

State of Colorado  
**Oil and Gas Conservation Commission**

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



#8110

FOR OGCC USE ONLY

**RECEIVED**  
**12/11/2013**

OGCC Employee:

☒ Spill ☐ Complaint

Inspection NOAV

Tracking No: **2145657**

**SITE INVESTIGATION AND REMEDIATION WORKPLAN**

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

**CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED**

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): \_\_\_\_\_

OGCC Operator Number: _____	Contact Name and Telephone: _____
Name of Operator: _____	_____
Address: _____	No: _____
City: _____ State: _____ Zip: _____	Fax: _____
API Number: _____	County: _____
Facility Name: _____	Facility Number: _____
Well Name: _____	Well Number: _____
Location: (QtrQtr, Sec, Twp, Rng, Meridian): _____ Latitude: _____ Longitude: _____	

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): \_\_\_\_\_

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☐ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): \_\_\_\_\_

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: \_\_\_\_\_

Potential receptors (water wells within 1/4 mi, surface waters, etc.): \_\_\_\_\_

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
Soils	_____	_____
Vegetation	_____	_____
Groundwater	_____	_____
Surface Water	_____	_____

**REMEDIALTION WORKPLAN**

Describe initial action taken (if previously provided, refer to that form or document):

Describe how source is to be removed:

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:



Tracking Number: \_\_\_\_\_  
Name of Operator: \_\_\_\_\_  
OGCC Operator No: \_\_\_\_\_  
Received Date: \_\_\_\_\_  
Well Name & No: \_\_\_\_\_  
Facility Name & No: \_\_\_\_\_

**REMEDIATION WORKPLAN (Cont.)**

\_\_\_\_\_

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required?                      Y                      N                      If yes, describe:

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

**IMPLEMENTATION SCHEDULE**

Date Site Investigation Began: \_\_\_\_\_ Date Site Investigation Completed: \_\_\_\_\_ Date Remediation Plan Submitted: \_\_\_\_\_  
Remediation Start Date: \_\_\_\_\_ Anticipated Completion Date: \_\_\_\_\_ Actual Completion Date: \_\_\_\_\_

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: \_\_\_\_\_ Signed: \_\_\_\_\_

Title: \_\_\_\_\_ Date: 12/11/2013

OGCC Approved: \_\_\_\_\_ Title: EPS Date: 12/11/2013



## **GROUNDWATER MONITORING AND WELL INSTALLATION REPORT OCTOBER 2013**

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### **KARCH BLUE DD 30-3J FLOWLINE COGCC TRACKING #2145657**

LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), conducted well installation and groundwater monitoring activities at the Karch Blue DD 30-3J Flowline (Site). Site history and remediation activities were described in previous reports. The excavated areas are split into two distinct areas referred to as the North Excavation and the South Excavation. A site location map is included as Figure 1 and a site map showing both North and South excavations is included as Figure 2. The October 2013 groundwater monitoring event constitutes the first post-remediation performance groundwater monitoring event.

#### **Soil Boring Advancement**

LTE advanced a total of 23 soil borings on August 23 and September 25 and 26, 2013. The soil borings were installed using a direct-push rig operated by ACI Services of Englewood, Colorado. Soil borings MW01 through MW11 located in the North Excavation and MW01 through MW12 located in the South Excavation were constructed as monitoring wells to allow for groundwater sampling.

The soil borings were logged by an LTE scientist and the soil was characterized by visual inspection of the collected soil samples. The total depths of the soil borings were approximately 12 feet to 14 feet below ground surface (bgs). Depth to groundwater observed in the soil borings ranged from approximately 5 feet to 6 feet bgs. The soil boring and well completion diagrams are included as Attachment 1.

#### **Soil Sampling**

Soil borings were advanced using direct-push methods and sampled using a continuous sampler on August 23 and September 25 and 26, 2013. Field measurements and soil samples were collected to identify the vertical and horizontal extent of soil impact. Soil samples were submitted for analysis based on the sample interval above the soil saturation zone that exhibited visible soil staining or where the highest photo-ionization detector (PID) reading was observed. If field screening methods indicated minimal petroleum hydrocarbon impact was present, the soil sample was collected directly above the static water level.

Six soil samples from the North Excavation (MW01@4', MW02@5', MW03@4', MW04@4', MW05@4', and MW06@5') were submitted to Summit Scientific, Inc. (Summit) of Golden, Colorado, on August 23, 2013. Twelve soil samples from the South Excavation (MW01@5', MW02@5', MW03@4', MW04@5', MW05@4', MW06@4', MW07@5', MW08@5',

MW09@5', MW10@5', MW11@5', and MW12@5') were submitted to Summit on September 25, 2013. An additional five soil samples from the North Excavation (MW07@5', MW08@5', MW09@4', MW10@5', and MW11@5') were submitted to Summit on September 26, 2013. All soil samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, and total petroleum hydrocarbons (TPH) as gasoline range organics (GRO) by United States Environmental Protection Agency (EPA) Method 8260B and TPH as diesel range organics (DRO) by EPA Method 8015.

### **Groundwater Monitoring Well Installation**

Soil borings MW01 through MW11 in the North Excavation and MW01 through MW12 in the South Excavation were completed as temporary groundwater monitoring wells. The monitoring wells were constructed of 1-inch diameter polyvinyl chloride (PVC) casing extending from the ground surface to depths of approximately 12 feet to 14 feet bgs. The lower 10 feet of each monitoring well consists of 0.010-inch factory-slotted PVC well screen. Silica sand was placed from the bottom of each well to one foot above the screen to act as a filter pack for the monitoring well. Bentonite chips were placed from the top of the silica sand to the ground surface and hydrated at each soil boring to provide a seal against surface contamination and precipitation infiltration. Well completion diagrams are included as Attachment 1.

### **Groundwater Sampling**

Groundwater samples from monitoring wells MW01 through MW11 in the North Excavation and MW01 through MW12 in the South Excavation were collected on October 15, 2013. Prior to sampling each monitoring well, depth to static groundwater was measured and recorded for calculating well-specific purge volumes. Following well development and purging, samples were collected, placed on ice and delivered with a complete chain of custody form to Origins Laboratory, Inc. of Denver, Colorado for analysis of BTEX by EPA Method 8260C.

### **Hydrogeology**

During the October 2013 monitoring event, the depth to static groundwater level at the North Excavation ranged from 4.10 feet below top of casing (btoc) in MW01 to 5.15 feet btoc in MW07 and MW10. The depth to static groundwater level at the South Excavation ranged from 4.05 feet below top of casing (btoc) in MW02 to 5.02 feet btoc in MW07. Groundwater in the North Excavation was calculated to flow north-northwest with an average hydraulic gradient of 0.005 feet per foot. Groundwater in the South Excavation was calculated to flow north-northwest with an average hydraulic gradient of 0.011 feet per foot. The relative groundwater elevations for the North Excavation and the South Excavation are depicted on Figures 3 and 4, respectively.

## **Soil Analytical Results**

The Colorado Oil and Gas Conservation Commission (COGCC) standards for BTEX in soil are 0.17 milligrams per kilogram (mg/kg), 85 mg/kg, 100 mg/kg, and 175 mg/kg, respectively. The COGCC standards for naphthalene and TPH are 23 mg/kg and 500 mg/kg, respectively.

Soil analytical results from the North Excavation are in compliance with COGCC standards. Soil analytical results from the South Excavation indicate that MW01@5' and MW04@5' exceeded the COGCC standards for TPH at concentrations of 7,700 mg/kg and 4,798 mg/kg, respectively. The soil analytical results for the North Excavation and South Excavation are presented on Figures 5 and 6 and summarized in Tables 1 and 2, respectively. The laboratory analytical reports are included as Attachment 2.

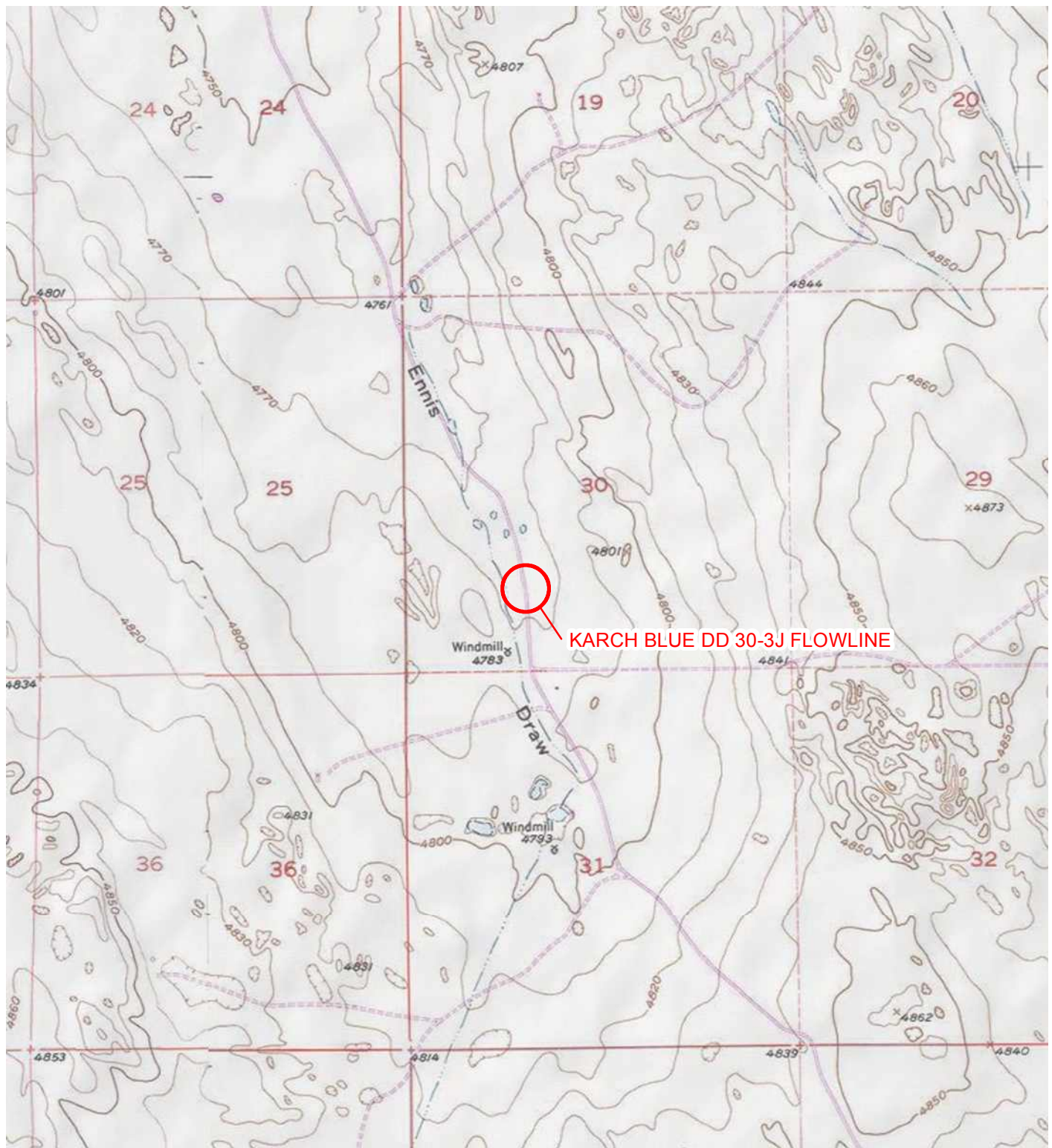
## **Groundwater Analytical Results**

The Colorado Department of Public Health and Environment-Water Quality Control Commission has established Regulation 41-The Basic Standards for Ground Water (WQCC Reg 41) for BTEX at 5.0 micrograms per liter (µg/L), 560 µg/L, 700 µg/L, and 1,400 µg/L, respectively.

Groundwater analytical results for the North Excavation indicate BTEX concentrations are in compliance with WQCC Reg 41. Groundwater analytical results for the South Excavation indicate that MW04 exceeded the WQCC Reg 41 for benzene at a concentration of 177 µg/L. Groundwater analytical results for the North Excavation and South Excavation are presented on Figures 7 and 8 and summarized in Tables 3 and 4, respectively. The laboratory analytical reports are included as Attachment 2.

LTE, under the direction of Noble, will continue to conduct quarterly groundwater monitoring with the goal of obtaining four consecutive quarters with analytical results in compliance with WQCC Reg 41. The next quarterly groundwater monitoring event is scheduled for January 2014.

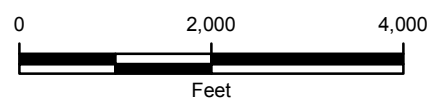
## FIGURES



**LEGEND**

 SITE LOCATION

IMAGE COURTESY OF ESRI/USGS



**FIGURE 1**  
**SITE LOCATION MAP**  
**KARCH BLUE DD 30-3J FLOWLINE**  
**NESW SEC 30 T3N-R63W**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**







**LEGEND**

 SITE LOCATION

IMAGE COURTESY OF ESRI/USGS

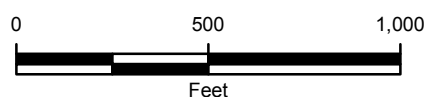


FIGURE 2  
SITE MAP  
KARCH BLUE DD 30-3J FLOWLINE  
NESW SEC 30 T3N-R63W  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.





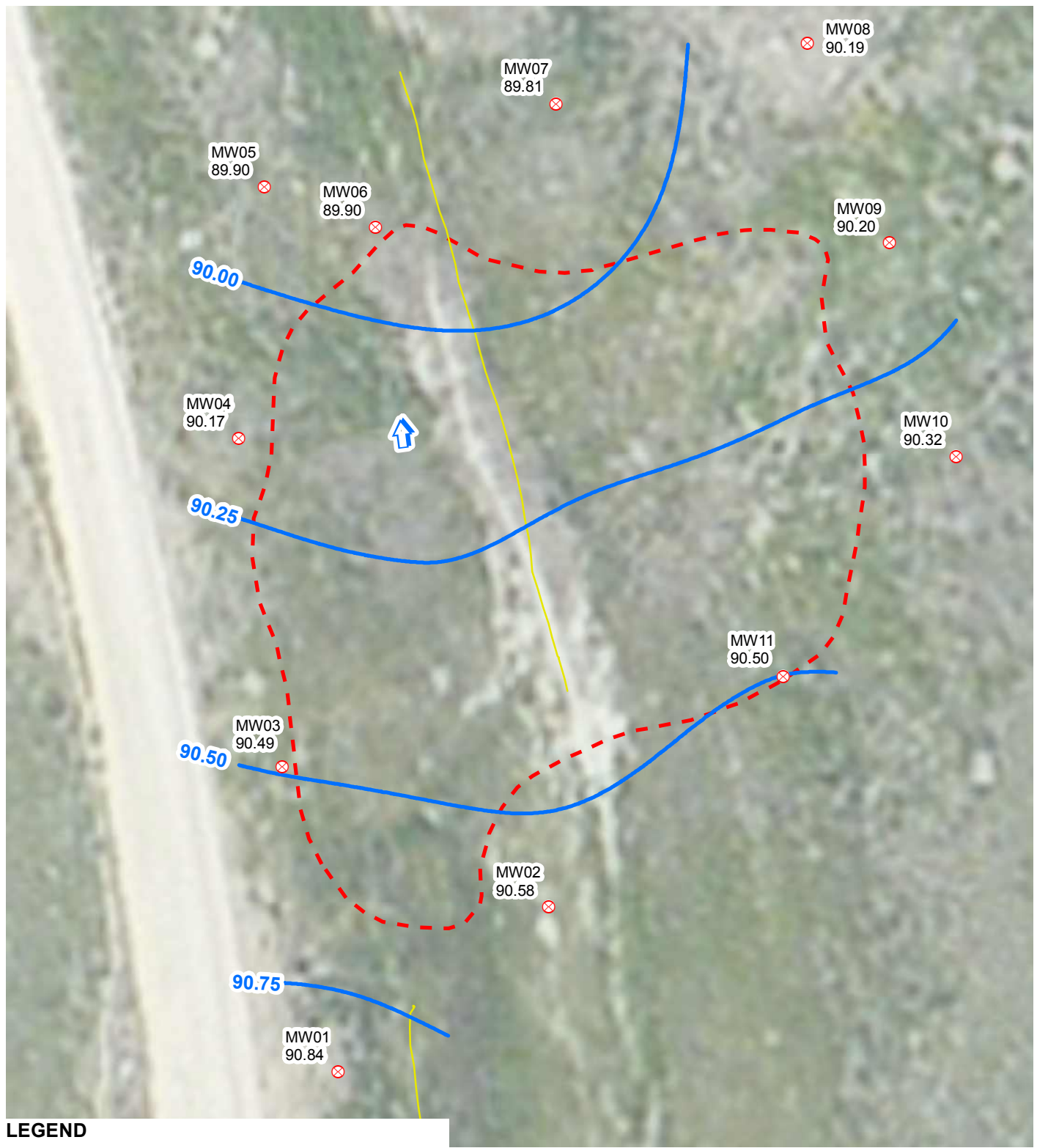
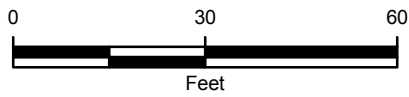


IMAGE COURTESY OF ESRI/BING MAPS

# LEGEND

- MONITORING WELL
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR  
 CONTOUR INTERVAL = 0.25 FEET  
 GRADIENT = 0.005 FEET/FOOT
- UNDERGROUND UTILITIES
- EXCAVATION EXTENT



**FIGURE 3**  
**RELATIVE GROUNDWATER ELEVATION MAP - NORTH**  
**KARCH BLUE DD 30-3J FLOWLINE**  
**OCTOBER 15, 2013**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**



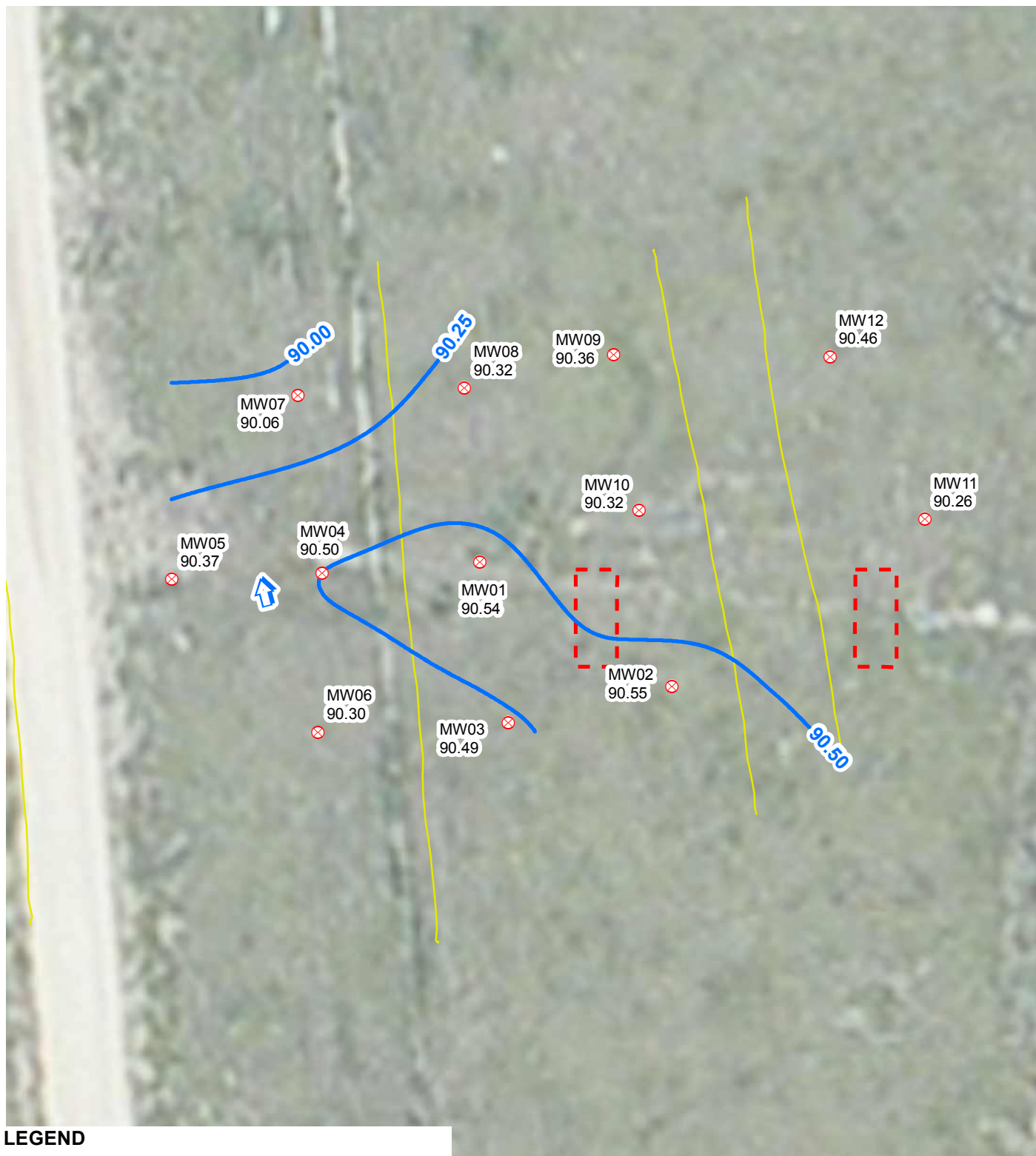
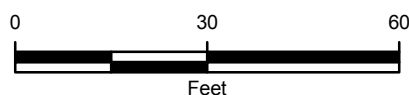


IMAGE COURTESY OF ESRI/BING MAPS

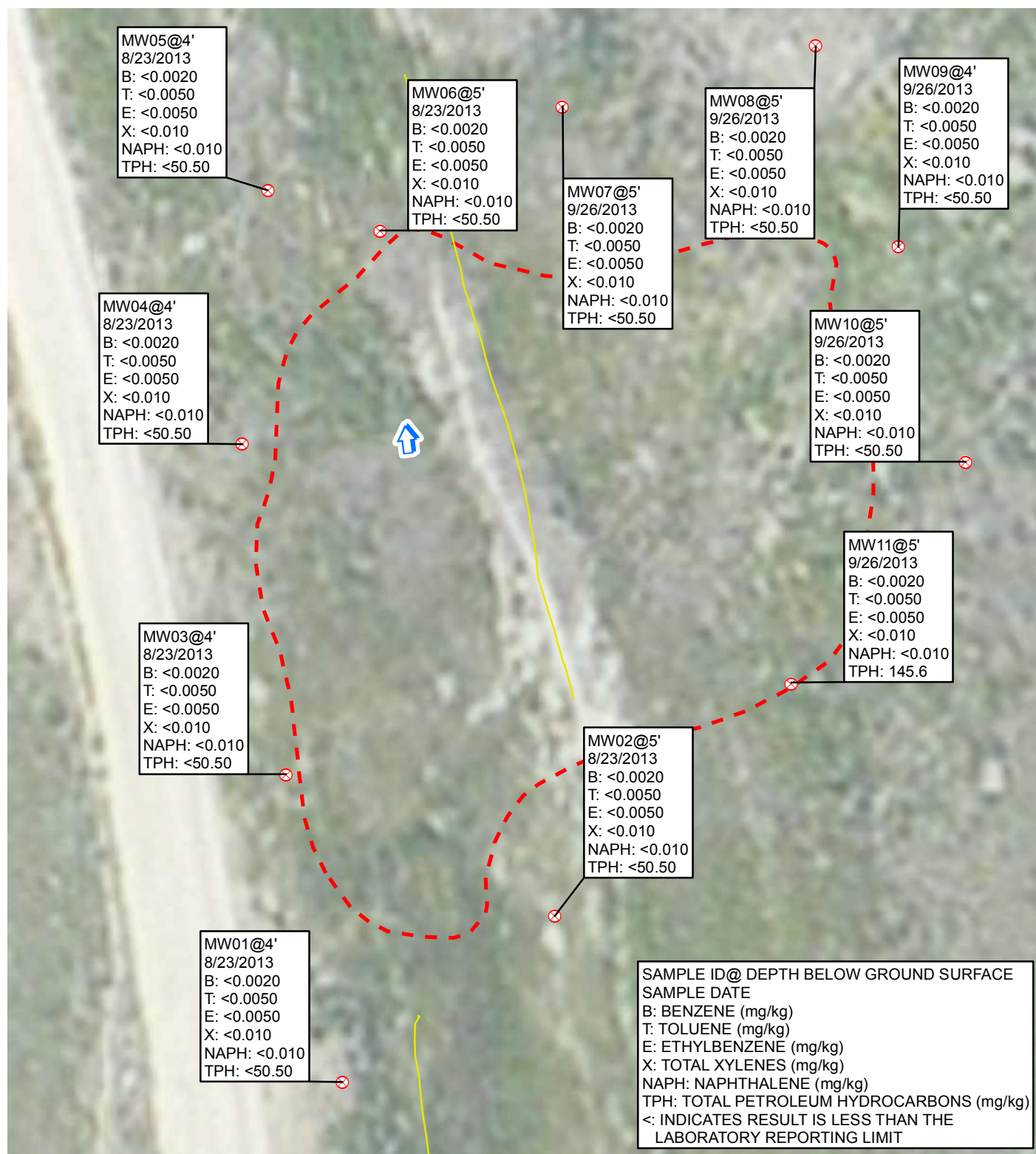
# LEGEND

- ⊗ MONITORING WELL
- ↑ ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR  
CONTOUR INTERVAL = 0.25 FEET  
GRADIENT = 0.011 FEET/FOOT
- UNDERGROUND UTILITIES
- - - EXCAVATION EXTENT



**FIGURE 4**  
**RELATIVE GROUNDWATER ELEVATION MAP - SOUTH**  
**KARCH BLUE DD 30-3J FLOWLINE**  
**OCTOBER 15, 2013**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**









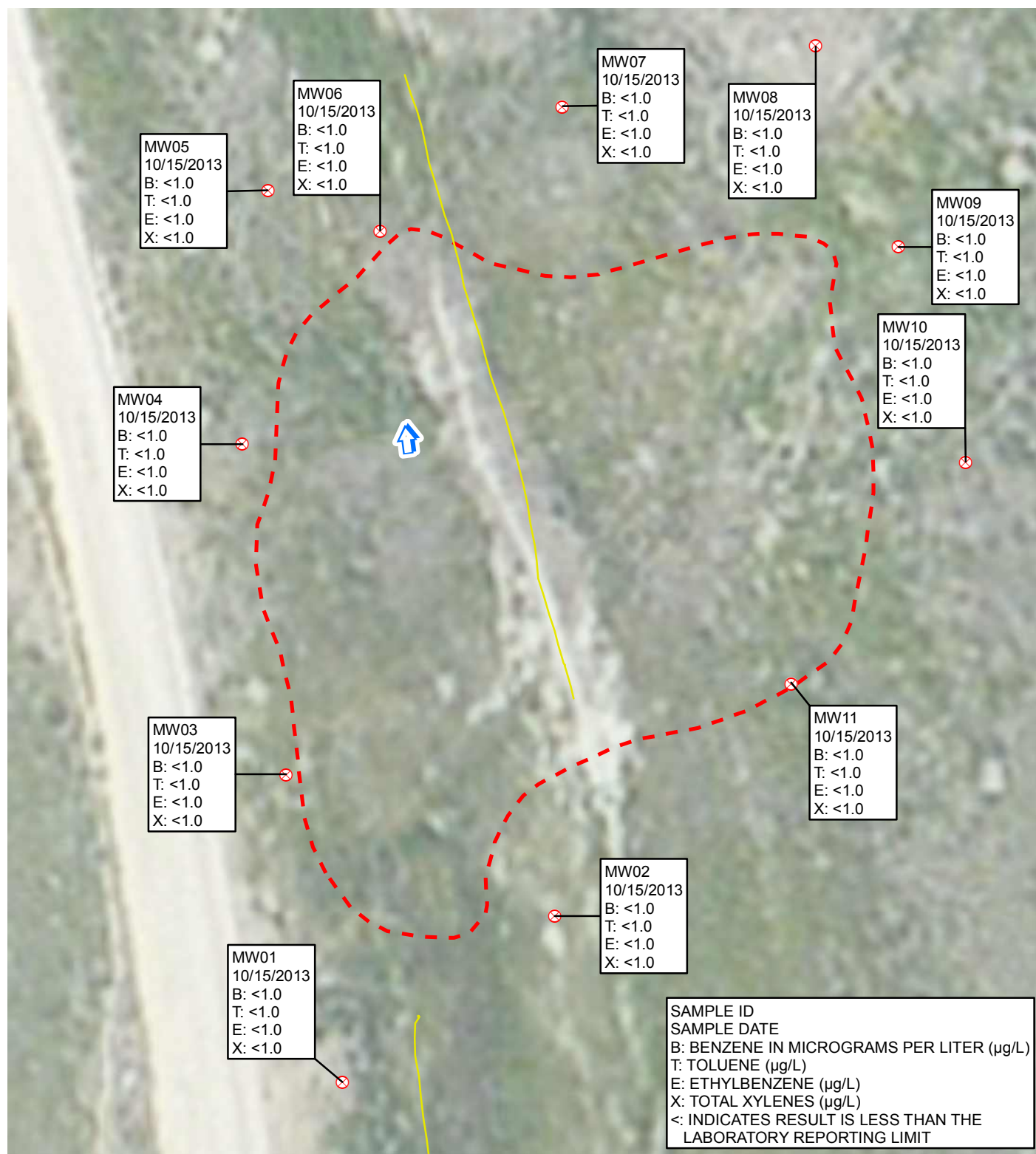
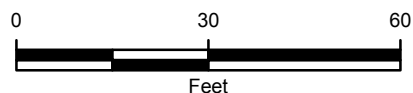


IMAGE COURTESY OF ESRI/BING MAPS

## LEGEND

- ⊗ MONITORING WELL
- ↑ ESTIMATED GROUNDWATER FLOW DIRECTION
- UNDERGROUND UTILITIES
- - - EXCAVATION EXTENT

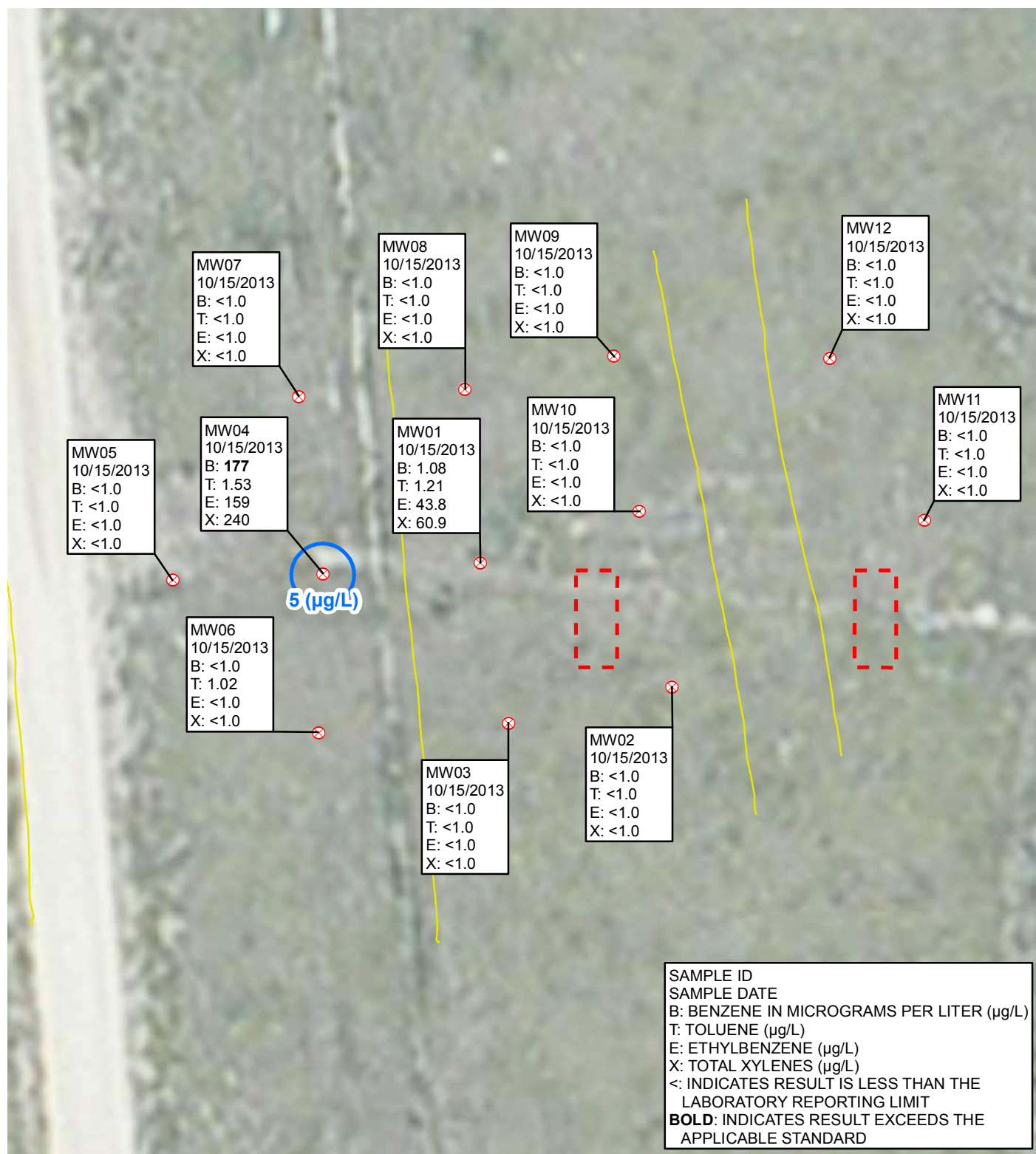


**FIGURE 7**  
 GROUNDWATER ANALYTICAL RESULTS - NORTH  
 KARCH BLUE DD 30-3J FLOWLINE  
 WELD COUNTY, COLORADO

NOBLE ENERGY, INC.







## **TABLES**

**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
**KARCH BLUE DD 30-3J FLOWLINE - NORTH**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**

Soil Sample	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)
MW01@4'	8/23/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW02@5'	8/23/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW03@4'	8/23/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW04@4'	8/23/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW05@4'	8/23/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW06@5'	8/23/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW07@5'	9/26/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW08@5'	9/26/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW09@4'	9/26/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW10@5'	9/26/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW11@5'	9/26/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	5.6	140	145.6
<b>COGCC Table 910-1 Standards</b>		<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>--</b>	<b>--</b>	<b>500</b>

**NOTES:**

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics analyzed by EPA Method 8015

GRO - gasoline range organics analyzed by EPA Method 8260B

mg/kg - milligrams per kilogram

TPH - total petroleum hydrocarbons

TPH is the sum of GRO and DRO

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

-- - not applicable

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

**TABLE 2**  
**SOIL ANALYTICAL RESULTS**  
**KARCH BLUE DD 30-3J FLOWLINE - SOUTH**  
**WELD COUNTY, COLORADO**  
**NOBLE ENERGY, INC.**

Soil Sample	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)
MW01@5'	9/25/2013	0.0035	<0.050	5.0	9.3	5.5	3,900	3,800	<b>7,700</b>
MW02@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW03@4'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW04@5'	9/25/2013	<0.0020	<0.0050	0.11	0.10	0.28	98	4,700	<b>4,798</b>
MW05@4'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW06@4'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW07@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW08@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW09@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW10@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	1.2	<50	1.2
MW11@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
MW12@5'	9/25/2013	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50.50
<b>COGCC Table 910-1 Standards</b>		<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	--	--	<b>500</b>

**NOTES:**

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics analyzed by EPA Method 8015

GRO - gasoline range organics analyzed by EPA Method 8260B

mg/kg - milligrams per kilogram

TPH - total petroleum hydrocarbons

TPH is the sum of GRO and DRO

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

-- - not applicable

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

**BOLD** indicates result exceeds the applicable standard

TABLE 3

**GROUNDWATER ANALYTICAL RESULTS  
KARCH BLUE 30-3J FLOWLINE - NORTH  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

Groundwater Sample	Date	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	10/15/2013	4.10	90.84	<1.0	<1.0	<1.0	<1.0
MW02	10/15/2013	4.45	90.58	<1.0	<1.0	<1.0	<1.0
MW03	10/15/2013	4.45	90.49	<1.0	<1.0	<1.0	<1.0
MW04	10/15/2013	4.37	90.17	<1.0	<1.0	<1.0	<1.0
MW05	10/15/2013	5.00	89.90	<1.0	<1.0	<1.0	<1.0
MW06	10/15/2013	5.06	89.90	<1.0	<1.0	<1.0	<1.0
MW07	10/15/2013	5.15	89.81	<1.0	<1.0	<1.0	<1.0
MW08	10/15/2013	4.85	90.19	<1.0	<1.0	<1.0	<1.0
MW09	10/15/2013	5.00	90.20	<1.0	<1.0	<1.0	<1.0
MW10	10/15/2013	5.15	90.32	<1.0	<1.0	<1.0	<1.0
MW11	10/15/2013	4.76	90.50	<1.0	<1.0	<1.0	<1.0
<b>CDPHE WQCC Reg 41</b>				<b>5.0</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

µg/L - micrograms per liter

btoc - below top of casing

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

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

Commission Regulation 41 covering The Basic Standards for Ground Water

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



TABLE 4

**GROUNDWATER ANALYTICAL RESULTS  
KARCH BLUE 30-3J FLOWLINE - SOUTH  
WELD COUNTY, COLORADO  
NOBLE ENERGY, INC.**

Groundwater Sample	Date	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	10/15/2013	4.30	90.54	1.08	1.21	43.8	60.9
MW02	10/15/2013	4.05	90.55	<1.0	<1.0	<1.0	<1.0
MW03	10/15/2013	4.45	90.49	<1.0	<1.0	<1.0	<1.0
MW04	10/15/2013	4.56	90.50	<b>177</b>	1.53	159	240
MW05	10/15/2013	4.83	90.37	<1.0	<1.0	<1.0	<1.0
MW06	10/15/2013	4.91	90.30	<1.0	1.02	<1.0	<1.0
MW07	10/15/2013	5.02	90.06	<1.0	<1.0	<1.0	<1.0
MW08	10/15/2013	4.66	90.32	<1.0	<1.0	<1.0	<1.0
MW09	10/15/2013	4.29	90.36	<1.0	<1.0	<1.0	<1.0
MW10	10/15/2013	4.30	90.32	<1.0	<1.0	<1.0	<1.0
MW11	10/15/2013	4.57	90.26	<1.0	<1.0	<1.0	<1.0
MW12	10/15/2013	4.60	90.46	<1.0	<1.0	<1.0	<1.0
<b>CDPHE WQCC Reg 41</b>				<b>5.0</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

µg/L - micrograms per liter

btoc - below top of casing

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

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment-Water Quality Control Commission Regulation 41 covering The Basic Standards for Ground Water

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

**BOLD** indicates result exceeds the applicable standard

**ATTACHMENT 1**  
**WELL COMPLETION DIAGRAMS**



***LT Environmental, Inc.  
4600 W. 60th Avenue  
Arvada, Colorado 80003***

**BORING/WELL NO.:** MW01  
**DATE:** 8/23/13  
**LOGGED BY:** Danny Burns  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 14'      **DTW:** 5'

**GROUT:** NA

**CASING LENGTH:** 4'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



**LT Environmental, Inc.**  
**4600 W. 60th Avenue**  
**Arvada, Colorado 80003**

**SAMPLE MTHD:** Continuous

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



***LT Environmental, Inc.  
4600 W. 60th Avenue  
Arvada, Colorado 80003***

**BORING/WELL NO.:** MW03  
**DATE:** 8/23/13  
**LOGGED BY:** Danny Burns  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**SCREEN TYPE: SCH. 40 PVC**

**SCREEN SLOT: 0.010"**

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



[illegible]

***LT Environmental, Inc.  
4600 W. 60th Avenue  
Arvada, Colorado 80003***

**BORING/WELL NO.:** MW04  
**DATE:** 8/23/13  
**LOGGED BY:** Danny Burns  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 14'      **DTW:** 5'

**GROUT:** NA

**CASING LENGTH:** 4'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Dry			0	SP		SP: Sand - 0'-2' - fine grained, brown, dry, no odor	
0.0			Moist		5/5		SC		SC: Sand - 2'-5' - medium grained, clayey, light gray, moist, no odor	
0.0			Wet	MW04 @4'		5	SP		SP: Sand - 5'-10' - medium grained, gray-brown with orange oxydation staining, wet, no odor	
0.0					5/5				No Recovery - Collapsing sands Point to 14' Flush mount	
0.0					0/4					
						15				

[illegible]

***LT Environmental, Inc.  
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Arvada, Colorado 80003***

**BORING/WELL NO.:** MW05  
**DATE:** 8/23/13  
**LOGGED BY:** Danny Burns  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 14'      **DTW:** 5'

**GROUT:** NA

**CASING LENGTH:** 4'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



***LT Environmental, Inc.  
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Arvada, Colorado 80003***

**BORING/WELL NO.:** MW06  
**DATE:** 8/23/13  
**LOGGED BY:** Danny Burns  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 14'      **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 4'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



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Arvada, Colorado 80003***

**BORING/WELL NO.:** MW07  
**DATE:** 9/26/13  
**LOGGED BY:** Dan Hosler  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 13'      **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
	0.0		Dry		4/5	0	SP		SP: Sand - 0'-6' - fine grained, medium brown, some orange oxydation staining, dry, poorly graded, no odor	
	0.0		Moist	MW07 @ 5'	5/5	5			SP: Sand - 6'-10' - fine-medium grained, brown with orange oxydation staining, wet, poorly graded, no odor	
	0.0		Wet				10		No staining observed Point to 13' Flush mount	
	0.0					15				



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Arvada, Colorado 80003***

**BORING/WELL NO.:** MW08  
**DATE:** 9/26/13  
**LOGGED BY:** Dan Hosler  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 13'      **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									





***LT Environmental, Inc.  
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**BORING/WELL NO.:** MW09  
**DATE:** 9/26/13  
**LOGGED BY:** Dan Hosler  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**SCREEN TYPE:** SCH. 40 PVC

**SCREEN SLOT: 0.010"**

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



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**BORING/WELL NO.:** MW10  
**DATE:** 9/26/13  
**LOGGED BY:** Dan Hosler  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 13'      **DTW:** 5'

**GROUT:** NA

**CASING LENGTH: 3'**

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									



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4600 W. 60th Avenue  
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**BORING/WELL NO.:** MW11  
**DATE:** 9/26/13  
**LOGGED BY:** Dan Hosler  
**DRILL MTHD:** Direct Push

**PROJECT:**Karch Blue 30-3J North  
**PROJECT NO.:** 008313054  
**DRILLED BY:** ACI  
**SAMPLE MTHD:** Continuous

**TD:** 13'      **DTW:** 6'

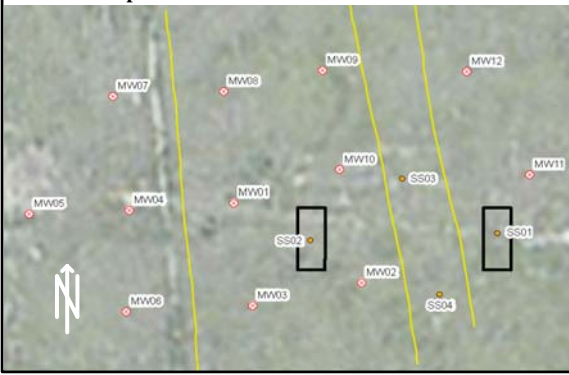
**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									

# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW01

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

**SCREEN SLOT:** 0.010"

**TD:** 12' **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 2'

**SCREEN LENGTH:** 10'

Vapor (ppm)	Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0 1000.0									
					0			Topsoil	
0.0				3/5		SP		SP: Sand - 0'-5' - fine-medium grained, trace-some clay, increase in clay with depth, medium brown, dry, no odor	
0.0									
323.7		Moist	MW01 @ 5'	5				SP: Sand - 5'-10' - medium grained, black stain with slight odor @ 5'-7', medium brown, moist, wet @ 6', poorly graded	
18.2		Wet							
				5/5					
0.0									
				10				Point to 12' Flush mount	
				0/2					
					15				

# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW02

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

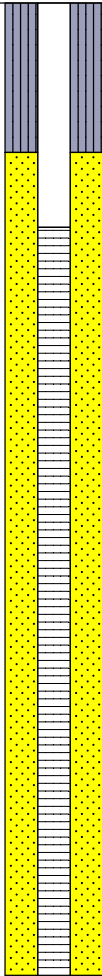
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

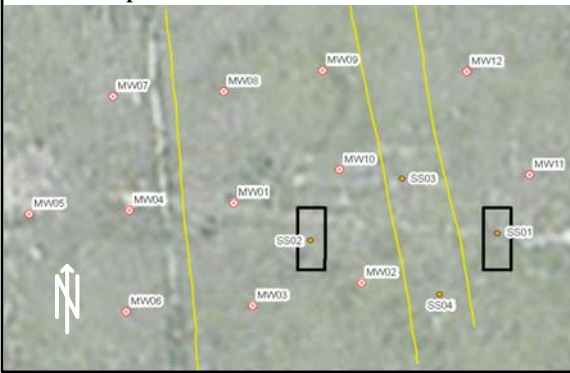
**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction	
0.0	1000.0										
			Dry	MW02 @ 5'		0	SP		SP: Sand - 0'-4' - fine-medium grained, trace-some clay, white-light brown, dry, no odor		
	0.0				4/5						
	0.0		Moist						SP: Sand - 4'-10' - fine grained, increase in grain size with depth, brown with orange oxydation staining, moist, wet @ 6', poorly graded, no odor		
			Wet			5					
	0.0				5/5						
	0.0					10			No staining observed Point to 13' Flush mount		
				0/3							
						15					

# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW03

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"


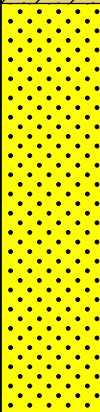
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 5'

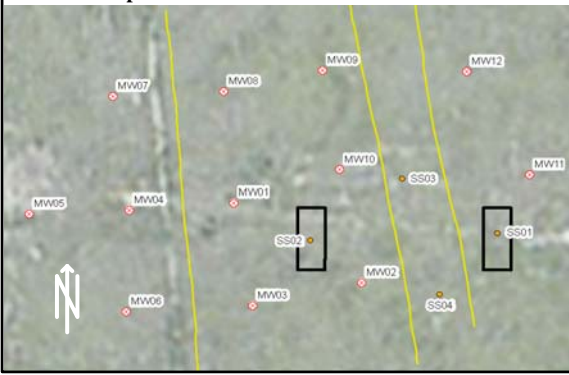
**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
<div></div>										
			Dry			0	SC		SC: Sand - 0'-4.5' - fine grained, some clay, medium brown, dry, no odor	
0.0					4/5					
0.0			Moist	MW03 @4'		5	SP		SP: Sand - 4.5'-10' - fine-medium grained, alternating gray-brown with orange oxydation staining, moist, wet @ 5', poorly graded, no odor	
0.0			Wet			5/5				
0.0						10			No staining observed Point to 13' Flush mount	
					0/3					
						15				

# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW04

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

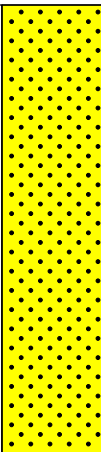
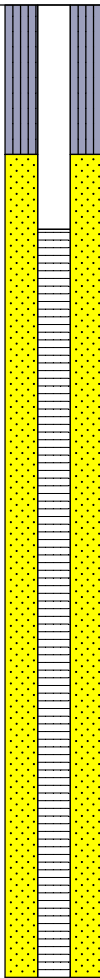

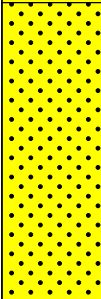
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
<div></div>										
			Dry			0	SP		SP: Sand - 0'-6' - fine grained, trace clay, light brown, dry, moist @ 4.5', poorly graded, no odor	
	0.0				4/5					
	0.0		Moist		5					
	13.9		Wet	MW04 @ 5'				SP: Sand - 6'-10' - fine grained, medium brown, black stain with moderate odor @ 6'-8', wet, poorly graded		
	499.3				5/5					
	0.0					10			Point to 13' Flush mount	
					0/3					
						15				



# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW05

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

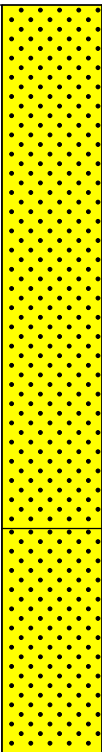
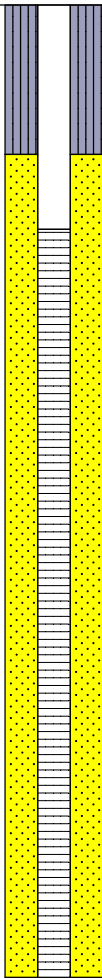
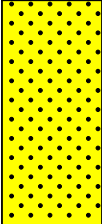
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 5'

**GROUT:** NA

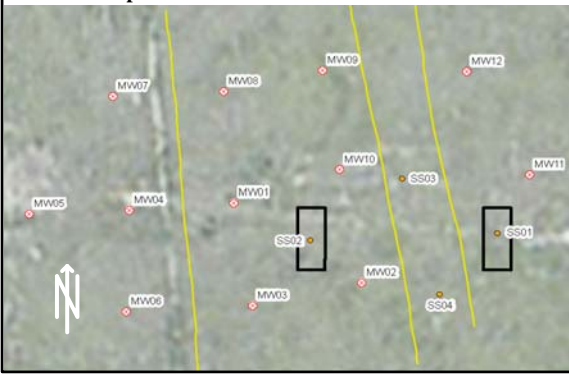
**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
<div></div>										
			Dry			0	SP		SP: Sand - 0'-7' - fine grained, increase in grain size with depth, trace clay, medium brown, dry, wet @ 5', poorly graded, no odor	
0.0					4/5					
0.0			Wet	MW05 @ 4'	5					
0.0					5/5				SP: Sand - 4'-10' - fine grained, trace-some clay, gray-brown, wet, poorly graded, no odor	
0.0						10			No staining observed Point to 13' Flush mount	
					0/3					
						15				



# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW06

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

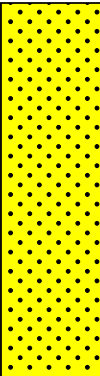
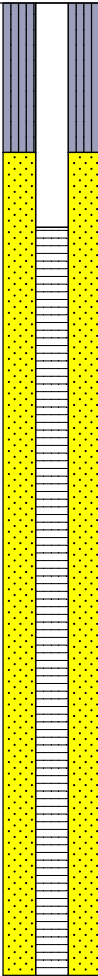
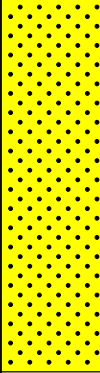
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 5'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
<div></div>										
			Dry			0	SP		SP: Sand - 0'-5' - fine grained, trace clay, light brown, dry,moist @ 4.5',poorly graded, no odor	
0.0					4/5					
0.0			Moist	MW06 @4'		5			SP: Sand - 5'-10' - fine grained, gray-brown with orange oxydation staining, wet, poorly graded, no odor	
0.0			Wet			5/5				
0.0						10			No staining observed Point to 13' Flush mount	
					0/3					
						15				

# Location Map



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW07

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

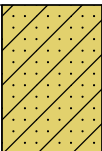
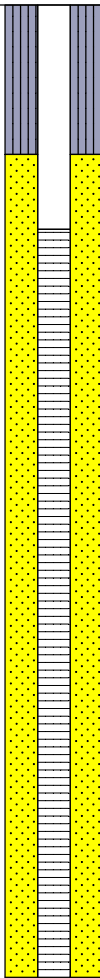
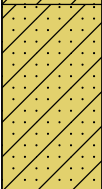
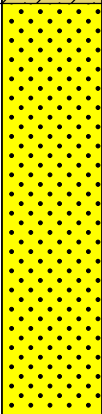
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
<div></div>										
			Dry	MW07 @ 5'		0	SC		SC: Sand - 0'-2' - fine grained, some clay, medium brown, dry, no odor	
0.0					4/5			SC: Sand - 2'-4.5' - fine grained, clayey, white-light brown, dry, low plasticity, low cohesion, no odor		
0.0			Moist		5	SP		SP: Sand - 4.5'-10' - fine grained, trace clay @ 8'-8.5', gray-brown with orange oxydation staining, moist, wet @ 6', poorly graded, no odor		
0.0			Wet		5/5					
0.0					0/3	10		No staining observed Point to 13' Flush mount		
						15				

# Location Map



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**Arvada, Colorado 80003**

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW08

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

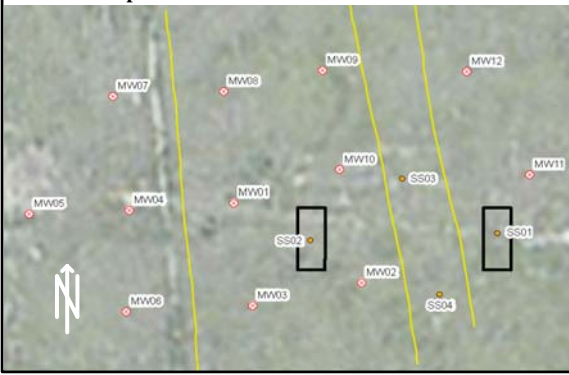
**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
						0				
			Dry			4/5	SC		SC: Sand - 0'-3' - fine grained, some clay, medium brown, dry, no odor	
						5			SC: Sand - 3'-6' - fine grained, clayey, white-light brown, dry, low plasticity, low cohesion, no odor	
			Wet	MW08 @ 5'		5/5	SP		SP: Sand - 6'-8' - fine-medium grained, gray-brown with orange oxydation staining, wet, poorly graded, no odor	
						10			SP: Sand - 8'-10' - fine grained, trace-some clay, orange oxydation staining, poorly graded, no odor	
						0/3			No staining observed Point to 13' Flush mount	
						15				

# Location Map



Compliance • Engineering • Remediation

**LT Environmental, Inc.**

**4600 W. 60th Avenue**

**Arvada, Colorado 80003**

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW09

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

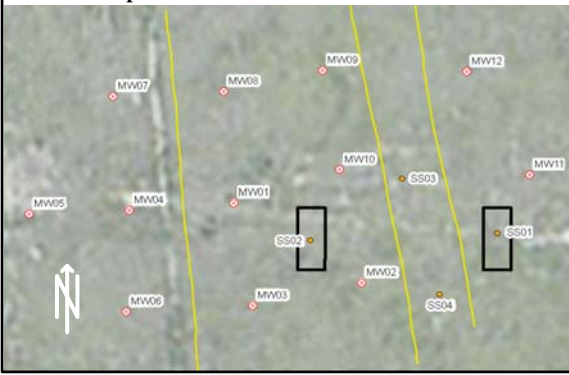
**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
						0	SC		SC: Sand - 0'-5.5' - fine grained, clayey, white-light brown, dry, crumbly, no odor	
0.0					3/5					
0.0						5	SP		SP: Sand - 5.5'-10' - fine-medium grained, decrease in grain size with depth, trace clay, gray-brown with orange oxydation staining, wet, poorly graded, no odor	
0.0					5/5					
0.0						10			No staining observed Point to 13' Flush mount	
					0/3					
						15				

# Location Map



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**LT Environmental, Inc.**

**4600 W. 60th Avenue**

**Arvada, Colorado 80003**

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW10

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"


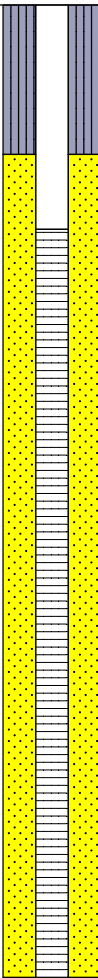



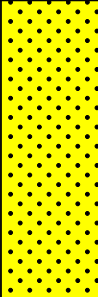
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
<div></div>										
			Dry			0	SC		Topsoil	
	0.0				3/5			SC: Sand - 1'-4' - fine grained, some clay, medium brown, dry, no odor		
	0.0				5			SC: Sand - 4'-6' - fine grained, clayey, light brown, dry, low plasticity, low cohesion, no odor		
	18.0		Wet	MW10 @ 5'	5/5	5	SP		SP: Sand - 6'-10' - fine-medium grained, medium brown, slight gray stain with slight odor @ 7'-8', wet, poorly graded, no odor	
	0.0				10					
					0/3	10			Point to 13' Flush mount	
						15				

# Location Map



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**LT Environmental, Inc.**

**4600 W. 60th Avenue**

**Arvada, Colorado 80003**

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW11

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

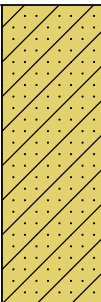
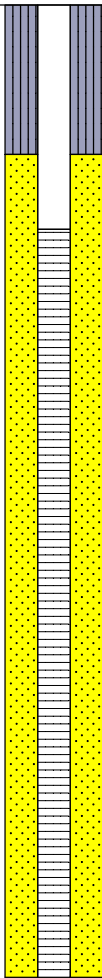
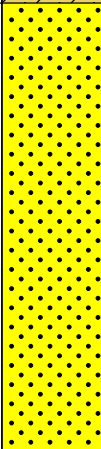
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

**GROUT:** NA

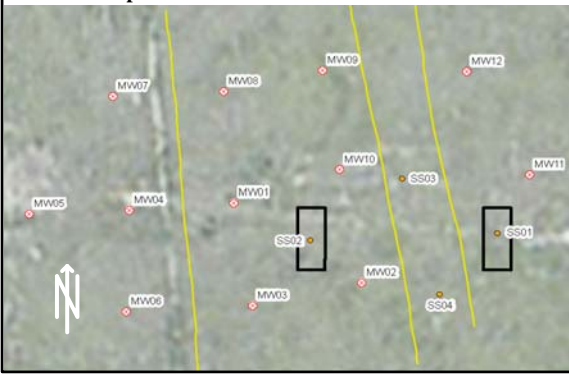
**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Dry	MW11 @ 5'		0	SC		SC: Sand - 0'-4' - fine grained, clayey, white-light brown, dry, crumbly, no odor	
	0.0				4/5					
	0.0		Moist			5	SP		SP: Sand - 4'-10' - fine grained, increase in grain size with depth, brown with orange oxydation staining, moist, wet @ 6', poorly graded, no odor	
	0.0		Wet		5/5					
	0.0					10			No staining observed Point to 13' Flush mount	
				0/3						
						15				



# Location Map



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**4600 W. 60th Avenue**

**Arvada, Colorado 80003**

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

**BORING/WELL NO.:** MW12

**DATE:** 9/25/13

**LOGGED BY:** Dan Hosler

**DRILL MTHD:** Direct Push

**PROJECT:** Karch Blue 30-3j South

**PROJECT NO.:** 008313054

**DRILLED BY:** ACI

**SAMPLE MTHD:** Continuous

**DETECTOR:** MiniRae2000

**GRAVEL PACK:** 10-20 Silica Sand

**CASING TYPE:** SCH. 40 PVC

**SCREEN TYPE:** SCH. 40 PVC

**HOLE DIA.:** 2.25"

**SEAL:** Bent. Chips

**CASING DIA.:** 1"

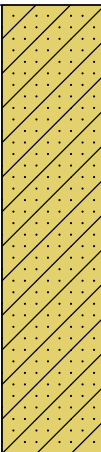
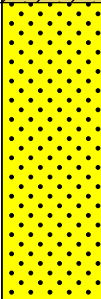
**SCREEN SLOT:** 0.010"

**TD:** 13' **DTW:** 6'

**GROUT:** NA

**CASING LENGTH:** 3'

**SCREEN LENGTH:** 10'

Vapor (ppm)		Staining	Moisture Content	Sample	Sample Run	Depth (ft. bgs.)	USCS	Soil Type	Lithology Description	Well Construction
0.0	1000.0									
			Dry	MW12 @ 5'	0	SC		SC: Sand - 0'-6' - fine grained, clayey, light brown with orange oxydation staining, crumbly, dry, no odor		
	0.0				4/5					
	0.0				5	SP		SP: Sand - 6'-10' - fine grained, trace-some clay, brown with orange oxydation staining, wet, poorly graded, no odor		
	0.0		Wet		5/5					
	0.0				10			No staining observed Point to 13' Flush mount		
				0/3						
				15						

**ATTACHMENT 2**  
**LABORATORY ANALYTICAL REPORTS**



# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 28, 2013

Rob Rebel

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: NEP - Karch Blue 30-3J,6J

Enclosed are the results of analyses for samples received by Summit Scientific on 08/23/13 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director

This report shall not be reproduced, except in its entirety, without the written approval of Summit Scientific. Test results relate only to samples analyzed.

Summit Scientific is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.



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

Project: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

**Reported:**  
08/28/13 15:18

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01@4'	R308243-01	Soil	08/23/13 00:00	08/23/13 17:30
MW02@5'	R308243-02	Soil	08/23/13 00:00	08/23/13 17:30
MW03@4'	R308243-03	Soil	08/23/13 00:00	08/23/13 17:30
MW04@4'	R308243-04	Soil	08/23/13 00:00	08/23/13 17:30
MW05@4'	R308243-05	Soil	08/23/13 00:00	08/23/13 17:30
MW06@5'	R308243-06	Soil	08/23/13 00:00	08/23/13 17:30

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: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

Summit Scientific R308243

S<sub>2</sub>

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
303-277-9310 • 303-277-9531 Fax

Client: LT Environmental, Inc.  
Address: 4600 West 60th Avenue  
City/State/Zip: Arvada, CO 80003  
Phone: (303) 433-9788 Fax: (303) 374-5933  
Sampler Name: D. Burns  
Project Manager: Rob Rebel  
E-Mail: rebel@ltenv.com  
Project Name: Karch Blue 30-3J,6J  
Project Number:

Page 1 of 1

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative	Matrix	Analyze For:	Special Instructions
MW01 @ 4'	8/23/13		1	HCl	Air - Canister Serial #	TEH-DR C BTEX-GRC Napthalene	
MW02 @ 5'				None	Soil		
MW03 @ 4'				Other (Specify)	Groundwater		
MW04 @ 4'							
MW05 @ 4'							
MW06 @ 5'							

Requisitioned by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check)	Notes:
RB	8/23/13 17:00	RB	8/23/13 1730	<input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 24 Hours <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/> Standard	

Requisitioned by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:
				Temperature Upon Receipt: 10°C Impact: Yes No

www.s2scientific.com



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

Project: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**MW01@4'**  
**R308243-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3082609	08/26/13	08/27/13	8015M	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		89.8 %	30-150		"	"	"	"	

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

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3082608	08/26/13	08/26/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %	21-167		"	"	"	"	

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: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**MW02@5'**  
**R308243-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3082609	08/26/13	08/27/13	8015M	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		91.0 %	30-150		"	"	"	"	

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

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3082608	08/26/13	08/27/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		120 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		114 %	21-167		"	"	"	"	

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: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**MW03@4'**  
**R308243-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3082609	08/26/13	08/28/13	8015M	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		86.0 %	30-150		"	"	"	"	

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

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3082608	08/26/13	08/27/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.2 %	21-167		"	"	"	"	

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: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**MW04@4'**  
**R308243-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3082609	08/26/13	08/28/13	8015M	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		94.3 %	30-150		"	"	"	"	

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

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3082608	08/26/13	08/27/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.7 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**MW05@4'**  
**R308243-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3082609	08/26/13	08/28/13	8015M	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		88.3 %	30-150		"	"	"	"	

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

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3082608	08/26/13	08/28/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		118 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.9 %	21-167		"	"	"	"	

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: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**MW06@5'**  
**R308243-06 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3082609	08/26/13	08/28/13	8015M	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		81.5 %	30-150		"	"	"	"	

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

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3082608	08/26/13	08/28/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **08/23/13 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.3 %	21-167		"	"	"	"	

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: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 3082609 - EPA 3550A**

<b>Blank (3082609-BLK1)</b>				Prepared & Analyzed: 08/26/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>Blank (3082609-BLK2)</b>				Prepared & Analyzed: 08/26/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>LCS (3082609-BS1)</b>				Prepared & Analyzed: 08/26/13						
C10-C28 (DRO)	564	50	mg/kg	501		113	73-134			
<b>LCS (3082609-BS2)</b>				Prepared & Analyzed: 08/26/13						
C10-C28 (DRO)	547	50	mg/kg	501		109	73-134			
<b>LCS Dup (3082609-BSD1)</b>				Prepared & Analyzed: 08/26/13						
C10-C28 (DRO)	564	50	mg/kg	501		113	73-134	0.0193	11	
<b>LCS Dup (3082609-BSD2)</b>				Prepared & Analyzed: 08/26/13						
C10-C28 (DRO)	543	50	mg/kg	501		108	73-134	0.815	11	
<b>Matrix Spike (3082609-MS1)</b>				<b>Source: R308243-01</b>		Prepared & Analyzed: 08/26/13				
C10-C28 (DRO)	572	50	mg/kg	495	ND	116	50-148			
<b>Matrix Spike (3082609-MS2)</b>				<b>Source: R308243-02</b>		Prepared: 08/26/13 Analyzed: 08/27/13				
C10-C28 (DRO)	558	50	mg/kg	490	ND	114	50-148			
<b>Matrix Spike Dup (3082609-MSD1)</b>				<b>Source: R308243-01</b>		Prepared & Analyzed: 08/26/13				
C10-C28 (DRO)	583	50	mg/kg	499	ND	117	50-148	1.83	13	
<b>Matrix Spike Dup (3082609-MSD2)</b>				<b>Source: R308243-02</b>		Prepared: 08/26/13 Analyzed: 08/27/13				
C10-C28 (DRO)	567	50	mg/kg	498	ND	114	50-148	1.62	13	

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

Project: NEP - Karch Blue 30-3J,6J  
Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**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 3082608 - EPA 5030 Soil MS**

**Blank (3082608-BLK1)**

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0437		"	0.0397	110	23-173				
Surrogate: Toluene-d8	0.0415		"	0.0400	104	20-170				
Surrogate: 4-Bromofluorobenzene	0.0450		"	0.0400	112	21-167				

**Blank (3082608-BLK2)**

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0450		"	0.0397	113	23-173				
Surrogate: Toluene-d8	0.0411		"	0.0400	103	20-170				
Surrogate: 4-Bromofluorobenzene	0.0459		"	0.0400	115	21-167				

**LCS (3082608-BS1)**

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg			66-138				
Benzene	0.0952	0.0020	"	0.100	95.2	58-130				
Toluene	0.113	0.0050	"	0.100	113	61-134				
Ethylbenzene	0.121	0.0050	"	0.100	121	74-139				
m,p-Xylene	0.224	0.010	"	0.200	112	73-137				
o-Xylene	0.115	0.0050	"	0.100	115	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0446		"	0.0397	112	23-173				
Surrogate: Toluene-d8	0.0414		"	0.0400	103	20-170				
Surrogate: 4-Bromofluorobenzene	0.0438		"	0.0400	110	21-167				

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

Project: NEP - Karch Blue 30-3J,6J  
Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

**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 3082608 - EPA 5030 Soil MS**

**LCS (3082608-BS2)**

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0944	0.0020	"	0.100		94.4	58-130			
Toluene	0.112	0.0050	"	0.100		112	61-134			
Ethylbenzene	0.123	0.0050	"	0.100		123	74-139			
m,p-Xylene	0.227	0.010	"	0.200		114	73-137			
o-Xylene	0.116	0.0050	"	0.100		116	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0442		"	0.0397		111	23-173			
Surrogate: Toluene-d8	0.0416		"	0.0400		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0442		"	0.0400		110	21-167			

**LCS Dup (3082608-BSD1)**

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0965	0.0020	"	0.100		96.5	58-130	1.38	13	
Toluene	0.114	0.0050	"	0.100		114	61-134	1.03	16	
Ethylbenzene	0.122	0.0050	"	0.100		122	74-139	0.519	12	
m,p-Xylene	0.225	0.010	"	0.200		112	73-137	0.562	14	
o-Xylene	0.116	0.0050	"	0.100		116	73-141	0.260	12	
Surrogate: 1,2-Dichloroethane-d4	0.0452		"	0.0397		114	23-173			
Surrogate: Toluene-d8	0.0415		"	0.0400		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0435		"	0.0400		109	21-167			

**LCS Dup (3082608-BSD2)**

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0922	0.0020	"	0.100		92.2	58-130	2.28	13	
Toluene	0.110	0.0050	"	0.100		110	61-134	2.46	16	
Ethylbenzene	0.123	0.0050	"	0.100		123	74-139	0.244	12	
m,p-Xylene	0.227	0.010	"	0.200		113	73-137	0.212	14	
o-Xylene	0.117	0.0050	"	0.100		117	73-141	1.19	12	
Surrogate: 1,2-Dichloroethane-d4	0.0421		"	0.0397		106	23-173			
Surrogate: Toluene-d8	0.0407		"	0.0400		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0440		"	0.0400		110	21-167			

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

Project: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

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

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

**Batch 3082608 - EPA 5030 Soil MS**

**Matrix Spike (3082608-MS1)**

Source: R308243-01

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0916	0.0020	"	0.0969	ND	94.6	30-131			
Toluene	0.109	0.0050	"	0.0969	ND	113	30-134			
Ethylbenzene	0.117	0.0050	"	0.0969	ND	121	22-153			
m,p-Xylene	0.218	0.010	"	0.194	ND	113	10-159			
o-Xylene	0.113	0.0050	"	0.0969	ND	117	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0443		"	0.0385		115	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0388		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0434		"	0.0388		112	21-167			

**Matrix Spike (3082608-MS2)**

Source: R308243-02

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0929	0.0020	"	0.0978	ND	95.0	30-131			
Toluene	0.112	0.0050	"	0.0978	ND	114	30-134			
Ethylbenzene	0.119	0.0050	"	0.0978	ND	122	22-153			
m,p-Xylene	0.222	0.010	"	0.196	ND	114	10-159			
o-Xylene	0.114	0.0050	"	0.0978	ND	117	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0451		"	0.0388		116	23-173			
Surrogate: Toluene-d8	0.0407		"	0.0391		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0436		"	0.0391		112	21-167			

**Matrix Spike Dup (3082608-MSD1)**

Source: R308243-01

Prepared & Analyzed: 08/26/13

Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0936	0.0020	"	0.0967	ND	96.8	30-131	2.13	34	
Toluene	0.110	0.0050	"	0.0967	ND	114	30-134	0.415	30	
Ethylbenzene	0.118	0.0050	"	0.0967	ND	122	22-153	0.793	24	
m,p-Xylene	0.220	0.010	"	0.193	ND	114	10-159	0.774	68	
o-Xylene	0.114	0.0050	"	0.0967	ND	118	31-151	0.575	38	
Surrogate: 1,2-Dichloroethane-d4	0.0449		"	0.0384		117	23-173			
Surrogate: Toluene-d8	0.0400		"	0.0387		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0427		"	0.0387		110	21-167			

Summit Scientific

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

Project: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

Reported:  
08/28/13 15:18

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

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

**Batch 3082608 - EPA 5030 Soil MS**

Matrix Spike Dup (3082608-MSD2)		Source: R308243-02			Prepared & Analyzed: 08/26/13					
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0911	0.0020	"	0.0986	ND	92.4	30-131	1.97	34	
Toluene	0.109	0.0050	"	0.0986	ND	110	30-134	2.69	30	
Ethylbenzene	0.119	0.0050	"	0.0986	ND	121	22-153	0.301	24	
m,p-Xylene	0.223	0.010	"	0.197	ND	113	10-159	0.402	68	
o-Xylene	0.113	0.0050	"	0.0986	ND	115	31-151	1.18	38	
Surrogate: 1,2-Dichloroethane-d4	0.0436		"	0.0392		111	23-173			
Surrogate: Toluene-d8	0.0406		"	0.0394		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0431		"	0.0394		109	21-167			

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

Project: NEP - Karch Blue 30-3J,6J

Project Number: 0083  
Project Manager: Rob Rebel

**Reported:**  
08/28/13 15:18

### 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

A handwritten signature in black ink, appearing to read 'Rob Rebel IV'.

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 02, 2013

Rob Rebel

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: NEP - Karch Blue 30-3S (B)

Enclosed are the results of analyses for samples received by Summit Scientific on 09/25/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 11:03

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01@5'	R309209-01	Soil	09/25/13 09:00	09/25/13 17:00
MW02@5'	R309209-02	Soil	09/25/13 09:20	09/25/13 17:00
MW03@4'	R309209-03	Soil	09/25/13 09:40	09/25/13 17:00
MW04@5'	R309209-04	Soil	09/25/13 10:00	09/25/13 17:00
MW05@4'	R309209-05	Soil	09/25/13 10:20	09/25/13 17:00
MW06@4'	R309209-06	Soil	09/25/13 10:35	09/25/13 17:00
MW07@5'	R309209-07	Soil	09/25/13 11:00	09/25/13 17:00
MW08@5'	R309209-08	Soil	09/25/13 11:20	09/25/13 17:00
MW09@5'	R309209-09	Soil	09/25/13 11:40	09/25/13 17:00
MW10@5'	R309209-10	Soil	09/25/13 12:10	09/25/13 17:00
MW11@5'	R309209-11	Soil	09/25/13 12:40	09/25/13 17:00
MW12@5'	R309209-12	Soil	09/25/13 13:00	09/25/13 17:00

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 11:03

R309209-1

Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
303-277-9910 • 303-374-5933 Fax

Client: LIFE Project Manager: Bob Rabold Page 2 of 2  
 Address: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_  
 Phone: 413-978-4131 E-Mail: Bob.Rabold@lifenet.org  
 Fax: \_\_\_\_\_ Project Name: Orth. Res. 2-3 (R)  
 Sample Name: 10/04 Project Number: 0870054

Client: LFE

Page 1 of 2

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Regd. Agent IV

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 11:03

R309209-2

Summit Scientific

**S<sub>2</sub>**  
741 Corporate Circle Suite 1 • Golden, Colorado 80401  
303-277-9310 • 303-374-5933 Fax

Client: LTE

Page 2 of 2

Client:	LE	Project Manager:	Ron Rode
Address:		E-Mail:	ron@le.com
City/State/Zip:		Project Name:	546 Bay 3-3 (B)
Phone:	301-437-7788	Fax:	
Sample Name:	D464C	Project Number:	00781854

[illegible]

[www.s2scientific.com](http://www.s2scientific.com)

Summit Scientific

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*Legal Eagle IV*



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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW01@5'**  
**R309209-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>3800</b>	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		59.3 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>5.5</b>	0.10	mg/kg	10	3092623	09/26/13	09/29/13	EPA 8260B	
<b>Benzene</b>	<b>0.0035</b>	0.0020	"	1	"	"	"	"	
Toluene	ND	0.050	"	10	"	"	"	"	
<b>Ethylbenzene</b>	<b>5.0</b>	0.050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>9.3</b>	0.10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>3900</b>	100	"	200	"	"	"	"	

Date Sampled: **09/25/13 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		129 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW02@5'**  
**R309209-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.9 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW03@4'**  
**R309209-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.1 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW04@5'**  
**R309209-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>4700</b>	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		29.6 %	30-150		"	"	"	"	S-02

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

Date Sampled: **09/25/13 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>0.28</b>	0.10	mg/kg	10	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	1	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.11</b>	0.050	"	10	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.10</b>	0.010	"	1	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>98</b>	50	"	100	"	"	"	"	

Date Sampled: **09/25/13 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		106 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		93.6 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		100 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW05@4'**  
**R309209-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.2 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.3 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW06@4'**  
**R309209-06 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.9 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.3 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW07@5'**  
**R309209-07 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		88.0 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW08@5'**  
**R309209-08 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.6 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW09@5'**  
**R309209-09 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.3 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.8 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW10@5'**  
**R309209-10 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/28/13	8015M	

Date Sampled: **09/25/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		96.2 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1.2</b>	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	21-167		"	"	"	"	

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

MW11@5'  
R309209-11 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 09/25/13 12:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/29/13	8015M	

Date Sampled: 09/25/13 12:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		89.6 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 09/25/13 12:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 09/25/13 12:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.3 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**MW12@5'**  
**R309209-12 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/25/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092624	09/26/13	09/29/13	8015M	

Date Sampled: **09/25/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		86.1 %	30-150		"	"	"	"	

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

Date Sampled: **09/25/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092623	09/26/13	09/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/25/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.7 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 3092624 - EPA 3550A**

**Blank (3092624-BLK1)**

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) ND 50 mg/kg

**Blank (3092624-BLK2)**

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) ND 50 mg/kg

**LCS (3092624-BS1)**

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 522 50 mg/kg 501 104 73-134

**LCS (3092624-BS2)**

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 497 50 mg/kg 501 99.1 73-134

**LCS Dup (3092624-BSD1)**

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 540 50 mg/kg 501 108 73-134 3.45 11

**LCS Dup (3092624-BSD2)**

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 490 50 mg/kg 501 97.8 73-134 1.36 11

**Matrix Spike (3092624-MS1)**

Source: R309199-01

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 488 50 mg/kg 501 ND 97.4 50-148

**Matrix Spike (3092624-MS2)**

Source: R309199-02

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 463 50 mg/kg 501 ND 92.4 50-148

**Matrix Spike Dup (3092624-MSD1)**

Source: R309199-01

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 479 50 mg/kg 501 ND 95.5 50-148 1.97 13

**Matrix Spike Dup (3092624-MSD2)**

Source: R309199-02

Prepared: 09/26/13 Analyzed: 09/28/13

C10-C28 (DRO) 497 50 mg/kg 501 ND 99.3 50-148 7.22 13

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)  
Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

**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 3092623 - EPA 5030 Soil MS**

**Blank (3092623-BLK1)**

Prepared: 09/26/13 Analyzed: 09/28/13

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0438		"	0.0397		110	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0383		"	0.0400		95.8	21-167			

**LCS (3092623-BS1)**

Prepared: 09/26/13 Analyzed: 09/28/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0867	0.0020	"	0.100		86.7	58-130			
Toluene	0.0988	0.0050	"	0.100		98.8	61-134			
Ethylbenzene	0.103	0.0050	"	0.100		103	74-139			
m,p-Xylene	0.203	0.010	"	0.200		102	73-137			
o-Xylene	0.106	0.0050	"	0.100		106	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0436		"	0.0397		110	23-173			
Surrogate: Toluene-d8	0.0400		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	21-167			

**LCS (3092623-BS2)**

Prepared: 09/26/13 Analyzed: 09/28/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0835	0.0020	"	0.100		83.5	58-130			
Toluene	0.0955	0.0050	"	0.100		95.5	61-134			
Ethylbenzene	0.101	0.0050	"	0.100		101	74-139			
m,p-Xylene	0.196	0.010	"	0.200		97.9	73-137			
o-Xylene	0.103	0.0050	"	0.100		103	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0434		"	0.0397		109	23-173			
Surrogate: Toluene-d8	0.0400		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400		97.2	21-167			

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: NEP - Karch Blue 30-3S (B)  
Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

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

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

**Batch 3092623 - EPA 5030 Soil MS**

**LCS Dup (3092623-BSD1)**

Prepared: 09/26/13 Analyzed: 09/28/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0876	0.0020	"	0.100		87.6	58-130	0.998	13	
Toluene	0.0964	0.0050	"	0.100		96.4	61-134	2.46	16	
Ethylbenzene	0.101	0.0050	"	0.100		101	74-139	2.29	12	
m,p-Xylene	0.200	0.010	"	0.200		100	73-137	1.43	14	
o-Xylene	0.105	0.0050	"	0.100		105	73-141	1.08	12	
Surrogate: 1,2-Dichloroethane-d4	0.0457		"	0.0397		115	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.8	21-167			

**LCS Dup (3092623-BSD2)**

Prepared: 09/26/13 Analyzed: 09/28/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0863	0.0020	"	0.100		86.3	58-130	3.29	13	
Toluene	0.0991	0.0050	"	0.100		99.1	61-134	3.70	16	
Ethylbenzene	0.102	0.0050	"	0.100		102	74-139	0.800	12	
m,p-Xylene	0.198	0.010	"	0.200		99.0	73-137	1.11	14	
o-Xylene	0.105	0.0050	"	0.100		105	73-141	1.93	12	
Surrogate: 1,2-Dichloroethane-d4	0.0435		"	0.0397		110	23-173			
Surrogate: Toluene-d8	0.0406		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.5	21-167			

**Matrix Spike (3092623-MS1)**

Source: R309199-01

Prepared: 09/26/13 Analyzed: 09/28/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0273	0.0020	"	0.100	ND	27.3	30-131			QM-07
Toluene	0.0374	0.0050	"	0.100	ND	37.4	30-134			
Ethylbenzene	0.0751	0.0050	"	0.100	ND	75.1	22-153			
m,p-Xylene	0.0994	0.010	"	0.200	ND	49.7	10-159			
o-Xylene	0.0916	0.0050	"	0.100	ND	91.6	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0436		"	0.0397		110	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0411		"	0.0400		103	21-167			

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

Project: NEP - Karch Blue 30-3S (B)  
Project Number: 0083-13054  
Project Manager: Rob Rebel

Reported:  
10/02/13 11:03

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

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

**Batch 3092623 - EPA 5030 Soil MS**

Matrix Spike (3092623-MS2)				Source: R309199-02		Prepared: 09/26/13		Analyzed: 09/28/13		
Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0838	0.0020	"	0.100	ND	83.8	30-131			
Toluene	0.0943	0.0050	"	0.100	ND	94.3	30-134			
Ethylbenzene	0.101	0.0050	"	0.100	ND	101	22-153			
m,p-Xylene	0.200	0.010	"	0.200	ND	99.9	10-159			
o-Xylene	0.103	0.0050	"	0.100	ND	103	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0397		108	23-173			
Surrogate: Toluene-d8	0.0392		"	0.0400		98.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400		101	21-167			

Matrix Spike Dup (3092623-MSD1)				Source: R309199-01		Prepared: 09/26/13		Analyzed: 09/28/13		
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0358	0.0020	"	0.100	ND	35.8	30-131	27.2	34	
Toluene	0.0465	0.0050	"	0.100	ND	46.5	30-134	21.8	30	
Ethylbenzene	0.0802	0.0050	"	0.100	ND	80.2	22-153	6.57	24	
m,p-Xylene	0.105	0.010	"	0.200	ND	52.3	10-159	5.03	68	
o-Xylene	0.0950	0.0050	"	0.100	ND	95.0	31-151	3.73	38	
Surrogate: 1,2-Dichloroethane-d4	0.0442		"	0.0397		111	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0397		"	0.0400		99.2	21-167			

Matrix Spike Dup (3092623-MSD2)				Source: R309199-02		Prepared: 09/26/13		Analyzed: 09/28/13		
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0824	0.0020	"	0.100	ND	82.4	30-131	1.73	34	
Toluene	0.0950	0.0050	"	0.100	ND	95.0	30-134	0.760	30	
Ethylbenzene	0.100	0.0050	"	0.100	ND	100	22-153	1.07	24	
m,p-Xylene	0.196	0.010	"	0.200	ND	97.8	10-159	2.14	68	
o-Xylene	0.103	0.0050	"	0.100	ND	103	31-151	0.612	38	
Surrogate: 1,2-Dichloroethane-d4	0.0429		"	0.0397		108	23-173			
Surrogate: Toluene-d8	0.0399		"	0.0400		99.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		97.0	21-167			

Summit Scientific

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

Project: NEP - Karch Blue 30-3S (B)

Project Number: 0083-13054  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 11:03

### Notes and Definitions

S-02      The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

QM-07    The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 02, 2013

Rob Rebel

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: NEP - Karch Blue 30-3J (A)

Enclosed are the results of analyses for samples received by Summit Scientific on 09/26/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'JS' or 'JMS' with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury For Joseph J Egry IV  
Laboratory Director



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

Project: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 19:26

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW07@5'	R309234-01	Soil	09/26/13 11:30	09/26/13 17:00
MW08@5'	R309234-02	Soil	09/26/13 11:50	09/26/13 17:00
MW09@4'	R309234-03	Soil	09/26/13 12:10	09/26/13 17:00
MW10@5'	R309234-04	Soil	09/26/13 12:20	09/26/13 17:00
MW11@5'	R309234-05	Soil	09/26/13 12:50	09/26/13 17:00

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: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

**MW07@5'**  
**R309234-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/26/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092802	09/28/13	09/29/13	8015M	

Date Sampled: **09/26/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		92.6 %	30-150		"	"	"	"	

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

Date Sampled: **09/26/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092801	09/28/13	09/30/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/26/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		122 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

**MW08@5'**  
**R309234-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/26/13 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092802	09/28/13	09/29/13	8015M	

Date Sampled: **09/26/13 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		94.0 %	30-150		"	"	"	"	

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

Date Sampled: **09/26/13 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092801	09/28/13	09/30/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/26/13 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.7 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

**MW09@4'**  
**R309234-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/26/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092802	09/28/13	09/29/13	8015M	

Date Sampled: **09/26/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		93.4 %	30-150		"	"	"	"	

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

Date Sampled: **09/26/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092801	09/28/13	09/30/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/26/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		123 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.3 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 19:26

**MW10@5'**  
**R309234-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/26/13 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3092802	09/28/13	09/29/13	8015M	

Date Sampled: **09/26/13 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		93.2 %	30-150		"	"	"	"	

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

Date Sampled: **09/26/13 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092801	09/28/13	09/30/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/26/13 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	21-167		"	"	"	"	

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: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

**MW11@5'**  
**R309234-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/26/13 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	140	50	mg/kg	1	3092802	09/28/13	09/29/13	8015M	

Date Sampled: **09/26/13 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.4 %	30-150		"	"	"	"	

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

Date Sampled: **09/26/13 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3092801	09/28/13	09/30/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	5.6	0.50	"	"	"	"	"	"	

Date Sampled: **09/26/13 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)  
Project Number: 0083-13056  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 19:26

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 3092802 - EPA 3550A**

<b>Blank (3092802-BLK1)</b>				Prepared & Analyzed: 09/28/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>Blank (3092802-BLK2)</b>				Prepared & Analyzed: 09/28/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>LCS (3092802-BS1)</b>				Prepared & Analyzed: 09/28/13						
C10-C28 (DRO)	449	50	mg/kg	501		89.7	73-134			
<b>LCS (3092802-BS2)</b>				Prepared & Analyzed: 09/28/13						
C10-C28 (DRO)	459	50	mg/kg	501		91.5	73-134			
<b>LCS Dup (3092802-BSD1)</b>				Prepared & Analyzed: 09/28/13						
C10-C28 (DRO)	456	50	mg/kg	501		91.1	73-134	1.58	11	
<b>LCS Dup (3092802-BSD2)</b>				Prepared & Analyzed: 09/28/13						
C10-C28 (DRO)	465	50	mg/kg	501		92.9	73-134	1.49	11	
<b>Matrix Spike (3092802-MS1)</b>				<b>Source: R309230-01</b>		Prepared & Analyzed: 09/28/13				
C10-C28 (DRO)	477	50	mg/kg	501	ND	95.2	50-148			
<b>Matrix Spike (3092802-MS2)</b>				<b>Source: R309230-02</b>		Prepared: 09/28/13 Analyzed: 09/29/13				
C10-C28 (DRO)	474	50	mg/kg	501	ND	94.5	50-148			
<b>Matrix Spike Dup (3092802-MSD1)</b>				<b>Source: R309230-01</b>		Prepared: 09/28/13 Analyzed: 09/29/13				
C10-C28 (DRO)	493	50	mg/kg	501	ND	98.5	50-148	3.32	13	
<b>Matrix Spike Dup (3092802-MSD2)</b>				<b>Source: R309230-02</b>		Prepared: 09/28/13 Analyzed: 09/29/13				
C10-C28 (DRO)	485	50	mg/kg	501	ND	96.8	50-148	2.38	13	

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: NEP - Karch Blue 30-3J (A)  
Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

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

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

**Batch 3092801 - EPA 5030 Soil MS**

**Blank (3092801-BLK1)**

Prepared: 09/28/13 Analyzed: 09/29/13

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0458		"	0.0397	115	23-173				
Surrogate: Toluene-d8	0.0395		"	0.0400	98.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0400	98.9	21-167				

**LCS (3092801-BS1)**

Prepared: 09/28/13 Analyzed: 09/29/13

Naphthalene	ND	0.010	mg/kg			66-138				
Benzene	0.0839	0.0020	"	0.100	83.9	58-130				
Toluene	0.0980	0.0050	"	0.100	98.0	61-134				
Ethylbenzene	0.104	0.0050	"	0.100	104	74-139				
m,p-Xylene	0.204	0.010	"	0.200	102	73-137				
o-Xylene	0.107	0.0050	"	0.100	107	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0432		"	0.0397	109	23-173				
Surrogate: Toluene-d8	0.0401		"	0.0400	100	20-170				
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400	98.6	21-167				

**LCS (3092801-BS2)**

Prepared: 09/28/13 Analyzed: 09/29/13

Naphthalene	ND	0.010	mg/kg			66-138				
Benzene	0.0911	0.0020	"	0.100	91.1	58-130				
Toluene	0.0990	0.0050	"	0.100	99.0	61-134				
Ethylbenzene	0.105	0.0050	"	0.100	105	74-139				
m,p-Xylene	0.205	0.010	"	0.200	102	73-137				
o-Xylene	0.108	0.0050	"	0.100	108	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0455		"	0.0397	115	23-173				
Surrogate: Toluene-d8	0.0400		"	0.0400	100	20-170				
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400	96.8	21-167				

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)  
Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

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

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

**Batch 3092801 - EPA 5030 Soil MS**

**LCS Dup (3092801-BSD1)**

Prepared: 09/28/13 Analyzed: 09/29/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0839	0.0020	"	0.100		83.9	58-130	0.0358	13	
Toluene	0.0981	0.0050	"	0.100		98.1	61-134	0.122	16	
Ethylbenzene	0.104	0.0050	"	0.100		104	74-139	0.0576	12	
m,p-Xylene	0.205	0.010	"	0.200		103	73-137	0.499	14	
o-Xylene	0.107	0.0050	"	0.100		107	73-141	0.0841	12	
Surrogate: 1,2-Dichloroethane-d4	0.0427		"	0.0397		107	23-173			
Surrogate: Toluene-d8	0.0406		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0400		103	21-167			

**LCS Dup (3092801-BSD2)**

Prepared: 09/28/13 Analyzed: 09/29/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0899	0.0020	"	0.100		89.9	58-130	1.29	13	
Toluene	0.100	0.0050	"	0.100		100	61-134	1.12	16	
Ethylbenzene	0.106	0.0050	"	0.100		106	74-139	1.48	12	
m,p-Xylene	0.209	0.010	"	0.200		105	73-137	2.14	14	
o-Xylene	0.109	0.0050	"	0.100		109	73-141	1.66	12	
Surrogate: 1,2-Dichloroethane-d4	0.0441		"	0.0397		111	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0404		"	0.0400		101	21-167			

**Matrix Spike (3092801-MS1)**

Source: R309230-01

Prepared: 09/28/13 Analyzed: 09/29/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0579	0.0020	"	0.100	ND	57.9	30-131			
Toluene	0.0492	0.0050	"	0.100	ND	49.2	30-134			
Ethylbenzene	0.0410	0.0050	"	0.100	ND	41.0	22-153			
m,p-Xylene	0.0601	0.010	"	0.200	ND	30.1	10-159			
o-Xylene	0.0453	0.0050	"	0.100	ND	45.3	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0473		"	0.0397		119	23-173			
Surrogate: Toluene-d8	0.0396		"	0.0400		99.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0380		"	0.0400		95.1	21-167			

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)  
Project Number: 0083-13056  
Project Manager: Rob Rebel

Reported:  
10/02/13 19:26

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

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

**Batch 3092801 - EPA 5030 Soil MS**

Matrix Spike (3092801-MS2)				Source: R309230-02		Prepared: 09/28/13		Analyzed: 09/29/13	
Naphthalene	ND	0.010	mg/kg		ND		10-158		
Benzene	0.0483	0.0020	"	0.100	ND	48.3	30-131		
Toluene	0.0413	0.0050	"	0.100	ND	41.3	30-134		
Ethylbenzene	0.0296	0.0050	"	0.100	ND	29.6	22-153		
m,p-Xylene	0.0526	0.010	"	0.200	ND	26.3	10-159		
o-Xylene	0.0360	0.0050	"	0.100	ND	36.0	31-151		
Surrogate: 1,2-Dichloroethane-d4	0.0454		"	0.0397		114	23-173		
Surrogate: Toluene-d8	0.0403		"	0.0400		101	20-170		
Surrogate: 4-Bromofluorobenzene	0.0385		"	0.0400		96.2	21-167		
Matrix Spike Dup (3092801-MSD1)				Source: R309230-01		Prepared: 09/28/13		Analyzed: 09/29/13	
Naphthalene	ND	0.010	mg/kg		ND		10-158		42
Benzene	0.0546	0.0020	"	0.100	ND	54.6	30-131	5.87	34
Toluene	0.0416	0.0050	"	0.100	ND	41.6	30-134	16.9	30
Ethylbenzene	0.0306	0.0050	"	0.100	ND	30.6	22-153	29.0	24
m,p-Xylene	0.0432	0.010	"	0.200	ND	21.6	10-159	32.7	68
o-Xylene	0.0367	0.0050	"	0.100	ND	36.7	31-151	21.0	38
Surrogate: 1,2-Dichloroethane-d4	0.0462		"	0.0397		116	23-173		
Surrogate: Toluene-d8	0.0398		"	0.0400		99.5	20-170		
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.7	21-167		
Matrix Spike Dup (3092801-MSD2)				Source: R309230-02		Prepared: 09/28/13		Analyzed: 09/29/13	
Naphthalene	ND	0.010	mg/kg		ND		10-158		42
Benzene	0.0494	0.0020	"	0.100	ND	49.4	30-131	2.15	34
Toluene	0.0436	0.0050	"	0.100	ND	43.6	30-134	5.23	30
Ethylbenzene	0.0348	0.0050	"	0.100	ND	34.8	22-153	16.1	24
m,p-Xylene	0.0573	0.010	"	0.200	ND	28.6	10-159	8.63	68
o-Xylene	0.0412	0.0050	"	0.100	ND	41.2	31-151	13.4	38
Surrogate: 1,2-Dichloroethane-d4	0.0458		"	0.0397		115	23-173		
Surrogate: Toluene-d8	0.0405		"	0.0400		101	20-170		
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400		97.2	21-167		

Summit Scientific

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

Project: NEP - Karch Blue 30-3J (A)

Project Number: 0083-13056  
Project Manager: Rob Rebel

**Reported:**  
10/02/13 19:26

### Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

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



October 18, 2013

LT Environmental, Inc.

Chris Roy

4600 West 60th Avenue

Arvada

CO 80003

Project Name - Noble - Karch Blue 30-3J 14 North

Project Number - 008313054

Attached are you analytical results for Noble - Karch Blue 30-3J 14 North received by Origins Laboratory, Inc. October 15, 2013. This project is associated with Origins project number X310078-01.

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X310078-01	Water	October 15, 2013 14:00	10/15/2013 16:00
MW02	X310078-02	Water	October 15, 2013 14:05	10/15/2013 16:00
MW03	X310078-03	Water	October 15, 2013 14:10	10/15/2013 16:00
MW04	X310078-04	Water	October 15, 2013 14:15	10/15/2013 16:00
MW05	X310078-05	Water	October 15, 2013 14:20	10/15/2013 16:00
MW06	X310078-06	Water	October 15, 2013 14:30	10/15/2013 16:00
MW07	X310078-07	Water	October 15, 2013 14:40	10/15/2013 16:00
MW08	X310078-08	Water	October 15, 2013 14:45	10/15/2013 16:00
MW09	X310078-09	Water	October 15, 2013 14:50	10/15/2013 16:00
MW10	X310078-10	Water	October 15, 2013 14:55	10/15/2013 16:00
MW11	X310078-11	Water	October 15, 2013 15:00	10/15/2013 16:00

Origins Laboratory, Inc.



Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

www.originslaboratory.com

page 1 of 2

X310078

**ORIGINS** LABORATORY, INC

Client: LTE  
Address:  
Telephone Number: 303-433-9788  
Email Address: Croy@henric.com

Project Manager: Chris Roy  
Project Name: Karch Blue 30-3J, 14 North  
Project Number: 008313054 North  
Samples Collected By: Croy

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #	Other			
MW01	10/15/13	1400	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
MW02		1405		✓	✓	✓	✓	✓	✓	✓	✓	✓	2	
MW03		1410		✓	✓	✓	✓	✓	✓	✓	✓	✓	3	
MW04		1415		✓	✓	✓	✓	✓	✓	✓	✓	✓	4	
MW05		1420		✓	✓	✓	✓	✓	✓	✓	✓	✓	5	
MW06		1430		✓	✓	✓	✓	✓	✓	✓	✓	✓	6	
MW07		1440		✓	✓	✓	✓	✓	✓	✓	✓	✓	7	
MW08		1445		✓	✓	✓	✓	✓	✓	✓	✓	✓	8	
MW09		1450		✓	✓	✓	✓	✓	✓	✓	✓	✓	9	
MW10		1455		✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
Relinquished By: <i>Amg</i>	Date: 10/15/13	Time: 1400		Received By: <i>[Signature]</i>				Received By: <i>[Signature]</i>				Date: 10/15/13	Time: 16:00	
Relinquished By:	Date:	Time:		Received By:				Received By:				Date:	Time:	

Turnaround Time: Same Day ☐ 24 Hr ☐ 48 Hr ☐ 72 Hr ☐ Standard ☒

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

Origins Laboratory, Inc.

*Noelle E Doyle*

Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**ORIGINS** LABORATORY, INC

www.originslaboratory.com

page 2 of 2

**X310078**

Client: LTE

Address: \_\_\_\_\_

Telephone Number: 303-433-9758

Email Address: Croy@Hem.com

Project Manager: Chris Roy

Project Name: Karch Blue 30-3J, 14 North

Project Number: 008313054 North

Samples Collected By: CMH/niz

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #			Other
MW11	10/15/13	1500	3	✓				✓				1	
												2	
												3	
												4	
												5	
												6	
												7	
												8	
												9	
												10	

Relinquished By: [Signature]

Relinquished By: [Signature]

Date: 10/15/13

Date: 10/15/13

Time: 1600

Time: 1600

Received By: [Signature]

Date: 10/15/13

Time: 1600

Turnaround Time: ☐ Same Day ☐ 24 Hr ☐ 48 Hr ☒ Standard

Origins Laboratory, Inc.

Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

Origins Laboratory

F-012207-01-R1  
Effective Date: 01/09/12

## Sample Receipt Checklist

Origins Work Order: X310078

Client: LTE

Client Project ID: Karch Blue 30-3J North

Checklist Completed by: Jace Smith

Shipped Via: H/D  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 01/13/13 16:20

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid ☒ Water ☐ Other: ☐ (Describe)

Cooler Number/Temperature: 16.8 °C 1 °C 1 °C 1 °C

Thermometer ID: 1802

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		<u>Sampled Some Dry</u>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) / (pH < 2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH > 10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input checked="" type="checkbox"/>			<u>NCC</u>
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

[Signature]  
Reviewed by (Project Manager)

10/18/13 10:34  
Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

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, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**MW01**

**10/15/2013 2:00:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X310078-01 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"
Surrogate: Toluene-d8	97.9 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	109 %	84-114			"	"	"

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, President



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW02

10/15/2013 2:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

## Origins Laboratory, Inc. X310078-02 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"
Surrogate: Toluene-d8	96.9 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	111 %	84-114			"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW03

10/15/2013 2:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. X310078-03 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	100 %	84-121			"	"	"
Surrogate: Toluene-d8	97.8 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	109 %	84-114			"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

MW04

10/15/2013 2:15:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X310078-04 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	100 %	84-121			"	"	"
Surrogate: Toluene-d8	96.0 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	109 %	84-114			"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

MW05

10/15/2013 2:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310078-05 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.2 %	84-121			"	"	"
Surrogate: Toluene-d8	97.5 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114			"	"	"

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW06

10/15/2013 2:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. X310078-06 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121			"	"	"
Surrogate: Toluene-d8	96.3 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114			"	"	"

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

MW07

10/15/2013 2:40:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X310078-07 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"
Surrogate: Toluene-d8	96.9 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	111 %	84-114			"	"	"

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW08

10/15/2013 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. X310078-08 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"
Surrogate: Toluene-d8	98.6 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	84-114			"	"	"

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW09

10/15/2013 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. X310078-09 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121			"	"	"
Surrogate: Toluene-d8	98.4 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	107 %	84-114			"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW10

10/15/2013 2:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. X310078-10 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	99.9 %	84-121			"	"	"
Surrogate: Toluene-d8	97.9 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	107 %	84-114			"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

## MW11

10/15/2013 3:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. X310078-11 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"
Surrogate: Toluene-d8	97.2 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114			"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)**

**Blank (3J16007-BLK1)**

Prepared: 10/16/2013 Analyzed: 10/16/2013

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5	101		84-121			
Surrogate: Toluene-d8	61		"	62.5	96.9		85-115			
Surrogate: 4-Bromofluorobenzene	69		"	62.5	110		84-114			

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)**

**Blank (3J16007-BLK2)**

Prepared: 10/16/2013 Analyzed: 10/16/2013

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.7	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.0	85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		106	84-114			

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3J16007 - EPA 5030B (Water)</b>										
<b>LCS (3J16007-BS1)</b>					Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	51.3	1.0	ug/L	50.0		103	74-130			
Toluene	50.5	1.0	"	50.0		101	76-128			
Ethylbenzene	52.8	1.0	"	50.0		106	78-130			
m,p-Xylene	106	2.0	"	100		106	75-134			
o-Xylene	52.7	1.0	"	50.0		105	76-129			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.9	84-121			
Surrogate: Toluene-d8	60		"	62.5		95.4	85-115			
Surrogate: 4-Bromofluorobenzene	68		"	62.5		109	84-114			

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3J16007 - EPA 5030B (Water)</b>										
<b>LCS (3J16007-BS2)</b>					Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	57.6	1.0	ug/L	50.0		115	74-130			
Toluene	56.9	1.0	"	50.0		114	76-128			
Ethylbenzene	59.8	1.0	"	50.0		120	78-130			
m,p-Xylene	119	2.0	"	100		119	75-134			
o-Xylene	58.7	1.0	"	50.0		117	76-129			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.4	84-121			
Surrogate: Toluene-d8	61		"	62.5		96.9	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	84-114			

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)**

Matrix Spike (3J16007-MS1)		Source: X310067-02			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	53.3	1.0	ug/L	50.0	ND	107	74-130			
Toluene	53.5	1.0	"	50.0	0.3	106	73-131			
Ethylbenzene	56.2	1.0	"	50.0	ND	112	76-132			
m,p-Xylene	112	2.0	"	100	ND	112	69-139			
o-Xylene	55.5	1.0	"	50.0	ND	111	74-131			
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5		92.9	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.5	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		108	84-114			

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)**

Matrix Spike (3J16007-MS2)		Source: X310067-01			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	51.9	1.0	ug/L	50.0	ND	104	74-130			
Toluene	52.5	1.0	"	50.0	ND	105	73-131			
Ethylbenzene	53.6	1.0	"	50.0	ND	107	76-132			
m,p-Xylene	108	2.0	"	100	ND	108	69-139			
o-Xylene	54.9	1.0	"	50.0	ND	110	74-131			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.9	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.9	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		108	84-114			

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4600 West 60th Avenue  
Arvada CO 80003

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

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

**Batch 3J16007 - EPA 5030B (Water)**

Matrix Spike Dup (3J16007-MSD1)		Source: X310067-02			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	52.3	1.0	ug/L	50.0	ND	105	74-130	1.87	20	
Toluene	52.6	1.0	"	50.0	0.3	105	73-131	1.70	20	
Ethylbenzene	54.4	1.0	"	50.0	ND	109	76-132	3.27	20	
m,p-Xylene	109	2.0	"	100	ND	109	69-139	2.71	20	
o-Xylene	54.7	1.0	"	50.0	ND	109	74-131	1.49	20	
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5		92.4	84-121			
Surrogate: Toluene-d8	60		"	62.5		96.5	85-115			
Surrogate: 4-Bromofluorobenzene	70		"	62.5		112	84-114			

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J 14 North

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)**

Matrix Spike Dup (3J16007-MSD2)		Source: X310067-01			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	52.8	1.0	ug/L	50.0	ND	106	74-130	1.68	20	
Toluene	52.5	1.0	"	50.0	ND	105	73-131	0.0762	20	
Ethylbenzene	54.0	1.0	"	50.0	ND	108	76-132	0.817	20	
m,p-Xylene	109	2.0	"	100	ND	109	69-139	0.877	20	
o-Xylene	55.5	1.0	"	50.0	ND	111	74-131	1.01	20	
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.8	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.8	85-115			
Surrogate: 4-Bromofluorobenzene	68		"	62.5		109	84-114			

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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Chris Roy

Project Number: 008313054

Project: Noble - Karch Blue 30-3J 14 North

### Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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October 17, 2013

LT Environmental, Inc.

Chris Roy

4600 West 60th Avenue

Arvada

CO 80003

Project Name - Noble - Karch Blue 30-3J South

Project Number - 008313054

Attached are you analytical results for Noble - Karch Blue 30-3J South received by Origins Laboratory, Inc. October 15, 2013. This project is associated with Origins project number X310077-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

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



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

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X310077-01	Water	October 15, 2013 11:15	10/15/2013 15:55
MW02	X310077-02	Water	October 15, 2013 11:20	10/15/2013 15:55
MW03	X310077-03	Water	October 15, 2013 11:25	10/15/2013 15:55
MW04	X310077-04	Water	October 15, 2013 11:30	10/15/2013 15:55
MW05	X310077-05	Water	October 15, 2013 11:35	10/15/2013 15:55
MW06	X310077-06	Water	October 15, 2013 11:40	10/15/2013 15:55
MW07	X310077-07	Water	October 15, 2013 11:45	10/15/2013 15:55
MW08	X310077-08	Water	October 15, 2013 11:50	10/15/2013 15:55
MW09	X310077-09	Water	October 15, 2013 11:55	10/15/2013 15:55
MW10	X310077-10	Water	October 15, 2013 12:00	10/15/2013 15:55
MW11	X310077-11	Water	October 15, 2013 12:05	10/15/2013 15:55
MW12	X310077-12	Water	October 15, 2013 12:10	10/15/2013 15:55

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

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X310077 page 1 of 2

ORIGINS  
LABORATORY, INC

Client: LTE  
Address: 4600 W. 60th Ave.  
Telephone Number: 303-433-9788  
Email Address: C.Roy@ltenv.com

Project Manager: Chris Roy  
Project Name: Karch Blue 30-3J South  
Project Number: 008313054  
Samples Collected By: Ryan Krutberger

Fax: 303.265.9645

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa #		
MW001	10/15/13	1115	3	X				X				1
MW002	1120	1120	3	X				X				2
MW003	1125	1125	3	X				X				3
MW004	1130	1130	3	X				X				4
MW005	1135	1135	3	X				X				5
MW006	1140	1140	3	X				X				6
MW007	1145	1145	3	X				X				7
MW008	1150	1150	3	X				X				8
MW009	1155	1155	3	X				X				9
MW010	1200	1200	3	X				X				10
Relinquished By: Ryan Krutberger	Date: 10/15/13	Time: 15:55		Received By: [Signature]				Time: 15:55			Date: 10/15/13	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard
Relinquished By:	Date:	Time:		Received By:				Time:			Date:	

Date Results Needed

Origins Laboratory, Inc.

*Noelle E Doyle*

Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

www.originslaboratory.com

page 2 of 2

X310077

**ORIGINS**  
LABORATORY, INC

Client: LTE  
Address: 4600 W. 60th Ave.  
Telephone Number: 303-433-9788  
Email Address: C.Roy@LenV.com

Project Manager: Chris Roy  
Project Name: Karch Blue 30-3J South  
Project Number: 008313054  
Samples Collected By: Ryan Kitzberger

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #			Other
MW 11	10/15/13	1205	3	X				X				1	
MW 17	10/15/13	1210	3	X				X				2	
												3	
												4	
												5	
												6	
												7	
												8	
												9	
												10	

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
Chris Roy	10/15/13	15:55	Ryan Kitzberger	10/15/13	15:55	Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>

Date Results Needed

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

Origins Laboratory, Inc.

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

Origins Laboratory

F-012207-01-R1  
Effective Date: 01/09/12

## Sample Receipt Checklist

Origins Work Order: X310077

Client: LTE

Client Project ID: Karch Blue 30-3J South

Checklist Completed by: Jesse Smith

Shipped Via: H/D  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 10/15/13 16:11

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid ☒ Water ☐ Other: ☐

Cooler Number/Temperature: 1 6.8 °C 1 °C 1 °C (Describe)

Thermometer ID: B02

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		<u>Sampled Same Day</u>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)(pH < 2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH > 10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)		<input checked="" type="checkbox"/>		<u>Samples will be analyzed within 7 Days of Collection</u>
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager)

10-17-13 1348  
Date/Time Reviewed

Origins Laboratory, Inc.

Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW01

10/15/2013 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-01 (Water)

### BTEX by EPA 8260C

Benzene	1.08	1.0	ug/L	1	3J16007	10/16/2013	10/16/2013
Toluene	1.21	1.0	"	"	"	"	"
Ethylbenzene	43.8	1.0	"	"	"	"	"
Xylenes, total	60.9	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

102 % 84-121  
96.9 % 85-115  
109 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW02

10/15/2013 11:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-02 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/16/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121	"	"	"
Surrogate: Toluene-d8	97.2 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114	"	"	"

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW03

10/15/2013 11:25:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-03 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/16/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

101 % 84-121  
97.3 % 85-115  
106 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW04

10/15/2013 11:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-04 (Water)

### BTEX by EPA 8260C

Benzene	177	1.0	ug/L	1	3J16007	10/16/2013	10/16/2013
Toluene	1.53	1.0	"	"	"	"	"
Ethylbenzene	159	10.0	"	10	"	"	10/17/2013
Xylenes, total	240	1.0	"	1	"	"	10/16/2013

Surrogate: 1,2-Dichloroethane-d4	99.0 %	84-121	"	"	"
Surrogate: Toluene-d8	103 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	113 %	84-114	"	"	"

Origins Laboratory, Inc.



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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Chris Roy

Project Number: 008313054

Project: Noble - Karch Blue 30-3J South

MW05

10/15/2013 11:35:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-05 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4

102 % 84-121

"

"

"

Surrogate: Toluene-d8

97.4 % 85-115

"

"

"

Surrogate: 4-Bromofluorobenzene

108 % 84-114

"

"

"

Origins Laboratory, Inc.



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LT Environmental, Inc.  
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Arvada CO 80003

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW06

10/15/2013 11:40:00AM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X310077-06 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	1.02	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121	"	"	"
Surrogate: Toluene-d8	96.5 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114	"	"	"

Origins Laboratory, Inc.



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Arvada CO 80003

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW07

10/15/2013 11:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-07 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121	"	"	"
Surrogate: Toluene-d8	98.3 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW08

10/15/2013 11:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-08 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

102 % 84-121  
97.1 % 85-115  
107 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW09

10/15/2013 11:55:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-09 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	103 %	84-121	"	"	"
Surrogate: Toluene-d8	97.2 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	108 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW10  
10/15/2013 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-10 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

101 % 84-121  
97.6 % 85-115  
108 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW11

10/15/2013 12:05:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X310077-11 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

100 % 84-121  
98.2 % 85-115  
110 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

MW12

10/15/2013 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
X310077-12 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	3J16007	10/16/2013	10/17/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

102 % 84-121  
97.4 % 85-115  
109 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Chris Roy

Project Number: 008313054

Project: Noble - Karch Blue 30-3J South

## Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control

### Origins Laboratory, Inc.

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

Batch 3J16007 - EPA 5030B (Water)

Blank (3J16007-BLK1)

Prepared: 10/16/2013 Analyzed: 10/16/2013

Benzene	ND	1.0	ug/L
Toluene	ND	1.0	"
Ethylbenzene	ND	1.0	"
Xylenes, total	ND	1.0	"

Surrogate: 1,2-Dichloroethane-d4	63	"	62.5	101	84-121
Surrogate: Toluene-d8	61	"	62.5	96.9	85-115
Surrogate: 4-Bromofluorobenzene	69	"	62.5	110	84-114

Origins Laboratory, Inc.



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Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control  
Origins Laboratory, Inc.

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

Batch 3J16007 - EPA 5030B (Water)

Blank (3J16007-BLK2)

Prepared: 10/16/2013 Analyzed: 10/16/2013

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5	99.7		84-121			
Surrogate: Toluene-d8	62		"	62.5	99.0		85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5	106		84-114			

Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Chris Roy

Project Number: 008313054

Project: Noble - Karch Blue 30-3J South

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
Origins Laboratory, Inc.

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

Batch 3J16007 - EPA 5030B (Water)

LCS (3J16007-BS1)

Prepared: 10/16/2013 Analyzed: 10/16/2013

Benzene	51.3	1.0	ug/L	50.0		103	74-130			
Toluene	50.5	1.0	"	50.0		101	76-128			
Ethylbenzene	52.8	1.0	"	50.0		106	78-130			
m,p-Xylene	106	2.0	"	100		106	75-134			
o-Xylene	52.7	1.0	"	50.0		105	76-129			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.9	84-121			
Surrogate: Toluene-d8	60		"	62.5		95.4	85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		109	84-114			

Origins Laboratory, Inc.



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Noelle E Doyle, President

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Chris Roy

Project Number: 008313054

Project: Noble - Karch Blue 30-3J South

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control  
Origins Laboratory, Inc.

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

Batch 3J16007 - EPA 5030B (Water)

LCS (3J16007-BS2)

Prepared: 10/16/2013 Analyzed: 10/16/2013

Benzene	57.6	1.0	ug/L	50.0		115	74-130			
Toluene	56.9	1.0	"	50.0		114	76-128			
Ethylbenzene	59.8	1.0	"	50.0		120	78-130			
m,p-Xylene	119	2.0	"	100		119	75-134			
o-Xylene	58.7	1.0	"	50.0		117	76-129			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.4	84-121			
Surrogate: Toluene-d8	61		"	62.5		96.9	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	84-114			

Origins Laboratory, Inc.



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Noelle E Doyle, President



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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)

Matrix Spike (3J16007-MS1)		Source: X310067-02			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	53.3	1.0	ug/L	50.0	ND	107	74-130			
Toluene	53.5	1.0	"	50.0	0.3	106	73-131			
Ethylbenzene	56.2	1.0	"	50.0	ND	112	76-132			
m,p-Xylene	112	2.0	"	100	ND	112	69-139			
o-Xylene	55.5	1.0	"	50.0	ND	111	74-131			
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5		92.9	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.5	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		108	84-114			

Origins Laboratory, Inc.



Noelle E Doyle, President

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

Chris Roy  
Project Number: 008313054  
Project: Noble - Karch Blue 30-3J South

**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)

Matrix Spike (3J16007-MS2)		Source: X310067-01			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	51.9	1.0	ug/L	50.0	ND	104	74-130			
Toluene	52.5	1.0	"	50.0	ND	105	73-131			
Ethylbenzene	53.6	1.0	"	50.0	ND	107	76-132			
m,p-Xylene	108	2.0	"	100	ND	108	69-139			
o-Xylene	54.9	1.0	"	50.0	ND	110	74-131			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.9	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.9	85-115			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		108	84-114			

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**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)

Matrix Spike Dup (3J16007-MSD1)		Source: X310067-02			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	52.3	1.0	ug/L	50.0	ND	105	74-130	1.87	20	
Toluene	52.6	1.0	"	50.0	0.3	105	73-131	1.70	20	
Ethylbenzene	54.4	1.0	"	50.0	ND	109	76-132	3.27	20	
m,p-Xylene	109	2.0	"	100	ND	109	69-139	2.71	20	
o-Xylene	54.7	1.0	"	50.0	ND	109	74-131	1.49	20	
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5		92.4	84-121			
Surrogate: Toluene-d8	60		"	62.5		96.5	85-115			
Surrogate: 4-Bromofluorobenzene	70		"	62.5		112	84-114			

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**Volatile Organic Compounds by GC/MS SW846 8260C - 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 3J16007 - EPA 5030B (Water)

Matrix Spike Dup (3J16007-MSD2)		Source: X310067-01			Prepared: 10/16/2013 Analyzed: 10/16/2013					
Benzene	52.8	1.0	ug/L	50.0	ND	106	74-130	1.68	20	
Toluene	52.5	1.0	"	50.0	ND	105	73-131	0.0762	20	
Ethylbenzene	54.0	1.0	"	50.0	ND	108	76-132	0.817	20	
m,p-Xylene	109	2.0	"	100	ND	109	69-139	0.877	20	
o-Xylene	55.5	1.0	"	50.0	ND	111	74-131	1.01	20	
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.8	84-121			
Surrogate: Toluene-d8	61		"	62.5		97.8	85-115			
Surrogate: 4-Bromofluorobenzene	66		"	62.5		109	84-114			

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### Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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