



March 17, 2014

Mr. Todd Cullum  
Base Construction Foreman                      Remediation # 8264  
Noble Energy, Inc.  
2115 117<sup>th</sup> Avenue  
Greeley, Colorado 80634

Mr. Jacob Evans  
Senior Environmental Specialist  
Noble Energy, Inc.  
1625 Broadway, Suite 2200  
Denver, Colorado 80202

RE:    **Well Installation and Groundwater Monitoring Report  
State 16-16I4 Flow Line  
Weld County, Colorado  
COGCC Tracking #2147149**

Dear Mr. Cullum and Mr. Evans:

LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), installed post-remediation groundwater monitoring wells and conducted groundwater monitoring activities at the State 16-16I4 Flow Line (Site). The Site is located approximately 0.4 miles west of the intersection of County Road 44 and County Road 55 in Weld County, Colorado. The legal site description is the southwest quarter of the southeast quarter of Section 16, Township 4 North, Range 64 West, 6<sup>th</sup> Principal Meridian. The Site Location Map is provided as Figure 1. Site history and remediation activities were described in preceding reports. The January 2014 groundwater monitoring event constitutes the first post-remediation performance groundwater monitoring event.

### **Monitoring Well Installation**

LTE personnel, under the direction of Noble, were on site January 22, 2014, to install a total of five monitoring wells (SB01 through SB05) to delineate the extent of dissolved-phase petroleum hydrocarbon impacted groundwater at the Site. The soil borings were advanced using a direct-push drill rig operated by Site Services, Inc. of Golden, Colorado. The monitoring wells were constructed of 1-inch diameter polyvinyl chloride (PVC) casing extending from the surface stickups to depths to approximately 12 to 14 feet below ground surface (bgs). The lower 10 feet of each monitoring well consists of 0.010-inch factory-slotted PVC well screen. Silica sand was placed from the bottom of each soil boring to one foot above the screened interval to act as filter pack for the monitoring well. Bentonite chips were placed from the top of the silica sand to the ground surface and hydrated to provide a seal against surface contamination and precipitation infiltration. Monitoring well locations are depicted on Figure 2. The Well Completion Diagrams are included as Attachment 1. There was no staining, odor, or elevated photo-ionization detector (PID) readings observed in any of the soil borings.

## **Soil Sampling**

Soil samples were collected for laboratory analysis based on the sample interval that exhibited visible soil staining or where the highest PID reading was observed above the groundwater saturated zone. Five soil samples (SB01@6' through SB05@6') were collected, placed on ice, and submitted with a complete chain of custody form to Origins Laboratory, Inc. of Denver, Colorado (Origins), for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, and total petroleum hydrocarbons (TPH) as gasoline range organics (GRO) by United States Environmental Protection Agency (EPA) Method 8260C and TPH as diesel range organics (DRO) by EPA Method 8015C.

## **Groundwater Sampling**

Prior to purging, depth to groundwater was measured and recorded for calculating well-specific target purge volumes and relative groundwater elevations. Depth to groundwater ranged from 5.45 feet below top of casing (btoc) in monitoring well SB03 to 6.06 feet btoc in monitoring well SB04. No light non-aqueous phase liquids were observed in any of the monitoring wells. Groundwater was calculated to flow southwest with an average hydraulic gradient of 0.007 feet per foot. The Relative Groundwater Elevation Map is provided as Figure 3. Following well development and purging, groundwater samples were collected, placed on ice, and submitted with a complete chain of custody form to Origins for analysis of BTEX by EPA Method 8260C.

## **Soil Analytical Results**

The Colorado Oil and Gas Conservation Commission (COGCC) standards for BTEX, naphthalene, and TPH in soil are 0.17 milligrams per kilogram (mg/kg), 85 mg/kg, 100 mg/kg, 175 mg/kg, 23 mg/kg, and 500 mg/kg, respectively. Soil analytical results indicate all soil samples are in compliance with applicable COGCC Table 910-1 standards. The soil analytical results are presented on Figure 4 and summarized in Table 1. The laboratory soil analytical report is included as Attachment 2.

## **Groundwater Analytical Results**

The Colorado Department of Public Health and Environment-Water Quality Control Commission has established Regulation 41-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. Groundwater analytical results indicate monitoring wells SB02 and SB03 exceeded WQCC Reg 41 for benzene at concentrations of 109  $\mu\text{g/L}$  and 262  $\mu\text{g/L}$ , respectively. All remaining samples are in compliance with applicable WQCC Reg 41 standards. Groundwater analytical results are summarized in Table 2 and presented on Figure 5 along with the current estimated benzene groundwater plume. The laboratory groundwater analytical report is included as Attachment 2.

## Summary and Conclusions

The excavation activities, in conjunction with the laboratory analytical results of soil samples collected from the well installations, indicate that all impacted soil has been removed from the Site. Groundwater remediation efforts will be described in future reports. LTE, under the direction of Noble, will continue to conduct quarterly groundwater monitoring with the goal of obtaining four consecutive quarters with laboratory analytical results in compliance with applicable WQCC Reg 41 standards. The next quarterly groundwater monitoring event is scheduled for April 2014.

LTE appreciates the opportunity to provide environmental services to Noble. Please call us at 303-433-9788 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.



Charles Greeson  
Staff Project Scientist



Chris Roy  
Project Manager

## Attachments

- Figure 1 Site Location Map
- Figure 2 Site Map
- Figure 3 Relative Groundwater Elevation Map
- Figure 4 Soil Analytical Results
- Figure 5 Groundwater Analytical Results
- Table 1 Soil Analytical Results
- Table 2 Groundwater Analytical Results
- Attachment 1 Well Completion Diagrams
- Attachment 2 Laboratory Analytical Reports

## **FIGURES**

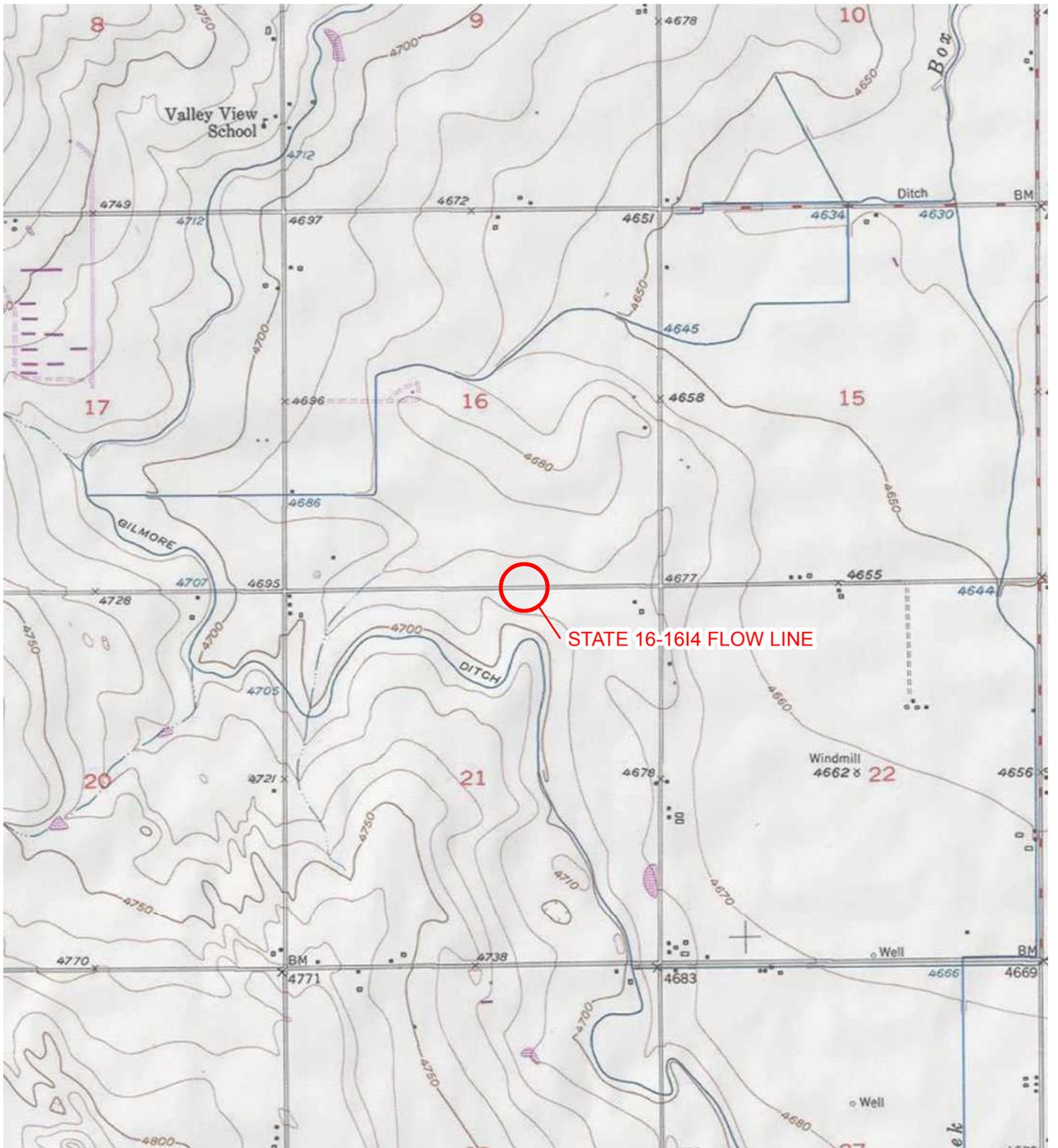
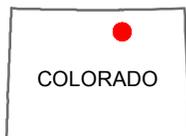
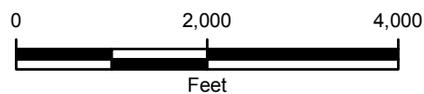


IMAGE COURTESY OF ESRI/USGS

**LEGEND**

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**STATE 16-1614 FLOW LINE**  
**WELD COUNTY, COLORADO**



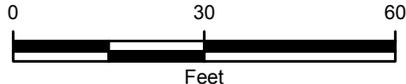
**NOBLE ENERGY, INC.**



IMAGE COURTESY OF ESRI

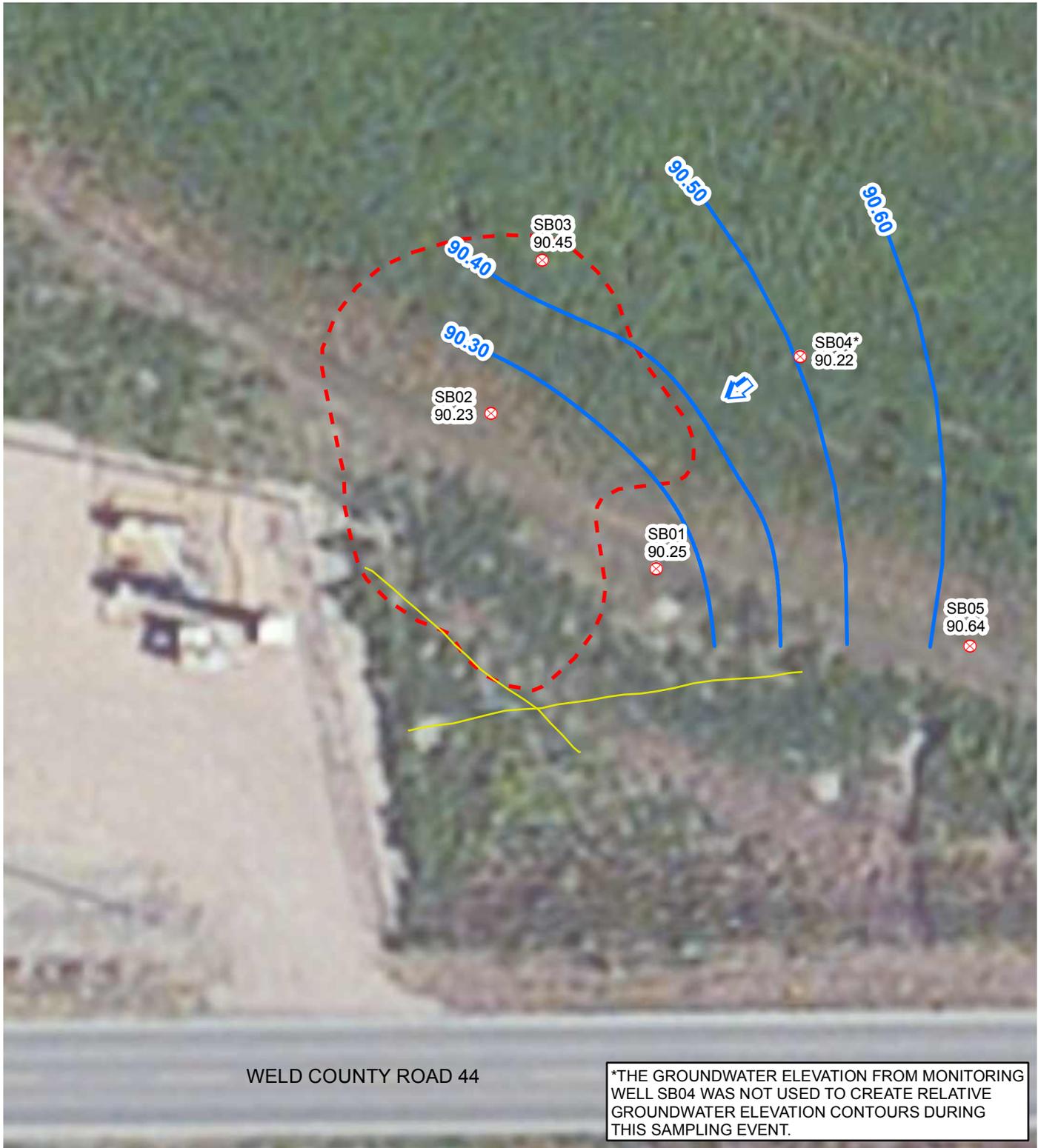
**LEGEND**

-  MONITORING WELL
-  FLOW LINE
-  EXCAVATION EXTENT



**FIGURE 2**  
**SITE MAP**  
**STATE 16-1614 FLOW LINE**  
**WELD COUNTY, COLORADO**  
  
**NOBLE ENERGY, INC.**



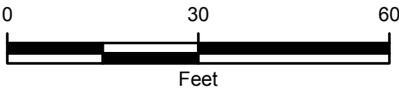


\*THE GROUNDWATER ELEVATION FROM MONITORING WELL SB04 WAS NOT USED TO CREATE RELATIVE GROUNDWATER ELEVATION CONTOURS DURING THIS SAMPLING EVENT.

IMAGE COURTESY OF ESRI

**LEGEND**

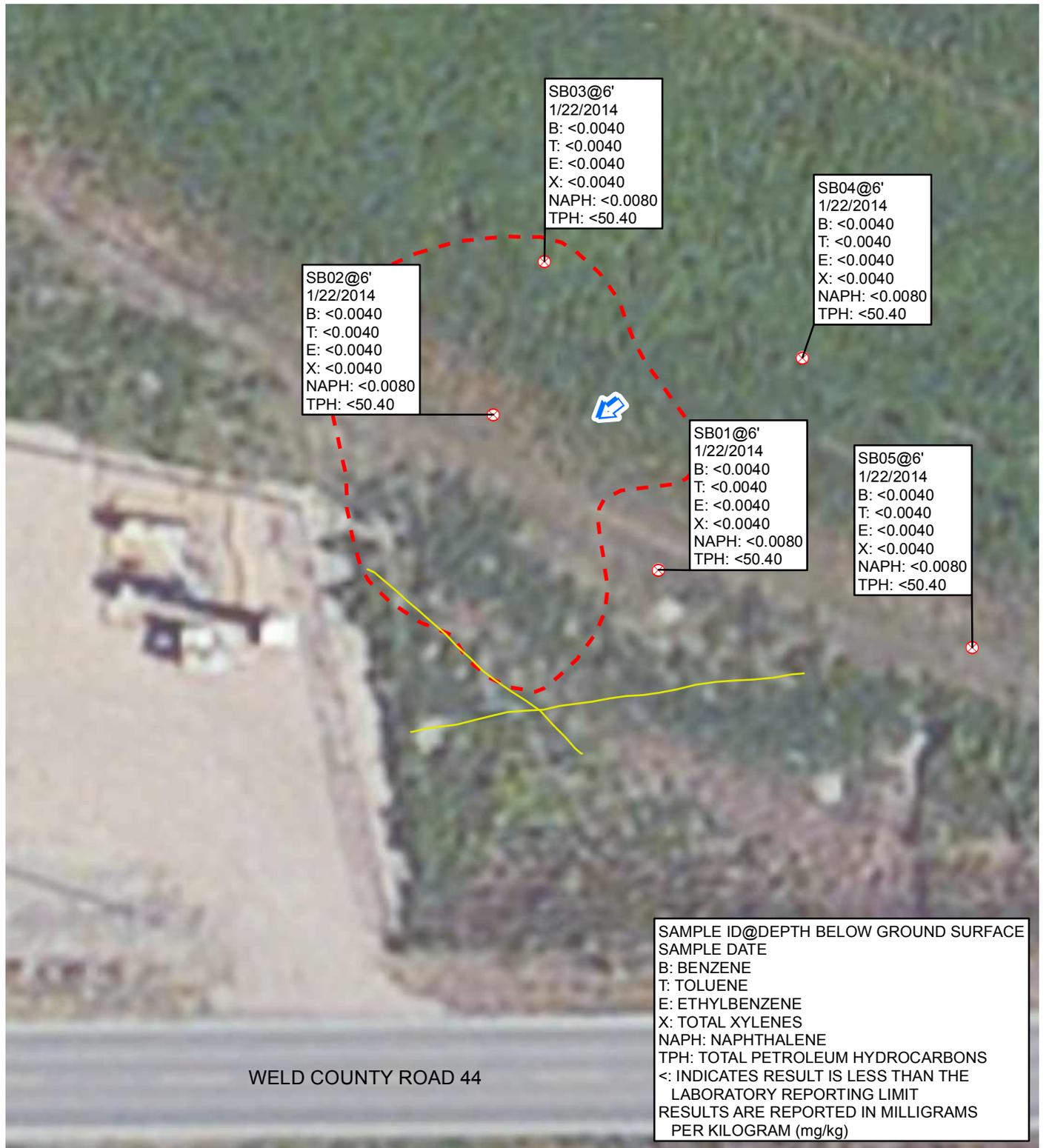
- MONITORING WELL
- CALCULATED GROUNDWATER FLOW DIRECTION
- FLOW LINE
- EXCAVATION EXTENT
- RELATIVE GROUNDWATER ELEVATION CONTOUR  
CONTOUR INTERVAL = 0.10 FEET  
GRADIENT = 0.007 FEET/FOOT



**FIGURE 3**  
**RELATIVE GROUNDWATER ELEVATION MAP**  
**STATE 16-1614 FLOW LINE**  
**WELD COUNTY, COLORADO**

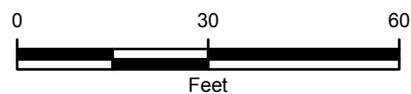
**NOBLE ENERGY, INC.**





**LEGEND**

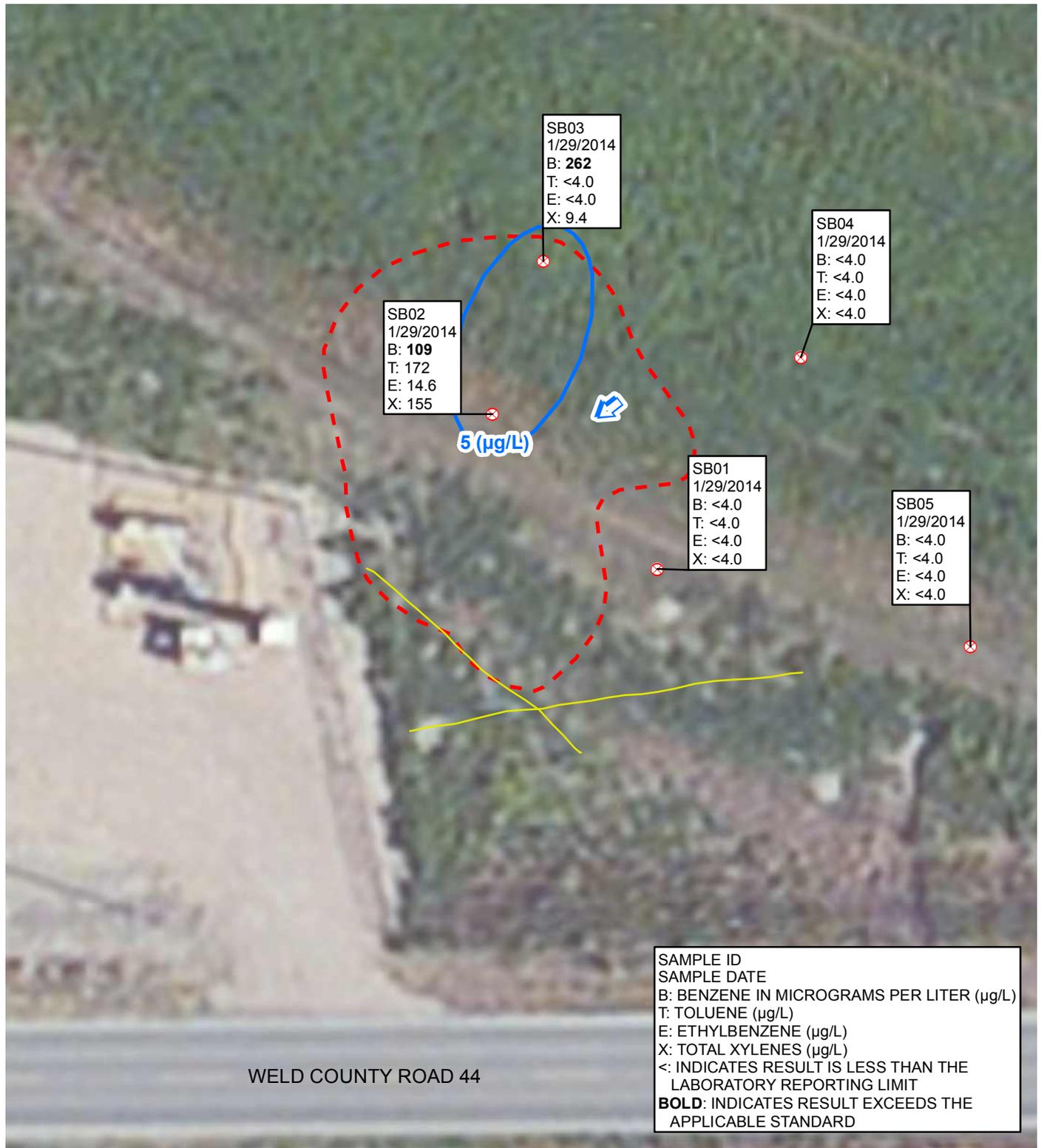
-  MONITORING WELL
-  CALCULATED GROUNDWATER FLOW DIRECTION
-  FLOW LINE
-  EXCAVATION EXTENT



**FIGURE 4**  
SOIL ANALYTICAL RESULTS  
STATE 16-1614 FLOW LINE  
WELD COUNTY, COLORADO

**NOBLE ENERGY, INC.**



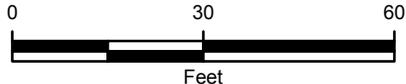


SAMPLE ID  
 SAMPLE DATE  
 B: BENZENE IN MICROGRAMS PER LITER (µg/L)  
 T: TOLUENE (µg/L)  
 E: ETHYLBENZENE (µg/L)  
 X: TOTAL XYLENES (µg/L)  
 <: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT  
**B**: INDICATES RESULT EXCEEDS THE APPLICABLE STANDARD

IMAGE COURTESY OF ESRI

**LEGEND**

- MONITORING WELL
- CALCULATED GROUNDWATER FLOW DIRECTION
- FLOW LINE
- BENZENE ISOCONCENTRATION CONTOUR (µg/L)
- EXCAVATION EXTENT



**FIGURE 5**  
**GROUNDWATER ANALYTICAL RESULTS**  
**STATE 16-1614 FLOW LINE**  
**WELD COUNTY, COLORADO**

**NOBLE ENERGY, INC.**



## **TABLES**

**TABLE 1**

**SOIL ANALYTICAL RESULTS  
STATE 16-1614 FLOW LINE  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

<b>Soil Sample ID</b>	<b>Date</b>	<b>Benzene (mg/kg)</b>	<b>Toluene (mg/kg)</b>	<b>Ethylbenzene (mg/kg)</b>	<b>Total Xylenes (mg/kg)</b>	<b>Naphthalene (mg/kg)</b>	<b>GRO (mg/kg)</b>	<b>DRO (mg/kg)</b>	<b>TPH (mg/kg)</b>
SB01@6'	1/22/2014	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.40	<50.0	<50.40
SB02@6'	1/22/2014	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.40	<50.0	<50.40
SB03@6'	1/22/2014	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.40	<50.0	<50.40
SB04@6'	1/22/2014	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.40	<50.0	<50.40
SB05@6'	1/22/2014	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.40	<50.0	<50.40
<b>COGCC Table 910-1 Standard</b>		<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>--</b>	<b>--</b>	<b>500</b>

**NOTES:**

DRO - diesel range organics analyzed by EPA Method 8015C

GRO - gasoline range organics analyzed by EPA Method 8260C

mg/kg - milligrams per kilogram

TPH - total petroleum hydrocarbons

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

-- - not applicable

COGCC - Colorado Oil and Gas Conservation Commission

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

TABLE 2

GROUNDWATER ANALYTICAL RESULTS  
 STATE 16-16I4 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	1/29/2014	6.05	90.25	<4.0	<4.0	<4.0	<4.0
SB02	1/29/2014	5.75	90.23	<b>109</b>	172	14.6	155
SB03	1/29/2014	5.45	90.45	<b>262</b>	<4.0	<4.0	9.4
SB04	1/29/2014	6.06	90.22	<4.0	<4.0	<4.0	<4.0
SB05	1/29/2014	5.68	90.64	<4.0	<4.0	<4.0	<4.0
<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 reporting limit

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

**BOLD** indicates result exceeds the applicable standard

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment-Water Quality Control Commission  
 Regulation 41-The Basic Standards for Ground Water

**ATTACHMENT 1**  
**WELL COMPLETION DIAGRAMS**



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**LT Environmental, Inc.**  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

**BORING/WELL NO.:** SB01  
**DATE:** 1/22/14  
**LOGGED BY:** Bill Baldwin  
**DRILL MTHD:** Direct Push

**PROJECT:** State 16-1614  
**PROJECT NO.:** 008313110  
**DRILLED BY:** Site Services  
**SAMPLE MTHD:** Continuous

**DETECTOR:** MultiRae 3000  
**GRAVEL PACK:** 10-20 Silica Sand  
**CASING TYPE:** SCH. 40 PVC  
**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"  
**SEAL:** Bent. Chips  
**CASING DIA.:** 1"  
**SCREEN SLOT:** 0.010"

**TD:** 12'      **DTW:** 6'  
**GROUT:** NA  
**CASING LENGTH:** 2'  
**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Dry			0		Backfill	SM: Sand - 0'-1' - silty, brown, dry, no odor	
			Moist			4/5			CL: Clay - 1'-2' - brown, moist, dense, no odor	
						4/5			CL: Clay - 2'-4' - brown, moist, dense, plastic, no odor	
			Wet	MW01 @ 6'		5			SP: Sand - 4'-12' - fine grained, some silt, light brown, moist, wet at 6', no odor	
						4/5				
						10				
						2/2				



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**LT Environmental, Inc.**  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

**BORING/WELL NO.:** SB02  
**DATE:** 1/22/14  
**LOGGED BY:** Bill Baldwin  
**DRILL MTHD:** Direct Push

**PROJECT:** State 16-1614  
**PROJECT NO.:** 008313110  
**DRILLED BY:** Site Services  
**SAMPLE MTHD:** Continuous

**DETECTOR:** MultiRae 3000  
**GRAVEL PACK:** 10-20 Silica Sand  
**CASING TYPE:** SCH. 40 PVC  
**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"  
**SEAL:** Bent. Chips  
**CASING DIA.:** 1"  
**SCREEN SLOT:** 0.010"

**TD:** 12'      **DTW:** 6'  
**GROUT:** NA  
**CASING LENGTH:** 2'  
**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Dry			0	Backfill		SP: Sand - 0'-3.5' - fine grained, little clay, little gravel, brown, no odor	
	0.0		Moist			2/5				
	0.0					5			SP: Sand - 3.5'-5' - fine grained, little gravel, brown, no odor	
						5			SC: Sand - 5'-7' - fine grained, clayey, little gravel, brown, wet, no odor	
	3.3		Wet	MW02 @ 6'		2/5			CL: Clay - 7'-10' - little gravel, brown, wet, plastic, no odor	
	3.2					10			SP: Sand - 10'-12' - fine grained, light brown, wet, no odor	
	0.0					1/2				



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**LT Environmental, Inc.**  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

**BORING/WELL NO.:** SB03  
**DATE:** 1/22/14  
**LOGGED BY:** Bill Baldwin  
**DRILL MTHD:** Direct Push

**PROJECT:** State 16-1614  
**PROJECT NO.:** 008313110  
**DRILLED BY:** Site Services  
**SAMPLE MTHD:** Continuous

**DETECTOR:** MultiRae 3000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

**SCREEN SLOT:** 0.010"

**TD:** 12'      **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 2'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Moist			0	SC		SC: Sand - 0'-10' - fine grained, clayey, some gravel, brown, moist, no odor	
0.0						1/5				
0.0						5				
			Wet	MW03 @ 6'		6				
0.2						2/5				
0.0						10	SP		SP: Sand - 10'-12' - fine grained, light brown, wet, no odor	
0.0						2/2				



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 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

**BORING/WELL NO.:** SB04  
**DATE:** 1/22/14  
**LOGGED BY:** Bill Baldwin  
**DRILL MTHD:** Direct Push

**PROJECT:** State 16-1614  
**PROJECT NO.:** 008313110  
**DRILLED BY:** Site Services  
**SAMPLE MTHD:** Continuous

**DETECTOR:** MultiRae 3000  
**GRAVEL PACK:** 10-20 Silica Sand  
**CASING TYPE:** SCH. 40 PVC  
**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"  
**SEAL:** Bent. Chips  
**CASING DIA.:** 1"  
**SCREEN SLOT:** 0.010"

**TD:** 12'      **DTW:** 6'  
**GROUT:** NA  
**CASING LENGTH:** 2'  
**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Moist			0	SP		SP: Sand - 0'-5' - fine grained, brown, moderate plasticity, no odor	
0.0						3/5				
0.0						5			SP: Sand - 5'-12' - fine grained, light brown, wet, no odor	
			Wet	MW04 @ 6'		5/5				
0.0						10				
0.0						2/2				



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**LT Environmental, Inc.**  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

**BORING/WELL NO.:** SB05  
**DATE:** 1/22/14  
**LOGGED BY:** Bill Baldwin  
**DRILL MTHD:** Direct Push

**PROJECT:** State 16-1614  
**PROJECT NO.:** 008313110  
**DRILLED BY:** Site Services  
**SAMPLE MTHD:** Continuous

**DETECTOR:** MultiRae 3000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

**SCREEN SLOT:** 0.010"

**TD:** 14'      **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 4'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Moist			0	SP		SP: Sand - 0'-5' - fine grained, moist, no odor 6" clay lense at 3', brown, no odor	
0.0						3/5				
0.0						5			SP: Sand - 5'-14' - light brown, wet, no odor	
			Wet	MW05 @ 6'		6				
0.0						3/5				
0.0						10				
0.0						4/4				

**ATTACHMENT 2**  
**LABORATORY ANALYTICAL REPORTS**



January 27, 2014

LT Environmental, Inc.

Chris Roy

4600 West 60th Avenue

Arvada CO 80003

Project Name - Noble - State 16-1614

Project Number - 008313110

Attached are your analytical results for Noble - State 16-1614 received by Origins Laboratory, Inc. January 22, 2014. This project is associated with Origins project number X401236-01.

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

Chris Roy  
Project Number: 008313110  
Project: Noble - State 16-1614

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB01 @ 6'	X401236-01	Soil	January 22, 2014 9:25	01/22/2014 17:00
SB02 @ 6'	X401236-02	Soil	January 22, 2014 9:46	01/22/2014 17:00
SB03 @ 6'	X401236-03	Soil	January 22, 2014 10:15	01/22/2014 17:00
SB04 @ 6'	X401236-04	Soil	January 22, 2014 11:15	01/22/2014 17:00
SB05 @ 6'	X401236-05	Soil	January 22, 2014 11:45	01/22/2014 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.*

Noelle Doyle Mathis, President



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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

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

Sample Receipt Checklist

Origins Work Order: X401236 Client: LTE  
 Client Project ID: State 16-1614  
 Checklist Completed by: Jeff Smith Shipped Via: Pick Up  
 Date/time completed: 1/22/14 17:25 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Airbill #: NA  
 Matrix(s) Received: (check all that apply)  Soil/Solid  Water  Other \_\_\_\_\_  
 Cooler Number/Temperature: 1 / 11.8 °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C (Describe) \_\_\_\_\_ °C  
 Thermometer ID: T002

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>	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>1)?</sup>	X			
Was adequate sample volume provided <sup>1)?</sup>	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>1)?</sup>		X		
Is a chain-of-custody (COC) present and filled out completely <sup>1)?</sup>	X			
Does the COC agree with the number and type of sample bottles received <sup>1)?</sup>	X			
Do the sample IDs on the bottle labels match the COC <sup>1)?</sup>	X			
Is the COC properly relinquished by the client with date and time recorded <sup>1)?</sup>	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	Soil
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)			X	Soil
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 in the additional comments (above) and the case narrative.

Reviewed by: [Signature] Date/Time Reviewed: 1/25/13 1145

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB01 @ 6'  
 1/22/2014 9:25:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401236-01 (Soil)

### Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	4A23010	01/23/2014	01/23/2014	
<i>Surrogate: o-Terphenyl</i>	113 %	59-131			"	"	"	

### GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.40	mg/kg	1	4A23009	01/23/2014	01/27/2014	
Benzene	ND	0.0040	"	"	"	"	"	
Toluene	ND	0.0040	"	"	"	"	"	
Ethylbenzene	ND	0.0040	"	"	"	"	"	
Xylenes, total	ND	0.0040	"	"	"	"	"	
Naphthalene	ND	0.0080	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	85.9 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	105 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %	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.

Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB02 @ 6'  
 1/22/2014 9:46:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401236-02 (Soil)

### Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	4A23010	01/23/2014	01/23/2014	
<i>Surrogate: o-Terphenyl</i>	109 %	59-131			"	"	"	

### GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.40	mg/kg	1	4A23009	01/23/2014	01/27/2014	
Benzene	ND	0.0040	"	"	"	"	"	
Toluene	ND	0.0040	"	"	"	"	"	
Ethylbenzene	ND	0.0040	"	"	"	"	"	
Xylenes, total	ND	0.0040	"	"	"	"	"	
Naphthalene	ND	0.0080	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	85.1 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	107 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB03 @ 6'  
 1/22/2014 10:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401236-03 (Soil)

### Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	4A23010	01/23/2014	01/23/2014	
<i>Surrogate: o-Terphenyl</i>	106 %	59-131			"	"	"	

### GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.40	mg/kg	1	4A23009	01/23/2014	01/27/2014	
Benzene	ND	0.0040	"	"	"	"	"	
Toluene	ND	0.0040	"	"	"	"	"	
Ethylbenzene	ND	0.0040	"	"	"	"	"	
Xylenes, total	ND	0.0040	"	"	"	"	"	
Naphthalene	ND	0.0080	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	84.5 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	107 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %	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.

Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB04 @ 6'  
 1/22/2014 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401236-04 (Soil)

### Diesel Range Organics (DRO/TEPH) by EPA 8015C

Diesel (C10-C28)	ND	50.0	mg/kg	1	4A23010	01/23/2014	01/23/2014	
<i>Surrogate: o-Terphenyl</i>	115 %	59-131			"	"	"	

### GBTEX + Napthalene by 8260C

Gasoline Range Hydrocarbons	ND	0.40	mg/kg	1	4A23009	01/23/2014	01/27/2014	
Benzene	ND	0.0040	"	"	"	"	"	
Toluene	ND	0.0040	"	"	"	"	"	
Ethylbenzene	ND	0.0040	"	"	"	"	"	
Xylenes, total	ND	0.0040	"	"	"	"	"	
Naphthalene	ND	0.0080	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	82.0 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	109 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %	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.

Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB05 @ 6'

1/22/2014 11:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401236-05 (Soil)

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4A23010	01/23/2014	01/23/2014	
<i>Surrogate: o-Terphenyl</i>	112 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.40	mg/kg	1	4A23009	01/23/2014	01/27/2014	
Benzene	ND	0.0040	"	"	"	"	"	
Toluene	ND	0.0040	"	"	"	"	"	
Ethylbenzene	ND	0.0040	"	"	"	"	"	
Xylenes, total	ND	0.0040	"	"	"	"	"	
Naphthalene	ND	0.0080	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	82.4 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	104 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

**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
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Batch 4A23009 - EPA 5030 (soil)

**Blank (4A23009-BLK1)**

Prepared: 01/23/2014 Analyzed: 01/27/2014

Gasoline Range Hydrocarbons	ND	0.40	mg/kg							
Benzene	ND	0.0040	"							
Toluene	ND	0.0040	"							
Ethylbenzene	ND	0.0040	"							
Xylenes, total	ND	0.0040	"							
Naphthalene	ND	0.0080	"							
Surrogate: 1,2-Dichloroethane-d4	53		ug/kg	62.5	84.3		70-130			
Surrogate: Toluene-d8	67		"	62.5	107		70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5	103		70-130			

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

**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
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Batch 4A23009 - EPA 5030 (soil)

**LCS (4A23009-BS1)**

Prepared: 01/23/2014 Analyzed: 01/27/2014

Benzene	0.20	0.0040	mg/kg	0.200		102	70-130			
Toluene	0.21	0.0040	"	0.200		104	70-130			
Ethylbenzene	0.20	0.0040	"	0.200		98.0	70-130			
m,p-Xylene	0.39	0.0080	"	0.400		96.7	70-130			
o-Xylene	0.19	0.0040	"	0.200		95.5	70-130			
Naphthalene	0.19	0.0080	"	0.200		93.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	48		ug/kg	62.5		77.5	70-130			
Surrogate: Toluene-d8	64		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		105	70-130			

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

**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
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Batch 4A23009 - EPA 5030 (soil)

Matrix Spike (4A23009-MS1)	Source: X401212-01			Prepared: 01/23/2014 Analyzed: 01/27/2014						
Benzene	0.18	0.0040	mg/kg	0.200	ND	87.6	70-130			
Toluene	0.18	0.0040	"	0.200	ND	90.4	70-130			
Ethylbenzene	0.19	0.0040	"	0.200	ND	92.6	70-130			
m,p-Xylene	0.35	0.0080	"	0.400	ND	86.4	70-130			
o-Xylene	0.18	0.0040	"	0.200	ND	91.9	70-130			
Naphthalene	0.19	0.0080	"	0.200	ND	92.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	50		ug/kg	62.5		79.9	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.4	70-130			

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

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
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Batch 4A23009 - EPA 5030 (soil)

Matrix Spike Dup (4A23009-MSD1)	Source: X401212-01			Prepared: 01/23/2014 Analyzed: 01/27/2014						
Benzene	0.18	0.0040	mg/kg	0.200	ND	91.4	70-130	4.18	20	
Toluene	0.20	0.0040	"	0.200	ND	98.1	70-130	8.11	20	
Ethylbenzene	0.19	0.0040	"	0.200	ND	93.3	70-130	0.753	20	
m,p-Xylene	0.35	0.0080	"	0.400	ND	87.8	70-130	1.53	20	
o-Xylene	0.19	0.0040	"	0.200	ND	93.8	70-130	2.07	20	
Naphthalene	0.18	0.0080	"	0.200	ND	89.4	70-130	3.50	20	
Surrogate: 1,2-Dichloroethane-d4	49		ug/kg	62.5		78.0	70-130			
Surrogate: Toluene-d8	67		"	62.5		107	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

**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
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**Extractable Petroleum Hydrocarbons by 8015M - 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 4A23010 - EPA 3580

**Blank (4A23010-BLK1)**

Prepared: 01/23/2014 Analyzed: 01/23/2014

Diesel (C10-C28) ND 50.0 mg/kg

Surrogate: *o*-Terphenyl 58 g 50.0 117 59-131

**LCS (4A23010-BS1)**

Prepared: 01/23/2014 Analyzed: 01/23/2014

Diesel (C10-C28) 1120 50.0 mg/kg 1000 112 64-121

Surrogate: *o*-Terphenyl 61 g 50.0 122 59-131

**Matrix Spike (4A23010-MS1)**

Source: X401212-02

Prepared: 01/23/2014 Analyzed: 01/23/2014

Diesel (C10-C28) 1060 50.0 mg/kg 1000 ND 106 53-125

Surrogate: *o*-Terphenyl 55 g 50.0 110 59-131

**Matrix Spike Dup (4A23010-MSD1)**

Source: X401212-02

Prepared: 01/23/2014 Analyzed: 01/23/2014

Diesel (C10-C28) 1180 50.0 mg/kg 1000 ND 118 53-125 10.8 20

Surrogate: *o*-Terphenyl 60 g 50.0 120 59-131

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
Project Number: 008313110  
Project: Noble - State 16-1614

---

**Notes and Definitions**

ND Analyte NOT DETECTED at or above the reporting limit  
RPD Relative Percent Difference

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



January 31, 2014

LT Environmental, Inc.

Chris Roy

4600 West 60th Avenue

Arvada CO 80003

Project Name - Noble - State 16-1614

Project Number - 008313110

Attached are your analytical results for Noble - State 16-1614 received by Origins Laboratory, Inc. January 29, 2014. This project is associated with Origins project number X401303-01.

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

Chris Roy  
Project Number: 008313110  
Project: Noble - State 16-1614

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB01	X401303-01	Water	January 29, 2014 10:20	01/29/2014 16:50
SB02	X401303-02	Water	January 29, 2014 10:30	01/29/2014 16:50
SB03	X401303-03	Water	January 29, 2014 10:40	01/29/2014 16:50
SB04	X401303-04	Water	January 29, 2014 10:50	01/29/2014 16:50
SB05	X401303-05	Water	January 29, 2014 11:00	01/29/2014 16:50

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

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

Sample Receipt Checklist

Origins Work Order: X401303 Client: LTE  
 Client Project ID: State 16-16114  
 Checklist Completed by: Jeff Smith Shipped Via: Pick Up  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Date/time completed: 1/29/14 17:26 Airbill #: NA  
 Matrix(s) Received: (Check all that apply)  Soil/Solid  Water  Other: \_\_\_\_\_ (Describe)  
 Cooler Number/Temperature: 1 12.8 °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)2)</sup> ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>1)2)</sup> ?	X			
Was adequate sample volume provided <sup>1)2)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>1)2)</sup> ?		X		
Is a chain-of-custody (COC) present and filled out completely <sup>1)2)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>1)2)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>1)2)</sup> ?	X			
Is the COC properly relinquished by the client with date and time recorded <sup>1)2)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation and was it checked <sup>1)2)</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)		X		
Additional Comments (if any):				

<sup>1)2)</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 be in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature] Date/Time Reviewed 1/29/14 2209

Origins Laboratory, Inc.  
  
 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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB01

1/29/2014 10:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401303-01 (Water)

**BTEX by EPA 8260C**

Benzene	ND	4.0	ug/L	4	4A30008	01/30/2014	01/30/2014	
Toluene	ND	4.0	"	"	"	"	"	
Ethylbenzene	ND	4.0	"	"	"	"	"	
Xylenes, total	ND	4.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	99.5 %	84-121			"	"	"	
Surrogate: Toluene-d8	102 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.7 %	84-114			"	"	"	

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB02

1/29/2014 10:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401303-02 (Water)

**BTEX by EPA 8260C**

Benzene	109	4.0	ug/L	4	4A30008	01/30/2014	01/30/2014	
Toluene	172	4.0	"	"	"	"	"	
Ethylbenzene	14.6	4.0	"	"	"	"	"	
Xylenes, total	155	4.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	99.6 %	84-121			"	"	"	
Surrogate: Toluene-d8	102 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.9 %	84-114			"	"	"	

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

**SB03**

1/29/2014 10:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 X401303-03 (Water)

**BTEX by EPA 8260C**

Benzene	262	4.0	ug/L	4	4A30008	01/30/2014	01/30/2014	
Toluene	ND	4.0	"	"	"	"	"	
Ethylbenzene	ND	4.0	"	"	"	"	"	
Xylenes, total	9.4	4.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	100 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.6 %	84-114			"	"	"	

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Chris Roy  
 Project Number: 008313110  
 Project: Noble - State 16-1614

SB04

1/29/2014 10:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401303-04 (Water)

**BTEX by EPA 8260C**

Benzene	ND	4.0	ug/L	4	4A30008	01/30/2014	01/30/2014	
Toluene	ND	4.0	"	"	"	"	"	
Ethylbenzene	ND	4.0	"	"	"	"	"	
Xylenes, total	ND	4.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	99.3 %	84-121			"	"	"	
Surrogate: Toluene-d8	101 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	96.1 %	84-114			"	"	"	

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

Chris Roy  
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 Project: Noble - State 16-1614

SB05

1/29/2014 11:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
 X401303-05 (Water)

**BTEX by EPA 8260C**

Benzene	ND	4.0	ug/L	4	4A30008	01/30/2014	01/30/2014	
Toluene	ND	4.0	"	"	"	"	"	
Ethylbenzene	ND	4.0	"	"	"	"	"	
Xylenes, total	ND	4.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	101 %	84-121			"	"	"	
<i>Surrogate: Toluene-d8</i>	101 %	85-115			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	97.2 %	84-114			"	"	"	

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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
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Batch 4A30008 - EPA 5030B (Water)

Blank (4A30008-BLK1)

Prepared: 01/30/2014 Analyzed: 01/30/2014

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>98.5</i>		<i>84-121</i>			
<i>Surrogate: Toluene-d8</i>	<i>64</i>		<i>"</i>	<i>62.5</i>	<i>102</i>		<i>85-115</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>	<i>96.7</i>		<i>84-114</i>			

Origins Laboratory, Inc.



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**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
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Batch 4A30008 - EPA 5030B (Water)

LCS (4A30008-BS1)

Prepared: 01/30/2014 Analyzed: 01/30/2014

Benzene	46.7	1.0	ug/L	50.0		93.4	74-130			
Toluene	47.2	1.0	"	50.0		94.4	76-128			
Ethylbenzene	47.6	1.0	"	50.0		95.3	78-130			
m,p-Xylene	91.0	2.0	"	100		91.0	75-134			
o-Xylene	47.4	1.0	"	50.0		94.7	76-129			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>93.6</i>	<i>84-121</i>			
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>85-115</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>61</i>		<i>"</i>	<i>62.5</i>		<i>98.1</i>	<i>84-114</i>			

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**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
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Batch 4A30008 - EPA 5030B (Water)

Matrix Spike (4A30008-MS1)	Source: X401303-01			Prepared: 01/30/2014 Analyzed: 01/30/2014						
Benzene	54.5	1.0	ug/L	50.0	ND	109	74-130			
Toluene	55.4	1.0	"	50.0	ND	111	73-131			
Ethylbenzene	55.5	1.0	"	50.0	ND	111	76-132			
m,p-Xylene	106	2.0	"	100	ND	106	69-139			
o-Xylene	54.3	1.0	"	50.0	ND	109	74-131			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>55</i>		<i>"</i>	<i>62.5</i>		<i>87.4</i>	<i>84-121</i>			
<i>Surrogate: Toluene-d8</i>	<i>64</i>		<i>"</i>	<i>62.5</i>		<i>102</i>	<i>85-115</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>60</i>		<i>"</i>	<i>62.5</i>		<i>96.3</i>	<i>84-114</i>			

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**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
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Batch 4A30008 - EPA 5030B (Water)

Matrix Spike Dup (4A30008-MSD1)	Source: X401303-01			Prepared: 01/30/2014 Analyzed: 01/30/2014						
Benzene	51.0	1.0	ug/L	50.0	ND	102	74-130	6.71	20	
Toluene	52.0	1.0	"	50.0	ND	104	73-131	6.30	20	
Ethylbenzene	51.4	1.0	"	50.0	ND	103	76-132	7.54	20	
m,p-Xylene	98.8	2.0	"	100	ND	98.8	69-139	7.22	20	
o-Xylene	50.6	1.0	"	50.0	ND	101	74-131	7.11	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>57</i>		<i>"</i>	<i>62.5</i>		<i>91.1</i>	<i>84-121</i>			
<i>Surrogate: Toluene-d8</i>	<i>64</i>		<i>"</i>	<i>62.5</i>		<i>103</i>	<i>85-115</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>59</i>		<i>"</i>	<i>62.5</i>		<i>94.9</i>	<i>84-114</i>			

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**Notes and Definitions**

ND Analyte NOT DETECTED at or above the reporting limit  
RPD Relative Percent Difference

Origins Laboratory, Inc.



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