on HOLD) BTEX	FacID 295679
SESW_3_4N_65W													Sample Freq: SP
Temperature, field													
pH, field													
Conductivity, field													
Oxidation Reduction Potential, field													
Dissolved Oxygen, field													
Turbidity, field													
Relinquished By: [Signature]	Date: 12-17-19	Time: 1735	Time: 1735	Received By: [Signature]	Date: 12-17-19	Time: 1735	Time: 1735	Received By: [Signature]	Date: 12-17-19	Time: 1735	Time: 1735	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/>	
Relinquished By: [Signature]	Date: [ ]	Time: [ ]	Time: [ ]	Received By: [ ]	Date: [ ]	Time: [ ]	Time: [ ]	Received By: [ ]	Date: [ ]	Time: [ ]	Time: [ ]	Standard <input checked="" type="checkbox"/>	

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

Origins Laboratory, Inc.

*Jefe Pellegrini*

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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: 4912303

Client: Noble Energy

Client Project ID: Oil Gas/GWA Weezer Investigation

Checklist Completed by: D. L. L.

Shipped Via: LTD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 12-18-11

Airbill #: NA

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1 / 1.0 °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C

Thermometer ID: 603

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>No</u>
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup>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) [Signature]

Date/Time Reviewed 12/18/11

Origins Laboratory, Inc.

[Signature]

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Noble Energy Inc. - Greeley

2115 117th Avenue

Greeley CO 80631

Heather Shideman

Project Number: 540.1910.01

Project: Oil\_Gas/GWA\_Weezer\_Investigation

**OG Weezer G 3 21**

**12/17/2019 2:45:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
Y912303-01 (Water)

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B9L1801	ZZZ	12/18/2019	12/18/2019	U
Toluene	ND	4.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	4.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	4.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	94.8 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	100 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	<b>6070</b>	13.0	ug/L	1	11111		12/20/2019	12/20/2019	
Methane	<b>14200</b>	100.0	"	10	"		"	12/21/2019	
n-Propane	<b>2850</b>	18.6	"	1	"		"	12/20/2019	

Origins Laboratory, Inc.



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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**Blank (B9L1801-BLK1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	73		"	62.5		116	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**LCS (B9L1801-BS1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	54.3	1.00	ug/L	50.0		109	70-130			
Toluene	52.5	1.00	"	50.0		105	70-130			
Ethylbenzene	51.2	1.00	"	50.0		102	70-130			
m,p-Xylene	105	2.00	"	100		105	70-130			
o-Xylene	54.4	1.00	"	50.0		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	77		"	62.5		123	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

<b>Matrix Spike (B9L1801-MS1)</b>	<b>Source: Y912270-21</b>			<b>Prepared: 12/18/2019 Analyzed: 12/18/2019</b>						
Benzene	53.5	1.00	ug/L	50.0	ND	107	70-130			
Toluene	50.1	1.00	"	50.0	0.110	100	70-130			
Ethylbenzene	49.4	1.00	"	50.0	0.090	98.6	70-130			
m,p-Xylene	100	2.00	"	100	0.220	100	70-130			
o-Xylene	50.8	1.00	"	50.0	0.080	101	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

<b>Matrix Spike Dup (B9L1801-MSD1)</b>	<b>Source: Y912270-21</b>			<b>Prepared: 12/18/2019 Analyzed: 12/18/2019</b>						
Benzene	51.3	1.00	ug/L	50.0	ND	103	70-130	4.08	20	
Toluene	47.7	1.00	"	50.0	0.110	95.1	70-130	4.97	20	
Ethylbenzene	46.7	1.00	"	50.0	0.090	93.3	70-130	5.60	20	
m,p-Xylene	94.6	2.00	"	100	0.220	94.4	70-130	5.98	20	
o-Xylene	48.4	1.00	"	50.0	0.080	96.6	70-130	4.84	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.5	70-130			

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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

---

**Notes and Definitions**

U Sample is Non-Detect.

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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---

Jen Pellegrini, Project Manager

December 23, 2019

**Noble Energy Inc. - Greeley**

**Heather Shideman**

**2115 117th Avenue**

**Greeley CO 80631**

**Project Name - Oil\_Gas/GWA\_Weezer\_Investigation Project Number - 540.1910.01**  
**n**

Attached are your analytical results for Oil\_Gas/GWA\_Weezer\_Investigation received by Origins Laboratory, Inc. December 17, 2019. This project is associated with Origins project number Y912299-01.

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



Noble Energy Inc. - Greeley  
2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OG_Weezer_G_3_24	Y912299-01	Water	December 17, 2019 16:00	12/17/2019 17:35

Legal: SESW\_3\_4N\_65W

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

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 4912291  
 page 1 of 1

**ORIGINS**  
 LABORATORY, INC

Client: Noble Energy, Inc (NBL)  
 Address: 2115 117th Avenue Greeley, CO 80634

Project Manager: Heather Shideman  
 Project Name: Oil\_Gas/GWA\_Weezer\_Investigation

Project Number: 540.1910.01  
 Samples Collected By: K. Wilson, Heather Shideman

Telephone Number: Heather.Shideman@apexcos.com;  
 Kobi.Olson@apexcos.com;  
 Rochelle.Carrisle@apexcos.com

Email Address: Heather.Shideman@apexcos.com;  
 Kobi.Olson@apexcos.com;  
 Rochelle.Carrisle@apexcos.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative			Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil			Air Summa #
OG_Weezer_G_3_24	12-17-19	1600	8	X				X			RSK 175 Methane, Ethane, Propane; NG1 Isoflask on HOLD, BTEX	FaeID 298677
SESW_3_4N_65W												Sample Freq. SP
Temperature, field		degrees C										
pH, field		s.u.										
Conductivity, field		us/cm										
Oxidation Reduction Potential, field		mV										
Dissolved Oxygen, field		mg/L										
Turbidity, field		NTU										
Relinquished By: [Signature]	Date: 12-17-19	Time: 1735	Time: 1735	Received By: [Signature]	Date: 12-17-19	Time: 1737	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>					
Relinquished By:	Date:	Time:	Time:	Received By:	Date:	Time:						

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

Origins Laboratory, Inc.

*Jen Pellegrini*

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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

Origins Laboratory

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

**Sample Receipt Checklist**

Origins Work Order: 4912299

Client: Noble - Energy

Client Project ID: Oil Gas/GWA Weezer Investigation

Checklist Completed by: D. Miller

Shipped Via: HD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 12-18-17

Airbill #: NA

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1 / 1.0 °C 1 / \_\_\_\_\_ °C 1 / \_\_\_\_\_ °C 1 / \_\_\_\_\_ °C

Thermometer ID: 1052

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup>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) [Signature]

Date/Time Reviewed 12/18/19

Origins Laboratory, Inc.

[Signature: Jen Pellegrini]

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Noble Energy Inc. - Greeley  
 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**OG Weezer G 3 24**  
**12/17/2019 4:00:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y912299-01 (Water)**

**BTEX by EPA 8260D**

Benzene	ND	4.00	ug/L	4	B9L1801	ZZZ	12/18/2019	12/18/2019	U
Toluene	ND	4.00	"	"	"	ZZZ	"	"	U
Ethylbenzene	ND	4.00	"	"	"	ZZZ	"	"	U
Xylenes, total	ND	4.00	"	"	"	ZZZ	"	"	U

Surrogate: 1,2-Dichloroethane-d4	110 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	93.9 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	"	

**Dissolved Gasses by RSK 175**

Ethane	<b>1020</b>	13.0	ug/L	1	11111		12/20/2019	12/20/2019	
Methane	<b>3320</b>	10.0	"	"	"		"	"	
n-Propane	<b>437</b>	18.6	"	"	"		"	"	

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 2115 117th Avenue  
 Greeley CO 80631

Heather Shideman  
 Project Number: 540.1910.01  
 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**Blank (B9L1801-BLK1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	73		"	62.5		116	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

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 Greeley CO 80631

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 Project: Oil\_Gas/GWA\_Weezer\_Investigation

**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 B9L1801 - EPA 5030B (Water)**

**LCS (B9L1801-BS1)**

Prepared: 12/18/2019 Analyzed: 12/18/2019

Benzene	54.3	1.00	ug/L	50.0		109	70-130			
Toluene	52.5	1.00	"	50.0		105	70-130			
Ethylbenzene	51.2	1.00	"	50.0		102	70-130			
m,p-Xylene	105	2.00	"	100		105	70-130			
o-Xylene	54.4	1.00	"	50.0		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	77		"	62.5		123	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

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Heather Shideman  
 Project Number: 540.1910.01  
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**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 B9L1801 - EPA 5030B (Water)**

Matrix Spike (B9L1801-MS1)	Source: Y912270-21			Prepared: 12/18/2019 Analyzed: 12/18/2019						
Benzene	53.5	1.00	ug/L	50.0	ND	107	70-130			
Toluene	50.1	1.00	"	50.0	0.110	100	70-130			
Ethylbenzene	49.4	1.00	"	50.0	0.090	98.6	70-130			
m,p-Xylene	100	2.00	"	100	0.220	100	70-130			
o-Xylene	50.8	1.00	"	50.0	0.080	101	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

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**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 B9L1801 - EPA 5030B (Water)**

<b>Matrix Spike Dup (B9L1801-MSD1)</b>	<b>Source: Y912270-21</b>			<b>Prepared: 12/18/2019 Analyzed: 12/18/2019</b>						
Benzene	51.3	1.00	ug/L	50.0	ND	103	70-130	4.08	20	
Toluene	47.7	1.00	"	50.0	0.110	95.1	70-130	4.97	20	
Ethylbenzene	46.7	1.00	"	50.0	0.090	93.3	70-130	5.60	20	
m,p-Xylene	94.6	2.00	"	100	0.220	94.4	70-130	5.98	20	
o-Xylene	48.4	1.00	"	50.0	0.080	96.6	70-130	4.84	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.5	70-130			

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2115 117th Avenue  
Greeley CO 80631

Heather Shideman  
Project Number: 540.1910.01  
Project: Oil\_Gas/GWA\_Weezer\_Investigation

---

**Notes and Definitions**

U Sample is Non-Detect.

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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Jen Pellegrini, Project Manager

**APPENDIX B**

**LOW FLOW SAMPLING PARAMETERS**

Weezer - Low Flow Sampling Data Readings

17-Mar-20

MW-1

Time (min)	Temp (Deg C)	Spec. Cond. (mmhos)	pH (units)	ORP (mV)	DO (mg/L)	Turbidity (ntu)
5	8.54	0.08	7.35	116.1	2.61	2543.1
10	8.49	0.08	7.07	181.9	0.56	1378.4
15	8.44	0.08	7.00	190.1	0.47	1158.2
20	8.46	0.08	6.99	192.9	0.4	1123.7

Total Purge volume = 2.5 gal

MW-2

Time (min)	Temp (Deg C)	Spec. Cond. (mmhos)	pH (units)	ORP (mV)	DO (mg/L)	Turbidity (ntu)
5	9.26	0.08	7.04	120.9	0.9	75.16
10	7.68	256.6	7.33	85.6	9.68	348.6
15	7.11	1775.4	7.52	11.5	2.04	220.04
20	7.26	1978.8	7.5	9	0.81	281.24
25	7.35	1990.5	7.51	7.6	0.51	245.8
30	7.41	1988.3	7.51	7.4	0.71	256.6

Total Purge volume = 3.0 gal

MW-3

Time (min)	Temp (Deg C)	Spec. Cond. (mmhos)	pH (units)	ORP (mV)	DO (mg/L)	Turbidity (ntu)
5	10.15	2331.6	7.37	39.4	2.07	56.21
10	8.36	2333.2	7.35	29.9	1.45	67.94
15	8.45	2329.5	7.35	26.5	1.41	73.43
20	8.43	2324.6	7.35	23.6	1.29	76.98
25	8.43	2319.1	7.35	23.4	1.45	74.78

Total Purge volume = 2.5 gal

MW-4

Time (min)	Temp (Deg C)	Spec. Cond. (mmhos)	pH (units)	ORP (mV)	DO (mg/L)	Turbidity (ntu)
5	8.02	2224.1	7.76	-127.6	1.09	1022.9
10	8.12	2227.1	7.77	-139.1	0.63	633.4
15	8.16	2211.7	7.79	-145	0.58	314.3
20	8.06	2209.8	7.78	-147.8	1.23	179.9
25	8.09	2209.4	7.78	-143.5	0.61	160.1
30	8.18	2204.3	7.78	-131.8	0.77	177.1
35	8.19	2203.1	7.78	-129.7	0.91	168.5

Total Purge volume = 3.5 gal

MW-5

Time (min)	Temp (Deg C)	Spec. Cond. (mmhos)	pH (units)	ORP (mV)	DO (mg/L)	Turbidity (ntu)
5	8.26	1172.6	7.9	159.8	1.35	28.5
10	8.7	1248.3	7.93	-161.8	1.2	33.43
15	8.71	1266.5	7.93	-158.5	1.48	36.75
20	8.82	1293.8	7.94	-154.4	1.34	37.14
25	8.76	1287.1	7.95	-163.5	1.31	37.05

Total Purge volume = 2.5 gal