



**Encana Oil & Gas (USA) Inc.**  
370 17<sup>th</sup> Street, Suite 1700  
Denver, CO 80202  
Phone: (303) 623-2300  
Fax: (303) 623-2400  
www.encana.com

July 27, 2012

Mr. Bob Chesson  
Department of Natural Resources  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, Colorado 80203-2136

RE: **Quarterly Groundwater Monitoring Report**  
**Miller 1, 2-17 Tank Battery**  
**API # 05-123-16647**  
**Facility ID: 248845**  
**COGCC Remediation # 6820**  
**SENE Section 17, T2N R67W 6PM**  
**40.141161, -104.908313**  
**Weld County, Colorado**

Dear Mr. Chesson:

Attached is the Quarterly Groundwater Monitoring Report for the Miller 1, 2-17 Tank Battery. This report details the monitoring activities conducted at the site. Please contact the Encana Oil & Gas Environmental Department at (303) 774-3962 if you have any questions or require additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew Harrison". The signature is fluid and cursive, with the first name being more prominent.

Matthew Harrison  
Environmental Coordinator  
Encana Oil & Gas (USA) Inc.

Attachments:

Miller 1,2-17 Tank Battery Groundwater Monitoring Report – July 2012



## GROUNDWATER MONITORING REPORT JULY 2012

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### MILLER 1, 2-17 TANK BATTERY

On July 2, 2012, LT Environmental, Inc. (LTE), under the direction of Encana Oil & Gas (USA) Inc. (Encana), conducted groundwater monitoring activities at the Miller 1, 2-17 (API # 05-123-16647, Facility ID: 248845) Tank Battery (Site). The Site is located at 40.141161/-104.908313, and the legal description is SENE 17-T2N-R67W 6PM. This constitutes the third post-remediation performance monitoring event at the Site. Site history and remediation activities have been described in preceding reports.

Monitoring wells MW01 through MW03 were installed on January 12, 2012, using a direct-push rig operated by High Plains Drilling of Denver, Colorado. A site map depicting monitoring well locations is presented as Figure 1. Groundwater level measurements were collected from the monitoring wells and are summarized in Table 1.

Depth to groundwater, which ranged from 10.45 feet below top of casing (btoc) in MW03 to 11.09 feet btoc in MW02, was used to calculate well-specific purge volumes. Calculated depth to groundwater below ground surface (bgs) ranged from 7.50 feet bgs in MW03 to 9.02 feet bgs in MW01. Following purging, samples were collected and then submitted to Summit Scientific of Golden, Colorado, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260B.

Groundwater analytical results, summarized in Table 1, indicate monitoring well MW03 exceeds the Colorado Department of Public Health and Environment-Water Quality Control Commission Regulation 41 (WQCC Reg 41) for benzene at 13 micrograms per liter. Monitoring wells MW01 and MW02 are in compliance with the WQCC Reg 41. The laboratory analytical report is attached.

The July 2012 groundwater monitoring event constitutes the third post-remediation quarterly monitoring event at the Site. LTE recommends continued quarterly groundwater monitoring and natural attenuation at this Site until four consecutive quarters of groundwater analytical results exhibit concentrations in compliance with the WQCC Reg 41. The next scheduled sampling event is for October 2012.

**FIGURE**



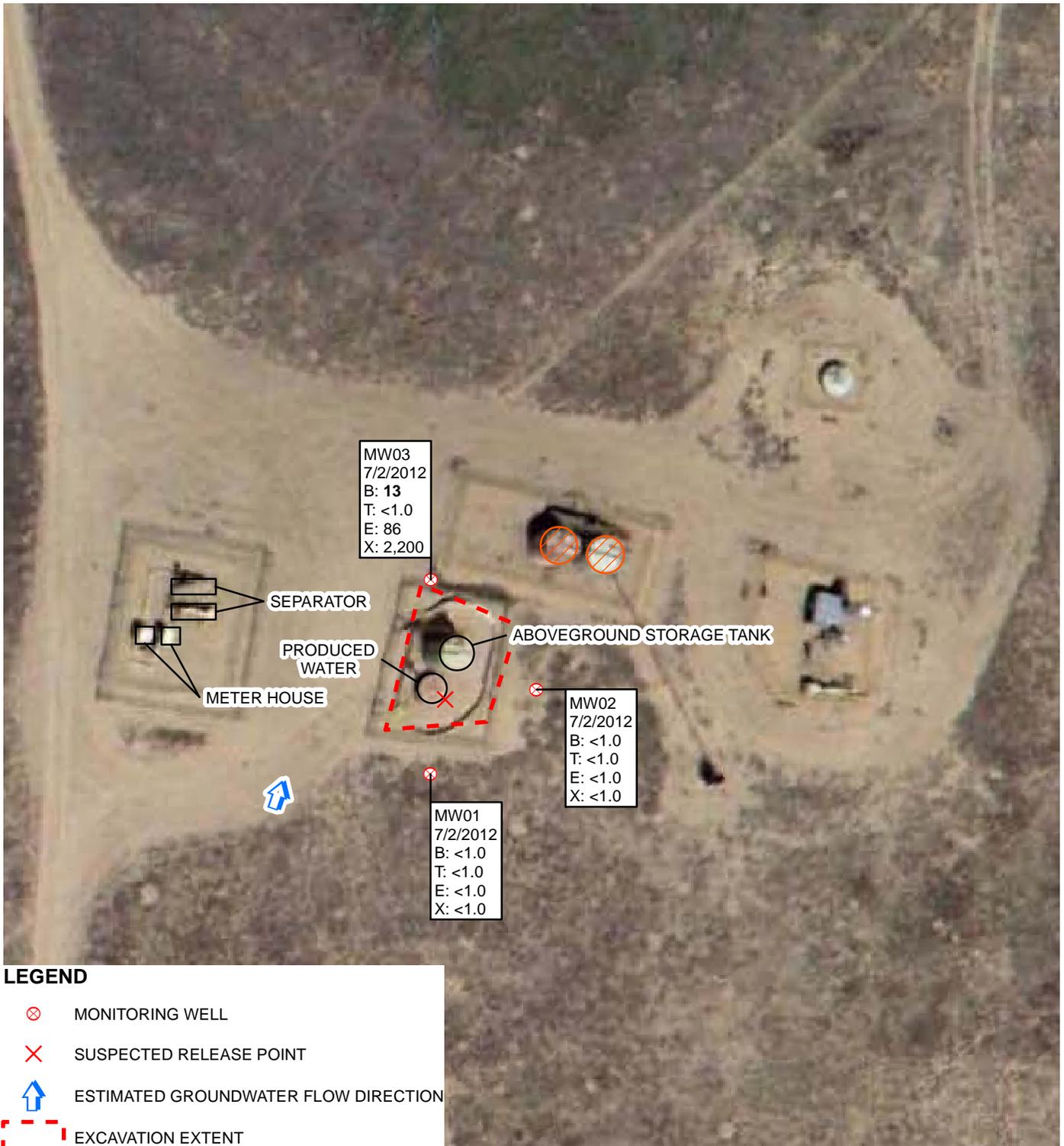


IMAGE COURTESY OF GOOGLE EARTH, 05/04/2011

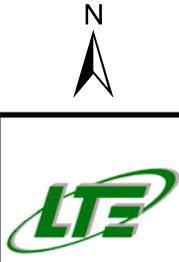
**LEGEND**

- MONITORING WELL
- SUSPECTED RELEASE POINT
- ESTIMATED GROUNDWATER FLOW DIRECTION
- EXCAVATION EXTENT
- CURRENT INFRASTRUCTURE
- MACHII-ROSS INFRASTRUCTURE

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

**FIGURE 1**  
**GROUNDWATER ANALYTICAL RESULTS**  
**MILLER 1, 2-17 TANK BATTERY**  
**WELD COUNTY, COLORADO**

**ENCANA OIL & GAS (USA) INC.**



**TABLE**



TABLE 1

GROUNDWATER ANALYTICAL RESULTS  
 MILLER 1, 2-17 TANK BATTERY  
 WELD COUNTY, COLORADO  
 ENCANA OIL & GAS (USA) INC.

Well Name	Date Sampled	Depth to Water (feet btoc)	Well Stick-Up Height (feet)	Calculated Depth to Water (feet bgs)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	1/18/2012	11.22	1.95	9.27	<1.0	1.6	<1.0	<1.0
	4/13/2012	10.73	1.95	8.78	<1.0	<1.0	<1.0	<1.0
	7/2/2012	10.97	1.95	9.02	<1.0	<1.0	<1.0	<1.0
MW02	1/18/2012	11.27	3.11	8.16	<1.0	<1.0	<1.0	<1.0
	4/13/2012	10.80	3.11	7.69	<1.0	<1.0	<1.0	<1.0
	7/2/2012	11.09	3.11	7.98	<1.0	<1.0	<1.0	<1.0
MW03	1/18/2012	10.76	2.95	7.81	<b>24</b>	<1.0	150	4,000
	4/13/2012	10.20	2.95	7.25	<b>45</b>	1.1	270	3,700
	7/2/2012	10.45	2.95	7.50	<b>13</b>	<1.0	86	2,200
<b>CDPHE WQCC Reg 41</b>					<b>5</b>	<b>560</b>	<b>700</b>	<b>10,000</b>

NOTES:

btoc - below top of casing

bgs - below ground surface

µg/L- microgram per liter

< indicates result is less than the stated laboratory reporting limit

**BOLD** indicates result exceeds applicable standard

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

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



**ATTACHMENT**  
**LABORATORY ANALYTICAL REPORT**



# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 05, 2012

Daniel Burns

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: ENC - Miller 1,2-17

Enclosed are the results of analyses for samples received by Summit Scientific on 07/02/12 16:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'BS' with a long, sweeping underline that extends to the right.

Ben Shrewsbury

President / Laboratory Director



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

Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
Project Manager: Daniel Burns

**Reported:**  
07/05/12 17:17

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	R207023-01	Water	07/02/12 11:15	07/02/12 16:30
MW02	R207023-02	Water	07/02/12 11:20	07/02/12 16:30
MW03	R207023-03	Water	07/02/12 11:25	07/02/12 16:30

Summit Scientific

*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

Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
 Project Manager: Daniel Burns

**Reported:**  
 07/05/12 17:17

**MW01**  
**R207023-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **07/02/12 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2070310	07/03/12	07/04/12	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **07/02/12 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %	49.7-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.8 %	51-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.2 %	50.1-150		"	"	"	"	

Summit Scientific

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

Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
 Project Manager: Daniel Burns

**Reported:**  
 07/05/12 17:17

**MW02**  
**R207023-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **07/02/12 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2070310	07/03/12	07/04/12	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **07/02/12 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		<i>105 %</i>	<i>49.7-150</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: Toluene-d8</i>		<i>100 %</i>	<i>51-150</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>		<i>100 %</i>	<i>50.1-150</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

Summit Scientific

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

Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
 Project Manager: Daniel Burns

**Reported:**  
 07/05/12 17:17

**MW03**  
**R207023-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **07/02/12 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>13</b>	1.0	ug/l	1	2070310	07/03/12	07/04/12	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>86</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>2200</b>	100	"	100	"	"	07/04/12	"	

Date Sampled: **07/02/12 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		100 %	49.7-150		"	"	07/04/12	"	
<i>Surrogate: Toluene-d8</i>		104 %	51-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		98.9 %	50.1-150		"	"	"	"	

Summit Scientific

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Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
Project Manager: Daniel Burns

Reported:  
07/05/12 17:17

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

Analyte	Reporting			Spike Level	Source		%REC		RPD		Notes
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit		

**Batch 2070310 - EPA 5030 Water MS**

**Blank (2070310-BLK1)**

Prepared: 07/03/12 Analyzed: 07/04/12

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	1.0	"								
Surrogate: 1,2-Dichloroethane-d4	15.4		"	13.2	116	49.7-150					
Surrogate: Toluene-d8	13.1		"	13.3	98.3	51-150					
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3	105	50.1-150					

**LCS (2070310-BS1)**

Prepared: 07/03/12 Analyzed: 07/04/12

Benzene	26.7	1.0	ug/l	33.3	80.1	56.7-114					
Toluene	27.2	1.0	"	33.3	81.5	50.7-130					
Ethylbenzene	26.9	1.0	"	33.3	80.8	54.2-143					
m,p-Xylene	54.6	2.0	"	66.7	81.9	58.3-134					
o-Xylene	27.4	1.0	"	33.3	82.2	57.4-134					
Surrogate: 1,2-Dichloroethane-d4	14.9		"	13.2	112	49.7-150					
Surrogate: Toluene-d8	13.1		"	13.3	98.6	51-150					
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3	103	50.1-150					

**LCS Dup (2070310-BSD1)**

Prepared: 07/03/12 Analyzed: 07/04/12

Benzene	27.1	1.0	ug/l	33.3	81.3	56.7-114	1.49	14.6			
Toluene	28.0	1.0	"	33.3	84.2	50.7-130	3.15	18.9			
Ethylbenzene	26.9	1.0	"	33.3	80.7	54.2-143	0.111	11.9			
m,p-Xylene	54.6	2.0	"	66.7	81.9	58.3-134	0.0916	13.7			
o-Xylene	27.4	1.0	"	33.3	82.3	57.4-134	0.0729	15			
Surrogate: 1,2-Dichloroethane-d4	15.6		"	13.2	118	49.7-150					
Surrogate: Toluene-d8	13.4		"	13.3	100	51-150					
Surrogate: 4-Bromofluorobenzene	13.7		"	13.3	103	50.1-150					

Summit Scientific

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4600 West 60th Avenue  
Arvada CO, 80003

Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
Project Manager: Daniel Burns

Reported:  
07/05/12 17:17

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 2070310 - EPA 5030 Water MS**

<b>Matrix Spike (2070310-MS1)</b>	<b>Source: R207021-01</b>			Prepared: 07/03/12		Analyzed: 07/04/12				
Benzene	26.9	1.0	ug/l	33.3	ND	80.7	33.5-135			
Toluene	27.6	1.0	"	33.3	ND	82.7	30-150			
Ethylbenzene	27.4	1.0	"	33.3	ND	82.1	30-150			
m,p-Xylene	55.7	2.0	"	66.7	ND	83.6	30-150			
o-Xylene	27.7	1.0	"	33.3	ND	83.0	44.8-147			
Surrogate: 1,2-Dichloroethane-d4	16.1		"	13.2		122	49.7-150			
Surrogate: Toluene-d8	13.2		"	13.3		99.0	51-150			
Surrogate: 4-Bromofluorobenzene	14.1		"	13.3		106	50.1-150			

<b>Matrix Spike Dup (2070310-MSD1)</b>	<b>Source: R207021-01</b>			Prepared: 07/03/12		Analyzed: 07/04/12				
Benzene	26.8	1.0	ug/l	33.3	ND	80.5	33.5-135	0.298	21.3	
Toluene	27.3	1.0	"	33.3	ND	81.9	30-150	0.948	15.5	
Ethylbenzene	27.2	1.0	"	33.3	ND	81.5	30-150	0.734	17.4	
m,p-Xylene	54.9	2.0	"	66.7	ND	82.3	30-150	1.57	18.1	
o-Xylene	27.4	1.0	"	33.3	ND	82.2	44.8-147	0.944	15	
Surrogate: 1,2-Dichloroethane-d4	16.2		"	13.2		122	49.7-150			
Surrogate: Toluene-d8	13.0		"	13.3		97.5	51-150			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		103	50.1-150			

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Project: ENC - Miller 1,2-17

Project Number: 0334-11100  
Project Manager: Daniel Burns

**Reported:**  
07/05/12 17:17

### Notes and Definitions

DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference

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Summit Scientific

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