

GROUNDWATER MONITORING REPORT JANUARY 2009

STRONG 1, P-21-2, 7, 8, 9, 10J, 16, 1JI, 2JI, 7JI TANK BATTERY

On January 6, 2009, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc. (Noble) at the Strong 1, P-21-2, 7, 8, 9, 10J, 16, 1JI, 2JI, 7JI Tank Battery (Site). This sampling event constitutes the fifth post remediation monitoring event at the 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 (MW01, MW02, MW03 and MW04) were installed surrounding the tank battery excavation on October 3, 2007. A Site Map is presented on Figure 1.

Depth to groundwater, which ranged from 8.28 feet below top of casing (btoc) in MW01 to 9.86 feet btoc in MW04, was used to calculate well-specific purge volumes. Following purging, groundwater samples were collected and preserved on ice. Samples were then 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 indicate BTEX concentrations at monitoring wells MW01, MW02, and MW04 did not exceed the Colorado Groundwater Quality Standards (CGWQS) or the laboratory method detection limits. Monitoring well MW03 exhibited benzene, ethylbenzene, and total xylenes above laboratory method detection limits, but below the CGWQS. Analytical results are summarized in Table 1. The laboratory analytical report is attached as an 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 April 2009.



TABLE



TABLE 1

GROUNDWATER ANALYTICAL DATA
STRONG 1, P-21-2, 7, 8, 9, 10J, 16, 1JI, 2JI, 7JI TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.

MONITORING WELL	DATE	DEPTH TO	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
		WATER (feet btoc)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MW01	1/18/2008	8.19	<1.0	<1.0	<1.0	<2.0
	4/17/2008	9.37	<1.0	<1.0	<1.0	<2.0
	7/18/2008	8.11	<1.0	<1.0	<1.0	<3.0
	10/31/2008	7.06	<1.0	<1.0	<1.0	<3.0
	1/6/2009	8.28	<1.0	<1.0	<1.0	<3.0
MW02	1/18/2008	8.50	<1.0	<1.0	<1.0	<2.0
	4/17/2008	9.61	<1.0	<1.0	<1.0	<2.0
	7/18/2008	8.29	<1.0	<1.0	<1.0	<3.0
	10/31/2008	7.40	<1.0	<1.0	<1.0	<3.0
	1/6/2009	8.53	<1.0	<1.0	<1.0	<3.0
MW03	1/18/2008	8.95	<1.0	<1.0	29.3	65.52
	4/17/2008	10.12	<1.0	5.55	<1.0	37.8
	7/18/2008	8.70	181	<1.0	5.54	13.8
	10/31/2008	7.98	5.44	1.29	9.24	35.91
	1/6/2009	9.02	2.59	<1.0	6.71	21.36
MW04	1/18/2008	9.90	<1.0	<1.0	<1.0	<2.0
	4/17/2008	11.13	34.5	5.81	<1.0	18.87
	7/18/2008	9.50	6.94	<1.0	<1.0	<3.0
	10/31/2008	9.04	<1.0	<1.0	<1.0	2.10
	1/6/2009	9.86	<1.0	<1.0	<1.0	<3.0
CGWQS			5.0	1,000	700	1,400

NOTES:

btoc - below top of casing

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

Bold indicates concentration exceeds the CGWQS Standard

CGWQS - Colorado Groundwater Quality Standards

ug/L - micrograms per liter

< Indicates result is less than the stated laboratory method detection limit

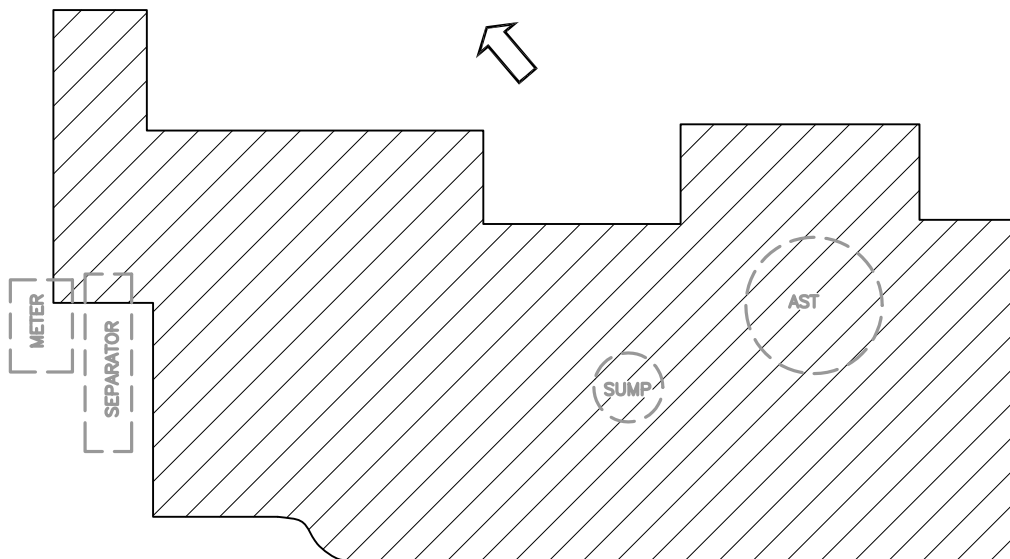
FIGURE



MW04

MW03

MW02



MW01

LEGEND

MW01  MONITORING WELL LOCATION

 EXCAVATION AREA

 ESTIMATED GROUNDWATER FLOW DIRECTION

SOURCE:
LTE SKETCH

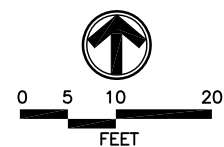


FIGURE 1
MONITORING WELL LOCATION MAP
STRONG 1, P21-2, 7, 8, 9, 10J, 16, 1JI, 2JI, 7JI
TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.



NEP072203

APPENDIX
ANALYTICAL REPORT





4640 Pecos Street | Unit C | Denver, Colorado 80211
303.433.1322 Phone 303.265.9645 Fax

January 09, 2009

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

Brian Dodek
Project Number: NEP0722
Project: Noble - Strong 1,P-21...

Attached are the analytical results for Noble - Strong 1,P-21... received by Origins Laboratory, Inc. 1/6/2009 4:01:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Laboratory Manager
Noelle E Doyle

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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Arvada CO 80003

Brian Dodek
Project Number: NEP0722
Project: Noble – Strong 1,P-21...

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW01	X901010-01	Water	1/6/2009 11:00:00AM	01/06/2009 16:01
MW02	X901010-02	Water	1/6/2009 11:05:00AM	01/06/2009 16:01
MW03	X901010-03	Water	1/6/2009 11:10:00AM	01/06/2009 16:01
MW04	X901010-04	Water	1/6/2009 11:15:00AM	01/06/2009 16:01

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek
Project Number: NEP0722
Project: Noble - Strong 1,P-21...

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originslaboratory.com

Project Manager: BDD
Project Name: Strong 1,P-21...
Project Number: NEP0722
Samples Collected by: TED

Client: LTE
Address: 4600 W 60th
Arvada 80003
Telephone Number: DN FILE
E-Mail Address:

Sample ID - Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other - ICE	Groundwater	Soil	Air - Summa Canister #		
MW01	1/6/09	1105	3	X	X	X	X	X	X	X	BTX 8260M	1
MW02	1/6/09	1105	1	X	X	X	X	X	X	X		2
MW03	1/6/09	1110	1	X	X	X	X	X	X	X		3
MW04	1/6/09	1115	1	X	X	X	X	X	X	X		4
MW05	1/6/09	1115	1	X	X	X	X	X	X	X		5
												6
												7
												8
												9
												10
Relinquished by: S-2	Date: 1/6/09	Time: 16:01										Temperature Upon Receipt: 23°C
Relinquished by:	Date:	Time:										Turn Around Time: 24 hr
												48 hr
												72 hr

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MW01

X901010-01 (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	9A07001	01/07/2009	01/08/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.5 %	70.3-123	"	"	"
Surrogate: Toluene-d8	101 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	83-123	"	"	"

Origins Laboratory, Inc.

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MW02

X901010-02 (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	9A07001	01/07/2009	01/08/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	95.9 %	70.3-123	"	"	"
Surrogate: Toluene-d8	105 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	107 %	83-123	"	"	"

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MW03

X901010-03 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	0.00259	0.00100	mg/L	1	9A07001	01/07/2009	01/08/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	0.00671	0.00100	"	"	"	"	"
o-Xylene	0.00216	0.00100	"	"	"	"	"
m,p-Xylene	0.0192	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	109 %	70.3-123	"	"	"
Surrogate: Toluene-d8	91.7 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	93.8 %	83-123	"	"	"

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MW04

X901010-04 (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	9A07001	01/07/2009	01/08/2009
Toluene	ND	0.00100	"	"	"	"	"
Ethylbenzene	ND	0.00100	"	"	"	"	"
o-Xylene	ND	0.00100	"	"	"	"	"
m,p-Xylene	ND	0.00200	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	70.3-123	"	"	"
Surrogate: Toluene-d8	103 %	75.9-123	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	83-123	"	"	"

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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
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Batch 9A07001 – EPA 5030B

Blank (9A07001–BLK1)

Prepared: 01/07/2009 Analyzed: 01/08/2009

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	61.5		ug/L	62.5		98.4	70.3–123			
Surrogate: Toluene-d8	62.6		"	62.5		100	75.9–123			
Surrogate: 4-Bromofluorobenzene	67.5		"	62.5		108	83–123			

LCS (9A07001–BS1)

Prepared: 01/07/2009 Analyzed: 01/08/2009

Benzene	0.04	0.001	mg/L	0.0500		84.1	64.2–124			
Toluene	0.04	0.001	"	0.0500		81.9	63.9–119			
Surrogate: 1,2-Dichloroethane-d4	60.4		ug/L	62.5		96.7	70.3–123			
Surrogate: Toluene-d8	62.6		"	62.5		100	75.9–123			
Surrogate: 4-Bromofluorobenzene	63.4		"	62.5		101	83–123			

Matrix Spike (9A07001–MS1)

Source: X901009–01

Prepared: 01/07/2009 Analyzed: 01/08/2009

Benzene	0.05	0.001	mg/L	0.0500	ND	90.4	64.2–124			
Toluene	0.04	0.001	"	0.0500	ND	78.4	63.9–119			
Surrogate: 1,2-Dichloroethane-d4	62.4		ug/L	62.5		99.8	70.3–123			
Surrogate: Toluene-d8	64.6		"	62.5		103	75.9–123			
Surrogate: 4-Bromofluorobenzene	60.5		"	62.5		96.8	83–123			

Matrix Spike Dup (9A07001–MSD1)

Source: X901009–01

Prepared: 01/07/2009 Analyzed: 01/08/2009

Benzene	0.04	0.001	mg/L	0.0500	ND	88.5	64.2–124	2.10	25	
Toluene	0.04	0.001	"	0.0500	ND	76.6	63.9–119	2.30	25	
Surrogate: 1,2-Dichloroethane-d4	63.2		ug/L	62.5		101	70.3–123			
Surrogate: Toluene-d8	58.8		"	62.5		94.1	75.9–123			
Surrogate: 4-Bromofluorobenzene	61.4		"	62.5		98.2	83–123			

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Notes and Definitions

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

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