



## GROUNDWATER MONITORING REPORT MAY 2014

---

### KARCH BLUE D 24-11 FLOW LINE COGCC TRACKING #2232915

LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), conducted groundwater monitoring activities at the Karch Blue D 24-11 Flow Line (Site). The Site is located 3.78 miles southeast of County Road 34 and County Road 53 in Weld County, Colorado. The legal site description is the northeast quarter of the southwest quarter of Section 24, Township 3 North, Range 64 West, 6<sup>th</sup> Principal Meridian. The Site Location Map is included as Figure 1. Site history was described in the *LTE Environmental Assessment Results* dated June 17, 2013.

Soil borings SB01 through SB12 were advanced on May 21, 2013. Soil borings SB01 through SB03, SB05 through SB08, SB10, and SB12 were completed as temporary groundwater monitoring wells to delineate the extent of dissolved-phase petroleum hydrocarbon impact.

Groundwater monitoring was conducted on May 8, 2014, in four monitoring wells (SB01, SB03, SB06, and SB12). Prior to purging, depth to groundwater was measured and recorded to calculate well-specific target purge volumes and relative groundwater elevations. During the May 2014 monitoring event, depth to groundwater ranged from 7.95 feet below top of casing (btoc) in monitoring well SB03 to 9.31 feet btoc in monitoring well SB12. Groundwater was calculated to flow northwest with an average hydraulic gradient of 0.006 feet per foot. Relative groundwater elevations are presented on Figure 2 and summarized in Table 1. Following purging, samples were collected, placed on ice, and submitted with a complete chain of custody form to Origins Laboratory, Inc. of Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260C.

The Colorado Department of Public Health and Environment-Water Quality Control Commission has established Regulation 41-The Basic Standards for Ground Water (WQCC Reg 41) for BTEX at 5.0 micrograms per liter ( $\mu\text{g/L}$ ), 560  $\mu\text{g/L}$ , 700  $\mu\text{g/L}$ , and 1,400  $\mu\text{g/L}$ , respectively. Laboratory analytical results indicate all monitoring wells are in compliance with applicable WQCC Reg 41 standards. Laboratory groundwater analytical results are presented on Figure 3 and summarized in Table 1. The laboratory analytical report is attached.

The May 2014 groundwater event constitutes the first quarter in which all monitoring wells are in compliance with applicable, appropriate, and relevant regulations. LTE, under the direction of Noble, will continue to conduct quarterly groundwater monitoring with the goal of obtaining four consecutive quarters with analytical results in compliance with applicable WQCC Reg 41 standards. The next quarterly groundwater monitoring event is scheduled for August 2014.

## **FIGURES**

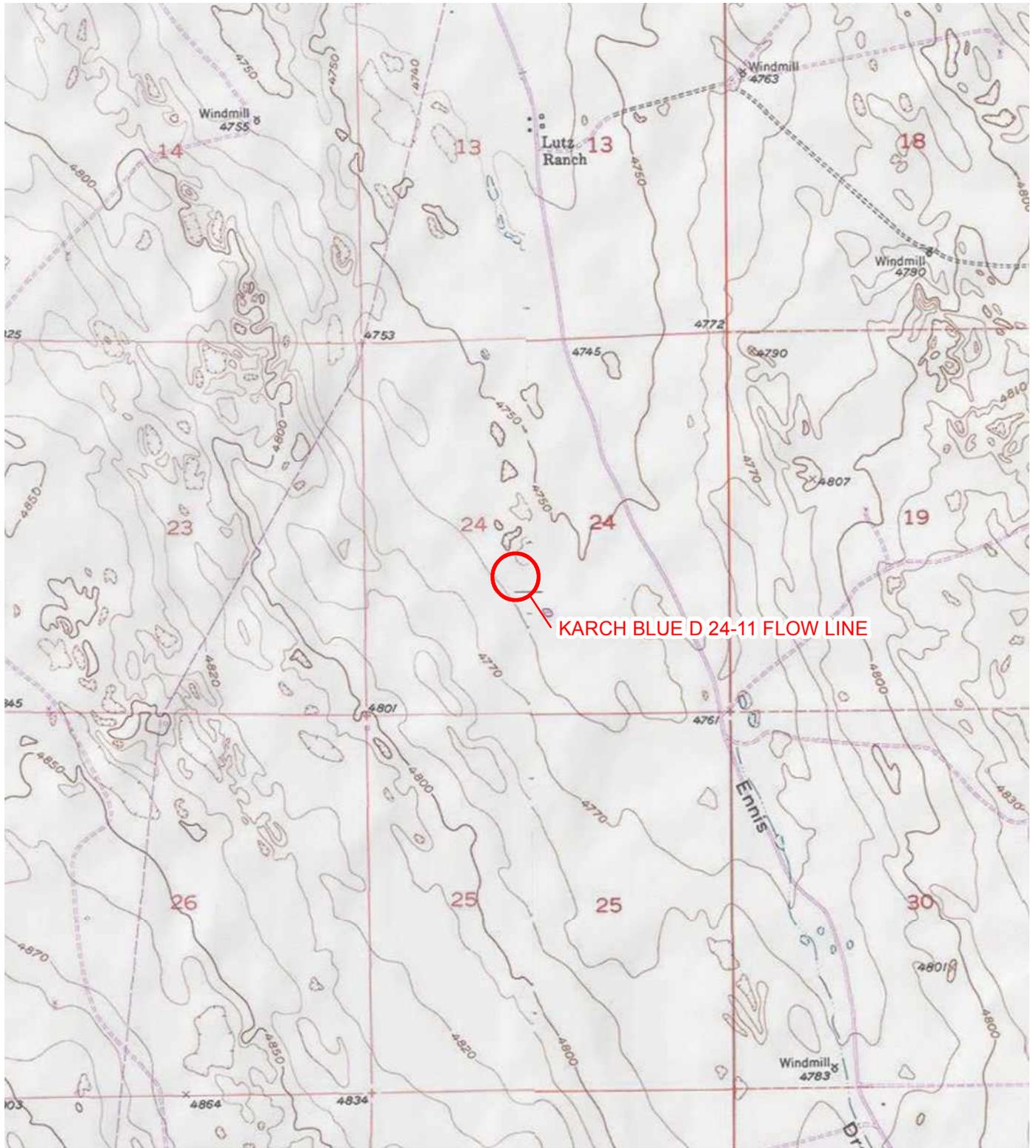
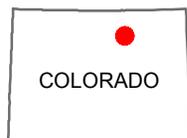
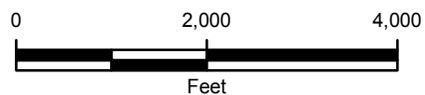


IMAGE COURTESY OF ESRI/USGS

**LEGEND**

 SITE LOCATION

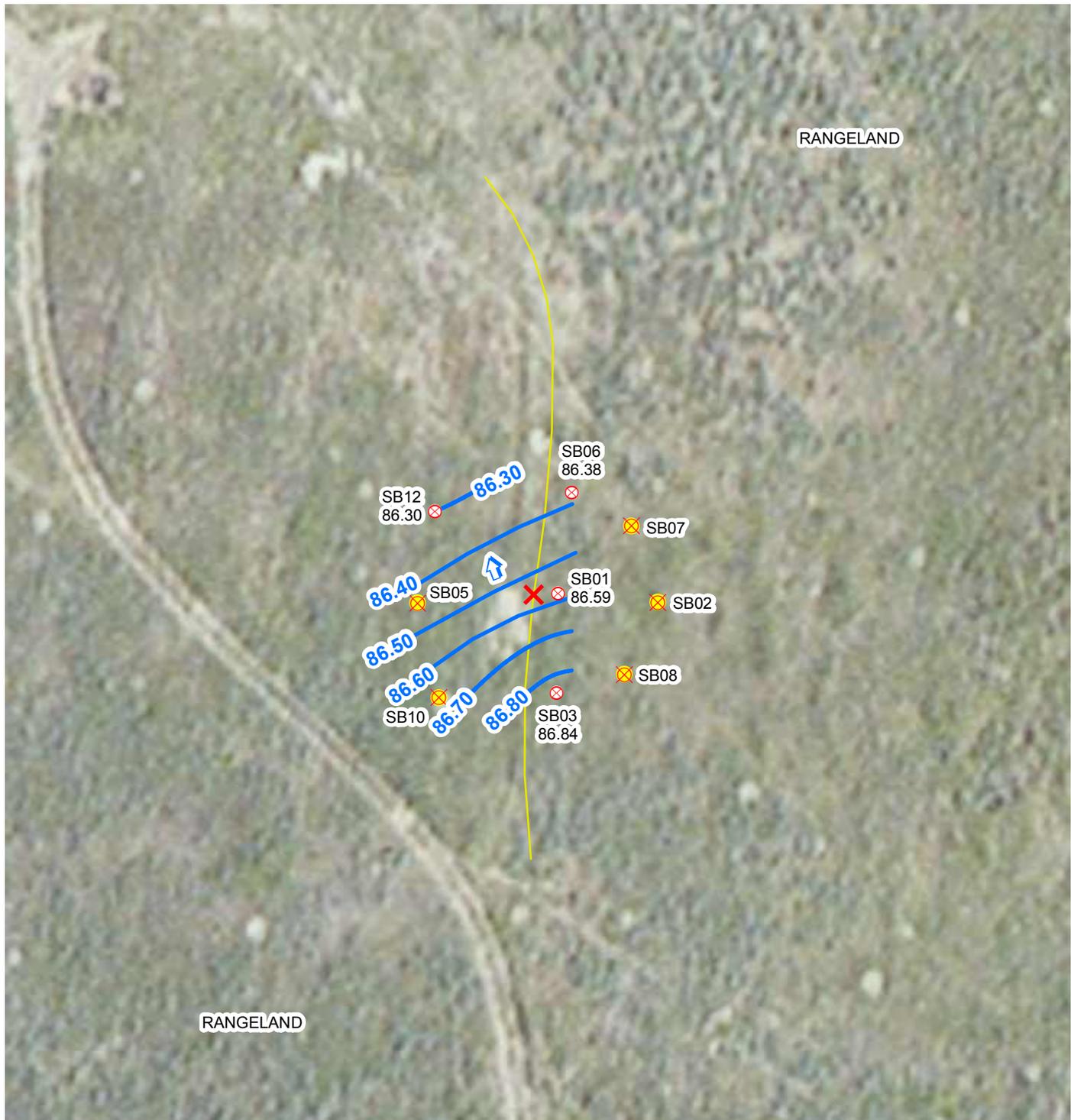


COLORADO

**FIGURE 1**  
**SITE LOCATION MAP**  
**KARCH BLUE D 24-11 FLOW LINE**  
**WELD COUNTY, COLORADO**



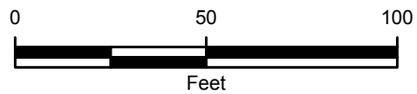
**NOBLE ENERGY, INC.**



**LEGEND**

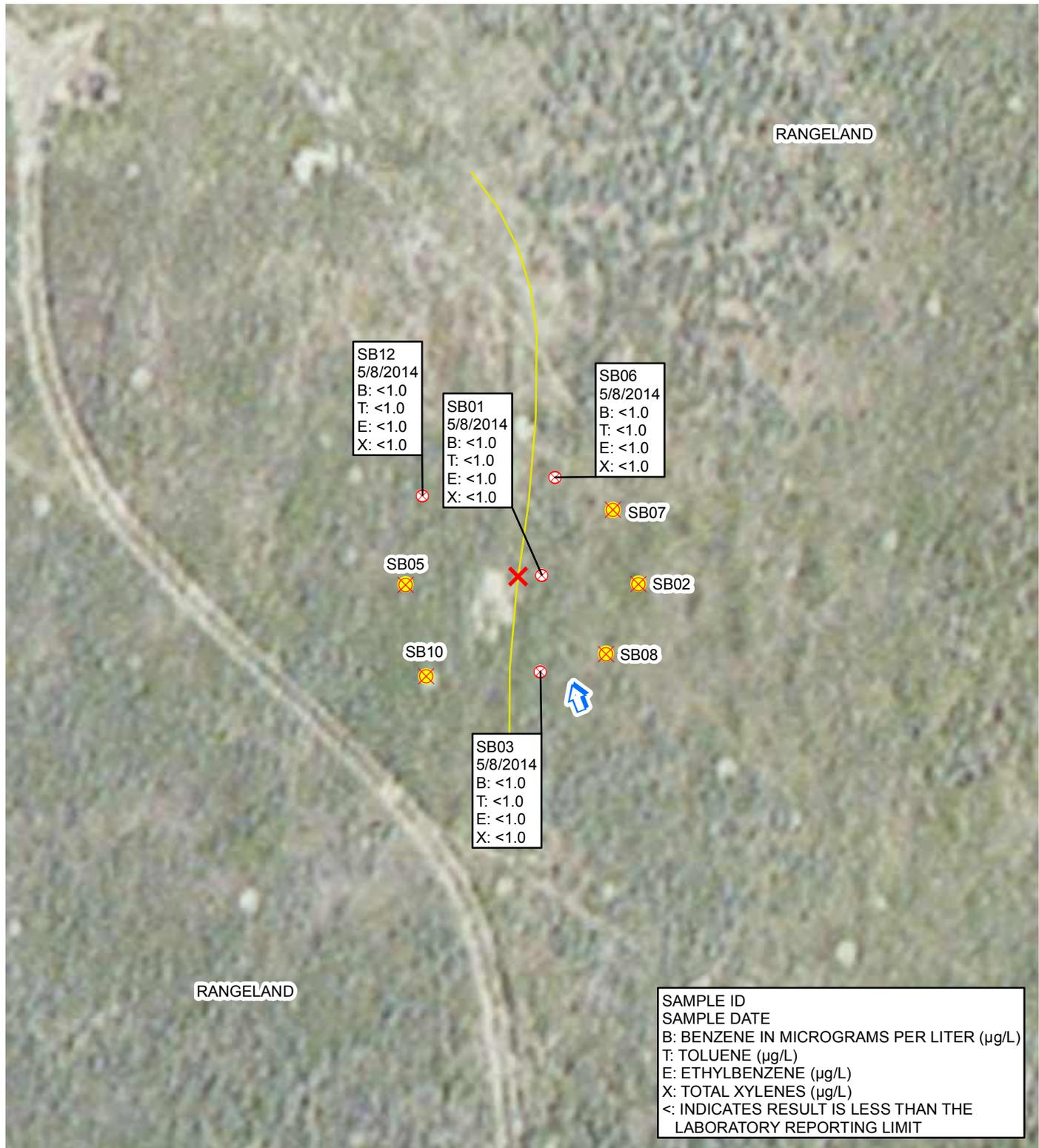
-  MONITORING WELL REMOVED FROM MONITORING PROGRAM
-  MONITORING WELL
-  RELEASE
-  CALCULATED GROUNDWATER FLOW DIRECTION
-  FLOW LINE
-  RELATIVE GROUNDWATER ELEVATION CONTOUR  
CONTOUR INTERVAL = 0.10 FEET  
GRADIENT = 0.006 FEET/FOOT

IMAGE COURTESY OF ESRI



**FIGURE 2**  
**RELATIVE GROUNDWATER ELEVATION MAP**  
 MAY 8, 2014  
 KARCH BLUE D 24-11 FLOW LINE  
 WELD COUNTY, COLORADO  
**NOBLE ENERGY, INC.**



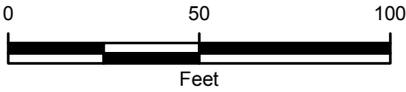


SAMPLE ID  
 SAMPLE DATE  
 B: BENZENE IN MICROGRAMS PER LITER ( $\mu\text{g/L}$ )  
 T: TOLUENE ( $\mu\text{g/L}$ )  
 E: ETHYLBENZENE ( $\mu\text{g/L}$ )  
 X: TOTAL XYLENES ( $\mu\text{g/L}$ )  
 <: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT

IMAGE COURTESY OF ESRI

**LEGEND**

-  MONITORING WELL REMOVED FROM MONITORING PROGRAM
-  RELEASE
-  MONITORING WELL
-  CALCULATED GROUNDWATER FLOW DIRECTION
-  FLOW LINE



**FIGURE 3**  
**GROUNDWATER ANALYTICAL RESULTS**  
**KARCH BLUE D 24-11 FLOW LINE**  
**WELD COUNTY, COLORADO**



**NOBLE ENERGY, INC.**

## **TABLE**

TABLE 1

**GROUNDWATER ANALYTICAL RESULTS  
KARCH BLUE D 24-11 FLOW LINE  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
SB01	5/23/2013	7.62	87.32	<b>205</b>	23.3	275	192
	8/27/2013	8.54	86.40	<b>37</b>	<1.0	164	<1.0
	11/18/2013	8.32	86.62	<b>54.4</b>	<1.0	177	<1.0
	2/20/2014	8.75	86.19	<b>14.0</b>	<2.0	103	<2.0
	5/8/2014	8.35	86.59	<1.0	<1.0	<1.0	<1.0
SB02	5/23/2013	6.98	87.41	<1.0	<1.0	<1.0	<1.0
	8/27/2013	7.96	86.43	<1.0	<1.0	<1.0	<1.0
	11/18/2013	7.73	86.66	<1.0	<1.0	<1.0	<1.0
	2/20/2014	8.22	86.17	<1.0	<1.0	<1.0	<1.0
Removed from monitoring program							
SB03	5/23/2013	7.15	87.64	<1.0	<1.0	<1.0	<1.0
	8/27/2013	8.15	86.64	<1.0	<1.0	<1.0	<1.0
	11/18/2013	7.87	86.92	<1.0	<1.0	<1.0	<1.0
	2/20/2014	8.42	86.37	<1.0	<1.0	<1.0	<1.0
	5/8/2014	7.95	86.84	<1.0	<1.0	<1.0	<1.0
SB05	5/23/2013	8.43	87.35	<1.0	1.23	<1.0	<1.0
	8/27/2013	9.43	86.35	<1.0	<1.0	<1.0	<1.0
	11/18/2013	9.25	86.53	<1.0	<1.0	<1.0	<1.0
	2/20/2014	9.65	86.13	<1.0	<1.0	<1.0	<1.0
Removed from monitoring program							
SB06	5/23/2013	7.91	87.07	<1.0	0.960	<1.0	4.43
	8/27/2013	8.84	86.14	<1.0	<1.0	<1.0	<1.0
	11/18/2013	8.62	86.36	<1.0	<1.0	<1.0	<1.0
	2/20/2014	9.05	85.93	<1.0	<1.0	<1.0	<1.0
	5/8/2014	8.60	86.38	<1.0	<1.0	<1.0	<1.0
SB07	5/23/2013	7.33	87.23	<1.0	<1.0	<1.0	2.42
	8/27/2013	8.30	86.26	<1.0	<1.0	<1.0	<1.0
	11/18/2013	8.02	86.54	<1.0	<1.0	<1.0	<1.0
	2/20/2014	8.50	86.06	<1.0	<1.0	<1.0	<1.0
Removed from monitoring program							
SB08	5/23/2013	7.33	87.41	<1.0	<1.0	<1.0	<1.0
	8/27/2013	8.31	86.43	<1.0	<1.0	<1.0	<1.0
	11/18/2013	8.07	86.67	<1.0	<1.0	<1.0	<1.0
	2/20/2014	8.36	86.38	<1.0	<1.0	<1.0	<1.0
Removed from monitoring program							

TABLE 1 (Continued)

**GROUNDWATER ANALYTICAL RESULTS  
KARCH BLUE D 24-11 FLOW LINE  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
SB10	5/23/2013	7.80	87.57	<1.0	<1.0	<1.0	<1.0
	8/27/2013	8.82	86.55	<1.0	<1.0	<1.0	<1.0
	11/18/2013	8.60	86.77	<1.0	<1.0	<1.0	<1.0
	2/20/2014	9.10	86.27	<1.0	<1.0	<1.0	<1.0
Removed from monitoring program							
SB12	5/23/2013	8.37	87.24	<1.0	1.24	<1.0	<1.0
	8/27/2013	9.56	86.05	<1.0	<1.0	<1.0	<1.0
	11/18/2013	9.20	86.41	<1.0	<1.0	<1.0	<1.0
	2/20/2014	9.71	85.90	<1.0	<1.0	<1.0	<1.0
	5/8/2014	9.31	86.30	<1.0	<1.0	<1.0	<1.0
<b>CDPHE WQCC Reg 41</b>				<b>5.0</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

btoc - below top of casing

µg/L - micrograms per liter

< - indicates result is less than the stated laboratory method reporting limit

**BOLD** indicates result exceeds the applicable standard

Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260C

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment-Water Quality

Control Commission Regulation 41-The Basic Standards for Ground Water

**ATTACHMENT**  
**LABORATORY ANALYTICAL REPORT**



May 13, 2014

LT Environmental, Inc.

Charles Greeson

4600 West 60th Avenue

Arvada CO 80003

Project Name - Noble - Karch Blue D 24-11

Project Number - 008313023

Attached are your analytical results for Noble - Karch Blue D 24-11 received by Origins Laboratory, Inc. May 08, 2014. This project is associated with Origins project number X405093-01.

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

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Charles Greeson  
Project Number: 008313023  
Project: Noble - Karch Blue D 24-11

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB03	X405093-01	Water	May 8, 2014 11:15	05/08/2014 17:00
SB06	X405093-02	Water	May 8, 2014 11:20	05/08/2014 17:00
SB12	X405093-03	Water	May 8, 2014 11:25	05/08/2014 17:00
SB01	X405093-04	Water	May 8, 2014 11:30	05/08/2014 17:00

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.*

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

www.originslaboratory.com

page 1 of 1

**ORIGINS** LABORATORY, INC

**X405093**

Client: LTE Project Manager/Send Report To: Charles Greeson

Address: \_\_\_\_\_ Email Address: CGreeson@Ltenv.com

Telephone Number: \_\_\_\_\_ Project Name/Number: Karch Blue D24-11, 008313023

\_\_\_\_\_ Samples Collected By: Jayson Evangelista

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

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis/Method	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Canister #			Other
SB03	5/8/14	1115	3	X				X				BTEX	1
SB06	↓	1120	↓	↓				↓					2
SB12	↓	1125	↓	↓				↓					3
SB01	↓	1130	↓	↓				↓					4
													5
													6
													7
													8
													9
													10

Requisitioned By: [Signature] Date: 5/8/14 Time: 1700

Requisitioned By: [Signature] Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received By: [Signature] Date: \_\_\_\_\_ Time: \_\_\_\_\_

Standard  24 Hr  48 Hr  72 Hr

Comments:

Origins Laboratory, Inc.

[Signature]

Noelle Doyle Mathis, President

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.

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

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

**Sample Receipt Checklist**

Origins Work Order: X405093 Client: LTE  
 Client Project ID: Karch Blue D24-11

Checklist Completed by: Jesse Smith Shipped Via: Pick Up  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Date/time completed: 5/9/14 8:43 Airbill #: NA

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

Cooler Number/Temperature: \_\_\_\_\_ / 1.7 °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C

Thermometer ID: 1002

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 HNO3, HCL, H2SO4) / (pH > 10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)		<input checked="" type="checkbox"/>		Samples will be analyzed within 7 Days of collection
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.

*R. Mathis*  
 Reviewed by (Project Manager) 5/13/14 11:02  
Date/Time Reviewed

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.

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

**SB03**

5/8/2014 11:15:00AM

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

**Origins Laboratory, Inc.**  
 X405093-01 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	4E09011	05/09/2014	05/12/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	101 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.6 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	"	

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.*

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

**SB06**

5/8/2014 11:20:00AM

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

**Origins Laboratory, Inc.**  
 X405093-02 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	4E09011	05/09/2014	05/12/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	101 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.0 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	"	

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.*

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

**SB12**

5/8/2014 11:25:00AM

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

**Origins Laboratory, Inc.**  
 X405093-03 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	4E09011	05/09/2014	05/12/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	102 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	99.1 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %	88.6-111			"	"	"	

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.*

Noelle Doyle Mathis, President

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

SB01

5/8/2014 11:30:00AM

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

Origins Laboratory, Inc.  
 X405093-04 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	4E09011	05/09/2014	05/12/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	102 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	100 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	88.6-111			"	"	"	

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.*

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 4E09011 - EPA 5030B (Water)

Blank (4E09011-BLK1)

Prepared: 05/09/2014 Analyzed: 05/12/2014

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>62</i>		<i>"</i>	<i>62.5</i>	<i>99.6</i>		<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>	<i>101</i>		<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63</i>		<i>"</i>	<i>62.5</i>	<i>101</i>		<i>88.6-111</i>			

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.*

Noelle Doyle Mathis, President

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 4E09011 - EPA 5030B (Water)

LCS (4E09011-BS1)

Prepared: 05/09/2014 Analyzed: 05/12/2014

Benzene	50.6	1.0	ug/L	50.0	101	75-126				
Toluene	51.1	1.0	"	50.0	102	78.7-126				
Ethylbenzene	48.5	1.0	"	50.0	96.9	81-130				
m,p-Xylene	97.4	2.0	"	100	97.4	77.2-133				
o-Xylene	48.3	1.0	"	50.0	96.5	77.9-126				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>59</i>		<i>"</i>	<i>62.5</i>	<i>94.4</i>	<i>87.3-113</i>				
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>	<i>101</i>	<i>90.9-108</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>64</i>		<i>"</i>	<i>62.5</i>	<i>103</i>	<i>88.6-111</i>				

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.*

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 4E09011 - EPA 5030B (Water)

Matrix Spike (4E09011-MS1)	Source: X405091-01			Prepared: 05/09/2014 Analyzed: 05/12/2014						
Benzene	54.9	1.0	ug/L	50.0	ND	110	74-130			
Toluene	55.2	1.0	"	50.0	ND	110	73-131			
Ethylbenzene	52.8	1.0	"	50.0	ND	106	76-132			
m,p-Xylene	106	2.0	"	100	ND	106	69-139			
o-Xylene	51.2	1.0	"	50.0	ND	102	74-131			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>92.5</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>64</i>		<i>"</i>	<i>62.5</i>		<i>102</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>88.6-111</i>			

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.*

LT Environmental, Inc.  
 4600 West 60th Avenue  
 Arvada CO 80003

Charles Greeson  
 Project Number: 008313023  
 Project: Noble - Karch Blue D 24-11

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 4E09011 - EPA 5030B (Water)

Matrix Spike Dup (4E09011-MSD1)	Source: X405091-01			Prepared: 05/09/2014 Analyzed: 05/12/2014						
Benzene	56.6	1.0	ug/L	50.0	ND	113	74-130	3.01	20	
Toluene	56.7	1.0	"	50.0	ND	113	73-131	2.82	20	
Ethylbenzene	54.1	1.0	"	50.0	ND	108	76-132	2.38	20	
m,p-Xylene	108	2.0	"	100	ND	108	69-139	2.21	20	
o-Xylene	52.6	1.0	"	50.0	ND	105	74-131	2.71	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>93.6</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>88.6-111</i>			

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.*

LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Charles Greeson  
Project Number: 008313023  
Project: Noble - Karch Blue D 24-11

---

### Notes and Definitions

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.*

---

Noelle Doyle Mathis, President