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west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Tuesday, April 13, 2021  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC  
380 SOUTHPOINTE BOULEVARD, PLAZA II  
SUITE 200  
CANONSBURG, PA 15317

Re: Permit Modification Approval for HUDSON S-5HM  
47-051-02291-00-00

**Lateral Extension**

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before 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: HUDSON S-5HM  
Farm Name: CNX LAND LLC  
U.S. WELL NUMBER: 47-051-02291-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 4/13/2021

Promoting a healthy environment.

04/16/2021



March 23, 2021

WADE STANSBERRY  
WV DEP OFFICE OF OIL & GAS  
601 57<sup>TH</sup> STREET SE  
CHARLESTON, WV 25304-2345

VIA USPS

RE: **Hudson S-5HM API# 47-051-02291 (H6A Permit Modification)**  
**Meade District, Marshall County, WV**

Dear Wade:

Tug Hill Operating, LLC is submitting a permit modification for its permitted well, Hudson S-5HM to add 4,087.32' to the lateral length. Therefore, enclosed please find the following:

- Modified WW-6B with changes highlighted in yellow
- Updated well plat
- Updated WW-6A1 information
- Updated Site Safety Plan (The only information that has changed is the contact information for the Inspector at the contact list at the end of the Plan).
- Updated Area of Review

If you have any questions or need any additional information, please do not hesitate to call me on (304) 376-0111. Thank you for attention to this matter, it is greatly appreciated.

Sincerely,

AMY MORRIS  
PERMIT SPECIALIST-APPALACHIA REGION  
TUG HILL OPERATING, LLC

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Enclosures



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

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

2) Operator's Well Number: Hudson S-5HM Well Pad Name: Hudson

3) Farm Name/Surface Owner: CNX Land, LLC Public Road Access: Roberts Ridge Road (CR 21)

4) Elevation, current ground: 1,346' Elevation, proposed post-construction: 1,346'

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 *Bay Stiles 3-16-21*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):

Marcellus is the target formation at a depth of 6,765' - 6,817', thickness of 52' and anticipated pressure of approx. 3800 psi.

8) Proposed Total Vertical Depth: 6,917'

9) Formation at Total Vertical Depth: Onondaga

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10) Proposed Total Measured Depth: 17,966'

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11) Proposed Horizontal Leg Length: 10,688.52'

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12) Approximate Fresh Water Strata Depths: 70; 980'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 1,444'

15) Approximate Coal Seam Depths: Sewickley Coal - 888' and Pittsburgh Coal - 974'

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 X No

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

Depth: Pittsburgh coal TVD - 974'; and 372' subsea level

Seam: Pittsburgh

Owner: Murray Energy / Consolidated Coal Company

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'	259^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	1,080'	1,080'	1,100^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	1,080'	1,080'	1,100^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,878'	2,878'	955^3(CTS)
Production	5 1/2"	NEW	P110	20#	17,966'	17,966'	4,578^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	6,574'		
Liners							

*Bay Stdy 3-16-21*

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

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PACKERS

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



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

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

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

Well to be completed with approximately 26,720,000 lb proppant and 485,000 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

B.S. 3-16-21

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 22.94 acres

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22) Area to be disturbed for well pad only, less access road (acres): 6.18 acres

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23) Describe centralizer placement for each casing string:

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

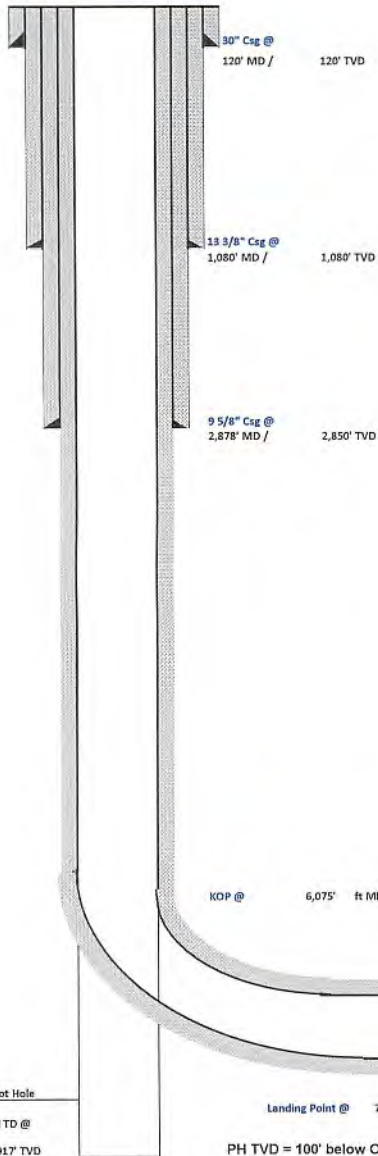
24) Describe all cement additives associated with each cement type:

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

25) Proposed borehole conditioning procedures:

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

\*Note: Attach additional sheets as needed.



**WELL NAME:** Hudson S-5HM  
**STATE:** WV **COUNTY:** Marshall  
**DISTRICT:** Meade  
**DF Elev:** 1,346' **GL Elev:** 1,346'  
**TD:** 17,966'  
**TH Latitude:** 39.828761  
**TH Longitude:** -80.672633  
**BH Latitude:** 39.804766  
**BH Longitude:** -80.653835

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	980
Sewickley Coal	888
Pittsburgh Coal	974
Big Lime	2088
Weir	2509
Berea	2706
Gordon	2959
Rhinstreet	6086
Geneseo/Burkett	6619
Tully	6652
Hamilton	6683
Marcellus	6765
Landing Depth	6799
Onondaga	6817
Pilot Hole Depth	6917

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	1,080'	1,080'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,878'	2,850'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	17,966'	6,986'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,113	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	958	A	15	Air	1 Centralizer every other jt
Production	4,199	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to s/c

*B.S. 3-16-21*

Pilot Hole  
 PHTD @ 6,917 TVD  
 Landing Point @ 7,279' MD / 6,799' TVD  
 PH TVD = 100' below Onondaga Top

Lateral TD @ 17,966' ft MD  
 6,986' ft TVD

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**Tug Hill Operating, LLC Casing and Cement Program**

**Hudson S-5HM**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,080'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,878'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4	17,966'	CTS

**Cement**

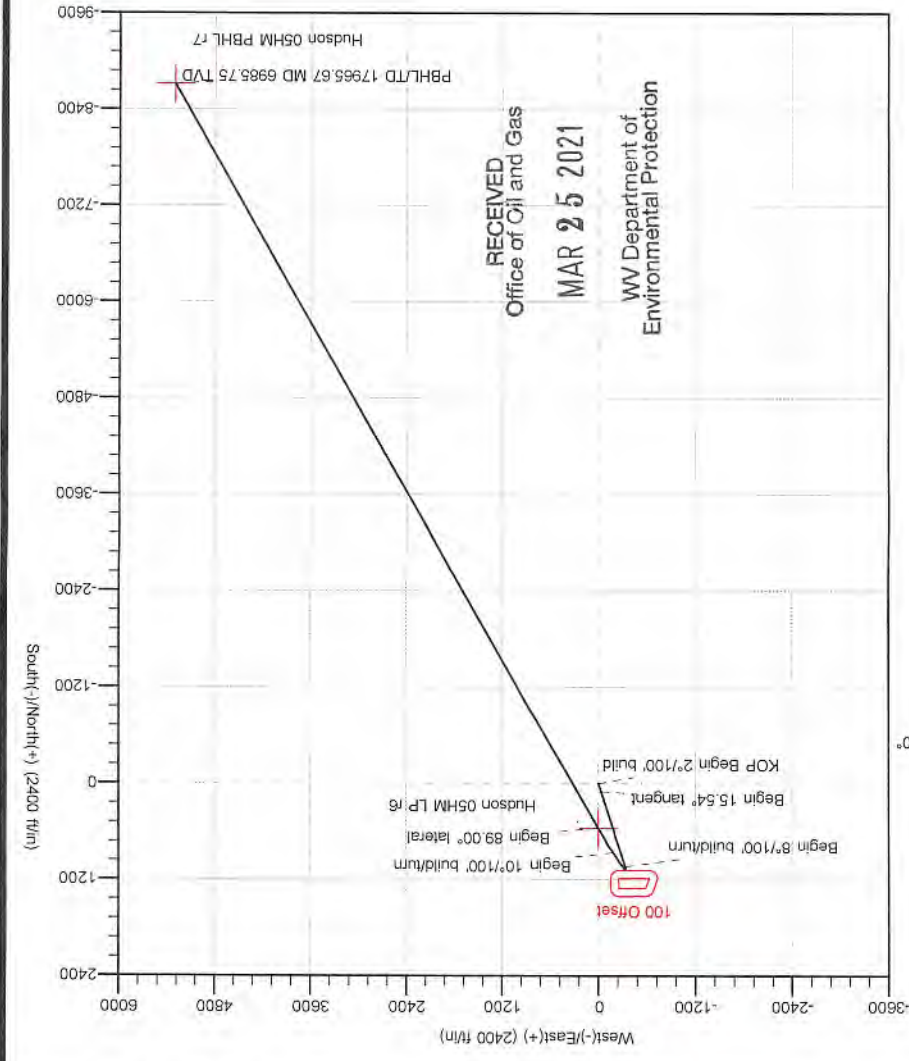
- Conductor: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
- Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed 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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SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Diag	Tface	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1601.75	0.00	1601.75	0.00	0.00	0.00	0.00	0.00	0.00	
3	2378.58	15.54	342.47	2369.09	99.82	-31.52	2.00	342.474	-101.65	KOP Begin 2°/100' build
4	6074.61	15.54	342.47	5930.07	1043.86	-329.65	0.00	0.000	-1062.95	Begin 8°/100' build/turm
5	6888.31	50.00	147.48	6664.31	865.34	-178.29	8.00	167.382	-831.75	Begin 10°/100' build/turm
6	7279.08	89.00	150.23	6798.57	557.53	6.37	10.00	4.361	-472.81	Begin 89.00° lateral
7	17965.67	89.00	150.23	6985.75	-8717.45	5311.35	0.00	0.000	0208.06	PBHLTD 17965.67 MD 6985.75 TVD

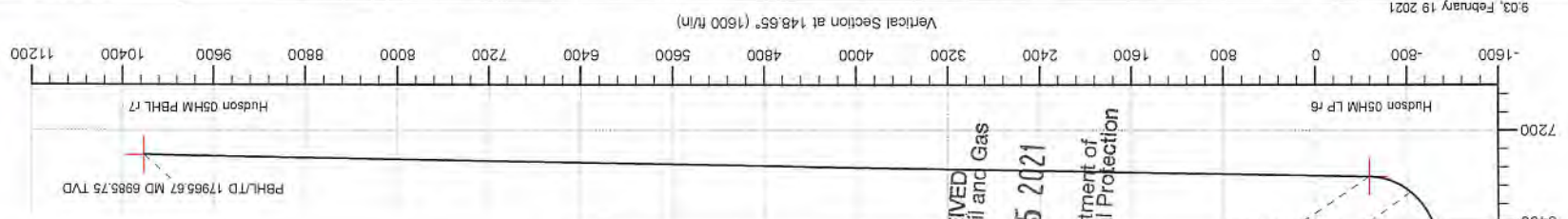
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (84 W to 78 W)  
 System Datum: Mean Sea Level  
 Depth Reference: GL @ 1346.00ft  
 Magnetic Field  
 Strength: 51800.7nT  
 Dip Angle: 66.60°  
 Date: 2/9/2021  
 Model: IGRF2020  
 Azimuths to Grid North  
 True North: -0.21°  
 Magnetic North: -8.90°



DESIGN TARGET DETAILS

Name	+N-S	+E-W	Latitude	Longitude
Hudson 05HM LP r6	6798.57	6.38	39.83029200	-80.67260300
Hudson 05HM PBHL r7	6985.75	-8717.45	5311.35	39.80476600
- plan misses target center by 0.01ft at 7279.10ft MD (6798.57 TVD, 557.51 N, 6.38 E)				
- plan hits target center				

**Well:** Hudson S-05 HM (slot M)  
**Site:** Hudson Alt North  
**Project:** Marshall County, West Virginia  
**Design:** revh  
**Rig:**



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Planning Report - Geographic

<b>Database:</b>	Win10Lt_Dec2820_v16	<b>Local Co-ordinate Reference:</b>	Well Hudson S-05 HM (slot M)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1346.00ft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1346.00ft
<b>Site:</b>	Hudson Alt North	<b>North Reference:</b>	Grid
<b>Well:</b>	Hudson S-05 HM (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

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<b>Project</b>	Marshall County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

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<b>Site</b>	Hudson Alt North				
<b>Site Position:</b>		<b>Northing:</b>	14,464,552.10 usft	<b>Latitude:</b>	39.82877400
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,732,278.45 usft	<b>Longitude:</b>	-80.67279800
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "		

<b>Well</b>	Hudson S-05 HM (slot M)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,464,547.53 usft	<b>Latitude:</b>	39.82876100
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,732,324.79 usft	<b>Longitude:</b>	-80.67263300
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,346.00 ft
<b>Grid Convergence:</b>	0.210 °					

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	2/9/2021	-8.690	66.600	51,800.67846319

<b>Design</b>	rev8			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	148.65

<b>Plan Survey Tool Program</b>	<b>Date</b>	2/19/2021		
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	17,965.67 rev8 (Original Hole)	MWD	
			MWD - Standard	

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Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,601.75	0.00	0.00	1,601.75	0.00	0.00	0.00	0.00	0.00	0.000	
2,378.58	15.54	342.47	2,369.09	99.82	-31.52	2.00	2.00	0.00	342.474	
6,074.61	15.54	342.47	5,930.07	1,043.86	-329.65	0.00	0.00	0.00	0.000	
6,888.31	50.00	147.48	6,664.31	865.34	-178.29	8.00	4.24	20.28	167.382	
7,279.08	89.00	150.23	6,798.57	557.53	6.37	10.00	9.98	0.70	4.361	
17,965.67	89.00	150.23	6,985.75	-8,717.45	5,311.35	0.00	0.00	0.00	0.000	Hudson 05HM PBHL

Planning Report - Geographic

Database: Win10Lt\_Dec2820\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Hudson Alt North  
 Well: Hudson S-05 HM (slot M)  
 Wellbore: Original Hole  
 Design: rev8

Local Co-ordinate Reference: Well Hudson S-05 HM (slot M)  
 TVD Reference: GL @ 1346.00ft  
 MD Reference: GL @ 1346.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
100.00	0.00	0.00	100.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
200.00	0.00	0.00	200.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
300.00	0.00	0.00	300.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
400.00	0.00	0.00	400.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
500.00	0.00	0.00	500.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
600.00	0.00	0.00	600.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
700.00	0.00	0.00	700.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
800.00	0.00	0.00	800.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
900.00	0.00	0.00	900.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
1,601.75	0.00	0.00	1,601.75	0.00	0.00	14,464,547.53	1,732,324.79	39.82876100	-80.67263300	
<b>KOP Begin 2°/100' build</b>										
1,700.00	1.97	342.47	1,699.98	1.61	-0.51	14,464,549.14	1,732,324.28	39.82876542	-80.67263479	
1,800.00	3.97	342.47	1,799.84	6.54	-2.06	14,464,554.07	1,732,322.73	39.82877898	-80.67264027	
1,900.00	5.97	342.47	1,899.46	14.79	-4.67	14,464,562.33	1,732,320.12	39.82880167	-80.67264944	
2,000.00	7.97	342.47	1,998.72	26.35	-8.32	14,464,573.89	1,732,316.47	39.82883346	-80.67266230	
2,100.00	9.97	342.47	2,097.49	41.21	-13.01	14,464,588.75	1,732,311.78	39.82887431	-80.67267882	
2,200.00	11.97	342.47	2,195.66	59.35	-18.74	14,464,606.88	1,732,306.05	39.82892418	-80.67269898	
2,300.00	13.97	342.47	2,293.11	80.74	-25.50	14,464,628.28	1,732,299.29	39.82898300	-80.67272277	
2,378.58	15.54	342.47	2,369.09	99.82	-31.52	14,464,647.36	1,732,293.27	39.82903545	-80.67274398	
<b>Begin 15.54° tangent</b>										
2,400.00	15.54	342.47	2,389.73	105.29	-33.25	14,464,652.83	1,732,291.54	39.82905049	-80.67275006	
2,500.00	15.54	342.47	2,486.08	130.83	-41.32	14,464,678.37	1,732,283.47	39.82912072	-80.67277846	
2,600.00	15.54	342.47	2,582.42	156.38	-49.38	14,464,703.91	1,732,275.41	39.82919094	-80.67280686	
2,700.00	15.54	342.47	2,678.77	181.92	-57.45	14,464,729.45	1,732,267.34	39.82926117	-80.67283525	
2,800.00	15.54	342.47	2,775.12	207.46	-65.52	14,464,754.99	1,732,259.28	39.82933139	-80.67286365	
2,900.00	15.54	342.47	2,871.46	233.00	-73.58	14,464,780.54	1,732,251.21	39.82940162	-80.67289205	
3,000.00	15.54	342.47	2,967.81	258.54	-81.65	14,464,806.08	1,732,243.14	39.82947184	-80.67292045	
3,100.00	15.54	342.47	3,064.15	284.09	-89.71	14,464,831.62	1,732,235.08	39.82954207	-80.67294885	
3,200.00	15.54	342.47	3,160.50	309.63	-97.78	14,464,857.16	1,732,227.01	39.82961229	-80.67297724	
3,300.00	15.54	342.47	3,256.85	335.17	-105.85	14,464,882.70	1,732,218.95	39.82968252	-80.67300564	
3,400.00	15.54	342.47	3,353.19	360.71	-113.91	14,464,908.25	1,732,210.88	39.82975274	-80.67303404	
3,500.00	15.54	342.47	3,449.54	386.25	-121.98	14,464,933.79	1,732,202.81	39.82982297	-80.67306244	
3,600.00	15.54	342.47	3,545.88	411.80	-130.04	14,464,959.33	1,732,194.75	39.82989319	-80.67309083	
3,700.00	15.54	342.47	3,642.23	437.34	-138.11	14,464,984.87	1,732,186.68	39.82996342	-80.67311923	
3,800.00	15.54	342.47	3,738.58	462.88	-146.18	14,465,010.41	1,732,178.62	39.83003364	-80.67314763	
3,900.00	15.54	342.47	3,834.92	488.42	-154.24	14,465,035.96	1,732,170.55	39.83010387	-80.67317603	
4,000.00	15.54	342.47	3,931.27	513.96	-162.31	14,465,061.50	1,732,162.48	39.83017409	-80.67320443	
4,100.00	15.54	342.47	4,027.61	539.51	-170.37	14,465,087.04	1,732,154.42	39.83024432	-80.67323282	
4,200.00	15.54	342.47	4,123.96	565.05	-178.44	14,465,112.58	1,732,146.35	39.83031454	-80.67326122	
4,300.00	15.54	342.47	4,220.31	590.59	-186.51	14,465,138.12	1,732,138.29	39.83038477	-80.67328962	
4,400.00	15.54	342.47	4,316.65	616.13	-194.57	14,465,163.67	1,732,130.22	39.83045499	-80.67331802	
4,500.00	15.54	342.47	4,413.00	641.67	-202.64	14,465,189.21	1,732,122.15	39.83052522	-80.67334642	
4,600.00	15.54	342.47	4,509.34	667.22	-210.70	14,465,214.75	1,732,114.09	39.83059544	-80.67337482	
4,700.00	15.54	342.47	4,605.69	692.76	-218.77	14,465,240.29	1,732,106.02	39.83066567	-80.67340322	
4,800.00	15.54	342.47	4,702.04	718.30	-226.84	14,465,265.83	1,732,097.96	39.83073589	-80.67343161	
4,900.00	15.54	342.47	4,798.38	743.84	-234.90	14,465,291.38	1,732,089.89	39.83080612	-80.67346001	

WV Department of Environmental Protection



Planning Report - Geographic

Database: Win10Lt\_Dec2820\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Hudson Alt North  
 Well: Hudson S-05 HM (slot M)  
 Wellbore: Original Hole  
 Design: rev8

Local Co-ordinate Reference: Well Hudson S-05 HM (slot M)  
 TVD Reference: GL @ 1346.00ft  
 MD Reference: GL @ 1346.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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MAR 25 2021

WV Department of  
 Environmental Protection

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,000.00	15.54	342.47	4,894.73	769.38	-242.97	14,465,316.92	1,732,081.82	39.83087634	-80.67348841	
5,100.00	15.54	342.47	4,991.07	794.93	-251.03	14,465,342.46	1,732,073.76	39.83094657	-80.67351681	
5,200.00	15.54	342.47	5,087.42	820.47	-259.10	14,465,368.00	1,732,065.69	39.83101679	-80.67354521	
5,300.00	15.54	342.47	5,183.77	846.01	-267.17	14,465,393.54	1,732,057.63	39.83108702	-80.67357361	
5,400.00	15.54	342.47	5,280.11	871.55	-275.23	14,465,419.09	1,732,049.56	39.83115724	-80.67360201	
5,500.00	15.54	342.47	5,376.46	897.09	-283.30	14,465,444.63	1,732,041.49	39.83122747	-80.67363041	
5,600.00	15.54	342.47	5,472.80	922.64	-291.37	14,465,470.17	1,732,033.43	39.83129769	-80.67365880	
5,700.00	15.54	342.47	5,569.15	948.18	-299.43	14,465,495.71	1,732,025.36	39.83136792	-80.67368720	
5,800.00	15.54	342.47	5,665.50	973.72	-307.50	14,465,521.25	1,732,017.29	39.83143814	-80.67371560	
5,900.00	15.54	342.47	5,761.84	999.26	-315.56	14,465,546.80	1,732,009.23	39.83150837	-80.67374400	
6,000.00	15.54	342.47	5,858.19	1,024.80	-323.63	14,465,572.34	1,732,001.16	39.83157859	-80.67377240	
6,074.61	15.54	342.47	5,930.07	1,043.86	-329.65	14,465,591.39	1,731,995.14	39.83163099	-80.67379359	
<b>Begin 8°/100' build/turn</b>										
6,100.00	13.56	344.37	5,954.65	1,049.97	-331.47	14,465,597.50	1,731,993.32	39.83164778	-80.67380002	
6,200.00	6.14	3.31	6,053.12	1,066.63	-334.33	14,465,614.16	1,731,990.46	39.83169356	-80.67380997	
6,300.00	4.40	100.72	6,152.85	1,071.26	-330.24	14,465,618.80	1,731,994.55	39.83170625	-80.67379536	
6,400.00	11.35	133.33	6,251.89	1,063.78	-319.30	14,465,611.32	1,732,005.50	39.83168560	-80.67375646	
6,500.00	19.14	140.58	6,348.30	1,044.34	-301.70	14,465,591.87	1,732,023.09	39.83163201	-80.67369403	
6,600.00	27.05	143.71	6,440.22	1,013.30	-277.79	14,465,560.83	1,732,047.00	39.83154653	-80.67360928	
6,700.00	34.99	145.50	6,525.85	971.27	-248.05	14,465,518.81	1,732,076.74	39.83143083	-80.67350388	
6,800.00	42.96	146.69	6,603.53	919.08	-213.04	14,465,466.61	1,732,111.75	39.83128714	-80.67337986	
6,888.31	50.00	147.48	6,664.31	865.34	-178.29	14,465,412.88	1,732,146.50	39.83113922	-80.67325679	
<b>Begin 10°/100' build/turn</b>										
6,900.00	51.17	147.60	6,671.73	857.72	-173.45	14,465,405.26	1,732,151.35	39.83111824	-80.67323962	
7,000.00	61.14	148.45	6,727.36	787.34	-129.55	14,465,334.88	1,732,195.24	39.83092452	-80.67308418	
7,100.00	71.12	149.15	6,767.77	709.21	-82.25	14,465,256.75	1,732,242.54	39.83070949	-80.67291673	
7,200.00	81.10	149.77	6,791.75	625.71	-32.99	14,465,173.24	1,732,291.80	39.83047967	-80.67274236	
7,279.08	89.00	150.23	6,798.57	557.53	6.37	14,465,105.06	1,732,331.16	39.83029204	-80.67260305	
<b>Begin 89.00° lateral</b>										
7,300.00	89.00	150.23	6,798.93	539.37	16.75	14,465,086.91	1,732,341.55	39.83024208	-80.67256629	
7,400.00	89.00	150.23	6,800.68	452.58	66.40	14,465,000.12	1,732,391.19	39.83000323	-80.67239061	
7,500.00	89.00	150.23	6,802.44	365.79	116.04	14,464,913.33	1,732,440.83	39.82976438	-80.67221492	
7,600.00	89.00	150.23	6,804.19	279.00	165.68	14,464,826.54	1,732,490.47	39.82952554	-80.67203924	
7,700.00	89.00	150.23	6,805.94	192.21	215.32	14,464,739.75	1,732,540.11	39.82928669	-80.67186356	
7,800.00	89.00	150.23	6,807.69	105.42	264.96	14,464,652.95	1,732,589.75	39.82904784	-80.67168787	
7,900.00	89.00	150.23	6,809.44	18.63	314.60	14,464,566.16	1,732,639.39	39.82880900	-80.67151219	
8,000.00	89.00	150.23	6,811.19	-68.16	364.24	14,464,479.37	1,732,689.04	39.82857015	-80.67133651	
8,100.00	89.00	150.23	6,812.95	-154.95	413.89	14,464,392.58	1,732,738.68	39.82833130	-80.67116084	
8,200.00	89.00	150.23	6,814.70	-241.74	463.53	14,464,305.79	1,732,788.32	39.82809245	-80.67098516	
8,300.00	89.00	150.23	6,816.45	-328.53	513.17	14,464,219.00	1,732,837.96	39.82785360	-80.67080948	
8,400.00	89.00	150.23	6,818.20	-415.32	562.81	14,464,132.21	1,732,887.60	39.82761475	-80.67063381	
8,500.00	89.00	150.23	6,819.95	-502.12	612.45	14,464,045.42	1,732,937.24	39.82737590	-80.67045814	
8,600.00	89.00	150.23	6,821.70	-588.91	662.09	14,463,958.63	1,732,986.88	39.82713705	-80.67028247	
8,700.00	89.00	150.23	6,823.46	-675.70	711.74	14,463,871.84	1,733,036.53	39.82689820	-80.67010680	
8,800.00	89.00	150.23	6,825.21	-762.49	761.38	14,463,785.05	1,733,086.17	39.82665935	-80.66993113	
8,900.00	89.00	150.23	6,826.96	-849.28	811.02	14,463,698.26	1,733,135.81	39.82642050	-80.66975546	
9,000.00	89.00	150.23	6,828.71	-936.07	860.66	14,463,611.47	1,733,185.45	39.82618165	-80.66957979	
9,100.00	89.00	150.23	6,830.46	-1,022.86	910.30	14,463,524.68	1,733,235.09	39.82594280	-80.66940413	
9,200.00	89.00	150.23	6,832.21	-1,109.65	959.94	14,463,437.89	1,733,284.73	39.82570395	-80.66922846	
9,300.00	89.00	150.23	6,833.96	-1,196.44	1,009.58	14,463,351.09	1,733,334.37	39.82546510	-80.66905280	
9,400.00	89.00	150.23	6,835.72	-1,283.23	1,059.23	14,463,264.30	1,733,384.02	39.82522625	-80.66887714	
9,500.00	89.00	150.23	6,837.47	-1,370.02	1,108.87	14,463,177.51	1,733,433.66	39.82498740	-80.66870147	
9,600.00	89.00	150.23	6,839.22	-1,456.82	1,158.51	14,463,090.72	1,733,483.30	39.82474854	-80.66852581	
9,700.00	89.00	150.23	6,840.97	-1,543.61	1,208.15	14,463,003.93	1,733,532.94	39.82450969	-80.66835016	

Planning Report - Geographic

Database: Win10Lt\_Dec2820\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Hudson Alt North  
 Well: Hudson S-05 HM (slot M)  
 Wellbore: Original Hole  
 Design: rev8

Local Co-ordinate Reference:  
 TVD Reference:  
 MD Reference:  
 North Reference:  
 Survey Calculation Method:

Well Hudson S-05 HM (slot M)  
 GL @ 1346.00ft  
 GL @ 1346.00ft  
 Grid  
 Minimum Curvature

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 Office of Oil and Gas  
 MAR 25 2021

WV Department of  
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,800.00	89.00	150.23	6,842.72	-1,630.40	1,257.79	14,462,917.14	1,733,582.58	39.82427084	-80.66817450
9,900.00	89.00	150.23	6,844.47	-1,717.19	1,307.43	14,462,830.35	1,733,632.22	39.82403199	-80.66799884
10,000.00	89.00	150.23	6,846.23	-1,803.98	1,357.07	14,462,743.56	1,733,681.86	39.82379313	-80.66782319
10,100.00	89.00	150.23	6,847.98	-1,890.77	1,406.72	14,462,656.77	1,733,731.51	39.82355428	-80.66764753
10,200.00	89.00	150.23	6,849.73	-1,977.56	1,456.36	14,462,569.98	1,733,781.15	39.82331543	-80.66747188
10,300.00	89.00	150.23	6,851.48	-2,064.35	1,506.00	14,462,483.19	1,733,830.79	39.82307657	-80.66729623
10,400.00	89.00	150.23	6,853.23	-2,151.14	1,555.64	14,462,396.40	1,733,880.43	39.82283772	-80.66712058
10,500.00	89.00	150.23	6,854.98	-2,237.93	1,605.28	14,462,309.61	1,733,930.07	39.82259886	-80.66694493
10,600.00	89.00	150.23	6,856.74	-2,324.72	1,654.92	14,462,222.82	1,733,979.71	39.82236001	-80.66676928
10,700.00	89.00	150.23	6,858.49	-2,411.51	1,704.57	14,462,136.02	1,734,029.35	39.82212115	-80.66659364
10,800.00	89.00	150.23	6,860.24	-2,498.31	1,754.21	14,462,049.23	1,734,078.99	39.82188230	-80.66641799
10,900.00	89.00	150.23	6,861.99	-2,585.10	1,803.85	14,461,962.44	1,734,128.64	39.82164344	-80.66624235
11,000.00	89.00	150.23	6,863.74	-2,671.89	1,853.49	14,461,875.65	1,734,178.28	39.82140459	-80.66606671
11,100.00	89.00	150.23	6,865.49	-2,758.68	1,903.13	14,461,788.86	1,734,227.92	39.82116573	-80.66589107
11,200.00	89.00	150.23	6,867.24	-2,845.47	1,952.77	14,461,702.07	1,734,277.56	39.82092687	-80.66571542
11,300.00	89.00	150.23	6,869.00	-2,932.26	2,002.41	14,461,615.28	1,734,327.20	39.82068802	-80.66553979
11,400.00	89.00	150.23	6,870.75	-3,019.05	2,052.06	14,461,528.49	1,734,376.84	39.82044916	-80.66536415
11,500.00	89.00	150.23	6,872.50	-3,105.84	2,101.70	14,461,441.70	1,734,426.48	39.82021030	-80.66518851
11,600.00	89.00	150.23	6,874.25	-3,192.63	2,151.34	14,461,354.91	1,734,476.13	39.81997144	-80.66501288
11,700.00	89.00	150.23	6,876.00	-3,279.42	2,200.98	14,461,268.12	1,734,525.77	39.81973259	-80.66483724
11,800.00	89.00	150.23	6,877.75	-3,366.21	2,250.62	14,461,181.33	1,734,575.41	39.81949373	-80.66466161
11,900.00	89.00	150.23	6,879.51	-3,453.00	2,300.26	14,461,094.54	1,734,625.05	39.81925487	-80.66448598
12,000.00	89.00	150.23	6,881.26	-3,539.80	2,349.91	14,461,007.75	1,734,674.69	39.81901601	-80.66431035
12,100.00	89.00	150.23	6,883.01	-3,626.59	2,399.55	14,460,920.96	1,734,724.33	39.81877715	-80.66413472
12,200.00	89.00	150.23	6,884.76	-3,713.38	2,449.19	14,460,834.16	1,734,773.97	39.81853829	-80.66395909
12,300.00	89.00	150.23	6,886.51	-3,800.17	2,498.83	14,460,747.37	1,734,823.62	39.81829943	-80.66378346
12,400.00	89.00	150.23	6,888.26	-3,886.96	2,548.47	14,460,660.58	1,734,873.26	39.81806057	-80.66360784
12,500.00	89.00	150.23	6,890.01	-3,973.75	2,598.11	14,460,573.79	1,734,922.90	39.81782171	-80.66343221
12,600.00	89.00	150.23	6,891.77	-4,060.54	2,647.75	14,460,487.00	1,734,972.54	39.81758285	-80.66325659
12,700.00	89.00	150.23	6,893.52	-4,147.33	2,697.40	14,460,400.21	1,735,022.18	39.81734399	-80.66308097
12,800.00	89.00	150.23	6,895.27	-4,234.12	2,747.04	14,460,313.42	1,735,071.82	39.81710513	-80.66290535
12,900.00	89.00	150.23	6,897.02	-4,320.91	2,796.68	14,460,226.63	1,735,121.46	39.81686627	-80.66272973
13,000.00	89.00	150.23	6,898.77	-4,407.70	2,846.32	14,460,139.84	1,735,171.11	39.81662741	-80.66255411
13,100.00	89.00	150.23	6,900.52	-4,494.49	2,895.96	14,460,053.05	1,735,220.75	39.81638855	-80.66237849
13,200.00	89.00	150.23	6,902.28	-4,581.29	2,945.60	14,459,966.26	1,735,270.39	39.81614969	-80.66220287
13,300.00	89.00	150.23	6,904.03	-4,668.08	2,995.24	14,459,879.47	1,735,320.03	39.81591082	-80.66202726
13,400.00	89.00	150.23	6,905.78	-4,754.87	3,044.89	14,459,792.68	1,735,369.67	39.81567196	-80.66185165
13,500.00	89.00	150.23	6,907.53	-4,841.66	3,094.53	14,459,705.89	1,735,419.31	39.81543310	-80.66167603
13,600.00	89.00	150.23	6,909.28	-4,928.45	3,144.17	14,459,619.10	1,735,468.95	39.81519423	-80.66150042
13,700.00	89.00	150.23	6,911.03	-5,015.24	3,193.81	14,459,532.30	1,735,518.60	39.81495537	-80.66132481
13,800.00	89.00	150.23	6,912.79	-5,102.03	3,243.45	14,459,445.51	1,735,568.24	39.81471651	-80.66114920
13,900.00	89.00	150.23	6,914.54	-5,188.82	3,293.09	14,459,358.72	1,735,617.88	39.81447764	-80.66097360
14,000.00	89.00	150.23	6,916.29	-5,275.61	3,342.74	14,459,271.93	1,735,667.52	39.81423878	-80.66079799
14,100.00	89.00	150.23	6,918.04	-5,362.40	3,392.38	14,459,185.14	1,735,717.16	39.81399992	-80.66062238
14,200.00	89.00	150.23	6,919.79	-5,449.19	3,442.02	14,459,098.35	1,735,766.80	39.81376105	-80.66044678
14,300.00	89.00	150.23	6,921.54	-5,535.99	3,491.66	14,459,011.56	1,735,816.44	39.81352219	-80.66027118
14,400.00	89.00	150.23	6,923.29	-5,622.78	3,541.30	14,458,924.77	1,735,866.09	39.81328332	-80.66009558
14,500.00	89.00	150.23	6,925.05	-5,709.57	3,590.94	14,458,837.98	1,735,915.73	39.81304446	-80.65991998
14,600.00	89.00	150.23	6,926.80	-5,796.36	3,640.58	14,458,751.19	1,735,965.37	39.81280559	-80.65974438
14,700.00	89.00	150.23	6,928.55	-5,883.15	3,690.23	14,458,664.40	1,736,015.01	39.81256672	-80.65956878
14,800.00	89.00	150.23	6,930.30	-5,969.94	3,739.87	14,458,577.61	1,736,064.65	39.81232786	-80.65939318
14,900.00	89.00	150.23	6,932.05	-6,056.73	3,789.51	14,458,490.82	1,736,114.29	39.81208899	-80.65921759
15,000.00	89.00	150.23	6,933.80	-6,143.52	3,839.15	14,458,404.03	1,736,163.93	39.81185012	-80.65904199
15,100.00	89.00	150.23	6,935.56	-6,230.31	3,888.79	14,458,317.24	1,736,213.58	39.81161126	-80.65886640
15,200.00	89.00	150.23	6,937.31	-6,317.10	3,938.43	14,458,230.44	1,736,263.22	39.81137239	-80.65869081



Planning Report - Geographic

<b>Database:</b>	Win10Lt_Dec2820_v16	<b>Local Co-ordinate Reference:</b>	Well Hudson S-05 HM (slot M)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1346.00ft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1346.00ft
<b>Site:</b>	Hudson Alt North	<b>North Reference:</b>	Grid
<b>Well:</b>	Hudson S-05 HM (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

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Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,300.00	89.00	150.23	6,939.06	-6,403.89	3,988.08	14,458,143.65	1,736,312.86	39.81113352	-80.65851522
15,400.00	89.00	150.23	6,940.81	-6,490.68	4,037.72	14,458,056.86	1,736,362.50	39.81089465	-80.65833963
15,500.00	89.00	150.23	6,942.56	-6,577.48	4,087.36	14,457,970.07	1,736,412.14	39.81065579	-80.65816404
15,600.00	89.00	150.23	6,944.31	-6,664.27	4,137.00	14,457,883.28	1,736,461.78	39.81041692	-80.65798845
15,700.00	89.00	150.23	6,946.07	-6,751.06	4,186.64	14,457,796.49	1,736,511.42	39.81017805	-80.65781287
15,800.00	89.00	150.23	6,947.82	-6,837.85	4,236.28	14,457,709.70	1,736,561.07	39.80993918	-80.65763728
15,900.00	89.00	150.23	6,949.57	-6,924.64	4,285.92	14,457,622.91	1,736,610.71	39.80970031	-80.65746170
16,000.00	89.00	150.23	6,951.32	-7,011.43	4,335.57	14,457,536.12	1,736,660.35	39.80946144	-80.65728612
16,100.00	89.00	150.23	6,953.07	-7,098.22	4,385.21	14,457,449.33	1,736,709.99	39.80922257	-80.65711054
16,200.00	89.00	150.23	6,954.82	-7,185.01	4,434.85	14,457,362.54	1,736,759.63	39.80898370	-80.65693496
16,300.00	89.00	150.23	6,956.57	-7,271.80	4,484.49	14,457,275.75	1,736,809.27	39.80874483	-80.65675938
16,400.00	89.00	150.23	6,958.33	-7,358.59	4,534.13	14,457,188.96	1,736,858.91	39.80850596	-80.65658380
16,500.00	89.00	150.23	6,960.08	-7,445.38	4,583.77	14,457,102.17	1,736,908.56	39.80826709	-80.65640823
16,600.00	89.00	150.23	6,961.83	-7,532.17	4,633.42	14,457,015.37	1,736,958.20	39.80802822	-80.65623265
16,700.00	89.00	150.23	6,963.58	-7,618.97	4,683.06	14,456,928.58	1,737,007.84	39.80778935	-80.65605708
16,800.00	89.00	150.23	6,965.33	-7,705.76	4,732.70	14,456,841.79	1,737,057.48	39.80755048	-80.65588150
16,900.00	89.00	150.23	6,967.08	-7,792.55	4,782.34	14,456,755.00	1,737,107.12	39.80731160	-80.65570593
17,000.00	89.00	150.23	6,968.84	-7,879.34	4,831.98	14,456,668.21	1,737,156.76	39.80707273	-80.65553036
17,100.00	89.00	150.23	6,970.59	-7,966.13	4,881.62	14,456,581.42	1,737,206.40	39.80683386	-80.65535479
17,200.00	89.00	150.23	6,972.34	-8,052.92	4,931.26	14,456,494.63	1,737,256.05	39.80659499	-80.65517923
17,300.00	89.00	150.23	6,974.09	-8,139.71	4,980.91	14,456,407.84	1,737,305.69	39.80635611	-80.65500366
17,400.00	89.00	150.23	6,975.84	-8,226.50	5,030.55	14,456,321.05	1,737,355.33	39.80611724	-80.65482810
17,500.00	89.00	150.23	6,977.59	-8,313.29	5,080.19	14,456,234.26	1,737,404.97	39.80587837	-80.65465253
17,600.00	89.00	150.23	6,979.35	-8,400.08	5,129.83	14,456,147.47	1,737,454.61	39.80563949	-80.65447697
17,700.00	89.00	150.23	6,981.10	-8,486.87	5,179.47	14,456,060.68	1,737,504.25	39.80540062	-80.65430141
17,800.00	89.00	150.23	6,982.85	-8,573.67	5,229.11	14,455,973.89	1,737,553.89	39.80516174	-80.65412585
17,900.00	89.00	150.23	6,984.60	-8,660.46	5,278.75	14,455,887.10	1,737,603.54	39.80492287	-80.65395029
17,965.67	89.00	150.23	6,985.75	-8,717.45	5,311.35	14,455,830.10	1,737,636.13	39.80476600	-80.65383500

PBHL/TD 17965.67 MD 6985.75 TVD

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Hudson 05HM LP r6	0.00	0.00	6,798.57	557.52	6.38	14,465,105.05	1,732,331.17	39.83029200	-80.67260300
- plan misses target center by 0.01ft at 7279.10ft MD (6798.57 TVD, 557.51 N, 6.38 E)									
- Point									
Hudson 05HM PBHL r7	0.00	0.01	6,985.75	-8,717.45	5,311.35	14,455,830.10	1,737,636.13	39.80476600	-80.65383500
- plan hits target center									
- Point									

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
1,601.75	1,601.75	0.00	0.00	KOP Begin 2°/100' build	
2,378.58	2,369.09	99.82	-31.52	Begin 15.54° tangent	
6,074.61	5,930.07	1,043.86	-329.65	Begin 8°/100' build/turn	
6,888.31	6,664.31	865.34	-178.29	Begin 10°/100' build/turn	
7,279.08	6,798.57	557.53	6.37	Begin 89.00° lateral	
17,965.67	6,985.75	-8,717.45	5,311.35	PBHL/TD 17965.67 MD 6985.75 TVD	

### Area of Review

#### Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.

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

#### Data Sources Reviewed:

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

Contacted Adam Picard 724-485-9331, [apicard@dpslandservices.com](mailto:apicard@dpslandservices.com), DPS GIS (02/16/2021) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it is the best publicly available. See attached map he provided.

#### Request maps for:

1. Wellbore with 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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**Wells within 500' Buffer**

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705102248	Tug Hill Operating, LLC	6848' TVD, proposed	none	none	Yes, this is a proposed well in the Marcellus. Once completed proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	A permitted well on the pad that is not drilled or perforated.
4705102249	Tug Hill Operating, LLC	6862' TVD, proposed	none	none	Yes, this is a proposed well in the Marcellus. Once completed proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	A permitted well on the pad that is not drilled or perforated.
4705102250	Tug Hill Operating, LLC	6870' TVD, proposed	none	none	Yes, this is a proposed well in the Marcellus. Once completed proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	A permitted well on the pad that is not drilled or perforated.
4705102251	Tug Hill Operating, LLC	6886' TVD, proposed	none	none	Yes, this is a proposed well in the Marcellus. Once completed proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	A permitted well on the pad that is not drilled or perforated.

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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
4705102292	Tug Hill Operating, LLC	11923' TVD, proposed	none	none	No, this is a proposed well in the Point Pleasant. Once completed the well will not be deep enough to be within the expected fracture propagation from a Marcellus stimulation.	A permitted well on the pad that is not drilled or perforated.
4705102293	Tug Hill Operating, LLC	11961' TVD, proposed	none	none	No, this is a proposed well in the Point Pleasant. Once completed the well will not be deep enough to be within the expected fracture propagation from a Marcellus stimulation.	A permitted well on the pad that is not drilled or perforated.
4705102296	Tug Hill Operating, LLC	11901' TVD, proposed	none	none	No, this is a proposed well in the Point Pleasant. Once completed the well will not be deep enough to be within the expected fracture propagation from a Marcellus stimulation.	A permitted well on the pad that is not drilled or perforated.
4705170638	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705170639	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.

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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
4705100841	McElroy Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 4/27/1999.
4705100842	McElroy Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 6/30/1999.

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WV Geological & Economic Survey

Well: County = 51 Permit = 02248

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102248	Marshall	2248	Meade	Glen Easton	Cameron	39.828765	-80.672708	528007.2	4408803.3

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102248	1 As Proposed	528915	4405569.9	-80.662243	39.799602

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM
4705102248	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC		S-1HM	Hudson		Charlene L Barker et al	Tug Hill Operating, LLC	6848	Marcellus Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEf	G_AFT	O
4705102248	-/-	-/-	1370	Ground Level															

WV Geological & Economic Survey

Well: County = 51 Permit = 02249

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102249	Marshall	2249	Meade	Glen Easton	Cameron	39.828798	-80.672705	528007.5	4408807

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102249	1 As Proposed	529095.5	4405714.6	-80.660128	39.800899

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM
4705102249	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC		S-2HM	Hudson		Charlene L Baker et al	Tug Hill Operating, LLC	6862	Marcellus Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEf	G_AFT	O
4705102249	-/-	-/-	1370	Ground Level															

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WV Geological &amp; Economic Survey

Well: County = 51 Permit = 02250

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102250	Marshall	2250	Meade	Glen Easton	Cameron	39.828831	-80.672702	528007.7	4408810.7

## Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102250	1 As Proposed	528759.9	4406752.9	-80.664003	39.810266

## Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	T
4705102250	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC	-/-	S-3HM	Hudson		Charlene L Barker et al	Tug Hill Operating, LLC	6870	Marcellus Fm	

## Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEFO	G_AFT O
4705102250	-/-	-/-	1370	Ground Level														

WV Geological &amp; Economic Survey:

Well: County = 51 Permit = 02251

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102251	Marshall	2251	Meade	Glen Easton	Cameron	39.828864	-80.672698	528008.1	4408814.3

## Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102251	1 As Proposed	528811.5	4407120.8	-80.663384	39.813579

## Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	T
4705102251	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC	-/-	S-4HM	Hudson		Charlene L Baker et al	Tug Hill Operating, LLC	6886	Marcellus Fm	

## Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEFO	G_AFT O
4705102251	-/-	-/-	1370	Ground Level														

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WV Geological & Economic Survey

Well: County = 51 Permit = 02292

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102292	Marshall	2292	Meade	Glen Easton	Cameron	39.828733	-80.672711	528007	4408799.8

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102292	1 As Proposed	528726.7	4406996.2	-80.66438	39.812459

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TI
4705102292	-/-	Dvtd Wrkd Ovr	Permitted	CNX Land LLC		S-12HU	Hudson		Charlene L Baker et al	Tug Hill Operating, LLC	11923	Pt Pleasant Fm	
4705102292	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC		S-12HU	Hudson		C L Baker et al	Tug Hill Operating, LLC	11923	Pt Pleasant Fm	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEFO	G_AFTO
4705102292	-/-	-/-	1370	Ground Level														
4705102292	-/-	-/-	1370	Ground Level														

WV Geological & Economic Survey

Well: County = 51 Permit = 02293

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102293	Marshall	2293	Meade	Gen Easton	Cameron	39.828667	-80.672718	528006.4	4408792.5

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102293	1 As Proposed	528974.7	4407331.6	-80.661468	39.815472

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TI
4705102293	-/-	Dvtd Wrkd Ovr	Permitted	CNX Land LLC		S-13HU	Hudson		Charlene L Baker et al	Tug Hill Operating, LLC	11957	Pt Pleasant Fm	
4705102293	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC		S-13HU	Hudson		C L Baker et al	Tug Hill Operating, LLC	11961	Pt Pleasant Fm	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEFO	G_AFTO
4705102293	-/-	-/-	1370	Ground Level														
4705102293	-/-	-/-	1370	Ground Level														

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Well: County = 51 Permit = 02296

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102296	Marshall	2296	Meade	Glen Easton	Cameron	39.8287	-80.672714	528006.8	4408796.1

Bottom Hole Location Information:

API	EP	FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102296	1	As Proposed	529023.4	4405715.4	-80.66097	39.800909

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM
4705102296	-/-	Dvtd Orgnl Loc	Permitted	CNX Land LLC		S-11HU	Hudson		C L Baker et al	Tug Hill Operating, LLC	11901	Pt Pleasant Fm
4705102296	-/-	Dvtd Wrkd Ovr	Permitted	CNX Land LLC		S-11HU	Hudson		Charlene L Baker et al	Tug Hill Operating, LLC	11901	Pt Pleasant Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT
4705102296	-/-	-/-	1370	Ground Level														
4705102296	-/-	-/-	1370	Ground Level														

WV Geological & Economic Survey

Well: County = 51 Permit = 70638

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170638	Marshall	70638	Meade	Glen Easton	Cameron	39.815704	-80.659964	529103.3	4407357.8

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170638	-/-	unknown	Prpty Map	John Chapman Jr		1225				----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT
4705170638	-/-	-/-						unclassified	unclassified	not available	unknown	unknown						

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 MAR 25 2021  
 WV Department of  
 Environmental Protection

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MAR 25 2021  
WV Department of  
Environmental Protection



Well: County = 51 Permit = 70639

WV Geological & Economic Survey

Well Reassignment Information: Reassigned To

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70639	51	841

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170639	Marshall	70639	Meade	Glen Easton	Cameron	39.813691	-80.662222	528910.9	4407133.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170639	-/-		unknown	Reassign						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BE
4705170639	-/-	-/-						unclassified	unclassified	not available	unknown	unknown			0		0		0

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 WV Department of  
 Environmental Protection

Well: County = 51 Permit = 00841

WV Geological & Economic Survey

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70639	51	841

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100841	Marshall	841	Meade	Glen Easton	Cameron	39.813111	-80.660717	529039.9	4407069.7

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100841	5/28/1999	Plugging	Completed	Wilda H Miller		M-38			Wilda H Miller	McElroy Coal Company			
4705100841	-/-	unknown	Prpty Map	John Blake		1113				----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEFG	G_A
4705100841	5/28/1999	4/27/1999	1291	Ground Level				unclassified	unclassified	not available	unknown	unknown						
4705100841	-/-	-/-						unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705100841	Plugging	Pittsburgh coal	Well Record	1020	Reasonable	6	Reasonable	1291	Ground Level

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100841	4/27/1999	0

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 WV Department of  
 Environmental Protection



**Well: County = 51 Permit = 00842**

WV Geological & Economic Survey:

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70640	51	842

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100842	Marshall	842	Meade	Glen Easton	Cameron	39.808157	-80.655639	529476.7	4406521.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100842	6/30/1999	Plugging	Completed	Wilda Miller		M-68			Wilda Miller	McElroy Coal Company			
4705100842	-/-	unknown	Prpty Map	John Blake						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_
4705100842	6/30/1999	6/17/1999	986	Ground Level						not available	unknown	unknown						
4705100842	-/-	-/-						unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

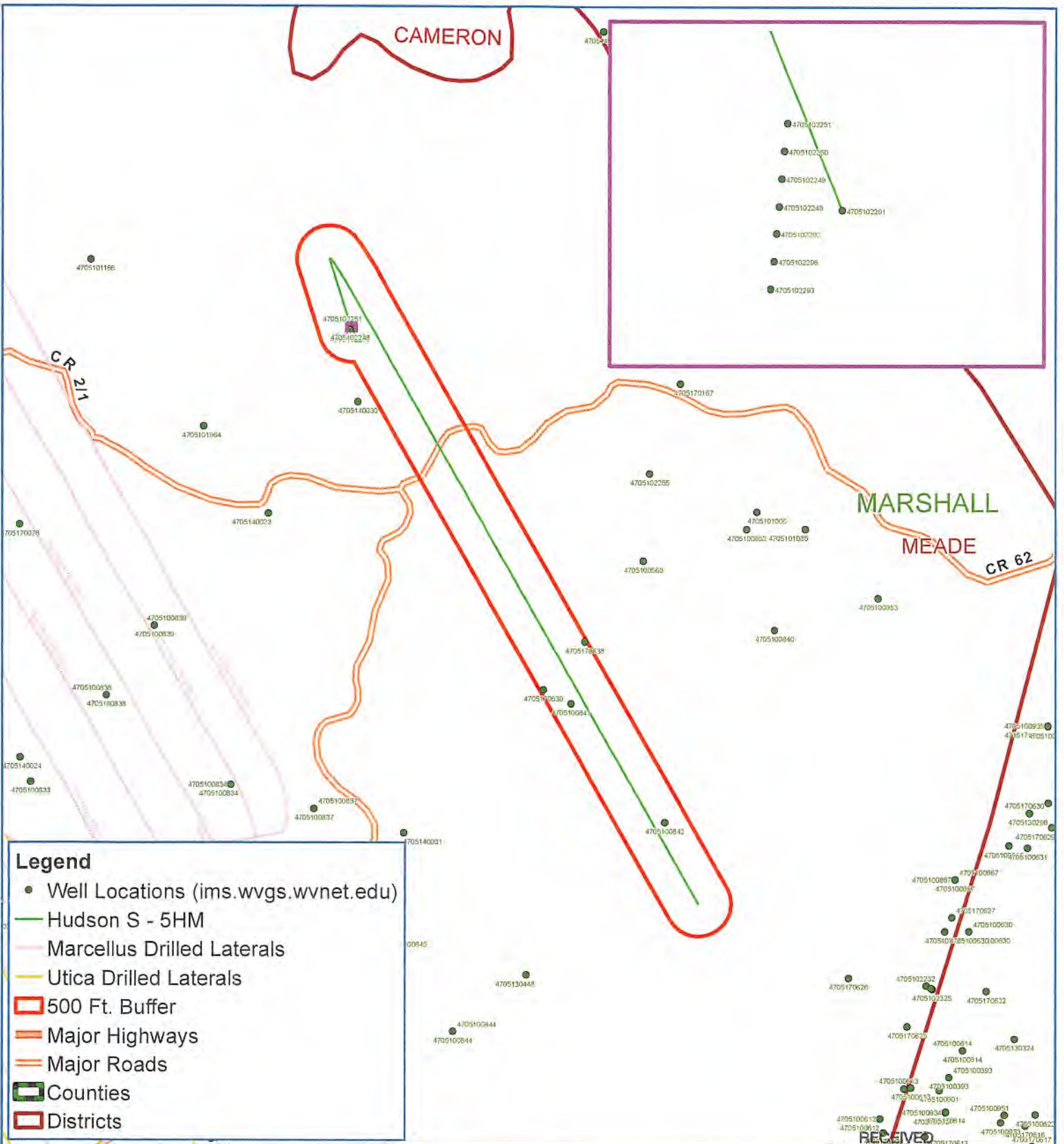
There is no Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100842	6/30/1999	0

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 Office of Oil and Gas  
**MAR 25 2021**  
 WV Department of  
 Environmental Protection



- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
  - Hudson S - 5HM
  - Marcellus Drilled Laterals
  - Utica Drilled Laterals
  - 500 Ft. Buffer
  - Major Highways
  - Major Roads
  - ▭ Counties
  - ▭ Districts

Office of Oil and Gas



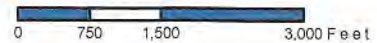
# Hudson S - 5HM Meade District Marshall County, WV

MAR 25 2021

WV Department of  
Environmental Protection



Map Prepared by:



Notes:

All locations are approximate and are for visualization purposes only.

Map Created: February 16, 2021  
Map Current As Of: February 16, 2021





# Well Site Safety Plan

## Tug Hill Operating, LLC

*B.S. 3-16-21*

Well Name: Hudson S-5HM

Pad Location: Hudson Pad

Marshall County, West Virginia

UTM (meters , NAD83, Zone 17:

    Northing: 4,408,802.91

    Easting: 528,013.65

Updated  
2/2021

04/16/2021



**HUDSON S  
WELL 5HM  
TUG HILL OPERATING**

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

T.H. LONGITUDE 80°40'00"  
B.H. LONGITUDE 80°37'30"

10,406' B.H.

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-2-9.1	CONSOLIDATION COAL CO.	1.00
9-2-9.2	CONSOLIDATION COAL CO.	1.00
9-3-1.2	CONSOLIDATION COAL CO.	1.00
9-5-11.1	MARK H. FOX	2.619
9-7-10	DONALD M. & THERESA L. HARRIS	3.00
9-8-1	CNX LAND CO. LLC	2.908
9-8-2	CNX LAND CO. LLC	6000 SQ. FT.
9-8-3	CHURCH OF CHRIST	LOT
9-8-4	DONALD M. & THERESA L. HARRIS	3.183
9-8-4.1	CNX LAND RESOURCES, INC.	0.333

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

NAD'83 S.P.C.(FT)	N. 486,126.41	E. 1,639,179.25
NAD'83 GEO.	LAT-(N) 39.828761	LONG-(W) 80.672633
NAD'83 UTM (M)	N. 4,408,802.91	E. 528,013.65
<b>LANDING POINT</b>		
NAD'83 S.P.C.(FT)	N. 486,683.9	E. 1,639,194.9
NAD'83 GEO.	LAT-(N) 39.830292	LONG-(W) 80.672603
NAD'83 UTM (M)	N. 4,408,972.8	E. 528,015.6
<b>BOTTOM HOLE</b>		
NAD'83 S.P.C.(FT)	N. 477,318.5	E. 1,644,345.9
NAD'83 GEO.	LAT-(N) 39.804766	LONG-(W) 80.653835
NAD'83 UTM (M)	N. 4,406,145.8	E. 529,632.6

**NOTES ON SURVEY**

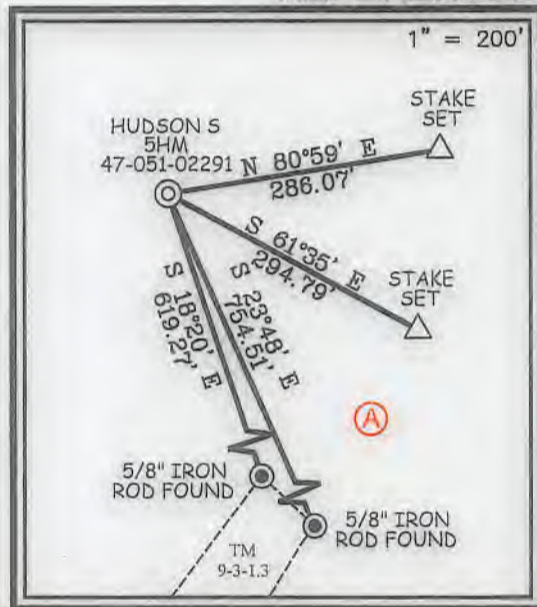
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS OR DWELLINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.



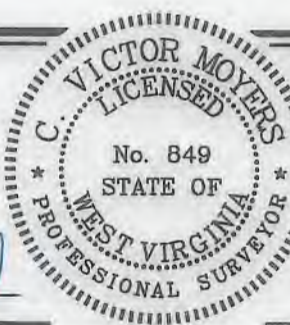
12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5654  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
slswv.com



**REFERENCES**



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



P.S. 849

*C. Victor Moyers*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE JUNE 14, 20 19  
REVISED JUNE 25, 2019, FEBRUARY 18, 2021  
OPERATORS WELL NO. HUDSON S-5HM  
API WELL NO. 47 - 051 - 02291  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8911P5HMR2.dwg  
HUDSON S-5HM REV7  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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



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

LOCATION: ELEVATION 1,346' WATERSHED GRAVE CREEK (HUC 10)  
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER CNX LAND LLC ACREAGE 106.935±  
ROYALTY OWNER CHARLENE L. BAKER, ET AL ACREAGE 106.904

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

PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
ESTIMATED DEPTH TVD: 6,917' / TMD: 17,966'

WELL OPERATOR TUG HILL OPERATING, LLC  
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500  
FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER  
ADDRESS CT CORPORATION SYSTEM  
5400 D BIG TYLER ROAD  
CHARLESTON, WV 25313

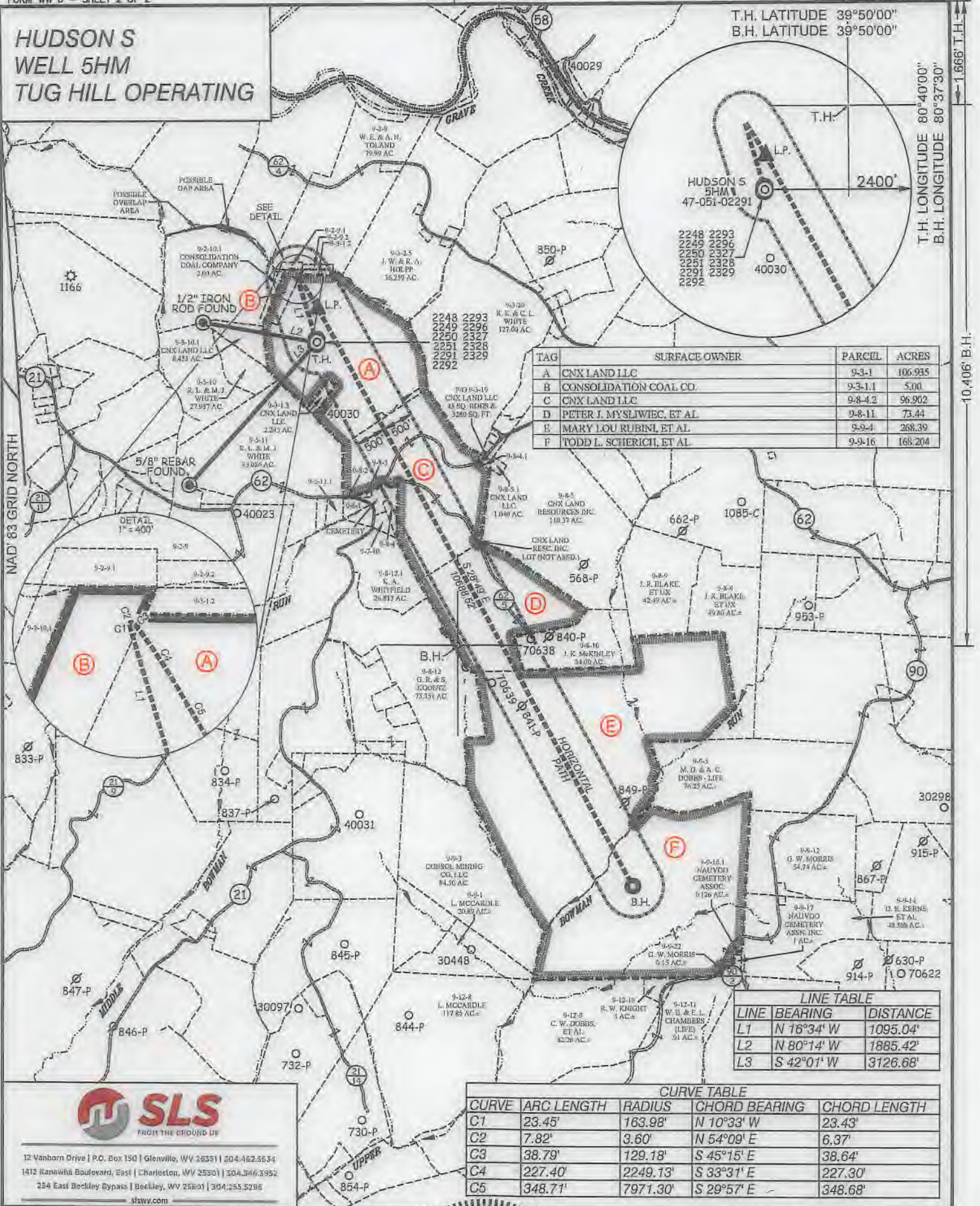
COUNTY NAME

PERMIT

04/16/2021



**HUDSON S  
WELL 5HM  
TUG HILL OPERATING**



TAG	SURFACE OWNER	PARCEL	ACRES
A	CNX LAND LLC	9-3-1	106.935
B	CONSOLIDATION COAL CO.	9-3-1.1	5.00
C	CNX LAND LLC	9-8-4.2	96.902
D	PETER J. MYSLIWIEC, ET AL	9-8-11	73.44
E	MARY LOU RUBINI, ET AL	9-9-4	268.39
F	TODD L. SCHERICI, ET AL	9-9-16	168.204

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 16°34' W	1095.04'
L2	N 80°14' W	1885.42'
L3	S 42°01' W	3126.68'

CURVE TABLE				
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	23.45'	163.98'	N 10°33' W	23.43'
C2	7.82'	3.60'	N 54°09' E	6.37'
C3	38.79'	129.18'	S 45°15' E	38.64'
C4	227.40'	2249.13'	S 33°31' E	227.30'
C5	348.71'	7971.30'	S 29°57' E	348.68'

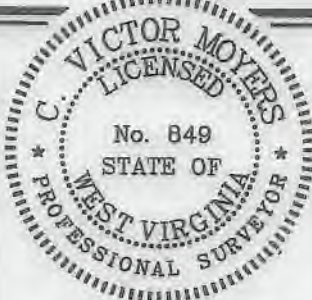


12 Vanborn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634  
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
 254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5295  
 slswv.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD'83 S.P.C.(FT) N. 486,126.41 E. 1,639,179.25  
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 NAD'83 UTM (M) N. 4,408,802.91 E. 528,013.65

**LANDING POINT**  
 NAD'83 S.P.C.(FT) N. 486,683.9 E. 1,639,194.9  
 NAD'83 GEO. LAT-(N) 39.830292 LONG-(W) 80.672603  
 NAD'83 UTM (M) N. 4,408,972.8 E. 528,015.6

**BOTTOM HOLE**  
 NAD'83 S.P.C.(FT) N. 477,318.5 E. 1,644,345.9  
 NAD'83 GEO. LAT-(N) 39.804766 LONG-(W) 80.653835  
 NAD'83 UTM (M) N. 4,406,145.8 E. 529,632.6



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

P.S. *C. Victor Moyers*  
 849

SCALE 1" = 2000' FILE NO. 8911P5HMR2.dwg  
 HUDSON S-5HM REV7  
 DATE JUNE 14, 2019  
 REVISED JUNE 25, 2019, FEBRUARY 18, 2021  
 OPERATORS WELL NO. HUDSON S-5HM MOD  
 API WELL NO. 47-051-02291  
 STATE COUNTY PERMIT

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

**LEGEND**

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

04/16/2021

WELL OPERATOR TUG HILL OPERATING, LLC ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107  
 DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313



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

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

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

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

\*See attached pages

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

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

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

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

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

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26041	9-3-1	A	FREDDIE C WHITE AND VIOLET L WHITE	CHESAPEAKE APPALACHIA LLC	1/8+	728	527	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 27/386	Statoil USA Onshore Properties Inc to Chevron USA Inc: 30/427	Chesapeake Appalachia LLC to Chevron USA Inc: 30/461	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26044	9-3-1	A	JOYCE A WALLACE	CHEVRON USA INC	1/8+	863	296	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26047	9-3-1	A	ROBERT D BLAKE AND ATHENA LIBERTY BLAKE	CHEVRON USA INC	1/8+	863	138	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26048	9-3-1	A	LOIS J ELIAS AND LOUIS J ELIAS	CHEVRON USA INC	1/8+	861	599	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26049	9-3-1	A	MARY H HUBBS	CHEVRON USA INC	1/8+	863	560	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26050	9-3-1	A	BERNARD O CROW AND KAREN S CROW	CHEVRON USA INC	1/8+	863	627	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26051	9-3-1	A	ROBERT W KIDNER	CHEVRON USA INC	1/8+	863	644	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26052	9-3-1	A	BETTY J BLAKE	CHEVRON USA INC	1/8+	863	545	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26057	9-3-1	A	JOHN PURDY AND BRENDA S PURDY	CHEVRON USA INC	1/8+	854	420	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26058	9-3-1	A	CAROLE J WOOD	CHEVRON USA INC	1/8+	854	415	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26059	9-3-1	A	TERRY L BLAKE	CHEVRON USA INC	1/8+	854	215	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26060	9-3-1	A	ROBERT C BLAKE AND LYN BLAKE	CHEVRON USA INC	1/8+	854	333	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26061	9-3-1	A	RODNEY W AND LINDA L HUBBS	CHEVRON USA INC	1/8+	854	435	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26062	9-3-1	A	SHANNON ROGER AND LORRAINE HUBBS	CHEVRON USA INC	1/8+	854	233	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26063	9-3-1	A	PATTY L RINE AND FLOYD D RINE	CHEVRON USA INC	1/8+	854	238	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26064	9-3-1	A	CATHARINE LEE BLAKE	CHEVRON USA INC	1/8+	863	550	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26066	9-3-1	A	DANNY E AND MARVA L BEYSER	CHEVRON USA INC	1/8+	858	36	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26067	9-3-1	A	DONALD DEAN BEYSER	CHEVRON USA INC	1/8+	858	41	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26068	9-3-1	A	GARY F BLAKE AND DORIS E BLAKE	CHEVRON USA INC	1/8+	858	31	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26069	9-3-1	A	MARILYN SUE REILLEY	CHEVRON USA INC	1/8+	857	597	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26070	9-3-1	A	MARY W HOLMES	CHEVRON USA INC	1/8+	857	602	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26071	9-3-1	A	CHARLENE LORRAINE BAKER	CHEVRON USA INC	1/8+	857	607	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26072	9-3-1	A	JAMES L BLAKE	CHEVRON USA INC	1/8+	857	616	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26073	9-3-1	A	DARLENE L BEYSER	CHEVRON USA INC	1/8+	860	176	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26075	9-3-1	A	BETTY JOANN CECIL	CHEVRON USA INC	1/8+	860	119	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26076	9-3-1	A	DORIS IMOGENE GARRISON	CHEVRON USA INC	1/8+	860	114	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26077	9-3-1	A	DOROTHY J AND ROBERT M BLAKE	CHEVRON USA INC	1/8+	860	104	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26078	9-3-1	A	VELMA RUTH HARRIS	CHEVRON USA INC	1/8+	860	228	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



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10*26079	9-3-1	A	MARY O'DESSA HARRIS LOUDEN	CHEVRON USA INC	1/8+	860	109	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26080	9-3-1	A	SHARON DIANE HOLMES JAHN AND WILLILAM HENRY JAHN III	CHEVRON USA INC	1/8+	860	217	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26081	9-3-1	A	CYNTHIA JEAN AND EDDIE W WILSON	CHEVRON USA INC	1/8+	861	545	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26082	9-3-1	A	BRIAN C AND SARA M LUTZ	CHEVRON USA INC	1/8+	861	550	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26083	9-3-1	A	WILLIAM S BLAKE JR	CHEVRON USA INC	1/8+	861	535	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26084	9-3-1	A	CYNTHIA A AND JAMES O DAVIDSON	CHEVRON USA INC	1/8+	889	46	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26085	9-3-1	A	CLYDE R AND JANA HIGGINS	CHEVRON USA INC	1/8+	861	508	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26086	9-3-1	A	DELMAS W AND ROSE HIGGINS	CHEVRON USA INC	1/8+	861	503	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26087	9-3-1	A	JERRY L AND DENISE HIGGINS	CHEVRON USA INC	1/8+	861	526	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26088	9-3-1	A	SHIRL W AND DORIS HIGGINS	CHEVRON USA INC	1/8+	861	540	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26089	9-3-1	A	ALVA L AND SHIRLEY HIGGINS	CHEVRON USA INC	1/8+	861	521	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26090	9-3-1	A	H DEAN AND KAREN HIGGINS	CHEVRON USA INC	1/8+	861	516	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26091	9-3-1	A	JOELENE M MANN	CHEVRON USA INC	1/8+	864	55	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26092	9-3-1	A	SHAWN J AND SARAH E CREWS	CHEVRON USA INC	1/8+	864	50	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



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10*26093	9-3-1	A	JOYCE HOLMES CONE AND WILLIAM CONE	CHEVRON USA INC	1/8+	861	493	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26094	9-3-1	A	MARK L CURRY	CHEVRON USA INC	1/8+	865	102	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26095	9-3-1	A	CHRISTINA C MUNSON	CHEVRON USA INC	1/8+	865	107	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26097	9-3-1	A	DAVID L BEYSER	CHEVRON USA INC	1/8+	865	173	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26098	9-3-1	A	KIMBERLY J HOLDER	CHEVRON USA INC	1/8+	867	87	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26099	9-3-1	A	CAROL TROWBRIDGE ET VIR	CHEVRON USA INC	1/8+	866	138	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26100	9-3-1	A	JOSEPH L AND ROSE MARIE MAUPIN	CHEVRON USA INC	1/8+	866	67	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26120	9-3-1	A	JAMES D AND LINDA D YOCUM	CHEVRON USA INC	1/8+	884	635	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26121	9-3-1	A	BETTY BRYNER	CHEVRON USA INC	1/8+	871	64	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26236	9-3-1	A	GERALD W QUIGLEY AND VICKI L QUIGLEY	CHEVRON USA INC	1/8+	884	50	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26237	9-3-1	A	FREDA L CAMPBELL	CHEVRON USA INC	1/8+	889	40	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26238	9-3-1	A	MARSHA L MERCER	CHEVRON USA INC	1/8+	883	639	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26287	9-3-1	A	IVAN R AND MARY A BLAKE	CHEVRON USA INC	1/8+	888	542	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26288	9-3-1	A	REBECCA J BLAKE	CHEVRON USA INC	1/8+	888	571	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



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10*26289	9-3-1	A	DUANETTA B BLAKE FROMHART	CHEVRON USA INC	1/8+	888	574	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26291	9-3-1	A	BARBARA A BLAKE MASON	CHEVRON USA INC	1/8+	901	125	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26292	9-3-1	A	JUDITH L BLAKE	CHEVRON USA INC	1/8+	882	329	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26293	9-3-1	A	JAY C CURRY	CHEVRON USA INC	1/8+	882	433	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26294	9-3-1	A	JOAN A GIEGER	CHEVRON USA INC	1/8+	880	509	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26295	9-3-1	A	ARTHUR LEE WARYCK	CHEVRON USA INC	1/8+	880	512	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26296	9-3-1	A	CARL G CALDWELL	CHEVRON USA INC	1/8+	883	530	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26297	9-3-1	A	DIANA L MCKINNEY	CHEVRON USA INC	1/8+	885	560	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26298	9-3-1	A	JANE HENDRICKSON	CHEVRON USA INC	1/8+	886	429	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26299	9-3-1	A	BETTY WILKINSON DANIEL A MCVANE AIF	CHEVRON USA INC	1/8+	886	432	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26300	9-3-1	A	JILL LORI HENNEN BARNETT	CHEVRON USA INC	1/8+	886	439	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*27180	9-3-1	A	TAMALA SCOLLIK	TH EXPLORATION LLC	1/8+	1053	1	N/A	N/A	N/A	N/A
10*27181	9-3-1	A	CRYSTAL THOMAS	TH EXPLORATION LLC	1/8+	1052	648	N/A	N/A	N/A	N/A
10*27703	9-3-1	A	DOROTHY MAXINE MOORE TRUST	TH EXPLORATION LLC	1/8+	1061	255	N/A	N/A	N/A	N/A
10*26044	9-3-1.1	B	JOYCE A WALLACE	CHEVRON USA INC	1/8+	863	296	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26047	9-3-1.1	B	ROBERT D BLAKE AND ATHENA LIBERTY BLAKE	CHEVRON USA INC	1/8+	863	138	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26048	9-3-1.1	B	LOIS J ELIAS AND LOUIS J ELIAS	CHEVRON USA INC	1/8+	861	599	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



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10*26049	9-3-1.1	B	MARY H HUBBS	CHEVRON USA INC	1/8+	863	560	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26050	9-3-1.1	B	BERNARD O CROW AND KAREN S CROW	CHEVRON USA INC	1/8+	863	627	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26051	9-3-1.1	B	ROBERT W KIDNER	CHEVRON USA INC	1/8+	863	644	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26052	9-3-1.1	B	BETTY J BLAKE	CHEVRON USA INC	1/8+	863	545	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26057	9-3-1.1	B	JOHN PURDY AND BRENDA S PURDY	CHEVRON USA INC	1/8+	854	420	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26058	9-3-1.1	B	CAROLE J WOOD	CHEVRON USA INC	1/8+	854	415	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26059	9-3-1.1	B	TERRY L BLAKE	CHEVRON USA INC	1/8+	854	215	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26060	9-3-1.1	B	ROBERT C BLAKE AND LYN BLAKE	CHEVRON USA INC	1/8+	854	333	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26061	9-3-1.1	B	RODNEY W AND LINDA L HUBBS	CHEVRON USA INC	1/8+	854	435	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26062	9-3-1.1	B	SHANNON ROGER AND LORRAINE HUBBS	CHEVRON USA INC	1/8+	854	233	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26063	9-3-1.1	B	PATTY L RINE AND FLOYD D RINE	CHEVRON USA INC	1/8+	854	238	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26064	9-3-1.1	B	CATHARINE LEE BLAKE	CHEVRON USA INC	1/8+	863	550	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26066	9-3-1.1	B	DANNY E AND MARVA L BEYSER	CHEVRON USA INC	1/8+	858	36	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26067	9-3-1.1	B	DONALD DEAN BEYSER	CHEVRON USA INC	1/8+	858	41	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26068	9-3-1.1	B	GARY F BLAKE AND DORIS E BLAKE	CHEVRON USA INC	1/8+	858	31	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26069	9-3-1.1	B	MARILYN SUE REILLEY	CHEVRON USA INC	1/8+	857	597	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26070	9-3-1.1	B	MARY W HOLMES	CHEVRON USA INC	1/8+	857	602	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26071	9-3-1.1	B	CHARLENE LORRAINE BAKER	CHEVRON USA INC	1/8+	857	607	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26072	9-3-1.1	B	JAMES L BLAKE	CHEVRON USA INC	1/8+	857	616	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26073	9-3-1.1	B	DARLENE L BEYSER	CHEVRON USA INC	1/8+	860	176	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26075	9-3-1.1	B	BETTY JOANN CECIL	CHEVRON USA INC	1/8+	860	119	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



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10*26076	9-3-1.1	B	DORIS IMOGENE GARRISON	CHEVRON USA INC	1/8+	860	114	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26077	9-3-1.1	B	DOROTHY J AND ROBERT M BLAKE	CHEVRON USA INC	1/8+	860	104	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26078	9-3-1.1	B	VELMA RUTH HARRIS	CHEVRON USA INC	1/8+	860	228	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26079	9-3-1.1	B	MARY O'DESSA HARRIS LOUDEN	CHEVRON USA INC	1/8+	860	109	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26080	9-3-1.1	B	SHARON DIANE HOLMES JAHN AND WILLILAM HENRY JAHN III	CHEVRON USA INC	1/8+	860	217	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26081	9-3-1.1	B	CYNTHIA JEAN AND EDDIE W WILSON	CHEVRON USA INC	1/8+	861	545	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26082	9-3-1.1	B	BRIAN C AND SARA M LUTZ	CHEVRON USA INC	1/8+	861	550	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26083	9-3-1.1	B	WILLIAM S BLAKE JR	CHEVRON USA INC	1/8+	861	535	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26084	9-3-1.1	B	CYNTHIA A AND JAMES O DAVIDSON	CHEVRON USA INC	1/8+	889	46	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26085	9-3-1.1	B	CLYDE R AND JANA HIGGINS	CHEVRON USA INC	1/8+	861	508	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26086	9-3-1.1	B	DELMAS W AND ROSE HIGGINS	CHEVRON USA INC	1/8+	861	503	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26087	9-3-1.1	B	JERRY L AND DENISE HIGGINS	CHEVRON USA INC	1/8+	861	526	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26088	9-3-1.1	B	SHIRL W AND DORIS HIGGINS	CHEVRON USA INC	1/8+	861	540	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26089	9-3-1.1	B	ALVA L AND SHIRLEY HIGGINS	CHEVRON USA INC	1/8+	861	521	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26090	9-3-1.1	B	H DEAN AND KAREN HIGGINS	CHEVRON USA INC	1/8+	861	516	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26091	9-3-1.1	B	JOELENE M MANN	CHEVRON USA INC	1/8+	864	55	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26092	9-3-1.1	B	SHAWN J AND SARAH E CREWS	CHEVRON USA INC	1/8+	864	50	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26093	9-3-1.1	B	JOYCE HOLMES CONE AND WILLIAM CONE	CHEVRON USA INC	1/8+	861	493	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26094	9-3-1.1	B	MARK L CURRY	CHEVRON USA INC	1/8+	865	102	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26095	9-3-1.1	B	CHRISTINA C MUNSON	CHEVRON USA INC	1/8+	865	107	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26097	9-3-1.1	B	DAVID L BEYSER	CHEVRON USA INC	1/8+	865	173	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



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**Operator's Well No. Hudson S - 5HM**

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26098	9-3-1.1	B	KIMBERLY J HOLDER	CHEVRON USA INC	1/8+	867	87	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26099	9-3-1.1	B	CAROL TROWBRIDGE ET VIR	CHEVRON USA INC	1/8+	866	138	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26100	9-3-1.1	B	JOSEPH L AND ROSE MARIE MAUPIN	CHEVRON USA INC	1/8+	866	67	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26120	9-3-1.1	B	JAMES D AND LINDA D YOCUM	CHEVRON USA INC	1/8+	884	635	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26121	9-3-1.1	B	BETTY BRYNER	CHEVRON USA INC	1/8+	871	64	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26236	9-3-1.1	B	GERALD W QUIGLEY AND VICKI L QUIGLEY	CHEVRON USA INC	1/8+	884	50	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26237	9-3-1.1	B	FREDA L CAMPBELL	CHEVRON USA INC	1/8+	889	40	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26238	9-3-1.1	B	MARSHA L MERCER	CHEVRON USA INC	1/8+	883	639	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26287	9-3-1.1	B	IVAN R AND MARY A BLAKE	CHEVRON USA INC	1/8+	888	542	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26288	9-3-1.1	B	REBECCA J BLAKE	CHEVRON USA INC	1/8+	888	571	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26289	9-3-1.1	B	DUANETTA B BLAKE FROMHART	CHEVRON USA INC	1/8+	888	574	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26291	9-3-1.1	B	BARBARA A BLAKE MASON	CHEVRON USA INC	1/8+	901	125	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26292	9-3-1.1	B	JUDITH L BLAKE	CHEVRON USA INC	1/8+	882	329	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26293	9-3-1.1	B	JAY C CURRY	CHEVRON USA INC	1/8+	882	433	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26294	9-3-1.1	B	JOAN A GIEGER	CHEVRON USA INC	1/8+	880	509	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26295	9-3-1.1	B	ARTHUR LEE WARYCK	CHEVRON USA INC	1/8+	880	512	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26296	9-3-1.1	B	CARL G CALDWELL	CHEVRON USA INC	1/8+	883	530	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26297	9-3-1.1	B	DIANA L MCKINNEY	CHEVRON USA INC	1/8+	885	560	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26298	9-3-1.1	B	JANE HENDRICKSON	CHEVRON USA INC	1/8+	886	429	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26299	9-3-1.1	B	BETTY WILKINSON DANIEL A MCVANE AIF	CHEVRON USA INC	1/8+	886	432	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26300	9-3-1.1	B	JILL LORI HENNEN BARNETT	CHEVRON USA INC	1/8+	886	439	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95



Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*26304	9-3-1.1	B	CNX GAS COMPANY LLC AND NOBLE ENERGY INC	CHEVRON USA INC	1/8+	888	521	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*27180	9-3-1.1	B	TAMALA SCOLLIK	TH EXPLORATION LLC	1/8+	1053	1	N/A	N/A	N/A	N/A
10*27181	9-3-1.1	B	CRYSTAL THOMAS	TH EXPLORATION LLC	1/8+	1052	648	N/A	N/A	N/A	N/A
10*27703	9-3-1.1	B	DOROTHY MAXINE MOORE TRUST	TH EXPLORATION LLC	1/8+	1061	255	N/A	N/A	N/A	N/A
10*29767	9-3-1.1	B	HG ENERGY II APPALACHIA LLC	TH EXPLORATION LLC	1/8+	1100	79	N/A	N/A	N/A	N/A
10*28092	9-8-4.2	C	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	TH EXPLORATION LLC	1/8+	1073	370	N/A	N/A	N/A	N/A
10*47051.109.0	9-8-4.2	C	DONALD M AND THERESA L HARRIS	TH EXPLORATION LLC	1/8+	859	440	N/A	N/A	N/A	N/A
10*22745	9-8-11	D	BONNIE J JENKINS	TH EXPLORATION LLC	1/8+	968	288	N/A	N/A	N/A	N/A
10*23314	9-8-11	D	CYNTHIA WATSON	TH EXPLORATION LLC	1/8+	988	499	N/A	N/A	N/A	N/A
10*23353	9-8-11	D	SHARON E MCDONALD AND HAROLD S MCDONALD	TH EXPLORATION LLC	1/8+	988	495	N/A	N/A	N/A	N/A
10*25718	9-8-11	D	KATHLEEN JEANNE B JENKINS	TH EXPLORATION LLC	1/8+	1035	13	N/A	N/A	N/A	N/A
10*25719	9-8-11	D	NICHOLE M JENKINS	TH EXPLORATION LLC	1/8+	1035	17	N/A	N/A	N/A	N/A
10*26025	9-8-11	D	DAVID D MURRAY	CHEVRON USA INC	1/8+	791	45	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26026	9-8-11	D	JUDITH ELLEN DOTY	CHEVRON USA INC	1/8+	787	249	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26027	9-8-11	D	DANIEL W CHAPMAN	CHEVRON USA INC	1/8+	788	111	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26028	9-8-11	D	DAVID W CHAPMAN	CHEVRON USA INC	1/8+	788	104	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26029	9-8-11	D	GREGORY L CHAPMAN	CHEVRON USA INC	1/8+	788	96	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26030	9-8-11	D	DONALD CARMICHAEL	CHEVRON USA INC	1/8+	787	471	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26031	9-8-11	D	SARAH LEONA MCGLONE	CHEVRON USA INC	1/8+	787	478	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26032	9-8-11	D	MARGARET ANN JONES	CHEVRON USA INC	1/8+	787	364	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26033	9-8-11	D	LINDA S COLEMAN	CHEVRON USA INC	1/8+	791	143	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26034	9-8-11	D	LUANN N HIMMELFARB	CHEVRON USA INC	1/8+	791	205	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26035	9-8-11	D	PATRICK P TRUEX	CHEVRON USA INC	1/8+	791	219	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26038	9-8-11	D	DOUGLAS A WAYSON	CHEVRON USA INC	1/8+	811	440	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26039	9-8-11	D	DAWNETTA M WAYSON	CHEVRON USA INC	1/8+	807	420	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26040	9-8-11	D	ROBERT BRANDT WAYSON	CHEVRON USA INC	1/8+	808	524	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26042	9-8-11	D	SHARON ANN PETERSON	CHEVRON USA INC	1/8+	838	396	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26043	9-8-11	D	GREGORY A CHAPMAN	CHEVRON USA INC	1/8+	834	354	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26204	9-8-11	D	COLE DALE GRIMM	CHEVRON USA INC	1/8+	889	244	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26494	9-8-11	D	JOHN P JENKINS	TH EXPLORATION LLC	1/8+	1037	434	N/A	N/A	N/A	N/A
10*27524	9-8-11	D	KEVIN A MYSLIWIEC AND SANDY L MYSLIWIEC	CHEVRON USA INC	1/8+	784	292	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 44/357
10*27527	9-8-11	D	PETER J & JUDY B MYSLIWIEC	CHEVRON USA INC	1/8+	784	285	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 44/357

**WW-6A1 Supplement**

**Operator's Well No. Hudson S - 5HM**

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed BK/Page		Assignment	Assignment	Assignment	Assignment
10*31001	9-9-4	E	ERIC KATZMEYER	CHEVRON USA INC	1/8+	791	226	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31003	9-9-4	E	DAVID KATZMEYER AND SHIRLEY A KATZMEYER	CHEVRON USA INC	1/8+	792	226	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*31004	9-9-4	E	MARY LOU RUBINI	CHEVRON USA INC	1/8+	793	287	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC: 45/593
10*19987	9-9-16	F	LESLEY D BALLA	TH EXPLORATION LLC	1/8+	955	103	N/A	N/A	N/A	N/A
10*19993	9-9-16	F	DIANA D COSLICK	TH EXPLORATION LLC	1/8+	955	105	N/A	N/A	N/A	N/A
10*19994	9-9-16	F	ELAINE A FONTES	TH EXPLORATION LLC	1/8+	960	36	N/A	N/A	N/A	N/A
10*21117	9-9-16	F	JOELLYN JOHNSON	TH EXPLORATION LLC	1/8+	952	392	N/A	N/A	N/A	N/A
10*21322	9-9-16	F	PHILLIP H WAYT AND BILLIE A WAYT	TH EXPLORATION LLC	1/8+	953	293	N/A	N/A	N/A	N/A
10*22199	9-9-16	F	DONALD BROOKS WESLEY	BLUE ROAN RESOURCES LLC	1/8+	926	424	N/A	N/A	N/A	Blue Roan Resources LLC to TH Exploration LLC: 41/405
10*22201	9-9-16	F	FREDERICK MAXWELL YEATER	BLUE ROAN RESOURCES LLC	1/8+	926	422	N/A	N/A	N/A	Blue Roan Resources LLC to TH Exploration LLC: 41/405
10*22202	9-9-16	F	MARK DAVID HUNT	BLUE ROAN RESOURCES LLC	1/8+	935	109	N/A	N/A	N/A	Blue Roan Resources LLC to TH Exploration LLC: 41/405
10*22203	9-9-16	F	MELISSA ELAINE SCHROTH	BLUE ROAN RESOURCES LLC	1/8+	934	471	N/A	N/A	N/A	Blue Roan Resources LLC to TH Exploration LLC: 41/405
10*22526	9-9-16	F	BARBARA FURFARI	TH EXPLORATION LLC	1/8+	964	528	N/A	N/A	N/A	N/A
10*22528	9-9-16	F	RONALD DAKAN	TH EXPLORATION LLC	1/8+	964	530	N/A	N/A	N/A	N/A
10*22553	9-9-16	F	DAVID H DAKAN	TH EXPLORATION LLC	1/8+	966	130	N/A	N/A	N/A	N/A
10*22783	9-9-16	F	SUZANNE SWIFT	TH EXPLORATION LLC	1/8+	972	85	N/A	N/A	N/A	N/A
10*23315	9-9-16	F	TIM A WILLIS AND DIANE CLARE WILLIS	TH EXPLORATION LLC	1/8+	988	138	N/A	N/A	N/A	N/A
10*24047	9-9-16	F	BESSIE CARMICHAEL ET AL SHANE M MALLET, SPECIAL COMMISSIONER	TH EXPLORATION LLC	1/8+	1021	117	N/A	N/A	N/A	N/A



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10*24397	9-9-16	F	MARK D CHAMBERS AND SHERYL CHAMBERS	TH EXPLORATION LLC	1/8+	1023	163	N/A	N/A	N/A	N/A
10*24398	9-9-16	F	TODD SCHERICH AND WANDA D SCHERICH	TH EXPLORATION LLC	1/8+	1023	160	N/A	N/A	N/A	N/A
10*24413	9-9-16	F	BRADLEY S SCHERICH AND LEIGH SCHERICH	TH EXPLORATION LLC	1/8+	1023	157	N/A	N/A	N/A	N/A

STATE OF WEST VIRGINIA           §  
  §  
COUNTY OF MARSHALL           §

**ASSIGNMENT AND BILL OF SALE**

This **ASSIGNMENT AND BILL OF SALE** (this "Assignment") dated as of February 7, 2019 (the "Signing Date"), but effective from and after 7:00 a.m., Eastern Standard Time on February 1, 2019 (the "Effective Date"), is made by **Chevron U.S.A. Inc.**, a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 ("Chevron" or "Assignor") to **TH Exploration II, LLC** and **TH Exploration, LLC**, Texas limited liability companies, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (collectively "Assignee") and is accepted by Assignee upon the following terms and conditions.

**RECITALS**

- A. Assignor desires to sell, convey, transfer, assign and deliver to Assignee Assignor's Crawford 1 well and certain related assets, including certain leasehold interests, located in Marshall County, West Virginia.
- B. Through an Acreage Trade Agreement to be executed contemporaneously with this Assignment, Assignor desires to transfer, convey and assign to Assignee certain of Assignor's oil and gas leasehold interests located in Marshall County, West Virginia in exchange for the transfer, conveyance and assignment to Assignor by Assignee certain of Assignee's oil and gas leasehold interests located in Marshall County, West Virginia.
- C. In consideration of the mutual promises set out in this Assignment, including execution of the Acreage Trade Agreement, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree to be bound by the terms of this Assignment.

**1. DEFINITIONS**

1.1 **Definitions.** As used in this Assignment, these words and expressions have the following meanings:

"Acreage Trade Agreement" means that certain Acreage Trade Agreement by and between Chevron U.S.A. Inc. and TH Exploration, LLC with an Effective Date of February 1, 2019 to be contemporaneously executed with this Assignment.

"Act" has the meaning given to such term in Section 9.1(C).

"Affiliate" means any legal entity which controls, is controlled by, or is under common control with, another legal entity. An entity is deemed to "control" another if it owns directly or indirectly at least fifty percent of either of the following: (A) the shares entitled to vote at a general election of directors of such

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STATE OF WEST VIRGINIA §  
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COUNTY OF MARSHALL §

**ASSIGNMENT AND CONVEYANCE**

**THIS ASSIGNMENT AND CONVEYANCE** (the "**Assignment**") is made and entered into this 19 day of August 2019 (the "**Effective Date**"), by and between **CHEVRON U.S.A. INC.**, a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 (hereinafter "**Assignor**") and **TH EXPLORATION, LLC**, a Texas limited liability company, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**").

**WITNESSETH:**

**WHEREAS**, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain oil and gas leases situated in Marshall County, West Virginia, as described in **Exhibit "A"**, attached hereto and made a part hereof (hereinafter the "**Leases**"), less and except certain exclusions; and

**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 the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor excepts and reserves from this Assignment the following:

A. Any portion of the Leases set forth in the column entitled "Less and Except" on Exhibit A.

**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. **No Warranty**. The Assignment is made on an "as is, where is" basis without warranty of any kind. Assignor makes no, and expressly disclaims any, representation or warranty to Assignee regarding the Leases, whether express, statutory or implied, in fact, at law, common law, in equity or otherwise.

3. **Successors and Assigns**. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors and assigns, and such terms shall be covenants running with the land, and with each subsequent transfer or assignment thereof.

4. **Further Assurances**. Assignor and Assignee hereby agree to take all actions and execute, acknowledge, and deliver all such instruments as are necessary or advisable to effectuate the purposes of this Assignment, except Assignor has no obligation to defend title to the Leases.

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STATE OF WEST VIRGINIA     §  
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COUNTY OF MARSHALL       §

**ASSIGNMENT AND CONVEYANCE**

THIS ASSIGNMENT AND CONVEYANCE (the "**Assignment**") is made and entered into this 24<sup>th</sup> day of June 2020 (the "**Effective Date**"), by and between CHEVRON U.S.A. INC., a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 (hereinafter "**Assignor**") and TH EXPLORATION II, LLC, a Texas limited liability company, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**").

**WITNESSETH:**

**WHEREAS**, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain oil and gas Leases situated in Marshall County, West Virginia, as described in **Exhibit "A"**, attached hereto and made a part hereof (hereinafter the "**Leases**"), subject to any applicable overriding royalty interests and midstream obligations;

**NOW, THEREFORE**, for good and valuable consideration, 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 the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

**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. **Payment**. Within 15 days of execution of this Assignment by both parties, Assignee agrees to tender payment to Assignor in the amount and manner described in **Exhibit "B"**.

3. **No Warranty**. The Assignment is made on an "as is, where is" basis without warranty of any kind and is subject to any existing liens, encumbrances or burdens, including specifically any overriding royalty interests or midstream dedications, attached to or affecting the Leases. Assignor makes no, and expressly disclaims any, representation or warranty to Assignee regarding the Leases or title thereto, whether express, statutory or implied, in fact, at law, common law, in equity or otherwise.

4. **Existing Obligations**. This Assignment is made subject to and Assignee agrees to accept and perform all obligations under any existing agreements that affect the Leases, including Assignor's remaining obligations under any gathering, processing or other midstream contracts as those contracts relate specifically to the Leases.

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**ASSIGNMENT OF OIL AND GAS LEASES**

This **ASSIGNMENT OF OIL AND GAS LEASES** (the "**Assignment**") is made and entered into this 8th day of March, 2018 (the "**Effective Date**"), from **Blue Roan Resources, LLC**, a West Virginia limited liability company, having an address at 3437 University Avenue, Morgantown, WV, 26505 (hereinafter "**Assignor**"), and **TH Exploration, LLC**, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**").

**WITNESSETH:**

**WHEREAS**, Assignor is the owner of the right, title, and interest in those certain Oil and Gas Leases situated in Marshall County, West Virginia, which are described in Exhibit "A" attached hereto and made a part hereof (hereinafter the "**Leases**"); and

**WHEREAS**, subject to the exceptions and reservations herein contained, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases.

**NOW, THEREFORE**, for and in consideration of the sum of Ten Dollars (\$10.00), cash in hand paid, and other 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, subject to the terms, reservations, waivers and provisions as hereinafter set forth, an undivided interest of all of Assignor's right, title and interest in and to the Leases and all oil, natural gas, natural gas liquids, condensate, casinghead gas and other liquefied or gaseous hydrocarbons or products ("**Hydrocarbons**") thereby held, in any and all depths and formations ("**Assigned Formations**"), together with any and all other rights that are reasonably necessary or convenient to explore for and produce Hydrocarbons from the Assigned Formations, including, but not limited to, the right of surface access, use and occupancy, the right of ingress and egress, the right to conduct geophysical and other exploratory activities, the right to lay pipeline, the right to drill through, but not perforate or stimulate, all other depths and formations necessary for the purpose of reaching the Assigned Formations and to conduct operations therein.

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

2. **Representations and Warranties.** Assignor represents and warrants that such Assignor has not conveyed or otherwise encumbered its interest in the Leases since the time that Assignor obtained its interests in the Leases.

Assignor represents and warrants that, as to its interests in the Leases, Assignor has paid all royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, including, but not limited to, the interests assigned hereunder, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period.

3. **Successors and Assigns.** The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors and assigns, and such terms shall be covenants running with the land, and with each subsequent transfer or assignment thereof.

4. **Further Assurances.** Assignor and Assignee hereby agree to take all actions and execute, acknowledge, and deliver all such instruments as are necessary or advisable to effectuate the purposes of this Assignment.

RECEIVED  
Office of Oil and Gas  
MAR 25 2021  
WV Department of  
Environmental Protection

04/16/2021