

## **GROUNDWATER MONITORING REPORT OCTOBER 2009**

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### **UPRC 9, 9K, 10K**

On August 25, 2009, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the UPRC 9, 9K, 10K Tank Battery (Site). This sampling event constitutes the second post remediation monitoring event at this Site. Site history and remediation activities, well installation, and performance monitoring have been described in the preceding reports.

Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1. The monitoring wells (MW01, MW02, and MW03) were installed on April 14, 2009. A Site Map is presented on Figure 1.

Depth to groundwater, ranged from 2.01 feet below top of casing (btoc) in MW03 to 2.21 feet btoc in MW01, was used to calculate well-specific purge volumes. Following purging, groundwater samples were collected and preserved on ice. Samples were submitted under strict chain of custody protocol to Origins Laboratory, Inc. of Denver, Colorado for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260B.

Analytical results from the monitoring wells, presented in Table 1, indicated BTEX concentrations are in compliance with Colorado Department of Public Health and Environment-Water Quality Control Commission Regulation 41 (WQCC Reg 41). The laboratory analytical report is included in the Appendix.

LTE will continue to conduct quarterly groundwater monitoring events with the goal of observing four consecutive quarters with analytical results in compliance with WQCC Reg 41. The next quarterly groundwater sampling event is scheduled for November 2009.

## TABLE

**TABLE 1**

**GROUNDWATER ANALYTICAL DATA  
UPRC 9, 9k, 10k TANK BATTERY  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

MONITORING WELL	DATE	DEPTH TO	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	TOTAL
		WATER (feet btoc)				XYLENES (ug/L)
MW01	4/28/2009	6.12	<1.0	<1.0	<1.0	<3.0
	8/25/2009	2.21	<1.0	<1.0	<1.0	<3.0
MW02	4/28/2009	6.52	<1.0	<1.0	<1.0	<3.0
	8/25/2009	2.16	<1.0	<1.0	<1.0	<3.0
MW03	4/28/2009	6.69	2.70	<1.0	108	519.19
	8/25/2009	2.01	<1.0	<1.0	<1.0	<3.0
<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

ug/L - micrograms per liter

&lt; - indicates result is less than the stated laboratory method detection limit

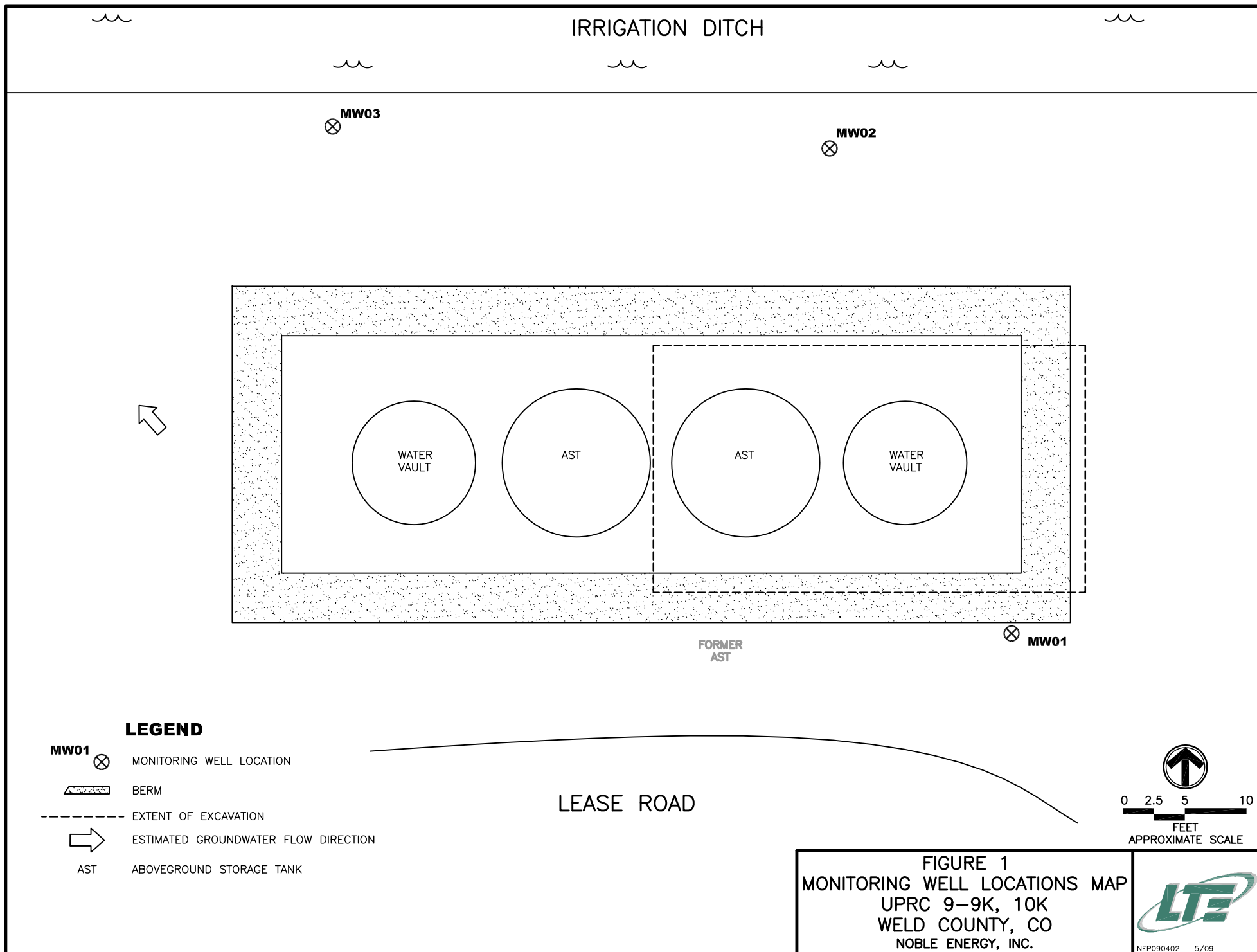
Benzene, toluene, ethylbenzene, and xylenes analyzed by EPA Method 8260B

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

Commission Regulation 41 covering Basic Standards for Groundwater



**FIGURE**



**APPENDIX**  
**ANALYTICAL REPORT**



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September 01, 2009

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

Brian Dodek  
Project Number: NEP0904  
Project: Noble – UPRC 9, 9k– 10k

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Attached are the analytical results for Noble – UPRC 9, 9k– 10k received by Origins Laboratory, Inc. 8/25/2009 4:00:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Noelle E Doyle  
Laboratory Manager

The analytical results in the following report were analyzed under the guidelines of EPA Methods specified in SW-846. The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. This laboratory report is intended solely for the above addressee and it is only to be used and or reproduced in its entirety.

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Brian Dodek  
Project Number: NEP0904  
Project: Noble – UPRC 9, 9k– 10k

#### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW01	X908091-01	Water	8/25/2009 1:40:00PM	08/25/2009 16:00
MW02	X908091-02	Water	8/25/2009 1:45:00PM	08/25/2009 16:00
MW03	X908091-03	Water	8/25/2009 1:50:00PM	08/25/2009 16:00

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager



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1608091  
page 1 of 1



originslaboratory.com

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Telephone Number: 303.433.1322  
E-Mail Address: brian.dodek@ltenv.com

Project Manager: Brian Dodek  
Project Name: UPRC 9, 9k, 10k  
Project Number: NEP0904  
Samples Collected by: M. Hyman

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air - Summa Canister #		
MW01	8/25/09	1340	2	X								1
MW02	8/25/09	1345	1								X BTEX	2
MW03	8/25/09	1350	1								X DRO/GRO	3
												4
												5
												6
												7
												8
												9
												10

Relinquished by:	Date	Time	Received by:	Date	Time	Temperature Upon Receipt:		
						Same Day	24-hr	72-hr
M. Hyman	8/25/09	1600	M. Hyman	8/25/09	1600			X
Relinquished by:	Date	Time	Received by:	Date	Time	Standard	48-hr	72-hr

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**MW01**

**X908091–01 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9H26001	08/26/2009	08/26/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	113 %	85.7–134	"	"	"
Surrogate: Toluene-d8	92.1 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	115 %	74.7–127	"	"	"

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MW02  
X908091–02 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	9H26001	08/26/2009	08/26/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	108 %	85.7–134			"	"	"
Surrogate: Toluene-d8	95.5 %	81.4–121			"	"	"
Surrogate: 4-Bromofluorobenzene	191 %	74.7–127			"	"	" S-GC

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**MW03**

**X908091–03 (Water)**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

**Origins Laboratory, Inc.**

**BTEX by EPA 8260B**

Benzene	ND	0.00100	mg/L	1	9H26001	08/26/2009	08/26/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	113 %	85.7–134	"	"	"
Surrogate: Toluene-d8	91.1 %	81.4–121	"	"	"
Surrogate: 4-Bromofluorobenzene	109 %	74.7–127	"	"	"

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**Volatile Organic Compounds by EPA Method 8260B – Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 9H26001 – EPA 5030B</b>										
<b>Blank (9H26001–BLK1)</b>										
					Prepared: 08/26/2009 Analyzed: 08/26/2009					
Benzene	ND	0.001	mg/L							
Toluene	ND	0.001	"							
Ethylbenzene	ND	0.001	"							
o-Xylene	ND	0.001	"							
m,p-Xylene	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	70.3		ug/L	62.5		112	85.7–134			
Surrogate: Toluene-d8	59.4		"	62.5		95.0	81.4–121			
Surrogate: 4-Bromofluorobenzene	72.0		"	62.5		115	74.7–127			
<b>LCS (9H26001–BS1)</b>										
					Prepared: 08/26/2009 Analyzed: 08/26/2009					
Benzene	0.04	0.001	mg/L	0.0500		87.3	74.9–126			
Toluene	0.05	0.001	"	0.0500		90.5	73.3–128			
Surrogate: 1,2-Dichloroethane-d4	68.6		ug/L	62.5		110	85.7–134			
Surrogate: Toluene-d8	56.9		"	62.5		91.0	81.4–121			
Surrogate: 4-Bromofluorobenzene	70.8		"	62.5		113	74.7–127			
<b>Matrix Spike (9H26001–MS1)</b>										
					Source: X908090–01		Prepared: 08/26/2009 Analyzed: 08/26/2009			
Benzene	0.05	0.001	mg/L	0.0500	ND	92.6	78.1–132			
Toluene	0.05	0.001	"	0.0500	ND	95.2	71.7–124			
Surrogate: 1,2-Dichloroethane-d4	70.9		ug/L	62.5		113	85.7–134			
Surrogate: Toluene-d8	56.0		"	62.5		89.6	81.4–121			
Surrogate: 4-Bromofluorobenzene	71.3		"	62.5		114	74.7–127			
<b>Matrix Spike Dup (9H26001–MSD1)</b>										
					Source: X908090–01		Prepared: 08/26/2009 Analyzed: 08/26/2009			
Benzene	0.04	0.001	mg/L	0.0500	ND	87.7	78.1–132	5.44	24.8	
Toluene	0.04	0.001	"	0.0500	ND	89.9	71.7–124	5.68	25	
Surrogate: 1,2-Dichloroethane-d4	70.0		ug/L	62.5		112	85.7–134			
Surrogate: Toluene-d8	57.3		"	62.5		91.7	81.4–121			
Surrogate: 4-Bromofluorobenzene	72.2		"	62.5		115	74.7–127			

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### Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference

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