



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Friday, January 07, 2022
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BOLEVARD, PLAZA II
SUITE 200
CANONSBURG, PA 15371

Re: Permit approval for WILLETT S-8HM
47-051-02422

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: WILLETT S-8HM
Farm Name: CNX LAND, LLC
U.S. WELL NUMBER: 47-051-02422
Horizontal 6A New Drill
Date Issued: 01/07/2022

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Glen Easton 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Willett S-8HM Well Pad Name: Willett

3) Farm Name/Surface Owner: CNX Land, LLC Public Road Access: CR 62 New Bethel Road

4) Elevation, current ground: 1,310.03' Elevation, proposed post-construction: 1,310.03'

5) Well Type (a) Gas X Oil _____ Underground Storage _____

Other _____

(b) If Gas Shallow X Deep _____

Horizontal X _____

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6,852' - 6,903, thickness of 51' and anticipated pressure of approx. 3800 psi.

8) Proposed Total Vertical Depth: 7,003'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 20,460'

11) Proposed Horizontal Leg Length: 11,702.07'

12) Approximate Fresh Water Strata Depths: 70; 992'

13) Method to Determine Fresh Water Depths: Based on the depth of Pittsburgh Coal seam, per WVGES mapping contours

14) Approximate Saltwater Depths: 1,464'

15) Approximate Coal Seam Depths: Sewickley Coal - 888' and Pittsburgh Coal - 986'

16) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

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17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes X No _____

WV Department of Environmental Protection

(a) If Yes, provide Mine Info: Name: Marshall County Coal Resources, Inc./Marshall County Mine

Depth: 986' TVD and 324' subsea level

Seam: Pittsburgh

Owner: Marshall County Coal Resources, Inc.

18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259ft^3(CTS)
Fresh Water/Coal	13 3/8"	NEW	J55	54.5#	1,100'	1,100'	1114^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	3,014'	3,014'	999^3(CTS)
Production	5 1/2"	NEW	CYPH110	20#	20,460'	20,460'	4649^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		8,433'	
Liners							

B.S. 10-14-21

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water/ Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8" _ 8 3/4"	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill through the Marcellus and TD Pilot Hole 100' into the Onondaga. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well to be completed with approximately 29,300,000 lb proppant and 530,000 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

B.S. 10-14-21

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 15.60 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.44 acres

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

24) Describe all cement additives associated with each cement type:

Sfc - Premium NE-1 + 2% CaCl; Int1 - Premium NE-1 + 1.5% CaCL + Flake; Int2 - Lead: Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170 Tail: Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate; Kick Plug - Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L; Prod - Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

*Note: Attach additional sheets as needed.

102422

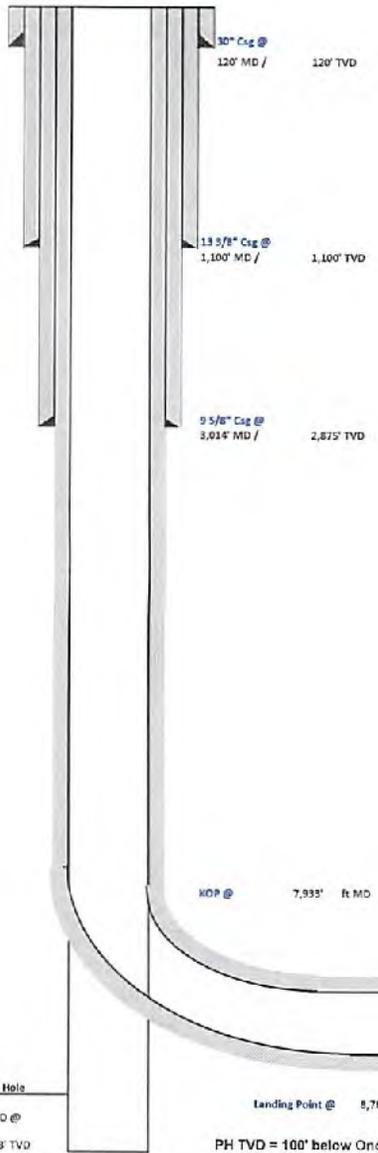


WELL NAME: Willett S-SHM
 STATE: WV COUNTY: Marshall
 DISTRICT: Meade
 DF Elev: 1,310' GL Elev: 1,310'
 TD: 20,460'
 TH Latitude: 39.82310274
 TH Longitude: -80.65619732
 BH Latitude: 39.796496
 BH Longitude: -80.619949

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	992
Sewickley Coal	888
Pittsburgh Coal	966
Big Lime	2111
Weir	2532
Berea	2729
Gordon	2981
Rhinestreet	6141
Genesee/Burkett	6698
Tully	6732
Hamilton	6761
Marcellus	6852
Landing Depth	6932
Onondaga	6903
Pilot Hole Depth	7003

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	6W	BW	Surface
Surface	17.5	13 3/8	1,100'	1,100'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	3,014'	2,875'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	20,460'	7,136'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,128	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	1,004	A	15	Air	1 Centralizer every other Jt
Production	4,895	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other Jt to s/c



Boyer-Atkins
 10-14-21

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#1st Hole
 PH TD @ 7,003' TVD
 Landing Point @ 8,769' MD / 6,932' TVD
 PH TVD = 100' below Onondaga Top

Lateral TD @ 20,460' ft MD
 7,136' ft TVD



Tug Hill Operating, LLC Casing and Cement Program

Willett S-8HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,100'	CTS
Intermediate	9 5/8"	J55	12 1/4"	3,014'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	20,460'	CTS

Cement

Conductor:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
Surface:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
Intermediate:	Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15 ppg, Y=1.19
Kick Off Plug:	Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug
Production:	50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 14.5 ppg, Y = 1.19

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Well: Willett S-08 HM (slot F)
 Site: Willett
 Project: Marshall County, West Virginia
 Design: rev2
 Rig:

DESIGN TARGET DETAILS

4705102422

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Willett S-08HM LP r1	6919.00	1114.77	4005.70	14463619.27	1740952.72	39.82612100	-80.64191500
- plan misses target center by 354.09ft at 8250.00ft MD (6762.85 TVD, 797.83 N, 4029.00 E)							
Willett S-08HM PBHL r1	7136.00	-9647.16	10218.73	14452857.36	1747165.73	39.79649600	-80.61994900
- plan hits target center							

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1101.00	0.00	0.00	1101.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	3191.71	41.81	77.85	3011.00	153.51	713.30	2.00	77.854	413.29	Begin 41.81° tangent
4	7933.04	41.81	77.85	6544.77	818.61	3803.57	0.00	0.000	2203.88	Begin 8°/100' build/turn
5	8194.87	50.00	104.91	6728.54	811.09	3987.96	8.00	77.085	2343.05	Begin 10°/100' build/turn
6	8759.86	89.00	150.00	6931.80	483.84	4389.75	10.00	58.124	2845.32	Begin 89.00° lateral
7	20459.83	89.00	150.00	7136.00	-9647.16	10218.73	0.00	0.000	4053.11	PBHL/TD 20459.83 MD 7136.00 TVD

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
 Depth Reference: GL @ 1310.00ft

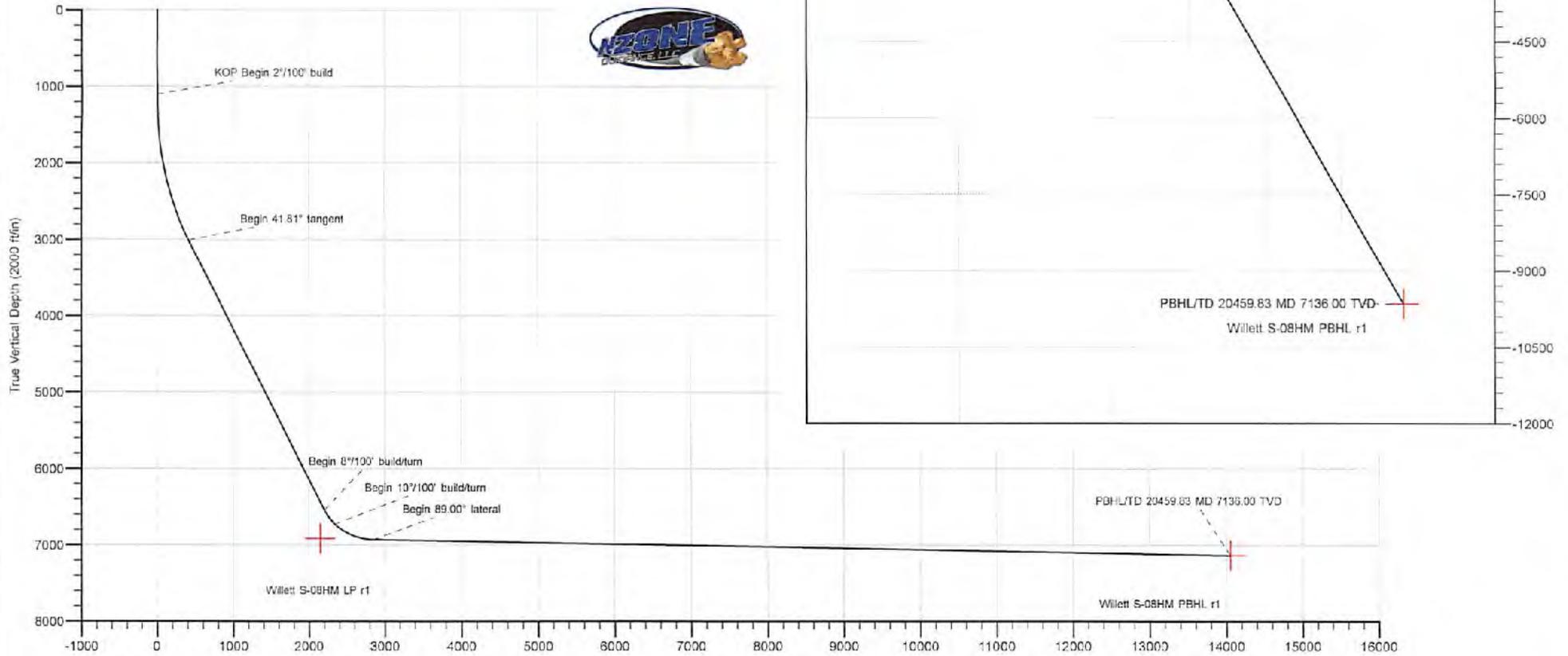
Northing	Easting	Latitude	Longitude
14462504.50	1736947.03	39.82310274	-80.65619732

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.921°



Azimuths to Grid North
 True North: -0.22°
 Magnetic North: -8.92°

Magnetic Field
 Strength: 51741.8nT
 Dip Angle: 65.54°
 Date: 9/19/2021
 Model: IGRF2020



Southwell/Geotech/12/2020/ft/m



Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Willett S-08 HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1310.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1310.00ft
Site:	Willett	North Reference:	Grid
Well:	Willett S-08 HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Project	Marshall County, West Virginia		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (64 W to 78 W)		

Site	Willett					
Site Position:	From:	Lat/Long	Northing:	14,462,447.53 usft	Latitude:	39.82294609
			Easting:	1,736,965.80 usft	Longitude:	-80.65813126
Position Uncertainty:	0.00 ft		Slot Radius:	13-3/16 "		

Well	Willett S-08 HM (slot F)					
Well Position	+N/-S	0.00 ft	Northing:	14,452,504.50 usft	Latitude:	39.82310274
	+E/-W	0.00 ft	Easting:	1,736,947.03 usft	Longitude:	-80.65619732
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	1,310.00 ft
Grid Convergence:						

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	8/19/2021	-8.701	66.542	51,741.84219284

Design	rev2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	133.35

Plan Survey Tool Program	Date				
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	20,459.83 rev2 (Original Hole)			

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,101.00	0.00	0.00	1,101.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,191.71	41.81	77.85	3,011.00	153.51	713.30	2.00	2.00	0.00	77.854	
7,933.04	41.81	77.85	6,544.77	818.61	3,803.67	0.00	0.00	0.00	0.000	
8,194.87	50.00	104.91	6,728.54	811.09	3,987.96	8.00	3.13	10.33	77.085	
8,759.86	89.00	150.00	6,931.80	483.84	4,369.75	10.00	6.90	7.98	58.124	
20,459.83	89.00	150.00	7,136.00	-9,647.16	10,218.73	0.00	0.00	0.00	0.000	Willett S-08HM PBHL



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Willett
 Well: Willett S-06 HM (slot F)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Willett S-08 HM (slot F)
 TVD Reference: GL @ 1310.00ft
 MD Reference: GL @ 1310.00ft
 North Reference: Grd
 Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
100.00	0.00	0.00	100.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
200.00	0.00	0.00	200.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
300.00	0.00	0.00	300.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
400.00	0.00	0.00	400.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
500.00	0.00	0.00	500.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
600.00	0.00	0.00	600.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
700.00	0.00	0.00	700.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
800.00	0.00	0.00	800.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
900.00	0.00	0.00	900.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
1,101.00	0.00	0.00	1,101.00	0.00	0.00	14,462,504.50	1,736,947.03	39.82310274	-80.65619732
KOP Begin 2°/100' build									
1,200.00	1.98	77.85	1,199.98	0.36	1.67	14,462,504.88	1,736,948.70	39.82310371	-80.65619136
1,300.00	3.98	77.85	1,299.84	1.45	6.75	14,462,505.95	1,736,953.78	39.82310666	-80.65617324
1,400.00	5.98	77.85	1,399.46	3.20	15.24	14,462,507.78	1,736,962.27	39.82311159	-80.65614300
1,500.00	7.98	77.85	1,498.71	5.84	27.12	14,462,510.34	1,736,974.15	39.82311848	-80.65610085
1,600.00	9.98	77.85	1,597.48	9.12	42.38	14,462,513.62	1,736,989.41	39.82312734	-80.65604626
1,700.00	11.98	77.85	1,695.64	13.13	61.00	14,462,517.63	1,737,008.03	39.82313815	-80.65597989
1,800.00	13.98	77.85	1,793.08	17.85	82.96	14,462,522.35	1,737,029.98	39.82315090	-80.65590163
1,900.00	15.98	77.85	1,889.66	23.29	106.22	14,462,527.79	1,737,055.25	39.82316556	-80.65581156
2,000.00	17.98	77.85	1,985.32	29.44	136.77	14,462,533.93	1,737,083.80	39.82318213	-80.65570980
2,100.00	19.98	77.85	2,079.88	36.28	168.57	14,462,540.78	1,737,115.59	39.82320059	-80.65559847
2,200.00	21.98	77.85	2,173.24	43.81	203.57	14,462,548.31	1,737,150.80	39.82322091	-80.65547171
2,300.00	23.98	77.85	2,265.30	52.02	241.73	14,462,558.52	1,737,188.76	39.82324306	-80.65533567
2,400.00	25.98	77.85	2,355.94	60.91	283.02	14,462,565.41	1,737,230.04	39.82326702	-80.65518852
2,500.00	27.98	77.85	2,445.05	70.45	327.37	14,462,574.95	1,737,274.39	39.82329277	-80.65503043
2,600.00	29.98	77.85	2,532.53	80.65	374.73	14,462,585.15	1,737,321.76	39.82332026	-80.65486160
2,700.00	31.98	77.85	2,618.26	91.48	425.05	14,462,595.98	1,737,372.08	39.82334946	-80.65468224
2,800.00	33.98	77.85	2,702.14	102.93	478.26	14,462,607.43	1,737,425.29	39.82338035	-80.65449258
2,900.00	35.98	77.85	2,784.07	114.99	534.30	14,462,619.49	1,737,481.33	39.82341288	-80.65429278
3,000.00	37.98	77.85	2,863.95	127.65	593.11	14,462,632.15	1,737,540.14	39.82344701	-80.65408319
3,100.00	39.98	77.85	2,941.68	140.88	654.60	14,462,645.38	1,737,601.63	39.82348270	-80.65386399
3,191.71	41.81	77.85	3,011.00	153.51	713.30	14,462,658.01	1,737,660.33	39.82351677	-80.65365477
Begin 41.81° tangent									
3,200.00	41.81	77.85	3,017.18	154.68	718.70	14,462,659.18	1,737,665.73	39.82351991	-80.65363551
3,300.00	41.81	77.85	3,091.71	168.70	783.88	14,462,673.20	1,737,730.91	39.82355774	-80.65340317
3,400.00	41.81	77.85	3,166.24	182.73	849.06	14,462,687.23	1,737,796.09	39.82359556	-80.65317084
3,500.00	41.81	77.85	3,240.78	196.76	914.24	14,462,701.26	1,737,861.27	39.82363339	-80.65293851
3,600.00	41.81	77.85	3,315.31	210.79	979.42	14,462,715.29	1,737,926.45	39.82367122	-80.65270617
3,700.00	41.81	77.85	3,389.84	224.82	1,044.60	14,462,729.31	1,737,991.63	39.82370905	-80.65247384
3,800.00	41.81	77.85	3,464.37	238.84	1,109.78	14,462,743.34	1,738,056.80	39.82374688	-80.65224150
3,900.00	41.81	77.85	3,538.90	252.87	1,174.96	14,462,757.37	1,738,121.98	39.82378471	-80.65200917
4,000.00	41.81	77.85	3,613.43	266.90	1,240.14	14,462,771.40	1,738,187.16	39.82382253	-80.65177683
4,100.00	41.81	77.85	3,687.96	280.93	1,305.32	14,462,785.42	1,738,252.34	39.82386036	-80.65154450
4,200.00	41.81	77.85	3,762.49	294.95	1,370.50	14,462,799.45	1,738,317.52	39.82389818	-80.65131216
4,300.00	41.81	77.85	3,837.02	308.98	1,435.67	14,462,813.48	1,738,382.70	39.82393601	-80.65107983
4,400.00	41.81	77.85	3,911.56	323.01	1,500.85	14,462,827.51	1,738,447.88	39.82397383	-80.65084749
4,500.00	41.81	77.85	3,986.09	337.04	1,566.03	14,462,841.54	1,738,513.06	39.82401166	-80.65061515
4,600.00	41.81	77.85	4,060.62	351.06	1,631.21	14,462,855.56	1,738,578.24	39.82404948	-80.65038282
4,700.00	41.81	77.85	4,135.15	355.09	1,696.39	14,462,869.59	1,738,643.42	39.82408731	-80.65015048
4,800.00	41.81	77.85	4,209.68	379.12	1,761.57	14,462,883.62	1,738,708.60	39.82412513	-80.64991814
4,900.00	41.81	77.85	4,284.21	393.15	1,826.75	14,462,897.65	1,738,773.78	39.82416295	-80.64968581
5,000.00	41.81	77.85	4,358.74	407.18	1,891.93	14,462,911.67	1,738,838.95	39.82420077	-80.64945347



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Willett S-08 HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1310.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1310.00ft
Site:	Willett	North Reference:	Grid
Well:	Willett S-08 HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,100.00	41.81	77.85	4,433.27	421.20	1,957.11	14,462,925.70	1,738,904.13	39.82423859	-80.64922113	
5,200.00	41.81	77.85	4,507.80	435.23	2,022.29	14,462,939.73	1,738,959.31	39.82427642	-80.64898879	
5,300.00	41.81	77.85	4,582.34	449.26	2,087.47	14,462,953.76	1,739,034.49	39.82431424	-80.64875646	
5,400.00	41.81	77.85	4,656.87	463.29	2,152.65	14,462,967.78	1,739,099.67	39.82435206	-80.64852412	
5,500.00	41.81	77.85	4,731.40	477.31	2,217.83	14,462,981.81	1,739,164.85	39.82438988	-80.64829178	
5,600.00	41.81	77.85	4,805.93	491.34	2,283.01	14,462,995.84	1,739,230.03	39.82442769	-80.64805944	
5,700.00	41.81	77.85	4,880.46	505.37	2,348.19	14,463,009.87	1,739,295.21	39.82446551	-80.64782710	
5,800.00	41.81	77.85	4,954.99	519.40	2,413.36	14,463,023.89	1,739,360.39	39.82450333	-80.64759476	
5,900.00	41.81	77.85	5,029.52	533.42	2,478.54	14,463,037.92	1,739,425.57	39.82454115	-80.64736242	
6,000.00	41.81	77.85	5,104.05	547.45	2,543.72	14,463,051.95	1,739,490.75	39.82457897	-80.64713008	
6,100.00	41.81	77.85	5,178.58	561.48	2,608.90	14,463,065.98	1,739,555.93	39.82461678	-80.64689774	
6,200.00	41.81	77.85	5,253.11	575.51	2,674.08	14,463,080.01	1,739,621.11	39.82465460	-80.64666540	
6,300.00	41.81	77.85	5,327.65	589.53	2,739.26	14,463,094.03	1,739,686.28	39.82469242	-80.64643306	
6,400.00	41.81	77.85	5,402.18	603.56	2,804.44	14,463,108.06	1,739,751.46	39.82473023	-80.64620072	
6,500.00	41.81	77.85	5,476.71	617.59	2,869.62	14,463,122.09	1,739,816.64	39.82476805	-80.64596838	
6,600.00	41.81	77.85	5,551.24	631.62	2,934.80	14,463,136.12	1,739,881.82	39.82480586	-80.64573603	
6,700.00	41.81	77.85	5,625.77	645.65	2,999.98	14,463,150.14	1,739,947.00	39.82484367	-80.64550369	
6,800.00	41.81	77.85	5,700.30	659.67	3,065.16	14,463,164.17	1,740,012.18	39.82488149	-80.64527135	
6,900.00	41.81	77.85	5,774.83	673.70	3,130.34	14,463,178.20	1,740,077.36	39.82491930	-80.64503901	
7,000.00	41.81	77.85	5,849.36	687.73	3,195.52	14,463,192.23	1,740,142.54	39.82495711	-80.64480667	
7,100.00	41.81	77.85	5,923.89	701.76	3,260.70	14,463,206.25	1,740,207.72	39.82499493	-80.64457432	
7,200.00	41.81	77.85	5,998.43	715.78	3,325.88	14,463,220.28	1,740,272.90	39.82503274	-80.64434198	
7,300.00	41.81	77.85	6,072.96	729.81	3,391.05	14,463,234.31	1,740,338.08	39.82507055	-80.64410964	
7,400.00	41.81	77.85	6,147.49	743.84	3,456.23	14,463,248.34	1,740,403.26	39.82510836	-80.64387729	
7,500.00	41.81	77.85	6,222.02	757.87	3,521.41	14,463,262.36	1,740,468.43	39.82514617	-80.64364495	
7,600.00	41.81	77.85	6,296.55	771.89	3,586.59	14,463,276.39	1,740,533.61	39.82518398	-80.64341260	
7,700.00	41.81	77.85	6,371.08	785.92	3,651.77	14,463,290.42	1,740,598.79	39.82522179	-80.64318025	
7,800.00	41.81	77.85	6,445.61	799.95	3,716.95	14,463,304.45	1,740,663.97	39.82525960	-80.64294792	
7,900.00	41.81	77.85	6,520.14	813.98	3,782.13	14,463,318.48	1,740,729.15	39.82529741	-80.64271557	
7,933.04	41.81	77.85	6,544.77	818.61	3,803.67	14,463,323.11	1,740,750.69	39.82530990	-80.64263879	
Begin 8°/100' build/turn										
7,950.00	42.13	79.83	6,557.38	820.81	3,814.79	14,463,325.30	1,740,761.81	39.82531580	-80.64259914	
8,000.00	43.27	85.48	6,594.14	825.12	3,848.40	14,463,329.62	1,740,795.42	39.82532728	-80.64247939	
8,050.00	44.67	90.88	6,630.13	826.20	3,883.07	14,463,330.70	1,740,830.09	39.82532987	-80.64235590	
8,100.00	46.31	96.00	6,665.19	824.04	3,918.63	14,463,328.54	1,740,865.65	39.82532355	-80.64222925	
8,150.00	48.17	100.82	6,699.15	818.65	3,954.92	14,463,323.15	1,740,901.95	39.82530835	-80.64210007	
8,194.87	50.00	104.91	6,728.54	811.09	3,987.96	14,463,315.59	1,740,934.98	39.82528722	-80.64198252	
Begin 10°/100' build/turn										
8,200.00	50.27	105.48	6,731.83	810.06	3,991.76	14,463,314.55	1,740,938.78	39.82528434	-80.64196689	
8,250.00	53.08	110.77	6,762.85	797.83	4,029.00	14,463,302.33	1,740,976.02	39.82525036	-80.64183654	
8,300.00	56.07	115.67	6,791.85	781.75	4,066.40	14,463,286.25	1,741,013.42	39.82520578	-80.64170356	
8,350.00	59.26	120.23	6,818.60	761.93	4,103.69	14,463,266.43	1,741,050.71	39.82515095	-80.64157105	
8,400.00	62.60	124.49	6,842.90	738.53	4,140.57	14,463,243.03	1,741,087.59	39.82508527	-80.64144003	
8,450.00	66.05	128.50	6,864.57	711.72	4,176.76	14,463,216.22	1,741,123.78	39.82501225	-80.64131149	
8,500.00	69.61	132.30	6,883.44	681.71	4,212.00	14,463,186.20	1,741,159.02	39.82492944	-80.64118842	
8,550.00	73.25	135.92	6,899.36	648.72	4,246.01	14,463,153.22	1,741,193.03	39.82483847	-80.64106576	
8,600.00	76.95	139.40	6,912.22	613.01	4,278.53	14,463,117.51	1,741,225.55	39.82474004	-80.64095044	
8,650.00	80.69	142.78	6,921.92	574.85	4,309.32	14,463,079.34	1,741,256.34	39.82463490	-80.64084132	
8,700.00	84.46	146.09	6,928.38	534.52	4,338.14	14,463,039.02	1,741,285.16	39.82452385	-80.64073925	
8,750.00	88.25	149.36	6,931.56	492.35	4,364.78	14,462,996.84	1,741,311.80	39.82440772	-80.64064500	
8,759.86	89.00	150.00	6,931.80	483.84	4,369.75	14,462,988.34	1,741,316.77	39.82439431	-80.64062740	
Begin 89.00° lateral										
8,800.00	89.00	150.00	6,932.50	449.08	4,339.82	14,462,953.58	1,741,336.84	39.82428863	-80.64055642	
8,900.00	89.00	150.00	6,934.24	352.49	4,439.81	14,462,866.99	1,741,386.83	39.82405028	-80.64037961	



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Willett
 Well: Willett S-08 HM (slot F)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Willett S-08 HM (slot F)
 TVD Reference: GL @ 1310.00ft
 MD Reference: GL @ 1310.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,000.00	89.00	150.00	6,935.99	275.90	4,489.80	14,462,780.40	1,741,436.02	39.82381194	-80.64020281
9,100.00	89.00	150.00	6,937.73	189.31	4,539.79	14,462,693.81	1,741,406.81	39.82357359	-80.64002600
9,200.00	89.00	150.00	6,939.48	102.72	4,589.78	14,462,607.22	1,741,536.80	39.82333524	-80.63984919
9,300.00	89.00	150.00	6,941.23	16.13	4,639.78	14,462,520.63	1,741,586.80	39.82309690	-80.63967239
9,400.00	89.00	150.00	6,942.97	-70.46	4,689.77	14,462,434.04	1,741,636.79	39.82285855	-80.63949559
9,500.00	89.00	150.00	6,944.72	-157.05	4,739.76	14,462,347.45	1,741,686.78	39.82262020	-80.63931879
9,600.00	89.00	150.00	6,946.46	-243.64	4,789.75	14,462,260.86	1,741,736.77	39.82238185	-80.63914199
9,700.00	89.00	150.00	6,948.21	-330.23	4,839.74	14,462,174.27	1,741,786.76	39.82214350	-80.63896519
9,800.00	89.00	150.00	6,949.95	-416.82	4,889.73	14,462,087.68	1,741,836.75	39.82190515	-80.63878839
9,900.00	89.00	150.00	6,951.70	-503.41	4,939.72	14,462,001.09	1,741,886.74	39.82166680	-80.63861159
10,000.00	89.00	150.00	6,953.44	-590.00	4,989.72	14,461,914.50	1,741,936.73	39.82142845	-80.63843480
10,100.00	89.00	150.00	6,955.19	-676.59	5,039.71	14,461,827.91	1,741,986.73	39.82119010	-80.63825800
10,200.00	89.00	150.00	6,956.93	-763.18	5,089.70	14,461,741.32	1,742,036.72	39.82095175	-80.63808121
10,300.00	89.00	150.00	6,958.68	-849.77	5,139.69	14,461,654.73	1,742,086.71	39.82071340	-80.63790442
10,400.00	89.00	150.00	6,960.42	-936.36	5,189.68	14,461,568.14	1,742,136.70	39.82047505	-80.63772763
10,500.00	89.00	150.00	6,962.17	-1,022.95	5,239.67	14,461,481.55	1,742,186.69	39.82023670	-80.63755084
10,600.00	89.00	150.00	6,963.91	-1,109.54	5,289.66	14,461,394.96	1,742,236.68	39.81999835	-80.63737405
10,700.00	89.00	150.00	6,965.66	-1,196.13	5,339.66	14,461,308.37	1,742,286.67	39.81976000	-80.63719726
10,800.00	89.00	150.00	6,967.41	-1,282.72	5,389.65	14,461,221.78	1,742,336.66	39.81952165	-80.63702047
10,900.00	89.00	150.00	6,969.15	-1,369.31	5,439.64	14,461,135.19	1,742,386.66	39.81928330	-80.63684369
11,000.00	89.00	150.00	6,970.90	-1,455.90	5,489.63	14,461,048.60	1,742,436.65	39.81904494	-80.63666691
11,100.00	89.00	150.00	6,972.64	-1,542.49	5,539.62	14,460,962.01	1,742,486.64	39.81880659	-80.63649012
11,200.00	89.00	150.00	6,974.39	-1,629.08	5,589.61	14,460,875.42	1,742,536.63	39.81856824	-80.63631334
11,300.00	89.00	150.00	6,976.13	-1,715.67	5,639.60	14,460,788.83	1,742,586.62	39.81832989	-80.63613656
11,400.00	89.00	150.00	6,977.88	-1,802.26	5,689.59	14,460,702.24	1,742,636.61	39.81809153	-80.63595978
11,500.00	89.00	150.00	6,979.62	-1,888.85	5,739.59	14,460,615.65	1,742,686.60	39.81785318	-80.63578301
11,600.00	89.00	150.00	6,981.37	-1,975.44	5,789.58	14,460,529.06	1,742,736.59	39.81761482	-80.63560623
11,700.00	89.00	150.00	6,983.11	-2,062.03	5,839.57	14,460,442.47	1,742,786.58	39.81737647	-80.63542946
11,800.00	89.00	150.00	6,984.86	-2,148.62	5,889.56	14,460,355.88	1,742,836.58	39.81713812	-80.63525268
11,900.00	89.00	150.00	6,986.60	-2,235.21	5,939.55	14,460,269.29	1,742,886.57	39.81689976	-80.63507591
12,000.00	89.00	150.00	6,988.35	-2,321.80	5,989.54	14,460,182.71	1,742,936.56	39.81666141	-80.63489914
12,100.00	89.00	150.00	6,990.09	-2,408.39	6,039.53	14,460,096.12	1,742,986.55	39.81642305	-80.63472237
12,200.00	89.00	150.00	6,991.84	-2,494.98	6,089.53	14,460,009.53	1,743,036.54	39.81618470	-80.63454560
12,300.00	89.00	150.00	6,993.58	-2,581.57	6,139.52	14,459,922.94	1,743,086.53	39.81594634	-80.63436883
12,400.00	89.00	150.00	6,995.33	-2,668.16	6,189.51	14,459,836.35	1,743,136.52	39.81570798	-80.63419207
12,500.00	89.00	150.00	6,997.08	-2,754.75	6,239.50	14,459,749.76	1,743,186.52	39.81546963	-80.63401530
12,600.00	89.00	150.00	6,998.82	-2,841.34	6,289.49	14,459,663.17	1,743,236.51	39.81523127	-80.63383854
12,700.00	89.00	150.00	7,000.57	-2,927.93	6,339.48	14,459,576.58	1,743,286.50	39.81499291	-80.63366177
12,800.00	89.00	150.00	7,002.31	-3,014.52	6,389.47	14,459,489.99	1,743,336.49	39.81475456	-80.63348501
12,900.00	89.00	150.00	7,004.06	-3,101.11	6,439.47	14,459,403.40	1,743,386.48	39.81451620	-80.63330825
13,000.00	89.00	150.00	7,005.80	-3,187.70	6,489.46	14,459,316.81	1,743,436.47	39.81427784	-80.63313149
13,100.00	89.00	150.00	7,007.55	-3,274.29	6,539.45	14,459,230.22	1,743,486.46	39.81403948	-80.63295473
13,200.00	89.00	150.00	7,009.29	-3,360.88	6,589.44	14,459,143.63	1,743,536.45	39.81380113	-80.63277798
13,300.00	89.00	150.00	7,011.04	-3,447.47	6,639.43	14,459,057.04	1,743,586.44	39.81356277	-80.63260122
13,400.00	89.00	150.00	7,012.78	-3,534.06	6,689.42	14,458,970.45	1,743,636.44	39.81332441	-80.63242447
13,500.00	89.00	150.00	7,014.53	-3,620.65	6,739.41	14,458,883.86	1,743,686.43	39.81308605	-80.63224771
13,600.00	89.00	150.00	7,016.27	-3,707.24	6,789.40	14,458,797.27	1,743,736.42	39.81284769	-80.63207096
13,700.00	89.00	150.00	7,018.02	-3,793.83	6,839.40	14,458,710.68	1,743,786.41	39.81260933	-80.63189421
13,800.00	89.00	150.00	7,019.76	-3,880.42	6,889.39	14,458,624.09	1,743,836.40	39.81237097	-80.63171746
13,900.00	89.00	150.00	7,021.51	-3,967.01	6,939.38	14,458,537.50	1,743,886.39	39.81213261	-80.63154071
14,000.00	89.00	150.00	7,023.26	-4,053.60	6,989.37	14,458,450.91	1,743,936.39	39.81189425	-80.63136397
14,100.00	89.00	150.00	7,025.00	-4,140.19	7,039.36	14,458,364.32	1,743,986.38	39.81165589	-80.63118722
14,200.00	89.00	150.00	7,026.75	-4,226.78	7,089.35	14,458,277.73	1,744,036.37	39.81141753	-80.63101048
14,300.00	89.00	150.00	7,028.49	-4,313.37	7,139.34	14,458,191.14	1,744,086.36	39.81117917	-80.63083373
14,400.00	89.00	150.00	7,030.24	-4,399.96	7,189.34	14,458,104.55	1,744,136.35	39.81094080	-80.63065699



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Willett
 Well: Willett S-03 HM (slot F)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Willett S-03 HM (slot F)
 TVD Reference: GL @ 1310.00ft
 MD Reference: GL @ 1310.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,500.00	89.00	150.00	7,031.96	-4,486.55	7,239.33	14,458,017.96	1,744,186.34	39.81070244	-80.63048025	
14,600.00	89.00	150.00	7,033.73	-4,573.14	7,289.32	14,457,891.37	1,744,236.33	39.81046408	-80.63030351	
14,700.00	89.00	150.00	7,035.47	-4,659.73	7,339.31	14,457,844.78	1,744,286.32	39.81022572	-80.63012877	
14,800.00	89.00	150.00	7,037.22	-4,746.32	7,389.30	14,457,758.19	1,744,336.32	39.80998736	-80.62995004	
14,900.00	89.00	150.00	7,038.96	-4,832.91	7,439.29	14,457,671.60	1,744,386.31	39.80974899	-80.62977330	
15,000.00	89.00	150.00	7,040.71	-4,919.50	7,489.28	14,457,585.01	1,744,436.30	39.80951063	-80.62959657	
15,100.00	89.00	150.00	7,042.45	-5,006.09	7,539.28	14,457,498.42	1,744,486.29	39.80927227	-80.62941983	
15,200.00	89.00	150.00	7,044.20	-5,092.68	7,589.27	14,457,411.83	1,744,536.28	39.80903390	-80.62924310	
15,300.00	89.00	150.00	7,045.94	-5,179.27	7,639.26	14,457,325.24	1,744,586.27	39.80879554	-80.62906637	
15,400.00	89.00	150.00	7,047.69	-5,265.86	7,689.25	14,457,238.65	1,744,636.26	39.80855717	-80.62888964	
15,500.00	89.00	150.00	7,049.44	-5,352.45	7,739.24	14,457,152.06	1,744,686.25	39.80831881	-80.62871291	
15,600.00	89.00	150.00	7,051.18	-5,439.04	7,789.23	14,457,065.47	1,744,736.25	39.80808044	-80.62853618	
15,700.00	89.00	150.00	7,052.93	-5,525.63	7,839.22	14,456,978.88	1,744,786.24	39.80784208	-80.62835945	
15,800.00	89.00	150.00	7,054.67	-5,612.22	7,889.22	14,456,892.29	1,744,836.23	39.80760371	-80.62818273	
15,900.00	89.00	150.00	7,056.42	-5,698.81	7,939.21	14,456,805.70	1,744,886.22	39.80736535	-80.62800601	
16,000.00	89.00	150.00	7,058.16	-5,785.40	7,989.20	14,456,719.11	1,744,936.21	39.80712698	-80.62782928	
16,100.00	89.00	150.00	7,059.91	-5,871.99	8,039.19	14,456,632.52	1,744,986.20	39.80688862	-80.62765256	
16,200.00	89.00	150.00	7,061.65	-5,958.58	8,089.18	14,456,545.94	1,745,036.19	39.80665025	-80.62747584	
16,300.00	89.00	150.00	7,063.40	-6,045.17	8,139.17	14,456,459.35	1,745,086.18	39.80641188	-80.62729912	
16,400.00	89.00	150.00	7,065.14	-6,131.76	8,189.16	14,456,372.76	1,745,136.18	39.80617352	-80.62712241	
16,500.00	89.00	150.00	7,066.89	-6,218.35	8,239.15	14,456,286.17	1,745,186.17	39.80593515	-80.62694569	
16,600.00	89.00	150.00	7,068.63	-6,304.94	8,289.15	14,456,199.58	1,745,236.16	39.80569678	-80.62676897	
16,700.00	89.00	150.00	7,070.38	-6,391.53	8,339.14	14,456,112.99	1,745,286.15	39.80545841	-80.62659226	
16,800.00	89.00	150.00	7,072.12	-6,478.12	8,389.13	14,456,026.40	1,745,336.14	39.80522005	-80.62641555	
16,900.00	89.00	150.00	7,073.87	-6,564.71	8,439.12	14,455,939.81	1,745,386.13	39.80498168	-80.62623884	
17,000.00	89.00	150.00	7,075.62	-6,651.30	8,489.11	14,455,853.22	1,745,436.12	39.80474331	-80.62606212	
17,100.00	89.00	150.00	7,077.36	-6,737.89	8,539.10	14,455,766.63	1,745,486.11	39.80450494	-80.62588542	
17,200.00	89.00	150.00	7,079.11	-6,824.48	8,589.09	14,455,680.04	1,745,536.11	39.80426657	-80.62570871	
17,300.00	89.00	150.00	7,080.85	-6,911.07	8,639.09	14,455,593.45	1,745,586.10	39.80402820	-80.62553200	
17,400.00	89.00	150.00	7,082.60	-6,997.66	8,689.08	14,455,506.86	1,745,636.09	39.80378983	-80.62535529	
17,500.00	89.00	150.00	7,084.34	-7,084.25	8,739.07	14,455,420.27	1,745,686.08	39.80355146	-80.62517859	
17,600.00	89.00	150.00	7,086.09	-7,170.84	8,789.06	14,455,333.68	1,745,736.07	39.80331309	-80.62500188	
17,700.00	89.00	150.00	7,087.83	-7,257.43	8,839.05	14,455,247.09	1,745,786.06	39.80307472	-80.62482518	
17,800.00	89.00	150.00	7,089.58	-7,344.02	8,889.04	14,455,160.50	1,745,836.05	39.80283635	-80.62464848	
17,900.00	89.00	150.00	7,091.32	-7,430.60	8,939.03	14,455,073.91	1,745,886.04	39.80259798	-80.62447179	
18,000.00	89.00	150.00	7,093.07	-7,517.19	8,989.03	14,454,987.32	1,745,936.04	39.80235961	-80.62429509	
18,100.00	89.00	150.00	7,094.81	-7,603.78	9,039.02	14,454,900.73	1,745,986.03	39.80212124	-80.62411839	
18,200.00	89.00	150.00	7,096.56	-7,690.37	9,089.01	14,454,814.14	1,746,036.02	39.80188286	-80.62394169	
18,300.00	89.00	150.00	7,098.30	-7,776.96	9,139.00	14,454,727.55	1,746,086.01	39.80164449	-80.62376500	
18,400.00	89.00	150.00	7,100.05	-7,863.55	9,189.00	14,454,640.96	1,746,136.00	39.80140612	-80.62358831	
18,500.00	89.00	150.00	7,101.79	-7,950.14	9,239.00	14,454,554.37	1,746,186.00	39.80116775	-80.62341161	
18,600.00	89.00	150.00	7,103.54	-8,036.73	9,289.00	14,454,467.78	1,746,236.00	39.80092937	-80.62323492	
18,700.00	89.00	150.00	7,105.29	-8,123.32	9,339.00	14,454,381.19	1,746,286.00	39.80069100	-80.62305823	
18,800.00	89.00	150.00	7,107.03	-8,209.91	9,389.00	14,454,294.60	1,746,336.00	39.80045263	-80.62288154	
18,900.00	89.00	150.00	7,108.78	-8,296.50	9,439.00	14,454,208.01	1,746,386.00	39.80021425	-80.62270485	
19,000.00	89.00	150.00	7,110.52	-8,383.09	9,489.00	14,454,121.42	1,746,436.00	39.79997588	-80.62252817	
19,100.00	89.00	150.00	7,112.27	-8,469.68	9,539.00	14,454,034.83	1,746,486.00	39.79973750	-80.62235149	
19,200.00	89.00	150.00	7,114.01	-8,556.27	9,589.00	14,453,948.24	1,746,536.00	39.79949913	-80.62217480	
19,300.00	89.00	150.00	7,115.76	-8,642.86	9,639.00	14,453,861.65	1,746,586.00	39.79926075	-80.62199812	
19,400.00	89.00	150.00	7,117.50	-8,729.45	9,689.00	14,453,775.06	1,746,636.00	39.79902238	-80.62182144	
19,500.00	89.00	150.00	7,119.25	-8,816.04	9,739.00	14,453,688.47	1,746,686.00	39.79878400	-80.62164476	
19,600.00	89.00	150.00	7,120.99	-8,902.63	9,789.00	14,453,601.88	1,746,736.00	39.79854563	-80.62146808	
19,700.00	89.00	150.00	7,122.74	-8,989.22	9,839.00	14,453,515.29	1,746,786.00	39.79830725	-80.62129140	
19,800.00	89.00	150.00	7,124.48	-9,075.81	9,889.00	14,453,428.70	1,746,836.00	39.79806888	-80.62111473	
19,900.00	89.00	150.00	7,126.23	-9,162.40	9,939.00	14,453,342.11	1,746,886.00	39.79783050	-80.62093805	

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Willett S-08 HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1310.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1310.00ft
Site:	Willett	North Reference:	Grid
Well:	Willett S-08 HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
20,000.00	89.00	150.00	7,127.97	-9,248.99	9,988.85	14,453,255.52	1,746,935.86	39.79759212	-80.62076138	
20,100.00	89.00	150.00	7,129.72	-9,335.58	10,038.84	14,453,168.93	1,746,985.85	39.79735375	-80.62058470	
20,200.00	89.00	150.00	7,131.47	-9,422.17	10,088.84	14,453,082.34	1,747,035.84	39.79711537	-80.62040803	
20,300.00	89.00	150.00	7,133.21	-9,508.76	10,138.83	14,452,995.75	1,747,085.84	39.79687699	-80.62023136	
20,400.00	89.00	150.00	7,134.86	-9,595.35	10,188.82	14,452,909.17	1,747,135.83	39.79663861	-80.62005469	
20,459.83	89.00	150.00	7,136.00	-9,647.16	10,218.73	14,452,857.36	1,747,165.73	39.79649600	-80.61994900	
PBHL/TD 20459.83 MD 7136.00 TVD										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Willett S-08HM LP r1	0.00	0.00	6,919.00	1,114.77	4,005.70	14,463,619.27	1,740,952.72	39.82612100	-80.64191500	
- hit/miss target										
- Shape										
- plan misses target center by 354.09ft at 8250.00ft MD (6762.85 TVD, 797.83 N, 4029.00 E)										
- Point										
Willett S-08HM PBHL r1	0.00	0.01	7,136.00	-9,647.16	10,218.73	14,452,857.36	1,747,165.73	39.79649600	-80.61994900	
- plan hits target center										
- Point										

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")		
20,459.83	7,136.00	20" Casing	20	24		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,101.00	1,101.00	0.00	0.00	KOP Begin 2"/100' build	
3,191.71	3,011.00	153.51	713.30	Begin 41.81° tangent	
7,933.04	6,544.77	818.61	3,803.67	Begin 8"/100' build/turn	
8,194.87	6,728.54	811.09	3,987.96	Begin 10"/100' build/turn	
8,759.86	6,931.80	483.84	4,369.75	Begin 89.00° lateral	
20,459.83	7,136.00	-9,647.16	10,218.73	PBHL/TD 20459.83 MD 7136.00 TVD	

Area of Review**Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.**

Description of process to identify potential pathways for well communication during hydraulic fracturing activities.

Data Sources Reviewed:

1. Enverus and RS Energy Group Well Data service: Public nationwide data service that pulls directly from State agency Oil and Gas databases
2. Farm Maps
3. Topo Maps: Recent and older (contact WVGES)
4. Check with DPS

Contacted Adam Picard 724-485-9331, apicard@dpslandservices.com, DPS GIS (08/25/2021) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it is the best publicly available. See attached map he provided.

Request maps for:

1. Wellbore with Enverus All Wells Layer
2. Map with Farm lines overlain and any well spots identified on Farm Maps
3. More recent (1970s vintage) topos and older topos

Discussion with Phil Dinterman WVGES GIS Department (7/15/2016)

- WVGES has plotted every well spot they have access to and are aware of with that contains a coordinate. 30000, 70000, and 90000 series wells are available via the WVGES online map. Some locations aren't great due to vintage and manipulation of maps through time
- 30000 series – any well drilled prior to 1929 – APIs were not assigned to original wells
- 70000 series – Well spots pulled from old Farm line maps that the WVGES has access to
- 90000 series – Any sources that the WVGES has access that shows a well spot but has no additional supporting information. DEP does not have 90000 series on their maps.
- There can be duplication between wells in the 3 series
- Phil indicated that other Operators are providing a screenshot of the WVGES map with their planned well and using that for permits

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Environmental Protection

Wells within 500' Buffer

Note: Well spots depicted on Area of Review map are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots.

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705102255	Tug Hill Operating, LLC	6870' TVD (proposed)	Marcellus (proposed)	none	Yes, this is a proposed well in the Marcellus. Once completed the well will be within the expected fracture propagation from a Marcellus stimulation. Proper casing and cement should prevent migration of fluids between wellbores.	A Tug Hill Operating, LLC permitted well on the pad that is not drilled or perforated.
4705100966	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 2/6/2006.
4705100967	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 12/12/2005.
4705101086	CNX Gas Co. LLC (North)	unknown	Pittsburgh Coal	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705170040	South Penn Oil (S. Penn Nat. Gas)	3122' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation.	
4705170207 (reassigned to 4705170040)	South Penn Oil (S. Penn Nat. Gas)	3122' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation.	API # 4705170207 reassigned to 4705170040 (see above row).
4705100958	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 11/15/2005.
4705170631	unknown	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705100879	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 11/18/2002.

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705100919	Consolidation Coal Co.	2914' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well is plugged.	Well was plugged 6/25/2004.
4705130127 (reassigned to 4705100919)	Consolidation Coal Co.	2914' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well is plugged.	API # 4705130127 reassigned to 4705100919 (see above row). Well was plugged 6/25/2004.
4705100920	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 6/8/2004.
4705130159	South Penn Oil (S. Penn Nat. Gas)	2817' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well is plugged.	Well was plugged 9/30/1941.
4705130265	Randall-Zogg Supply Co.	3017' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well is plugged.	Well was plugged in 1947.

WV Geological & Economic Survey

Well: County = 51 Permit = 02255

Report Time: Monday, August 30, 2021 9:22:18 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102255	Marshall	2255	Meade	Glen Easton	Cameron	39.822712	-80.656398	529405.5	4408136.8

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT
4705102255	-/-		Dvtd Orgnl Loc	Permitted	GNX Land LLC	21V	Willett		Appalachian Basin Minerals LP et al	Tug Hill Operating, LLC	6870	Marcellus Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF
4705102255	-/-	-/-	1315	Ground Level															

WV Geological & Economic Survey:

Well: County = 51 Permit = 00966

Report Time: Monday, August 30, 2021 11:10:01 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100966	Marshall	966	Liberty	Glen Easton	Cameron	39.812386	-80.62988	531679.6	4406999.8

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100966	2/6/2006	Plugging	Completed	Carroll/Anna Morris			M-328B			Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEf	G_AF
4705100966	2/6/2006	12/13/2005	1385	Ground Level				unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705100966	Plugging	Pittsburgh coal	Well Record	1133	Reasonable	6	Reasonable	1385	Ground Level

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100966	2/6/2006	0

There is no Sample data for this well

WV Geological & Economic Survey:

Well: County = 51 Permit = 00967

Report Time: Monday, August 30, 2021 11:10:33 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100967	Marshall	967	Liberty	Glen Easton	Cameron	39.812241	-80.630068	531663.6	4406983.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100967	12/12/2005	Plugging	Completed	Carroll & Anna Morris		M-328C				Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_A
4705100967	12/12/2005	11/16/2005	1367	Ground Level				unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well *** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100967	12/12/2005	0

There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 01086

Report Time: Monday, August 30, 2021 11:10:50 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705101086	Marshall	1066	Liberty	Glen Easton	Cameron	39.817026	-80.633453	531371.7	4407513.5

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST
4705101086	-/-	Original Loc	Permitted	Carroll & Anna Morris		5A2			Carroll & Anna Morris	CNX Gas Co. LLC (North)		999	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_
4705101086	-/-	-/-	1313	Ground Level			Pittsburgh coal	unclassified	unclassified	Methane (CBM)	unknown	unknown						

There is no Pay data for this well

Production Gas Information: (Volumes in Mcf)

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101086	CNX Gas Co. LLC (North)	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2020	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_OIL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101086	CNX Gas Co. LLC (North)	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2020	0	0	0	0	0	0	0	0	0	0	0	0	0

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_NGL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101086	CNX Gas Co. LLC (North)	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2020	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Water Information: (Volumes in Gallons)

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_WTR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101086	CNX Gas Co. LLC (North)	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101086	CNX Gas Co. LLC (North)	2020	0	0	0	0	0	0	0	0	0	0	0	0	0

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 70040

Report Time: Monday, August 30, 2021 11:11:09 AM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70207	51	70040

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170040	Marshall	70040	Liberty	Glen Easton	Cameron	39.811372	-80.630633	531615.7	4406886.9

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170040	-/-		Original Loc	Completed	P M Conner	2	M-74			South Penn Oil (S. Penn Nat. Gas)			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT
4705170040	-/-	-/-	1360	Barometer		Gordon (undiff)	Gordon (undiff)	unclassified	unclassified	not available	unknown	unknown	3112		3112			

WV Geological & Economic Survey

Well: County = 51 Permit = 70207

Report Time: Monday, August 30, 2021 11:11:26 AM

Well Reassignment Information: Reassigned To

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70207	51	70040

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170207	Marshall	70207	Liberty	Glen Easton	Cameron	39.811371	-80.630633	531615.7	4406886.9

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170207	-/-		unknown	Reassign						South Penn Oil (S. Penn Nat. Gas)			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AF
4705170207	-/-	-/-																		

WV Geological & Economic Survey

Well: County = 51 Permit = 00958

Report Time: Monday, August 30, 2021 11:11:41 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100958	Marshall	958	Liberty	Glen Easton	Cameron	39.810356	-80.631008	531584	4406774.1

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100958	11/15/2005	Plugging	Completed	James & Linda Hubbs		M-325				Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_A
4705100958	11/15/2005	10/28/2005	1272 Ground Level				unclassified	unclassified	not available	unknown	UnFinWVStm						

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705100958	Original Loc	Pittsburgh coal	Well Record	1031	Reasonable	5	Reasonable	1272 Ground Level

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100958	11/15/2005	0

WV Geological & Economic Survey

Well: County = 51 Permit = 70631

Report Time: Monday, August 30, 2021 11:11:56 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170631	Marshall	70631	Liberty	Glen Easton	Cameron	39.810045	-80.630068	531664.6	4406739.9

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170631	-/-		unknown	Prpty Map Wylie Allen		3				----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_
4705170631	-/-	-/-						unclassified	unclassified	not available	unknown	unknown							

WV Geological & Economic Survey

Well: County = 51 Permit = 00879

Report Time: Monday, August 30, 2021 11:12:16 AM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70628	51	879

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100879	Marshall	879	Liberty	Glen Easton	Cameron	39.803396	-80.626496	531973.5	4406003.2

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM
4705100879	11/18/2002	Plugging	Completed	James A Hubbs Estate			M-327		Consolidation Coal Co	Consolidation Coal Co.			
4705100879	--	Original Loc	Prpty Map	Wylie Allen						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FIG	KOD	G_BEF	G_A
4705100879	11/18/2002	11/10/2002	1227	Ground Level				unclassified	unclassified	not available	unknown	unknown						
4705100879	--	--						unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100879	11/18/2002	0

WV Geological & Economic Survey

Well: County = 51 Permit = 00919

Report Time: Monday, August 30, 2021 11:12:37 AM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	30127	51	919

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100919	Marshall	919	Liberty	Glen Easton	Cameron	39.801511	-80.625368	532070.9	4405794.4

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PRC
4705100919	10/22/1913	Original Loc	Completed	Chas E Carrigan et al		2	John Wilson	66322	Chas E Carrigan et al	South Penn Oil (S. Penn Nat. Gas)		
4705100919	6/25/2004	Plugging	Completed	Shirley M & George A & Paul L Burris		M-351			Consolidation Coal Co	Consolidation Coal Co		

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF
4705100919	10/22/1913	5/12/1913	1171	Ground Level	Cameron-Garner	Gordon	Gordon	unclassified	unclassified	Oil	Cable Tool	Shot	2914		2914		0
4705100919	6/25/2004	6/15/2004	1164	Ground Level													

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4705100919	10/22/1913	Show	Oil	Vertical		Gordon	2892	Gordon	0	0			
4705100919	10/22/1913	Pay	Oil	Vertical		Gordon	2914	Gordon	0	0			

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100919	--/1940	0
4705100919	6/25/2004	0

WV Geological & Economic Survey.

Well: County = 51 Permit = 30127

Report Time: Monday, August 30, 2021 11:12:56 AM

Well Reassignment Information: Reassigned To:

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	30127	51	919

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705130127	Marshall	30127	Liberty	Glen Easton	Cameron	39.801511	-80.625368	532070.9	4405794.4

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705130127	--		unknown	Reassign						South Penn Oil (S. Penn Nat. Gas)			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AF
4705130127	--	--																		

WV Geological & Economic Survey

Well: County = 51 Permit = 00920

Report Time: Monday, August 30, 2021 11:13:12 AM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70454	51	920

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
4705100920	Marshall	920	Liberty	Cameron	Cameron	39.800786	-80.62205	532355.3	4405715.1

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100920	6/8/2004	Plugging	Completed	James A Hubbs est		M-365				Consolidation Coal Co.			
4705100920	-/-	unknown	Prpty Map	Frank Hibbs	5					unknown			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AF
4705100920	6/8/2004	5/17/2004	1392	Ground Level														
4705100920	-/-	-/-						unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705100920	Plugging	Pittsburgh coal	Well Record	1156	Reasonable	6	Reasonable		Ground Level

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100920	6/8/2004	0

WV Geological & Economic Survey

Well: County = 51 Permit = 30159

Report Time: Monday, August 30, 2021 11:13:26 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705130159	Marshall	30159	Liberty	Cameron	Cameron	39.797161	-80.620732	532469.8	4405313.3

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_E
4705130159	3/16/1902	Original Loc	Completed	Minter Pletcher Heirs	1		E A Logsdon	30294	Dr W F Crow	South Penn Oil (S. Penn Nat. Gas)			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTC
4705130159	3/16/1902	12/16/1901	1058	Ground Level	Cameron-Garner	UDev undf.Ber/LoHURN	Gordon	Development Well	unclassified	Oil and Gas	Cable Tool	Shot	2817		2817

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEFO	G_AFT	O_BEFO	O_AFT	WATER_QNTY
4705130159	3/16/1902	Pay	Oil & Gas	Vertical			2794	Gordon	0	0			

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705130159	Original Loc	unidentified coal	Well Record	500	Reasonable	5	Reasonable	1058	Ground Level
4705130159	Original Loc	Sewickley coal	Well Record	710	Reasonable	4	Reasonable	1058	Ground Level
4705130159	Original Loc	Pittsburgh coal	Well Record	790	Reasonable	8	Reasonable	1058	Ground Level
4705130159	Original Loc	Bufflo Ss/1st Cow Rn	Well Record	1210	Reasonable	15	Reasonable	1058	Ground Level
4705130159	Original Loc	Maltonig Ss/Big Dunk	Well Record	1270	Reasonable	30	Reasonable	1058	Ground Level
4705130159	Original Loc	Big Lime	Well Record	1875	Reasonable	45	Reasonable	1058	Ground Level
4705130159	Original Loc	Big Injun (undiff)	Well Record	1920	Reasonable	250	Reasonable	1058	Ground Level
4705130159	Original Loc	Gordon	Well Record	2791	Reasonable	23	Reasonable	1058	Ground Level

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705130159	9/30/1941	0

WV Geological & Economic Survey

Well: County = 51 Permit = 30265

Report Time: Monday, August 30, 2021 11:13:43 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705130265	Marshall	30265	Liberty	Cameron	Cameron	39.797596	-80.620169	532517.9	4405361.8

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TF
4705130265	10/30/1901	Original Loc	Completed	Georgia Hubbs et al	4		Geo Hubbs		Georgia & Sofia Hubbs	Randall-Zogg Supply Co			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	I
4705130265	10/30/1901	-/-	1259	Ground Level	Cameron-Gamer	UDev undf Ber/LcHURN	Gordon	Development Well	Development Well	Oil	Cable Tool	Shot	3017		3017	

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4705130265	10/30/1901	Pay	Oil	Vertical			2966	Gordon	0	0			

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

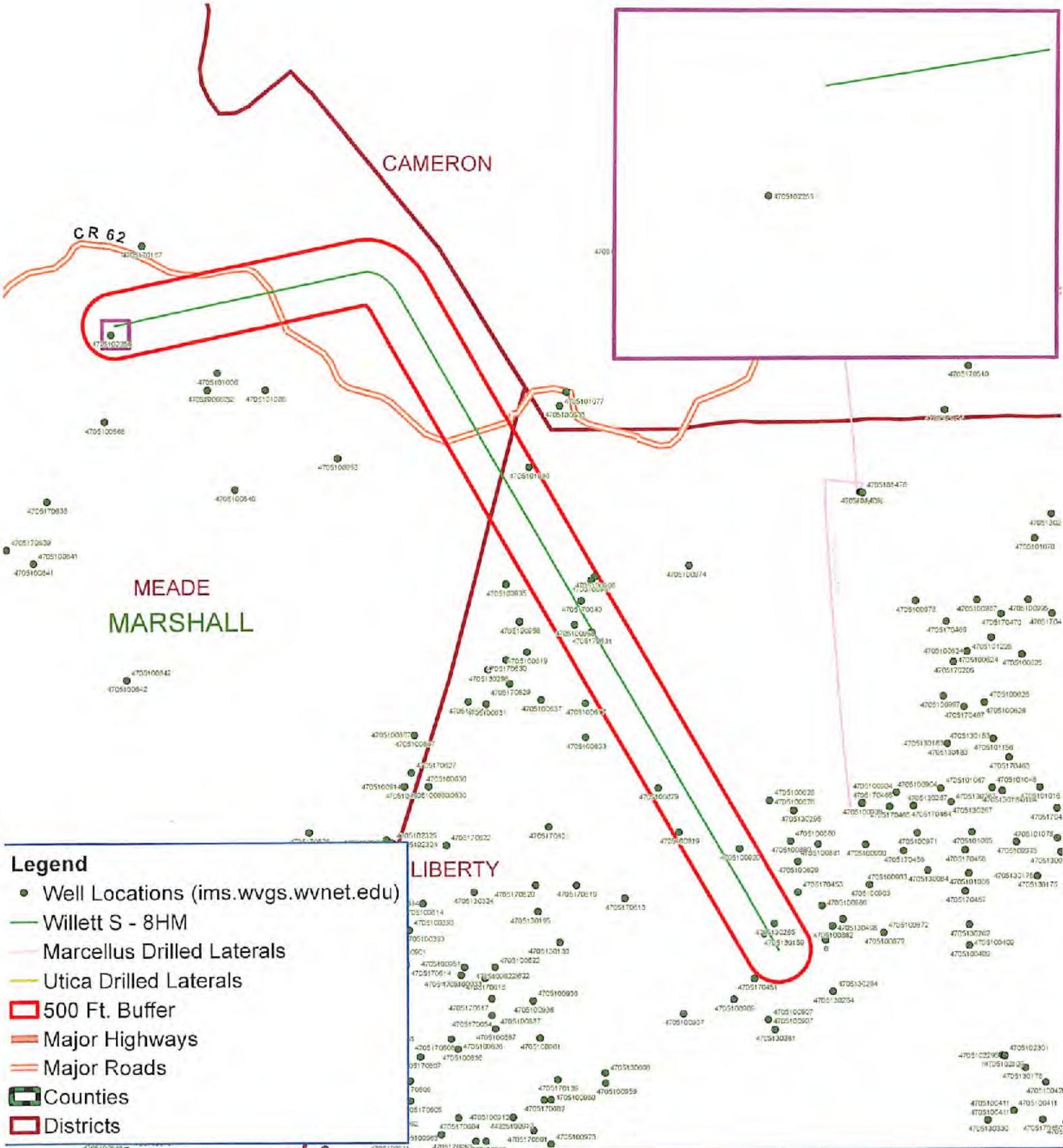
Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705130265	Original Loc	unidentified coal	Well Record	360	Reasonable	2	Reasonable	1259	Ground Level
4705130265	Original Loc	Sewickley coal	Well Record	900	Reasonable	4	Reasonable	1259	Ground Level
4705130265	Original Loc	Pittsburgh coal	Well Record	990	Reasonable	5	Reasonable	1259	Ground Level
4705130265	Original Loc	Bufflo Ss/1st Cow Rn	Well Record	1310	Reasonable	35	Reasonable	1259	Ground Level
4705130265	Original Loc	Mahoning Ss/Big Dunk	Well Record	1510	Reasonable	25	Reasonable	1259	Ground Level
4705130265	Original Loc	Salt Sands (undiff)	Well Record	1610	Reasonable	310	Reasonable	1259	Ground Level
4705130265	Original Loc	Big Lime	Well Record	2080	Reasonable	37	Reasonable	1259	Ground Level
4705130265	Original Loc	Big Injun (undiff)	Well Record	2117	Reasonable	243	Reasonable	1259	Ground Level
4705130265	Original Loc	Gordon Stray	Well Record	2935	Reasonable	5	Reasonable	1259	Ground Level
4705130265	Original Loc	Gordon	Well Record	2934	Reasonable	31	Reasonable	1259	Ground Level

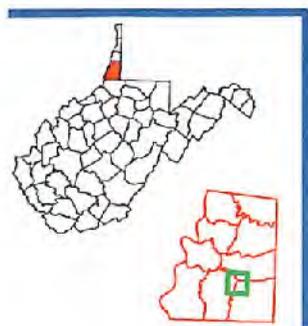
There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705130265	-/-/1947	0



- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
 - Willett S - 8HM
 - Marcellus Drilled Laterals
 - Utica Drilled Laterals
 - 500 Ft. Buffer
 - Major Highways
 - Major Roads
 - ▭ Counties
 - ▭ Districts



Willett S - 8HM Meade District Marshall County, WV



Map Prepared by:

 01/14/2022

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Willitt S-6HM

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Middle Fish Creek Quadrangle Glen Easton 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: AST Tanks with proper containment will be used for staging fresh and produced water for frac

Will a synthetic liner be used in the pit? Yes No If so, what ml.? AST Tanks will be used with proper contain

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number UIC 2459, UIC 965, UIC 359, UIC 2D0732540, UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

Will closed loop system be used? If so, describe: Yes - For Vertical Drilling

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air for vertical

-If oil based, what type? Synthetic, petroleum, etc. n/a

Additives to be used in drilling medium? _____

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings to be disposed of in a Landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Weston County Sanitary Landfill (SWF-102) / WV(9109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP ECR1326426) Christchurch Valley Landfill (160419)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature James A. Pancake

Company Official (Typed Name) Jim Pancake

Company Official Title Vice President - Geosciences

Office of Oil and Gas
DEC 06 2021
WV Department of Environmental Protection

Subscribed and sworn before me this 23rd day of November, 2021

Suzanne Deliere

Notary Public

My commission expires 1/15/2025

Commonwealth of Pennsylvania - Notary Seal
Suzanne Deliere, Notary Public
Washington County
My commission expires 01/14/2022
Commission number 1382332
Member, Pennsylvania Association of Notaries

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 5.44 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Orchard Grass	12
Spring Oats	96	Ladino	3
		White Clover	2

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Benny Stiller

RECEIVED
Office of Oil and Gas

Comments:

DEC 06 2021

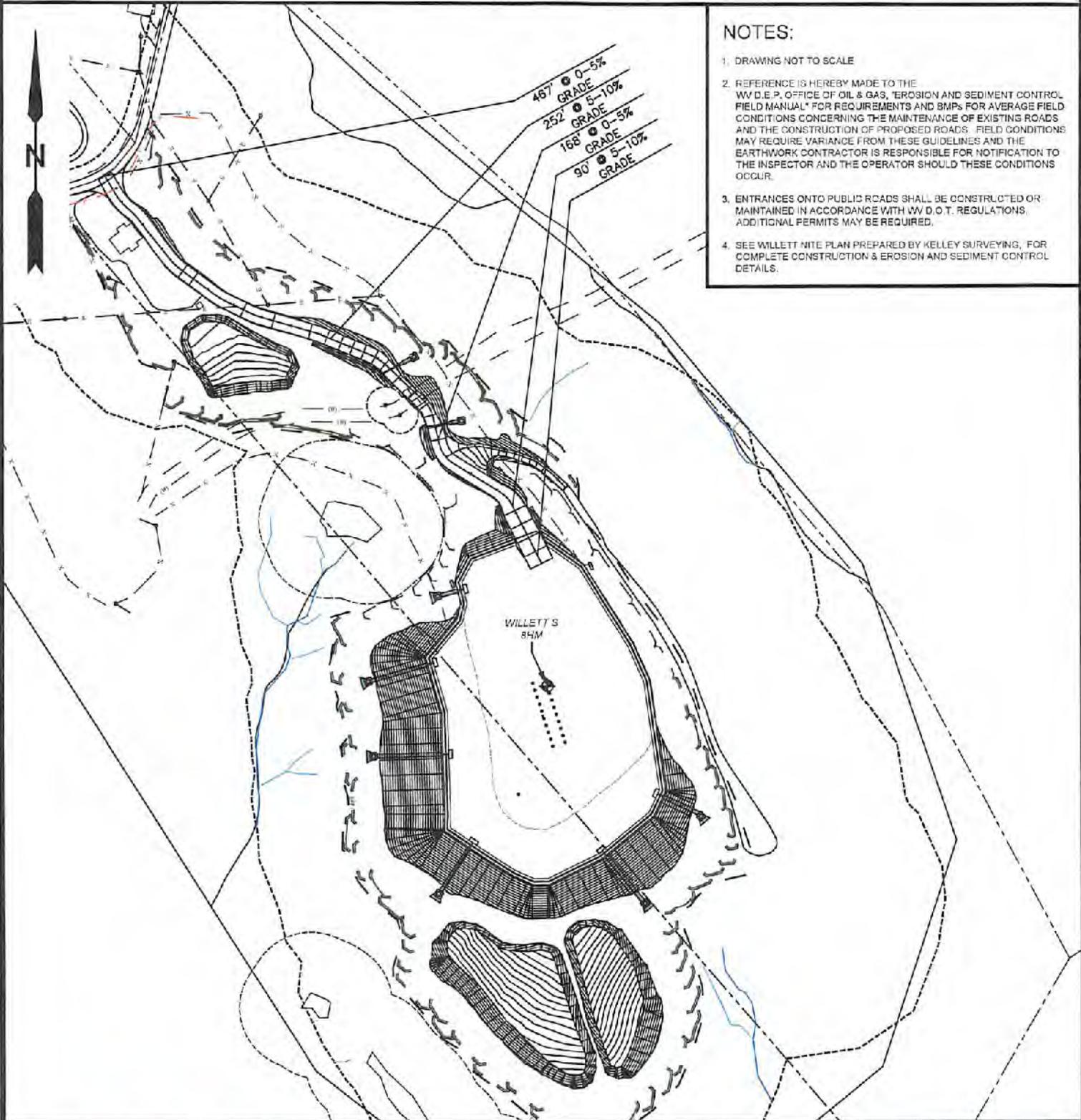
WV Department of
Environmental Protection

Title: Oil and Gas Inspector

Date: 10-14-21

Field Reviewed? Yes No

PROPOSED WILLETT S - 8HM



NOTES:

1. DRAWING NOT TO SCALE
2. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
3. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
4. SEE WILLETT NITE PLAN PREPARED BY KELLEY SURVEYING, FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.452.5634
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3932
 254 East Beckley Synais | Beckley, WV 25801 | 304.255.5296
 slsvv.com

TOPO SECTION:

GLEN EASTON 7.5'	
COUNTY	DISTRICT
MARSHALL	MEADE
DRAWN BY	JOB NO.
K.G.M.	8939

OPERATOR:

PREPARED FOR:
 TUG HILL OPERATING, LLC
 380 SOUTHPOINTE BLVD
 SUITE 200
 CANONSBURG, PA. 15317



**TUG HILL
OPERATING**

01/14/2022



TUG HILL
OPERATING

Well Site Safety Plan
Part A – Site Specific Data and Figures

Well Name: Willett S-8HM

Pad Name: Willett Pad

County: Marshall

UTM (meters), NAD83, Zone 17

Northing: 4,408,180.13

Easting: 529,422.51

RECEIVED
Office of Oil and Gas

DEC 06 2021

WV Department of
Environmental Protection

B.S. ~~10-14-21~~ 10-14-21

**KEY CONTACT FOR WELL SITE SAFETY PLAN
DEVELOPMENT AND MAINTENANCE**

Jerry V. DeRosa, Director EH&S Affairs

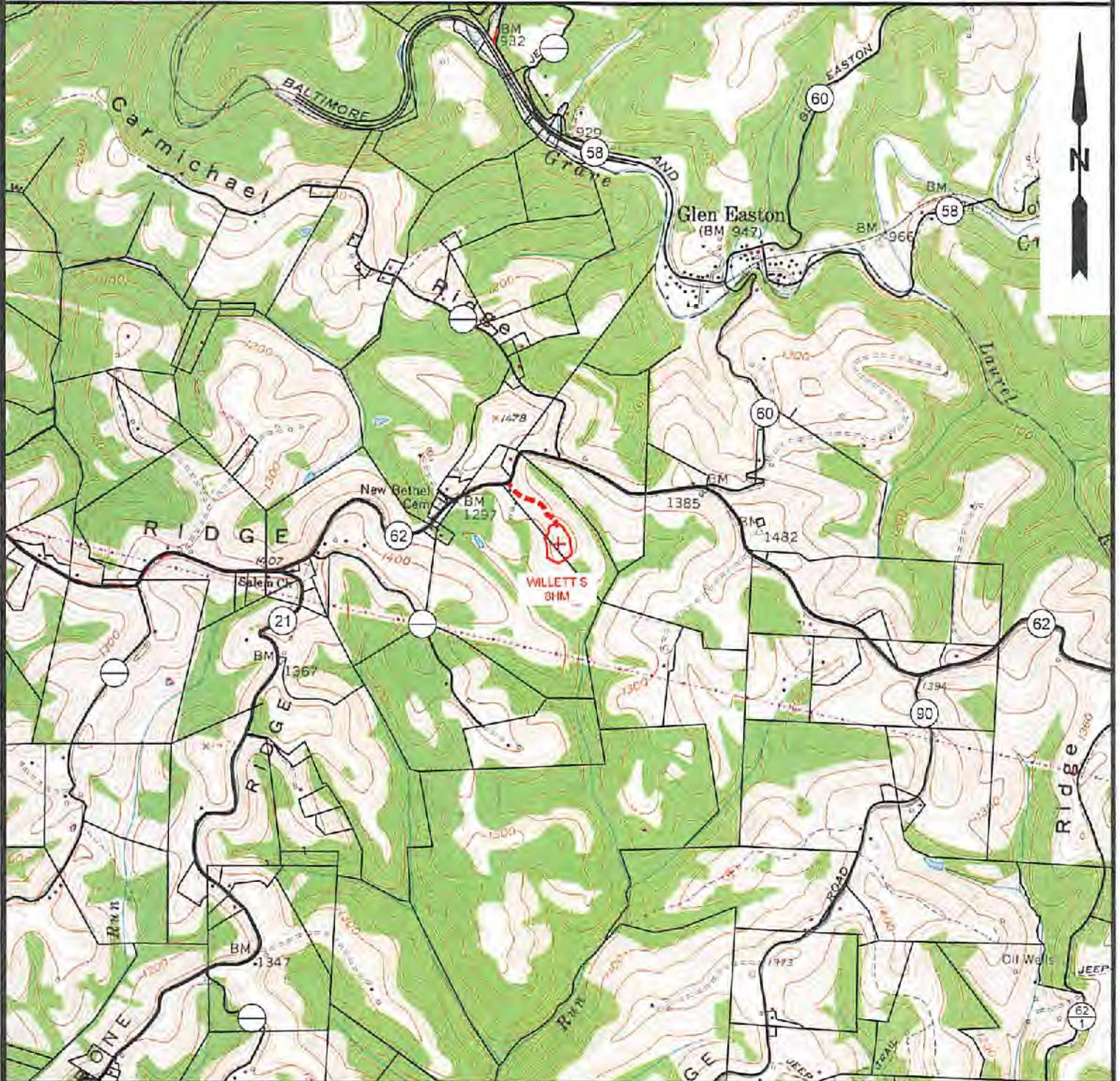
(724) 338-2029 (office)

(412) 736-5767 (cellular)

24-HOUR EMERGENCY PHONE NUMBER

(800) 921-9745

PROPOSED WILLETT S - 8HM



NOTE: CLOSEST WATER PURVEYOR
CITY OF CAMERON - FRANK WALKER RESERVOIR
CAMDEN, WV

LAT: 39.829865
LON: -80.573724
LOCATED: N 84°36'39" E AT 23,313.72' FROM THE CENTER OF WILLETT S WELL PAD LOCATION.

12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 26801 | 304.265.9286
slswv.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8939	09/14/2021	1" = 2000'

**TUG HILL
OPERATING**

01/14/2022

10,288' B.H.

8,762' T.H.

**WILLETT S LEASE
8HM
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°50'00"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT) N. 484,005.70 E. 1,643,768.25
NAD'83 GEO. LAT-(N) 39.829103 LONG-(W) 80.656197
NAD'83 UTM (M) N. 4,406,180.19 E. 529,422.51

LANDING POINT

NAD'83 S.P.C.(FT) N. 484,416.6 E. 1,649,146.9
NAD'83 GEO. LAT-(N) 39.824384 LONG-(W) 80.640627
NAD'83 UTM (M) N. 4,408,327.7 E. 530,754.4

BOTTOM HOLE

NAD'83 S.P.C.(FT) N. 474,185.9 E. 1,653,827.7
NAD'83 GEO. LAT-(N) 39.796498 LONG-(W) 80.619949
NAD'83 UTM (M) N. 4,405,289.7 E. 532,537.2

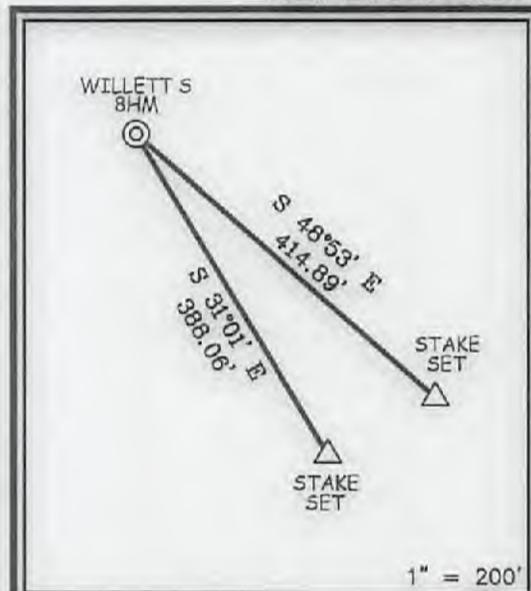
T.H. LONGITUDE 80°37'30"
B.H. LONGITUDE 80°35'00"

T.H.

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
3-19-77	SONIA J. STROPE	46.783
3-18-78	CNX LAND, LLC	30.927
3-19-80	RAYMOND DEWAINE DOBBS, ET AL	30.54
3-19-81	XCL PROCESSING OPERATING LLC	26.52
3-19-82	XCL PROCESSING OPERATING LLC	14.89
7-1-7.1	NANCY L. PARSONS	0.5
7-1-19	JEAN JAMISON	51.89
7-7-2	KAREN S. EVANS & JUDY KAY MATTHEWS	24.50
7-7-8.1	KENNETH WAYNE STEELE TRUST	79.03
9-3-13.1	XCL PROCESSING OPERATING LLC	10.00
9-3-15.1	MARSHALL COUNTY PUBLIC SERVICE DISTRICT	0.2296
9-3-17.1	BRIAN & LEAH KESTNER	11.8
9-8-5.2	AMY EVANS & KAREN WHETZAL	4.586
9-8-6.1	KAYLA E. BRATTON	1.423
9-9-7.3	JEFFREY B. THOMAS	1.297
9-9-8.1	DIANA MAE PIATT	2.253
9-9-8.2	VINCENT PATRELLO	0.723
9-9-9	VINCENT P. PATRELLO	1.076

TAG	SURFACE OWNER	PARCEL	ACRES
A	CNX LAND, LLC	9-8-6	27.596
B	CNX LAND, LLC	9-3-17	65.86
C	LARRY S. NEELY - LIFE	9-8-7.1	76.005
D	RAYMOND DEWAINE DOBBS, ET AL	9-3-15	70.7424
E	XCL PROCESSING OPERATING LLC	9-3-13	28.00
F	RAYMOND DEWAINE DOBBS, ET AL	9-3-14	81.331
G	JAMES R. THOMAS, ET UX	9-9-7	60.796
H	XCL PROCESSING OPERATING LLC	9-9-7.2	3.907
I	JAMES D. BLAKE, ET AL	9-9-8	52.144
J	ANNA D. MORRIS - TOD	7-1-1	179.00
K	KAREN S. EVANS & JUDY KAY MATTHEWS	7-1-5	116.915
L	NICHOLAS J. EVANS	7-1-5.2	22.42
M	LARRY A. PAYNTER, ET UX	7-1-5.1	1.165
N	KAREN S. EVANS & JUDY KAY MATTHEWS	7-7-1	124.12
O	GEO A. BURRIS	7-8-14	95.44

REFERENCES



B.H.

NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 825' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.8634
1412 Kanawha Boulevard, East | Charleston, WV 25311 | 304.346.3952
284 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slsww.com

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 DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 *Gregory A. Smith*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
DATE SEPTEMBER 8, 20 21
REVISED _____, 20 _____
OPERATORS WELL NO. WILLETT S 8HM
API WELL NO. 47 - 051 - 02422
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8939P8HM.dwg
WILLETT S 8HM-REV2
HORIZONTAL & VERTICAL SCALE 1" = 2000'
CONTROL DETERMINED BY: DGPS (SURVEY GRADE TIE TO CORS NETWORK)

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION :
ELEVATION 1,310.03' WATERSHED TRIBUTARY OF UPPER BOWMAN RUN
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER CNX LAND LLC ACREAGE 27.596±
ROYALTY OWNER APPALACHIAN BASIN MINERALS, LP, ET AL ACREAGE 0.114/2022

PROPOSED WORK :
LEASE NO. SEE WW-6A1
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH TVD: 7,003' / TMD: 20,460'

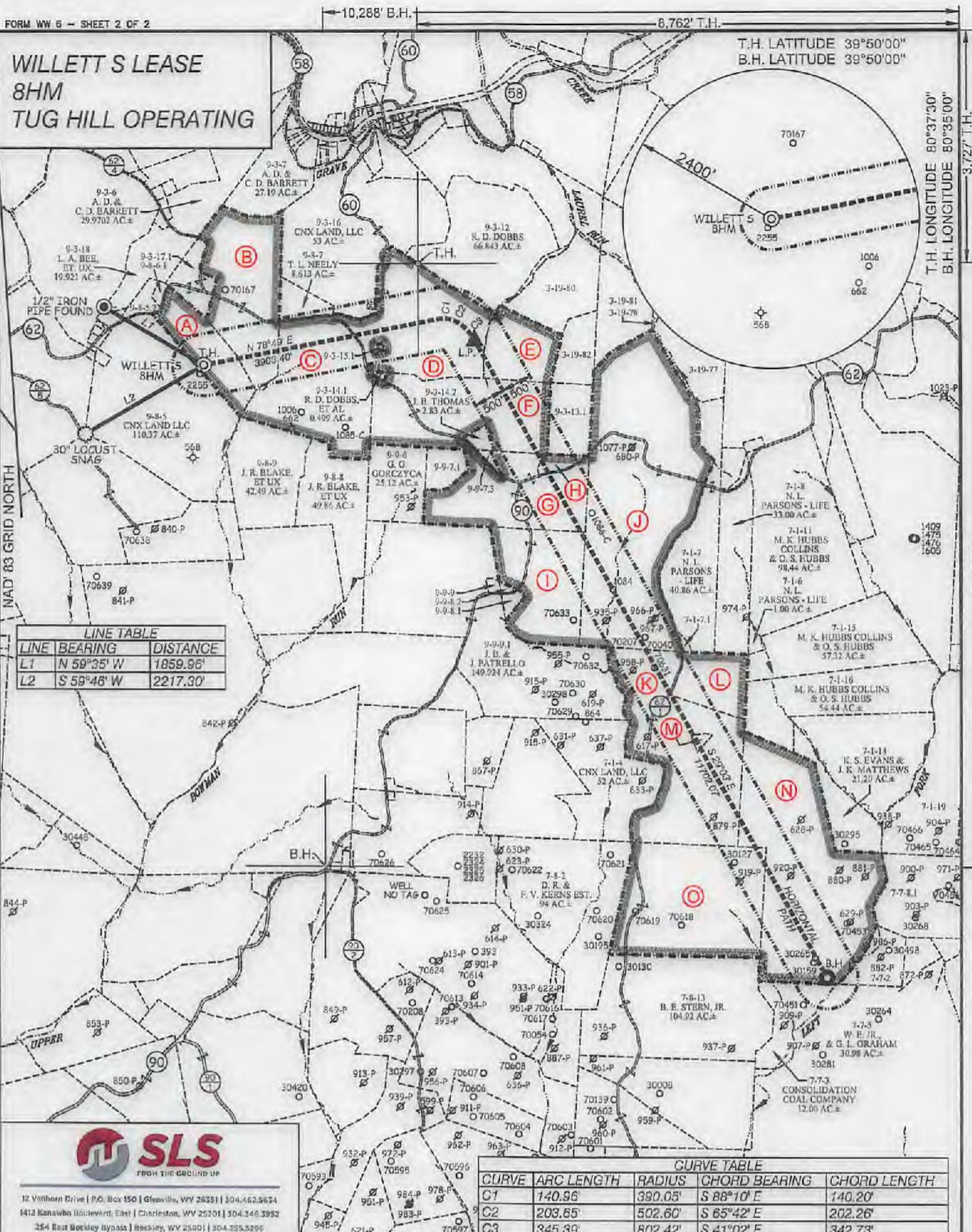
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W, STE 407
FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

COUNTY NAME
PERMIT

**WILLETT S LEASE
8HM
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°50'00"

T.H. LONGITUDE 80°37'30"
B.H. LONGITUDE 80°35'00"



LINE TABLE

LINE	BEARING	DISTANCE
L1	N 59°35' W	1859.96'
L2	S 59°46' W	2217.30'

CURVE TABLE

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	140.96'	390.05'	S 88°10' E	140.20'
C2	203.65'	502.60'	S 65°42' E	202.26'
C3	345.39'	802.42'	S 41°02' E	342.73'



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254 East Besley Bypass | Besley, WV 25801 | 304.305.5296
slsv.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 484,005.70 E. 1,843,768.25
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BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 474,185.0 E. 1,850,827.7
 NAD'83 GEO. LAT-(N) 39.796496 LONG-(W) 80.619949
 NAD'83 UTM (M) N. 4,405,209.7 E. 532,537.2



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

P.S. 677 *Gregory A. Smith*

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-6A1)

SCALE 1" = 2000' FILE NO. 8939P8HM.dwg
 WILLETT S 8HM-REV2
 DATE SEPTEMBER 8, 20 21
 REVISED _____, 20 _____
 OPERATORS WELL NO. WILLETT S 8HM
 API WELL NO. 47 051 02422
 STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
 DIVISION OF
 ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W. STE 407
 FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

04/14/2022

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
-------------------------	-----------------------	-----------------------	---------	-----------

*See attached pages

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Tug Hill Operating, LLC
 By: Amy L. Morris *Amy L. Morris*
 Its: Permitting Specialist - Appalachia Region

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment						
10*21602	9-8-6	A	CAROL STACY SAUNDERS	TH EXPLORATION LLC	1/8+	959 289	N/A						
10*21604	9-8-6	A	WILLIAM EDWARD STACY AND JACQUELINE L STACY	TH EXPLORATION LLC	1/8+	958 428	N/A						
10*22616	9-8-6	A	JAMES YOHO AND SANDRA YOHO	TH EXPLORATION LLC	1/8+	968 281	N/A						
10*22618	9-8-6	A	DANIEL YOHO	TH EXPLORATION LLC	1/8+	966 636	N/A						
10*22721	9-8-6	A	WINIFRED G TURNER	TH EXPLORATION LLC	1/8+	988 134	N/A						
10*22796	9-8-6	A	MARLENE YOHO	TH EXPLORATION LLC	1/8+	972 87	N/A						
10*22880	9-8-6	A	GREGORY K GLOVER	TH EXPLORATION LLC	1/8+	977 85	N/A						
10*22881	9-8-6	A	MARLIS GLOVER	TH EXPLORATION LLC	1/8+	977 87	N/A						
10*23033	9-8-6	A	MAXINE BEYSER	TH EXPLORATION LLC	1/8+	977 346	N/A						
10*23034	9-8-6	A	NINA L KOVACS	TH EXPLORATION LLC	1/8+	977 348	N/A						
10*23107	9-8-6	A	JOEL DAMON GLOVER	TH EXPLORATION LLC	1/8+	983 620	N/A						
10*23141	9-8-6	A	DEBORAH A LOMBARDO	TH EXPLORATION LLC	1/8+	984 7	N/A						
10*23142	9-8-6	A	KIMBERLY S GLOVER	TH EXPLORATION LLC	1/8+	984 5	N/A						
10*23161	9-8-6	A	KATHLEEN J GLOVER	TH EXPLORATION LLC	1/8+	983 618	N/A						
10*23162	9-8-6	A	AARON BOYLES AND TRACI BOYLES	TH EXPLORATION LLC	1/8+	983 622	N/A						
10*23163	9-8-6	A	EDWIN WOOLLEY AND DEBORAH L WOOLLEY	TH EXPLORATION LLC	1/8+	983 571	N/A						
10*23176	9-8-6	A	CAROL M YOHO	TH EXPLORATION LLC	1/8+	984 9	N/A						
10*23181	9-8-6	A	MICHAEL L GREENWOOD AND PEGGY ANNE GREENWOOD	TH EXPLORATION LLC	1/8+	983 627	N/A						
10*23192	9-8-6	A	JEFFREY C YOHO	TH EXPLORATION LLC	1/8+	984 472	N/A						
10*23313	9-8-6	A	DIANE DEVAULT	TH EXPLORATION LLC	1/8+	988 136	N/A						
10*23419	9-8-6	A	GARY MCPHERON AND SHELLEY ANN MCPHERON	TH EXPLORATION LLC	1/8+	988 492	N/A						
10*23420	9-8-6	A	SALLY LEE ORTIZ RIVERA	TH EXPLORATION LLC	1/8+	988 490	N/A						
10*23739	9-8-6	A	APPALACHIAN BASIN MINERALS LP	TH EXPLORATION LLC	1/8+	1011 538	N/A						
10*23740	9-8-6	A	PENNMARC RESOURCES II LP	TH EXPLORATION LLC	1/8+	1011 532	N/A						
10*23741	9-8-6	A	MCCROW ENERGY PARTNERS II LLC	TH EXPLORATION LLC	1/8+	1011 515	N/A						
10*23742	9-8-6	A	PURPLEBURGH VENTURES, LLC	TH EXPLORATION LLC	1/8+	1011 536	N/A						
10*23743	9-8-6	A	WILDES MINERAL INTERESTS LLC	TH EXPLORATION LLC	1/8+	1011 534	N/A						
10*23749	9-8-6	A	MARCELLUS TX MINERAL PRTRN LTD	TH EXPLORATION LLC	1/8+	1012 193	N/A						
10*24781	9-8-6	A	DENISE MARIE ROGERS AND GEORGE M ROGERS	TH EXPLORATION LLC	1/8+	1027 578	N/A						
10*24782	9-8-6	A	RICHARD A HEUSER	TH EXPLORATION LLC	1/8+	1027 572	N/A						
10*24783	9-8-6	A	BRUCE W JOHNSON AND TERRI L JOHNSON	TH EXPLORATION LLC	1/8+	1027 569	N/A						
10*25224	9-8-6	A	MAUREEN WILSON	TH EXPLORATION LLC	1/8+	1030 141	N/A						
10*25701	9-8-6	A	TIMOTHY KRUS AND BARBARA KRUS	TH EXPLORATION LLC	1/8+	1034 239	N/A						
10*25716	9-8-6	A	RUSSELL BREDBENNER	TH EXPLORATION LLC	1/8+	1035 23	N/A						
10*26631	9-8-6	A	JOSEPH R ZBOZIEN	TH EXPLORATION LLC	1/8+	1039 322	N/A						
10*27106	9-8-6	A	JASMINE LEIGH HALL PENA C/O ROBERT HALL	TH EXPLORATION LLC	1/8+	1050 217	N/A						
10*27229	9-8-6	A	KENNETH ANDERSON BY DAVID C WHITE, SP COMM	TH EXPLORATION LLC	1/8+	1068 311	N/A						
10*28092	9-8-6	A	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	TH EXPLORATION LLC	1/8+	1073 370	N/A						
10*28647	9-8-6	A	BRYAN S LEHNER	TH EXPLORATION LLC	1/8+	1076 65	N/A						
10*29613	9-8-6	A	JANE D BEARDEN AND WILLIAM L BEARDEN	TH EXPLORATION LLC	1/8+	1096 374	N/A						
10*29615	9-8-6	A	UNKNOWN HEIRS AND ASSIGNS OF LAWRENCE B OSTREY	TH EXPLORATION LLC	1/8+	1096 343	N/A						
10*29621	9-8-6	A	BRADLEY B LEHNER	TH EXPLORATION LLC	1/8+	1096 362	N/A						
10*29623	9-8-6	A	RACHAEL MARIA MCLARDY	TH EXPLORATION LLC	1/8+	1096 356	N/A						
10*29625	9-8-6	A	HARRY ALBERT RICHARDSON	TH EXPLORATION LLC	1/8+	1096 368	N/A						
10*29627	9-8-6	A	JANET M SMITH	TH EXPLORATION LLC	1/8+	1096 350	N/A						
10*29629	9-8-6	A	UNKNOWN INTEREST OWNERS OF THE BERNARD E KURLICH FAMILY TRUST	TH EXPLORATION LLC	1/8+	1096 335	N/A						
10*29631	9-8-6	A	UNKNOWN INTEREST OWNERS OF THE ROBERT WISE LIVING TRUST	TH EXPLORATION LLC	1/8+	1096 327	N/A						
10*31002	9-8-6	A	MARK F HEUSER	CHEVRON USA INC	1/8+	791 247	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31005	9-8-6	A	GARY KEITH BERGER	CHEVRON USA INC	1/8+	793 358	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31006	9-8-6	A	TERRY WITHEROW AND JAY WITHEROW	CHEVRON USA INC	1/8+	793 375	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31007	9-8-6	A	CAROL D ELMORE	CHEVRON USA INC	1/8+	793 383	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593

10*31008	9-8-6	A	NORMA V PRATICO	CHEVRON USA INC	1/8+	794	532	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31009	9-8-6	A	MARGARET LEE HALL	CHEVRON USA INC	1/8+	795	414	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31010	9-8-6	A	JULIANNE ERDOS	CHEVRON USA INC	1/8+	795	57	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31011	9-8-6	A	MARVIN C WILSON	CHEVRON USA INC	1/8+	795	350	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31012	9-8-6	A	JAMES P OVIES	CHEVRON USA INC	1/8+	797	368	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31013	9-8-6	A	BERTHA LYNN KLUG	CHEVRON USA INC	1/8+	797	548	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31014	9-8-6	A	CHERYL FOX BRAUCH	CHEVRON USA INC	1/8+	800	489	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31015	9-8-6	A	CAROL FOX VALLANDINGHAM	CHEVRON USA INC	1/8+	800	564	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31016	9-8-6	A	JESSICA M CHAVEZ	CHEVRON USA INC	1/8+	804	393	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31017	9-8-6	A	PHILIP A WILSON	CHEVRON USA INC	1/8+	805	421	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31018	9-8-6	A	JUANITA S HATCH LIVING TRUST DTD 2/16/1998	CHEVRON USA INC	1/8+	831	438	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31019	9-8-6	A	EDWARD F WILSON	CHEVRON USA INC	1/8+	813	564	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31020	9-8-6	A	MATTHEW L GROSSAINT	CHEVRON USA INC	1/8+	818	6	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31021	9-8-6	A	TROY THOMAS WILSON	CHEVRON USA INC	1/8+	828	352	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31022	9-8-6	A	ELLA JEAN MCCARDLE	CHEVRON USA INC	1/8+	828	374	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31027	9-8-6	A	LOU ANN GROSSAINT	CHEVRON USA INC	1/8+	829	470	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31029	9-8-6	A	JESSE ALLEN WILSON	CHEVRON USA INC	1/8+	831	355	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31034	9-8-6	A	APRIL DAWN HOGAN	CHEVRON USA INC	1/8+	835	248	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31035	9-8-6	A	KIMBERLY SUE PIERSON	CHEVRON USA INC	1/8+	835	271	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31036	9-8-6	A	JOSEPH RICHARD FOX	CHEVRON USA INC	1/8+	800	546	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593

10*31043	9-8-6	A	DIANE M BAYLESS	CHEVRON USA INC	1/8+	798	97	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31044	9-8-6	A	DENNIS M WILSON	CHEVRON USA INC	1/8+	798	97	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31045	9-8-6	A	DAVID H WILSON	CHEVRON USA INC	1/8+	798	77	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31046	9-8-6	A	SANDRA JEAN WILSON	CHEVRON USA INC	1/8+	794	605	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31047	9-8-6	A	MARY CHRISTINE MCKENNA	CHEVRON USA INC	1/8+	795	49	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31048	9-8-6	A	LAURENCE E WILSON JR	CHEVRON USA INC	1/8+	800	154	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31049	9-8-6	A	ROBERT L ARCHER	CHEVRON USA INC	1/8+	803	45	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31050	9-8-6	A	KATHERINE JEAN CONNELLY	CHEVRON USA INC	1/8+	803	30	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31051	9-8-6	A	STEVEN M ARCHER	CHEVRON USA INC	1/8+	803	38	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31052	9-8-6	A	WILLIAM R WISE	CHEVRON USA INC	1/8+	805	407	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*21602	9-3-17	B	CAROL STACY SAUNDERS	TH EXPLORATION LLC	1/8+	959	289	N/A						
10*21604	9-3-17	B	WILLIAM EDWARD STACY AND JACQUELINE L STACY	TH EXPLORATION LLC	1/8+	958	428	N/A						
10*22616	9-3-17	B	JAMES YOHO AND SANDRA YOHO	TH EXPLORATION LLC	1/8+	968	281	N/A						
10*22618	9-3-17	B	DANIEL YOHO	TH EXPLORATION LLC	1/8+	966	636	N/A						
10*22721	9-3-17	B	WINIFRED G TURNER	TH EXPLORATION LLC	1/8+	988	134	N/A						
10*22796	9-3-17	B	MARLENE YOHO	TH EXPLORATION LLC	1/8+	972	87	N/A						
10*22880	9-3-17	B	GREGORY K GLOVER	TH EXPLORATION LLC	1/8+	977	85	N/A						
10*22881	9-3-17	B	MARLIS GLOVER	TH EXPLORATION LLC	1/8+	977	87	N/A						
10*23033	9-3-17	B	MAXINE BEYSER	TH EXPLORATION LLC	1/8+	977	346	N/A						
10*23034	9-3-17	B	NINA L KOVACS	TH EXPLORATION LLC	1/8+	977	348	N/A						
10*23107	9-3-17	B	JOEL DAMON GLOVER	TH EXPLORATION LLC	1/8+	983	620	N/A						
10*23141	9-3-17	B	DEBORAH A LOMBARDO	TH EXPLORATION LLC	1/8+	984	7	N/A						
10*23142	9-3-17	B	KIMBERLY S GLOVER	TH EXPLORATION LLC	1/8+	984	5	N/A						
10*23161	9-3-17	B	KATHLEEN J GLOVER	TH EXPLORATION LLC	1/8+	983	618	N/A						
10*23162	9-3-17	B	AARON BOYLES AND TRACI BOYLES	TH EXPLORATION LLC	1/8+	983	622	N/A						
10*23163	9-3-17	B	EDWIN WOOLLEY AND DEBORAH L WOOLLEY	TH EXPLORATION LLC	1/8+	983	571	N/A						
10*23176	9-3-17	B	CAROL M YOHO	TH EXPLORATION LLC	1/8+	984	9	N/A						
10*23181	9-3-17	B	MICHAEL L GREENWOOD AND PEGGY ANNE GREENWOOD	TH EXPLORATION LLC	1/8+	983	627	N/A						
10*23192	9-3-17	B	JEFFREY C YOHO	TH EXPLORATION LLC	1/8+	984	472	N/A						
10*23313	9-3-17	B	DIANE DEVAULT	TH EXPLORATION LLC	1/8+	988	136	N/A						
10*23419	9-3-17	B	GARY MCPHERON AND SHELLEY ANN MCPHERON	TH EXPLORATION LLC	1/8+	988	492	N/A						
10*23420	9-3-17	B	SALLY LEE ORTIZ RIVERA	TH EXPLORATION LLC	1/8+	988	490	N/A						
10*23739	9-3-17	B	APPALACHIAN BASIN MINERALS LP	TH EXPLORATION LLC	1/8+	1011	538	N/A						
10*23740	9-3-17	B	PENNMARC RESOURCES II LP	TH EXPLORATION LLC	1/8+	1011	532	N/A						
10*23741	9-3-17	B	MCCROW ENERGY PARTNERS II LLC	TH EXPLORATION LLC	1/8+	1011	515	N/A						
10*23742	9-3-17	B	PURPLEBURGH VENTURES, LLC	TH EXPLORATION LLC	1/8+	1011	536	N/A						
10*23743	9-3-17	B	WILDES MINERAL INTERESTS LLC	TH EXPLORATION LLC	1/8+	1011	534	N/A						
10*23749	9-3-17	B	MARCELLUS TX MINERAL PRTRNR LTD	TH EXPLORATION LLC	1/8+	1012	193	N/A						
10*24781	9-3-17	B	DENISE MARIE ROGERS AND GEORGE M ROGERS	TH EXPLORATION LLC	1/8+	1027	578	N/A						
10*24782	9-3-17	B	RICHARD A HEUSER	TH EXPLORATION LLC	1/8+	1027	572	N/A						

10*24783	9-3-17	B	BRUCE W JOHNSON AND TERRI L JOHNSON	TH EXPLORATION LLC	1/8+	1027	569	N/A						
10*25224	9-3-17	B	MAUREEN WILSON	TH EXPLORATION LLC	1/8+	1030	141	N/A						
10*25701	9-3-17	B	TIMOTHY KRUS AND BARBARA KRUS	TH EXPLORATION LLC	1/8+	1034	239	N/A						
10*25716	9-3-17	B	RUSSELL BREDBENNER	TH EXPLORATION LLC	1/8+	1035	23	N/A						
10*26631	9-3-17	B	JOSEPH R ZBOZIEN	TH EXPLORATION LLC	1/8+	1039	322	N/A						
10*27106	9-3-17	B	JASMINE LEIGH HALL PENA C/O ROBERT HALL	TH EXPLORATION LLC	1/8+	1050	217	N/A						
10*27229	9-3-17	B	KENNETH ANDERSON BY DAVID C WHITE, SP COMM	TH EXPLORATION LLC	1/8+	1068	311	N/A						
10*28092	9-3-17	B	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	TH EXPLORATION LLC	1/8+	1073	370	N/A						
10*28647	9-3-17	B	BRYAN S LEHNER	TH EXPLORATION LLC	1/8+	1076	65	N/A						
10*29613	9-3-17	B	JANE D BEARDEN AND WILLIAM L BEARDEN	TH EXPLORATION LLC	1/8+	1096	374	N/A						
10*29615	9-3-17	B	UNKNOWN HEIRS AND ASSIGNS OF LAWRENCE B OSTREY	TH EXPLORATION LLC	1/8+	1096	343	N/A						
10*29621	9-3-17	B	BRADLEY B LEHNER	TH EXPLORATION LLC	1/8+	1096	362	N/A						
10*29623	9-3-17	B	RACHAEL MARIA MCLARDY	TH EXPLORATION LLC	1/8+	1096	356	N/A						
10*29625	9-3-17	B	HARRY ALBERT RICHARDSON	TH EXPLORATION LLC	1/8+	1096	368	N/A						
10*29627	9-3-17	B	JANET M SMITH	TH EXPLORATION LLC	1/8+	1096	350	N/A						
10*29629	9-3-17	B	UNKNOWN INTEREST OWNERS OF THE BERNARD E KURLICH FAMILY TRUST	TH EXPLORATION LLC	1/8+	1096	335	N/A						
10*29631	9-3-17	B	UNKNOWN INTEREST OWNERS OF THE ROBERT WISE LIVING TRUST	TH EXPLORATION LLC	1/8+	1096	327	N/A						
10*31002	9-3-17	B	MARK F HEUSER	CHEVRON USA INC	1/8+	791	247	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31005	9-3-17	B	GARY KEITH BERGER	CHEVRON USA INC	1/8+	793	358	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31006	9-3-17	B	TERRY WITHEROW AND JAY WITHEROW	CHEVRON USA INC	1/8+	793	375	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31007	9-3-17	B	CAROL D ELMORE	CHEVRON USA INC	1/8+	793	383	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31008	9-3-17	B	NORMA V PRATICO	CHEVRON USA INC	1/8+	794	532	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31009	9-3-17	B	MARGARET LEE HALL	CHEVRON USA INC	1/8+	795	414	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31010	9-3-17	B	JULIANNE ERDOS	CHEVRON USA INC	1/8+	795	57	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31011	9-3-17	B	MARVIN C WILSON	CHEVRON USA INC	1/8+	795	350	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31012	9-3-17	B	JAMES P OVIES	CHEVRON USA INC	1/8+	797	368	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31013	9-3-17	B	BERTHA LYNN KLUG	CHEVRON USA INC	1/8+	797	548	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31014	9-3-17	B	CHERYL FOX BRAUCH	CHEVRON USA INC	1/8+	800	489	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31015	9-3-17	B	CAROL FOX VALLANDINGHAM	CHEVRON USA INC	1/8+	800	564	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31016	9-3-17	B	JESSICA M CHAVEZ	CHEVRON USA INC	1/8+	804	393	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31017	9-3-17	B	PHILIP A WILSON	CHEVRON USA INC	1/8+	805	421	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593

10*31018	9-3-17	B	JUANITA S HATCH LIVING TRUST DTD 2/16/1998	CHEVRON USA INC	1/8+	831	438	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31019	9-3-17	B	EDWARD F WILSON	CHEVRON USA INC	1/8+	813	564	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31020	9-3-17	B	MATTHEW L GROSSAINT	CHEVRON USA INC	1/8+	818	6	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31021	9-3-17	B	TROY THOMAS WILSON	CHEVRON USA INC	1/8+	828	352	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31022	9-3-17	B	ELLA JEAN MCCARDLE	CHEVRON USA INC	1/8+	828	374	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31027	9-3-17	B	LOU ANN GROSSAINT	CHEVRON USA INC	1/8+	829	470	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31029	9-3-17	B	JESSE ALLEN WILSON	CHEVRON USA INC	1/8+	831	355	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31034	9-3-17	B	APRIL DAWN HOGAN	CHEVRON USA INC	1/8+	835	248	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31035	9-3-17	B	KIMBERLY SUE PIERSON	CHEVRON USA INC	1/8+	835	271	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31036	9-3-17	B	JOSEPH RICHARD FOX	CHEVRON USA INC	1/8+	800	546	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31043	9-3-17	B	DIANE M BAYLESS	CHEVRON USA INC	1/8+	798	97	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31044	9-3-17	B	DENNIS M WILSON	CHEVRON USA INC	1/8+	798	97	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31045	9-3-17	B	DAVID H WILSON	CHEVRON USA INC	1/8+	798	77	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31046	9-3-17	B	SANDRA JEAN WILSON	CHEVRON USA INC	1/8+	794	605	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31047	9-3-17	B	MARY CHRISTINE MCKENNA	CHEVRON USA INC	1/8+	795	49	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31048	9-3-17	B	LAURENCE E WILSON JR	CHEVRON USA INC	1/8+	800	154	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31049	9-3-17	B	ROBERT L ARCHER	CHEVRON USA INC	1/8+	803	45	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31050	9-3-17	B	KATHERINE JEAN CONNELLY	CHEVRON USA INC	1/8+	803	30	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31051	9-3-17	B	STEVEN M ARCHER	CHEVRON USA INC	1/8+	803	38	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31052	9-3-17	B	WILLIAM R WISE	CHEVRON USA INC	1/8+	805	407	N/A	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593

10*28092	9-8-7.1	C	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	TH EXPLORATION LLC	1/8+	1073	370	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*28808	9-8-7.1	C	HOLLY MARIE EBERSOLE	TH EXPLORATION LLC	1/8+	1078	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*38639	9-3-15	D	RAYMOND D DOBBS	CHESAPEAKE APPALACHIA LLC	1/8+	677	229	Chesapeake Appalachia LLC to Statoilhydro USA Onshore Properties Inc: 21/565	Chesapeake Appalachia LLC to SWN Production Company LLC: 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC: 33/424	Merger - SWN Exchange Title LLC merged with and into SWN Production Company LLC: 19/624	Statoil USA Onshore Properties Inc changed its name to Equinor USA Onshore Properties Inc: 2/427	SWN Production Company LLC to TH Exploration LLC: 49/635	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/615	
10*25188	9-3-13	E	JEFFREY LEE ALBRIGHT AND HYESOO PARK ALBRIGHT	TH EXPLORATION LLC	1/8+	1029	505	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26914	9-3-13	E	GARY VENUS AND JUNNETT VENUS	TH EXPLORATION LLC	1/8+	1045	449	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26915	9-3-13	E	SHIRLEY GRIFFITHS	TH EXPLORATION LLC	1/8+	1045	453	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19737	9-3-14	F	ALICE BUZZARD	TH EXPLORATION LLC	1/8+	948	195	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19738	9-3-14	F	JAMES R BLAIR	TH EXPLORATION LLC	1/8+	946	318	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19739	9-3-14	F	ROBERT C BLAKE AND LYN BLAKE	TH EXPLORATION LLC	1/8+	946	313	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19740	9-3-14	F	TERRY L BLAKE	TH EXPLORATION LLC	1/8+	946	311	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19741	9-3-14	F	JOHN PURDY AND BRENDA S PURDY	TH EXPLORATION LLC	1/8+	946	308	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19742	9-3-14	F	CAROLE J WOOD	TH EXPLORATION LLC	1/8+	946	316	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19922	9-3-14	F	MARLENE GARIN	TH EXPLORATION LLC	1/8+	946	320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19924	9-3-14	F	CHARLES W DOBBS AND JUDITH M DOBBS	TH EXPLORATION LLC	1/8+	946	322	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19991	9-3-14	F	BRADLEY S SCHERICH AND LEIGH SCHERICH	TH EXPLORATION LLC	1/8+	948	192	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19992	9-3-14	F	GARY F BLAKE AND DORIS E BLAKE	TH EXPLORATION LLC	1/8+	948	197	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21323	9-3-14	F	TODD SCHERICH AND WANDA D SCHERICH	TH EXPLORATION LLC	1/8+	946	324	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22723	9-3-14	F	LINDA SUE BENNETT AND THOMAS BENNETT	TH EXPLORATION LLC	1/8+	968	276	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22769	9-3-14	F	NANCY JO FENN	TH EXPLORATION LLC	1/8+	968	274	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22770	9-3-14	F	REBECCA LYNN RITZ AND THOMAS A RITZ	TH EXPLORATION LLC	1/8+	968	272	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22822	9-3-14	F	DARLA J KLUKAS	TH EXPLORATION LLC	1/8+	974	182	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22824	9-3-14	F	PEGGY ANNETTE GARDNER & ROBERT W GARDNER	TH EXPLORATION LLC	1/8+	974	180	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23227	9-3-14	F	ROGER F CROSS	TH EXPLORATION LLC	1/8+	984	478	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*24396	9-3-14	F	ELEANOR CHAMBERS	TH EXPLORATION LLC	1/8+	1023	166	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26711	9-3-14	F	CNX GAS COMPANY LLC	TH EXPLORATION LLC	1/8+	1074	593	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28446	9-3-14	F	TIMOTHY R LINKOUS	TH EXPLORATION LLC	1/8+	1072	375	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28700	9-3-14	F	ARTHUR AND VERA WORKMAN IRREVOCABLE TRUST	TH EXPLORATION LLC	1/8+	1077	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28854	9-3-14	F	CHARLES HAWKINS AND CONSTANCE HAWKINS	TH EXPLORATION LLC	1/8+	1077	258	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28949	9-3-14	F	SAMUEL W PHIPPS AND ALLISON M PHIPPS	TH EXPLORATION LLC	1/8+	1078	447	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26738	9-9-7	G	JAMES R THOMAS & DEBORAH L THOMAS	TH EXPLORATION LLC	1/8+	1041	153	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22767	9-9-7.2	H	DAVID L KINNEY	TH EXPLORATION LLC	1/8+	970	78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*39474	9-9-8	I	SHERMAN E KNOX SR AND AMARYLISS J KNOX	TH EXPLORATION LLC	1/8+	1120	493	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*39627	7-1-1	J	ANNA D MORRIS	TH EXPLORATION LLC	1/8+	1125	543	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*31110	7-1-5	K	CNX GAS COMPANY LLC	TH EXPLORATION LLC	1/8+	1098	608	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26711	7-1-5.2	L	CNX GAS COMPANY LLC	TH EXPLORATION LLC	1/8+	1074	593	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26711	7-1-5.1	M	CNX GAS COMPANY LLC	TH EXPLORATION LLC	1/8+	1074	593	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*25527	7-7-1	N	JUDY K MATTHEWS	PIKEWOOD ENERGY CORPORATION	1/8+	945	103	N/A	N/A	N/A	N/A	N/A	Pikewood Energy Corporation to American Petroleum Partners Operating LLC: 41/192	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/503	
10*25530	7-7-1	N	KAREN S WHETZAL	PIKEWOOD ENERGY CORPORATION	1/8+	945	99	N/A	N/A	N/A	N/A	N/A	Pikewood Energy Corporation to American Petroleum Partners Operating LLC: 41/192	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/503	
10*25508	7-8-14	O	THE AMY M TOUPS FAMILY TRUST OF 2013 DATED JUNE 14, 2013	FOSSIL CREEK OHIO, LLC	1/8+	827	119	N/A	N/A	N/A	N/A	Fossil Creek Ohio LLC to Gulfport Energy Corporation: 32/337	Gulfport Energy Corporation and Fossil Creek Ohio LLC to American Petroleum Partners Operating LLC: 36/588	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/515	

10*25509	7-8-14	O	ELIZABETH A PADDEN	FOSSIL CREEK OHIO, LLC	1/8+	827	123	N/A	N/A	N/A	N/A	Fossil Creek Ohio LLC to Gulfport Energy Corporation: 32/337	Gulfport Energy Corporation and Fossil Creek Ohio LLC to American Petroleum Partners Operating LLC: 36/588	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/515
10*25510	7-8-14	O	JOHN M PADDEN	FOSSIL CREEK OHIO, LLC	1/8+	827	121	N/A	N/A	N/A	N/A	Fossil Creek Ohio LLC to Gulfport Energy Corporation: 32/337	Gulfport Energy Corporation and Fossil Creek Ohio LLC to American Petroleum Partners Operating LLC: 36/588	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/515

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from EQUINOR USA ONSHORE PROPERTIES, INC., a Delaware corporation ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on October 18, 2021 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 15, 2021 (the "*Acreage Trade Agreement*").

ARTICLE 1
ASSIGNMENT OF ASSETS

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") IN SO FAR AND ONLY IN SO FAR as they cover those lands described on Exhibit A and Exhibit A-1 (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.2 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

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DEC 06 2021

WV Department of
Environmental Protection

01/14/2022



September 1, 2021

WV Department of Environmental Protection
Office of Oil & Gas
601 57th Street, SE
Charleston, WV 25304
Attention: Charles T. Brewer

RECEIVED
Office of Oil and Gas

DEC 06 2021

WV Department of
Environmental Protection

RE: Willett S-8HM

Subject: Marshall County Route 62/1 and County Route 60

Dear Taylor:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 62/1 and County Route 60 in the area reflected on the Willett S-8HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-376-0111, or by email at amorris@tug-hillop.com.

Sincerely,

Amy Morris
Permit Specialist – Appalachia Region
Cell 304-376-0111
Email: amorris@tug-hillop.com

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WV Department of
Environmental Protection

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE CERTIFICATION**

Date of Notice Certification: 11/23/2021

API No. 47- 051 -

Operator's Well No. Willett S-8HM

Well Pad Name: Willett

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83	Easting: <u>529,422.51</u>
County: <u>Marshall</u>		Northing: <u>4,408,180.13</u>
District: <u>Meade</u>	Public Road Access: <u>CR 62 New Bethel Road</u>	
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>CNX Land, LLC</u>	
Watershed: <u>Middle Fish Creek - HUC 10</u>		

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED <input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED <input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH) <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION <input checked="" type="checkbox"/> 5. PUBLIC NOTICE <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION		RECEIVED Office of Oil and Gas DEC 06 2021 WV Department of Environmental Protection	OOG OFFICE USE ONLY <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED
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Required Attachments:

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

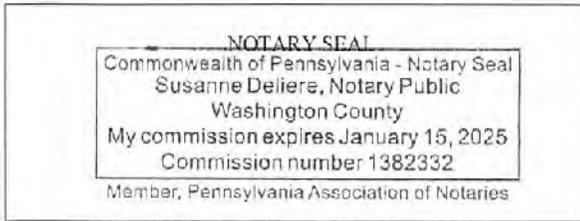
01/14/2022

4705102422

Certification of Notice is hereby given:

THEREFORE, I Amy L. Morris, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Morris <i>Amy L. Morris</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia Region</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amorris@tug-hilop.com</u>



Subscribed and sworn before me this 23rd day of November, 2021
Susanne Deliere Notary Public
 My Commission Expires 1/15/2025

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at deprivacyofficer@wv.gov.

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 WV Department of
 Environmental Protection

01/14/2022

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION**

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**

Date of Notice: 11/23/2021 **Date Permit Application Filed:** 11/24/2021

Notice of:

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
 Name: CNX Land Resources, LLC Attn: Casey Saunders
 Address: 1000 Consol Energy Drive
1000 Consol Energy Drive

COAL OWNER OR LESSEE
 Name: Consolidation Coal Company
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

Name: _____
 Address: _____

COAL OPERATOR
 Name: Marshall County Coal Resources, Inc. Attn: Steve Bair
 Address: 46226 National Road
St. Clairsville, OH 43950

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: _____
 Address: _____
 Name: _____
 Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
 Name: *see attached
 Address: _____

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____
 Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
 Address: _____

*Please attach additional forms if necessary

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 Environmental Protection

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

01/14/2022

Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

WW-6A
(8-13)

API NO. 47- 051 -
OPERATOR WELL NO. Willett S-8HM
Well Pad Name: Willett

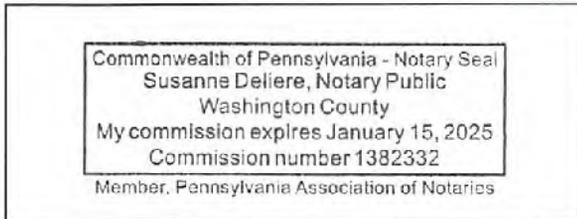
Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: amorris@tug-hilltop.com *amorris*

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.



Subscribed and sworn before me this 12th day of November 2021
Susanne Deliere Notary Public
My Commission Expires 1/15/2025

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Exhibit WW-6A

Supplement Pg. 1A

Tug Hill Operating, LLC
 380 Southpointe Blvd, Suite 200
 Cannonsburg, PA 15137

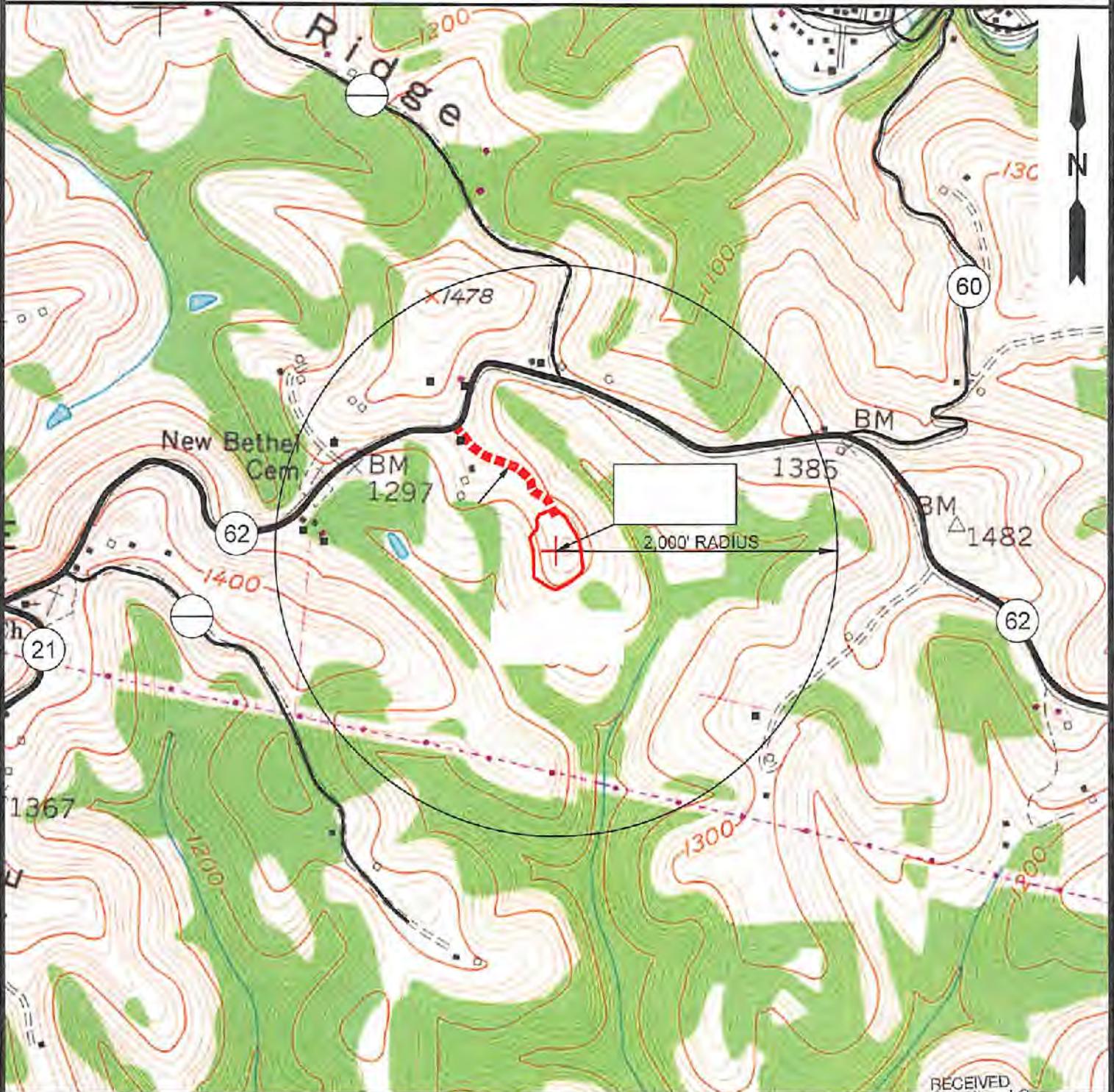
Residences within Two-Thousand Feet (2,000')

Well: Willett S – 8HM
 District: Meade
 State: WV

There are eight (8) residences, no business or commercial sites, no churches, no schools or emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p>Residence (#1) TM 8 Pcl. 6 CNX Land, LLC Phone: None Found Physical Address: 819 New Bethel Rd Glen Easton, WV 26039 Tax Address: 1000 Consol Energy Dr. Canonsburg, PA 15317-6506</p>	<p>Residence (#2) TM 8 Pcl. 6.1 Kayla E. Bratton Phone: 304-845-8266 Physical Address: Kayla Bratton (Reverse Address) 860 New Bethel Rd Glen Easton, WV 26039 Tax Address: Same</p>	<p>Residence (#3) TM 8 Pcl. 5.2 Amy Evans & Karen Whetzal Phone: 304-686-2827; 304-843-0902 (Larry Conkle) Physical Address: Larry Conkle (Reverse Address) 756 New Bethel Rd Glen Easton, WV 26039 Tax Address: Same</p>
<p>Residence (#4) TM 3 Pcl. 17 CNX Land, LLC Phone: 304-845-0038 (Leah Kestner) Physical Address: Leah Kestner (Reverse Address) 40 Carmichael Ln Glen Easton, WV 26039 Tax Address: 1000 Consol Energy Dr. Canonsburg, PA 15317-6506</p>	<p>Residence (#5) TM 8 Pcl. 9 James Richard Blake, Et Ux Phone: None Found – Reverse Address Physical Address: 295 Homestead Ln. Glen Easton, WV 26039 Tax Address: Same</p>	<p>Residence (#6) TM 8 Pcl. 5.1 Raymond E. & Cindy L. White Phone: 304-845-4529 (Raymond White) Physical Address: Ruth Siburt (Reverse Address) 575 New Bethel Rd Glen Easton, WV 26039 Tax Address: 656 New Bethel Rd. Glen Easton, WV 26039</p>
<p>Residence (#7) TM 3 Pcl. 19 Raymond E. & Cindy L. White Phone: 304-845-4529 (Raymond White); 903-276-5846 (Gary Whitlatch) Physical Address: Gary Whitlatch (Reverse Address) 569 New Bethel Rd Glen Easton, WV 26039 Tax Address: 656 New Bethel Rd. Glen Easton, WV 26039</p>	<p>Residence (#8) TM 3 Pcl. 18.2 Raymond E. & Cindy L. White Phone: 304-845-4529; 304-843-5087 (Matthew Meyer) Physical Address: Matthew Meyer (Reverse Address) 692 New Bethel Rd Glen Easton, WV 26039 Tax Address: 656 New Bethel Rd Glen Easton, WV 26039</p>	<p style="text-align: center;">RECEIVED Office of Oil and Gas DEC 06 2021 WV Department of Environmental Protection</p>

PROPOSED WILLETT S - 8HM



NOTE: THERE APPEARS TO BE EIGHT (8) POSSIBLE WATER SOURCES WITHIN 2,000'.

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12 Venkora Drive | P.O. Box 150 | Glenville, WV 26031 | 304.462.5634
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3932
 254 East Beckley Bypass | Beckley, WV 25801 | 304.259.5295
 slswv.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8939	09/14/2021	1" = 1000'



WV Department of
Environmental Protection
TUG HILL
OPERATING

01/14/2022

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 6/4/2019 **Date of Planned Entry:** 6/11/2019

Delivery method pursuant to West Virginia Code § 22-6A-10a

- PERSONAL SERVICE
 REGISTERED MAIL
 METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: CNX Land Resources, LLC Attn: Casey Saunders ✓
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

Name: _____
 Address: _____

Name: _____
 Address: _____

COAL OWNER OR LESSEE

Name: Consolidation Coal Company ✓
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Appalachian Basin Minerals, LP *See attached list ✓
 Address: 8235 Douglas Avenue, Suite 815
Dallas, TX 75225

*please attach additional forms if necessary

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Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.82306349; -80.85626349</u>
County: <u>Marshall</u>	Public Road Access: <u>New Bethel Road (County Route 62)</u>
District: <u>Meade</u>	Watershed: <u>Middle Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>CNX Land Resources, LLC</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: <u>Tug Hill Operating, LLC</u>	Address: <u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
Telephone: <u>724-749-8388</u>	<u>Canonsburg, PA 15317</u>
Email: <u>amiller@tug-hillcop.com</u>	Facsimile: <u>724-338-2030</u>

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

01/14/2022

WW-6A3 Notice of Entry for Plat Survey**Willet Pad
Additional Mineral Owners**

Carol Vallandingham
2430 Venetian Way
Burlington, KY 41005

Cheryl Brauch
6670 Snead Ln.
Florence, KY 41042

Teresa R. Fox
106 Brookside Ave
Ewing, NJ 08638

Juanita S. Hatch
1437 North Overland Trails Dr.
Washington, UT 84780

Bruce Johnson
6272 Highland Meadows Dr
Medina, OH 44256

Diane DeVault
9315 Brandywine Rd
Northfield, OH 44067

Bertha Lynn Klug
47 Shutler Ln.
Proctor, WV 26055

Marcellus TX Mineral Partners, Ltd.
307 West 7th St, Ste 1110
Fort Worth, TX 76102

McCrow Energy Partners II, LLC
8235 Douglas Ave., Ste 815
Dallas, TX 75225

Matthew Grossaint
4820 132 Pl SE
Mill Creek, WA 96012

Lou Ann Grossaint
1920 S. Atlantic St
Boise, ID 83705

Rachel Marie McLardy
5808 Medusa St
P.O. Box 931
Sechelt, British Columbia, VON 3A0

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4705102422

PennMarc Resources II, LP
2 East Market St., Ste 1
Clearfield, PA 16830

Purpleburgh Ventures, LLC
4675 Carfefree Trail
Parker, CO 80134

Wildes Mineral Interests, LLC
3517 Gillon Ave.
Dallas, TX 75205

Phillip A. Wilson
1715 Lancaster Dr
Youngstown, OH 44511

Jessica M. Chavez
5525 Alta Verde Cir
Arlington, TX 76017

Edward F. Wilson
2933 Hastings Dr
Grand Prairie, TX 75052

Denise Marie Rogers
9671 King Graves Rd NE
Warren, OH 44484

Julianne Erdos
119 Noran Cir
Bedford, OH 44146

The Robert Wise Living Trust
Trustee: Shirley Hagenbaugh
529 Genoa Dr
Kissimmee, FL 34759

Harry Albert Richardson
19819 10th Ave NW
Shoreline, WA 98177

Rev. Jane D. Bearden
19106 Timothy's Manor Ct
Parkton, MD 21120

Janet M. Smith
122 Kandahar Dr
East Aurora, NY 14052

Brad Lehner
2570 Chasewood Ct
Aurora, IL 60502

Bryan S. Lehner
372 5th Ave Apt 4J
New York, NY 10018

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Barbara Krus
421 Fox Chapel Dr
Lutherville Timonium, MD 21093

Maureen Wilson
12 Juliet Ln Apt 102
Nottingham, MD 21236

Russell Bredbenner
965 Seybert St
Hazelton, PA 18201

Joseph R. Zbozien
704 Pontiac Ave
Brooklyn, MD 21225

Jasmine Lee Hall Pena
c/o Robert A Hall
4400 Falls Rd
Baltimore, MD 21211

William Edward Stacy
116 Ocoee Falls Dr
Chapel Hill, NC 27517

Carol Stacy Saunders
4149 Andros Way
Oceanside, CA 92056

Carol D. Elmore
6461 Mesquite Dr
Midlothian, TX 76065

James S. Wilson
6306 Farley Dr
San Diego, CA 92122

Margaret Lee Hall
2910 Avenida De Autlan
Camarillo, CA 93010

Marvin Wilson
214 Saint Andrews Cir
Oxford, MS 38655

James Ovies
1204 5th St
Moundsville, WV 26041

Rick Heuser
162 Lawrence Lane
Reynoldsburg, OH 43068

Mark Heuser
209 Cherokee Ct
Pickerington, OH 43147

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Cindy Lee Richmond
157 Richmond Ln
Glen Easton, WV 26039

Berger Boys, LLC
1305 Center St
Moundsville, WV 26041

Ella Jean McCardle
348 Fairmont Ave
Wheeling, WV 26003

Jesse Allen Wilson
49 Forest Hill Dr
Glen Dale, WV 26038

Troy Thomas Wilson
49 Forest Hill Dr
Glen Dale, WV 26038

April Dawn Hogan
5032 Castleman Run Rd
Bethany, WV 26032

Kimberly Sue Pierson
30 Forest Hill Dr
Glen Dale, WV 26038

Kenneth R. Anderson
1706 N Washington Ave
Springfield, MO 65803

Charles Pratico
25 Hamilton Ave
Princeton, NJ 08542

Marietta Agocs
50 Orourke Dr Apt O
Trenton, NJ 08691

Eileen Sennett
10 Orchard Dr
Chesterfield, NJ 08515

Patricia Cassady
46 Heather Narrows
Toms River, NJ 08755

Sharon Bucci
120 7th Ave
Seaside Park, NJ 08752

Amy Pratico
19 E Railroad Ave
Jamesburg, NJ 08831

✓

01/14/2022

Abigail Constance
612 East Rd
Middletown, NJ 07748

Rachel Constance
36 Cherokee Ave
Rockaway, NJ 07866

Lawrence Bernard Ostry Estate, by
Rachael Marie McLardy as Trustee
5808 Medusa Street, PO Box 931
Sechely, British Columbia, V0N 3A0

The Bernard E. Kurlich Family Trust
c/o Richard P. Martin Co. L.P.A.
3603 Darrow Rd.
Stow, OH 44224

Joseph Richard Fox
2116 Autumn Way
Melbourne, FL 32935

Norma V. Pratico
821 River Road
Yardley, PA 19067

James R. Blair
1400 10th Street
Moundsville, WV 26041

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

September 3, 2021

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Willett Pad, Marshall County
Willett S-8HM Well Site ✓

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2019-0352 which has been issued to Tug Hill Operating for access to the State Road for a well site located off Marshall County Route 62 SLS MP 0.80.

This operator is in compliance with §22-6A-20 of the WV Code. Operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated October 1, 2018. This letter is valid for permitting purposes for one year from the date of this letter.

Very Truly Yours,

Gary K. Clayton, P.E.
Regional Maintenance Engineer
Central Office O&G Coordinator

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WV Department of
Environmental Protection

Cc: Amy Morris
Tug Hill Operating
CH, OM, D-6
File



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Willett Wells

PRODUCT NAME:	CHEMICAL DESCRIPTION:	PRODUCT USE:	HAZARDOUS COMPONENT:
GBW-20C	Hemicellulase Breaker	Breaker - Water	None
ALPHA 1427		Biocide	Glutaraldehyde – CAS#000111-30-8 Quaternary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) – CAS#068424-85-1 Ethanol – CAS# 000064-17-5 Water – CAS# 007732-18-5
FRAC SAND	Silica Sand (various Mesh sizes)	Proppant	Crystalline silica (quartz) CAS# 14808-60-7
S-8C, Sand	Silica Sand (100 mesh)	Sand	Silica – CAS# 14808-60-7
GW-3LDF		Gellant - Water	Petroleum Distillate Blend – Proprietary, (Not Associated with Diesel Fuel) Guar gum – CAS# 009000-30-0
FRW-18		Friction Reducer	Hydrotreated light distillate CAS# 064742-47-8
Scaletrol		Scale Inhibitor	Ethylene glycol – CAS# 000107-21-1 Diethylene glycol – CAS# 000111-46-6

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