WR-35
Rev. 8/23/13

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 095 - 02514 County TYLER District McELROY
Quad SHIRLEY Pad Name SHR38 Field/Pool Name
Farm name SECKMAN Well Number SHR38GHSM
Operator (as registered with the OOG) CNX GAS COMPANY, LLC
Address 1000 CONSOL ENERGY DRIVE City CANONSBURG State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 320181.66 (NAD 27) Easting 1622485.25 (NAD 27)
Landing Point of Curve Northing 320199.54 (NAD 27) Easting 1622547.81 (NAD 27)
Bottom Hole Northing 310765.92 (NAD 27) Easting 1625796.06 (NAD 27)

Elevation (ft) 1012 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL □ Oil □ Other
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole ■ Air ■ Mud □ Fresh Water □ Brine

Mud Type(s) and Additive(s)
SYNTHETIC BASED FLUID
ADDITIVES: ABS MUL (EMULSIFIER), CALCIUM CHLORIDE, FLR PLUS (GILSONITE), CLAYTONE EM (SUSPENSION AGENT), AES WA II (WETTING AGENT), LIME

Date permit issued 2/26/2019 Date drilling commenced 3/5/2019 Date drilling ceased 6/19/2019
Date completion activities began 8/22/2019 Date completion activities ceased 9/15/2019
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 225 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1920 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 430, 580, 900 TRACES: 160, 260, 1380, 1400, 1480, 1500 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

Reviewed by:
12/18/2019

API 47- 095 - 02514 Farm name SECKMAN Well number SHR38GHSM

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	112	NEW	94lb/ft	N/A	GROUT TO SURFACE
Surface	17.5"	13.375"	578	NEW	J-55 54.5lb/ft	N/A	Y - CEMENT TO SURFACE
Coal							
Intermediate 1	12.25"	9.625"	2585	NEW	J-55 36lb/ft	N/A	Y - CEMENT TO SURFACE
Intermediate 2							
Intermediate 3							
Production	8.75" & 8.5"	5.5"	16925	NEW	P-110 20lb/ft	N/A	Y - TOC @ 861
Tubing	5.5"	2.875	6,845	NEW	P110 6.5 IB/FT	N/A	N/A
Packer type and depth set		N/A					

Comment Details ALL TOPHOLE DEPTHS ARE REFERENCED TO RKB = 12' GLE
PRODUCTION DEPTHS ARE REFERENCED TO RKB = 29' GLE

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ^{3}/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	CLASS A	462	16	1.14	527	0	8
Coal							
Intermediate 1	CLASS A	851	15.6	1.19	1013	0	8
Intermediate 2							
Intermediate 3							
Production	NEOCEM	1075 (LEAD) / 2445 (TAIL)	15	1.135 (LEAD) / 1.132 (TAIL)	1220 (LEAD) / 2768 (TAIL)	861	8
Tubing							

Drillers TD (ft) 16952 Loggers TD (ft) 16952
Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
Plug back procedure N/A

Kick off depth (ft) 6000

Check all wireline logs run □ caliper □ density □ deviated/directional □ induction
□ neutron □ resistivity □ gamma ray □ temperature □sonic

Well cored □ Yes ■ No Conventional Sidewall Were cuttings collected ■ Yes □ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING
SURFACE: Centralize every 3rd joint from shoe to surface
INTERMEDIATE: Centralize every 3rd joint from shoe to surface
PRODUCTION: Centralize every joint from shoe to TOC

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

RECEIVED
Office of Oil and Gas
NOV 21 2019
WV Department of
Environmental Protection

API 47- 095 - 02514 Farm name SECKMAN Well number SHR38GHSM

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	ATTACHMENT	1		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
		SEE	ATTACHMENT	2				

RECEIVED
Office of Oil and Gas
NOV 21 2019
WV Department of
Environmental Protection

Please insert additional pages as applicable.

WR-35
Rev. 8/23/13

API 47- 095 - 02514 Farm name SECKMAN Well number SHR38GHSM

PRODUCING FORMATION(S)	DEPTHS		
MARCELLUS	6,517 TVD	6,882 MD	

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown ■ Open Flow OIL TEST □ Flow □ Pump

SHUT-IN PRESSURE Surface 3390 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 3453.20 mcfpd Oil 28 bpd NGL 0 bpd Water 459 bpd GAS MEASURED BY □ Estimated ■ Orifice □ Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
UNDIFFERENTIATED SAND	0	250	0	250	SANDSTONE / TRACES OF SILTSTONE & LIMESTONE & COAL
UNDIFFERENTIATED SILT	250	300	250	300	SILTSTONE/ TRACES OF SANDSTONE & COAL
UNDIFFERENTIATED SAND	300	400	300	400	SANDSTONE / TRACES OF SILTSTONE & LIMESTONE
UNDIFFERENTIATED SHALE	400	430	400	430	RED SHALE / TRACES OF SILTSTONE
WASHINGTON COAL	430	431	430	431	SANDSTONE/ RED SHALE/ COAL
UNDIFFERENTIATED SAND	431	480	431	480	SANDSTONE/ RED SHALE
UNDIFFERENTIATED SHALE	480	510	480	510	RED SHALE / TRACES OF SANDSTONE & GRAY SHALE
UNDIFFERENTIATED QUARTZ	510	580	510	580	QUARTZ / TRACES OF RED SHALE, SILTSTONE & SANDSTONE
WAYNESBURG COAL	580	582	580	582	QUARTZ / TRACES OF GRAY SHALE, QUARTZ, SILTSTONE & SANDSTONE
UNDIFFERENTIATED SAND	582	610	582	610	SANDSTONE / TRACES OF GRAY SHALE, QUARTZ & SILTSTONE
UNDIFFERENTIATED SILT	610	740	610	740	SILTSTONE / TRACES OF LIMESTONE & SANDSTONE
UNDIFFERENTIATED SAND	740	760	740	760	SANDSTONE / TRACES RED SHALE
UNDIFFERENTIATED SHALE	760	900	760	900	RED SHALE/ TRACES OF SILTSTONE, SANDSTONE, LIMESTONE
PITTSBURGH COAL	900	901	900	901	SANDSTONE/ COAL

Please insert additional pages as applicable.

Drilling Contractor SEE ATTACHMENT
Address _____ City _____ State _____ Zip _____

Logging Company DIVERSIFIED WELL LOGGING LLC (MUDLOG)
Address 71 N. MAIN STREET City WASHINGTON State PA Zip 15301

Cementing Company SEE ATTACHMENT
Address _____ City _____ State _____ Zip _____

Stimulating Company KEANE
Address 5825 North Sam Houston Parkway West Suite 600 City Houston State TX Zip 77086
Please insert additional pages as applicable.

Completed by Michael Honce Telephone 304-884-2138
Signature _____ Title Superintendent Completions Date 11/20/2019

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

RECEIVED
Office of Oil and Gas
NOV 21 2019
WV Department of Environmental Protection

SHR38GHSM – PERFORATION RECORD – ATTACHMENT 1					
Stage No.	Perforation Date	Perforation from MD ft.	Perforation to MD ft.	Number of Perforations	Formation(s)
1	8/21/2019	16,781.0	16,869.8	24	Marcellus Shale
2	8/22/2019	16,537.5	16,719.5	40	Marcellus Shale
3	8/22/2019	16,312.5	16,494.5	40	Marcellus Shale
4	8/22/2019	16,087.5	16,269.5	40	Marcellus Shale
5	8/22/2019	15,862.5	16,044.5	40	Marcellus Shale
6	8/22/2019	15,637.5	15,819.5	40	Marcellus Shale
7	8/23/2019	15,412.5	15,594.5	40	Marcellus Shale
8	8/23/2019	15,187.5	15,369.5	40	Marcellus Shale
9	8/23/2019	14,962.5	15,144.5	40	Marcellus Shale
10	8/23/2019	14,737.5	14,919.5	40	Marcellus Shale
11	8/23/2019	14,512.5	14,694.5	40	Marcellus Shale
12	8/24/2019	14,287.5	14,469.5	40	Marcellus Shale
13	8/24/2019	14,066.0	14,244.5	40	Marcellus Shale
14	8/24/2019	13,837.5	14,019.5	40	Marcellus Shale
15	8/24/2019	13,612.5	13,794.5	40	Marcellus Shale
16	8/24/2019	13,387.5	13,569.5	40	Marcellus Shale
17	8/24/2019	13,162.5	13,344.5	40	Marcellus Shale
18	8/25/2019	12,937.5	13,119.5	40	Marcellus Shale
19	8/25/2019	12,712.5	12,894.5	40	Marcellus Shale
20	8/25/2019	12,487.5	12,669.5	40	Marcellus Shale
21	8/25/2019	12,262.5	12,444.5	40	Marcellus Shale
22	8/25/2019	12,037.5	12,219.5	40	Marcellus Shale
23	8/25/2019	11,812.5	11,994.5	40	Marcellus Shale
24	8/26/2019	11,587.5	11,769.5	40	Marcellus Shale
25	8/26/2019	11,362.5	11,543.0	40	Marcellus Shale
26	8/26/2019	11,138.4	11,319.6	40	Marcellus Shale
27	8/26/2019	10,914.4	11,095.6	40	Marcellus Shale
28	8/26/2019	10,690.4	10,871.6	40	Marcellus Shale
29	8/26/2019	10,466.4	10,647.6	40	Marcellus Shale
30	8/27/2019	10,242.4	10,423.6	40	Marcellus Shale
31	8/27/2019	10,018.4	10,199.6	40	Marcellus Shale
32	8/27/2019	9,794.4	9,975.6	40	Marcellus Shale
33	8/27/2019	9,570.4	9,748.6	40	Marcellus Shale
34	8/27/2019	9,346.4	9,527.6	40	Marcellus Shale
35	8/27/2019	9,122.4	9,303.6	40	Marcellus Shale
36	8/28/2019	8,898.4	9,079.6	40	Marcellus Shale
37	8/28/2019	8,674.4	8,855.6	40	Marcellus Shale
38	8/28/2019	8,450.4	8,631.6	40	Marcellus Shale
39	8/28/2019	8,226.4	8,407.6	40	Marcellus Shale
40	8/28/2019	8,002.4	8,183.6	40	Marcellus Shale
41	8/29/2019	7,778.4	7,959.6	40	Marcellus Shale
42	8/29/2019	7,554.4	7,735.6	40	Marcellus Shale
43	8/29/2019	7,330.4	7,511.6	40	Marcellus Shale
44	8/29/2019	7,106.4	7,287.6	40	Marcellus Shale
45	8/30/2019	6,882.4	7,063.6	40	Marcellus Shale

SHR38GHSM – STIMULATION INFORMATION PER STAGE – ATTACHMENT 2								
Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (ibs)	Amount of Water (bbls)	Amount of Nitrogen/Other (units)
1	8/22/2019	99	7,969.0	6,086.0	4,599.0	402,365.0	8,346.98	N/A
2	8/22/2019	98	8,369.0	6,318.0	3,751.0	406,751.0	7,406.00	N/A
3	8/22/2019	96	8,367.0	5,915.0	4,164.0	397,741.0	7,308.00	N/A
4	8/22/2019	100	8,628.0	5,404.0	3,864.0	402,476.0	6,704.00	N/A
5	8/22/2019	90	7,895.0	5,589.0	4,154.0	398,444.0	6,632.00	N/A
6	8/23/2019	96	7,991.0	4,797.0	4,611.0	395,906.0	6,467.98	N/A
7	8/23/2019	98	8,241.0	5,689.0	3,739.0	398,528.0	6,399.00	N/A
8	8/23/2019	100	8,346.0	5,785.0	4,088.0	393,730.0	5,817.00	N/A
9	8/23/2019	92	7,815.0	6,058.0	3,994.0	401,873.0	6,190.00	N/A
10	8/23/2019	98	8,049.0	5,954.0	4,249.0	397,825.0	6,439.00	N/A
11	8/24/2019	95	8,037.0	6,018.0	4,110.0	398,054.0	6,392.98	N/A
12	8/24/2019	99	8,261.0	5,398.0	3,856.0	398,087.0	6,223.00	N/A
13	8/24/2019	100	8,739.0	6,168.0	3,546.0	365,364.0	5,790.00	N/A
14	8/24/2019	100	8,666.0	6,424.0	3,663.0	360,078.0	5,646.00	N/A
15	8/24/2019	99	8,256.0	5,806.0	3,829.0	389,007.0	5,959.00	N/A
16	8/24/2019	99	8,245.0	5,903.0	3,701.0	402,640.0	6,139.02	N/A
17	8/25/2019	99	8,056.0	5,656.0	3,659.0	402,928.0	6,111.00	N/A
18	8/25/2019	98	8,240.0	5,985.0	3,420.0	386,579.0	6,148.00	N/A
19	8/25/2019	100	8,201.0	5,923.0	3,847.0	383,193.0	5,848.00	N/A
20	8/25/2019	98	8,439.0	5,901.0	4,224.0	390,805.0	6,853.00	N/A
21	8/25/2019	99	7,913.0	5,528.0	3,780.0	402,810.0	5,744.02	N/A
22	8/25/2019	99	7,918.0	5,847.0	4,246.0	400,486.0	5,739.00	N/A
23	8/26/2019	100	7,841.0	5,567.0	4,314.0	404,849.0	5,701.00	N/A
24	8/26/2019	100	8,018.0	5,614.0	3,689.0	405,333.0	5,640.98	N/A
25	8/26/2019	98	8,039.0	5,704.0	4,758.0	437,572.0	6,691.00	N/A
26	8/26/2019	99	7,859.0	6,044.0	3,795.0	401,210.0	5,704.00	N/A
27	8/26/2019	100	7,931.0	5,708.0	3,844.0	400,324.0	5,614.00	N/A
28	8/26/2019	100	7,877.0	5,971.0	4,219.0	404,617.0	5,840.00	N/A
29	8/26/2019	99	7,886.0	5,621.0	3,640.0	398,616.0	5,778.00	N/A
30	8/27/2019	99	7,688.0	5,426.0	3,905.0	399,655.0	5,754.02	N/A
31	8/27/2019	99	7,777.0	5,288.0	4,208.0	402,765.0	5,844.00	N/A
32	8/27/2019	100	7,779.0	5,012.0	4,661.0	403,754.0	5,789.00	N/A
33	8/27/2019	99	7,463.0	6,145.0	3,845.0	399,940.0	6,267.00	N/A
34	8/27/2019	100	7,403.0	6,334.0	3,599.0	404,879.0	5,679.00	N/A
35	8/28/2019	99	7,375.0	5,769.0	3,664.0	397,092.0	5,609.98	N/A
36	8/28/2019	99	7,316.0	4,718.0	3,624.0	401,488.0	5,635.00	N/A
37	8/28/2019	99	7,436.0	5,918.0	3,142.0	398,101.0	5,816.00	N/A
38	8/28/2019	100	7,559.0	5,445.0	3,517.0	405,525.0	5,662.02	N/A
39	8/28/2019	100	7,604.0	6,103.0	3,184.0	399,972.0	5,667.00	N/A
40	8/28/2019	99	7,484.0	6,099.0	4,691.0	398,696.0	6,369.00	N/A
41	8/29/2019	99	7,658.0	5,776.0	3,378.0	400,292.0	5,620.00	N/A
42	8/29/2019	99	7,510.0	5,494.0	3,711.0	401,648.0	5,628.00	N/A
43	8/29/2019	100	7,535.0	6,190.0	3,347.0	406,478.0	5,724.98	N/A
44	8/30/2019	99	7,629.0	6,247.0	3,518.0	398,426.0	5,484.00	N/A
45	8/30/2019	98	7,685.0	5,717.0	3,196.0	363,814.0	5,330.98	N/A

SHR38GHSM 47-095-02514

LITHOLOGIES CONTINUED

LITHOLOGY / FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT NAME TVD	TOP DEPTH IN FT NAME MD	BOTTOM DEPTH IN FT NAME MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H2S, ETC)
UNDIFFERENTIATED SAND	901	940	901	940	SANDSTONE / TRACES OF GRAY SHALE, LIMESTONE & SILTSTONE
UNDIFFERENTIATED SHALE	940	980	940	980	RED SHALE / TRACES OF LIMESTONE & SANDSTONE
UNDIFFERENTIATED SAND	980	1000	980	1000	SANDSTONE / TRACES OF RED SHALE
UNDIFFERENTIATED SHALE	1000	1040	1000	1040	GRAY SHALE / TRACES OF LIMESTONE, SILTSTONE & SANDSTONE
UNDIFFERENTIATED SAND	1040	1060	1040	1060	SANDSTONE / SILTSTONE
UNDIFFERENTIATED QUARTZ	1060	1100	1060	1100	QUARTZ / TRACES OF SANDSTONE & SILTSTONE
UNDIFFERENTIATED LIME	1100	1120	1100	1120	LIMESTONE / TRACES OF SANDSTONE & SILTSTONE
UNDIFFERENTIATED SAND	1120	1160	1120	1160	SANDSTONE / SILTSTONE
UNDIFFERENTIATED SILT	1160	1280	1160	1280	SLTSTONE / TRACES OF SANDSTONE & LIMESTONE
UNDIFFERENTIATED QUARTZ	1280	1320	1280	1320	QUARTZ
UNDIFFERENTIATED SILT	1320	1340	1320	1340	SILTSTONE / TRACES OF SANDSTONE
UNDIFFERENTIATED QUARTZ	1340	1380	1340	1380	QUARTZ / TRACES OF SILTSTONE & SANDSTONE
UPPER KITANNING	1380	1480	1380	1480	QUARTZ & SILSTONE / TRACES OF SANDSTONE & COAL
LOWER KITANNING	1480	1840	1480	1840	SANDSTONE & SILTSTONE / TRACES OF QUARTZ & COAL
BIG LIME	1840	1920	1840	1920	LIMESTONE / TRACES OF SILTSTONE
BIG INJUN	1920	2060	1920	2060	SANDSTONE & LIMESTONE / TRACES OF SILTSTONE
PRICE	2060	2210	2060	2210	SILTSTONE / TRACES OF RED SHALE
WEIR	2210	2360	2210	2360	SANDSTONE & SILTSTONE / TRACES OF LIMESTONE
BEREA	2360	2540	2360	2540	SILTSTONE
GORDON	2540	3350			SILTSTONE / TRACES OF SANDSTONE & PYRITE
WARREN SAND	3350	4940			SILTSTONE & SANDSTONE
BENSON	4940	5150			SILTSTONE & SANDSTONE
ALEXANDER	5150	6302			SILTSTONE / TRACES OF GRAY SHALE
MIDDLESEX	6302	6371			GRAY SHALE / TRACES OF SILTSTONE
WEST RIVER	6371	6445			GRAY SHALE
BURKET	6445	6481			GRAY SHALE
TULLY	6481	6503			GRAY SHALE
HAMILTON	6503	6517			GRAY SHALE & LIMESTONE
UPPER MARCELLUS	6517	6537			GRAY SHALE
MIDDLE MARCELLUS	6537				GRAY SHALE
TD - MARCELLUS				16952	

Drilling Contractor

Tophole
Decker Drilling, Inc
11565 OH-676
Vincent, OH 45784

KOP to TD
Patterson-UTI Drilling Company
207 Carlton Drive
Eighty Four, PA 15330

Cementing Company

Tophole
Universal Pumping Pressure
2198 University Drive
Lemont Furnace, PA 15456

Production
Halliburton
121 Champion Way Suite #210
Canonsburg, PA 15317

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/22/2019
Job End Date:	8/30/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02514-00-00
Operator Name:	CNX Gas Company LLC
Well Name and Number:	SHR38GHSM
Latitude:	39.37146600
Longitude:	-80.83522700
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,552
Total Base Water Volume (gal):	12,061,770
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	CNX	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	84.25499	None
Sand (Proppant)	Keane	Proppant					
			Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	15.08463	None
Hydrochloric Acid (7.5%)	Keane	Acid Inhibitor					
			Water	7732-18-5	92.50000	0.50826	None
			Hydrochloric Acid	7647-01-0	7.50000	0.04121	None
KFR-48	Keane	Friction Reducer					
			Water	7732-18-5	47.00000	0.02813	None
			alkanes, C16-20-iso-	90622-59-6	25.00000	0.01496	None
			butene, homopolymer	9003-29-6	25.00000	0.01496	None
			Alcohols, C12-18, ethoxylated	68213-23-0	3.00000	0.00180	None
KSI-22	Keane	Scale Inhibitor					
			Methanol	67-56-1	50.00000	0.01019	None
			2-propenoic acid, polymer with 2-methyl-2-[(1-oxo-2- propenyl) amino]-1-propensulfonic acid monosodium salt and sodium phosphinite	110224-99-2	10.00000	0.00204	None

KWG-111LS	Keane	Gel					
			Guar gum	9000-30-0	55.00000	0.00417	None
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.00417	None
MBC-516	Keane	Biocide					
			glutaral	111-30-8	26.70000	0.00433	None
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00129	None
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00086	None
			Ethanol	64-17-5	2.80000	0.00045	None
KFEAC-30	Keane	Iron Control					
			acetic acid	64-19-7	60.00000	0.00214	None
			Citric acid	77-92-9	40.00000	0.00143	None
KAI-12	Keane	Acid Inhibitor					
			Methanol	67-56-1	90.00000	0.00158	None
			Fatty imidazoline	61790-69-0	5.00000	0.00009	None
			Alcohols, C7-9-iso-, C8-rich	68526-83-0	5.00000	0.00009	None
			isoproyl alcohol	67-63-0	5.00000	0.00009	None
			xylene	1330-20-7	5.00000	0.00009	None
			prop-2-yn-1-ol	107-19-7	5.00000	0.00009	None
			ethylbenzene	100-41-4	1.00000	0.00002	None
Chemliquid 250	Keane	pH Buffer					
			water	7732-18-5	75.00000	0.00111	None
			sodium hydroxide	1310-73-2	25.00000	0.00037	None
KWBO-2	Keane	Breaker					
			Sodium persulfate	7775-27-1	99.00000	0.00008	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	92.50000	0.50826	
			alkanes, C16-20-iso-	90622-59-6	25.00000	0.01496	
			butene, homopolymer	9003-29-6	25.00000	0.01496	
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.00417	
			2-propenoic acid, polymer with 2-methyl-2-[(1-oxo-2-propenyl) amino]-1-propensulfonic acid monosodium salt and sodium phosphinite	110224-99-2	10.00000	0.00204	
			Alcohols, C12-18, ethoxylated	68213-23-0	3.00000	0.00180	
			Citric acid	77-92-9	40.00000	0.00143	
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00129	
			water	7732-18-5	75.00000	0.00111	
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00086	

			Ethanol	64-17-5	2.80000	0.00045	
			xylene	1330-20-7	5.00000	0.00009	
			Alcohols, C7-9-iso-, C8-rich	68526-83-0	5.00000	0.00009	
			Fatty imidazoline	61790-69-0	5.00000	0.00009	
			isoproyl alcohol	67-63-0	5.00000	0.00009	
			prop-2-yn-1-ol	107-19-7	5.00000	0.00009	
			ethylbenzene	100-41-4	1.00000	0.00002	
			Water	7732-18-5	85.00000		

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

Schlumberger

CNX Gas

CNX

Borehole:	Well:	Field:	Structure:
Original Borehole	SHR-38G-HSM	WV Tyler County (NAD 27)	Patterson 801

Gravity & Magnetic Parameters						Surface Location		NAD27 West Virginia State Plane, Northern Zone, US Feet				Miscellaneous			
Model:	HDGM 2019	Dip:	66.457°	Date:	31-May-2019	Lat:	N 39 22 16.98	Northing:	320181.66ftUS	Grid Conv:	-0.8517°	Slot:	SHR-38G-HSM	TVD Ref:	KB(1040.57ft above MSL)
MagDec:	-7.707°	FS:	51831.175nT	Gravity FS:	999.321mgn (9.80665 Based)	Lon:	W 80 50 7.44	Easting:	1622485.25ftUS	Scale Fact:	0.99995056	Plan:	CNX SHR-38G-HSM Surveys 0ft to 16952ft MD		

Critical Points

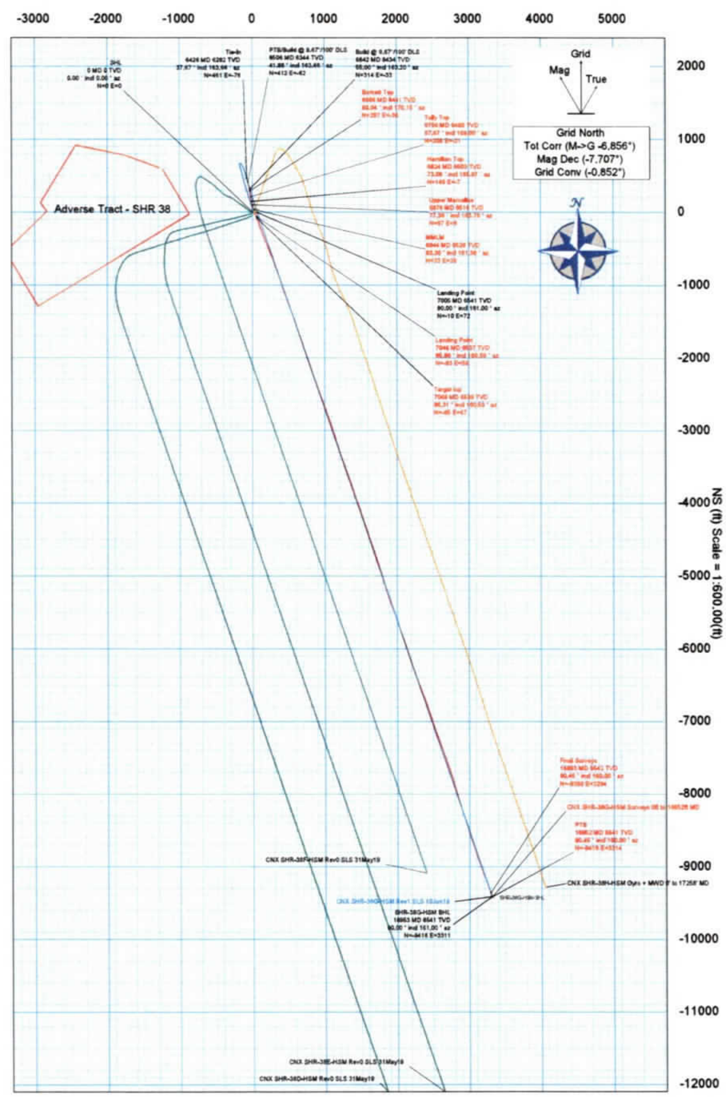
Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Burkett Top	6666.00	60.04	170.15	6440.73	-283.22	287.30	-35.54	10.33
Tully Top	6756.00	67.67	169.00	6490.34	-201.38	207.89	-20.96	8.53
Hamilton Top	6824.00	73.06	165.97	6503.15	-138.79	145.36	-7.18	8.11
Upper Marcellus	6876.00	77.36	163.76	6516.46	-89.64	96.67	6.00	9.40
MMLN	6944.00	83.30	161.38	6527.88	-22.86	32.95	26.06	9.40
Landing Point	7046.00	85.86	160.59	6537.07	78.91	-63.02	58.36	2.05
Target lap	7069.00	88.31	160.50	6538.64	101.86	-84.68	67.00	1.99
Final Surveys	16893.00	90.45	160.00	6541.83	9922.82	-9360.39	3294.22	0.12
PTB	16952.00	90.45	160.00	6541.17	9981.91	-9415.83	3314.40	0.00

PART	Seq.	Survey Tool/ Survey Tool Code	Vendor/Tool	Hole Size (in)	Casing Size (in)	Expected Max Incl (°)	MD From (ft)	MD To (ft)	Survey Frequency (ft)	EOU Size (Semi Major) (ft)	EOU Size (Semi Minor) (ft)	Comments/ Contingency
1	1	NAL_NSG+MSHOT-Depth Only		30	30		0	28.82	1/98.425	1.251	1.25	
1	2	NAL_NSG+MSHOT-Depth Only		30	30		28.82	28.82	Act Stns	1.251	1.25	
1	3	NAL_NSG+MSHOT		30	30		28.82	2549	Act Stns	3.7	1.606	
1	4	NAL_MWD-NON_SLB		30	30		2549	6426	Act Stns	13.366	6.449	
1	5	NAL_MWD_1.0_DEG		30	30		6426	16952	Act Stns	329.263	12.224	

Surface Location

Northing: 320181.665 Easting: 1622485.254 Latitude: N 39 22 16.98 Longitude: W 80 50 7.44 VSec Azimuth: 161.00

Target Description			Grid Coord						Local Coord	
Target Name	Shape	Dimension	Latitude	Longitude	Northing	Easting	TVD	VSec	N(+)/S(-)	E(+)/W(-)
Adverse Tract - SHR 38	Polyline	N/A	N 39 24 52.89	W 80 50 46.70	336008.76	1619639.13	1040.57	-15992.24	15827.81	-2846.27
SHR-38G-HSM BHL	Point	N/A	N 39 20 44.41	W 80 49 23.52	310765.82	1625796.06	6541.00	9981.17	-9416.23	3310.98
SHR-38G-HSM LP	Point	N/A	N 39 22 17.17	W 80 50 6.64	320199.54	1622547.81	6541.00	3.47	17.87	62.54

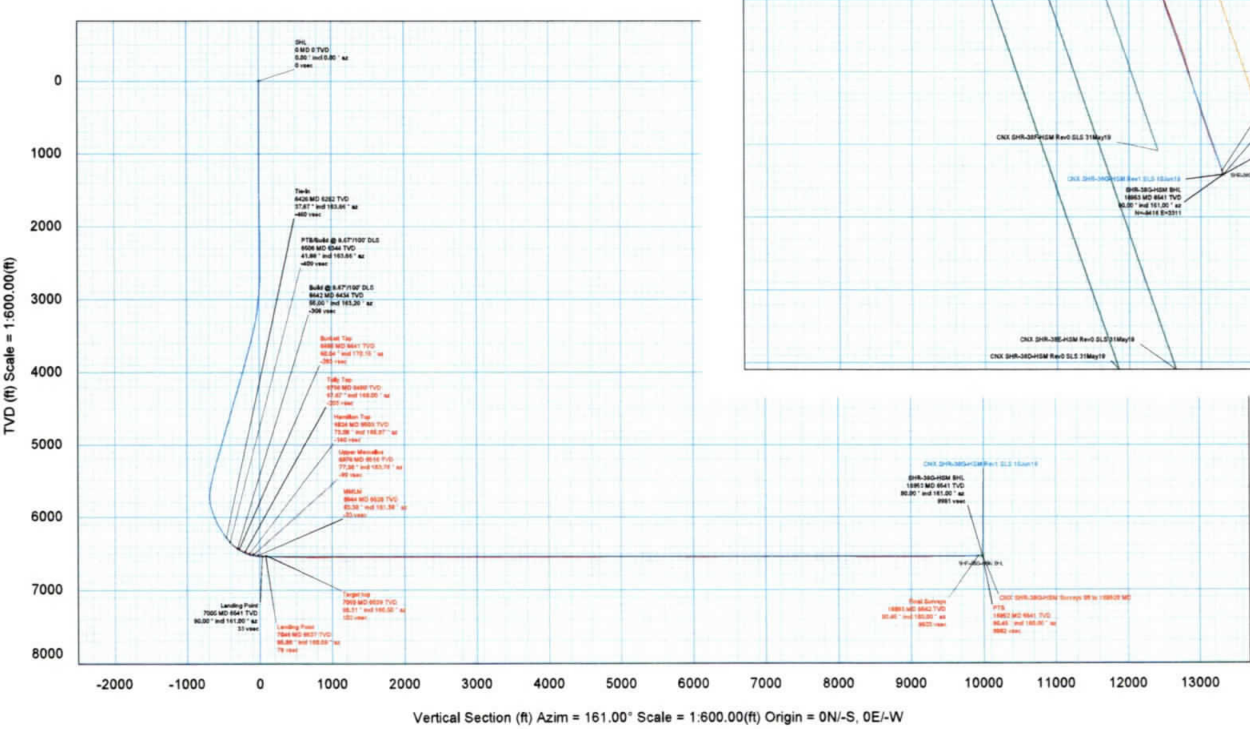


RECEIVED
Office of Oil and Gas

NOV 21 2019

WV Department of
Environmental Protection

CNX SHR-38G-HSM Surveys 0ft to 16952ft MD
CNX SHR-38G-HSM Rev0 SLS 31May19
CNX SHR-38F-HSM Rev0 SLS 31May19
CNX SHR-38G-HSM Rev1 SLS 10Jun19
CNX SHR-38E-HSM Rev0 SLS 31May19
Adverse Tract - SHR 38
SHR-38G-HSM BHL
SHR-38G-HSM LP



CONTROLLED

Plan ref	
Drawing ref	
Copy number	of 1
Date	19-Jul-2019
1 Drawn By	S. Shannon
Copy number	for

Schlumberger

CNX SHR-38G-HSM Surveys 0ft to 16952ft MD Survey Geodetic Report

(Def Survey)

Report Date:	July 19, 2019 - 11:12 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	CNX Gas	**Vertical Section Azimuth:**	161.000 ° (Grid North)
Field:	WV Tyler County (NAD 27)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	CNX SHR-38 Pad / SHR-38G-HSM	**TVD Reference Datum:**	KB
Well:	SHR-38G-HSM	**TVD Reference Elevation:**	1040.570 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	1011.650 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	-7.707 °
Survey Name:	CNX SHR-38G-HSM Surveys 0ft to 16952ft MD	**Total Gravity Field Strength:**	999.321mgn (9.80665 Based)
Survey Date:	May 31, 2019	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	241.108 ° / 11401.797 ft / 6.852 / 1.740	**Total Magnetic Field Strength:**	51831.175 nT
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet	**Magnetic Dip Angle:**	66.457 °
Location Lat / Long:	N 39° 22' 16.96391", W 80° 50' 7.43788"	**Declination Date:**	May 31, 2019
Location Grid N/E Y/X:	N 320181.866 ftUS, E 1622485.254 ftUS	**Magnetic Declination Model:**	HDGM 2019
CRS Grid Convergence Angle:	-0.8517 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99995056	**Grid Convergence Used:**	-0.8517 °
Version / Patch:	2.10.753.0	**Total Corr Mag North->Grid North:**	-8.8557 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1040.57	0.00	0.00	0.00	N/A	193.45M	N/A	N/A	320181.67	1622485.25	39.37138442	-80.83539941	0.00
	115.00	0.14	193.45	115.00	-925.57	0.12	-0.14	-0.03	0.12	297.97M	0.12	0.00	320181.53	1622485.22	39.37138404	-80.83539952	0.00
	215.00	0.05	297.97	215.00	-825.57	0.19	-0.24	-0.10	0.16	308.58M	-0.09	104.52	320181.43	1622485.15	39.37138377	-80.83539975	0.00
	315.00	0.08	306.69	315.00	-725.57	0.11	-0.18	-0.18	0.01	295.94M	0.01	10.72	320181.48	1622485.07	39.37138391	-80.83540004	0.00
	415.00	0.10	295.94	415.00	-625.57	0.01	-0.11	-0.30	0.04	24.29M	0.04	-12.75	320181.55	1622484.96	39.37138410	-80.83540046	0.00
	515.00	0.11	24.29	515.00	-525.57	-0.12	0.01	-0.34	0.15	304.18M	0.01	88.35	320181.68	1622484.92	39.37138445	-80.83540061	0.00
	615.00	0.05	304.18	615.00	-425.57	-0.23	0.13	-0.33	0.11	196.7M	-0.06	-80.11	320181.79	1622484.92	39.37138475	-80.83540060	0.00
	716.00	0.29	196.70	715.00	-325.57	-0.06	-0.09	-0.44	0.31	169.53M	0.24	-107.48	320181.57	1622484.81	39.37138417	-80.83540097	0.00
	816.00	0.31	169.53	815.00	-225.57	0.42	-0.60	-0.47	0.14	229.99M	0.02	-27.17	320181.07	1622484.79	39.37138275	-80.83540103	0.22
	916.00	0.35	229.99	915.00	-125.57	0.79	-1.06	-0.65	0.33	230M	0.04	60.46	320180.60	1622484.60	39.37138148	-80.83540166	0.46
	1016.00	0.23	230.00	1016.00	-25.57	0.97	-1.39	-1.04	0.12	243.99M	-0.12	0.01	320180.28	1622484.22	39.37138057	-80.83540301	0.59
	1115.00	0.24	243.99	1114.99	74.42	1.07	-1.61	-1.36	0.05	242.51M	0.01	13.89	320180.06	1622483.87	39.37137995	-80.83540421	0.67
	1215.00	0.08	242.51	1214.99	174.42	1.11	-1.73	-1.63	0.16	181.62M	-0.16	-1.38	320179.93	1622483.62	39.37137959	-80.83540509	0.75
	1315.00	0.25	181.62	1314.99	274.42	1.32	-1.98	-1.70	0.22	151.71M	0.17	-80.89	320179.68	1622483.56	39.37137890	-80.83540532	0.84
	1415.00	0.62	151.71	1414.99	374.42	2.06	-2.68	-1.45	0.42	137.36M	0.37	-29.91	320178.99	1622483.81	39.37137701	-80.83540439	1.01
	1515.00	0.51	137.35	1514.99	474.42	3.00	-3.48	-0.89	0.18	140.22M	-0.11	-14.36	320178.18	1622484.36	39.37137483	-80.83540238	1.13
	1615.00	0.71	140.22	1614.98	574.41	3.99	-4.28	-0.19	0.20	121.91M	0.20	2.87	320177.38	1622485.06	39.37137265	-80.83539987	1.24
	1715.00	1.06	121.91	1714.97	674.40	5.28	-5.25	0.96	0.44	109.8M	0.34	-18.31	320176.42	1622486.24	39.37137006	-80.83539586	1.40
	1815.00	1.13	109.80	1814.95	774.38	6.81	-6.06	2.69	0.24	96.49M	0.06	-12.11	320175.60	1622487.94	39.37136788	-80.83539059	1.53
	1915.00	0.67	96.49	1914.94	874.37	7.48	-6.46	4.20	0.50	102.04M	-0.46	-13.31	320175.20	1622489.45	39.37136685	-80.83538423	1.65
	2015.00	0.74	102.04	2014.93	974.36	8.06	-6.66	5.41	0.10	90.62M	0.07	5.56	320175.00	1622490.66	39.37136634	-80.83537903	1.71
	2115.00	0.80	90.62	2114.92	1074.36	8.57	-6.80	6.56	0.19	95.81M	-0.14	-11.42	320174.86	1622491.82	39.37136601	-80.83537584	1.78
	2216.00	0.49	95.81	2214.92	1174.36	8.93	-6.85	7.51	0.12	138.63M	-0.11	5.19	320174.81	1622492.77	39.37136591	-80.83537248	1.81
	2316.00	0.22	138.63	2314.92	1274.35	9.28	-7.04	8.06	0.36	151.15M	-0.27	42.82	320174.62	1622493.32	39.37136542	-80.83537052	1.86
	2415.00	0.25	151.15	2414.92	1374.35	9.68	-7.38	8.30	0.06	87.37M	0.03	12.52	320174.29	1622493.56	39.37136451	-80.83536968	1.87
	2515.00	0.17	87.37	2514.92	1474.35	9.93	-7.56	8.55	0.23	77M	-0.08	-63.76	320174.10	1622493.80	39.37136401	-80.83536677	1.90
	2549.00	0.14	77.00	2548.92	1508.35	9.95	-7.55	8.64	0.12	25.01M	-0.09	-30.50	320174.12	1622493.89	39.37136405	-80.83536645	1.91
	2647.00	0.14	25.01	2646.92	1606.35	9.88	-7.41	8.81	0.13	357.09M	0.00	-53.05	320174.25	1622494.06	39.37136443	-80.83536787	1.93
	2732.00	1.24	357.09	2731.91	1691.34	8.92	-6.40	8.81	1.32	350.37M	1.29	-32.85	320175.26	1622494.06	39.37136721	-80.83536793	2.04
	2817.00	3.62	350.37	2816.83	1776.26	5.30	-2.84	8.31	2.82	353.23M	2.80	-7.91	320178.83	1622493.56	39.37137697	-80.83536967	2.26
	2901.00	5.52	353.23	2900.55	1859.98	-1.16	3.79	7.39	2.28	352.72M	2.26	3.40	320185.46	1622492.64	39.37139513	-80.83537348	2.47
	2966.00	6.43	352.72	2965.09	1944.52	-9.83	12.57	6.30	1.07	346.94M	1.07	-0.80	320194.24	1622491.56	39.37141919	-80.83537777	2.62
	3070.00	8.76	346.94	3068.54	2027.97	-19.36	22.05	4.59	0.88	342.52M	0.39	-5.68	320203.72	1622489.85	39.37144515	-80.83538433	2.75
	3154.00	7.41	342.52	3151.90	2111.33	-29.69	32.04	1.85	1.01	344.99M	0.77	-5.26	320213.70	1622487.10	39.37147244	-80.83539456	2.87
	3239.00	9.18	344.99	3236.00	2195.43	-41.93	43.81	-1.56	2.12	12.99R	2.08	2.91	320225.48	1622483.70	39.37150463	-80.83540722	3.01
	3325.00	10.96	347.09	3320.86	2280.11	-56.91	58.41	-5.16	2.11	8.26R	2.07	2.44	320240.07	1622480.10	39.37154455	-80.83542073	3.15
	3409.00	12.67	348.22	3402.80	2362.32	-73.99	75.21	-8.82	2.05	37.17L	2.04	1.35	320256.87	1622476.43	39.37159063	-80.83543457	3.27
	3493.00	13.84	345.16	3484.69	2444.12	-93.01	93.81	-13.24	1.42	27.1L	1.15	-3.64	320275.47	1622472.01	39.37164139	-80.83545117	3.37
	3580.00	14.95	342.59	3568.99	2528.42	-114.46	114.43	-19.23	1.67	26.5L	1.51	-2.95	320296.09	1622466.03	39.37169776	-80.83547343	3.48
	3663.00	15.41	341.73	3649.10	2608.53	-136.18	135.12	-25.89	0.62	140.19L	0.55	-1.04	320316.78	1622459.37	39.37176428	-80.83549807	3.56
	3748.00	14.93	340.16	3731.14	2690.57	-158.43	156.14	-33.14	0.74	141.43R	-0.56	-1.85	320337.80	1622452.11	39.37181170	-80.83552484	3.62
	3834.00	14.73	340.79	3814.27	2773.70	-180.44	176.89	-40.50	0.30	53.93R	-0.23	0.73	320358.54	1622444.75	39.37186835	-80.83555195	3.67
	3917.00	16.17	343.04	3894.46	2853.89	-201.84	197.24	-47.14	0.88	29.98R	0.53	2.71	320378.89	1622436.12	39.37192394	-80.83557650	3.73
	4002.00	15.34	343.41	3976.47	2935.90	-224.19	218.85	-53.60	0.23	4.66L	0.20	0.44	320400.31	1622431.66	39.37198246	-80.83560046	3.77
	4088.00	16.16	343.17	4059.24	3018.67	-247.51	241.01	-60.31	0.96	43.25R	0.95	-0.28	320422.66	1622424.95	39.37204366	-80.83562538	3.83
	4175.00	16.66	344.79	4142.69	3102.12	-272.06	264.63	-67.09	0.78	99.23L	0.57	1.86	320446.28	1622418.17	39.37210813	-80.83565059	3.88
	4250.00	16.64	344.36	4223.17	3182.60	-295.08	287.83	-73.49	0.15	109.35L	-0.02	-0.52	320469.48	1622411.77	39.37217156	-80.83567445	3.91
	4343.00	16.44	342.23	4303.70	3263.13	-319.97	310.73	-80.36	0.76	103.26L	-0.24	-2.52	320492.38	1622404.90	39.37223415	-80.83569998	3.95
	4429.00	16.35	340.80	4386.20	3345.63	-344.24	333.75	-86.66	0.48	127.65R	-0.10	-1.66	320515.40	1622397.20	39.37229703	-80.83572839	3.99
	4512.00	16.14	341.79	4465.89	3425.32	-367.46	355.75	-95.50	0.42	66.06R	-0.25	1.19	320537.39	1622389.76	39.37235709	-80.83575588	4.02
	4598.00	16.31	343.25	4548.46	3507.89	-391.48	378.66	-102.72	0.51	31.04R	0.20	1.70	320560.31	1622382.54	39.37241971	-80.83578261	4.06
	4683.00	16.48	343.61	4630.01	3589.44	-415.45	401.66	-109.56	0.23	112.21R	0.20	0.42	320583.30	1622375.70	39.37248256	-80.83580801	4.08
	4768.00	16.17	346.51	4711.58	3671.01	-439.27	424.74	-115.72	1.03	168.26R	-0.36	3.41	320606.38	1622369.54	39.37254565	-80.83583102	4.12
	4853.00	15.86	346.73	4793.28	3752.71	-462.62	447.56	-121.15	0.35	64.12L	-0.34	0.26	320629.21	1622364.11	39.37260810	-80.83585143	4.15
	4937.00	16.12	345.00	4874.02	3833.45	-485.89	470.01	-126.81	0.64	17.84R	0.29	-2.06	320651.65	1622358.45	39.37266949	-80.83587262	4.18
	5022.00	16.50	345.43	4955.60	3915.03	-509.50	493.00	-132.90	0.47	41.36R	0.45	0.51	320674.73	1622352.36	39.37273260	-80.83589537	4.20
	5108.00	16.72	346.10	5038.01	3997.44	-534.00	516.92	-138.95	0.34	151.01L	0.26	0.78	320698.56	1622346.32	39.37279777	-80.83591800	4.22
	5193.00	16.17	345.00	5119.54	4078.97	-557.98	540.22	-144.95	0.74	163.5L	-0.65	-1.29	320721.86	1622340.32	39.37286149	-80.83594045	4.25
	5277.00	15.74	344.53	5200.30	4159.73	-581.02	562.50	-151.01	0.53	176.97R	-0.51	-0.56	320744.14	1622334.25	39.37292240	-80.83596307	4.28
	5363.00	15.34	344.61	5283.16	4242.59	-604.02	584.71	-157.14	0.47	173.66R	-0.47	0.09	320766.35	1622328.12	39.37298312	-80.83598592	4.30
	5448.00	13.42	345.53	5365.49	4324.92	-625.07	605.11	-162.59	2.27	73.78R	-2.26	1.08	320786.74	1622322.67	39.37303868	-80.83600827	4.34
	5533.00	13.46	346.11	5448.16	4407.59	-644.76	624.26	-167.43	0.17	154.64L	0.05	0.68	320805.89	1622317.83	39.37309126	-80.83602439	4.36
	5618.00	12.92	344.96	5530.92	4490.35	-664.09	643.04	-172.27	0.71	160.25R	-0.64	-1.35	320824.67	1622312.99	39.37314262	-80.83604250	4.37
	5704.00	8.00	358.30	5615.48	4574.91	-679.41	658.32	-174.95	5.84	51.93M	-5.72	15.51	320839.95	1622310.32	39.37318445	-80.83606276	4.45
	5789.00	5.13	51.93	5699.96	4659.41	-686.31	666.58	-172.13	7.66	83.65M	-3.38	63.09	320848.21	1622313.14	39.37320725	-80.83604323	4.52
	5832.00	6.97	83.65	5742.75	4702.18	-686.36	668.06	-168.02	8.71	100.91M	4.28	73.77	320849.69	1622317.24	39.37321147	-80.83602877	4.56
	5875.00	9.56	108.91	5785.31	4744.74	-683.70	667.31	-162.01	9.72	57.99R	6.02	54.09	320848.94	1622323.26	39.37320965	-80.83600747	4.60
	5918.00	13.03	126.61	5827.49	4786.92	-677.80	663.37	-154.89	11.96	56.81R	8.07	45.81	320845.01	1622330.57	39.37319916	-80.83598140	4.64
	5961.00	16.57	142.51	5869.07	4828.50	-667.77	656.61	-147.07	12.46	65.67R	8.23	36.98	320837.24	1622338.20	39.37317816	-80.83595402	4.69
	6002.00	18.47	153.58	5908.18	4867.61	-655.79	646.15	-140.62	9.34	14.99R	4.63	27.00	320826.79	1622344.85	39.37314971	-80.83593095	4.72
	6045.00	20.49	155.12	5948.72	4908.15	-641.54	632.23	-134.42	4.85	22.14R	4.70	3.58	320813.86	1622350.84	39.37311448	-80.83590805	4.74
	6086.00	22.56	157.30	5986.86	4946.29	-626.55	616.46	-128.36	5.41	61.56R	5.05	5.32	320800.09	1622356.90	39.37307693	-80.83588591	4.76
	6129.00	23.13	159.88	6026.48	4985.91	-609.88	602.92	-122.27	2.66	5.8R	1.33	6.00	320784.55	1622362.99	39.37303452	-80.83586356	4.78
	6173.00	25.46	160.43	6066.56	5026.01	-591.78	585.89	-116.13	5.32	10.85R	5.30	1.25	320767.52	1622369.13	39.37298803	-80.83584095	4.80
	6214.00	28.15	161.50	6103.18	5062.61	-573.29	568.41	-110.11	6.67	15.82R	6.56	2.61	320750.05	1622375.15	39.37294029	-80.83581873	4.83
	6256.00	29.92	162.49	6139.90	5099.33	-552.91	549.02	-103.82	4.37	12.82L	4.21	2.36	320730.66	1622381.44	39.37288733	-80.83579545	4.85
	6299.00	30.51	162.23	6177.05	5136.48	-531.28	528.40	-97.26	1.41	1.73L	1.37	-0.60	320710.04	1622388.00	39.37283099	-80.83577117	4.86
	6341.00	32.47	162.12	6212.67	5172.30	-509.35	507.52	-90.54	4.67	11R	4.67	-0.26	320689.16	1622394.72	39.37277393	-80.83574632	4.88
	6384.00	36.46	163.12	6248.53	6207.96	-485.34	484.50	-83.37	7.07	8.5R	6.95	2.33	320666.23	1622401.88	39.37271129	-80.83571976	4.91
	6426.00	37.67	163.66	6282.26	5241.69	-460.34	460.82	-76.23	5.32	12.26R	5.26	1.29	320642.26	1622409.03	39.37264578	-80.83569322	4.93
	6479.00	41.65	164.96	6323.06	5282.46	-426.58	428.06	-67.10	7.67	9.19R	7.51	2.45	320609.70	1622418.16	39.37255675	-80.83565922	4.97
	6574.00	50.92	166.88	6388.64	5348.07	-358.25	361.51	-50.50	9.87	17.39R	9.76	2.02	320543.16	1622434.76	39.37237475	-80.83559701	5.04
Burkett Top	*6606.00*	*60.04*	*170.18*	*6440.73*	*6400.16*	*-283.22*	*287.30*	*-35.54*	*10.33*	*15.53R*	*9.91*	*5.85*	*320488.95*	*1622449.72*	*39.37217164*	*-80.83554020*	*5.11*
	6668.00	60.24	170.21	6441.72	6401.15	-261.50	265.50	-35.24	10.33	8.8L	9.96	3.19	320467.24	1622450.01	39.37216906	-80.83553607	5.12
Tully Top	*6756.00*	*67.67*	*169.00*	*6460.84*	*5439.77*	*-203.38*	*207.88*	*-30.86*	*8.53*	*8.06L*	*8.44*	*-1.37*	*320389.84*	*1622444.29*	*39.37196423*	*-80.83548447*	*5.18*
Hamilton Top	*6824.00*	*73.08*	*165.97*	*6503.15*	*5462.58*	*-139.78*	*145.36*	*-7.18*	*9.11*	*29.49L*	*7.90*	*-4.82*	*320327.02*	*1622478.07*	*39.37178516*	*-80.83543246*	*5.22*
	6857.00	75.70	164.44	6512.03	5471.46	-108.09	114.84	0.94	9.11	21.93L	7.95	-4.63	320296.30	1622486.19	39.37169915	-80.83540213	5.25
Upper Marcellus	*6878.00*	*77.36*	*163.76*	*6516.46*	*5475.89*	*-89.64*	*96.87*	*6.00*	*9.40*	*21.77L*	*8.72*	*-5.60*	*320278.53*	*1622491.26*	*39.37165058*	*-80.83538329*	*5.26*
MidLM	*6944.00*	*83.30*	*161.38*	*6527.88*	*5487.31*	*-22.66*	*32.95*	*26.08*	*9.40*	*21.37L*	*8.74*	*-3.50*	*320214.61*	*1622511.34*	*39.37147594*	*-80.83530890*	*5.30*
Landing Point *Target top*	6952.00	84.00	161.10	6528.76	5488.19	-14.71	25.42	28.64	9.40	15.3L	8.75	-3.44	320207.09	1622513.89	39.37146538	-80.83529946	5.31
	7046.00	85.86	160.59	6537.07	5496.50	78.91	-63.02	59.36	2.05	11.12L	1.98	-0.54	320118.85	1622544.61	39.37121384	-80.83518616	5.36
	7060.00	*86.31*	*160.50*	*6538.24*	*5497.67*	*101.88*	*-84.86*	*67.00*	*1.99*	*11.11L*	*1.96*	*-0.39*	*320097.01*	*1622552.28*	*39.37115478*	*-80.83516799*	*5.38*
	7163.00	86.15	160.14	6543.16	5502.61	195.74	-173.06	98.82	1.99	79.7L	1.96	-0.38	320008.81	1622583.87	39.37091337	-80.83504153	5.40
	7257.00	88.21	159.81	6546.17	5505.80	289.66	-261.33	130.79	0.36	73.93L	0.06	-0.35	319920.35	1622616.04	39.37067236	-80.83492311	5.43
	7352.00	89.05	156.90	6548.44	5507.87	384.54	-349.60	165.82	3.19	95.5R	0.88	-3.06	319832.09	1622651.07	39.37043149	-80.83479450	5.47
	7446.00	88.82	159.30	6550.19	5509.62	478.39	-436.79	200.87	2.56	96.7L	-0.24	2.55	319744.90	1622686.12	39.37019356	-80.83466604	5.50
	7541.00	89.38	158.00	6551.58	5511.11	573.30	-525.26	235.45	1.49	66.18L	0.58	-1.37	319656.43	1622720.70	39.36995211	-80.83453910	5.53
	7635.00	89.72	157.23	6552.42	5511.85	667.13	-612.17	271.25	0.90	79.77R	0.36	-0.82	319569.52	1622756.49	39.36971499	-80.83440793	5.56

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
	7730.00	90.22	160.00	6552.47	5511.90	762.04	-700.82	305.89	2.96	147.53R	0.69	2.92	319481.08	1622791.13	39.36947369	-80.83428079	5.59
	7824.00	89.78	160.28	6552.47	5511.90	856.03	-789.03	337.82	0.55	55.91L	-0.47	0.30	319392.87	1622823.06	39.36923220	-80.83416321	5.62
	7918.00	90.22	159.63	6552.47	5511.90	950.01	-877.34	370.04	0.84	78.52R	0.47	-0.69	319304.37	1622855.28	39.36899110	-80.83404463	5.64
	8013.00	90.78	162.39	6551.84	5511.07	1045.00	-967.15	400.95	2.96	90L	0.59	2.91	319214.66	1622886.18	39.36874580	-80.83393060	5.67
	8107.00	90.78	159.91	6550.36	5509.79	1138.96	-1056.36	430.54	1.57	106.45L	0.00	-1.57	319125.36	1622915.77	39.36850211	-80.83382128	5.70
	8202.00	90.39	159.59	6549.39	5508.82	1233.97	-1145.77	462.64	1.45	116.56R	-0.41	-1.39	319035.95	1622947.87	39.36825799	-80.83370308	5.72
	8296.00	89.59	160.59	6549.16	5508.59	1327.95	-1234.15	494.65	1.19	78.06R	-0.53	1.06	318947.56	1622979.88	39.36801868	-80.83358522	5.75
	8391.00	90.00	161.11	6549.25	5508.68	1422.95	-1323.80	525.81	0.56	90.8L	0.12	0.55	318857.84	1623011.04	39.36777180	-80.83347030	5.77
	8486.00	90.17	160.06	6549.11	5508.54	1518.95	-1412.54	557.06	1.13	92.64R	0.18	-1.12	318769.19	1623042.28	39.36752960	-80.83336514	5.79
	8580.00	90.11	161.36	6548.88	5508.31	1611.94	-1502.21	588.44	1.37	76.53L	-0.06	1.37	318679.53	1623073.67	39.36728464	-80.83323945	5.81
	8674.00	90.34	160.40	6548.51	5507.94	1705.94	-1591.02	619.23	1.06	155.67L	0.24	-1.02	318590.72	1623104.45	39.36704209	-80.83312691	5.83
	8768.00	89.61	160.07	6548.55	5507.98	1799.93	-1679.48	651.02	0.85	90R	-0.78	-0.35	318502.27	1623136.24	39.36680055	-80.83300886	5.85
	8863.00	89.81	161.02	6549.20	5508.63	1894.93	-1769.06	682.66	1.00	41.31R	0.00	1.00	318412.70	1623167.88	39.36655595	-80.83288226	5.87
	8957.00	89.94	161.31	6549.57	5509.00	1988.93	-1858.02	713.00	0.47	124.51L	0.36	0.31	318323.74	1623198.22	39.36631296	-80.83278028	5.89
	9052.00	89.61	160.83	6549.94	5509.37	2083.92	-1947.88	743.82	0.61	34.29L	-0.35	-0.51	318233.88	1623229.04	39.36606754	-80.83266657	5.91
	9146.00	89.83	160.66	6550.40	5509.83	2177.92	-2036.63	774.81	0.28	80.79R	0.23	-0.16	318145.14	1623260.02	39.36582518	-80.83255235	5.92
	9241.00	89.89	161.05	6550.63	5510.06	2272.92	-2126.36	805.95	0.39	75.29R	0.06	0.39	318055.40	1623291.16	39.36558007	-80.83243752	5.94
	9335.00	89.94	161.24	6550.77	5510.20	2366.92	-2215.39	836.33	0.21	94.93L	0.05	0.20	317966.44	1623321.54	39.36533711	-80.83232543	5.96
	9430.00	89.89	160.66	6550.91	5510.34	2461.92	-2305.13	867.33	0.61	90L	-0.05	-0.61	317876.65	1623352.54	39.36509187	-80.83221107	5.97
	9524.00	89.89	160.36	6551.09	5510.52	2555.92	-2393.75	898.89	0.32	46.64L	0.00	-0.32	317788.04	1623383.90	39.36484989	-80.83209651	5.99
	9618.00	90.06	160.18	6551.13	5510.56	2649.91	-2482.23	930.43	0.26	98.71L	0.18	-0.19	317699.57	1623415.63	39.36460828	-80.83197865	6.00
	9713.00	89.89	159.07	6551.18	5510.61	2744.88	-2571.26	963.50	1.18	90R	-0.18	-1.17	317610.52	1623448.71	39.36436516	-80.83185702	6.02
	9807.00	89.89	159.89	6551.36	5510.79	2838.85	-2659.32	996.45	0.87	79.75L	0.00	0.87	317522.49	1623481.66	39.36412484	-80.83173589	6.04
	9902.00	90.06	158.95	6551.40	5510.83	2933.81	-2748.25	1029.85	1.01	107.84R	0.18	-0.99	317433.55	1623515.05	39.36388205	-80.83161313	6.05
	9996.00	89.78	159.82	6551.53	5510.96	3027.77	-2836.23	1062.94	0.97	87.49R	-0.30	0.93	317345.58	1623548.14	39.36364188	-80.83149149	6.07
	10091.00	89.89	162.33	6551.80	5511.23	3122.76	-2926.09	1093.75	2.64	79.51R	0.12	2.64	317255.73	1623578.95	39.36336648	-80.83137783	6.09
	10185.00	89.94	162.60	6551.94	5511.37	3216.73	-3016.72	1122.07	0.29	75.84R	0.05	0.29	317166.10	1623607.27	39.36315156	-80.83127298	6.10
	10280.00	90.22	163.71	6551.81	5511.24	3311.66	-3108.64	1149.80	1.21	102.24L	0.29	1.17	317075.18	1623634.80	39.36290309	-80.83117087	6.12
	10374.00	89.94	162.42	6551.68	5511.11	3405.60	-3199.57	1178.98	1.40	86.24L	-0.30	-1.37	316985.26	1623662.17	39.36265736	-80.83106934	6.13
	10469.00	90.00	161.70	6551.73	5511.16	3500.58	-3288.95	1208.24	0.78	96.54L	0.06	-0.76	316894.89	1623691.43	39.36241044	-80.83096113	6.15
	10563.00	89.78	159.78	6551.91	5511.34	3594.56	-3375.66	1237.25	2.06	12.09R	-0.23	-2.04	316806.16	1623722.44	39.36216511	-80.83084684	6.16
	10658.00	90.06	159.84	6552.04	5511.47	3689.56	-3464.84	1270.04	0.30	20.81L	0.29	0.06	316717.00	1623755.22	39.36192468	-80.83072622	6.18
	10752.00	90.56	159.65	6551.83	5510.96	3783.53	-3553.03	1302.58	0.57	107.88R	0.53	-0.20	316628.82	1623787.76	39.36168392	-80.83060653	6.19
	10847.00	90.34	160.34	6551.59	5510.72	3878.51	-3642.29	1335.06	0.76	77.09R	-0.23	0.73	316539.56	1623820.26	39.36144020	-80.83048694	6.20
	10941.00	90.56	161.30	6550.05	5509.46	3972.51	-3731.07	1365.96	1.05	168.56L	0.23	1.02	316450.79	1623851.14	39.36119775	-80.83037309	6.22
	11036.00	89.72	161.13	6549.82	5509.25	4067.51	-3821.01	1396.55	0.90	92.91L	-0.88	-0.18	316360.85	1623881.73	39.36095210	-80.83026020	6.23
	11130.00	89.94	160.70	6550.09	5509.52	4161.51	-3909.84	1427.28	0.51	90L	0.23	-0.46	316272.02	1623912.46	39.36070949	-80.83014667	6.24
	11225.00	89.94	160.65	6550.19	5509.62	4256.51	-3999.49	1458.72	0.05	92.68R	0.00	-0.05	316182.38	1623943.90	39.36046467	-80.83003101	6.25
	11319.00	89.89	161.72	6550.33	5509.76	4350.50	-4088.47	1489.04	1.14	32.66L	-0.05	1.14	316093.41	1623974.21	39.36022165	-80.82991915	6.27
	11413.00	90.67	161.22	6549.87	5509.30	4444.50	-4177.59	1518.91	0.99	140.6L	0.83	-0.53	316004.29	1624004.09	39.35997821	-80.82980885	6.28
	11508.00	90.39	160.99	6549.00	5508.43	4539.49	-4267.47	1549.67	0.38	84.09L	-0.29	-0.24	315914.42	1624034.85	39.35973273	-80.82969637	6.29
	11602.00	90.45	160.41	6548.31	5507.74	4633.49	-4356.18	1580.74	0.62	87.95R	0.06	-0.62	315825.71	1624066.91	39.35949046	-80.82956067	6.30
	11696.00	90.50	161.81	6547.53	5506.96	4727.48	-4445.11	1611.17	1.49	95.87L	0.05	1.49	315736.78	1624098.34	39.35924757	-80.82944861	6.32
	11791.00	90.39	160.74	6546.76	5506.22	4822.48	-4535.06	1641.67	1.13	51.84L	-0.12	-1.13	315646.82	1624126.84	39.35900183	-80.82933607	6.33
	11886.00	90.50	160.60	6546.06	5505.49	4916.47	-4623.78	1672.78	0.19	90R	0.12	-0.15	315558.12	1624157.95	39.35875981	-80.82922141	6.34
	11980.00	90.50	161.21	6545.23	5504.66	5011.47	-4713.55	1703.86	0.64	154.26R	0.00	0.64	315468.36	1624186.02	39.35851444	-80.82912682	6.35
	12075.00	89.94	161.48	6544.87	5504.30	5106.47	-4803.56	1734.24	0.65	88.58R	-0.59	0.28	315378.36	1624219.41	39.35826859	-80.82901467	6.36
	12169.00	90.00	163.90	6544.91	5504.34	5200.42	-4893.29	1762.21	2.58	107.53L	0.06	2.57	315288.62	1624247.37	39.35802339	-80.82891108	6.38
	12264.00	89.94	163.71	6544.96	5504.39	5295.30	-4984.52	1788.71	0.21	83.09L	-0.06	-0.20	315197.40	1624273.87	39.35777402	-80.82881262	6.39
	12358.00	90.06	162.72	6544.96	5504.39	5389.23	-5074.52	1815.86	1.06	107.1R	0.13	-1.06	315107.41	1624301.01	39.35752808	-80.82871193	6.40
	12453.00	89.78	163.63	6545.10	5504.53	5484.16	-5165.45	1843.35	1.00	86.71L	-0.29	0.96	315016.48	1624328.51	39.35727957	-80.82860996	6.41
	12547.00	89.89	161.72	6545.37	5504.80	5578.12	-5255.18	1871.34	2.04	98.17L	0.12	-2.03	314926.76	1624356.50	39.35703439	-80.82850628	6.42
	12642.00	89.61	159.77	6545.78	5505.21	5673.11	-5344.86	1902.67	2.07	108.44L	-0.29	-2.05	314837.08	1624387.82	39.35678947	-80.82839082	6.44
	12736.00	89.50	159.44	6546.51	5505.94	5767.08	-5432.96	1935.42	0.37	86.58R	-0.12	-0.35	314748.98	1624420.58	39.35654894	-80.82827039	6.45
	12831.00	89.55	160.27	6547.30	5506.73	5862.06	-5522.15	1966.14	0.88	27.59R	0.05	0.87	314659.80	1624453.29	39.35630645	-80.82815005	6.46
	12925.00	89.78	160.39	6547.85	5507.28	5956.05	-5610.86	1999.78	0.28	81.60L	0.24	0.13	314571.29	1624484.93	39.35606375	-80.82803354	6.47
	13019.00	89.89	159.64	6548.12	5507.55	6050.04	-5699.00	2031.91	0.81	45L	0.12	-0.80	314482.96	1624517.08	39.35582255	-80.82791533	6.48
	13114.00	89.94	159.59	6548.26	5507.69	6145.01	-5788.05	2066.00	0.07	83.54L	0.05	-0.05	314393.91	1624550.15	39.35557944	-80.82779367	6.48
	13208.00	90.06	158.53	6548.26	5507.69	6238.95	-5875.84	2098.59	1.13	72.47R	0.13	-1.13	314306.13	1624583.74	39.35533980	-80.82767030	6.50
	13303.00	90.95	161.35	6547.42	5506.85	6333.92	-5965.06	2131.17	3.11	130.05R	0.94	2.97	314216.91	1624616.32	39.35509519	-80.82755044	6.51
	13398.00	90.00	162.48	6546.64	5506.07	6428.90	-6055.37	2160.66	1.55	100.92L	-1.00	1.19	314126.61	1624645.80	39.35484960	-80.82744145	6.52
	13492.00	89.78	161.34	6546.82	5506.25	6522.89	-6144.72	2189.85	1.24	37.69L	-0.23	-1.21	314037.26	1624674.99	39.35460640	-80.82733358	6.53
	13587.00	90.00	161.17	6547.00	5506.43	6617.89	-6234.58	2220.38	0.29	93.58R	0.23	-0.18	313947.31	1624705.52	39.35435668	-80.82722094	6.54
	13681.00	89.94	162.13	6547.05	5506.48	6711.88	-6323.90	2249.97	1.02	86.45L	-0.06	1.02	313858.09	1624735.11	39.35411596	-80.82711185	6.55
	13776.00	90.11	159.39	6547.01	5506.44	6806.87	-6413.58	2281.27	2.89	85.99L	0.18	-2.88	313768.41	1624766.41	39.35387103	-80.82699629	6.57
	13870.00	90.17	158.54	6546.78	5506.21	6900.81	-6501.32	2315.01	0.91	103.84R	0.06	-0.90	313680.68	1624800.15	39.35363156	-80.82687241	6.57
	13965.00	90.00	159.23	6546.64	5506.07	6995.75	-6589.94	2349.24	0.75	2.94R	-0.18	0.73	313592.06	1624834.37	39.35338967	-80.82674678	6.58
	14059.00	90.39	159.25	6546.32	5505.75	7089.70	-6677.84	2382.65	0.42	172.23R	0.41	0.02	313504.17	1624867.80	39.35314973	-80.82662438	6.59
	14154.00	90.17	159.28	6545.85	5505.28	7184.66	-6766.88	2416.19	0.23	98.28R	-0.23	0.03	313415.33	1624901.32	39.35290720	-80.82650082	6.60
	14248.00	89.78	161.96	6545.89	5505.32	7278.65	-6855.36	2447.38	2.88	68.96L	-0.41	2.85	313326.87	1624932.51	39.35266506	-80.82638562	6.61
	14343.00	89.83	161.83	6546.22	5505.65	7373.63	-6945.84	2476.90	0.15	72.55L	0.05	-0.14	313236.38	1624962.03	39.35241830	-80.82627682	6.62
	14437.00	89.94	161.48	6546.40	5505.83	7467.63	-7034.86	2506.48	0.39	74.33L	0.12	-0.37	313147.16	1624991.61	39.35217466	-80.82616756	6.63
	14532.00	90.17	160.66	6546.31	5505.74	7562.63	-7124.73	2537.30	0.90	94.14L	0.24	-0.86	313057.31	1625022.43	39.35192922	-80.82605391	6.64
	14626.00	90.06	159.14	6546.12	5505.55	7656.61	-7213.00	2569.61	1.62	93.04R	-0.12	-1.62	312969.04	1625054.73	39.35168821	-80.82593609	6.65
	14721.00	90.00	160.27	6546.06	5505.61	7751.58	-7302.10	2602.56	1.19	122.91L	-0.06	1.19	312879.94	1625087.68	39.35144495	-80.82581394	6.66
	14815.00	89.89	160.10	6546.17	5505.80	7845.57	-7390.63	2634.42	0.22	82.88R	-0.12	-0.18	312791.51	1625119.54	39.35120348	-80.82569866	6.67
	14909.00	89.94	160.50	6546.30	5505.73	7939.56	-7479.03	2666.11	0.43	89.44L	0.05	0.43	312703.02	1625151.23	39.35096182	-80.82558001	6.67
	15004.00	90.06	160.18	6546.30	5505.73	8034.56	-7568.49	2698.07	0.36	99.65R	0.13	-0.34	312613.56	1625183.19	39.35071753	-80.82546234	6.68
	15098.00	89.89	161.18	6546.35	5505.78	8128.55	-7657.20	2729.17	1.08	115.9R	-0.18	1.06	312524.86	1625214.28	39.35047528	-80.82534776	6.69
	15193.00	89.22	162.56	6547.08	5506.51	8223.54	-7747.48	2758.73	1.61	32.47R	-0.71	1.45	312434.59	1625243.84	39.35022865	-80.82523864	6.70
	15287.00	89.44	162.70	6548.18	5507.61	8317.49	-7837.16	2786.79	0.26	38.48R	0.23	0.15	312344.88	1625271.90	39.34998353	-80.82513465	6.71
	15382.00	89.83	163.01	6548.79	5508.22	8412.44	-7927.98	2814.79	0.52	82.9R	0.41	0.33	312254.11	1625299.90	39.34973647	-80.82503091	6.72
	15476.00	90.17	165.74	6548.79	5508.22	8506.27	-8018.48	2840.11	2.93	92L	0.36	2.90	312163.60	1625325.22	39.34948801	-80.82493668	6.73
	15571.00	90.06	162.60	6548.60	5508.03	8601.11	-8109.86	2866.02	3.31	104.44R	-0.12	-3.31	312072.22	1625351.13	39.34923819	-80.82484031	6.74
	15665.00	89.89	163.26	6548.64	5508.07	8695.06	-8199.72	2893.61	0.73	86.04L	-0.18	0.70	311982.37	1625378.72	39.34899284	-80.82473607	6.75
	15760.00	90.00	161.67	6548.73	5508.16	8790.02	-8289.35	2921.93	1.70	57.53L	0.12	-1.69	311892.74	1625407.04	39.34874774	-80.82463327	6.76
	15854.00	90.28	161.23	6548.50	5507.93	8884.02	-8379.41	2952.16	0.55	115.91R	0.29	-0.46	311802.68	1625437.26	39.34850172	-80.82452172	6.77
	15948.00	89.94	161.90	6548.32	5507.75	8978.01	-8468.59	2981.88	0.80	67.48L	-0.36	0.71	311713.51	1625466.98	39.34825813	-80.82441108	6.77
	16043.00	90.11	161.49	6548.27	5507.70	9073.01	-8558.78	3011.72	0.47	80.35L	0.18	-0.43	311623.32	1625496.82	39.34801174	-80.82430179	6.78
	16137.00	90.28	160.49	6547.95	5507.38	9167.01	-8647.66	3042.34	1.06	83.53R	0.18	-1.06	311534.46	1625527.43	39.34776901	-80.82418891	6.79
	16232.00	90.39	161.46	6547.40	5506.83	9262.00	-8737.46	3073.30	1.03	114.44L	0.12	1.02	311444.85	1625558.40	39.34752373	-80.82407475	6.80
	16326.00	90.34	161.35	6546.89	5506.23	9356.00	-8826.56	3103.28	0.13	102.56L	-0.06	-0.12	311355.57	1625588.37	39.34728038	-80.82396413	6.80
	16421.00	90.11	160.32	6546.43	5505.86	9451.00	-8916.29	3134.48	1.11	47.45R	-0.24	-1.08	311265.84	1625619.58	39.34703531	-80.82384920	6.81
	16515.00	90.78	161.05	6545.70	5505.13	9544.99	-9004.99	3165.55	1.05	101.41L	0.71	0.78	311177.14	1625650.65	39.34679306	-80.82373466	6.82
	16609.00	90.56	159.96	6544.80	5504.03	9638.96	-9093.59	3196.92	1.16	10.01L	-0.23	-1.16	311088.54	1625682.01	39.34655109	-80.82361915	6.83
	16704.00	90.73	159.93	6543.53	5502.96	9733.96	-9182.83	3229.50	0.18	163.61R	0.18	-0.03	310999.31	1625714.59	39.34630746	-80.82349833	6.84
	16798.00	90.56	159.98	6542.47	5501.90	9827.94	-9271.13	3261.71	0.19	169.7R	-0.18	0.06	310911.01	1625746.80	39.34606536	-80.82338063	6.84
Final Surveys	16863.00	90.45	160.00	6541.83	5501.26	9922.92	-9360.39	3294.22	0.12	HS	-0.12	0.02	310821.76	1625779.31	39.34582264	-80.82326126	6.85
PTB	16952.00	90.45	160.00	6541.17	5500.60	9981.91	-9415.83	3314.40	0.00		0.00	0.00	310766.32	1625799.46	39.34567126	-80.82318704	6.85

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

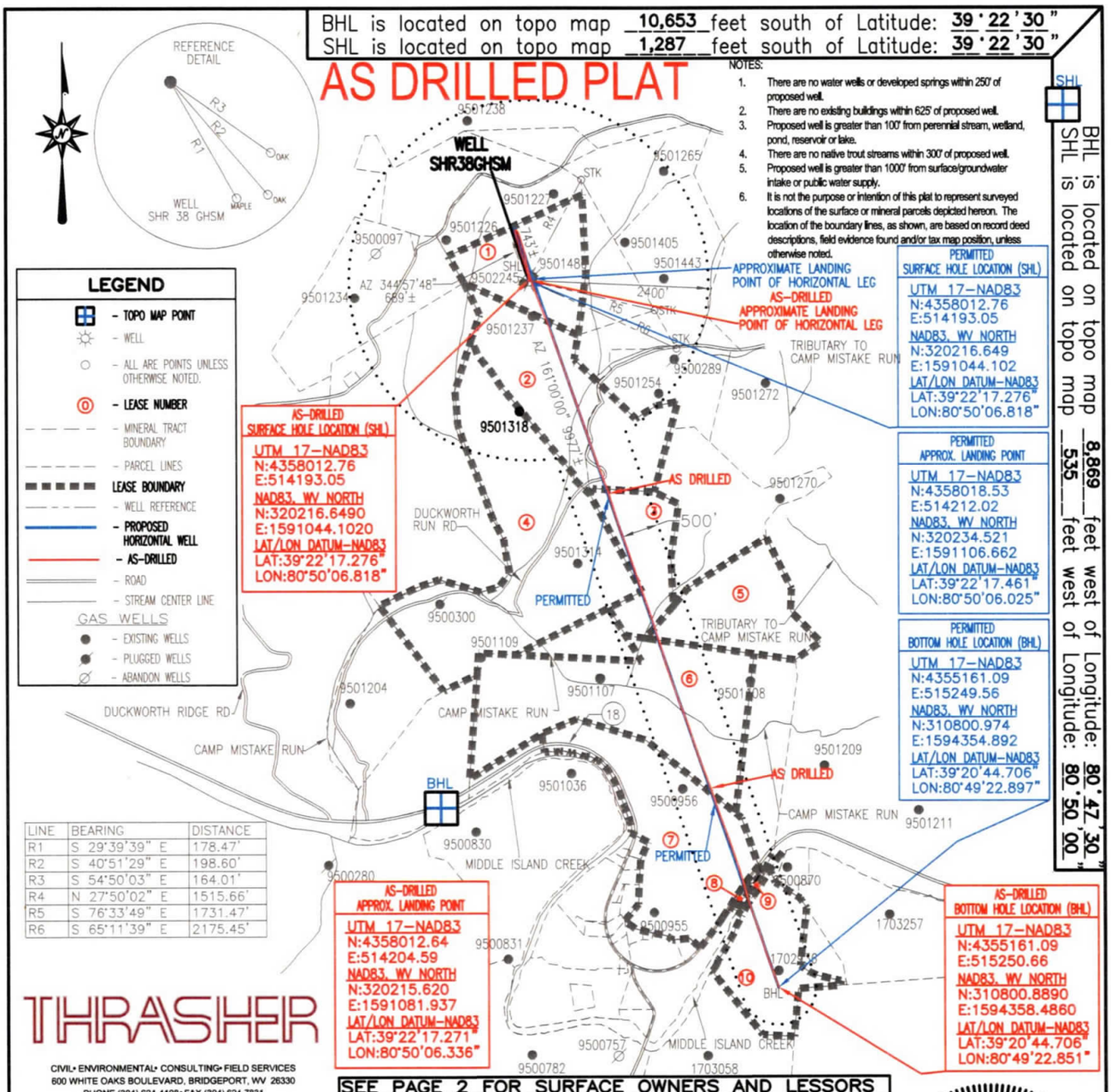
Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	28.920	1/98.425	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / CNX SHR-38G-HSM Surveys 0ft to 16952ft MD
	1	28.920	28.920	Act Stns	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / CNX SHR-38G-HSM Surveys 0ft to 16952ft MD
	1	28.920	2549.000	Act Stns	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / CNX SHR-38G-HSM Surveys 0ft to 16952ft MD
	1	2549.000	6426.000	Act Stns	30.000	30.000	NAL_MWD-NON_SLB	Original Borehole / CNX SHR-38G-HSM Surveys 0ft to 16952ft MD
	1	6426.000	16952.000	Act Stns	30.000	30.000	NAL_MWD_1.0_DEG	Original Borehole / CNX SHR-38G-HSM Surveys 0ft to 16952ft MD

BHL is located on topo map 10,653 feet south of Latitude: 39°22'30"
SHL is located on topo map 1,287 feet south of Latitude: 39°22'30"

AS DRILLED PLAT

NOTES:
1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.
5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
6. It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

BHL is located on topo map 8,869 feet west of Longitude: 80°42'30"
SHL is located on topo map 535 feet west of Longitude: 80°50'00"



LINE	BEARING	DISTANCE
R1	S 29°39'39" E	178.47'
R2	S 40°51'29" E	198.60'
R3	S 54°50'03" E	164.01'
R4	N 27°50'02" E	1515.66'
R5	S 76°33'49" E	1731.47'
R6	S 65°11'39" E	2175.45'

PERMITTED SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
N:4358012.76
E:514193.05
NAD83, WV NORTH
N:320216.649
E:1591044.102
LAT/LON DATUM-NAD83
LAT:39°22'17.276"
LON:80°50'06.818"

AS-DRILLED SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
N:4358012.76
E:514193.05
NAD83, WV NORTH
N:320216.6490
E:1591044.1020
LAT/LON DATUM-NAD83
LAT:39°22'17.276"
LON:80°50'06.818"

PERMITTED APPROX. LANDING POINT
UTM 17-NAD83
N:4358018.53
E:514212.02
NAD83, WV NORTH
N:320234.521
E:1591106.662
LAT/LON DATUM-NAD83
LAT:39°22'17.461"
LON:80°50'06.025"

PERMITTED BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
N:4355161.09
E:515249.56
NAD83, WV NORTH
N:310800.974
E:1594354.892
LAT/LON DATUM-NAD83
LAT:39°20'44.706"
LON:80°49'22.897"

AS-DRILLED APPROX. LANDING POINT
UTM 17-NAD83
N:4358012.64
E:514204.59
NAD83, WV NORTH
N:320215.620
E:1591081.937
LAT/LON DATUM-NAD83
LAT:39°22'17.271"
LON:80°50'06.336"

AS-DRILLED BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
N:4355161.09
E:515250.66
NAD83, WV NORTH
N:310800.8890
E:1594358.4860
LAT/LON DATUM-NAD83
LAT:39°20'44.706"
LON:80°49'22.851"

THRASHER
CIVIL• ENVIRONMENTAL• CONSULTING• FIELD SERVICES
600 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
PHONE (304) 624-4108• FAX (304) 624-7831

SEE PAGE 2 FOR SURFACE OWNERS AND LESSORS

FILE #: SHR 38 GHSM AS-DRILLED
DRAWING #: SHR 38 GHSM AS-DRILLED
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1/2500
PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

I,THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: George D. Six
R.P.E.: L.L.S.: P.S. No. 2000

GEORGE D. SIX LICENSED No. 2000 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR
PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: SEPTEMBER 17, 2019
OPERATOR'S WELL #: SHR 38 GHSM AS-DRILLED
API WELL #: 47 (STATE) 95 (COUNTY) 02514 (PERMIT)

Well Type: ☐ Oil ☐ Waste Disposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: HEADWATERS MIDDLE ISLAND CREEK
ELEVATION: 1012'±
COUNTY/DISTRICT: TYLER / CENTERVILLE
QUADRANGLE: WEST UNION, WV 7.5'
SURFACE OWNER: JAMES E. ASH ET AL
ACREAGE: 111±
OIL & GAS ROYALTY OWNER: JAMES E. ASH ET AL
ACREAGE: 593.675 ±

DRILL ☐ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐
PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☒ (SPECIFY): AS-DRILLED

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 6,480'± TMD: 16,957'±

WELL OPERATOR: CNX GAS COMPANY LLC
Address: 1000 CONSOL ENERGY DRIVE
City: CANONSBURG State: PA Zip Code: 15317

DESIGNATED AGENT: CHRIS TURNER
Address: 1 DOMINION DR.
City: JANE LEW State: WV Zip Code: 26378

SHR 38 GHSM

PAGE 2 OF 2

AS DRILLED PLAT

	SURFACE OWNER	LESSOR	DIST-TM/PAR
1	JAMES E. ASH ET AL	VERNA O. ASH, JAMES E. ASH AND THELMA B. ASH,	P/O 1-16/19
		BESSIE HAUGHT AND HAROLD WARNER	
		ERNEST G. SECKMAN AND O. JOANNE SECKMAN	
		RALPH E. PHILLIPS AND VELINDA PHILLIPS H/W	
2	JOHN R. ANDERS II	JOHN MICHAEL LEONIAN	1-16/21
	RICHARD H. METCALF	JOSEPH ROBERT LEONIAN	P/O 1-16/17
		MARGO L. KIEHL AND CHARLES F. KIEHL, W/H	
		BERDINA ROSE AND NORMAN W. ROSE, W/H	
		PHILLIP LEONIAN, AKA PHILLIP MARSHALL LEONIAN	
		MARION RAY BACHELOR, AKA MARION R. BACHELOR AND GLORIA JEAN BACHELOR	
		RITA G. JARVIS	
		MIKE ROSS, INC.	
		I.L. MORRIS	
		JO ELLEN HARPER DAY	
		MARY LEE LILLY	
		ARMEN LEONIAN, AKA ARMEN LANHAM LEONIAN	
		JOHN FULTON LEONIAN	
		NILA ASH SAYLOR REVOCABLE TRUST, BY JOSEPH F. SILEK, JR.	
		BAILEY ANN MILLS	
		WILLIAM PAUL HARPER	
		DAVID PAUL LOCOCO	
		MARY LYNNE SLATTERY, FKA MARY LYNNE LOCOCO	
		DONALD VINCENT LOCOCO	
		ROSE MARIE VANHEUVELN	
		THERESA LEE ROBERTSON	
		MARTHA SUE MUZIO, FKA MICHELLE LUCRETIA BUSHMIRE	
		MICHELLE LOCOCO BUSHMIRE, FKA MICHELLE LUCRETIA BUSHMIRE	
		ELIZABETH FLORENCE LOCOCO	
		RALPH E. PHILLIPS AND VELINDA PHILLIPS H/W	
		BRC APPALACHIAN MINERALS I, LLC	
		BRC APPALACHIAN MINERALS I, LLC	
3 4	D. RALPH THACKER & J. MAURICE CARLISLE JR.	CHARLES W. HENDERSON AND DOROTHY M. HENDERSON, H/W	1-16/26
		AND CHARLES W. HENDERSON, POWER OF ATTORNEY FOR	
		THE A. I. DOAK HEIRS	
		JOHN A. CONKLIN AND JEAN CONKLIN, H/W	
		GEORGE B. CONKLIN AND BETTY M. CONKLIN, H/W	
		BETTY L. CONKLIN	
		ROBERT LEE REED	
		LEWIS H. REED AND CAROL J. REED, H/W	
		KATHY PRANGER	
		VIRGINIA O'REAR AND RALPH O'REAR, W/H	
		ROBERT H. MELVIN	
		BETTY L. MELVIN	
		MARY S. LARTZ AND WILLIAM LARTZ, W/H	
		LILLIAN CRABILL AND WILLIAM CRABILL, W/H	
		MELISSA COLL	
		ROBERT BARTHOLOMEW AND BARBARA BARTHOLOMEW, H/W	
		PHILLIP L. MELVIN	
		JOANNE GREENMAN AND GERALD GREENMAN, H/W	
5	PEARLIE DAVIS	LINDA C. BRITTON	1-16/25
		STEVEN BRITTON	
		ALFRED BRITTON, ET AL	
		BRIAN BRITTON, AKA, BRYAN L. BRITTON AND ANNETTE BRITTON, H/W	
6	STEVEN E. MALICKI JR.	PAUL W. HYLBERT AND CHARLOTTE J. HYLBERT, H/W	1-18/1
	FRED M. DOTSON JR.		
	KAREN DOTSON		
	KEVIN DOTSON		
	STEVEN E. MALICKI JR.		1-18/1.1
7	MARY MONNIE COLLINS	CECILIA LOUISE BOOMER AND JAMES BOOMER, W/H	1-18/15
		WOODBERRY ROYALTY, INC	
		NANCY FOUT AND JOHN FOUT, W/H	
		THERESA MARIE SMITH, SINGLE	
		JAY COLLINS AND MARY M. COLLINS, H/W	
8	STEVEN R. & SHAWNA LEA CHIPPS	CECILIA LOUISE BOOMER AND JAMES BOOMER, W/H	1-18/18.1
		WOODBERRY ROYALTY, INC	
		NANCY FOUT AND JOHN FOUT, W/H	
		GLENDA L. HEDRICK	
		THERESA MARIE SMITH, SINGLE	
		STEVEN R. CHIPPS AND SHAWNA L. CHIPPS, H/W	
9	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	N/A
10	RALPH MCCUTCHAN II	JOSEPH C. STRICKLING AND JOSIES STRICKLING, H/W	8-3/3
	CHIPPS REVOCABLE LIVING TRUST 2004	PAUL STRICKLING	
		EARL STRICKLING AND RUTH G. STRICKLING, H/W	
		JOHN B. STRICKLING AND LILLIAN STRICKLING	

AS-DRILLED SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
N:4358012.76
E:514193.05
NAD83, WV NORTH
N:320216.6490
E:1591044.1020
LAT/LON DATUM-NAD83
LAT:39°22'17.276"
LON:80°50'06.818"

AS-DRILLED APPROX. LANDING POINT
UTM 17-NAD83
N:4358012.64
E:514204.59
NAD83, WV NORTH
N:320215.620
E:1591081.937
LAT/LON DATUM-NAD83
LAT:39°22'17.271"
LON:80°50'06.336"

AS-DRILLED BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
N:4355161.09
E:515250.66
NAD83, WV NORTH
N:310800.8890
E:1594358.4860
LAT/LON DATUM-NAD83
LAT:39°20'44.706"
LON:80°49'22.851"

PERMITTED SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
N:4358012.76
E:514193.05
NAD83, WV NORTH
N:320216.649
E:1591044.102
LAT/LON DATUM-NAD83
LAT:39°22'17.276"
LON:80°50'06.818"

PERMITTED APPROX. LANDING POINT
UTM 17-NAD83
N:4358018.53
E:514212.02
NAD83, WV NORTH
N:320234.521
E:1591106.662
LAT/LON DATUM-NAD83
LAT:39°22'17.461"
LON:80°50'06.025"

PERMITTED BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
N:4355161.09
E:515249.56
NAD83, WV NORTH
N:310800.974
E:1594354.892
LAT/LON DATUM-NAD83
LAT:39°20'44.706"
LON:80°49'22.897"

API WELL #: 47 (STATE) 95 (COUNTY) 02514 (PERMIT)

THRASHER
CIVIL• ENVIRONMENTAL• CONSULTING• FIELD SERVICES
600 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
PHONE (304) 624-4108•FAX (304) 624-7831

SEPTEMBER 17, 2019