



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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Thursday, June 27, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for GOUDY 1S-8HM
47-051-02228-00-00

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: GOUDY 1S-8HM
Farm Name: TH EXPLORATION III, LLC
U.S. WELL NUMBER: 47-051-02228-00-00
Horizontal 6A New Drill
Date Issued: 6/27/2019

PERMIT CONDITIONS

4705102228

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

PERMIT CONDITIONS 4705102228

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

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

1) Well Operator: Tug Hill Operating, LLC Operator ID: 494510851 County: Marshall District: Franklin Quadrangle: New Martinsville

2) Operator's Well Number: Goudy 1S-8HM Well Pad Name: Goudy

3) Farm Name/Surface Owner: TH Exploration III, LLC Public Road Access: Wells Hill Road (County Route 2/2)

4) Elevation, current ground: 1242' Elevation, proposed post-construction: 1242'

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 6379 - 6437' thickness of 58' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,537'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 12,505'

11) Proposed Horizontal Leg Length: 5,548.49'

12) Approximate Fresh Water Strata Depths: 70', 862'

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13) Method to Determine Fresh Water Depths: Use shallow offset wells to determine deepest freshwater. Or determine using predrill tests, testing while drilling or petrophysical evaluation of resistivity.

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14) Approximate Saltwater Depths: 2,167'

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15) Approximate Coal Seam Depths: Sewickly Coal - 761' and Pittsburgh Coal - 856'

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

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

(a) If Yes, provide Mine Info: Name: Depth: Seam: Owner:

WW-6B
(04/15)

API NO. 47-051 - 02050
OPERATOR WELL NO. Goudy 1S-8HM
Well Pad Name: Goudy

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	13 3/8"	NEW	H40	48#	970'	970'	1024ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	970'	970'	1024ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,654'	2,654'	879ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	12,505'	12,505'	3200ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,482'	
Liners							

JW
3/25/19

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	13 3/8"	17 1/2"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	1,730	1,384	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	9,000	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960	RECEIVED	
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PACKERS

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

JW
3/27/19

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 13,867,500 lb. proppant and 214,402 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 11.56 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.81 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:

*See Attachment

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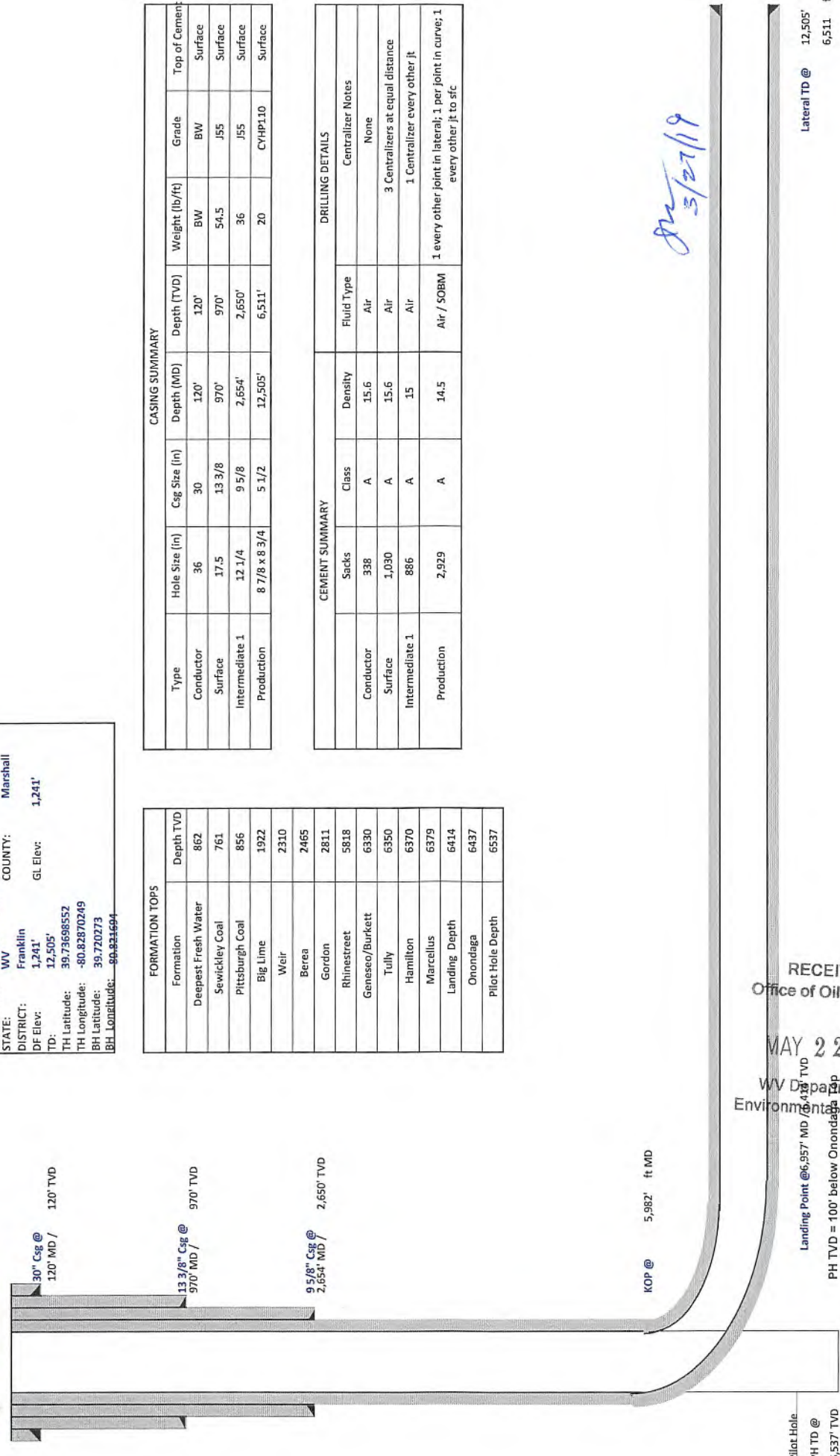
25) Proposed borehole conditioning procedures:

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.



WELL NAME: Goudy 1S-8HM COUNTY: Marshall
 STATE: WV DISTRICT: Franklin
 DF Elev: 1,241' GI Elev: 1,241'
 TD: 12,505'
 TH Latitude: 39.73698552
 TH Longitude: -80.82870249
 BH Latitude: 39.720273
 BH Longitude: 99.821694



FORMATION TOPS

Formation	Depth TVD
Deepest Fresh Water	862
Sewickley Coal	761
Pittsburgh Coal	856
Big Lime	1922
Weir	2310
Berea	2465
Gordon	2811
Rhonestreet	5818
Genesee/Burkett	6330
Tully	6350
Hamilton	6370
Marcellus	6379
Landing Depth	6414
Onondaga	6437
Pilot Hole Depth	6537

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'	BW	BW	Surface
Surface	17.5	13 3/8	970'	970'	54.5	J55	Surface
Intermediate 1	12.1/4	9 5/8	2,654'	2,650'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	12,505'	6,511'	20	CY-HP110	Surface

CEMENT SUMMARY

Type	Sacks	Class	Density	Fluid Type		Centralizer Notes
				Class	Density	
Conductor	338	A	15.6	Air	None	
Surface	1,030	A	15.6	Air	3 Centralizers at equal distance	
Intermediate 1	886	A	15	Air	1 Centralizer every other ft	
Production	2,929	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to sfc	

DRILLING DETAILS

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Lateral TD @ 12,505' ft MD
 6,511' ft TVD



Tug Hill Operating, LLC Casing and Cement Program

Goudy 1S-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"	970'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,654'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	12,505'	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 15.6 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 15.2ppg, Y = 1.19

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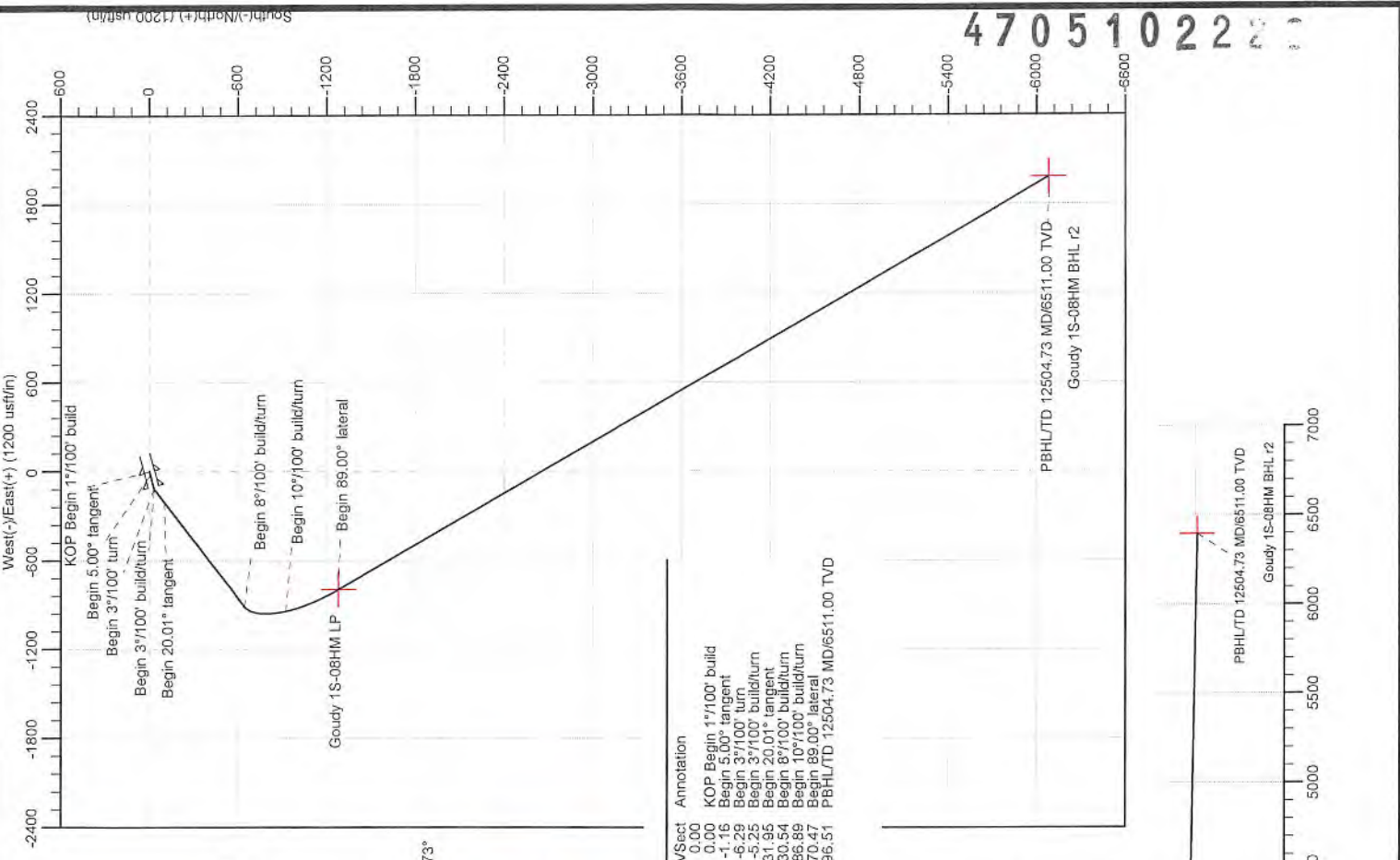
Well: Goudy 1S-08HM (I)
Site: Goudy
Project: Marshall County, West Virginia.
Design: rev2

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: RKB=1241+13 @ 1254.00usft
 Northing: 14431007.47
 Easting: 1688572.26
 Longitude: 80.82870249
 Latitude: 39.73698552

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.73°

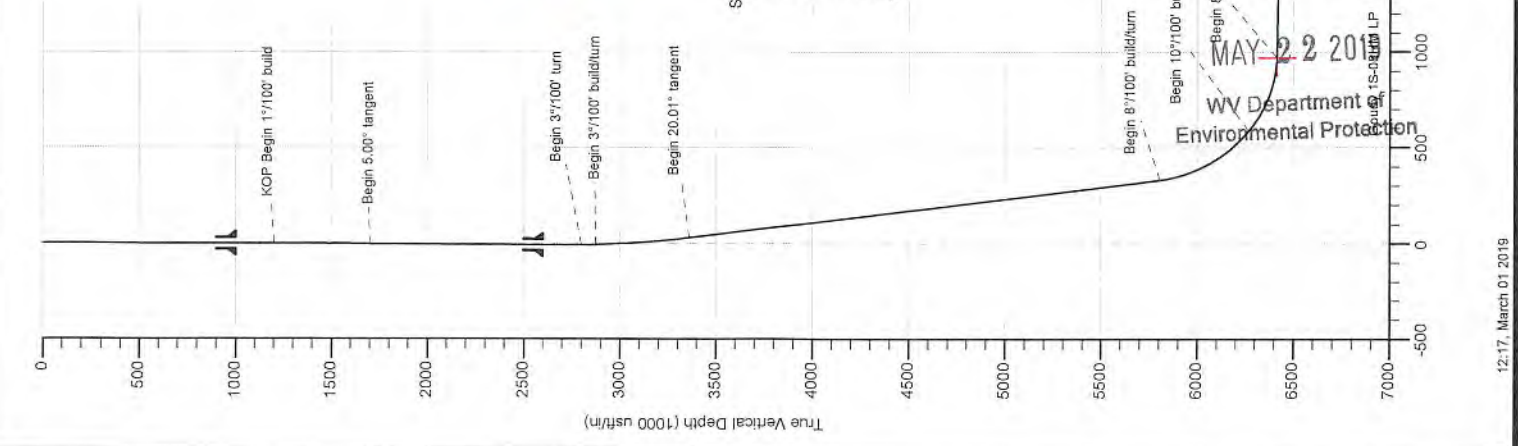


Azinuths to Grid North
 True North: -0.11°
 Magnetic North: -8.73°
 Magnetic Field
 Strength: 52056.3snrT
 Dip Angle: 66.86°
 Date: 5/11/2018
 Model: IGRF2015



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 1°/100' build
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	Begin 5.00° tangent
3	1700.00	5.00	255.00	1599.37	-5.64	-21.06	1.00	255.00	-1.16	Begin 3°/100' turn
4	2804.84	5.00	255.00	2800.00	-30.57	-114.07	0.00	0.00	-6.29	Begin 20.01° tangent
5	2877.92	5.00	229.64	2672.81	-33.45	-119.58	3.00	-102.63	-5.25	Begin 8°/100' build/turn
6	3378.57	20.01	232.36	3360.19	-100.28	-204.53	3.60	31.95	330.54	Begin 10°/100' build/turn
7	5981.72	20.01	167.33	5268.51	-644.28	-909.98	0.00	0.00	586.89	Begin 89.00° lateral
8	6536.55	50.00	149.98	6414.00	-923.71	-940.07	8.00	-83.12	586.89	Begin 89.00° lateral
9	6957.27	89.00	149.98	6414.00	-1279.15	-792.82	10.00	-26.43	970.47	PBHL/TD 12504.73 MD/6511.00 TVD
10	12504.73	89.00	149.98	6511.00	-6081.58	1982.35	0.00	0.00	6396.51	PBHL/TD 12504.73 MD/6511.00 TVD



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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Goudy 1S-08HM (I)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1241+13 @ 1254.00usft
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1241+13 @ 1254.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-08HM (I)	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 (84 W to 78 W)		

Site	Goudy				
Site Position:		Northing:	14,430,942.40 usft	Latitude:	39.73680688
From:	Lat/Long	Easting:	1,688,559.77 usft	Longitude:	-80.82874732
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.11 °

Well	Goudy 1S-08HM (I)					
Well Position	+N/-S	0.00 usft	Northing:	14,431,007.47 usft	Latitude:	39.73698552
	+E/-W	0.00 usft	Easting:	1,688,572.25 usft	Longitude:	-80.82870249
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	1,241.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/11/2018	-8.62	66.86	52,058.29004157

Design	rev2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	161.95

Plan Survey Tool Program	Date	3/1/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	12,504.73 rev2 (Original Hole)	MWD MWD - Standard	

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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Goudy 1S-08HM (I)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1241+13 @ 1254.00usft
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1241+13 @ 1254.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-08HM (I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,700.00	5.00	255.00	1,699.37	-5.64	-21.06	1.00	1.00	0.00	255.00	
2,804.84	5.00	255.00	2,800.00	-30.57	-114.07	0.00	0.00	0.00	0.00	
2,877.92	5.00	229.64	2,872.81	-33.45	-119.58	3.00	0.00	-34.70	-102.63	
3,378.57	20.01	232.36	3,360.19	-100.28	-204.53	3.00	3.00	0.54	3.60	
5,981.72	20.01	232.36	5,806.16	-644.28	-909.98	0.00	0.00	0.00	0.00	
6,536.56	50.00	167.33	6,268.51	-923.71	-940.07	8.00	5.40	-11.72	-83.12	
6,957.27	89.00	149.98	6,414.00	-1,279.15	-792.82	10.00	9.27	-4.12	-26.43	
12,504.73	89.00	149.98	6,511.00	-6,081.58	1,982.35	0.00	0.00	0.00	0.00	Goudy 1S-08HM BHL

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Planning Report - Geographic

4705102228

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Goudy
 Well: Goudy 1S-08HM (I)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Goudy 1S-08HM (I)
 TVD Reference: RKB=1241+13 @ 1254.00usft
 MD Reference: RKB=1241+13 @ 1254.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
100.00	0.00	0.00	100.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
200.00	0.00	0.00	200.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
300.00	0.00	0.00	300.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
400.00	0.00	0.00	400.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
500.00	0.00	0.00	500.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
600.00	0.00	0.00	600.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
700.00	0.00	0.00	700.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
800.00	0.00	0.00	800.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
900.00	0.00	0.00	900.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,431,007.47	1,688,572.25	39.73698552	-80.82870249	
KOP Begin 1°/100' build										
1,300.00	1.00	255.00	1,299.99	-0.23	-0.84	14,431,007.25	1,688,571.41	39.73698491	-80.82870549	
1,400.00	2.00	255.00	1,399.96	-0.90	-3.37	14,431,006.57	1,688,568.88	39.73698306	-80.82871449	
1,500.00	3.00	255.00	1,499.86	-2.03	-7.58	14,431,005.44	1,688,564.67	39.73697998	-80.82872948	
1,600.00	4.00	255.00	1,599.68	-3.61	-13.48	14,431,003.86	1,688,558.77	39.73697567	-80.82875047	
1,700.00	5.00	255.00	1,699.37	-5.64	-21.06	14,431,001.83	1,688,551.19	39.73697013	-80.82877744	
Begin 5.00° tangent										
1,800.00	5.00	255.00	1,798.99	-7.90	-29.48	14,430,999.57	1,688,542.77	39.73696398	-80.82880740	
1,900.00	5.00	255.00	1,898.60	-10.15	-37.90	14,430,997.32	1,688,534.36	39.73695783	-80.82883737	
2,000.00	5.00	255.00	1,998.22	-12.41	-46.32	14,430,995.06	1,688,525.94	39.73695168	-80.82886733	
2,100.00	5.00	255.00	2,097.84	-14.67	-54.73	14,430,992.81	1,688,517.52	39.73694553	-80.82889729	
2,200.00	5.00	255.00	2,197.46	-16.92	-63.15	14,430,990.55	1,688,509.10	39.73693938	-80.82892725	
2,300.00	5.00	255.00	2,297.08	-19.18	-71.57	14,430,988.30	1,688,500.68	39.73693323	-80.82895721	
2,400.00	5.00	255.00	2,396.70	-21.43	-79.99	14,430,986.04	1,688,492.26	39.73692708	-80.82898717	
2,500.00	5.00	255.00	2,496.32	-23.69	-88.41	14,430,983.78	1,688,483.84	39.73692093	-80.82901714	
2,600.00	5.00	255.00	2,595.94	-25.94	-96.83	14,430,981.53	1,688,475.43	39.73691478	-80.82904710	
2,700.00	5.00	255.00	2,695.56	-28.20	-105.25	14,430,979.27	1,688,467.01	39.73690863	-80.82907706	
2,800.00	5.00	255.00	2,795.18	-30.46	-113.66	14,430,977.02	1,688,458.59	39.73690248	-80.82910702	
2,804.84	5.00	255.00	2,800.00	-30.57	-114.07	14,430,976.91	1,688,458.18	39.73690218	-80.82910847	
Begin 3°/100' turn										
2,877.92	5.00	229.64	2,872.81	-33.45	-119.58	14,430,974.02	1,688,452.68	39.73689428	-80.82912807	
Begin 3°/100' build/turn										
2,900.00	5.66	230.06	2,894.80	-34.77	-121.14	14,430,972.70	1,688,451.11	39.73689065	-80.82913365	
3,000.00	8.66	231.17	2,994.01	-42.66	-130.79	14,430,964.81	1,688,441.46	39.73686904	-80.82916802	
3,100.00	11.66	231.70	3,092.43	-53.65	-144.59	14,430,953.83	1,688,427.67	39.73683895	-80.82921717	
3,200.00	14.66	232.03	3,189.79	-67.69	-162.49	14,430,939.78	1,688,409.76	39.73680046	-80.82928096	
3,300.00	17.66	232.24	3,285.83	-84.77	-184.46	14,430,922.70	1,688,387.80	39.73675388	-80.82935921	
3,378.57	20.01	232.36	3,360.19	-100.28	-204.53	14,430,907.20	1,688,367.73	39.73671200	-80.82943070	
Begin 20.01° tangent										
3,400.00	20.01	232.36	3,380.33	-104.76	-210.33	14,430,902.72	1,688,361.92	39.73669893	-80.82945139	
3,500.00	20.01	232.36	3,474.29	-125.65	-237.43	14,430,881.82	1,688,334.82	39.73664168	-80.82954793	
3,600.00	20.01	232.36	3,568.25	-146.55	-264.53	14,430,860.92	1,688,307.72	39.73658443	-80.82964447	
3,700.00	20.01	232.36	3,662.21	-167.45	-291.63	14,430,840.02	1,688,280.62	39.73652718	-80.82974101	
3,800.00	20.01	232.36	3,756.17	-188.35	-318.73	14,430,819.13	1,688,253.52	39.73646993	-80.82983755	
3,900.00	20.01	232.36	3,850.14	-209.24	-345.83	14,430,798.23	1,688,226.42	39.73641268	-80.82993409	
4,000.00	20.01	232.36	3,944.10	-230.14	-372.93	14,430,777.33	1,688,199.32	39.73635543	-80.83003063	
4,100.00	20.01	232.36	4,038.06	-251.04	-400.03	14,430,756.43	1,688,172.22	39.73629818	-80.83012716	
4,200.00	20.01	232.36	4,132.02	-271.94	-427.13	14,430,735.54	1,688,145.12	39.73624093	-80.83022370	
4,300.00	20.01	232.36	4,225.98	-292.84	-454.23	14,430,714.64	1,688,118.02	39.73618368	-80.83032024	
4,400.00	20.01	232.36	4,319.95	-313.73	-481.33	14,430,693.74	1,688,090.92	39.73612643	-80.83041678	
4,500.00	20.01	232.36	4,413.91	-334.63	-508.43	14,430,672.84	1,688,063.82	39.73606918	-80.83051332	

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Planning Report - Geographic

4705102222

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Goudy 1S-08HM (I)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1241+13 @ 1254.00usft
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1241+13 @ 1254.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-08HM (I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,600.00	20.01	232.36	4,507.87	-355.53	-535.53	14,430,651.94	1,688,036.72	39.73601193	-80.83060986	
4,700.00	20.01	232.36	4,601.83	-376.43	-562.63	14,430,631.05	1,688,009.62	39.73595467	-80.83070640	
4,800.00	20.01	232.36	4,695.79	-397.32	-589.73	14,430,610.15	1,687,982.52	39.73589742	-80.83080293	
4,900.00	20.01	232.36	4,789.76	-418.22	-616.83	14,430,589.25	1,687,955.42	39.73584017	-80.83089947	
5,000.00	20.01	232.36	4,883.72	-439.12	-643.93	14,430,568.35	1,687,928.32	39.73578292	-80.83099601	
5,100.00	20.01	232.36	4,977.68	-460.02	-671.03	14,430,547.46	1,687,901.22	39.73572567	-80.83109255	
5,200.00	20.01	232.36	5,071.64	-480.92	-698.13	14,430,526.56	1,687,874.12	39.73566842	-80.83118908	
5,300.00	20.01	232.36	5,165.60	-501.81	-725.23	14,430,505.66	1,687,847.02	39.73561117	-80.83128562	
5,400.00	20.01	232.36	5,259.57	-522.71	-752.33	14,430,484.76	1,687,819.92	39.73555391	-80.83138216	
5,500.00	20.01	232.36	5,353.53	-543.61	-779.43	14,430,463.86	1,687,792.82	39.73549666	-80.83147870	
5,600.00	20.01	232.36	5,447.49	-564.51	-806.53	14,430,442.97	1,687,765.72	39.73543941	-80.83157523	
5,700.00	20.01	232.36	5,541.45	-585.40	-833.64	14,430,422.07	1,687,738.62	39.73538216	-80.83167177	
5,800.00	20.01	232.36	5,635.41	-606.30	-860.74	14,430,401.17	1,687,711.52	39.73532491	-80.83176831	
5,900.00	20.01	232.36	5,729.38	-627.20	-887.84	14,430,380.27	1,687,684.42	39.73526765	-80.83186484	
5,981.72	20.01	232.36	5,806.16	-644.28	-909.98	14,430,363.20	1,687,662.27	39.73522087	-80.83194373	
Begin 8°/100' build/turn										
6,000.00	20.24	228.16	5,823.33	-648.30	-914.81	14,430,359.18	1,687,657.44	39.73520985	-80.83196095	
6,100.00	23.06	207.74	5,916.40	-677.22	-936.85	14,430,330.26	1,687,635.40	39.73513055	-80.83203953	
6,200.00	27.87	192.77	6,006.75	-717.41	-951.16	14,430,290.06	1,687,621.10	39.73502024	-80.83209068	
6,300.00	33.83	182.30	6,092.62	-768.10	-957.45	14,430,239.37	1,687,614.80	39.73488106	-80.83211342	
6,400.00	40.42	174.78	6,172.35	-828.30	-955.62	14,430,179.18	1,687,616.63	39.73471573	-80.83210729	
6,500.00	47.39	169.09	6,244.38	-896.83	-945.69	14,430,110.64	1,687,626.56	39.73452746	-80.83207243	
6,536.56	50.00	167.33	6,268.51	-923.71	-940.07	14,430,083.76	1,687,632.18	39.73445361	-80.83205262	
Begin 10°/100' build/turn										
6,600.00	55.73	163.92	6,306.80	-972.66	-927.47	14,430,034.82	1,687,644.79	39.73431913	-80.83200811	
6,700.00	64.93	159.38	6,356.27	-1,054.96	-900.00	14,429,952.51	1,687,672.25	39.73409296	-80.83191098	
6,800.00	74.24	155.49	6,391.12	-1,141.35	-864.00	14,429,866.12	1,687,708.25	39.73385552	-80.83178349	
6,900.00	83.62	151.94	6,410.31	-1,229.21	-820.55	14,429,778.27	1,687,751.70	39.73361401	-80.83162953	
6,957.27	89.00	149.98	6,414.00	-1,279.15	-792.82	14,429,728.32	1,687,779.44	39.73347671	-80.83153122	
Begin 89.00° lateral										
7,000.00	89.00	149.98	6,414.75	-1,316.14	-771.44	14,429,691.33	1,687,800.81	39.73337501	-80.83145543	
7,100.00	89.00	149.98	6,416.50	-1,402.71	-721.42	14,429,604.76	1,687,850.84	39.73313701	-80.83127807	
7,200.00	89.00	149.98	6,418.24	-1,489.28	-671.39	14,429,518.19	1,687,900.86	39.73289900	-80.83110071	
7,300.00	89.00	149.98	6,419.99	-1,575.85	-621.36	14,429,431.62	1,687,950.89	39.73266099	-80.83092335	
7,400.00	89.00	149.98	6,421.74	-1,662.42	-571.34	14,429,345.05	1,688,000.92	39.73242298	-80.83074599	
7,500.00	89.00	149.98	6,423.49	-1,748.99	-521.31	14,429,258.48	1,688,050.94	39.73218498	-80.83056864	
7,600.00	89.00	149.98	6,425.24	-1,835.56	-471.29	14,429,171.91	1,688,100.97	39.73194697	-80.83039128	
7,700.00	89.00	149.98	6,426.99	-1,922.13	-421.26	14,429,085.34	1,688,150.99	39.73170896	-80.83021393	
7,800.00	89.00	149.98	6,428.74	-2,008.70	-371.23	14,428,998.77	1,688,201.02	39.73147095	-80.83003658	
7,900.00	89.00	149.98	6,430.48	-2,095.27	-321.21	14,428,912.20	1,688,251.05	39.73123295	-80.82985922	
8,000.00	89.00	149.98	6,432.23	-2,181.84	-271.18	14,428,825.63	1,688,301.07	39.73099494	-80.82968187	
8,100.00	89.00	149.98	6,433.98	-2,268.41	-221.16	14,428,739.06	1,688,351.10	39.73075693	-80.82950453	
8,200.00	89.00	149.98	6,435.73	-2,354.98	-171.13	14,428,652.49	1,688,401.12	39.73051892	-80.82932718	
8,300.00	89.00	149.98	6,437.48	-2,441.55	-121.10	14,428,565.92	1,688,451.15	39.73028091	-80.82914983	
8,400.00	89.00	149.98	6,439.23	-2,528.12	-71.08	14,428,479.35	1,688,501.17	39.73004290	-80.82897249	
8,500.00	89.00	149.98	6,440.98	-2,614.69	-21.05	14,428,392.78	1,688,551.20	39.72980489	-80.82879514	
8,600.00	89.00	149.98	6,442.72	-2,701.26	28.97	14,428,306.21	1,688,601.23	39.72956688	-80.82861780	
8,700.00	89.00	149.98	6,444.47	-2,787.83	79.00	14,428,219.64	1,688,651.25	39.72932887	-80.82844046	
8,800.00	89.00	149.98	6,446.22	-2,874.40	129.03	14,428,133.07	1,688,701.28	39.72909086	-80.82826312	
8,900.00	89.00	149.98	6,447.97	-2,960.97	179.05	14,428,046.50	1,688,751.30	39.72885285	-80.82808578	
9,000.00	89.00	149.98	6,449.72	-3,047.54	229.08	14,427,959.93	1,688,801.33	39.72861484	-80.82790844	
9,100.00	89.00	149.98	6,451.47	-3,134.11	279.10	14,427,873.36	1,688,851.36	39.72837682	-80.82773111	
9,200.00	89.00	149.98	6,453.22	-3,220.68	329.13	14,427,786.79	1,688,901.38	39.72813881	-80.82755377	
9,300.00	89.00	149.98	6,454.96	-3,307.25	379.15	14,427,700.22	1,688,951.41	39.72790080	-80.82737644	

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West Virginia Department of Environmental Protection



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Goudy 1S-08HM (I)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1241+13 @ 1254.00usft
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1241+13 @ 1254.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-08HM (I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,400.00	89.00	149.98	6,456.71	-3,393.82	429.18	14,427,613.65	1,689,001.43	39.72766279	-80.82719910
9,500.00	89.00	149.98	6,458.46	-3,480.39	479.21	14,427,527.08	1,689,051.46	39.72742477	-80.82702177
9,600.00	89.00	149.98	6,460.21	-3,566.96	529.23	14,427,440.51	1,689,101.49	39.72718676	-80.82684444
9,700.00	89.00	149.98	6,461.96	-3,653.53	579.26	14,427,353.94	1,689,151.51	39.72694875	-80.82666711
9,800.00	89.00	149.98	6,463.71	-3,740.10	629.28	14,427,267.37	1,689,201.54	39.72671073	-80.82648978
9,900.00	89.00	149.98	6,465.46	-3,826.67	679.31	14,427,180.80	1,689,251.56	39.72647272	-80.82631246
10,000.00	89.00	149.98	6,467.20	-3,913.24	729.34	14,427,094.23	1,689,301.59	39.72623471	-80.82613513
10,100.00	89.00	149.98	6,468.95	-3,999.81	779.36	14,427,007.66	1,689,351.62	39.72599669	-80.82595781
10,200.00	89.00	149.98	6,470.70	-4,086.38	829.39	14,426,921.10	1,689,401.64	39.72575868	-80.82578048
10,300.00	89.00	149.98	6,472.45	-4,172.95	879.41	14,426,834.53	1,689,451.67	39.72552066	-80.82560316
10,400.00	89.00	149.98	6,474.20	-4,259.52	929.44	14,426,747.96	1,689,501.69	39.72528265	-80.82542584
10,500.00	89.00	149.98	6,475.95	-4,346.09	979.47	14,426,661.39	1,689,551.72	39.72504463	-80.82524852
10,600.00	89.00	149.98	6,477.70	-4,432.66	1,029.49	14,426,574.82	1,689,601.74	39.72480661	-80.82507120
10,700.00	89.00	149.98	6,479.44	-4,519.23	1,079.52	14,426,488.25	1,689,651.77	39.72456860	-80.82489389
10,800.00	89.00	149.98	6,481.19	-4,605.80	1,129.54	14,426,401.68	1,689,701.80	39.72433058	-80.82471657
10,900.00	89.00	149.98	6,482.94	-4,692.37	1,179.57	14,426,315.11	1,689,751.82	39.72409256	-80.82453926
11,000.00	89.00	149.98	6,484.69	-4,778.94	1,229.60	14,426,228.54	1,689,801.85	39.72385455	-80.82436194
11,100.00	89.00	149.98	6,486.44	-4,865.51	1,279.62	14,426,141.97	1,689,851.87	39.72361653	-80.82418463
11,200.00	89.00	149.98	6,488.19	-4,952.08	1,329.65	14,426,055.40	1,689,901.90	39.72337851	-80.82400732
11,300.00	89.00	149.98	6,489.93	-5,038.65	1,379.67	14,425,968.83	1,689,951.93	39.72314050	-80.82383001
11,400.00	89.00	149.98	6,491.68	-5,125.22	1,429.70	14,425,882.26	1,690,001.95	39.72290248	-80.82365270
11,500.00	89.00	149.98	6,493.43	-5,211.79	1,479.72	14,425,795.69	1,690,051.98	39.72266446	-80.82347539
11,600.00	89.00	149.98	6,495.18	-5,298.36	1,529.75	14,425,709.12	1,690,102.00	39.72242644	-80.82329809
11,700.00	89.00	149.98	6,496.93	-5,384.93	1,579.78	14,425,622.55	1,690,152.03	39.72218842	-80.82312078
11,800.00	89.00	149.98	6,498.68	-5,471.50	1,629.80	14,425,535.98	1,690,202.06	39.72195040	-80.82294348
11,900.00	89.00	149.98	6,500.43	-5,558.07	1,679.83	14,425,449.41	1,690,252.08	39.72171238	-80.82276618
12,000.00	89.00	149.98	6,502.17	-5,644.64	1,729.85	14,425,362.84	1,690,302.11	39.72147436	-80.82258887
12,100.00	89.00	149.98	6,503.92	-5,731.21	1,779.88	14,425,276.27	1,690,352.13	39.72123634	-80.82241157
12,200.00	89.00	149.98	6,505.67	-5,817.78	1,829.91	14,425,189.70	1,690,402.16	39.72099832	-80.82223428
12,300.00	89.00	149.98	6,507.42	-5,904.35	1,879.93	14,425,103.13	1,690,452.18	39.72076030	-80.82205698
12,400.00	89.00	149.98	6,509.17	-5,990.92	1,929.96	14,425,016.56	1,690,502.21	39.72052228	-80.82187968
12,500.00	89.00	149.98	6,510.92	-6,077.49	1,979.98	14,424,929.99	1,690,552.24	39.72028426	-80.82170239
12,504.73	89.00	149.98	6,511.00	-6,081.58	1,982.35	14,424,925.89	1,690,554.60	39.72027300	-80.82169400

PBHL/TD 12504.73 MD/6511.00 TVD

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Goudy 1S-08HM LP - hit/miss target - Shape - Point	0.00	0.01	6,414.00	-1,279.02	-792.71	14,429,728.45	1,687,779.54	39.73347706	-80.83153085
- plan misses target center by 0.15usft at 6957.21usft MD (6414.00 TVD, -1279.10 N, -792.85 E)									
Goudy 1S-08HM BHL r2 - plan hits target center - Point	0.00	0.01	6,511.00	-6,081.58	1,982.35	14,424,925.89	1,690,554.60	39.72027300	-80.82169400
Goudy 1S-08HM BHL r1 - plan misses target center by 9288.76usft at 12504.73usft MD (6511.00 TVD, -6081.58 N, 1982.35 E) - Point	0.00	0.01	6,673.00	-14,123.06	6,628.80	14,416,884.42	1,695,201.05	39.69816202	-80.80523198

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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Goudy 1S-08HM (I)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1241+13 @ 1254.00usft
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1241+13 @ 1254.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-08HM (I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,000.00	1,000.00	13 3/8" Casing	13-3/8	17	
2,604.07	2,600.00	9 5/8" Casing	9-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,200.00	1,200.00	0.00	0.00	KOP Begin 1°/100' build	
1,700.00	1,699.37	-5.64	-21.06	Begin 5.00° tangent	
2,804.84	2,800.00	-30.57	-114.07	Begin 3°/100' turn	
2,877.92	2,872.81	-33.45	-119.58	Begin 3°/100' build/turn	
3,378.57	3,360.19	-100.28	-204.53	Begin 20.01° tangent	
5,981.72	5,806.16	-644.28	-909.98	Begin 8°/100' build/turn	
6,536.56	6,268.51	-923.71	-940.07	Begin 10°/100' build/turn	
6,957.27	6,414.00	-1,279.15	-792.82	Begin 89.00° lateral	
12,504.73	6,511.00	-6,081.58	1,982.35	PBHL/TD 12504.73 MD/6511.00 TVD	

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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. IHS 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 Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (05/24/2018) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

1. Wellbore with IHS 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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4705102228

Permit well - Goudy 15-8HM

Wells within 500' Buffer

Note: Well spots depicted on Area of Review map (page 3) 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
4705101588	Tug Hill Operating	6401' TVD 12660' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101589	Tug Hill Operating	6461' TVD 12725' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101590	Tug Hill Operating	6395' TVD 13141' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101591	Tug Hill Operating	6458' TVD 12330' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101593	Tug Hill Operating	6413' TVD 13178' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101601	Tug Hill Operating	6456' TVD 13145' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101610	Tug Hill Operating	6480' TVD 13447' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705100523	Pittsburgh Plate Glass Co	8470' TVD	Salina	Unknown	Yes, deeper Salina saltwater disposal well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	
4705140035	Unknown	Unknown	Pittsburgh Co	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in	State records are incomplete

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4705102228

Well: County = 51 Permit = 01590

Location Information - Main Well
COUNTY PERMIT TAG NUMBER QUAD 75 QUAD 76 LAT 40 LONG 08 TIME 1986

Custom Hole Location Information
WELL PER PLAN TIME TIME LOCKED LAT DEG
4705102228 1 44 00 00 0114227 1402 00 00 0031018 33 28 021

Owner Information
WELL PER PLAN TIME 20015 SURFACE OWNER WILLIAMS COAL CO LEASE LEASE NUM MINERAL OWN OPERATOR/COMPLETION PROP OF PROP/OWN BY TRUCKER JW

Completion Information
WELL PER PLAN TIME 20015 SURFACE OWNER WILLIAMS COAL CO LEASE LEASE NUM MINERAL OWN OPERATOR/COMPLETION PROP OF PROP/OWN BY TRUCKER JW

Stratigraphic Information table with columns: WEL PER PLAN TIME, ACTIVITY, PRODUCT, SECTION, DEPTH TOP, FUL TOP, DEPTH BOT, FUL BOT, O-BEF, O-APT, O-BEF, O-APT, WATER, QNTY.

Production Gas Information (Volumes in MCF) table with columns: WEL PER PLAN TIME, PRODUCING OPERATOR, PROD YEAR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.

Production Oil Information (Volumes in Bbl) table with columns: WEL PER PLAN TIME, PRODUCING OPERATOR, PROD YEAR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.

Production NGL Information (Volumes in Bbl) table with columns: WEL PER PLAN TIME, PRODUCING OPERATOR, PROD YEAR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.

Production Water Information (Volumes in Gallons) table with columns: WEL PER PLAN TIME, PRODUCING OPERATOR, PROD YEAR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.

Stratigraphic Information table with columns: WEL PER PLAN TIME, ACTIVITY, PRODUCT, SECTION, DEPTH TOP, FUL TOP, DEPTH BOT, FUL BOT, THICKNESS, QUANTITY, ELEV, DATUM.

Well: County = 51 Permit = 01591

Location Information - Main Well
COUNTY PERMIT TAG NUMBER QUAD 75 QUAD 76 LAT 40 LONG 08 TIME 1986

Custom Hole Location Information
WELL PER PLAN TIME TIME TIME LOCKED LAT DEG
4705102228 1 44 00 00 0114227 1402 00 00 0031018 33 28 021

Owner Information
WELL PER PLAN TIME 20015 SURFACE OWNER WILLIAMS COAL CO LEASE LEASE NUM MINERAL OWN OPERATOR/COMPLETION PROP OF PROP/OWN BY TRUCKER JW

Completion Information
WELL PER PLAN TIME 20015 SURFACE OWNER WILLIAMS COAL CO LEASE LEASE NUM MINERAL OWN OPERATOR/COMPLETION PROP OF PROP/OWN BY TRUCKER JW

Stratigraphic Information table with columns: WEL PER PLAN TIME, ACTIVITY, PRODUCT, SECTION, DEPTH TOP, FUL TOP, DEPTH BOT, FUL BOT, THICKNESS, QUANTITY, ELEV, DATUM.

Production Gas Information (Volumes in MCF) table with columns: WEL PER PLAN TIME, PRODUCING OPERATOR, PROD YEAR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.

Production Oil Information (Volumes in Bbl) table with columns: WEL PER PLAN TIME, PRODUCING OPERATOR, PROD YEAR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.

Stratigraphic Information table with columns: WEL PER PLAN TIME, ACTIVITY, PRODUCT, SECTION, DEPTH TOP, FUL TOP, DEPTH BOT, FUL BOT, THICKNESS, QUANTITY, ELEV, DATUM.

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WV Dequek 4 Bottom Survey Well: County = 51 Permit = 40035

Location Information - Well Log

WV COUNTY PERMIT NO. DISTRICT QUAD 75 QUAD 76 LAT. NO. LONG. CO. STATE UTM

There is no Bottom Hole Location data for this well.

There is no Corrosion/Concentration data for this well.

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 HGL under Oil.

There is no Production HGL data for this well. - some operators may have reported HGL under Oil.

There is no Production Water data for this well.

Reservoir Information

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
51	51	40035	Production	Coal	20	20	0	Reservable	Oil	Ground

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

There is no Slugging data for this well.

There is no Sample data for this well.

WV Dequek 4 Bottom Survey Well: County = 103 Permit = 00222

Location Information - Well Log

WV COUNTY PERMIT NO. DISTRICT QUAD 75 QUAD 76 LAT. NO. LONG. CO. STATE UTM

There is no Bottom Hole Location data for this well.

Corrosion Information

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00222	Production	Coal	20	20	0	Reservable	Oil	Ground

Production Gas Information (Volumes in MCF)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00222	Production	Coal	20	20	0	Reservable	Oil	Ground

Production Oil Information (Volumes in Bbl)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00222	Production	Coal	20	20	0	Reservable	Oil	Ground

Production HGL Information (Volumes in Bbl)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00222	Production	Coal	20	20	0	Reservable	Oil	Ground

Production Water Information (Volumes in Gallons)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00222	Production	Coal	20	20	0	Reservable	Oil	Ground

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

Reservoir Information

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00222	Production	Coal	20	20	0	Reservable	Oil	Ground

There is no Sample data for this well.

WV Dequek 4 Bottom Survey Well: County = 103 Permit = 00185

Location Information - Well Log

WV COUNTY PERMIT NO. DISTRICT QUAD 75 QUAD 76 LAT. NO. LONG. CO. STATE UTM

There is no Bottom Hole Location data for this well.

Corrosion Information

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00185	Production	Coal	20	20	0	Reservable	Oil	Ground

Production Gas Information (Volumes in MCF)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00185	Production	Coal	20	20	0	Reservable	Oil	Ground

Production Oil Information (Volumes in Bbl)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00185	Production	Coal	20	20	0	Reservable	Oil	Ground

Production HGL Information (Volumes in Bbl)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00185	Production	Coal	20	20	0	Reservable	Oil	Ground

Production Water Information (Volumes in Gallons)

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00185	Production	Coal	20	20	0	Reservable	Oil	Ground

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

Reservoir Information

WV	WV COUNTY	PERMIT	ACTIVITY	SECTION	DEPTH TOP	DEPTH BOTTOM	THICKNESS	THICKNESS QUALITY	FLUID	STATUS
103	103	00185	Production	Coal	20	20	0	Reservable	Oil	Ground

There is no Sample data for this well.

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WV Department of Environmental Protection

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Goudy 1S-8HM

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) French Creek - Ohio River Quadrangle New Martinsville 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 water for frac and flow back water

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 and Horizontal Drilling

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

-If oil based, what type? Synthetic, petroleum, etc. Synthetic Oil Base

Additives to be used in drilling medium? Barite for weight

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? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386428)

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.

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Company Official Signature James A. Pancake

MAY 22 2019

Company Official (Typed Name) Jim Pancake

WV Department of
Environmental Protection

Company Official Title Vice President Geoscience

Subscribed and sworn before me this 26 day of MARCH, 20 19

Maureen A Stead

Notary Public

Commonwealth of Pennsylvania - Notary Seal
MAUREEN A STEAD - Notary Public
Washington County
My Commission Expires Jan 28, 2023
Commission Number 1259926

My commission expires 1/28/23

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 11.56 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
Annual Ryegrass	40
Spring Oats	96

Seed Type	lbs/acre
Orchard Grass	12
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: *Jim Anderson*

Comments: _____

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Title: Oil and Gas Inspector

Date: 3/27/19

Field Reviewed? () Yes () No

WW-9

**PROPOSED GOUDY
1S-8HM**

SUPPLEMENT PG 1

DRAWING NOT
TO SCALE

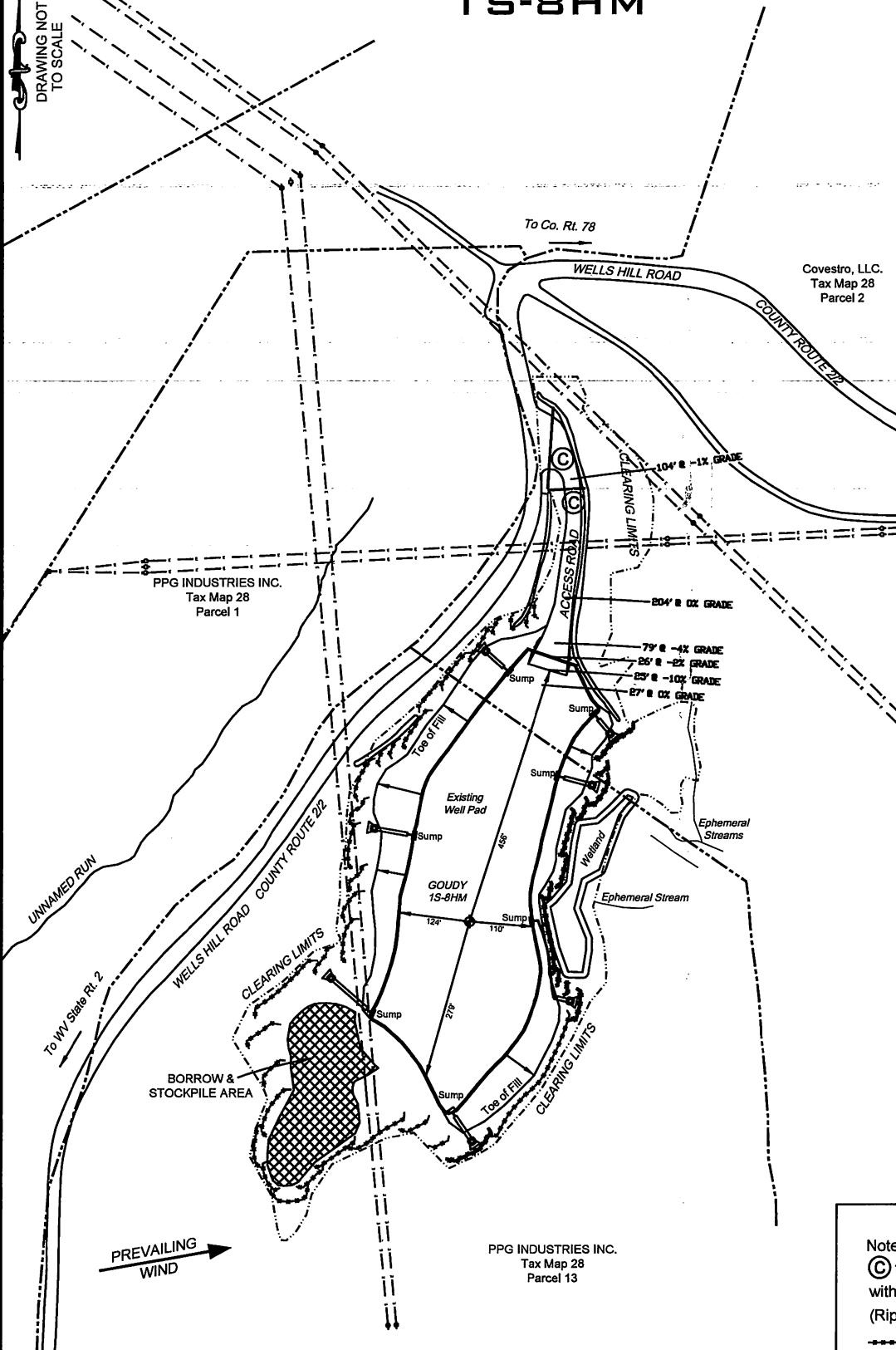
REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED. TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



Covestro, LLC.
Tax Map 28
Parcel 2

PPG INDUSTRIES INC.
Tax Map 28
Parcel 1

PPG INDUSTRIES INC.
Tax Map 28
Parcel 13

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LEGEND

- Note: WV Department of Environmental Protection
- Ⓢ - Denotes existing culvert with appropriate sediment outlet control (Rip Rap splash pad).
 - Silt Fence and or Sediment and Erosion Control Measure.
 - Surface Boundary
 - E — Overhead Utility

DATE: 03/25/2019

PROJECT NO: 494510851

DRAWN BY: J.A.H.



Well Site Safety Plan

Tug Hill Operating, LLC

JW
3/27/19

Well Name: Goudy 1S-8HM

Pad Location: Goudy Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing:

4,398,579.87 Easting:

514,677.85

RECEIVED
Office of ~~March~~ 2019

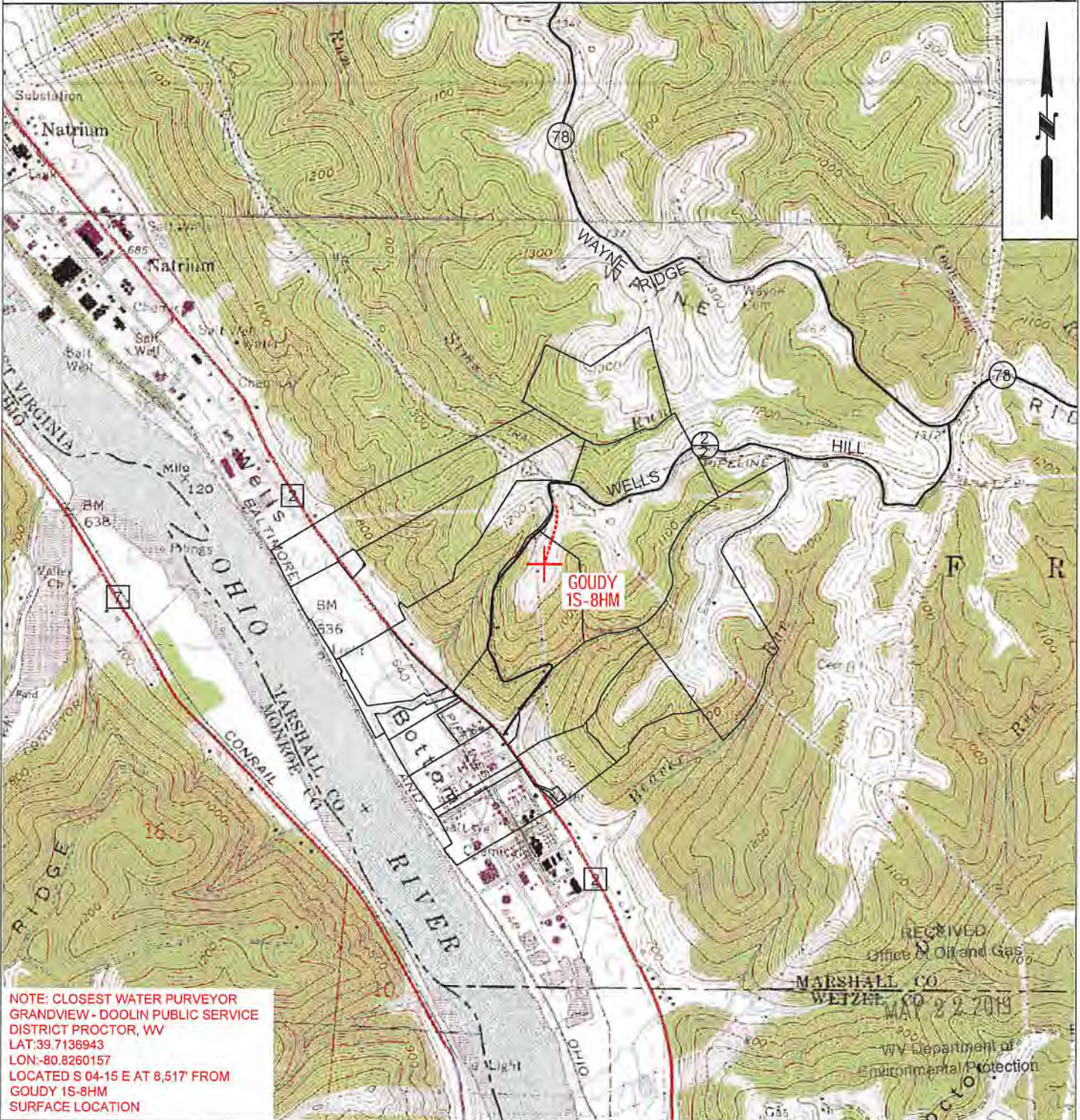
MAY 22 2019

WV Department of
Environmental Protection

WW-9

PROPOSED GOUDY 1S-8HM

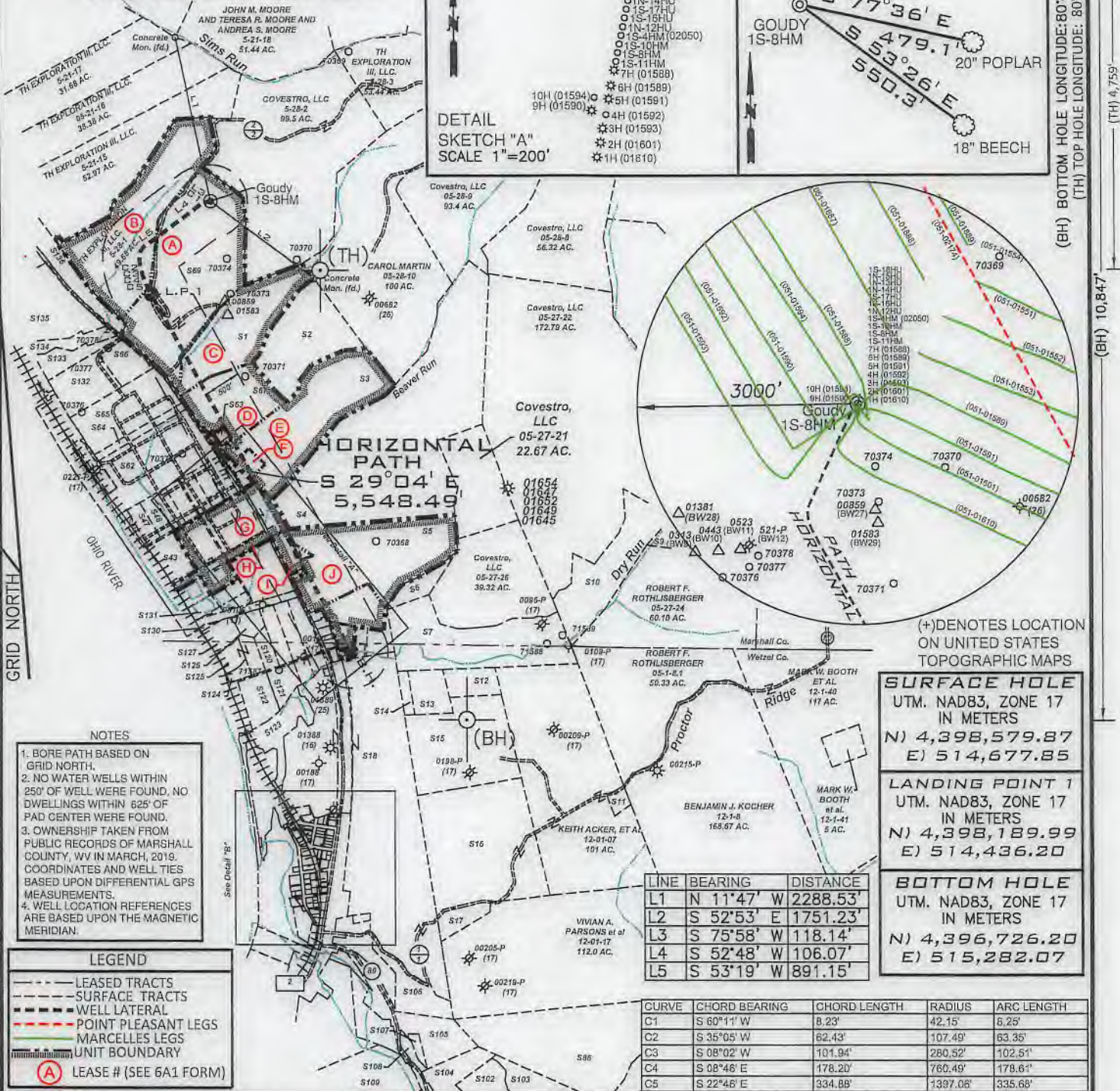
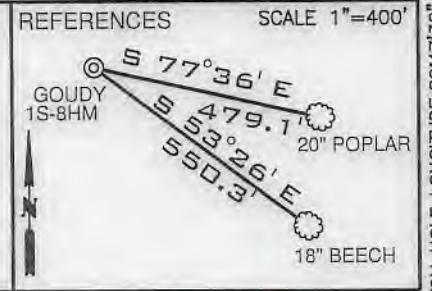
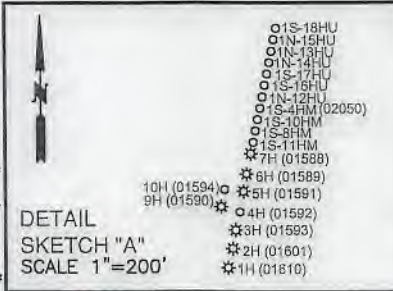
SUPPLEMENT PG 2



 TUG HILL OPERATING	OPERATOR 494510851 TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	TOPO SECTION NEW MARTINSVILLE 7.5'	LEASE NAME GOUDY
	SCALE: 1" = 2000'	DATE: DATE: 03/25/2019	

GOUDY LEASE WELL 1S-8HM 292.0837± ACRES

TOP HOLE LATITUDE: 39°45'00"
BOTTOM HOLE LATITUDE: 39°45'00"



- NOTES
1. BORE PATH BASED ON GRID NORTH.
 2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
 3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2019. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LEGEND

- LEASED TRACTS
- SURFACE TRACTS
- WELL LATERAL
- POINT PLEASANT LEGS
- MARCELLUS LEGS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

LINE	BEARING	DISTANCE
L1	N 11°47' W	2288.53'
L2	S 52°53' E	1751.23'
L3	S 75°58' W	118.14'
L4	S 52°48' W	106.07'
L5	S 53°19' W	891.15'

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	S 60°11' W	8.23'	42.15'	8.25'
C2	S 35°05' W	62.43'	107.49'	63.35'
C3	S 08°02' W	101.94'	280.52'	102.51'
C4	S 08°46' E	178.20'	760.49'	178.61'
C5	S 22°46' E	334.88'	1337.06'	335.68'

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,398,579.87
E) 514,677.85

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,398,189.99
E) 514,436.20

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,396,726.20
E) 515,282.07

FILE NUMBER _____

DRAWING NUMBER GOUDY_1S-8HM_REV2

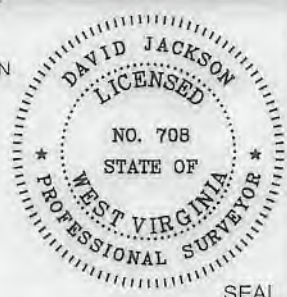
SCALE 1" = 2000'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

David L Jackson



JACKSON SURVEYING INC.
P.O. Box 1460
Clarksburg, WV 26302
304-623-5851

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET, SE
CHARLESTON, WV 25304

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X

LOCATION ELEVATION 1239.4' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE NEW MARTINSVILLE 7.5' LEASE NUMBER SEE WW-6A1 FORM

SURFACE OWNER TH EXPLORATION III, LLC. ACREAGE 70.0

OIL & GAS ROYALTY OWNER TH EXPLORATION III, LLC. LEASE ACREAGE 70.0

PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,537' TMD: 12,505'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
CT CORPORATION SYSTEM

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
FORT WORTH, TX 76107 CHARLESTON, WV 25313

COUNTY NAME
PERMIT

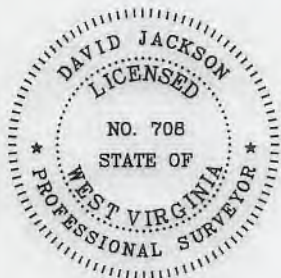
**GOUDY LEASE
WELL 1S-8HM
292.0837± ACRES**



Detail "A"



Detail "B"



P.S.
708

David L Jackson

Number	TAX MAP -PARCEL	SURFACE OWNER	ACRES
S1	C 05-28-12	TH Exploration III, LLC.	20.226
S2	05-28-11	Carol A. Martin	24.681
S3	E 05-27-19	Covestro, LLC	33.786
S4	05-27-20	Covestro, LLC	93.027
S5	J 05-27-20.1	Appalachian Power Co.	43.973
S6	05-27-27	James Andrew & Karen Lynne Richmond	8.9353
S7	05-27-25	James Andrew & Karen Lynne Richmond	41.35
S8	12-23-14	Robert F. Rothlisberger	0.27
S9	05-26-19	Eric Jay Booth & Karrol S. Booth	50.0
S10	05-27-23	Robert F. Rothlisberger	35.77
S11	12-01-7.1	Harry Wayman Estate	2.0
S12	12-01-04	Robert F. Rothlisberger	6.0
S13	12-01-03	Charles D. & Edith Feenerty Harrison	7.8
S14	12-01-02	James A. & Karen L. Richmond	2.7
S15	12-01-05	Irvin L. Hoyt, Jr. & David L. Hoyt	36.8
S16	12-01-06	Mona Parsons, et al	52.75
S17	12-01-16	Vivian A. Parsons, et al	5.125
S18	12-01-01	Covestro, LLC	135.0
S19	12-01-1.7	Colombia Gas Transmission, Corp.	0.15
S20	12-23-15	Paul E. & Donna Jo Cain	0.7
S21	O 12-23-15.1	Robert F. Rothlisberger	0.47
S22	N 12-23-13	Paul E. & Donna Jo Cain	0.38
S23	M 05-27-27.2	Paul E. Cain, et ux	0.1767
S24	L 05-27-27.1	Donald P. Cain	1.645
S25	05-27-27.3	Paul E. Cain, et ux	1.018
S26	K 05-27-28	Covestro, LLC	8.0
S27	12-23-12	Paul E. & Donna Jo Cain	0.37
S28	12-23-11	Covestro, LLC	1.25
S29	12-23-10	Covestro, LLC	1.28
S30	12-23-05	Covestro, LLC	3.69
S31	05-27-40	Covestro, LLC	3.36
S32	12-23-06	Covestro, LLC	0.34
S33	05-27-44	Covestro, LLC	0.21
S34	05-27-43	Covestro, LLC	0.63
S35	05-27-42	Covestro, LLC	0.52
S36	05-27-42.1	Covestro, LLC	0.52
S37	05-27-41	Martha Jean Arrick	0.99
S38	05-27-31.2	Appalachian Power Co.	3.33
S39	05-27-31	Covestro, LLC	16.1
S40	05-27-30	Covestro, LLC	0.371
S41	I 05-27-31.1	Covestro, LLC	3.0
S42	H 05-27-32.2	Covestro, LLC	3.95
S43	05-27-29	Covestro, LLC	9.0
S44	05-27-45	Covestro, LLC	0.3627
S45	G 05-27-32	Covestro, LLC	33.53
S46	05-27-03	Covestro, LLC	1.27
S47	05-27-04	Covestro, LLC	2.52
S48	05-27-05	Covestro, LLC	2.52
S49	05-27-06	Covestro, LLC	2.52
S50	05-27-07	Covestro, LLC	2.52
S51	05-27-08	Covestro, LLC	2.52
S52	05-27-09	Covestro, LLC	1.87
S53	05-27-10	Covestro, LLC	0.52
S54	05-27-12	Covestro, LLC	1.0
S55	05-27-13	Covestro, LLC	0.34
S56	05-27-14	Covestro, LLC	0.25
S57	05-27-15	Covestro, LLC	0.47
S58	05-27-16	Covestro, LLC	0.23
S59	05-27-18	Covestro, LLC	0.97
S60	05-27-17	Covestro, LLC	0.88
S61	F 05-27-19.3	Cemetery	2.0
S62	05-27-02	Covestro, LLC	28.099
S63	05-27-19.2	Wheeling Electric Co.	0.75
S64	05-28-12.2	Covestro, LLC	3.1
S65	05-28-12.3	Covestro, LLC	18.784
S66	05-28-13.1	Air Products & Chemicals, Inc	5.522
S67	D 05-27-19.1	Covestro, LLC	21.267
S68	05-27-11	Covestro, LLC	0.03
S69	A 05-28-13	TH Exploration III, LLC.	70.0



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: Goudy 1S-8HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API # 47-051-

WELL PLAT
PAGE 2 OF 3
DATE: 3/25/2019

**GOUDY LEASE
WELL 1S-8HM
292.0837± ACRES**

Number	TAX MAP -PARCEL	SURFACE OWNER	ACRES
S70	12-01-19	Steven J. & Susan L. Hafer	36.5
S71	12-01-31	Steven Jack & Susan Louise Hafer	20.0
S72	12-01-20	Charles E. Frohnapfel, Trustee of the Charles E. Frohnapfel Living Trust Dated October 3, 2017	126.0
S73	12-02-01	Nelson M. & Mary D. Miller	49.0
S74	12-01-34.1	Herbert Parsons & Virginia Yoho Roy	2.0
S75	12-01-34	John D. Amnah	38.0
S76	12-02-07	John D. Amnah	44.5
S77	12-06-52	John D. Amnah	6.46
S78	12-01-33	James & Charlene Lemley	1.06
S79	12-01-29	Baxter Farm, LLC	2.0
S80	12-06-26.3	Richard L. & Donna L. Erlewine	20.96
S81	12-06-26	Larry K. Keene	6.69
S82	12-06-24	Mark D. Baxter	84.92
S83	12-06-06	Baxter Farm, LLC	88.8
S84	12-01-32	Baxter Farm, LLC	78.74
S85	12-01-28	Steven J. & Susan L. Hafer	88.39
S86	12-01-18	Travis Darrell Blake & Angela Dawn Mitchell	48.4
S87	12-6A-11.2	Robert L. & Mary Ellen Stillwagoner	0.38
S88	12-06-18.1	Janice Haudenschilt	1.15
S89	12-06-18	Shelia Diane Gore	0.34
S90	12-6A-11.1	Robert L. & Mary Ellen Stillwagoner	0.66
S91	12-6A-11	Robert L. & Mary Ellen Stillwagoner	2.38
S92	12-6A-10	Jay Edward & Kathleen S. Smith	3.35
S93	12-6A-09	Joyce Kay Morris (L/E), Robert D. Jr. & Marsha J. Morris	3.52
S94	12-6A-08	Candis Darlene Clark	3.43
S95	12-6A-07	Janice Capoblanco	8.47
S96	12-6A-06	Ronald E. & Susan L. McCoy	2.09
S97	12-6A-03	Ronald E. & Susan L. McCoy	3.47
S98	12-6A-02	Ronald E. & Susan L. McCoy	3.49
S99	12-6A-01	Ronald E. & Susan L. McCoy	6.51
S100	12-06-05	Steven & Susan Louis Hafer	8.93
S101	12-06-04	Steven & Susan Hafer	6.2
S102	12-01-27	Steven J. & Susan Hafer	83.69
S103	12-01-26	Roland S. Fitzsimmons & William Joseph Blake	13.83
S104	12-01-25	Jack R. & Linda S. Blake	17.42
S105	12-01-15.3	Daniel L. & Vickie L. Williams	7.0
S106	12-01-1.1	W.V. D.O.H	10.59
S107	12-01-15.2	Michael Goddard	1.09
S108	12-01-15.1	Marshall & Tara Cecil (L/C), Roy Yoho	1.46

Number	TAX MAP -PARCEL	SURFACE OWNER	ACRES
S109	12-01-22	W.D. & R.A. Glover	18.84
S110	12-01-23.2	Sharon Maye McKinney	0.782
S111	12-01-23	Danny E. & Jill L. McKinney	1.55
S112	12-01-23.1	W.E & R.A. Glover	34.17
S113	12-01-25.1	Timothy Q. & Ronda K. Bohrer	1.2
S114	12-01-24	MitziLou Cecil, Trustee of the Tiger Cecil Irrevocable	0.85
S115	12-06-02	Brock T. Conner	23.83
S116	12-06-49	Kirkland Enterprises, LLC.	10.32
S117	12-06-51	Steven & Susan Hafer	0.599
S118	12-06-48	Ronald E. & Susan L. McCoy	0.36
S119 L	05-27-39	Covestro, LLC	3.74
S120	12-23-04	Pittsburgh Plate Glass Corp.	2.41
S121	12-23-09	Covestro, LLC	3.95
S122	12-23-08	Dora N. Moore Hrs., Et al	6.95
S123	12-01-1.5	United States of America	7.14
S124	12-23-02	Covestro, LLC	1.27
S125	12-23-03	Covestro, LLC	4.67
S126	12-27-38	Covestro, LLC	2.72
S127	12-27-37	Covestro, LLC	3.20
S128	12-27-35	Covestro, LLC	1.79
S129	12-27-34	Covestro, LLC	1.91
S130	12-27-36	Covestro, LLC	1.58
S131	12-27-33	Covestro, LLC	1.95
S132	05-28-13.2	Covestro, LLC	11.02
S133	05-28-1.1	Covestro, LLC	5.2217
S134	05-28-1.4	Covestro, LLC	11.69
S135	05-28-1.2	Covestro, LLC	21.62
S136	05-21-3.1	Eagle Natrum, LLC	98.61
S137	12-01-1.2	West Virginia Dept. of Transportation	0.27
S138	12-22-59	June M. Morris, Hrs.	2.00
S139	12-22-60	Franklin W. & Barabara J. Cogar	0.5
S140	12-22-09	M.B. Investment	0.20
S141	12-22-10	M.B. Investment	0.24
S142	12-22-12	Jack Ray & Linda S. Blake	0.16
S143	12-22-13	Dewayne E. & Patricia A. Yost	0.07
S144	12-22-28	June M. Morris, Hrs	0.12
S145	12-22-29	Jack R. & Linda S. Blake	0.50
S146	12-22-30	Jack R. & Linda S. Blake	0.24
S147	12-22-32	Ren Realty, LLC.	0.27
S148	12-22-33	Ren Realty, LLC.	0.08
S149	12-22-34	Ren Realty, LLC.	0.08
S150	12-22-51	Eric R. & Debra S. Sims	0.10
S151	12-22-52	Eric R. & Debra S. Sims	0.10
S152	12-22-53	Eric R. & Debra S. Sims	0.10
S153	12-22-54	Eric R. & Debra S. Sims	0.10
S154	12-22-55	Eric R. & Debra S. Sims	0.19
S155	12-22-56	Michael L. & Joyce D. Durig	0.22
S156	12-22-57	Michael L. & Joyce D. Durig	0.11
S157	12-22-58	Michael L. & Joyce D. Durig	0.15
S158	12-22-50	Michael L. & Joyce D. Durig	0.17
S159	12-22-49	Daniel J. Stillwagoner	0.13
S160	12-22-62	Virginia Bohrer, et al	0.05
S161	12-22-62.1	John R. & Toni Wright	0.314
S162	12-22-44	John R. & Toni Wright	0.52
S163	12-01-1.9	Grandview Doolin Public Service District	0.13
S164	12-22-27	Grandview Doolin Public Service District	0.27
S165	12-01-1.12	United States of America	22.55
S166	12-01-1.8	Grandview Doolin Public Service District	0.0895



P.S. 708 *David L Jackson*



OPERATOR'S
WELL #: Goudy 1S-8HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API # 47-051-

WELL PLAT
PAGE 3 OF 3
DATE: 3/25/2019

**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
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*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

RECEIVED
Office of Oil and Gas

MAY 22 2019

WV Department of
Environmental Protection

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. Miller 
 Its: Permitting Specialist - Appalachia Region

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment
10*14300	5-28-13	A	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/332	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14300	5-28-1	B	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/332	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14300	5-28-12	C	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/332	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14658	5-28-12	C	THOMAS WILLIAM ABERSOLD	GASTAR EXPLORATION USA, INC.	1/8+	775 314	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 28/499	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14659	5-28-12	C	JUDITH LEE ABERSOLD	GASTAR EXPLORATION USA INC	1/8+	781 609	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 28/499	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14493	5-27-19.1	D	BETTY JEAN NEELY	GASTAR EXPLORATION USA, INC	1/8+	748 468	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14494	5-27-19.1	D	MARY LOU WILSON	GASTAR EXPLORATION USA, INC	1/8+	748 471	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-19.1	D	PATRICIA HARTMAN	GASTAR EXPLORATION USA, INC	1/8+	752 197	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-19.1	D	STEPHANIE L HALL	GASTAR EXPLORATION USA	1/8+	752 215	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-19.1	D	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752 212	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14498	5-27-19.1	D	BAYER MATERIALSCIENCE LLC	GASTAR EXPLORATION USA INC	1/8+	757 340	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14493	5-27-19	E	BETTY JEAN NEELY	GASTAR EXPLORATION USA, INC	1/8+	748 468	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563

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Office of Oil and Gas

JUN 25 2019

WV Department of
Environmental Protection

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment
10*14494	5-27-19	E	MARY LOU WILSON	GASTAR EXPLORATION USA, INC	1/8+	748 471	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-19	E	PATRICIA HARTMAN	GASTAR EXPLORATION USA, INC	1/8+	752 197	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-19	E	STEPHANIE L HALL	GASTAR EXPLORATION USA	1/8+	752 215	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-19	E	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752 212	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14498	5-27-19	E	BAYER MATERIALSCIENCE LLC	GASTAR EXPLORATION USA INC	1/8+	757 340	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*22926	5-27-19	E	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976 27	N/A	N/A	N/A	N/A
10*14493	5-27-19.3	F	BETTY JEAN NEELY	GASTAR EXPLORATION USA, INC	1/8+	748 468	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14494	5-27-19.3	F	MARY LOU WILSON	GASTAR EXPLORATION USA, INC	1/8+	748 471	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-19.3	F	PATRICIA HARTMAN	GASTAR EXPLORATION USA, INC	1/8+	752 197	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-19.3	F	STEPHANIE L HALL	GASTAR EXPLORATION USA	1/8+	752 215	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-19.3	F	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752 212	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*25558	5-27-19.3	F	MARLENE RECTOR AND EUGENE RECTOR	TH EXPLORATION LLC	1/8+	1033 304	N/A	N/A	N/A	N/A
10*25494	5-27-19.3	F	MARIE ERLEWINE	TH EXPLORATION LLC	1/8+	1033 113	N/A	N/A	N/A	N/A
10*25655	5-27-19.3	F	HILLARY MONTGOMERY AND VIRGIE MONTGOMERY	TH EXPLORATION LLC	1/8+	1033 306	N/A	N/A	N/A	N/A
10*25473	5-27-19.3	F	ETHEL J EVANS	TH EXPLORATION LLC	1/8+	1033 115	N/A	N/A	N/A	N/A
10*25715	5-27-19.3	F	ANNA JONES AND ALAN JONES	TH EXPLORATION LLC	1/8+	1035 163	N/A	N/A	N/A	N/A

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26826	5-27-19.3	F	WILLIAM R MOORE	TH EXPLORATION LLC	1/8+	1040	535	N/A	N/A	N/A	N/A
10*26457	5-27-19.3	F	SHARON COLVIN	TH EXPLORATION LLC	1/8+	1035	3	N/A	N/A	N/A	N/A
10*26825	5-27-19.3	F	ROBERT C EVANS	TH EXPLORATION LLC	1/8+	1040	579	N/A	N/A	N/A	N/A
10*26584	5-27-19.3	F	RICHARD LEE ERLEWINE AND DONNA L ERLEWINE	TH EXPLORATION LLC	1/8+	1038	524	N/A	N/A	N/A	N/A
10*26829	5-27-19.3	F	REBECCA M COWARD AND EDWARD S COWARD	TH EXPLORATION LLC	1/8+	1040	529	N/A	N/A	N/A	N/A
PENDING	5-27-19.3	F	RACHAEL I MOORE	TH EXPLORATION LLC	1/8+	1040	541	N/A	N/A	N/A	N/A
10*26828	5-27-19.3	F	MICHAEL J MOORE	TH EXPLORATION LLC	1/8+	1040	547	N/A	N/A	N/A	N/A
10*26852	5-27-19.3	F	LINDA E HILL FKA LINDA LOU ERLEWINE AND JOHN S HILL	TH EXPLORATION LLC	1/8+	1038	532	N/A	N/A	N/A	N/A
10*26585	5-27-19.3	F	KELLY R ROOT FKA KELLY R EVANS	TH EXPLORATION LLC	1/8+	1038	528	N/A	N/A	N/A	N/A
10*26583	5-27-19.3	F	CRAIG DOUGLAS ERLEWINE AND DOREEN E ERLEWINE	TH EXPLORATION LLC	1/8+	1038	538	N/A	N/A	N/A	N/A
10*26508	5-27-19.3	F	CECELIA EDWARDS	TH EXPLORATION LLC	1/8+	1037	446	N/A	N/A	N/A	N/A
10*26827	5-27-19.3	F	ALBERT L MOORE	TH EXPLORATION LLC	1/8+	1040	553	N/A	N/A	N/A	N/A
10*22926	5-27-32	G	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976	27	N/A	N/A	N/A	N/A
10*22926	5-27-32.2	H	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976	27	N/A	N/A	N/A	N/A
10*22926	5-27-31.1	I	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976	27	N/A	N/A	N/A	N/A
10*14493	5-27-20.1	J	BETTY JEAN NEELY	GASTAR EXPLORATION USA, INC	1/8+	748	468	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14494	5-27-20.1	J	MARY LOU WILSON	GASTAR EXPLORATION USA, INC	1/8+	748	471	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-20.1	J	PATRICIA HARTMAN	GASTAR EXPLORATION USA, INC	1/8+	752	197	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-20.1	J	STEPHANIE L HALL	GASTAR EXPLORATION USA	1/8+	752	215	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-20.1	J	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752	212	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14499	5-27-20.1	J	UNION CARBIDE CORPORATION	GASTAR EXPLORATION USA INC	1/8+	815	221	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*14493	5-27-28	K	BETTY JEAN NEELY	GASTAR EXPLORATION USA, INC	1/8+	748	468	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14494	5-27-28	K	MARY LOU WILSON	GASTAR EXPLORATION USA, INC	1/8+	748	471	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-28	K	PATRICIA HARTMAN	GASTAR EXPLORATION USA, INC	1/8+	752	197	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-28	K	STEPHANIE L HALL	GASTAR EXPLORATION USA	1/8+	752	215	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-28	K	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752	212	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*22926	5-27-28	K	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976	27	N/A	N/A	N/A	N/A
10*18446	5-27-27.1	L	DONALD P CAIN	TH EXPLORATION LLC	1/8+	933	96	N/A	N/A	N/A	N/A
10*18445	5-27-27.2	M	PAUL E CAIN AND DONNA JO CAIN	TH EXPLORATION LLC	1/8+	933	93	N/A	N/A	N/A	N/A
10*18438	12-23-13	N	PAUL E CAIN AND DONNA JO CAIN	TH EXPLORATION LLC	1/8+	190A	191	N/A	N/A	N/A	N/A
10*23506	12-23-15.1	O	ROBERT F ROTHLSBERGER	TH EXPLORATION LLC	1/8+	210A	805	N/A	N/A	N/A	N/A

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STATE OF WEST VIRGINIA §
COUNTIES OF MARSHALL AND WETZEL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the “Assignment”) is made and entered into this 30th day of April, 2019 (the “Effective Date”), by and between Atinum Marcellus I, LLC (hereinafter “Assignor”) and TH Exploration II, LLC, (hereinafter “Assignee” and, together with Assignor, the “Parties”). Capitalized terms used but not defined herein shall have the meanings commonly given to such terms in the industry.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor’s right, title, and interest in and to one hundred feet (100 ft.) above the formation commonly referred to as the Marcellus Shale formation down to one hundred feet (100 ft.) below the same, in those certain Oil and Gas Leases, or the portions of those certain Oil and Gas Leases, situated in Marshall and Wetzel Counties, West Virginia, as described in Exhibit “A-1” and limited and described in Exhibit “A-2”, attached hereto and made a part hereof. It being the Parties intention to assign all of Assignor’s interest in each unit as described in Exhibit “A-1”, including any changes, revisions, or amendments to the same, now or at any time in the future. (hereinafter the “Leases”); and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor’s right, title, and interest in and to the Leases as described below.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor’s right, title, and interest in and to one hundred feet (100 ft.) above the formation commonly referred to as the Marcellus Shale formation down to one hundred feet (100 ft.) below the same, in the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon. It being the Parties intention to assign all of Assignor’s interest in each unit as described in Exhibit “A-1”, including any changes, revisions, or amendments to the same, now or at any time in the future.

TO HAVE AND TO HOLD such right, title and interest in and to the Leases unto Assignee or its designee, and their respective successors and assigns, forever, in accordance with the provisions of this Assignment.

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than permits or easements, rights of way, surface leases and other rights with respect to surface operations that do not materially interfere with, impair or prohibit the operation of the affected Leases, hereinafter “Permitted Encumbrances”) its interest in the Leases since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the

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Jan Pest
MARSHALL County 01:22:38 PM
Instrument No 1403489
Date Recorded 04/27/2016
Document Type ASB
Pages Recorded 77
Book-Page 36-9
Recording Fee \$77.00
Additional \$13.00

WHEN RECORDED RETURN TO:
TH Exploration II, LLC
1320 South University Drive, Suite 500
Fort Worth, Texas 76107
Attn: David Kalish

Execution Version

ASSIGNMENT AND BILL OF SALE

STATE OF WV §
 § KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF MARSHALL §

THIS ASSIGNMENT AND BILL OF SALE (this "*Assignment*"), dated April 7, 2016, but effective as of 7:00 A.M. Houston time on January 1, 2016 (the "*Effective Time*"), is between Gatar Exploration Inc., a Delaware corporation, whose address is 1331 Lamar Street, Suite 650 Houston, Texas 77010 ("*Assignor*"), and TH Exploration II, LLC, a Texas limited liability company, whose address is 1320 South University Drive, Suite 500, Fort Worth, Texas 76107 ("*Assignee*"). Assignor and Assignee are each, individually, referred to herein as a "*Party*" and, collectively, as the "*Parties*".

Capitalized terms used but not defined herein shall have the respective meanings set forth in that certain Purchase and Sale Agreement (the "*Purchase Agreement*"), dated as of February 19, 2016, by and between Assignor and Assignee (as successor-in-interest).

Section 1. Assignment. The conveyance and assignment herein shall be deemed effective as of the Effective Time.

For Ten Dollars (\$10.00) and other good and valuable consideration (the receipt and sufficiency of which are hereby acknowledged), Assignor does hereby forever GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, SET OVER AND DELIVER unto Assignee, all of Assignor's right, title and interest in and to the following interests and properties (such right, title and interest described in *subsections (a) through (k)* of this Section 1, less and except the Excluded Assets, collectively, the "*Conveyed Interests*"):

(a) all oil, gas and/or mineral leases of Assignor, together with any and all other right, title and interest of Assignor in and to the leasehold estates created thereby, including subleases, royalties, overriding royalties, net profits interest, carried interests or similar rights or interests in such leases, and together with all rights, privileges, benefits and powers conferred upon Assignor with respect to the use and occupation of the lands covered thereby that may be necessary, convenient or incidental to the possession and enjoyment of such leases, located in Marshall, Wetzell, Doddridge, Harrison, Lewis, Marion, and Monongalia Counties, West Virginia and Greene, Butler, Fayette, Somerset, and Clearfield Counties, Pennsylvania, including those described on Exhibit A—Part 1 attached hereto (subject to any reservations, limitations or depth restrictions described on Exhibit A—Part 1), (Assignor's interest in such leases and other right, title and interest as so limited, the "*Leases*");

(b) all rights and interests in, under or derived from all unitization agreements in effect with respect to any of the Leases and the units created thereby, including those described

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May 21, 2019

WV Department of Environmental Protection
Office of Oil & Gas
601 57th Street, SE
Charleston, WV 25304
Attention: Laura Adkins

RE: Goudy 1S-8HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Goudy 1S-8HM well plat.

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 amiller@tug-hill.com.

Sincerely,

A handwritten signature in blue ink that reads "Amy L. Miller".

Amy L. Miller
Permitting Specialist – Appalachia Region

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WW-6AC
(1/12)

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

Date of Notice Certification: 05/21/2019

API No. 47-051

Operator's Well No. Goudy 1S-8HM

Well Pad Name: Goudy

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>514,677.85</u>
County:	<u>Marshall</u>	UTM NAD 83 Northing:	<u>4,398,579.87</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Wells Hill Road (County Route 2/2)</u>
Quadrangle:	<u>New Martinsville 7.5'</u>	Generally used farm name:	<u>TH Exploration III, LLC</u>
Watershed:	<u>French Creek - Ohio River (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.

<p>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:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><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</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p align="center">OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED Office of Oil and Gas</p>
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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 Location 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.

MAY 22 2019

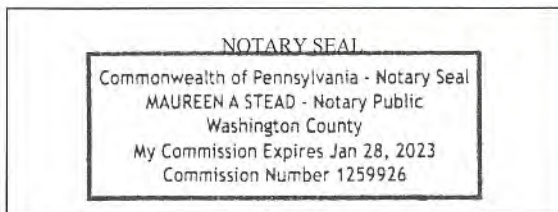
WV Department of
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WW-6AC
(1/12)

Certification of Notice is hereby given:

THEREFORE, I Amy L Miller, 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. Miller <i>Amy Miller</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 21 day of MAY, 2019.

Maureen A Stead Notary Public

My Commission Expires 1/28/23

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.

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WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Goudy 1S-8HM
Well Pad Name: Goudy

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: 3/29/2019 **Date Permit Application Filed:** 3/29/2019

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: TH Exploration III, LLC
Address: 1320 S. University Drive, Suite 500
Ft. Worth, TX 76107
Name: COVESTRO, LLC (formerly Bayer Material Science, LLC)
Address: 1 COVESTRO CIRCLE
PITTSBURGH PA 15272

COAL OWNER OR LESSEE
Name: TH Exploration III, LLC
Address: 1320 S. University Drive, Suite 500
Ft. Worth, TX 76107 **See attachment

COAL OPERATOR
Name: _____
Address: _____

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

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: _____
Address: _____
Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

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*Please attach additional forms if necessary

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 the 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

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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.**

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.

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WW-6A
(8-13)

47 05 02228

API NO. 47-051 -
OPERATOR WELL NO. Goudy 1S-8HM
Well Pad Name: Goudy

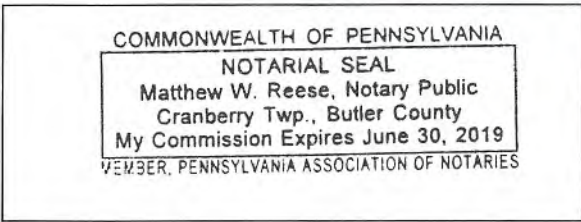
Notice is hereby given by:

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

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-838-2030

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 deprivacyofficer@wv.gov.



Subscribed and sworn before me this 29 day of MAY, 2019.

Matthew W. Reese Notary Public

My Commission Expires 6-30-2019

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4705102228

Operator Well No.: GOUDY 1S-8HM

**WW-6A Notice of Application
Supplement Page**

COAL OWNER(S):

NAME: APPALACHIAN POWER CO.
ADDRESS: 1 RIVERSIDE PLACE
COLUMBUS, OH 43215

NAME: COVESTRO, LLC (FORMERLY BAYER MATERIAL SCIENCE, LLC)
ADDRESS: 1 CONVESTRO CIRCLE
PITTSBURGH, PA 15205

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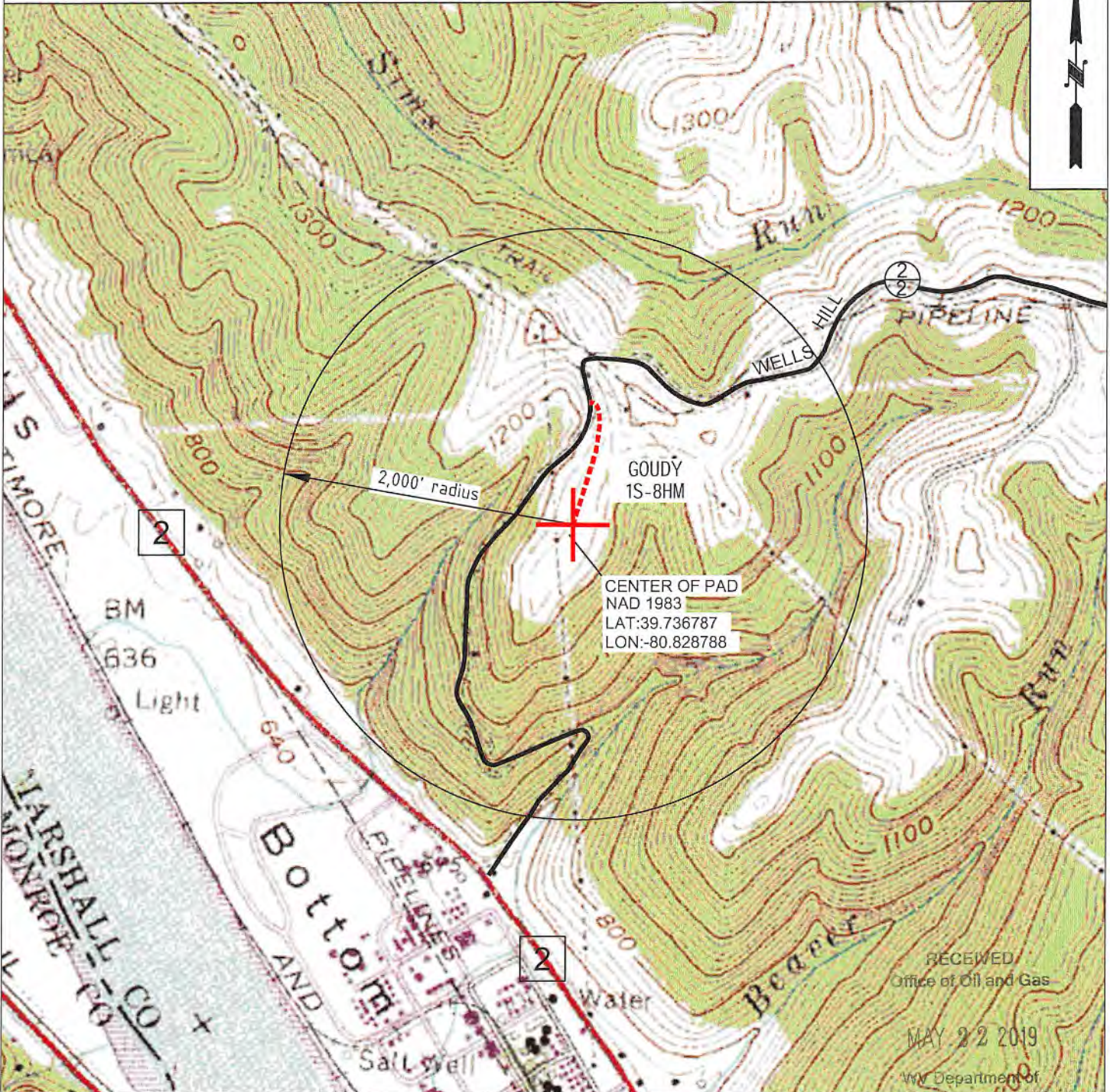
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WW-6A

PROPOSED GOUDY 1S-8HM

SUPPLEMENT PG 1


There appears to be no (0) possible water source within 2,000'.



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WV Department of
Environmental Protection

 TUG HILL OPERATING	OPERATOR 494510851 TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	TOPO SECTION NEW MARTINSVILLE 7.5'	LEASE NAME GOUDY
	SCALE: 1" = 1000'	DATE: DATE: 03/25/2019	

WW-6A3
(1/12)Operator Well No. Goudy 1S-8HM

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: 1/8/2019 **Date of Planned Entry:** 1/15/2018

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: TH Exploration III, LLC
 Address: 1320 S. University Drive, Suite 500
Ft. Worth, TX 76107
 Name: COVESTRO, LLC (formerly Bayer Material Science, LLC)
 Address: 1 COVESTRO CIRCLE
PITTSBURGH PA 15272
 Name: _____
 Address: _____

COAL OWNER OR LESSEE
 Name: TH Exploration III, LLC
 Address: 1320 S. University Drive, Suite 500
Ft. Worth, TX 76107 **SEE ATTACHED

MINERAL OWNER(s)
 Name: TH Exploration III, LLC
 Address: 1320 S. University Drive, Suite 500
Ft. Worth, TX 76107 **SEE ATTACHED

*please attach additional forms if necessary

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>39.73678670; -80.82878798</u>
County: <u>MARSHALL</u>	Public Road Access: <u>WELLS HEAD ROAD (ROUTE 22)</u>
District: <u>FRANKLIN</u>	Watershed: <u>(HUC 10) FRENCH CREEK- OHIO RIVER</u>
Quadrangle: <u>NEW MARTINSVILLE</u>	Generally used farm name: <u>PPG INDUSTRIES, INC.</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 17th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling gas be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: TUG HILL OPERATING, LLC
 Telephone: 724-338-2026
 Email: amiller@tug-hillop.com

MAY 22 2019

Address: 380 SOUTHPOINTE BLVD, SOUTHPOINTE PLAZA
CANONSBURG, PA 15317 Environmental Protection
 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.

Operator Well No.: GOUDY 1S-8HM**WW-6A Notice of Application
Supplement Page****COAL OWNER(S):**

NAME: APPALACHIAN POWER CO.
ADDRESS: 1 RIVERSIDE PLACE
COLUMBUS, OH 43215

NAME: COVESTRO, LLC (FORMERLY BAYER MATERIAL SCIENCE, LLC)
ADDRESS: 1 COVESTRO CIRCLE
PITTSBURGH, PA 15205

MINERAL OWNER(S):

NAME: COVESTRO, LLC (FORMERLY BAYER MATERIAL SCIENCE, LLC)
ADDRESS: 1 COVESTRO CIRCLE
PITTSBURGH, PA 15205

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WV Department of
Environmental Protection

WW-6A5
(1/12)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF PLANNED OPERATION

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

Date of Notice: 03/29/2019 **Date Permit Application Filed:** 03/29/2019

Delivery method pursuant to West Virginia Code § 22-6A-16(c)

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)

(at the address listed in the records of the sheriff at the time of notice):

Name: TH Exploration III, LLC

Address: 1320 S. University Drive, suite 500
Fort Worth, TX 76107

Name: COVESTRO, LLC (formerly Bayer Material Science, LLC)

Address: 1 Covestro Circle
Pittsburgh, PA 15272

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>514,677.85</u>
County:	<u>Marshall</u>		Northing:	<u>4,398,579.87</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Wells Hill Road (Route 22)</u>	
Quadrangle:	<u>New Martinsville 7.5'</u>	Generally used farm name:	<u>TH Exploration III, LLC</u>	
Watershed:	<u>French Creek - Ohio River</u>			

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. 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 Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: amiller@tug-hillop.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 300 **RECEIVED**
Canonsburg, PA 15317 **Office of Oil and Gas**
Facsimile: 724-338-2030

MAY 2 2019

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.



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Thomas J. Smith, P. E.
 Secretary of Transportation/
 Commissioner of Highways

May 7, 2018

Jill M. Newman
 Deputy Commissioner

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 Goudy Well Pad, Marshall County
 Goudy 1S-8HM

Dear Mr. Martin,

This well site will be accessed from Permit #06-2012-0518 transferred to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 2/2 SLS.

The 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 January 3, 2012.

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: Jonathan White
 Tug Hill Operating
 CH, OM, D-6
 File



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Goudy 1S-8HM

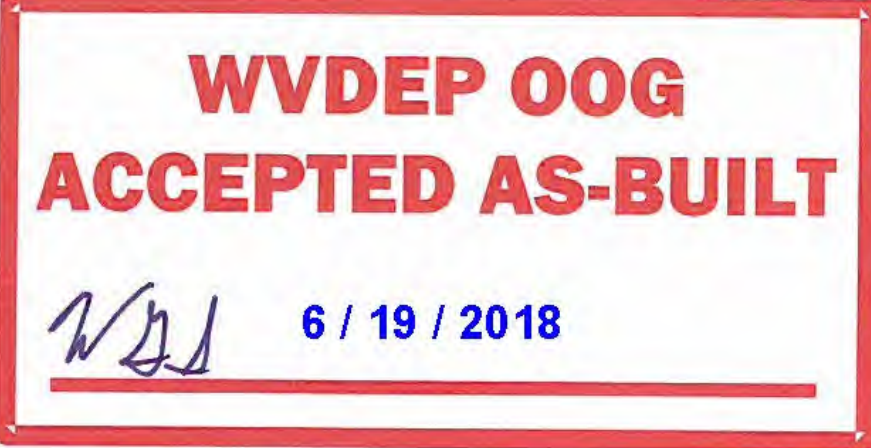
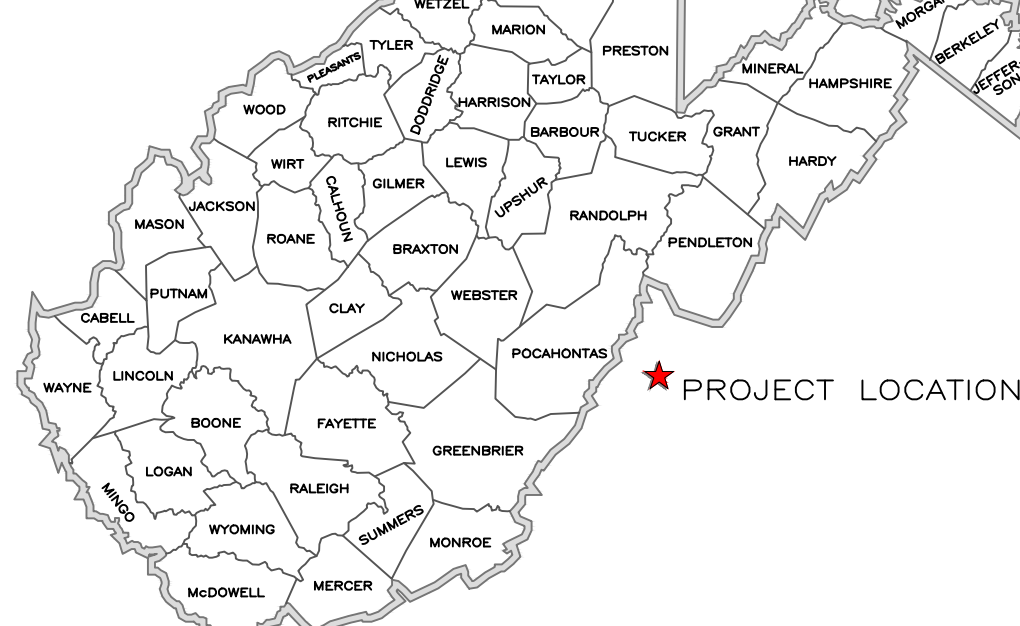
PRODUCT NAME:	CHEMICAL DESCRIPTION:	PRODUCT USE:	HAZARDOUS COMPONENT:
GBW-20C	Hemicellulase Breaker	Breaker - Water	None
ALPHA 1427		Biocide	Glutaraldehyde – CAS#000111-30-8 Quaternary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) – CAS#068424-85-1 Ethanol – CAS# 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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Environmental Protection

WEST VIRGINIA COUNTY MAP

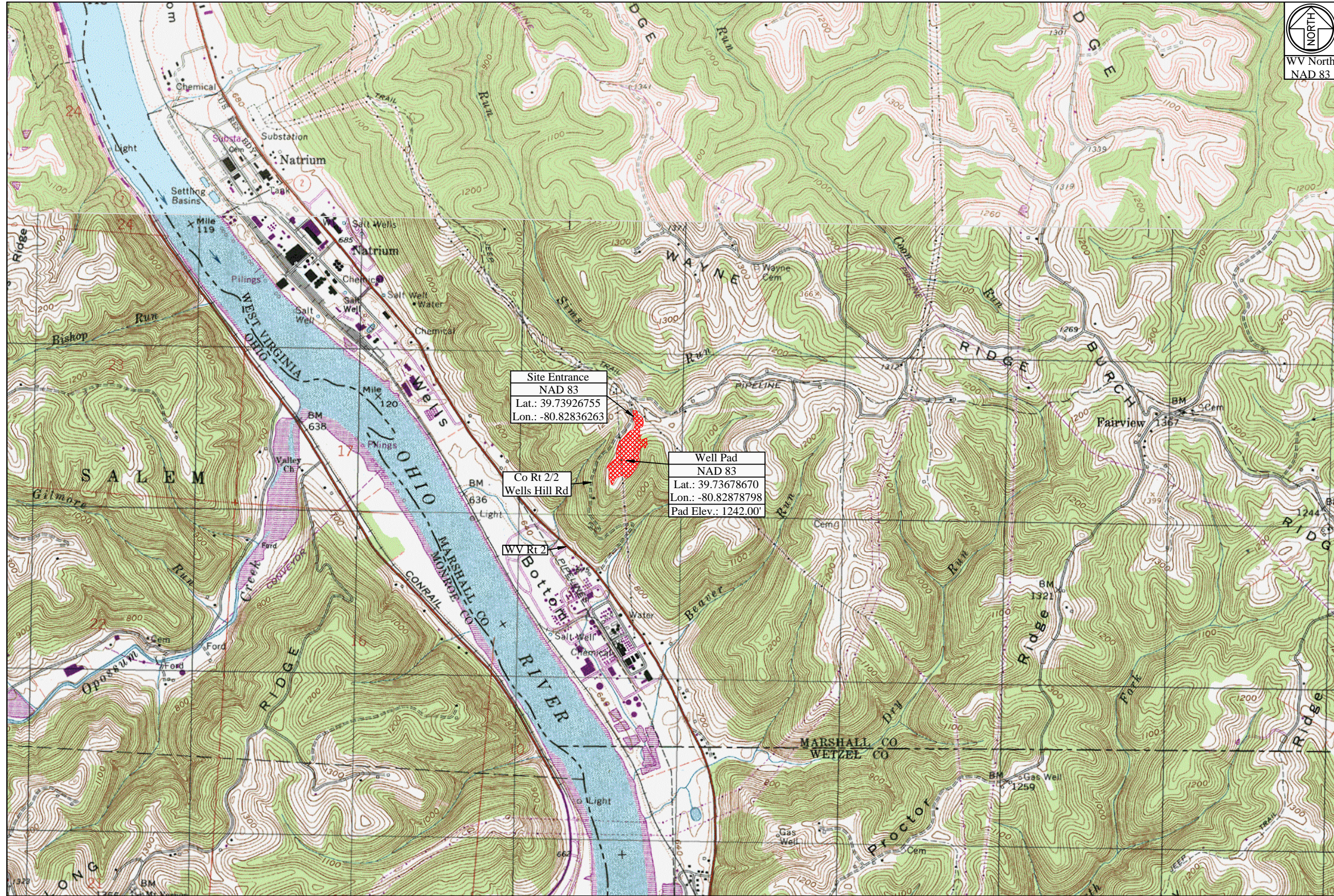


Goudy Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Franklin District
Latitude 39.73678670°
Longitude -80.82878798°
French Creek - Ohio River Watershed

Pertinent Site Information
Goudy Well Site
Emergency Number: 304-845-1920
Franklin District, Marshall County, WV
Watershed: French Creek - Ohio River Watershed
Tug Hill Contact Number: 1-817-632-3400

Table with 7 columns: Owner, TM - Parcel, Well Pad, Access Road, Topsoil/Excess, Add. Clearing, Total Disturbed. Rows for Bayer Material Sciences LLC and PPG Industries Inc.

Exhibit A: Final Design: Issue for Permitting



WV State Plane Coordinate System
North Zone, NAD 83
Elevations Based on NAV88
Established by Survey Grade GPS
and OPUS Post-Processing

Table with 4 columns: Owner, TM - Parcel, Road Length, Type. Row for Bayer Material Sciences LLC.

Table with 2 columns: Disturbed Area, Additional Information. Rows for Well Pad Construction, Access Road Construction, etc.

Table with 7 columns: Description, Cut (CY), Fill (CY), Spoil (CY), Borrow (CY), Max. Slope, Length of Slope. Rows for Well Pad Berm Grading, Access Road Mountable Berm, etc.

Table listing Goudy Well locations (Goudy 1H1 through Goudy 1S-18HU) with coordinates and UTM values.

Project Contacts
Tug Hill Operating
Jonathan White - Regulatory Analyst
Geoff Radler - V.P. Production

Survey and Engineer
Kenneth Kelly
John P. Cece
Zackary Summerfield

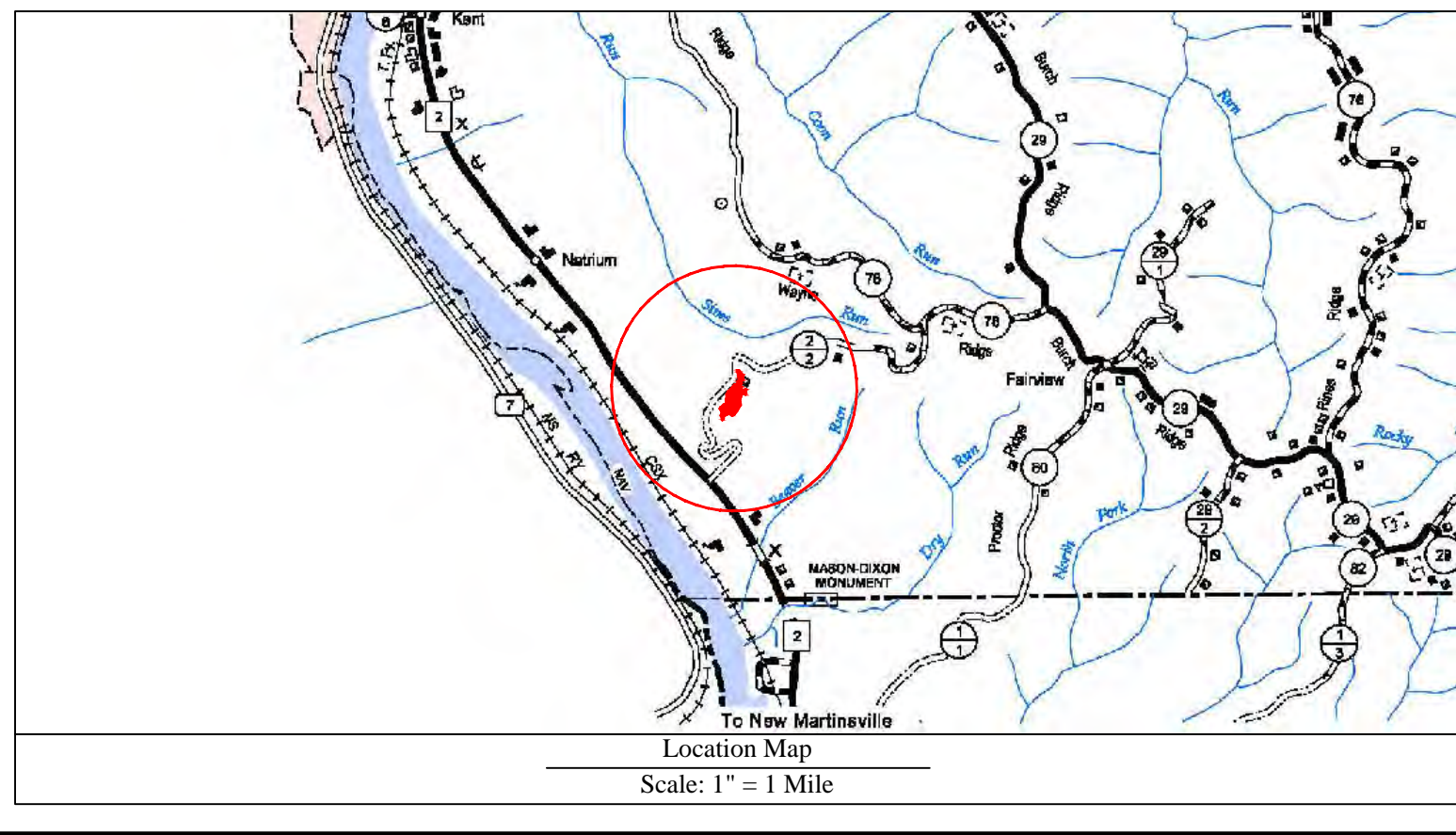
Geotechnical Engineer
American Geotech. Inc.
Kanti Patel

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
West Virginia State Law
Section XIV, Chapter 24-C requires that you call two business days before you dig in the state of West Virginia. IT'S THE LAW. Call before you dig.

Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities. The WV Mines Website was consulted. Previous (Current) mining activities are not within the AOI. WVDEP Website files show that there are active and/or abandoned gas wells within the AOI.

Approach Routes:
From the intersection of OH Rt 7 and WV Rt 2 near New Martinsville, WV. Travel North on WV Rt 2 for 6.1 mi. Turn Right onto Co Rt 2/2 (Wells Hill Rd). Follow Co Rt 2/2 for 0.9 mi. The site entrance will be on the Right (East) side of the road.

Tables for Site Locations (NAD 27) and Site Locations (NAD 83) with columns for Structure, Latitude, and Longitude.

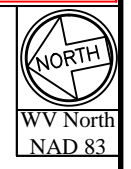


Well Location Restrictions
All Pad construction complies with the following restrictions.
*250' from an existing well or developed spring used for human or domestic animals.
*625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.
*300' from the edge of disturbance to a naturally reproducing trout stream.
*1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6A-12)
Design Certification
The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of Oil and Gas, 20C309.

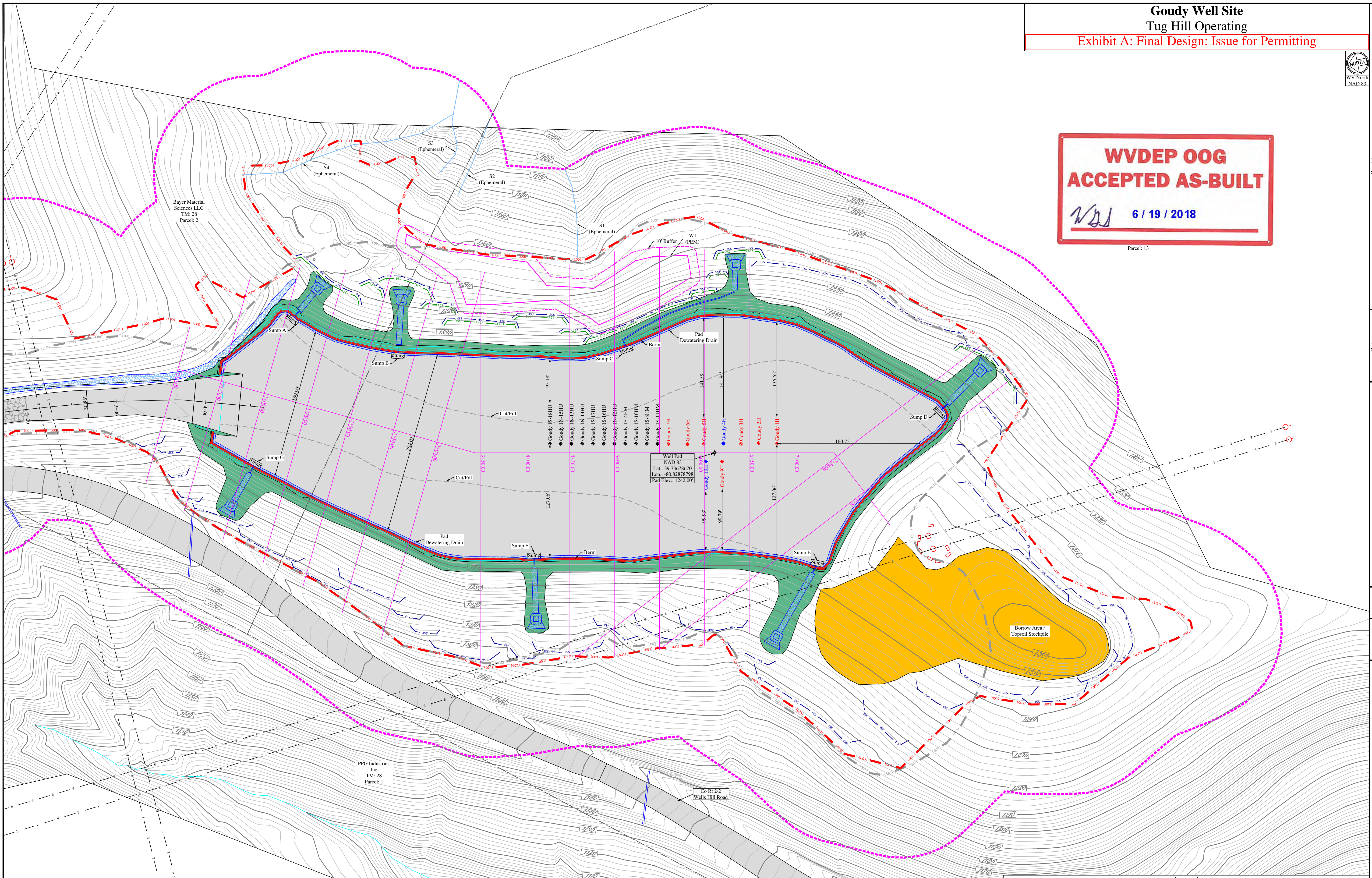
Table with 2 columns: Sheet, Description. Lists sheets 1 through P1 and their corresponding descriptions.

Vertical sidebar containing Tug Hill Operating logo, north arrow, document preparation info, Kelly Surveying logo, cover sheet info, and sheet number (1 of 12).



**WVDEP OOG
ACCEPTED AS-BUILT**

WJ 6/19/2018



Disturbed Area

Well Pad Construction	5.81 Ac
Access Road Construction	1.01 Ac
Topsoil / Excess Material	1.64 Ac
Additional Clearing	3.10 Ac
Total Disturbed Area	11.56 Ac

Additional Information

Total Wooded Acres Disturbed	0.00 Ac
Total Linear Feet of Access Road	465.07'

Access Road

Owner	TM - Parcel	Road Length	Type
Bayer Material Sciences LLC	TM: 28 Parcel: 2	465.07'	Existing Access Road

NOTE: All surface boundary lines shown hereon are based on boundary evidence collected with mapping grade GPS receivers.

0 50 100 150

Legend

Original Ground 2' Contour	Original Ground 10' Contour	Pad Design 2' Contour	Pad Design 10' Contour	Center of Structure	Existing Well	Existing Cellar	Proposed Well
24" Composite Filter Sock	Super Silt Fence	Limits of Disturbance (Original)	Limits of Disturbance	Area of Interest	Existing Gas Line	Existing Utility Pole Line	Rock Lined Ditch
PEM Wetland	POW Wetland	PSS Wetland	Perennial Stream	Intermittent Stream	Ephemeral Stream	Toe Key	Erosion Control Blanket Slope Area
Stone Check Dam							

Revision	Design
Date	05-16-2018
TUG HILL OPERATING	
THIS DOCUMENT PREPARED FOR TUG HILL OPERATING	
Kelly Surveying	
150 West 25th Street, WV 26209 304-338-6965	
Site Plan Goudy Well Site Franklin District Marshall County, WV	
Date:	05/16/2018
Scale:	As Shown
Designed By:	ZS
File No.	
Sheet	10 of 12