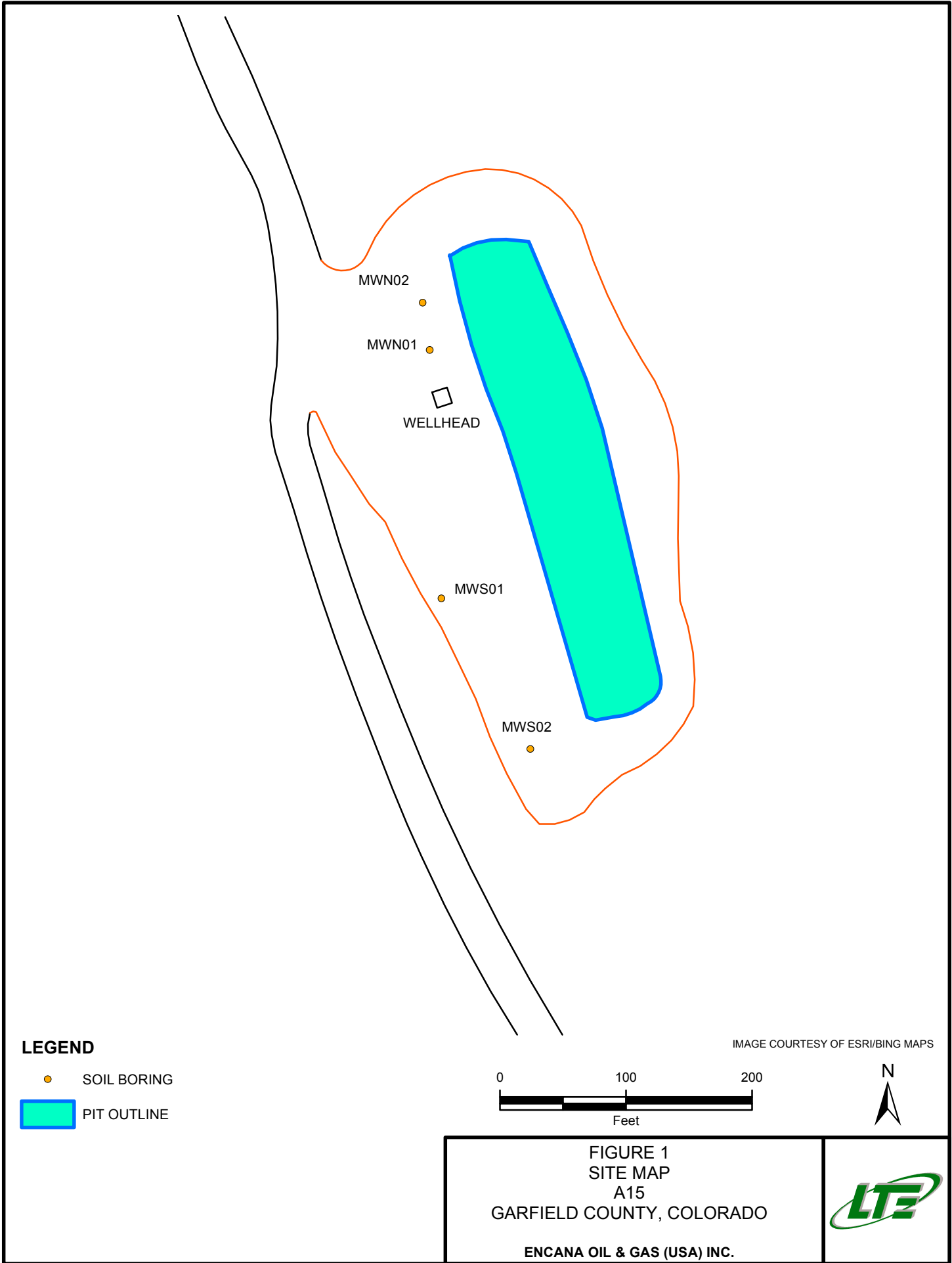


Appendix 11: A15 Pit – Monitor Well Drilling Logs



LEGEND



-  SOIL BORING
-  PIT OUTLINE

IMAGE COURTESY OF ESRI/BING MAPS

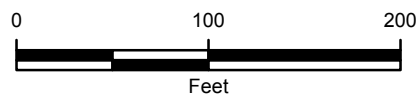
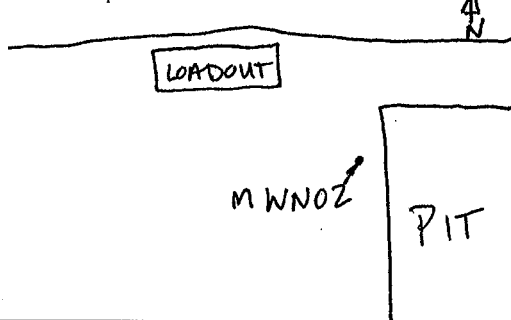


FIGURE 1
 SITE MAP
 A15
 GARFIELD COUNTY, COLORADO

ENCANA OIL & GAS (USA) INC.



Location Map:



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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MWN02		Project: A15	
Date: 4/4/2013 and 4/5/2013		Project Number: 033413009	
Logged By: Chris McKisson		Drilled By: Site Services CME 75	
Elevation:	Detector: PID and Petro Flag		Drilling Method: Hollow Stem Auger
Gravel Pack: Silica Sand		Seal: Bentonite	Sampling Method: Split Spoon
Casing Type: PVC	Diameter: 2"	Length: 25'	Hole Diameter: 8"
Screen Type: PVC	Slot: 0.02	Diameter: 2"	Length: 60'
		Total Depth: 85'	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			
				4			
				8			
				12			
				16			
12/14/17/15	9.4	N	1438	20			
7/7/20/10	5.4	N	1450	24			
5/9/50+	5.9	N	1500	28			
8/4/4/3	19.4	N	1515	32			
9/7/7/7	0.5	N	1530	36			
7/7/7/7	0.0	N	1545	40			
6/6/6/6	0.2	N	1600	44			
7/23/12/8	2.5	N	1620	48			
				52			
				56			
				60			
7/9/9/9	0.0	N	1645	64			
				68			
3/4/2/5	0.0	N	0850	72			
				76			
				80			
10/22/24/25				84			

Cement →

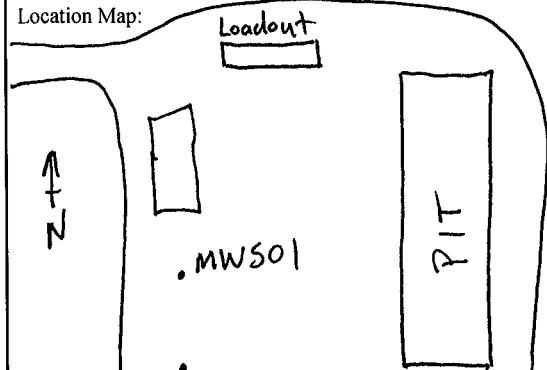
Cuttings →

Brown/light brown; colluvium;
 shale and sandstone fragments;
 shale, sandston, and clay lenses;
 dry, no stain, no odor

sw / Fill

TD = 85'

Location Map:



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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MWS01 Project: A15

Date: 4/3/2013 Project Number: 033413009

Logged By: Chris McKisson Drilled By: Site Services CME75

Elevation: Detector: PID + Petro Flag Drilling Method: Hollow stem Sampling Method: Split Spoon

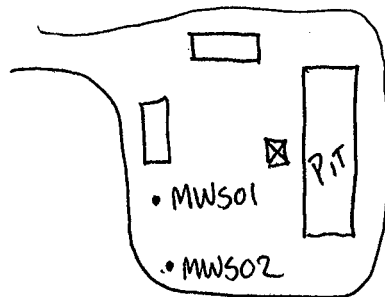
Gravel Pack: Silica Sand Seal: Bentonite Grout: Cement

Casing Type: PVC Diameter: 2" Length: Hole Diameter: 8" Depth to Liquid: NA

Screen Type: PVC Slot: 0.020 Diameter: 2" Length: Total Depth: 30' Depth to Water: NA

Penetration Resistance	Vapor (ppm)	Staining	Time	Depth (ft. bgs.)	Soil/Rock Type	Lithology/Remarks	Well Completion
				0			
				2			
				4			
				6			
				8			
				10			
4/8/18/7	1.8	N	1048	12		Colluvium fill, shale and sandstone fragments, dry, no odor	
				14			
				16			
				18			
				20			
44/16/9/16	71.2	N	1110	22		light brown, sandstone, dry, no odor	
				24			
				26			
				28			
50+				30		TD: 30, auger refusal	
				32		will step out in an attempt to go deeper.	
				34			
				36			

Location Map:



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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MWS01		Project: A15	
Date: 4/4/2013		Project Number: 033413009	
Logged By: Chris McKisson		Drilled By: Site Services CME 75	
Elevation:	Detector: PID and Petro Flag		Drilling Method: Hollow Stem Auger
Gravel Pack: Silica Sand		Seal: Bentonite	Sampling Method: Split Spoon
Casing Type: PVC	Diameter: 2"	Length: 51	Hole Diameter: 8"
Screen Type: PVC	Slot: 0.02	Diameter: 2"	Length: 30
		Total Depth: 81'	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			
				4			
				8			
				12			
				16			
8/7/8/6	0.6	N	0905	20			
				24			
				28			
6/7/9/12	2.4	N	0925	32			
				36			
				40			
12/13/13/13	9.1	N	0950	44			
				48			
20/23/16/23	40.4	N	1035	52			
	P.F 310			56			
				60			
11/13/15/22	5.6	N	1110	64			
				68			
8/15/15/15	7.8	N	1145	72			
				76			
				80			
17/30/35/50	1.6	N	1220	84			
	P.F=0						

Colluvium, brown, shale
 and sandstone fragments,
 small lenses of clay, dry,
 no stain, no odor.

SW

TD = 81'

cement

cuttings

Bentonite

Sand

Location Map:

Loadout

MWN02

Pit

MWN01



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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MWN01		Project: A15	
Date: 4/3/2013		Project Number: 033413009	
Logged By: Chris McKisson		Drilled By: Site Services CME 75	
Elevation:	Detector: PID and Petro Flag		Drilling Method: Hollow Stem Auger
Gravel Pack: Silica Sand		Seal: Bentonite	Grout: Cement
Casing Type: PVC	Diameter: 2"	Length: 40'	Hole Diameter: 8"
Screen Type: PVC	Slot: 0.02	Diameter: 2"	Length: 20'
		Total Depth: 60'	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			
				4			
				8			
3/4/6/9	N	0.5	1230	12			
6/6/7/11	N	1.4	1240	16			
4/9/8/10	N	0.8	1250	20			
3/4/4/6	N	0.1	1300	24			
3/8/11/9	N	0.0	1314	28			
4/7/8/8	N	0.7	1330	32			
6/10/14/12	N	2.3	1350	36			
3/7/8/9	N	0.4	1405	40			
5/7/9/7	N	0.6	1425	44			
				48			
				52			
				56			
12/22/15/20	N	1.7	1505	60			
		PF:20		64			
				68			
				72			
				76			
				80			
				84			

Colluvium, brown/light brown, shale and sandstone fragments, small lenses of clay/shale/sandstone, dry, no stain, no odor, slightly moist to dry

TD = 60'

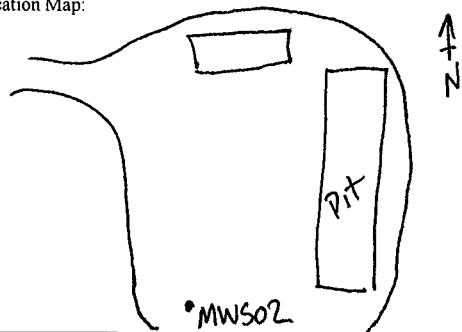
cement

Cuttings

Bentonite

sand

Location Map:



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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MWS02		Project: A15	
Date: 4/2/2013		Project Number: 033413009	
Logged By: Chris McKisson		Drilled By: Site Services CME 75	
Elevation:	Detector: PID and Petro Flag		Drilling Method: Hollow Stem Auger
Gravel Pack: Silica Sand		Seal: Bentonite	Grout: Cement
Casing Type: PVC	Diameter: 2"	Length: 25'	Hole Diameter: 8"
Screen Type: PVC	Slot: 0.02	Diameter: 2"	Length: 60'
		Total Depth: 85'	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			
				4			
				8			
2/3/3/2	0.0	N	0910	12			
3/6/7/6	1.5	N	0920	16			
4/10/21/6	2.3	N	0928	20			
7/7/10/18	0.8	N	0940	24			
3/5/18/15	0.7	N	0948	28			
5/10/11/50+	1.4	N	1000	36			
5/15/15/15	24.3	N	1015	40			
50+	no sample material			44			
				48			
14/18/20/21	6.5	N	1050	52			
36/50+	8.3	N	1120	56			
				60			
10/17/13/15	3.5	N	1145	64			
30/30/25/22	3.4	N	1215	68			
15/14/13/19	7.3	N	1320	72			
				76			
				80			
27/21/20/21	8.4	N	1425	84			

Colluvium, brown/light brown,
 shale and sandstone fragments,
 small lenses of shale/sandstone/
 clay, dry, no staining, no
 odor.

Cement

Cuttings

Bentonite

Sand

TD = 85'