



October 9, 2014

Mr. David Blake Ford  
Encana Oil & Gas (USA) Inc.  
3601 Stagecoach Road North  
Longmont, CO 80504

**RE: Additional Site Assessment and Groundwater Sampling Report – September 2014  
Harsch #31-27  
NW ¼ NE ¼ SEC.27 T2N R69W 6PM  
LAT./LONG.: 40.114543/-105.100403  
Boulder County, Colorado**

Dear Mr. Ford,

Eagle Environmental Consulting, Inc. (EAGLE) is pleased to present this Additional Site Assessment and Groundwater Sampling Report – September 2014 to Encana Oil & Gas (USA) (Encana) for the above referenced site.

## **1.0 SITE BACKGROUND**

In August 2014, a surface release was observed approximately 40 feet north, of the Harsch-62N69W/27NWNE Tank Battery due to a flow line release. Encana sub-contractors completed potholing activities at the location to determine the source of the Harsch #31-27 flow line release. During investigation activities on August 12, 2014, an Encana representative collected a grab groundwater sample (HARSCH31-27-FLOWLINE), from within a pothole located in the area of the suspected flow line release. The HARSCH31-27-FLOWLINE groundwater sample was submitted to ESC Lab Sciences (ESC) located in Mt. Juliet, Tennessee, for analysis of benzene, toluene, ethylbenzene, total xylenes (BTX) following Environmental Protection Agency (EPA) Method 8260B.

Based on laboratory analytical results, groundwater sample, HARSCH31-27-FLOWLINE, contained a concentration of benzene exceeding the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 regulatory limit of 5 micrograms per liter (µg/L) with a concentration of 500 µg/L.

On August 21, 2014, Encana sub-contractors completed excavation activities on site to expose the Harsch #31-27 flow line, located parallel to the lease road on the north side of the Harsch-62N69W/27NWNE Tank Battery. Excavation activities were completed to determine the exact location of the Harsch #31-27 flow line release. During excavation activities, petroleum hydrocarbon staining or odor was not observed within the soil beneath the site. Throughout the Harsch #31-27 flow line release investigation, a vacuum truck was present on site recovering groundwater observed within potholes/excavations. EAGLE completed soil boring/temporary monitoring well installation activities north of the Harsch-62N69W/27NWNE Tank Battery to define any potential dissolved or adsorbed petroleum hydrocarbon impacts beneath the site.

EAGLE utilized a hand auger to complete soil boring/temporary well installations at the site. Seven soil borings were advanced within the landscaping located north of the Harsch-62N69W/27NWNE Tank

Battery. Each soil boring was completed into 1-inch temporary groundwater monitoring wells (TMW-01 through TMW-07).

Per Encana's request, grab groundwater samples were collected from temporary monitoring wells TMW-01 through TMW-07 on August 21, 2014. The grab groundwater samples were collected from each monitoring well using the peristaltic pump and flow cell. The groundwater samples were submitted to ESC located in Mt. Juliet, Tennessee, for analysis of BTEX following EPA Method 8260B. Following groundwater sample collection, temporary monitoring wells TMW-01 through TMW-07 were removed and the soil borings were abandoned with 10/20 silica sand and bentonite to grade.

Based on laboratory analytical results, the grab groundwater samples collected from temporary monitoring wells, TMW-01 through TMW-07, did not contain concentrations of BTEX exceeding their respective COGCC Table 910-1 regulatory limits or laboratory reporting limits.

EAGLE recorded spatial locations of temporary monitoring wells TMW-01 through TMW-07 using a Trimble GeoXT 6000 series instrument. Their locations were updated on the current site map. A site map is included as Figure 1.

Site assessment activities completed on August 21, 2014 and groundwater analytical results were presented to the COGCC in the preceding Site Assessment and Groundwater Sampling Report – August 2014, submitted in September 2014.

## **2.0 SITE DESCRIPTION**

The Harsch #31-27 Well and the Harsch-62N69W/27NWNE Tank Battery site are located within the Northwest Quarter of the Northeast Quarter of Section 27, Township 2 North, Range 69 West of the 6<sup>th</sup> Prime Meridian. The site contains one 335 barrel (bbl) condensate storage tank and one, 110 bbl produced water tank. The Harsch #31-27 Well is located at latitude: 40.114543 and longitude -105.100403, and the Harsch-62N69W/27NWNE Tank Battery is located at latitude: 40.11453 and longitude -105.10039, in Boulder County, Colorado. A site location map is presented as Figure 2.

### **2.1 Site Hydrogeology**

Based on field observations, the site lithology beneath the site is a silty clay from the surface to approximately 3-4 feet below ground surface (bgs). The silty clay is underlain by a fine-grained sandy clay to approximately 10 feet bgs. Groundwater was observed within the temporary monitoring wells between approximately 1.6-7.2 feet bgs.

## **3.0 TEMPORARY MONITORING WELL INSTALLATION ACTIVITIES**

### **3.1 Field Work Preparation and Planning**

The Utility Notification Center of Colorado (UNCC) was called at least 48 hours in advance of drilling activities to confirm no unmarked utilities or other obstacles were present within the proposed drilling locations. Tier II facility owners were also contacted to confirm the necessary buried utility notifications were completed. Each boring location was also cleared to a depth of approximately 5 feet bgs, prior to the advancement of any proposed soil boring, with a pothole or "daylighting" rig, to ensure no unmarked utilities were present beneath the boring location. Prior to any subsurface disturbance activities, a Ground Disturbance Form was completed by Encana and EAGLE.

### **3.2 Temporary Monitoring Well Installation Activities**

On September 9, 2014, EAGLE mobilized to the site to complete temporary monitoring well installation activities. A Geoprobe 7822DT direct push rig was utilized to complete soil boring/temporary well installations at the site. One soil boring (TMW-08) was located within the release area and the other soil boring (TMW-09) was located upgradient of the release area. Each soil boring was completed into 1-inch temporary groundwater monitoring wells (TMW-08 and TMW-09).

Both soil borings were logged in the field according to soil type, soil classification, moisture content, staining, and volatile organic compound (VOC) concentrations. Following advancement, each soil boring was completed with 1-inch, schedule 40 polyvinyl chloride (PVC) pipe to an approximate depth of 10 feet bgs. Eight feet of 0.020 slot, 1-inch, PVC screen was placed at the bottom of the borings followed by approximately 2-4 feet of 1-inch PVC riser. The well annulus was backfilled with 10/20 silica sand to the top of the screened section, followed by a bentonite seal to the surface. Soil boring logs/temporary monitoring well completion diagrams are included in Attachment A.

### **3.3 Soil Sampling Procedures**

During temporary soil boring advancement, soil samples were collected continuously within 5-foot, plastic sample liners. The samples within the plastic liners were separated in 2.5 foot intervals for soil identification and analysis. A portion from each interval was placed in a sealable plastic bag, for VOC headspace analysis utilizing a field calibrated portable photoionization detector (PID). Each bag was sealed, labeled, and allowed to volatilize for approximately five to ten minutes. The other portion of each sample from the same interval was placed in laboratory supplied, 4-ounce, glass jars and sealed for laboratory analysis. After volatilization, the bagged sample was perforated with the probe of the calibrated field portable PID, using a 10.6 electron volt (eV) lamp, to measure the organic vapor concentration within the headspace. Organic vapor concentrations were recorded in parts per million by volume (ppm-v) for each sample. Photoionization detector values did not exceed 0.0 ppm-v within soil borings, TWM-08 and TMW-09.

The soil sample collected from soil boring TMW-08, TMW-08@5-7.5', was submitted to ESC located in Mt. Juliet, Tennessee, for laboratory analysis of BTEX and total petroleum hydrocarbons- gasoline range organics (TPH-GRO) following EPA Methods 8021/8015, and total petroleum hydrocarbons – diesel range organics (TPH-DRO) following modified EPA Method 3546. In addition, soil sample TMW-08@5-7.5' was analyzed for the metals and the 13 polycyclic aromatic hydrocarbons (PAHs) listed in COGCC Table 910-1 following EPA Methods 6010B and 3060A/7196A, and 8270C-SIM, respectively, as well as pH following EPA Method 9045D, and specific conductance following EPA Method 9050A. Sodium adsorption ratio (SAR) was also calculated by the laboratory.

In addition to the soil sample collected from soil boring TMW-08, ten baseline arsenic soil samples (AS-01 through AS-10) were collected upgradient of the Harsch-62N69W/27NWNE Tank Battery at approximately 0-0.5 feet bgs. The baseline arsenic soil samples, AS-01 through AS-10, were submitted to ESC located in Mt. Juliet, Tennessee, for laboratory analysis of total arsenic following EPA Method 6010B.

Following soil sample collection, EAGLE recorded spatial locations of soil borings TMW-08 and TMW-09, as well as soil samples AS-01 through AS-10 using a Trimble GeoXT 6000 series instrument. Their locations included on the current site map.

A representative from ESC picked up the soil samples under proper chain-of custody procedures for shipment to the laboratory and were received within quality assurance/quality control (QA/QC) parameters.

### **3.4 Soil Analytical Results**

Based on laboratory analytical results, the soil sample collected from soil boring TMW-08 did not contain concentrations of BTEX, TPH-GRO, or TPH-DRO exceeding their respective COGCC Table 910-1 regulatory limits or laboratory reporting limits. In addition, soil sample, TMW-08@5-7.5', did not contain PAHs, specific conductance, pH, or SAR concentrations/values exceeding their respective COGCC Table 910-1 regulatory limits and/or laboratory reporting limits.

Arsenic concentrations were observed in soil samples TMW-08@5-7.5' and AS-01 through AS-10 exceeding the COGCC Table 910-1 regulatory limit of 0.39 milligrams per kilogram (mg/kg), with concentrations ranging from 2.9 mg/kg (AS-04@0-0.5') to 5.5 mg/kg (AS-10@0-0.5').

Arsenic is naturally occurring in some geologic environments within Colorado due to the weathering and erosion of bedrock and soil. The Colorado Department of Public Health and Environment (CDPHE) developed a Risk Management Guidance Document for Evaluating Arsenic Concentrations in Soil, which was released in June 2011. During the study conducted by the EPA, the average concentration of arsenic observed in Colorado soils was 11 mg/kg. Based on the average concentration of arsenic listed in the guidance document provided by the CDPHE and the arsenic concentrations observed within the soil samples collected beneath the site, arsenic is not a chemical of concern to the site at this time.

Soil analytical results are summarized in Table 1, Table 1A, and Table 1B. A site map presenting soil sample locations is included as Figure 3. Laboratory analytical reports are included in Attachment B.

### **3.5 Groundwater Sampling Activities**

Per Encana's request, grab groundwater samples were collected from temporary monitoring wells TMW-08 and TMW-09 on September 10, 2014. The grab groundwater samples were collected from each temporary monitoring well in 40 milliliter (mL) amber vials using the peristaltic pump and flow cell with a pumping rate of no more than 500 milliliters per min (mL/min). Prior to groundwater sample collection, the following field parameters were recorded:

- initial depth to groundwater using an interface probe capable of measuring the depth to groundwater or product to an accuracy of 0.01 feet;

The groundwater samples were submitted to ESC located in Mt. Juliet, Tennessee, for analysis of BTEX following EPA Method 8260B. A representative from ESC picked up the groundwater samples under proper chain-of custody procedures for shipment to the laboratory, and the samples were received within QA/QC parameters.

Following grab groundwater sampling activities, temporary monitoring wells TMW-08 and TMW-09 were removed and the soil borings were abandoned with 10/20 silica sand and bentonite to grade.

### **3.6 Groundwater Analytical Results**

Based on laboratory analytical results, the grab groundwater sample collected from temporary monitoring well TMW-08 contained a concentration of benzene exceeding the COGCC Table 910-1 regulatory limit of 5 µg/L with a concentration of 7.2 µg/L. The grab groundwater sample collected from temporary monitoring well TMW-09 did not contain concentrations of BTEX exceeding their COGCC Table 910-1 regulatory limits or laboratory reporting limits.

Groundwater analytical results are summarized in Table 2 and presented in Figure 4. The laboratory analytical report are included in Attachment B.

### **4.0 CONCLUSIONS**

Based on the information described above, EAGLE concludes the following:

- Soil sample, TMW-08@5-7.5', did not contain concentrations of BTEX, TPH-GRO, or TPH-DRO exceeding their respective COGCC Table 910-1 regulatory limits or laboratory reporting limits.
- Soil sample, TMW-08@5-7.5', did not contain PAHs, specific conductance, pH, or SAR concentrations/values exceeding their respective COGCC Table 910-1 regulatory limits and/or laboratory reporting limits.
- Based on the CDPHE Risk Management Guidance Document for Evaluating Arsenic Concentrations in Soil, the arsenic concentrations observed within soil samples TMW-08@5-7.5' and AS-01 through AS-10 exceeding the COGCC Table 910-1 regulatory limit, are not a chemical of concern to the site at this time.
- The grab groundwater sample collected from temporary monitoring well TMW-08 on September 10, 2014, contained a concentration of benzene exceeding the COGCC Table 910-1 regulatory limit.
- The grab groundwater sample collected from temporary monitoring well TMW-09 on September 10, 2014, did not contain concentrations of BTEX exceeding their respective COGCC Table 910-1 regulatory limits or laboratory reporting limits.

## 5.0 RECOMMENDATIONS

- Based on the laboratory analytical results from the grab groundwater sample collected from temporary monitoring well TMW-08, EAGLE recommends the installation of five permanent groundwater monitoring wells at the site to define and monitor the extents of dissolved phase petroleum hydrocarbon impacts.

EAGLE sincerely appreciates the opportunity to provide our services. If you have any questions or require further information, please contact me at (303) 433-0479.

Sincerely,

***EAGLE ENVIRONMENTAL CONSULTING, INC.***



Martin Eckert III  
Senior Project Manager

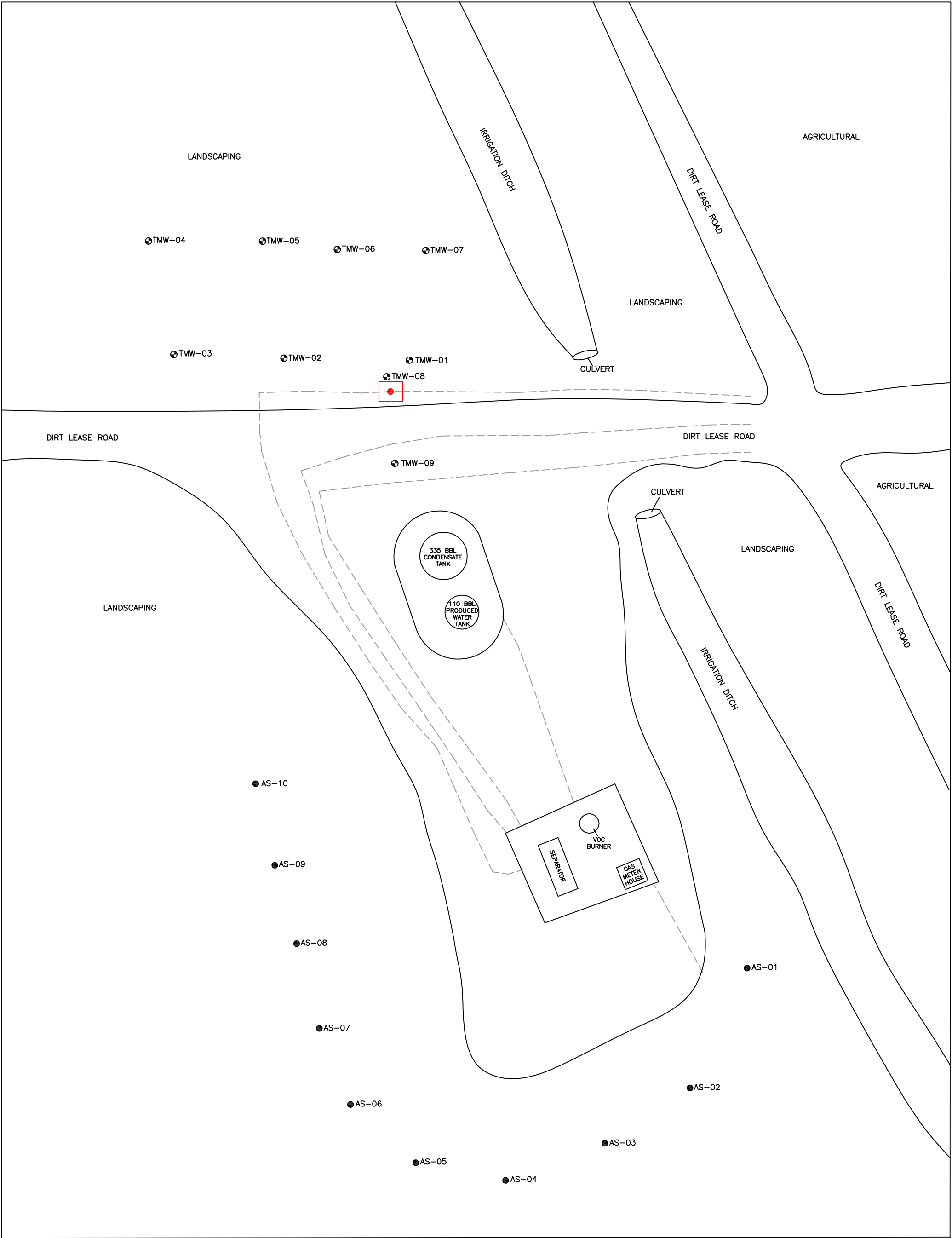
## **FIGURES**

**Figure 1: Site Map**

**Figure 2: Site Location Map**

**Figure 3: Soil Sample Location Map**

**Figure 4: Groundwater Sample Location Map**



**LEGEND**

- APPROXIMATE TEMPORARY MONITORING WELL LOCATION
- APPROXIMATE HARSCH31-27-FLOWLINE GROUNDWATER SAMPLE LOCATION
- APPROXIMATE FLOW LINE RELEASE LOCATION
- APPROXIMATE FLOW LINE LOCATION
- APPROXIMATE ARSENIC SOIL SAMPLE LOCATION

0 30'


APPROXIMATE SCALE IN FEET

DATE: 09/19/14

FIG. NO. 1

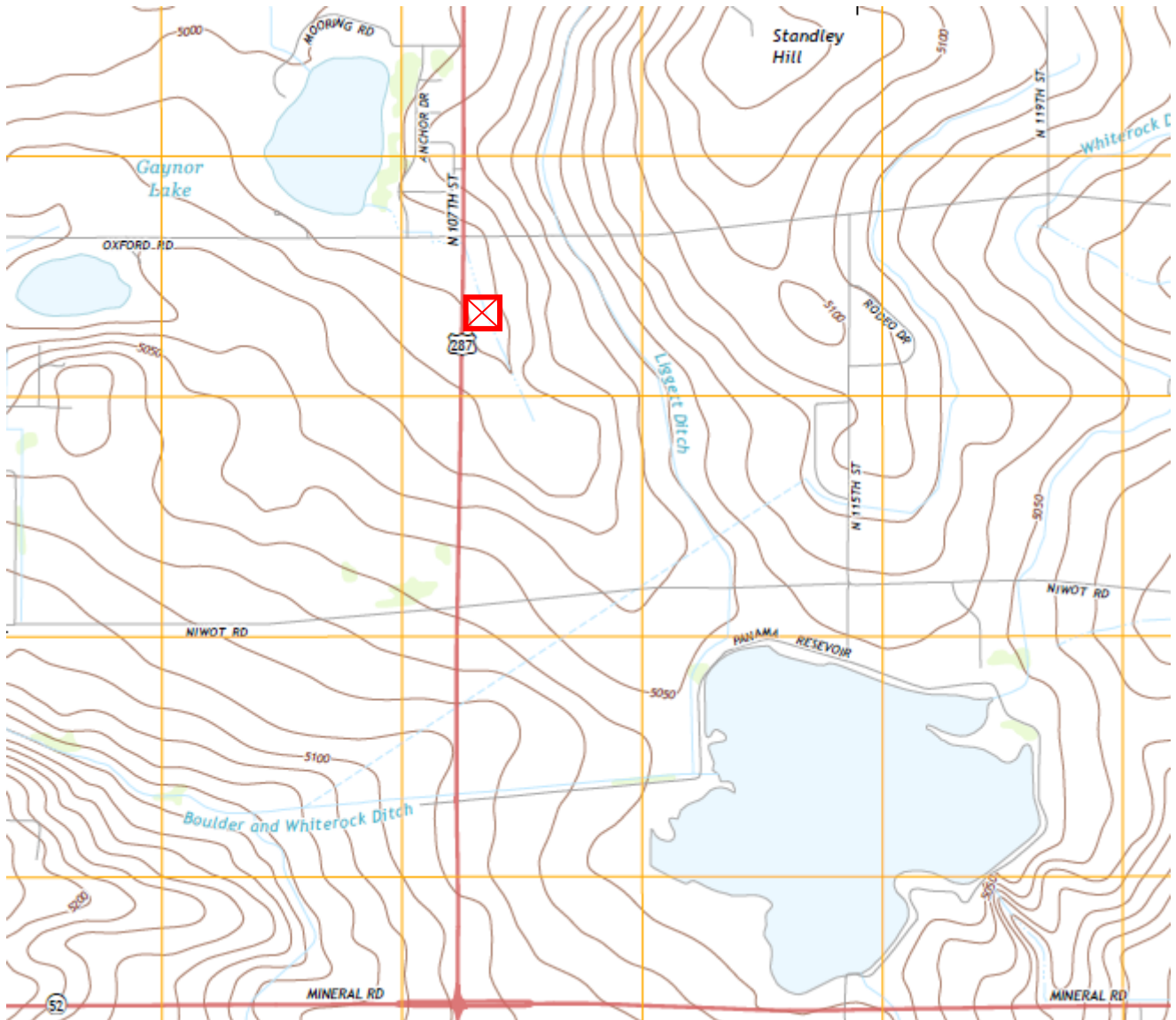
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**SITE MAP**  
HARSCH #31-27  
NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM  
LAT/LONG: 40.114543/-105.100403  
BOULDER COUNTY, COLORADO



**EAGLE**  
ENVIRONMENTAL  
CONSULTING, INC.  
4101 INCA STREET, DENVER, CO 80211  
Ph: 303-433-0479 • F: 303-325-5449





 APPROXIMATE LOCATION OF HARSCH-62N69W/27NWN TANK BATTERY

TOPOGRAPHIC MAP OBTAINED FROM LIBRE MAP PROJECT

ERIE, COLORADO QUADRANGLE UNITED STATES GEOLOGICAL SURVEY 7.5 MINUTE SERIES

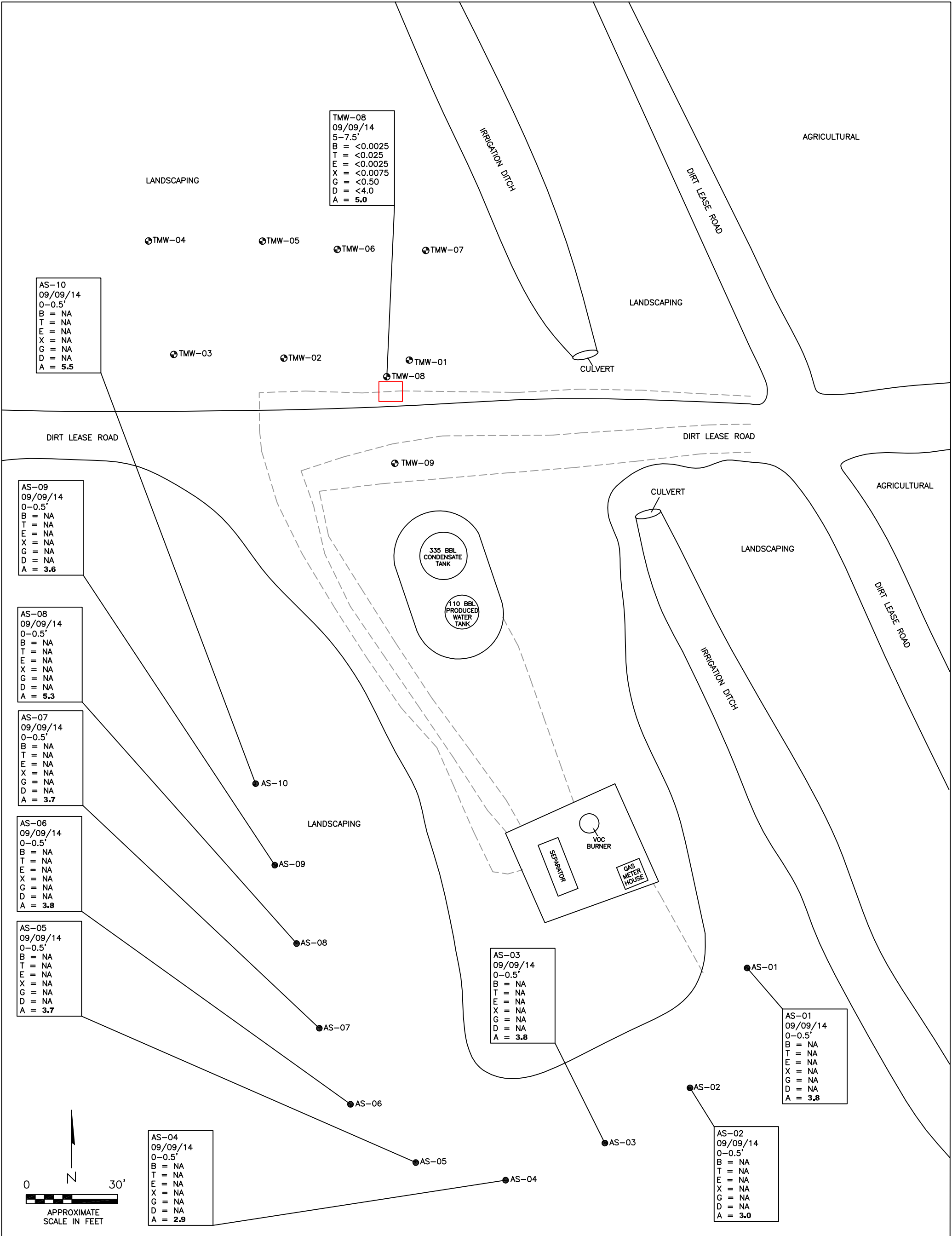
**FIGURE 2**  
**SITE LOCATION MAP**  
**HARSCH #31-27**  
**NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM**  
**LAT./LONG.: 40.114543/-105.100403**  
**BOULDER COUNTY, COLORADO**

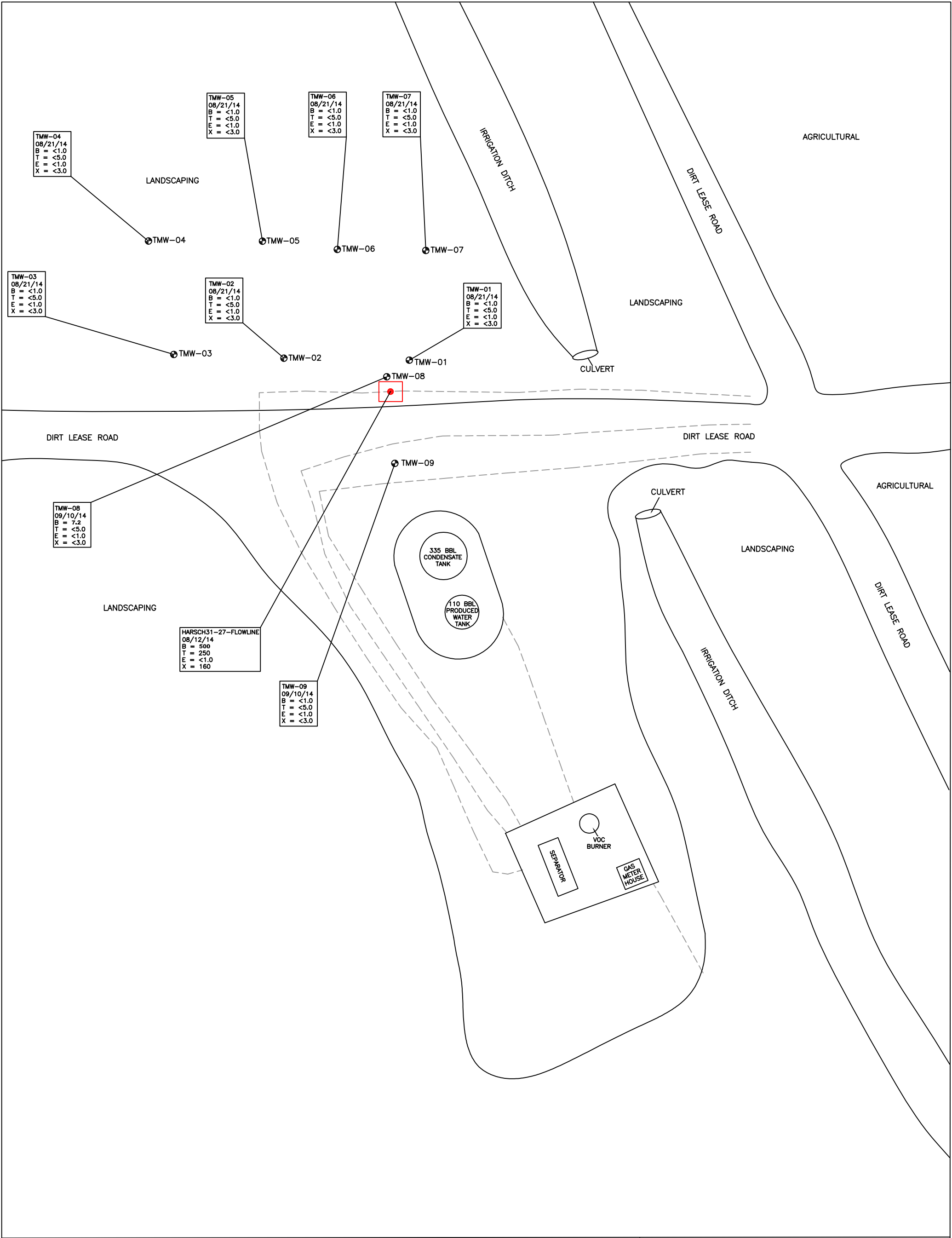


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DATE: 08/27/14





**LEGEND**

- APPROXIMATE TEMPORARY MONITORING WELL LOCATION
- APPROXIMATE HARSCH31-27-FLOWLINE GROUNDWATER SAMPLE LOCATION
- APPROXIMATE FLOW LINE RELEASE LOCATION
- APPROXIMATE FLOW LINE LOCATION

**PARAMETERS**

SAMPLE LOCATION  
DATE  
B = BENZENE (ug/L)  
T = TOLUENE (ug/L)  
E = ETHYLBENZENE (ug/L)  
X = TOTAL XYLENES (ug/L)

ug/L = MICROGRAMS PER LITER

NOTE: VALUES PRESENTED IN **BOLD** TYPEFACE EXCEED THE COGCC TABLE 910-1 REGULATORY LIMITS FOR THAT COMPOUND.

COGCC = COLORADO OIL AND GAS CONSERVATION COMMISSION

VALUES PRESENTED WITH A LESS THAN SYMBOL (<) INDICATE CONCENTRATIONS WERE NOT OBSERVED AT THE LABORATORY REPORTING LIMIT.

0 30'

N

APPROXIMATE SCALE IN FEET

**GROUNDWATER SAMPLE LOCATION MAP**  
HARSCH #31-27  
NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM  
LAT/LONG: 40.114543/-105.100403  
BOULDER COUNTY, COLORADO

DATE:	09/19/14
FIG. NO.	4
DRAWN BY:	DC

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## **TABLES**

**Table 1: Soil Analytical Results Summary**

**Table 1A: Soil Analytical Results Summary – Semi Volatile Organics**

**Table 1B: Soil Analytical Results Summary – Metals & Inorganics**

**Table 2: Groundwater Analytical Results Summary**

TABLE 1  
SOIL ANALYTICAL RESULTS SUMMARY  
HARSCH #31-27  
NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM  
LAT/LONG: 40.114543/-105.100403  
BOULDER COUNTY, COLORADO

Sample Location (Latitude/Longitude)	Date Sample Collected	Approximate Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
<b>COGCC Table 910-1 Regulatory Limit (mg/kg)</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>	
TMW-08 (40.112875868, -105.101402819)	09/09/14	5-7.5	<0.0025	<0.025	<0.0025	<0.0075	<0.50	<4.0

COGCC = Colorado Oil and Gas Conservation Commission

mg/kg = milligrams per kilogram

TPH-GRO = Total Petroleum Hydrocarbons - Gasoline Range Organics

TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range Organics

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

Note: Values presented in bold typeface exceed their respective COGCC Table 910-1 Regulatory Limit.

TABLE 1A  
SOIL ANALYTICAL RESULTS SUMMARY - SEMI VOLATILE ORGANICS  
HARSCH #31-27  
NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM  
LAT/LONG: 40.114543/-105.100403  
BOULDER COUNTY, COLORADO

Sample Location	Date	Approximate Depth (feet)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo(A) anthracene (mg/kg)	Benzo(B) fluoranthene (mg/kg)	Benzo(k) fluoranthene (mg/kg)	Benzo(A) pyrene (mg/kg)	Chrysene (mg/kg)	Dibenzo(A,H) anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3,C,D) pyrene (mg/kg)	Naphthalene (mg/kg)	Pyrene (mg/kg)
<b>COGCC Table 910-1 Regulatory Limit (mg/kg)</b>			<b>1,000</b>	<b>1,000</b>	<b>0.22</b>	<b>0.22</b>	<b>2.2</b>	<b>0.022</b>	<b>22</b>	<b>0.022</b>	<b>1,000</b>	<b>1,000</b>	<b>0.22</b>	<b>23</b>	<b>1,000</b>
TMW-08	09/09/14	5-7.5	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.020	<0.0060

COGCC = Colorado Oil and Gas Conservation Commission

mg/kg = milligrams per kilogram

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

Note: Values presented in bold typeface exceed their respective COGCC Table 910-1 Regulatory Limit.

TABLE 1B  
SOIL ANALYTICAL RESULTS SUMMARY - METALS & INORGANICS  
HARSCH #31-27  
NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM  
LAT/LONG: 40.114543/-105.100403  
BOULDER COUNTY, COLORADO

			Metals												Inorganics		
Sample Location (Latitude/Longitude)	Depth (feet)	Date	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (III) (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)	Electrical Conductivity (EC)	Sodium Adsorption Ratio (SAR)	pH
COGCC Table 910-1 Regulatory Limit (mg/kg)			0.39	15,000	70	120,000	23	3,100	400	23	1,600	390	390	23,000	<4mmhos/cm or 2x background	<12^5	6-9
TMW-08 (40.112875868, -105.101402819)	5-7.5	09/09/14	5.0	170	0.74	16	<2.0	16	16	<0.020	20	<2.0	<1.0	60	1.400	8.2	6.9
AS-01 (40.1123419071, -105.10098318)	0-0.5	09/09/14	3.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-02 (40.1122342142, -105.101050844)	0-0.5	09/09/14	3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-03 (40.1121848343, -105.101150812)	0-0.5	09/09/14	3.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-04 (40.1121518644, -105.101267606)	0-0.5	09/09/14	2.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-05 (40.1121681045, -105.101372826)	0-0.5	09/09/14	3.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-06 (40.1122207696, -105.101449071)	0-0.5	09/09/14	3.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-07 (40.1122894837, -105.101485376)	0-0.5	09/09/14	3.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-08 (40.1123659138, -105.101511448)	0-0.5	09/09/14	5.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-09 (40.1124362769, -105.101537162)	0-0.5	09/09/14	3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AS-10 (40.1125098110, -105.101558872)	0-0.5	09/09/14	5.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

COGCC = Colorado Oil and Gas Conservation Commission

mg/kg = milligrams per kilogram

mmhos/cm = millimhos per centimeter

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

Note: Values presented in bold typeface exceed their respective COGCC Table 910-1 Regulatory Limit.

\* Arsenic is naturally occurring in some geologic environments within Colorado due to the weathering and erosion of bedrock and soil. The Colorado Department of Public Health and Environment (CDPHE) developed a Risk Management Guidance Document for Evaluating Arsenic Concentrations in Soil, which was released in June 2011. During the study conducted by the EPA, the average concentration of arsenic observed in Colorado soils was 11 mg/kg. Based on the average concentration of arsenic listed in the guidance document provided by the CDPHE and the arsenic concentrations observed within the soil samples collected at the site, arsenic is not a chemical of concern to the site at this time.

**TABLE 2**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY**  
**HARSCH #31-27**  
**NW 1/4 NE 1/4 SEC.27 T2N R69W 6PM**  
**LAT/LONG: 40.114543/-105.100403**  
**BOULDER COUNTY, COLORADO**

Sample Location (Latitude/Longitude)	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
<b>COGCC Table 910-1 Regulatory Limits (µg/L)</b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>
FLOWLINE (40.112864169, -105.101400994)	08/12/14	<b>500</b>	250	<1.0	160
TMW-01 (40.11289811, -105.101382476)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-02 (40.112900614, -105.101540165)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-03 (40.112904417, -105.101678686)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-04 (40.113013626, -105.101678686)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-05 (40.113013333, -105.101566101)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-06 (40.113004646, -105.101472681)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-07 (40.113003775, -105.101361445)	08/21/14	<1.0	<5.0	<1.0	<3.0
TMW-08 (40.112875868, -105.101402819)	09/10/14	<b>7.2</b>	<5.0	<1.0	<3.0
TMW-09 (40.112797981, -105.101393822)	09/10/14	<1.0	<5.0	<1.0	<3.0

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = micrograms per liter

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

Values presented in bold typeface exceed their respective COGCC Table 910-1 Regulatory Limit.

Note: FLOWLINE is a grab groundwater sample from a pothole during investigation activities. Groundwater samples were grab samples collected from tempoary monitoring wells.

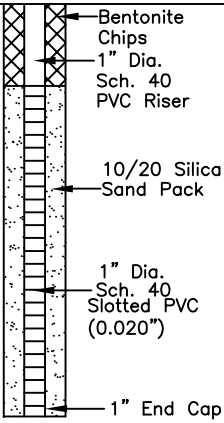


## **ATTACHMENT A**

### **Soil Boring/Temporary Monitoring Well Completion Diagrams**

# Boring Log/Well Completion Diagram: TMW-09

PAGE 1 OF 1

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	Potholed.									<p>Potholed to ~5' bgs 1-inch PVC temporary well was removed following GW grab sample collection</p> <p>Well was abandoned with 10/20 silica sand and bentonite to grade</p>
5	sandy CLAY - brown, med stiff, mod plasticity, poorly sorted with approximately 10% fine grained sand, moist, N/O, N/S.	CL				0.0	N/A	5		
10	BoB @ 10'		GP	1	100	0.0		10		
15								15		
20								20		
25								25		
30								30		<p>HC - Hydrocarbon BoB - Bottom of Boring N/O - no odor N/S - no staining TOC - top of casing bgs - below ground surface N/A - not applicable</p>

START/COMPLETION DATE: 09/09/2014

SAND PACK INTERVAL (FEET): 2-10

PROJECT: HARSCH #31-27

BENTONITE/GROUT INTERVAL (FEET): 0-2

LOGGED BY: D. COLOCCIA

WELL SCREEN INTERVAL (FEET): 2-10

DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE

WELL DIAMETER (INCHES): 1

BORING DEPTH (FEET): 10

WELL DEPTH (FEET): 10

PID INSTRUMENT: MiniRAE 2000

TIME STARTED/COMPLETED: 1030/1100

SAMPLE COLLECTION DEPTH (FEET)/TIME: N/A

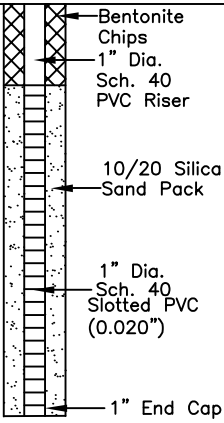


**EAGLE**  
ENVIRONMENTAL  
CONSULTING, INC.

4101 INCA STREET, DENVER, CO 80211  
Ph: 303-433-0479 • F: 303-325-5449

# Boring Log/Well Completion Diagram: TMW-08

PAGE 1 OF 1

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	Potholed.									<p>Potholed to ~5' bgs 1-inch PVC temporary well was removed following GW grab sample collection</p> <p>Well was abandoned with 10/20 silica sand and bentonite to grade</p>
5	sandy CLAY - brown, med stiff, mod plasticity, poorly sorted with approximately 10% fine grained sand, moist, N/O, N/S.	CL				0.0	N/A	5		
10	BoB @ 10'		GP	1	100	0.0		10		
15								15		
20								20		
25								25		
30								30		<p>HC - Hydrocarbon BoB - Bottom of Boring N/O - no odor N/S - no staining TOC - top of casing bgs - below ground surface N/A - not applicable</p>

START/COMPLETION DATE: 09/09/2014

SAND PACK INTERVAL (FEET): 2-10

PROJECT: HARSCH #31-27

BENTONITE/GROUT INTERVAL (FEET): 0-2

LOGGED BY: D. COLOCCIA

WELL SCREEN INTERVAL (FEET): 2-10

DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE

WELL DIAMETER (INCHES): 1

BORING DEPTH (FEET): 10

WELL DEPTH (FEET): 10

PID INSTRUMENT: MiniRAE 2000

TIME STARTED/COMPLETED: 0945/1030

SAMPLE COLLECTION DEPTH (FEET)/TIME: 5-7.5/1038



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## **ATTACHMENT B**

### **Laboratory Analytical Reports**



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Est. 1970

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

## Report Summary

Monday September 15, 2014

Report Number: L721258


Samples Received: 09/12/14

Client Project:

Description: Harsch 31-27

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

  
Jared Willis , ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-IN-01, KY - 90010, KYUST - 0016,  
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,  
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,  
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,  
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 15, 2014

Date Received : September 12, 2014  
Description : Harsch 31-27  
Sample ID : HARSCH31-27-TMW-08-091014  
Collected By : D. Coloccia  
Collection Date : 09/10/14 17:00

ESC Sample # : L721258-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	7.2	1.0	ug/l	8260B	09/14/14	1
Toluene	BDL	5.0	ug/l	8260B	09/14/14	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/14/14	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/14/14	1
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	09/14/14	1
Dibromofluoromethane	102.		% Rec.	8260B	09/14/14	1
a,a,a-Trifluorotoluene	108.		% Rec.	8260B	09/14/14	1
4-Bromofluorobenzene	107.		% Rec.	8260B	09/14/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/15/14 10:03 Printed: 09/15/14 10:03



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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 15, 2014

Date Received : September 12, 2014  
Description : Harsch 31-27  
Sample ID : HARSCH31-27-TMW-09-091014  
Collected By : D. Coloccia  
Collection Date : 09/10/14 16:15

ESC Sample # : L721258-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/14/14	1
Toluene	BDL	5.0	ug/l	8260B	09/14/14	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/14/14	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/14/14	1
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	09/14/14	1
Dibromofluoromethane	102.		% Rec.	8260B	09/14/14	1
a,a,a-Trifluorotoluene	108.		% Rec.	8260B	09/14/14	1
4-Bromofluorobenzene	107.		% Rec.	8260B	09/14/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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.

Reported: 09/15/14 10:03 Printed: 09/15/14 10:03

Summary of Remarks For Samples Printed  
09/15/14 at 10:03:26

TSR Signing Reports: 358  
R4 - Rush: Three Day

Log all BTEX waters as V8260BTEX unless specified otherwise. Enter depths for all samples as part of sample ID. Try not to report benzene as BDL above a 5x dilution.

Sample: L721258-01 Account: ENCANLCO Received: 09/12/14 09:00 Due Date: 09/17/14 00:00 RPT Date: 09/15/14 10:03

Sample: L721258-02 Account: ENCANLCO Received: 09/12/14 09:00 Due Date: 09/17/14 00:00 RPT Date: 09/15/14 10:03



Company Name/Address:

**ENCANLCO-EAGLE**Encana Oil and Gas  
3601 Stagecoach Rd.  
Longmont, CO 80504

Billing Information:

Encana oil and Gas

Attn: Blake Ford

ENCANLCO-EAGLE

Report to:

B. Ford, Martin Eckert III

Email To:

David.Ford@encana.com, mce3@

Project

Description: Harsch #31-27

City/State  
Collected:

Lab Project #

ENCANLCO-EAGLE

Phone: 970-379-5558

Client Project #

Fax:

Collected by (print):

D. Colocchia

Site/Facility ID #

P.O. #

Collected by (signature):

DCC

Rush? (Lab MUST Be Notified)

☐ Same Day ..... 200%  
☐ Next Day ..... 100%  
☐ Two Day ..... 50%  
☒ Three Day ..... 25%

Date Results Needed

Email? ☐ No ☒ YesFAX? ☐ No ☒ YesNo.  
of  
CntrsImmediately  
Packed on Ice N ☐ Y ☒

Sample ID

Comp/Grab

Matrix \*

Depth

Date

Time

Harsch31-27-TMW-08-0910H

Grab

GW

N/A

09/10/14

1700

2

Harsch31-27-TMW-09-0910H

↓

↓

↓

09/10/14

1615

2

BTEx (8260B)

Analysis / Container / Preservative

Chain of Custody Page 1 of 1



YOUR LAB OF CHOICE

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L# C721258

E030

Acctnum: ENCANLCO -

Template: EAGLE

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant

Sample # (lab only)

\* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

6127 6742 8426

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Hold #

Remarks:

Relinquished by: (Signature)

Date:

9-11-14

Time:

2:00

Received by: (Signature)

Received by: (Signature)

Received for lab by: (Signature)

Samples returned via: ☐ UPS☒ FedEx ☐ Courier ☐ \_\_\_\_\_

Temp: \_\_\_\_\_ °C Bottles Received:

3.4

4VP

Date:

9/12/14

Time:

0900

Condition: (lab use only)

COC Seal Intact: ☐ Y ☐ N ☐ NA

pH Checked:

NCF:



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Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

## Report Summary

Tuesday September 16, 2014

Report Number: L721141


Samples Received: 09/11/14

Client Project:

Description: Harsch #31-27

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

  
Jared Willis, ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-IN-01, KY - 90010, KYUST - 0016,  
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,  
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,  
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,  
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-01-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:13

ESC Sample # : L721141-01  
Site ID :  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.8	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
Note:  
The reported analytical results relate only to the sample submitted.  
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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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# REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-02-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:17

ESC Sample # : L721141-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.0	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-03-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:22

ESC Sample # : L721141-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.8	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-04-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:28

ESC Sample # : L721141-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.9	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
  
Sample ID : HARSCH31-27-AS-05-090914 0-0.5FT  
  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:35

ESC Sample # : L721141-05  
  
Site ID :  
  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.7	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
Note:  
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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-06-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:46

ESC Sample # : L721141-06

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.8	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26





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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-07-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:51

ESC Sample # : L721141-07  
Site ID :  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.7	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
Note:  
The reported analytical results relate only to the sample submitted.  
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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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# REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-08-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:54

ESC Sample # : L721141-08

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.3	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-09-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 09:59

ESC Sample # : L721141-09  
  
Site ID :  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.6	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
Note:  
The reported analytical results relate only to the sample submitted.  
This report shall not be reproduced, except in full, without the written approval from ESC.  
.  
Reported: 09/16/14 10:25 Printed: 09/16/14 10:26



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REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH31-27-AS-10-090914 0-0.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 10:04

ESC Sample # : L721141-10  
Site ID :  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.5	1.0	mg/kg	6010B	09/16/14	.5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
Note:  
The reported analytical results relate only to the sample submitted.  
This report shall not be reproduced, except in full, without the written approval from ESC.  
.  
Reported: 09/16/14 10:25 Printed: 09/16/14 10:26

Summary of Remarks For Samples Printed  
09/16/14 at 10:26:19

TSR Signing Reports: 358  
R5 - Desired TAT

Log all BTEX waters as V8260BTEX unless specified otherwise. Enter depths for all samples as part of sample ID. Try not to report benzene as BDL above a 5x dilution.

Sample: L721141-01 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-02 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-03 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-04 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-05 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-06 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-07 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-08 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-09 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25  
Sample: L721141-10 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/18/14 00:00 RPT Date: 09/16/14 10:25

Company Name/Address:

**ENCANLCO-EAGLE**Encana Oil and Gas  
3601 Stagecoach Rd.  
Longmont, CO 80504

Billing Information:

Encana oil and Gas

Attn: Blake Ford

ENCANLCO-EAGLE

Report to:

B. Ford, Martin Eckert III

Email to:

David.Ford@encana.com, mce3@

Project

Description: Harsch #31-27

City/State  
Collected:

Phone: 970-379-5558

Client Project #

Lab Project #

ENCANLCO-EAGLE

Fax:

Collected by (print):

D. Coloccia

Site/Facility ID #

P.O. #

Collected by (signature):

Dec

Rush? (Lab MUST Be Notified)

☐ Same Day .....200%  
☐ Next Day .....100%  
☐ Two Day .....50%  
☐ Three Day .....25%

Date Results Needed

Email? ☐ No ☒ YesFAX? ☐ No ☒ YesNo.  
of  
CntrsImmediately  
Packed on Ice N ☐ Y ☒

Sample ID

Comp/Grab

Matrix \*

Depth

Date

Time

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
Harsch 31-27-AS-01-090914	Grab	SS	0-5'	9/9/14	0913	1
Harsch 31-27-AS-02-090914					0917	1
Harsch 31-27-AS-03-090914					0922	1
Harsch 31-27-AS-04-090914					0928	1
Harsch 31-27-AS-05-090914					0935	1
Harsch 31-27-AS-06-090914					0946	1
Harsch 31-27-AS-07-090914					0951	1
Harsch 31-27-AS-08-090914					0954	1
Harsch 31-27-AS-09-090914					0959	1
Harsch 31-27-AS-10-090914					1004	1

\* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other 627 6742 8390

Remarks: Please include depth on lab report

Relinquished by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signature)

Date:

9-16-14

Time:

11:50

Received by: (Signature)

Received by: (Signature)

Received by: (Signature)

Received for lab by (signature)

Received for lab by (signature)

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Samples returned via: ☐ UPS☒ FedEx ☐ Courier ☐

Temp: \_\_\_\_\_ °C Bottles Received:

3.2 10(402)

Date: 9/11/14 Time: 0910U

Hold #

Condition: (lab use only)

5 (510)

COC Seal Intact: ☐ Y ☐ N ☐ NA

pH Checked:

NCF:

Analysis / Container / Preservative

Chain of Custody Page 1 of 1



ESC  
L.A.B S.C.I.E.N.C.E.S

YOUR LAB OF CHOICE

12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



L# L721141

K040

Acctnum: ENCANLCO

Template:

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant Sample # (lab only)

-01

-02

-03

-04

-05

-06

-07

-08

-09

-10



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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

## Report Summary

Tuesday September 16, 2014

Report Number: L721006


Samples Received: 09/11/14

Client Project:

Description: Harsch #31-27

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

  
Jared Willis, ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-IN-01, KY - 90010, KYUST - 0016,  
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,  
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,  
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,  
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

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# REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH 31-27- TMW-08-090914 5-7.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 10:38

ESC Sample # : L721006-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	09/15/14	1
Chromium, Trivalent	16.	2.0	mg/kg	Calc.	09/15/14	1
ORP	150		mV	2580 B-2011	09/12/14	1
pH	6.9		su	9045D	09/15/14	1
Sodium Adsorption Ratio	8.2			Calc.	09/14/14	1
Specific Conductance	1400		umhos/cm	9050AMod	09/16/14	1
Mercury	BDL	0.020	mg/kg	7471	09/12/14	1
Arsenic	5.0	2.0	mg/kg	6010B	09/12/14	1
Barium	170	0.50	mg/kg	6010B	09/12/14	1
Cadmium	0.74	0.50	mg/kg	6010B	09/12/14	1
Chromium	16.	1.0	mg/kg	6010B	09/12/14	1
Copper	16.	2.0	mg/kg	6010B	09/12/14	1
Lead	16.	0.50	mg/kg	6010B	09/12/14	1
Nickel	20.	2.0	mg/kg	6010B	09/12/14	1
Selenium	BDL	2.0	mg/kg	6010B	09/12/14	1
Silver	BDL	1.0	mg/kg	6010B	09/12/14	1
Zinc	60.	5.0	mg/kg	6010B	09/12/14	1
Benzene	BDL	0.0025	mg/kg	8021	09/12/14	5
Toluene	BDL	0.025	mg/kg	8021	09/12/14	5
Ethylbenzene	BDL	0.0025	mg/kg	8021	09/12/14	5
Total Xylene	BDL	0.0075	mg/kg	8021	09/12/14	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015	09/12/14	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8015	09/12/14	5
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	09/12/14	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	09/13/14	1
Surrogate recovery(%)						
o-Terphenyl	74.4		% Rec.	3546/DRO	09/13/14	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L721006-01 (PH) - 6.9@19.7c





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Est. 1970

# REPORT OF ANALYSIS

Blake Ford / Martin Eckert III  
EnCana Oil & Gas - Longmont, CO  
3601 Stagecoach Rd  
Longmont, CO 80504

September 16, 2014

Date Received : September 11, 2014  
Description : Harsch #31-27  
Sample ID : HARSCH 31-27- TMW-08-090914 5-7.5FT  
Collected By : D. Coloccia  
Collection Date : 09/09/14 10:38

ESC Sample # : L721006-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	09/16/14	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/16/14	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/16/14	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/16/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/16/14	1
Surrogate Recovery						
Nitrobenzene-d5	69.7		% Rec.	8270C-SIM	09/16/14	1
2-Fluorobiphenyl	75.5		% Rec.	8270C-SIM	09/16/14	1
p-Terphenyl-d14	58.2		% Rec.	8270C-SIM	09/16/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/16/14 16:44 Printed: 09/16/14 16:45  
L721006-01 (PH) - 6.9@19.7c

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L721006-01	WG742332	SAMP	Barium	R2988405	J6B

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
B	(EPA) - The indicated compound was found in the associated method blank as well as the laboratory sample.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed  
09/16/14 at 16:45:07

TSR Signing Reports: 358  
R4 - Rush: Three Day

Log all BTEX waters as V8260BTEX unless specified otherwise. Enter depths for all samples as part of sample ID. Try not to report benzene as BDL above a 5x dilution.

Sample: L721006-01 Account: ENCANLCO Received: 09/11/14 09:00 Due Date: 09/16/14 00:00 RPT Date: 09/16/14 16:44

[illegible]