



August 20, 2015

Mr. Brett Middleton
Environmental Specialist
Encana Oil & Gas (USA) Inc.
143 Diamond Avenue
Parachute, Colorado 81635

**RE: Report of Work Completed
B12 6104 (Location ID – 322420)
Historical Pit Closure (Facility ID – 111214)
Tank Battery Release (Spill/Release Point – 438526)
Garfield County, Colorado**

Dear Mr. Middleton:

LT Environmental, Inc. (LTE), under the direction of Encana Oil and Gas, Inc. (Encana), conducted site assessment activities associated historical pit closure (facility ID – 111214) and a tank battery release (spill/release point – 438526) at the B12 6104 (Site), located within the South Canyon area of operation in Garfield County, Colorado. This correspondence is a summary of the work completed by LTE in July, 2015.

Site Assessment Activities

On July 14 through 18, 2015, LTE advanced 13 soil borings at depths ranging from 42 to 75 feet below ground surface associated with a historical pit location and tank battery release at the Site. Five of the soil borings were converted to soil vapor extraction wells (SVE) to remediate residual hydrocarbon impacts. Soil confirmation samples were collected from each soil boring and submitted for laboratory analysis of constituents identified in Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1. The attached Site Diagram illustrates soil boring and SVE well locations. Boring Logs and Well Completion Diagrams are included as an attachment.

Analytical Results and Remediation

Laboratory analytical results indicate concentrations of total petroleum hydrocarbons, and benzene exceeding the COGCC Table 910-1 concentration levels. Laboratory analytical reports are included as an attachment and summarized in the attached Laboratory Results Summary Table. Additionally, the above-mentioned exceedances are illustrated on the Site Diagram.

Ventilator turbines will be secured to the top of SVE wells SVEN02, SVEN02, SVES02 for the purpose of remediating residual hydrocarbon concentrations. Additionally, solar-powered MicroBlowers will be installed on SVE wells SVEW01 and SVES01. The SVE system is designed to volatilize petroleum constituents adsorbed onto soil particles and promote bio-attenuation of residual hydrocarbons.



Bi-monthly measurements of flow, temperature, and gas concentrations will be collected at each SVE well. As gas concentrations stabilize, LTE will evaluate collected data and provide confirmation soil sampling recommendations with the goal of achieving site closure.

LTE appreciates the opportunity to provide environmental services to Encana. Please call us at 970-285-9985 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Chris McKisson'.

Chris McKisson
Project Manager

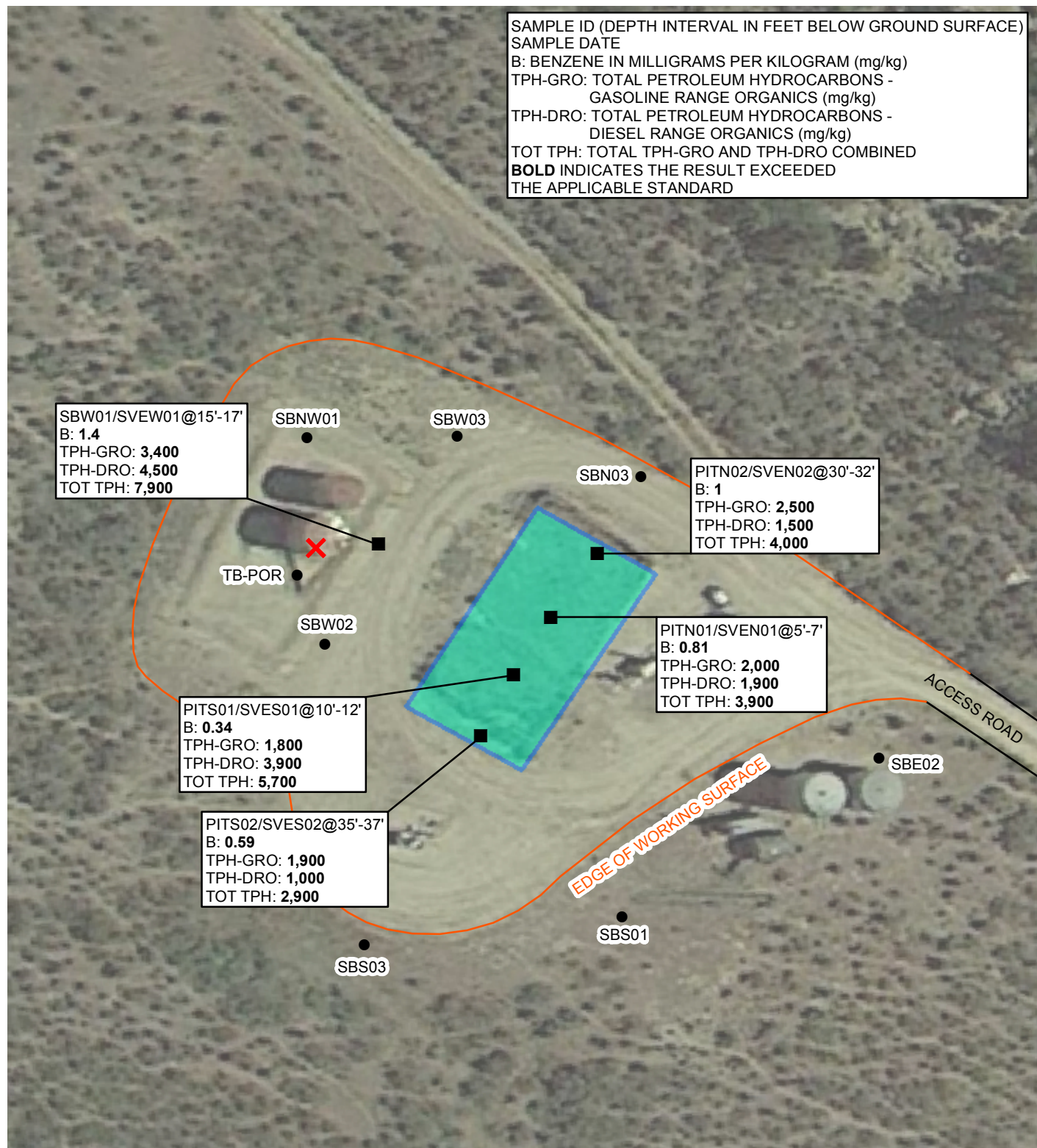
A handwritten signature in black ink, appearing to read 'Robert Fishburn'.

Robert Fishburn, P.G
Senior Hydrogeologist

Attachments

Site Diagram
Laboratory Results Summary Table
Laboratory Analytical Report
Boring Logs/Well Completion Diagrams

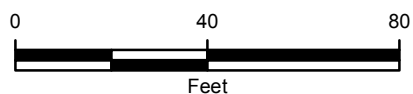
SAMPLE ID (DEPTH INTERVAL IN FEET BELOW GROUND SURFACE)
 SAMPLE DATE
 B: BENZENE IN MILLIGRAMS PER KILOGRAM (mg/kg)
 TPH-GRO: TOTAL PETROLEUM HYDROCARBONS -
 GASOLINE RANGE ORGANICS (mg/kg)
 TPH-DRO: TOTAL PETROLEUM HYDROCARBONS -
 DIESEL RANGE ORGANICS (mg/kg)
 TOT TPH: TOTAL TPH-GRO AND TPH-DRO COMBINED
BOLD INDICATES THE RESULT EXCEEDED
 THE APPLICABLE STANDARD



LEGEND

- X RELEASE
- SOIL BORING
- SOIL VAPOR EXTRACTION WELL
- PIT BOUNDARY

IMAGE COURTESY OF GOOGLE EARTH 2012



SITE DIAGRAM
 B12 6104
 SOUTH CANYON
 GARFIELD COUNTY, COLORADO

ENCANA OIL & GAS (USA) INC.

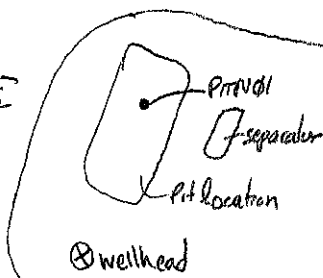


Laboratory Results Summary Table

				Organic Compounds in Soil (mg/kg [ppm])																				Inorganics in Soil			Metals in Soil (mg/kg [ppm])											
Allowable Concentration -->				500			0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000		(<12)	(6-9)	0.39	15000	70	120000	23	3100	400	23	1600	390	390	23000
Location	Sample Date:	Sample Matrix	Matrix Notes	TPH (total volatile and extractable petroleum hydrocarbons)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Benzo(A)pyrene	Chrysene	Dibenzo(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-CD)pyrene	Naphthalene	Pyrene	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH	Arsenic	Barium - EPA Total Barium	Cadmium	Chromium (III)	Chromium (VI)	Copper	Lead (inorganic)	Mercury	Nickel (soluble salts)	Selenium	Silver	Zinc
B12	07/14/15	Pit	S01 [75-77']	13	13	BDL	0.13	BDL	0.18	2.4																												
B12	07/13/15	Pit	N01 [5-7']	3900	2000	1900	0.81	3	4.4	38																												
B12	07/13/15	Pit	N01 [50-52']	11.3	5.1	6.2	0.019	BDL	0.025	0.16																												
B12	07/13/15	Pit	S01 [10-12']	5700	1800	3900	0.34	2.2	3.1	47	0.056	0.02	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.16	BDL	5	BDL	1	14	9.37	3.9	130	BDL	8.3	BDL	11	9.4	BDL	9.9	BDL	BDL	38
B12	07/15/15	Spill	TB-POR [70-71']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/14/15	Pit	S02 [35-37']	2900	1900	1000	0.59	3	7.1	60																												
B12	07/14/15	Pit	S02 [60-62']	11	1	10	BDL	BDL	0.0034	0.068																												
B12	07/16/15	Pit	SBS03 [70-72']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/16/15	Pit	PIT N02 [30-32']	4000	2500	1500	1	BDL	10																													
B12	07/16/15	Pit	PIT N02 [50-52']	73.8	69	4.8	BDL	BDL	0.043	0.068																												
B12	07/17/15	Pit	SBN03 [45-46']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/17/15	Pit	SBW01 [15-17']	7900	3400	4500	1.4	18	14	130																												
B12	07/17/15	Pit	SBW01 [40-42']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/17/15	Pit	SBW02 [40-42']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/18/15	Pit	SBW03 [40-42']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/18/15	Pit	SBNW01 [40-42']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/18/15	Pit	SBE01 [70-72']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												
B12	07/18/15	Pit	SBeE02 [50']	BDL	BDL	BDL	BDL	BDL	BDL	BDL																												

Location Map: B12

1N

Edge of
wet
Subarea

Compliance & Engineering & Remediation
LT Environmental, Inc.
820 Meagn Avenue Unit B
Rifle, Colorado 81650

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: 20150713-B12 (PIT#01)	Project: B12
Date: 7/13/15	Project Number: 033415007
Logged By: Wes Towes / DH	Drilled By: Dierich D90
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon
Gravel Pack: Silica Sand	Seal: Bentonite
	Grout: NA
Casing Type: PVC	Diameter: 2"
	Length: 5'
Screen Type: PVC	Slot: 0.020
	Diameter: 2"
	Length: 45'
	Total Depth: 50'
	Depth to Liquid: NA
	Depth to Water: NA

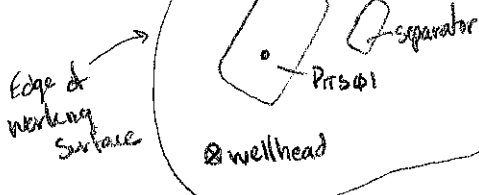
Penetration Resistance	Vapor (ppm)	Staining	Time	Depth (ft. bgs.)	Soil/Rock Type	Lithology/Remarks	Well Completion
6/3/5/8	20	yes	1238	0	SM	0-2' - tan brown clayey silt, 50% silt, 40% clay, 10% sand, odor HCL organics	
11/2/3/4	10603		1242	4	SM		
3/4/6/6	1295		1255	8	SM	5-7' - black silty clay, 60% clay, 35% silt, 5% sand - subunit	
3/3/5/6	1376		1300	12	SM		
2/3/6/9	1280		1306	16	SC	10-12' - same as above (soil deep) 50% clay, 35% silt, 15% sand	
3/6/9/12	1500		1314	20	SM	15-19' - same as above (soil deep) sand lenses, angular-sub angular sands	
3/4/6/7	1435	yes	1323	24	SC	20-22' - clay w/ interbedded silt, clay 60%, silt 35%, 10% sand	
4/3/4/6	1478	no	1334	28	SC		
3/4/5/7	1072		1345	32	SC	25-27' - silty sand, clay, gray tan, 50% clay, 30% silt, 20% sand	
4/7/7/10	1434		1400	36	SM	30-32' - tan gray black sand clay w/ interbedded sand lenses, 50% clay, 20% silt, 30% sand	
4/7/8/10	202	no	1420	40	SM	35-37' - same as above (soil deep) interbedded pebbles 1-8mm	
				44		40-42' - same as above (soil deep)	
				48		45-47' - gray tan silty clay w/ sand lenses, clay 50%, sand 30%, silt 20%, odor	
				52		50-52' - same as above (soil deep) dry, no odor, tan brown	
				56		- Subunit	
				60		TD=50' bgs	
				64			
				68			
				72			
				76			
				80			
				84			

Location Map: B12

1N



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LT Environmental, Inc.
 820 Meagn Avenue Unit B
 Rifle, Colorado 81650

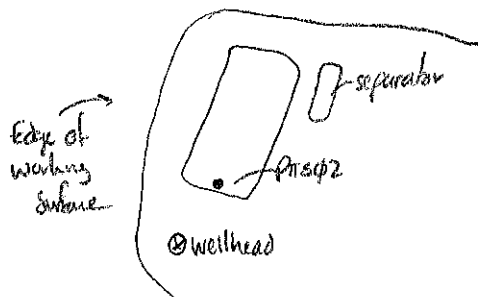
**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: PITS01 / SVES01		Project: B12	
Date: 7/13/15		Project Number: 033415007	
Logged By: DUSTIN HALO		Drilled By: Dierich D90	
Elevation:	Detector: PID	Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon
Gravel Pack: Silica Sand		Seal: Bentonite	Grout: NA
Casing Type: PVC	Diameter: 2"	Length: 5'	Hole Diameter: 8"
Screen Type: PVC	Slot: 0.020	Diameter: 2"	Length: 70'
		Total Depth: 75'	Depth to Liquid: NA
		Depth to Water: NA	

Penetration Resistance	Vapor (ppm)	Staining	Time	Depth (ft. bgs.)	Soil/Rock Type	Lithology/Remarks	Well Completion
				0			
2, 3, 4, 5	1015		1020	4	SC	5-7' gray black silty clay w/ sand	
				8	SC	lenses, odor, strong, moist, 50% clay	
3, 2, 3, 3	2186	yes	1025	12	SC	30% silt, 20% sand	
				16	SC	10-12' bgs - black sandy clay w/ interbedded sand lenses, 70% clay, 30% silt, 30% sand	
2, 3, 2, 3	1292		1032	20	SC	- Submitt	
4, 5, 7, 8	1714		1040	24	Sm	15-17' bgs - SAME AS ABOVE	
3, 5, 6, 12	1284		1047	28	SC	20-22' bgs - silty clay siltstone, moist, clay 60%, 30% silt, sand 10%	
3, 4, 5, 6	1803	yes	1700	32	Sm	25-27' bgs SAME AS ABOVE - clay 60%, 30% silt, sand 5%	
6, 6, 5, 7	1952		0825	36	SC	30-32' bgs - same as above - clay 50%, 30% silt, 20% sand	
3, 5, 9, 9	1833	yes	0845	40	SC	35-37' bgs - brown tan sandy clay, 50% clay, 20% silt, 30% sand,	
7, 5, 7, 10	1820		0856	48	SC	40-42' - brown clay w/ interbedded sand lenses, clay 50%, 20% silt, 25% sand	
5, 5, 6, 7	1822	no	0915	52	SC	45-47' - same as above -	
8, 7, 5, 6	1912		0933	56	SC	50-75' brown sandy clay, sand 20%, silt 20%, clay 60%, interbedded calcite lenses, oxides, sand/gravel lenses, grain size ranges from 2-20mm	
7, 7, 9, 10	1892		0952	64	SC		
7, 9, 13, 14	1500		1021	68	SC		
7, 9, 10, 12	1808		1045	72	SC		
7, 9, 4, 50	270	no	1112	76	clay shale	75-77' - Clay-shale brown, w/ coal lenses, clay 70%, silt 10%, 5% sand, 15% coal, no HC odor	
				80			
				84		- Submitt TD = 75' bgs	

Location Map: B12

1N



Compliance Engineering Remediation
LT Environmental, Inc.
 820 Meagn Avenue Unit B
 Rifle, Colorado 81650

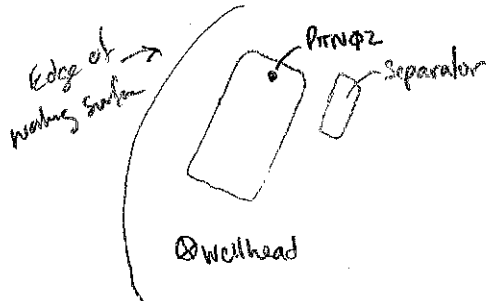
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: 20150714 - B12 (PITS#2)		Project: B12	
Date: 7/14/15		Project Number: 033415007	
Logged By: Wes Tones / DH		Drilled By: Dierich D90	
Drilling Method: Hollow Stem Auger		Sampling Method: Split Spoon	
Elevation:	Detector: PID	Seal: Bentonite	Grout: NA
Gravel Pack: Silica Sand			
Casing Type: PVC	Diameter: 2"	Length: 10'	Hole Diameter: 8"
Screen Type: PVC	Slot: 0.020	Diameter: 2"	Length: 55'
		Total Depth: 65'	Depth to Liquid: NA
		Depth to Water: NA	

Penetration Resistance	Vapor (ppm)	Staining	Time	Depth (ft. bgs.)	Soil/Rock Type	Lithology/Remarks	Well Completion
				0		5-7' bgs - tan brown silty clay, dry no odor, 60% clay-silt 20%, sand 10%	
				4	Sm		
				8	Sc	10-12' bgs - tan brown sandy clay, oxides clasts/particles 1-3mm, 50% clay, 35% silt, 20% sand	
617/6/8	110	NO	1408	12	Sm		
4/4/4/4	1.2	NO	1416	16	Sm	15-17' bgs silty clay w/ sand/gravel lenses, odor, 50% clay 25% silt, 20% sand 5% gravel/particles	
3/4/3/3	1014	yes	1419	20	Sm		
				24		20-22' bgs - same as above (soil disp) w/ interbedded calcite lenses	
3/3/7/9	1327		1430	28	Sm		
				32		25-27' bgs - same as above (soil disp) - no calcite lenses	
3/3/5/6	1033		1440	36	Sm		
5/10/5/6	1900		1448	40	Sm	30-32' bgs - gray bluish silty clay, sand/gravel lenses 30'-31.5', odor, subrounded clasts, 1-8mm, 50% clay, 20% sand, 25% silt	
5/5/8/8	2103		1501	44	Sm		
6/16/7/9	1007		1515	48	Sm	35-37' bgs - same as above (soil disp)	
4/9/9/9	1972	yes	1527	52	Sm	40-42' bgs - same as above (soil disp)	
8/9/12/10	1036		1544	56	Sm	45-47' bgs - same as above (soil disp)	
6/19/9	1173	NO	1600	60	Sc	50-52' bgs - silty clay w/ sand lenses, bluish brown, oxides, clasts 1-9mm clay 50%, silt 25%, sand 20%, gravel 5%	
6/23/9/5	95		1602	64		55-57' - same as above	
50/1/2	39.9	NO	1650	68		60-62' - sandy clay w/ sand lenses, 45% clay, 20% silt, 25% sand, 5% gravel	
				72		65-67' - NO recovery - Submer	
				76		TD=65' bgs	
				80			
				84			

Location Map: B12

1w



Compliance • Engineering • Remediation
LT Environmental, Inc.
 820 Meagn Avenue Unit B
 Rifle, Colorado 81650

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: 20150116 - B12 (PITAX2)	Project: B12
Date: 7/16/15	Project Number: 033415007
Logged By: Dustin Held	Drilled By: Dierich D90
Elevation:	Drilling Method: Hollow Stem Auger
Detector: PID	Sampling Method: Split Spoon
Gravel Pack: Silica Sand	Seal: Bentonite
Casing Type: PVC	Grout: NA
Screen Type: PVC	Diameter: 2"
Slot: 0.020	Length: 5'
Diameter: 2"	Hole Diameter: 8"
Length: 45'	Depth to Liquid: NA
Total Depth: 50'	Depth to Water: NA

Penetration Resistance	Vapor (ppm)	Staining	Time	Depth (ft. bgs.)	Soil/Rock Type	Lithology/Remarks	Well Completion
				0			
				4		5-7' bgs - black silty clay, clay 60%, silt 20%, sand 10%	
4.3.2.5	1002	yes	1300	8	MH		
				12	MH/SC	10-12' bgs - black silty clay, silt 45%, clay 50%, sand 5%	
4.5.5.4	1300	yes	1310	16			
4.6.6.5	1170	yes	1315	20	SC/MH	15-17' bgs - black sandy clay, clay 40%, sand 40%, silt 20%	
3.5.6.7	1040	yes	1325	24			
				28	MH	20-22' bgs - gray black silty clay w/ interbedded sand lenses, clay 65%, silt 45%, 15% sand	
5.5.5.7	1083	yes	1335	32	MH		
3.4.3.6	1807	yes	1340	36		25-27' bgs - same as above (silt deep)	
3.7.7.8	988	no	1355	40			
				44	MH/Lit	30-32' bgs - gray silty clay, clay 60%, silt 30%, sand 10%	
8.6.8.7	2777	no	1405	48			
12.17.18.22	678	no	1420	52	Sand Stone	35-37' bgs - gray silty clay w/ interbedded sandstone pebbles, clay 50%, silt 35%, 15% sand	
50/2	426	no	1455	56		40-42' bgs - same as above (silt deep)	
				60			
				64		45-47' bgs - thick native clay, claystone, clay 85%, silt 10%, sand 5%	
				68		organics (wood chips bent)	
				72			
				76		50-52' bgs - sandstone, fine grain	
				80		continuing layer - silt	
				84		TD=50' bgs	

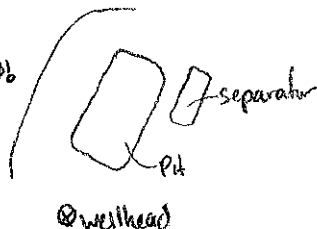
Location Map: B2

1N



Compliance Engineering Remediation
LT Environmental, Inc.
 820 Meagn Avenue Unit B
 Rifle, Colorado 81650

SBN#

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number:

20450717-B12 (SBN#1)

Project:

B12

Date:

7/17/15

Project Number:

033415007

Logged By:

Dustin H. H. H.

Drilled By:

Dierich D90

Elevation:

Detector:

PID

Drilling Method:

Hollow Stem Auger

Sampling Method:

Split Spoon

Gravel Pack:

Silica Sand

Seal:

Bentonite

Grout:

NA

Casing Type:

PVC

Diameter:

2"

Length:

10'

Hole Diameter:

8"

Depth to Liquid:

NA

Screen Type:

PVC

Slot:

0.020

Diameter:

2"

Length:

20'

Total Depth:

40'

Depth to Water:

NA

Penetration Resistance	Vapor (ppm)	Staining	Time	Depth (ft. bgs.)	Soil/Rock Type	Lithology/Remarks	Well Completion
				0			
				4		5-7' bgs - brown sandy clay, clay 50%, sand 35%, silt 15%	
2,3,3,4	0.0	no	1050	8	SC		
				12		10-12' bgs - brown sandy clay, clay 50%, sand 45%, silt 5%	
4,4,4,7	0.0	no	1055	16	SC		
3,7,4,8	1474	yes	1105	20		15-20' bgs - black-gray sandy clay, sand 45%, clay 40%, silt 15%	
5,7,8,11	830	yes	1115	24	SC	- silt	
				28		20-22' bgs - gray brown, sandy clay, 35% sand, clay 55%, silt 10%, oxides	
5,7,11,13	562	no	1125	32	SC/SM		
				36		25-27' bgs - brown sandy clay, sand 35%, clay 45%, silt 20%	
3,4,13,19	646	no	1135	40	SM		
				44		30-32' bgs - brown silty clay, 50% clay, silt 35%, 15% sand	
4,8,13,12	45	no	1145	48			
				52		35-37' bgs - same as above (soil disp)	
7,10,13,16	1.6	no	1200	56		40-42' bgs - brown silty clay, silt 30%, sand 35%, clay 35%	
				60		- silt	
				64		TD=40' bgs	
				68			
				72			
				76			
				80			
				84			