

GROUNDWATER MONITORING REPORT JUNE 2010

PHILLIPS L30-6JI

On May 19, 2010, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the Phillips L30-6JI Tank Battery (Site). This sampling event constitutes the fourth post remediation monitoring event at this Site. Site history, remediation activities, and groundwater monitoring results have been described in preceding reports.

Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1. Monitoring wells SB06, SB08, SB10, SB12, and SB13 were installed on May 21, 2009. Monitoring wells SB18 and SB19 were installed on May 26, 2009. Monitoring well SB06 was destroyed prior to the November 20, 2009 sampling event and was reinstalled January 15, 2010 as SB06R. Monitoring well SB08 could not be located. It is assumed that SB08 is destroyed. Well locations, surface features, and current benzene concentrations are presented in Figure 1.

Depth to groundwater ranged from 2.06 feet below top of casing (btoc) in SB19 to 3.49 feet btoc in SB12 and 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.

Groundwater analytical results, presented in Table 1, indicate BTEX concentrations in SB06R, SB10, SB12, SB13, and SB18 are in compliance with the Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 41 (WQCC Reg 41). SB19 exhibited a benzene concentration of 54.8 micrograms per liter ($\mu\text{g/L}$), which is above the WQCC Reg 41 standard of 5.0 $\mu\text{g/L}$. 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 of analytical results in compliance with applicable regulatory standards. The next quarterly groundwater sampling event is scheduled for August 2010.

TABLE

TABLE 1
GROUNDWATER ANALYTICAL DATA
PHILLIPS L30-6JI
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.

MONITORING		DEPTH TO	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
WELL	DATE	(feet btoc)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
SB06	5/29/2009	3.53	<1.00	9.71	20.5	30.81
	8/4/2009	2.03	33.7	<1.00	33.4	231.6
	11/20/2009	----- Destroyed -----				
SB06R	2/18/2010	3.78	<1.00	<1.00	<1.00	<3.00
	5/19/2010	3.43	<1.00	<1.00	<1.00	<1.00
SB10	5/29/2009	2.77	<1.00	<1.00	<1.00	<3.00
	8/4/2009	2.37	2.35	<1.00	9.88	89.5
	11/20/2009	2.79	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.22	<1.00	<1.00	<1.00	<3.00
SB12	5/19/2010	2.82	<1.00	<1.00	<1.00	<1.00
	5/29/2009	3.46	103	281	69.2	861
	8/4/2009	2.75	130	31.4	15.3	174.6
	11/20/2009	3.47	3.71	62.3	12.8	115.4
	2/18/2010	3.93	3.29	<1.00	37.4	279.0
SB13	5/19/2010	3.49	1.87	2.20	57.6	442
	5/29/2009	3.1	<1.00	<1.00	<1.00	<3.00
	8/4/2009	2.39	<1.00	<1.00	<1.00	<3.00
	11/20/2009	3.11	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.60	<1.00	<1.00	<1.00	<3.00
SB18	5/19/2010	3.19	<1.00	<1.00	<1.00	<1.00
	5/29/2009	3.06	2.52	<1.00	<1.00	<3.00
	8/4/2009	2.4	<1.00	<1.00	<1.00	<3.00
	11/20/2009	3.10	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.55	<1.00	<1.00	<1.00	<3.00
SB19	5/19/2010	3.14	<1.00	<1.00	<1.00	<1.00
	5/29/2009	2.97	17.1	<1.00	<1.00	<3.00
	8/4/2009	2.34	<1.00	<1.00	<1.00	<3.00
	11/20/2009	2.02	<1.00	<1.00	<1.00	<3.00
	2/18/2010	2.51	58.5	<1.00	18.68	<3.00
	5/19/2010	2.06	54.8	<1.00	<1.00	67.1
CDPHE WQCC Reg 41			5.0	560	700	1,400

NOTES:

btoc - below top of casing

ug/L - micrograms per liter

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

Bold - indicates concentration exceeds the CDPHE WQCC Reg 41 standard

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

Commission Regulation 41 covering Basic Standards for Groundwater

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

Analytical Tables.xls



FIGURE



LEGEND

- PRODUCTION WELLHEAD
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- PERMEABLE REACTIVE BARRIER (PRB)
- EXCAVATION EXTENT

GROUNDWATER SAMPLES WERE
COLLECTED ON MAY 19, 2010

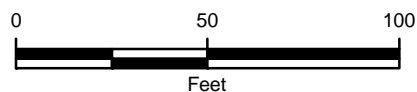


FIGURE 1
BENZENE CONCENTRATION IN GROUNDWATER
PHILLIPS L30-6JI
SEC30 - 3N - 66W
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.



APPENDIX
ANALYTICAL REPORT

5/22/2010

LT Environmental, Inc.

Matthew Harrison

4600 West 60th Avenue

Arvada

CO

80003

Project Name- Noble - Phillips L30-6JI

Project Number- NEP0909

Attached are your analytical results for Noble - Phillips L30-6JI received by Origins Laboratory, Inc. May 19, 2010 4:10 pm. This project is associated with Origins project number X005118-01 .

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.

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



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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
SB10	X005118-01	Water	5/19/2010 10:45:00AM	05/19/2010 16:10
SB18	X005118-02	Water	5/19/2010 11:15:00AM	05/19/2010 16:10
SB13	X005118-03	Water	5/19/2010 11:30:00AM	05/19/2010 16:10
SB06-R	X005118-04	Water	5/19/2010 1:00:00PM	05/19/2010 16:10
SB19	X005118-05	Water	5/19/2010 12:45:00PM	05/19/2010 16:10
SB12	X005118-06	Water	5/19/2010 12:25:00PM	05/19/2010 16:10

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 E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

www.originslaboratory.com

page 1 of 1

Client: LTE
Address:
Telephone Number:
Email Address:
Project Manager: M. Harrison
Project Name: Phillips L30-6JI
Project Number: NEP 0909
Samples Collected By: D Burns

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #			Other
SB 10	5/19/10	1045	2		X			X					1
SB 18		1115	1		X			X					2
SB 13		1130	1		X			X					3
SB 06-R		1300	1		X			X					4
SB 19		1245	1		X			X					5
SB 12		1225	1		X			X					6
													7
													8
													9
													10

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
<u>D.B.</u>	<u>5/19/10</u>	<u>1600</u>	<u>[Signature]</u>	<u>5-19-10</u>	<u>1600</u>	Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard <input type="checkbox"/>

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

Origins Laboratory, Inc.

Noelle E Doyle

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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB10

5/19/2010 10:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X005118-01 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OE21001	05/21/2010	05/21/2010	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
Xylenes, total	ND	0.00100	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	113 %	73.5-130			"	"	"	
Surrogate: Toluene-d8	87.1 %	79.3-113			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.6 %	81.5-117			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB18

5/19/2010 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X005118-02 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OE21001	05/21/2010	05/21/2010	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
Xylenes, total	ND	0.00100	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	113 %	73.5-130	"	"	"	"	"	
Surrogate: Toluene-d8	86.2 %	79.3-113	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	88.1 %	81.5-117	"	"	"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB13

5/19/2010 11:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X005118-03 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OE21001	05/21/2010	05/21/2010	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
Xylenes, total	ND	0.00100	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	73.5-130			"	"	"	
Surrogate: Toluene-d8	88.4 %	79.3-113			"	"	"	
Surrogate: 4-Bromofluorobenzene	90.6 %	81.5-117			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB06-R

5/19/2010 1:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X005118-04 (Water)

BTEX by EPA 8260B

Benzene	ND	0.00100	mg/L	1	OE21001	05/21/2010	05/21/2010	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
Xylenes, total	ND	0.00100	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	73.5-130	"	"	"	"	"	
Surrogate: Toluene-d8	87.2 %	79.3-113	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	88.8 %	81.5-117	"	"	"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB19

5/19/2010 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X005118-05 (Water)

BTEX by EPA 8260B

Benzene	0.0548	0.00100	mg/L	1	OE21001	05/21/2010	05/21/2010	
Toluene	ND	0.00100	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	
Xylenes, total	0.0671	0.00100	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	73.5-130			"	"	"	
Surrogate: Toluene-d8	87.9 %	79.3-113			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.0 %	81.5-117			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB12

5/19/2010 12:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X005118-06 (Water)

BTEX by EPA 8260B

Benzene	0.00187	0.00100	mg/L	1	OE21001	05/21/2010	05/21/2010	
Toluene	0.00220	0.00100	"	"	"	"	"	
Ethylbenzene	0.0576	0.00100	"	"	"	"	"	
Xylenes, total	0.442	0.00100	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	73.5-130			"	"	"	
Surrogate: Toluene-d8	84.9 %	79.3-113			"	"	"	
Surrogate: 4-Bromofluorobenzene	86.2 %	81.5-117			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

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
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Batch OE21001 - EPA 5030B

Blank (OE21001-BLK1)

Prepared: 05/21/2010 Analyzed: 05/21/2010

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	69.2	ug/L	62.5	111	73.5-130
Surrogate: Toluene-d8	54.4	"	62.5	87.0	79.3-113
Surrogate: 4-Bromofluorobenzene	56.7	"	62.5	90.7	81.5-117

Blank (OE21001-BLK2)

Prepared: 05/21/2010 Analyzed: 05/21/2010

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	71.6	ug/L	62.5	114	73.5-130
Surrogate: Toluene-d8	55.6	"	62.5	89.0	79.3-113
Surrogate: 4-Bromofluorobenzene	59.3	"	62.5	94.9	81.5-117

LCS (OE21001-BS1)

Prepared: 05/21/2010 Analyzed: 05/21/2010

Benzene	0.05	0.001	mg/L	0.0500	95.1	77.3-128
Toluene	0.04	0.001	"	0.0500	84.3	81.7-118

Surrogate: 1,2-Dichloroethane-d4	68.6	ug/L	62.5	110	73.5-130
Surrogate: Toluene-d8	52.9	"	62.5	84.7	79.3-113
Surrogate: 4-Bromofluorobenzene	55.4	"	62.5	88.6	81.5-117

LCS (OE21001-BS2)

Prepared: 05/21/2010 Analyzed: 05/21/2010

Benzene	0.05	0.001	mg/L	0.0500	97.1	77.3-128
Toluene	0.04	0.001	"	0.0500	88.2	81.7-118

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

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
Batch OE21001 - EPA 5030B										
LCS (OE21001-BS2)					Prepared: 05/21/2010 Analyzed: 05/21/2010					
Surrogate: 1,2-Dichloroethane-d4	72.5		ug/L	62.5		116	73.5-130			
Surrogate: Toluene-d8	53.4		"	62.5		85.5	79.3-113			
Surrogate: 4-Bromofluorobenzene	55.6		"	62.5		88.9	81.5-117			
Matrix Spike (OE21001-MS1)					Source: X005118-01		Prepared: 05/21/2010 Analyzed: 05/21/2010			
Benzene	0.05	0.001	mg/L	0.0500	ND	98.4	74.5-132			
Toluene	0.04	0.001	"	0.0500	ND	88.8	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	70.2		ug/L	62.5		112	73.5-130			
Surrogate: Toluene-d8	54.0		"	62.5		86.5	79.3-113			
Surrogate: 4-Bromofluorobenzene	56.3		"	62.5		90.0	81.5-117			
Matrix Spike (OE21001-MS2)					Source: X005118-02		Prepared: 05/21/2010 Analyzed: 05/21/2010			
Benzene	0.05	0.001	mg/L	0.0500	ND	102	74.5-132			
Toluene	0.04	0.001	"	0.0500	ND	87.3	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	73.0		ug/L	62.5		117	73.5-130			
Surrogate: Toluene-d8	54.6		"	62.5		87.3	79.3-113			
Surrogate: 4-Bromofluorobenzene	57.0		"	62.5		91.1	81.5-117			
Matrix Spike Dup (OE21001-MSD1)					Source: X005118-01		Prepared: 05/21/2010 Analyzed: 05/21/2010			
Benzene	0.05	0.001	mg/L	0.0500	ND	100	74.5-132	1.69	13.1	
Toluene	0.04	0.001	"	0.0500	ND	88.0	74.2-116	0.837	21.2	
Surrogate: 1,2-Dichloroethane-d4	73.9		ug/L	62.5		118	73.5-130			
Surrogate: Toluene-d8	53.9		"	62.5		86.2	79.3-113			
Surrogate: 4-Bromofluorobenzene	57.1		"	62.5		91.3	81.5-117			
Matrix Spike Dup (OE21001-MSD2)					Source: X005118-02		Prepared: 05/21/2010 Analyzed: 05/21/2010			
Benzene	0.05	0.001	mg/L	0.0500	ND	101	74.5-132	0.887	13.1	
Toluene	0.04	0.001	"	0.0500	ND	86.7	74.2-116	0.666	21.2	
Surrogate: 1,2-Dichloroethane-d4	73.9		ug/L	62.5		118	73.5-130			
Surrogate: Toluene-d8	53.6		"	62.5		85.7	79.3-113			
Surrogate: 4-Bromofluorobenzene	56.2		"	62.5		89.9	81.5-117			

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager



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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

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
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Batch OE21001 - EPA 5030B

Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager

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

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

Notes and Definitions

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

Origins Laboratory, Inc.



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Noelle E Doyle, Laboratory Manager