



Remediation # 5137

GROUNDWATER MONITORING REPORT FEBRUARY 2011

McCLELLAN 3-1, 3-32, 3-35

On January 12, 2011, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the McClellan 3-1, 3-32, 3-35 Tank Battery (Site). This sampling event constitutes the third post remediation monitoring event at this Site. Site history, remediation activities, well installation, and performance monitoring results 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 July 15, 2010. A Site Map is presented on Figure 1.

Depth to groundwater, which ranged from 3.71 feet below top of casing (btoc) in MW02 to 4.69 feet btoc in MW01, was used to calculate well-specific purge volumes. Samples were submitted 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 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 April 2011.

TABLE

TABLE 1

**GROUNDWATER ANALYTICAL DATA
McCLELLAN 3-1, 3-32, 3-35 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

MONITORING WELL	DATE	DEPTH TO WATER (feet btoc)	BENZENE (µg/l)	TOLUENE (µg/l)	ETHYLBENZENE (µg/l)	XYLENES (µg/l)
MW01	7/20/2010	4.36	<1.0	<1.0	<1.0	<1.0
	10/21/2010	4.24	<1.0	<1.0	<1.0	<3.0
	1/12/2011	4.69	<1.0	<1.0	<1.0	<1.0
MW02	7/20/2010	3.23	<1.0	<1.0	<1.0	<1.0
	10/21/2010	3.17	<1.0	<1.0	<1.0	<3.0
	1/12/2011	3.71	<1.0	<1.0	<1.0	<1.0
MW03	7/20/2010	3.41	<1.0	<1.0	<1.0	<1.0
	10/21/2010	3.20	<1.0	<1.0	<1.0	<3.0
	1/12/2011	3.87	<1.0	<1.0	<1.0	<1.0
CDPHE WQCC Reg 41			5.0	560	700	1,400

NOTES:

btoc - below top of casing

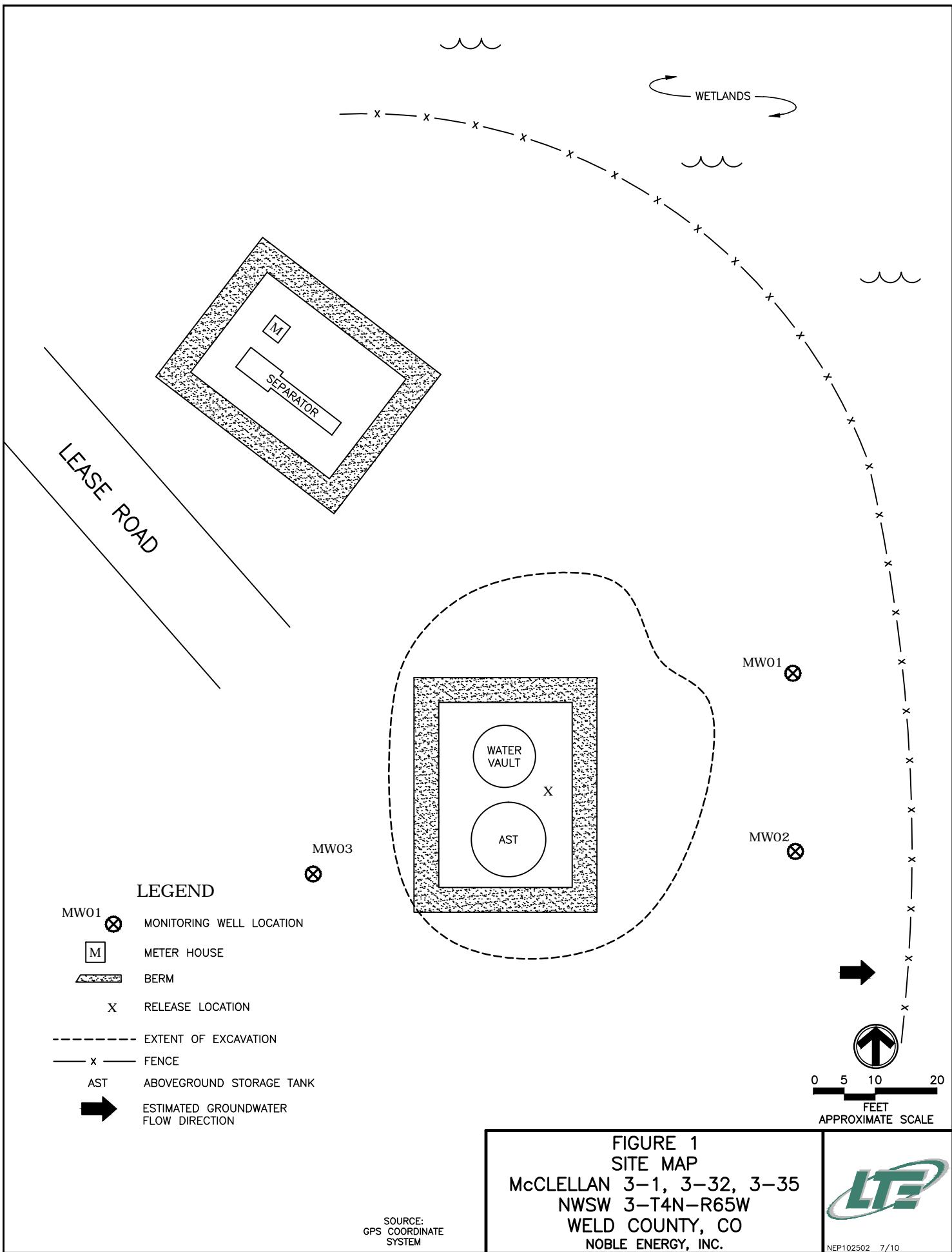
µg/l - micrograms per liter

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

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

FIGURE



APPENDIX
ANALYTICAL REPORT



January 14, 2011

LT Environmental, Inc.

Rob Rebel

4600 West 60th Avenue

Arvada CO 80003

Project Name - Noble - McClellan 3-1

Project Number NEP1025

Attached are you analytical results for Noble - McClellan 3-1 received by Origins Laboratory, Inc. 1/12/2011 3:39:00PM. This project is associated with Origins project number X101032-01.

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



4640 North Pecos Street | Unit C | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-01	X101032-01	Water	January 12, 2011 12:50	01/12/2011 15:39
MW-02	X101032-02	Water	January 12, 2011 12:55	01/12/2011 15:39
MW-03	X101032-03	Water	January 12, 2011 13:00	01/12/2011 15:39

Origins Laboratory, Inc.



Noelle E Doyle, Laboratory Manager

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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

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page 1 of 1

ORIGINS
LABORATORY, INC

Project Manager: R. Rebel
Project Name: McClellan 3-1
Project Number: NEP1025
Samples Collected By: D. Burns / B. Christopher

Client: LTE
Address:
Telephone Number:
Email Address:

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix				Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other				
MW01	1/2/11	1250	2	X											1
MW02	1/2/11	1255	1	X											2
MW03	1/2/11	1300	1	X											3
															4
															5
															6
															7
															8
															9
															10

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
[Signature]	1/2/11	1535	[Signature]	1/2/11	1539	Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input checked="" type="checkbox"/> 72 Hr <input 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

Noelle E Doyle, Laboratory Manager

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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

MW-01

1/12/2011 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X101032-01 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	1A13001	01/13/2011	01/13/2011
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	119 %	73.5-130	"	"	"
Surrogate: Toluene-d8	98.2 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

MW-02

1/12/2011 12:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X101032-02 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	1A13001	01/13/2011	01/13/2011
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	116 %	73.5-130	"	"	"
Surrogate: Toluene-d8	98.7 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

MW-03
1/12/2011 1:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X101032-03 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	1A13001	01/13/2011	01/13/2011
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	119 %	73.5-130	"	"	"
Surrogate: Toluene-d8	97.9 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

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 1A13001 - EPA 5030B

Blank (1A13001-BLK1)

Prepared: 01/13/2011 Analyzed: 01/13/2011

Benzene	ND	1.00	ug/L
Toluene	ND	1.00	"
Ethylbenzene	ND	1.00	"
m,p-Xylene	ND	2.00	"
o-Xylene	ND	1.00	"

Surrogate: 1,2-Dichloroethane-d4	73.3	"	62.5	117	73.5-130
Surrogate: Toluene-d8	61.7	"	62.5	98.7	79.3-113
Surrogate: 4-Bromofluorobenzene	65.0	"	62.5	104	81.5-117

Blank (1A13001-BLK2)

Prepared: 01/13/2011 Analyzed: 01/13/2011

Benzene	ND	1.00	ug/L
Toluene	ND	1.00	"
Ethylbenzene	ND	1.00	"
m,p-Xylene	ND	2.00	"
o-Xylene	ND	1.00	"

Surrogate: 1,2-Dichloroethane-d4	74.3	"	62.5	119	73.5-130
Surrogate: Toluene-d8	60.9	"	62.5	97.4	79.3-113
Surrogate: 4-Bromofluorobenzene	63.5	"	62.5	102	81.5-117

LCS (1A13001-BS1)

Prepared: 01/13/2011 Analyzed: 01/13/2011

Benzene	49.5	1.00	ug/L	50.0	99.0	77.3-128
Toluene	49.6	1.00	"	50.0	99.2	81.7-118

Surrogate: 1,2-Dichloroethane-d4	72.6	"	62.5	116	73.5-130
Surrogate: Toluene-d8	59.6	"	62.5	95.3	79.3-113
Surrogate: 4-Bromofluorobenzene	64.2	"	62.5	103	81.5-117

LCS (1A13001-BS2)

Prepared: 01/13/2011 Analyzed: 01/13/2011

Benzene	49.1	1.00	ug/L	50.0	98.2	77.3-128
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Arvada CO 80003

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

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 1A13001 - EPA 5030B										
LCS (1A13001-BS2)					Prepared: 01/13/2011 Analyzed: 01/13/2011					
Toluene	48.2	1.00	ug/L	50.0		96.4	81.7-118			
Surrogate: 1,2-Dichloroethane-d4	72.6		"	62.5		116	73.5-130			
Surrogate: Toluene-d8	59.3		"	62.5		94.8	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.2		"	62.5		103	81.5-117			
Matrix Spike (1A13001-MS1)		Source: X101036-08			Prepared: 01/13/2011 Analyzed: 01/13/2011					
Benzene	52.0	1.00	ug/L	50.0	ND	104	74.5-132			
Toluene	51.9	1.00	"	50.0	ND	104	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	74.0		"	62.5		118	73.5-130			
Surrogate: Toluene-d8	59.5		"	62.5		95.2	79.3-113			
Surrogate: 4-Bromofluorobenzene	66.2		"	62.5		106	81.5-117			
Matrix Spike (1A13001-MS2)		Source: X101037-01			Prepared: 01/13/2011 Analyzed: 01/13/2011					
Benzene	50.0	1.00	ug/L	50.0	ND	100	74.5-132			
Toluene	52.3	1.00	"	50.0	ND	105	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	70.8		"	62.5		113	73.5-130			
Surrogate: Toluene-d8	60.7		"	62.5		97.1	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.3		"	62.5		103	81.5-117			
Matrix Spike Dup (1A13001-MSD1)		Source: X101036-08			Prepared: 01/13/2011 Analyzed: 01/13/2011					
Benzene	51.5	1.00	ug/L	50.0	ND	103	74.5-132	0.908	13.1	
Toluene	50.2	1.00	"	50.0	ND	100	74.2-116	3.37	21.2	
Surrogate: 1,2-Dichloroethane-d4	73.2		"	62.5		117	73.5-130			
Surrogate: Toluene-d8	59.2		"	62.5		94.7	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.5		"	62.5		103	81.5-117			
Matrix Spike Dup (1A13001-MSD2)		Source: X101037-01			Prepared: 01/13/2011 Analyzed: 01/13/2011					
Benzene	52.1	1.00	ug/L	50.0	ND	104	74.5-132	4.02	13.1	

Origins Laboratory, Inc.



Noelle E Doyle, Laboratory Manager

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

Rob Rebel
Project Number: NEP1025
Project: Noble - McClellan 3-1

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 1A13001 - EPA 5030B

Matrix Spike Dup (1A13001-MSD2)		Source: X101037-01			Prepared: 01/13/2011 Analyzed: 01/13/2011					
Toluene	51.9	1.00	ug/L	50.0	ND	104	74.2-116	0.691	21.2	
Surrogate: 1,2-Dichloroethane-d4	71.9		"	62.5		115	73.5-130			
Surrogate: Toluene-d8	60.0		"	62.5		96.0	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.9		"	62.5		104	81.5-117			

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Project: Noble - McClellan 3-1

Notes and Definitions

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

Origins Laboratory, Inc.



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