



west virginia department of environmental protection

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

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

Wednesday, December 4, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD
CANONSBURG, PA 15317

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

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

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

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

James A. Martin
Chief

Operator's Well Number: HUDSON S-5HM
Farm Name: CNX LAND LLC
U.S. WELL NUMBER: 47-051-02291-00-00
Horizontal 6A New Drill
Date Issued: 12/4/2019

Promoting a healthy environment.

PERMIT CONDITIONS

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

CONDITIONS

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

API Number: _____

PERMIT CONDITIONS

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

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

1) Well Operator: Tug Hill Operating, LLC 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: 1370' Elevation, proposed post-construction: 1344.81'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep

Horizontal

Ju
6/28/19

6) Existing Pad: Yes or No No

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

Marcellus is the target formation at a depth of 6814' - 6762', thickness of 52' and an anticipated approximate pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6914' ✓

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 13,877' ✓

11) Proposed Horizontal Leg Length: 6,601.20'

12) Approximate Fresh Water Strata Depths: 70'; 978'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 886' and Pittsburgh Coal - 972'

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

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

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

Depth: 1059' TVD and 291' subsea level

Seam: Pittsburgh #8

Owner: Murray Energy / Consolidated Coal Co.

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18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120' ✓	259ft ³ (CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	1080'	1080' ✓	1100ft ³ (CTS)
Coal	13 3/8"	NEW	J55	54.5#	1080'	1080' ✓	1100ft ³ (CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,878'	2,878' ✓	955ft ³ (CTS)
Production	5 1/2"	NEW	P110	20#	13,877'	13,877'	3545ft ³ (CTS)
Tubing	2 3/8"	NEW	N80	4.7#	6,573'		
Liners							

Handwritten: JW 10/28/19

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8" _ 8 3/4"	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

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J. J. 10/21/19

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

Drill through the Marcellus tagging less than 100' from the top of the Onondaga to get depths and log data. Plug back to proposed kick off point. Drill the horizontal section to planned and proposed TD. Run casing and cement to surface. Run Bond Log from app. 60 deg to surface. Make clean out run and stimulate.

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

Well to completed with approximately 16,500,000 lb. proppant and 255,102 barrels of water. Max rate = 80bpm; max psi = 9,000#.

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

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

23) Describe centralizer placement for each casing string:

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

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

*See attachment

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.

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*Note: Attach additional sheets as needed.

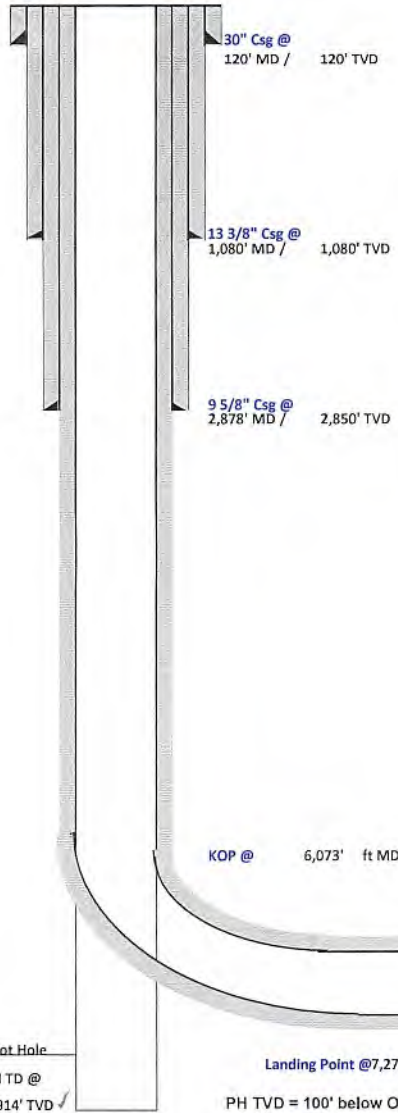


WELL NAME: Hudson 5-SHM
 STATE: WV COUNTY: Marshall
 DISTRICT: #N/A
 DF Elev: 1,344' GL Elev: 1,344'
 TD: 13,877'
 TH Latitude: 39.828761
 TH Longitude: -80.672633
 BH Latitude: 39.814528
 BH Longitude: 80.66101

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	978
Sewickley Coal	886
Pittsburgh Coal	972
Big Lime	2111
Weir	2542
Berea	2741
Gordon	3011
Rhinestreet	6128
Geneseo/Burkett	6644
Tully	6660
Hamilton	6695
Marcellus	6762
Landing Depth	6797
Onondaga	6814
Pilot Hole Depth	6914

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	13,877' ✓	6,912'	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	3,244	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



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Pilot Hole
 PH TD @ 6,914' TVD ✓
 Landing Point @ 7,277' MD / 6,797' TVD
 PH TVD = 100' below Onondaga Top ✓
 = OK =

Lateral TD @ 13,877' ft MD
 6,912' ft TVD ✓



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"	13,877'	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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TUG HILL
OPERATING

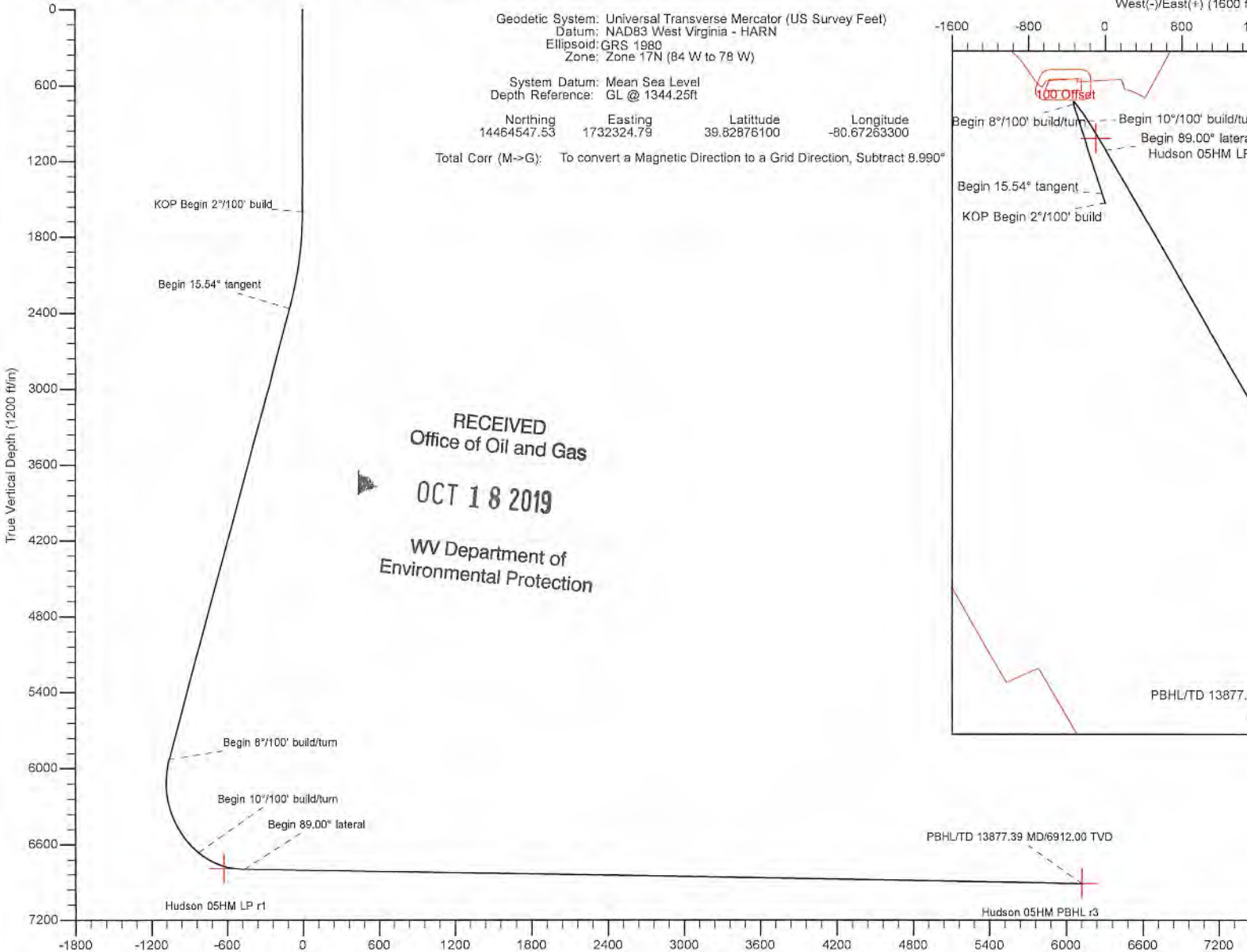
Well: Hudson S-05 HM (slot M)
Site: Hudson Alt North
Project: Marshall County, West Virginia
Design: rev5
Rig:

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1600.00	0.00	0.00	1600.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	2376.90	15.54	342.47	2367.41	99.84	-31.54	2.00	342.468	-101.19	Begin 15.54° tangent
4	6072.87	15.54	342.47	5928.30	1043.92	-329.78	0.00	0.000	-1058.05	Begin 8°/100' build/turn
5	6886.59	50.00	147.48	6662.56	865.41	-178.41	8.00	167.383	-826.22	Begin 10°/100' build/turn
6	7277.39	89.00	150.23	6796.82	557.58	6.28	10.00	4.364	-467.35	Begin 89.00° lateral
7	13877.39	89.00	150.23	6912.00	-5170.52	3282.80	0.00	0.000	6124.63	PBHL/TD 13877.39 MD/6912.00 TVD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Hudson 05HM LP r1	6794.25	678.34	-93.99	39.83062483	-80.67295893
Hudson 05HM PBHL r3	6912.00	-5170.52	3282.80	39.81452800	-80.66101000



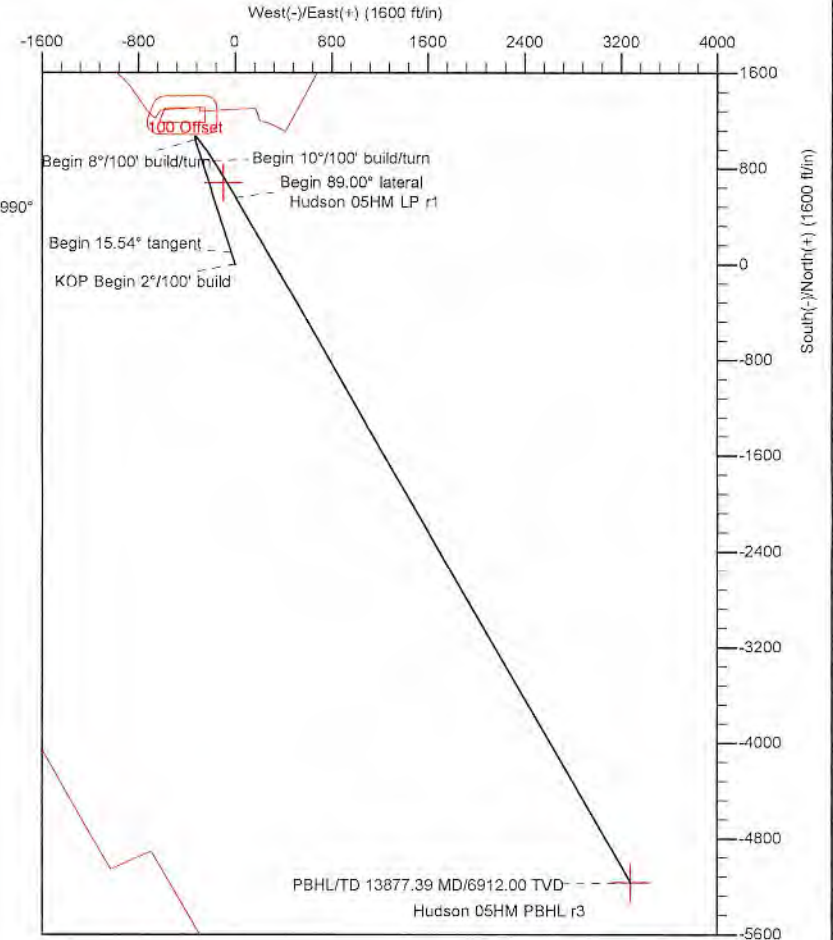
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
Depth Reference: GL @ 1344.25ft

Northing 14464547.53 Easting 1732324.79 Latitude 39.82876100 Longitude -80.67263300

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.990°

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Azimuths to Grid North
True North: -0.21°
Magnetic North: -8.99°

Magnetic Field
Strength: 51982.9snT
Dip Angle: 66.82°
Date: 6/7/2019
Model: IGRF2015



4705702291



Planning Report - Geographic

4705 02291

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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-05 HM (slot M)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-05 HM (slot M)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

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
KOP Begin 2°/100' build									
1,700.00	2.00	342.47	1,699.98	1.66	-0.53	14,464,549.20	1,732,324.27	39.82876558	-80.67263485
1,800.00	4.00	342.47	1,799.84	6.65	-2.10	14,464,554.19	1,732,322.69	39.82877930	-80.67264040
1,900.00	6.00	342.47	1,899.45	14.96	-4.73	14,464,562.50	1,732,320.06	39.82880215	-80.67264964
2,000.00	8.00	342.47	1,998.70	26.58	-8.40	14,464,574.12	1,732,316.39	39.82883409	-80.67266257
2,100.00	10.00	342.47	2,097.47	41.50	-13.11	14,464,589.04	1,732,311.68	39.82887510	-80.67267916
2,200.00	12.00	342.47	2,195.62	59.69	-18.86	14,464,607.23	1,732,305.93	39.82892513	-80.67269939
2,300.00	14.00	342.47	2,293.06	81.14	-25.63	14,464,628.68	1,732,299.16	39.82898410	-80.67272325
2,376.90	15.54	342.47	2,367.41	99.84	-31.54	14,464,647.37	1,732,293.25	39.82903549	-80.67274403
Begin 15.54° tangent									
2,400.00	15.54	342.47	2,389.67	105.74	-33.40	14,464,653.27	1,732,291.39	39.82905171	-80.67275060
2,500.00	15.54	342.47	2,486.01	131.28	-41.47	14,464,678.81	1,732,283.32	39.82912194	-80.67277901
2,600.00	15.54	342.47	2,582.36	156.82	-49.54	14,464,704.36	1,732,275.25	39.82919217	-80.67280742
2,700.00	15.54	342.47	2,678.70	182.37	-57.61	14,464,729.90	1,732,267.18	39.82926240	-80.67283582
2,800.00	15.54	342.47	2,775.05	207.91	-65.68	14,464,755.45	1,732,259.11	39.82933263	-80.67286423
2,900.00	15.54	342.47	2,871.39	233.45	-73.75	14,464,780.99	1,732,251.04	39.82940286	-80.67289264
3,000.00	15.54	342.47	2,967.74	259.00	-81.82	14,464,806.53	1,732,242.97	39.82947309	-80.67292105
3,100.00	15.54	342.47	3,064.09	284.54	-89.89	14,464,832.08	1,732,234.90	39.82954332	-80.67294946
3,200.00	15.54	342.47	3,160.43	310.09	-97.96	14,464,857.62	1,732,226.83	39.82961355	-80.67297787
3,300.00	15.54	342.47	3,256.78	335.63	-106.03	14,464,883.16	1,732,218.77	39.82968378	-80.67300628
3,400.00	15.54	342.47	3,353.12	361.17	-114.10	14,464,908.71	1,732,210.70	39.82975401	-80.67303469
3,500.00	15.54	342.47	3,449.47	386.72	-122.17	14,464,934.25	1,732,202.63	39.82982424	-80.67306310
3,600.00	15.54	342.47	3,545.81	412.26	-130.23	14,464,959.79	1,732,194.56	39.82989447	-80.67309151
3,700.00	15.54	342.47	3,642.16	437.80	-138.30	14,464,985.34	1,732,186.49	39.82996470	-80.67311992
3,800.00	15.54	342.47	3,738.50	463.35	-146.37	14,465,010.88	1,732,178.42	39.83003492	-80.67314833
3,900.00	15.54	342.47	3,834.85	488.89	-154.44	14,465,036.42	1,732,170.35	39.83010515	-80.67317674
4,000.00	15.54	342.47	3,931.19	514.43	-162.51	14,465,061.97	1,732,162.28	39.83017538	-80.67320515
4,100.00	15.54	342.47	4,027.54	539.98	-170.58	14,465,087.51	1,732,154.21	39.83024561	-80.67323356
4,200.00	15.54	342.47	4,123.88	565.52	-178.65	14,465,113.05	1,732,146.14	39.83031584	-80.67326197
4,300.00	15.54	342.47	4,220.23	591.06	-186.72	14,465,138.60	1,732,138.07	39.83038607	-80.67329037
4,400.00	15.54	342.47	4,316.57	616.61	-194.79	14,465,164.14	1,732,130.00	39.83045630	-80.67331878
4,500.00	15.54	342.47	4,412.92	642.15	-202.86	14,465,189.68	1,732,121.93	39.83052653	-80.67334719
4,600.00	15.54	342.47	4,509.26	667.69	-210.93	14,465,215.23	1,732,113.86	39.83059676	-80.67337560
4,700.00	15.54	342.47	4,605.61	693.24	-219.00	14,465,240.77	1,732,105.80	39.83066699	-80.67340401
4,800.00	15.54	342.47	4,701.96	718.78	-227.07	14,465,266.31	1,732,097.73	39.83073722	-80.67343242
4,900.00	15.54	342.47	4,798.30	744.32	-235.14	14,465,291.86	1,732,089.66	39.83080745	-80.67346084
5,000.00	15.54	342.47	4,894.65	769.87	-243.20	14,465,317.40	1,732,081.59	39.83087767	-80.67348925



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 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: rev5

Local Co-ordinate Reference: Well Hudson S-05 HM (slot M)
 TVD Reference: GL @ 1344.25ft
 MD Reference: GL @ 1344.25ft
 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	
5,100.00	15.54	342.47	4,990.99	795.41	-251.27	14,465,342.95	1,732,073.52	39.83094790	-80.67351766	
5,200.00	15.54	342.47	5,087.34	820.96	-259.34	14,465,368.49	1,732,065.45	39.83101813	-80.67354607	
5,300.00	15.54	342.47	5,183.68	846.50	-267.41	14,465,394.03	1,732,057.38	39.83108836	-80.67357448	
5,400.00	15.54	342.47	5,280.03	872.04	-275.48	14,465,419.58	1,732,049.31	39.83115859	-80.67360289	
5,500.00	15.54	342.47	5,376.37	897.59	-283.55	14,465,445.12	1,732,041.24	39.83122882	-80.67363130	
5,600.00	15.54	342.47	5,472.72	923.13	-291.62	14,465,470.66	1,732,033.17	39.83129905	-80.67365971	
5,700.00	15.54	342.47	5,569.06	948.67	-299.69	14,465,496.21	1,732,025.10	39.83136928	-80.67368812	
5,800.00	15.54	342.47	5,665.41	974.22	-307.76	14,465,521.75	1,732,017.03	39.83143951	-80.67371653	
5,900.00	15.54	342.47	5,761.75	999.76	-315.83	14,465,547.29	1,732,008.96	39.83150974	-80.67374494	
6,000.00	15.54	342.47	5,858.10	1,025.30	-323.90	14,465,572.84	1,732,000.89	39.83157997	-80.67377335	
6,072.87	15.54	342.47	5,928.31	1,043.92	-329.78	14,465,591.45	1,731,995.01	39.83163114	-80.67379405	
Begin 8°/100' build/turn										
6,100.00	13.43	344.51	5,954.57	1,050.42	-331.71	14,465,597.95	1,731,993.08	39.83164901	-80.67380087	
6,200.00	6.03	4.02	6,053.09	1,066.87	-334.45	14,465,614.40	1,731,990.34	39.83169423	-80.67381040	
6,300.00	4.49	102.06	6,152.82	1,071.30	-330.25	14,465,618.83	1,731,994.55	39.83170634	-80.67379537	
6,400.00	11.48	133.53	6,251.83	1,063.61	-319.18	14,465,611.14	1,732,005.61	39.83168512	-80.67375605	
6,500.00	19.27	140.65	6,348.18	1,043.96	-301.47	14,465,591.49	1,732,023.32	39.83163097	-80.67369322	
6,600.00	27.18	143.75	6,440.01	1,012.73	-277.46	14,465,560.26	1,732,047.33	39.83154496	-80.67360810	
6,700.00	35.13	145.52	6,525.51	970.52	-247.61	14,465,518.05	1,732,077.18	39.83142876	-80.67350234	
6,800.00	43.10	146.71	6,603.04	918.17	-212.52	14,465,465.70	1,732,112.27	39.83128462	-80.67337801	
6,886.59	50.00	147.48	6,662.56	865.41	-178.41	14,465,412.94	1,732,146.38	39.83113940	-80.67325721	
Begin 10°/100' build/turn										
6,900.00	51.34	147.61	6,671.06	856.66	-172.84	14,465,404.19	1,732,151.95	39.83111531	-80.67323750	
7,000.00	61.31	148.46	6,726.44	786.13	-128.87	14,465,333.66	1,732,195.92	39.83092118	-80.67308179	
7,100.00	71.29	149.16	6,766.58	707.89	-81.53	14,465,255.42	1,732,243.27	39.83070584	-80.67291416	
7,200.00	81.27	149.77	6,790.26	624.31	-32.24	14,465,171.85	1,732,292.55	39.83047583	-80.67273970	
7,277.39	89.00	150.23	6,796.82	557.58	6.28	14,465,105.11	1,732,331.07	39.83029218	-80.67260336	
Begin 89.00° lateral										
7,300.00	89.00	150.23	6,797.21	537.96	17.51	14,465,085.49	1,732,342.30	39.83023818	-80.67256363	
7,400.00	89.00	150.23	6,798.96	451.17	67.15	14,464,998.70	1,732,391.94	39.82999934	-80.67238794	
7,500.00	89.00	150.23	6,800.70	364.38	116.79	14,464,911.91	1,732,441.59	39.82976049	-80.67221224	
7,600.00	89.00	150.23	6,802.45	277.59	166.44	14,464,825.12	1,732,491.23	39.82952165	-80.67203655	
7,700.00	89.00	150.23	6,804.19	190.80	216.08	14,464,738.33	1,732,540.87	39.82928281	-80.67186086	
7,800.00	89.00	150.23	6,805.94	104.01	265.73	14,464,651.54	1,732,590.52	39.82904396	-80.67168517	
7,900.00	89.00	150.23	6,807.68	17.22	315.37	14,464,564.76	1,732,640.16	39.82880512	-80.67150948	
8,000.00	89.00	150.23	6,809.43	-69.57	365.02	14,464,477.97	1,732,689.81	39.82856628	-80.67133379	
8,100.00	89.00	150.23	6,811.17	-156.36	414.66	14,464,391.18	1,732,739.45	39.82832743	-80.67115810	
8,200.00	89.00	150.23	6,812.92	-243.15	464.30	14,464,304.39	1,732,789.09	39.82808859	-80.67098241	
8,300.00	89.00	150.23	6,814.66	-329.94	513.95	14,464,217.60	1,732,838.74	39.82784974	-80.67080673	
8,400.00	89.00	150.23	6,816.41	-416.73	563.59	14,464,130.81	1,732,888.38	39.82761090	-80.67063104	
8,500.00	89.00	150.23	6,818.15	-503.52	613.24	14,464,044.02	1,732,938.03	39.82737205	-80.67045536	
8,600.00	89.00	150.23	6,819.90	-590.30	662.88	14,463,957.23	1,732,987.67	39.82713321	-80.67027968	
8,700.00	89.00	150.23	6,821.64	-677.09	712.52	14,463,870.44	1,733,037.31	39.82689436	-80.67010400	
8,800.00	89.00	150.23	6,823.39	-763.88	762.17	14,463,783.65	1,733,086.96	39.82665551	-80.66992832	
8,900.00	89.00	150.23	6,825.14	-850.67	811.81	14,463,696.86	1,733,136.60	39.82641667	-80.66975264	
9,000.00	89.00	150.23	6,826.88	-937.46	861.46	14,463,610.07	1,733,186.25	39.82617782	-80.66957697	
9,100.00	89.00	150.23	6,828.63	-1,024.25	911.10	14,463,523.28	1,733,235.89	39.82593897	-80.66940129	
9,200.00	89.00	150.23	6,830.37	-1,111.04	960.75	14,463,436.50	1,733,285.54	39.82570013	-80.66922562	
9,300.00	89.00	150.23	6,832.12	-1,197.83	1,010.39	14,463,349.71	1,733,335.18	39.82546128	-80.66904994	
9,400.00	89.00	150.23	6,833.86	-1,284.62	1,060.03	14,463,262.92	1,733,384.82	39.82522243	-80.66887427	
9,500.00	89.00	150.23	6,835.61	-1,371.41	1,109.68	14,463,176.13	1,733,434.47	39.82498358	-80.66869860	
9,600.00	89.00	150.23	6,837.35	-1,458.20	1,159.32	14,463,089.34	1,733,484.11	39.82474474	-80.66852293	
9,700.00	89.00	150.23	6,839.10	-1,544.99	1,208.97	14,463,002.55	1,733,533.76	39.82450589	-80.66834726	
9,800.00	89.00	150.23	6,840.84	-1,631.78	1,258.61	14,462,915.76	1,733,583.40	39.82426704	-80.66817160	

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-05 HM (slot M)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-05 HM (slot M)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,900.00	89.00	150.23	6,842.59	-1,718.57	1,308.26	14,462,828.97	1,733,633.04	39.82402819	-80.66799593	
10,000.00	89.00	150.23	6,844.33	-1,805.36	1,357.90	14,462,742.18	1,733,682.69	39.82378934	-80.66782027	
10,100.00	89.00	150.23	6,846.08	-1,892.15	1,407.54	14,462,655.39	1,733,732.33	39.82355049	-80.66764460	
10,200.00	89.00	150.23	6,847.82	-1,978.94	1,457.19	14,462,568.60	1,733,781.98	39.82331164	-80.66746894	
10,300.00	89.00	150.23	6,849.57	-2,065.73	1,506.83	14,462,481.81	1,733,831.62	39.82307279	-80.66729328	
10,400.00	89.00	150.23	6,851.31	-2,152.51	1,556.48	14,462,395.02	1,733,881.27	39.82283394	-80.66711762	
10,500.00	89.00	150.23	6,853.06	-2,239.30	1,606.12	14,462,308.24	1,733,930.91	39.82259509	-80.66694196	
10,600.00	89.00	150.23	6,854.80	-2,326.09	1,655.77	14,462,221.45	1,733,980.55	39.82235624	-80.66676631	
10,700.00	89.00	150.23	6,856.55	-2,412.88	1,705.41	14,462,134.66	1,734,030.20	39.82211739	-80.66659065	
10,800.00	89.00	150.23	6,858.29	-2,499.67	1,755.05	14,462,047.87	1,734,079.84	39.82187853	-80.66641500	
10,900.00	89.00	150.23	6,860.04	-2,586.46	1,804.70	14,461,961.08	1,734,129.49	39.82163968	-80.66623934	
11,000.00	89.00	150.23	6,861.78	-2,673.25	1,854.34	14,461,874.29	1,734,179.13	39.82140083	-80.66606369	
11,100.00	89.00	150.23	6,863.53	-2,760.04	1,903.99	14,461,787.50	1,734,228.77	39.82116198	-80.66588804	
11,200.00	89.00	150.23	6,865.27	-2,846.83	1,953.63	14,461,700.71	1,734,278.42	39.82092313	-80.66571239	
11,300.00	89.00	150.23	6,867.02	-2,933.62	2,003.28	14,461,613.92	1,734,328.06	39.82068427	-80.66553674	
11,400.00	89.00	150.23	6,868.76	-3,020.41	2,052.92	14,461,527.13	1,734,377.71	39.82044542	-80.66536109	
11,500.00	89.00	150.23	6,870.51	-3,107.20	2,102.56	14,461,440.34	1,734,427.35	39.82020657	-80.66518545	
11,600.00	89.00	150.23	6,872.26	-3,193.99	2,152.21	14,461,353.55	1,734,476.99	39.81996771	-80.66500980	
11,700.00	89.00	150.23	6,874.00	-3,280.78	2,201.85	14,461,266.76	1,734,526.64	39.81972886	-80.66483416	
11,800.00	89.00	150.23	6,875.75	-3,367.57	2,251.50	14,461,179.97	1,734,576.28	39.81949000	-80.66465851	
11,900.00	89.00	150.23	6,877.49	-3,454.36	2,301.14	14,461,093.19	1,734,625.93	39.81925115	-80.66448287	
12,000.00	89.00	150.23	6,879.24	-3,541.15	2,350.78	14,461,006.40	1,734,675.57	39.81901230	-80.66430723	
12,100.00	89.00	150.23	6,880.98	-3,627.93	2,400.43	14,460,919.61	1,734,725.22	39.81877344	-80.66413159	
12,200.00	89.00	150.23	6,882.73	-3,714.72	2,450.07	14,460,832.82	1,734,774.86	39.81853458	-80.66395596	
12,300.00	89.00	150.23	6,884.47	-3,801.51	2,499.72	14,460,746.03	1,734,824.50	39.81829573	-80.66378032	
12,400.00	89.00	150.23	6,886.22	-3,888.30	2,549.36	14,460,659.24	1,734,874.15	39.81805687	-80.66360468	
12,500.00	89.00	150.23	6,887.96	-3,975.09	2,599.01	14,460,572.45	1,734,923.79	39.81781802	-80.66342905	
12,600.00	89.00	150.23	6,889.71	-4,061.88	2,648.65	14,460,485.66	1,734,973.44	39.81757916	-80.66325342	
12,700.00	89.00	150.23	6,891.45	-4,148.67	2,698.29	14,460,398.87	1,735,023.08	39.81734030	-80.66307778	
12,800.00	89.00	150.23	6,893.20	-4,235.46	2,747.94	14,460,312.08	1,735,072.72	39.81710145	-80.66290215	
12,900.00	89.00	150.23	6,894.94	-4,322.25	2,797.58	14,460,225.29	1,735,122.37	39.81686259	-80.66272652	
13,000.00	89.00	150.23	6,896.69	-4,409.04	2,847.23	14,460,138.50	1,735,172.01	39.81662373	-80.66255090	
13,100.00	89.00	150.23	6,898.43	-4,495.83	2,896.87	14,460,051.71	1,735,221.66	39.81638487	-80.66237527	
13,200.00	89.00	150.23	6,900.18	-4,582.62	2,946.52	14,459,964.93	1,735,271.30	39.81614602	-80.66219964	
13,300.00	89.00	150.23	6,901.92	-4,669.41	2,996.16	14,459,878.14	1,735,320.95	39.81590716	-80.66202402	
13,400.00	89.00	150.23	6,903.67	-4,756.20	3,045.80	14,459,791.35	1,735,370.59	39.81566830	-80.66184840	
13,500.00	89.00	150.23	6,905.41	-4,842.99	3,095.45	14,459,704.56	1,735,420.23	39.81542944	-80.66167277	
13,600.00	89.00	150.23	6,907.16	-4,929.78	3,145.09	14,459,617.77	1,735,469.88	39.81519058	-80.66149715	
13,700.00	89.00	150.23	6,908.90	-5,016.57	3,194.74	14,459,530.98	1,735,519.52	39.81495172	-80.66132153	
13,800.00	89.00	150.23	6,910.65	-5,103.35	3,244.38	14,459,444.19	1,735,569.17	39.81471286	-80.66114592	
13,877.39	89.00	150.23	6,912.00	-5,170.52	3,282.80	14,459,377.02	1,735,607.59	39.81452801	-80.66101000	

PBHL/TD 13877.39 MD/6912.00 TVD

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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-05 HM (slot M)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-05 HM (slot M)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
Hudson 05HM LP r1	0.00	0.00	6,794.25	678.34	-93.99	14,465,225.88	1,732,230.81	39.83062483	-80.67295893
- plan misses target center by 33.11ft at 7125.17ft MD (6774.13 TVD, 687.26 N, -69.25 E)									
- Point									
Hudson 05HM PBHL r3	0.00	0.01	6,912.00	-5,170.52	3,282.80	14,459,377.02	1,735,607.59	39.81452800	-80.66101000
- plan hits target center									
- Point									

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
		+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)		
1,600.00	1,600.00	0.00	0.00	KOP Begin 2°/100' build	
2,376.90	2,367.41	99.84	-31.54	Begin 15.54° tangent	
6,072.87	5,928.31	1,043.92	-329.78	Begin 8°/100' build/turn	
6,886.59	6,662.56	865.41	-178.41	Begin 10°/100' build/turn	
7,277.39	6,796.82	557.58	6.28	Begin 89.00° lateral	
13,877.39	6,912.00	-5,170.52	3,282.80	PBHL/TD 13877.39 MD/6912.00 TVD	

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Area of Review

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (06/14/2019) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Permit well - Hudson S-SHM

Wells within 500' Buffer

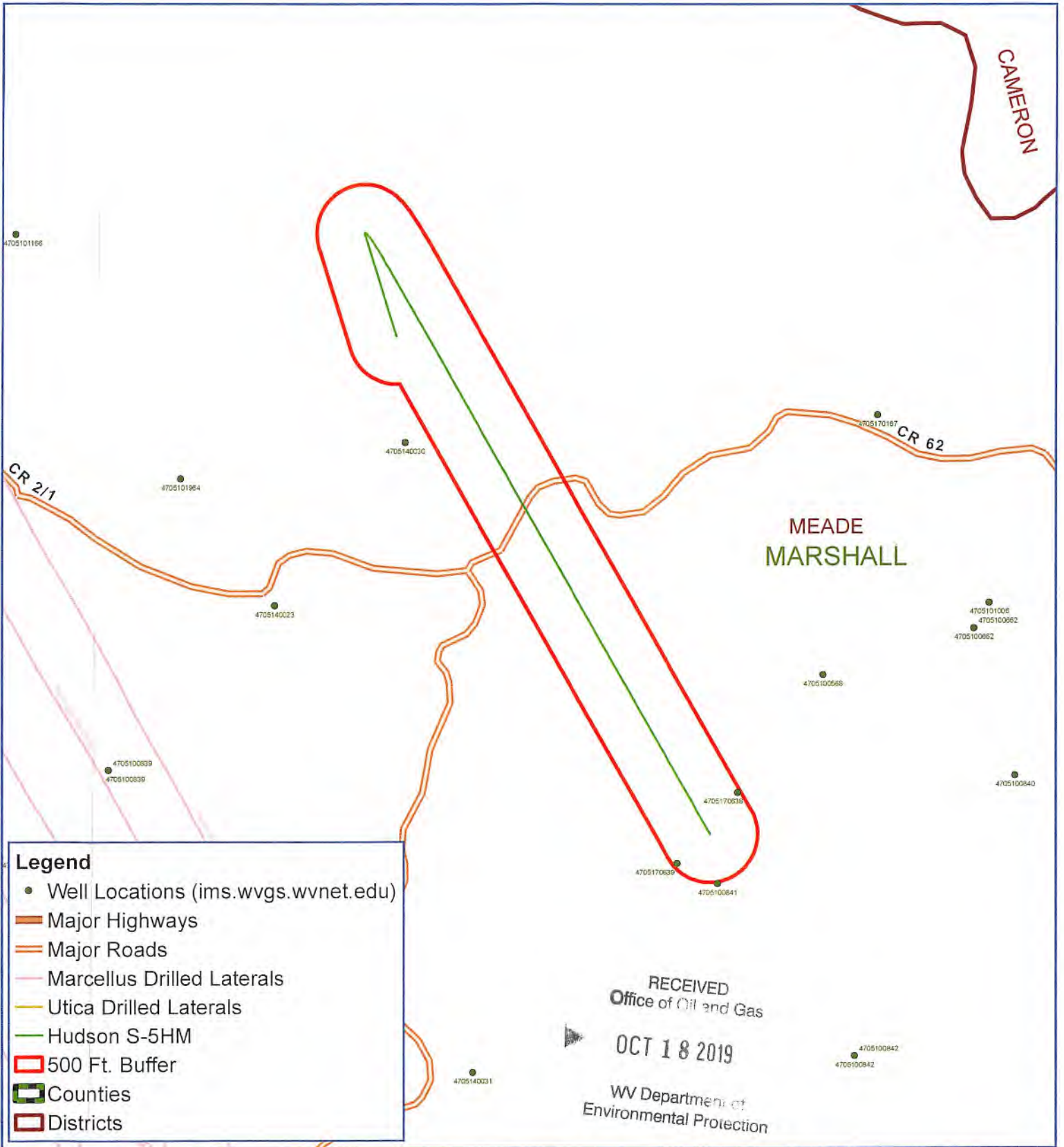
Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705170639	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705170638	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705100841	McElroy Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	Well was plugged 4/27/1999

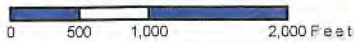
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Office of Oil and Gas

 OCT 18 2019

WV Department of
Environmental Protection



Hudson S - 5HM Meade District Marshall County, WV



Notes:
All locations are approximate and are for visualization purposes only.

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WW-9 Office of Oil and Gas
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Hudson S-5HM

OCT 18 2019

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

WV Department of
Environmental Protection

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Grave Creek Quadrangle Glen Easton 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

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

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

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

Company Official Signature *James Pancake*

Company Official (Typed Name) James Pancake

Company Official Title Vice President - Geoscience

Subscribed and sworn before me this 19 day of JUNE, 20 19

Maureen A Stead

Notary Public

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

My commission expires 1/28/23

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 22.94 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

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Office of Oil and Gas

OCT 18 2019

WV Department of
Environmental Protection

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Annual Ryegrass	40
Spring Oats	96

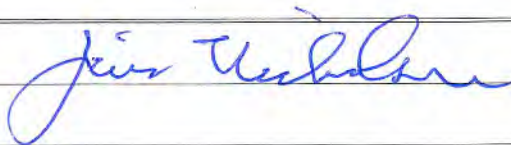
Seed Type	lbs/acre
Orchard Grass	12
Ladino	3
White Clover	2

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by:



Comments:

Title: Oil and Gas Inspector

Date: 6/19/19

Field Reviewed?

Yes

No

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Office of Oil and Gas

WW-9

OCT 18 2019

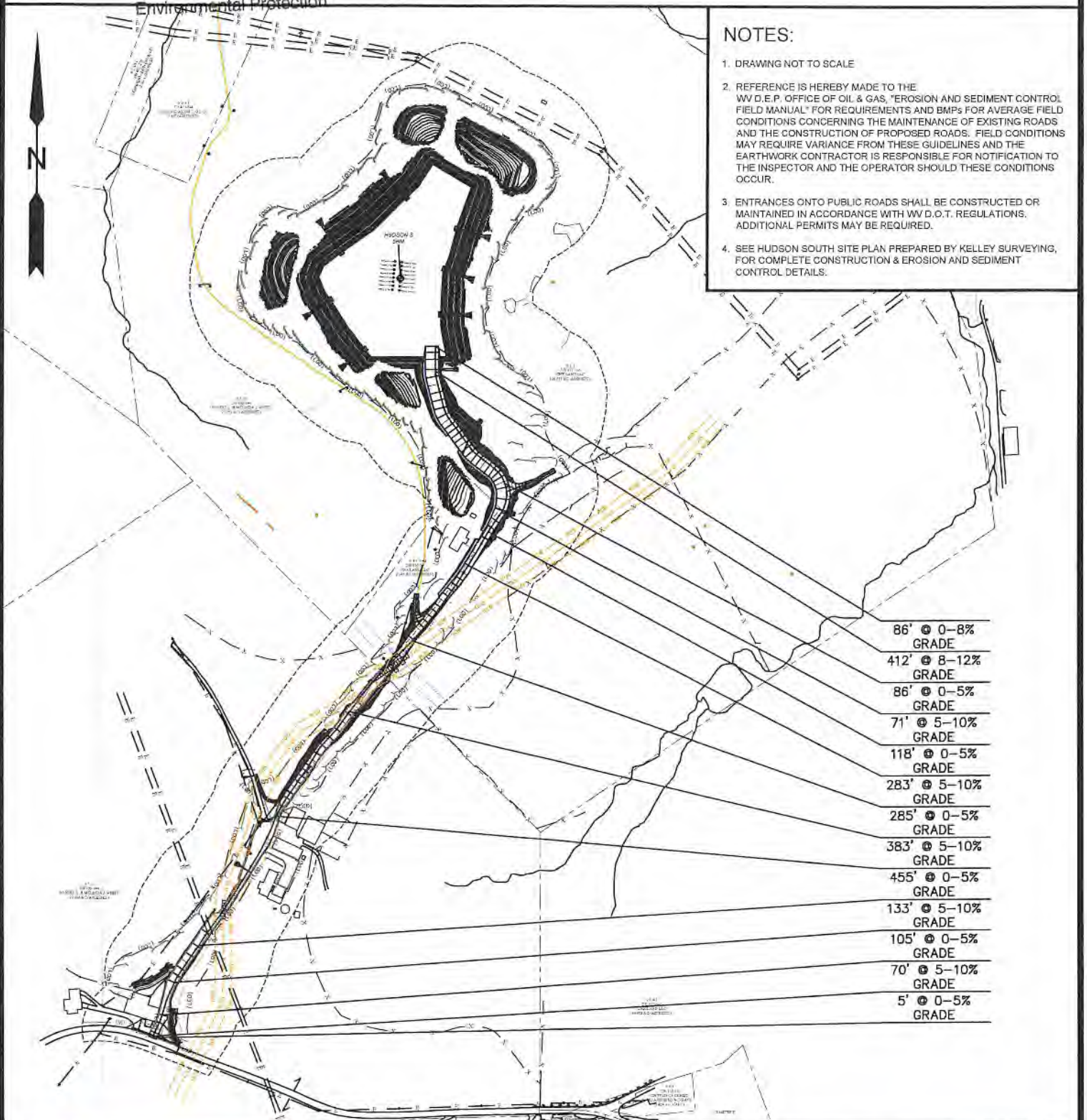
PROPOSED HUDSON S - 5HM

SUPPLEMENT PG. 1

WV Department of
Environmental Protection

NOTES:

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



- 86' @ 0-8% GRADE
- 412' @ 8-12% GRADE
- 86' @ 0-5% GRADE
- 71' @ 5-10% GRADE
- 118' @ 0-5% GRADE
- 283' @ 5-10% GRADE
- 285' @ 0-5% GRADE
- 383' @ 5-10% GRADE
- 455' @ 0-5% GRADE
- 133' @ 5-10% GRADE
- 105' @ 0-5% GRADE
- 70' @ 5-10% GRADE
- 5' @ 0-5% GRADE

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www.slswe.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8911	06/14/19	NONE

TUG HILL
OPERATING



Well Site Safety Plan

Tug Hill Operating, LLC

June 6/19/19

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

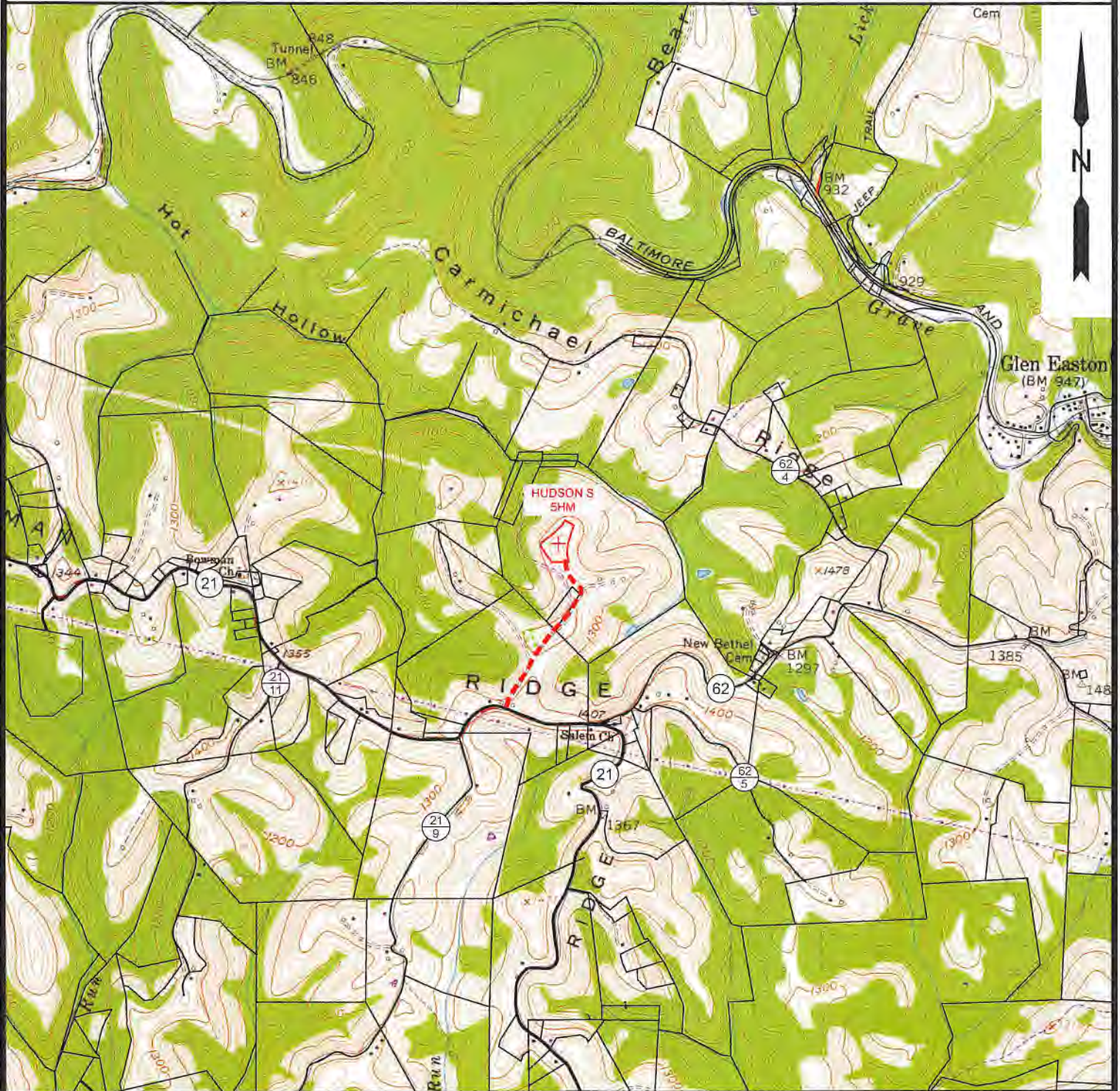
June 2019

RECEIVED
Office of Oil and Gas

OCT 18 2019

WV Department of
Environmental Protection

PROPOSED HUDSON S - 5HM



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

LAT: 39.829865
LON: -80.573724
LOCATED: N 89°55'26" E AT 27,779.45' FROM THE CENTER OF HUDSON S WELL PAD LOCATION.



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www.slsww.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
DRAWN BY		DATE	SCALE
K.G.M.		06/14/2019	1" = 2000'



TUG HILL
OPERATING

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

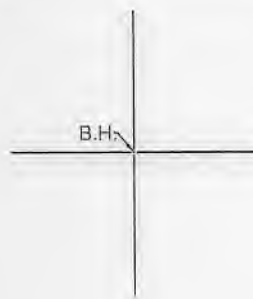
T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°50'00"

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

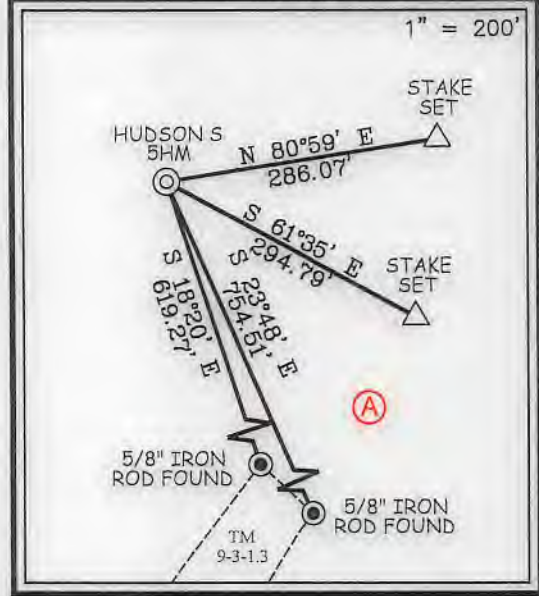
MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-2-9.1	CONSOLIDATION COAL CO.	1.00
9-2-9.2	CONSOLIDATION COAL CO.	1.00
9-3-1.2	CONSOLIDATION COAL CO.	1.00
9-5-11.1	MARK H. FOX	2.619
9-7-10	DONALD M. & THERESA L. HARRIS	3.00
9-8-1	CNX LAND CO. LLC	2.908
9-8-2	CNX LAND CO. LLC	6000 SQ. FT.
9-8-3	CHURCH 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
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 486,684.0	E. 1,639,194.9
NAD'83 GEO.	LAT-(N) 39.830292	LONG-(W) 80.672603
NAD'83 UTM (M)	N. 4,408,972.9	E. 528,015.6
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 480,900.0	E. 1,642,376.3
NAD'83 GEO.	LAT-(N) 39.814528	LONG-(W) 80.661010
NAD'83 UTM (M)	N. 4,407,226.9	E. 529,014.3



REFERENCES



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'.

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.

6/25/19



P.S. *C. Victor Moyers*
849

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

DATE JUNE 14, 20 19

REVISED JUNE 25, 20 19

OPERATORS WELL NO. HUDSON S-5HM

API WELL NO. 47 - 051 - 02291

STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8911P5HMR.dwg

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 INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: GROUND = 1,366.20' PROPOSED = 1,344.81' 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 106.935±

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: 6,914' / TMD: 13,877'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS CT CORPORATION SYSTEM

FORT WORTH, TX 76107 ADDRESS 5400 D BIG TYLER ROAD

CHARLESTON, WV 25313

COUNTY NAME
PERMIT

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

10,115' B.H.

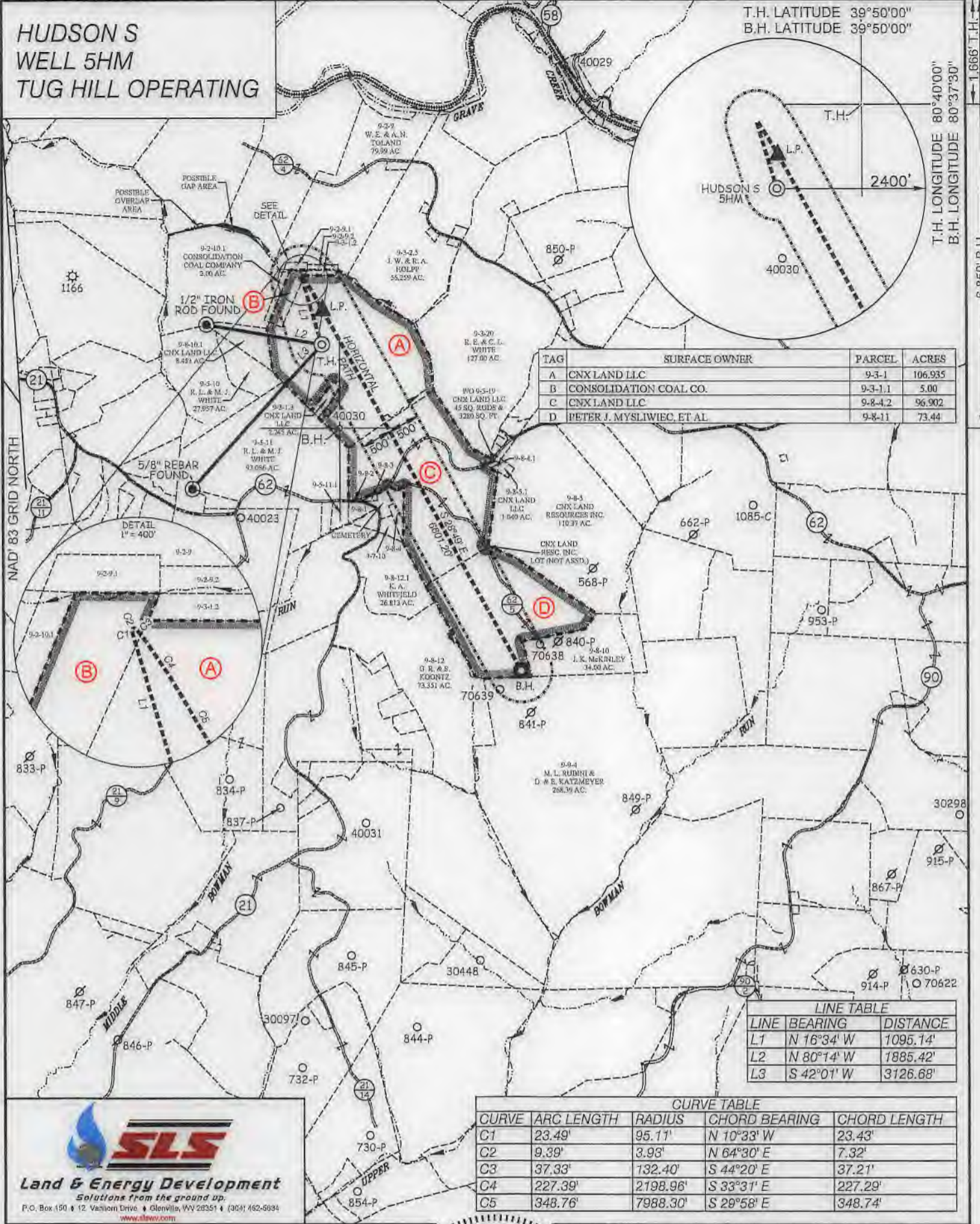
1,676' T.H.

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

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

1,666' T.H.

6,850' B.H.



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

LINE	BEARING	DISTANCE
L1	N 16°34' W	1095.14'
L2	N 80°14' W	1885.42'
L3	S 42°01' W	3126.68'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	23.49'	95.11'	N 10°33' W	23.43'
C2	9.39'	3.93'	N 64°30' E	7.32'
C3	37.33'	132.40'	S 44°20' E	37.21'
C4	227.39'	2198.96'	S 33°31' E	227.29'
C5	348.76'	7988.30'	S 29°58' E	348.74'

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(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 486,126.41 E. 1,839,179.25
 NAD'83 GEO. LAT-(N) 39.828761 LONG-(W) 80.672633
 NAD'83 UTM (M) N. 4,408,802.91 E. 528,018.65
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BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 480,900.0 E. 1,642,376.3
 NAD'83 GEO. LAT-(N) 39.814528 LONG-(W) 80.661010
 NAD'83 UTM (M) N. 4,407,226.9 E. 529,014.3



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 P.S. 849 *C. Victor Moyers*

SCALE 1" = 2000' FILE NO. 8911P5HMR.dwg
 HUDSON S-5HM REV5
 DATE JUNE 14 20 19
 REVISED JUNE 25 20 19
 OPERATORS WELL NO. HUDSON S-5HM
 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)

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

COUNTY NAME PERMIT

WW-6A1
(5/13)

Operator's Well No. Hansen S-5HM

**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
-------------------------	-----------------------	-----------------------	---------	-----------

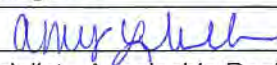
*See attached pages

**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. Miller 
 Its: Permitting Specialist - Appalachia Region

W/W - 6A1 Supplement

Operator's Well No. Hudson S - 5HM

Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26041	9-3-1	A	WHITE FREDDIE C ET UX	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	WALLACE JOYCE A	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	BLAKE ROBERT ET UX	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	ELIAS LOIS ET VIR	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	HUBBS MARY H	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	CROW BERNARD ET UX	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	KIDNER ROBERT W	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	A	BLAKE BETTY	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*26053	9-3-1	A	MOORE ANTHONY T	CHEVRON USA INC	1/8+	854	343	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26054	9-3-1	A	MOORE HIRAM V	CHEVRON USA INC	1/8+	854	353	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26055	9-3-1	A	MOORE LARRY SR	CHEVRON USA INC	1/8+	854	348	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26056	9-3-1	A	MOORE RONALD W	CHEVRON USA INC	1/8+	854	338	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	PURDY BRENDA ET VIR	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*26041
10*26044
10*26047
10*26048
10*26049
10*26050
10*26051
10*26052
10*26053
10*26054
10*26055
10*26056
10*26057

4705*0229

WW - 6A1 Supplement

Operator's Well No. Hudson S - 5HM

Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26058	9-3-1	A	WOOD CAROLE JEAN	CHEVRON USA INC	1/8+	854	414	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	BLAKE TERRY L	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	BLAKE ROBERT ET UX	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	HUBBS RODNEY ET UX	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	HUBBS SHANNON ET UX	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	A	RINE PATTY ET VIR	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	BLAKE CATHARINE LEE	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*26065	9-3-1	A	MOORE DENNIS ET UX	CHEVRON USA INC	1/8+	857	646	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	BEYSER DANNY ET UX	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	BEYSER DONALD D	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	BLAKE GARY ET UX	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	REILLEY MARILYN SUE	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	HOLMES MARY W	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	BAKER CHARLENE	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	BLAKE JAMES L	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	BEYSER DARLENE L	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*26074	9-3-1	A	MOORE RANDYLYN	CHEVRON USA INC	1/8+	860	166	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	CECIL BETTY JOANN	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	GARRISON DORIS I	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	BLAKE DOROTHY J ET VIR	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	HARRIS VELMA RUTH	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	A	LOUDEN MARY ET VIR	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	JAHN SHARON D ET VIR	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	WILSON CYNTHIA ET VIR	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	LUTZ BRIAN C ET UX	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	BLAKE WILLIAMS 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

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10*26084	9-3-1	A	DAVIDSON CYNTHIA ET VIR	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	HIGGINS CLYDE ET UX	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	A	HIGGINS DELMAS ET UX	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	HIGGINS JERRY ET UX	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	HIGGINS SHIRL ET UX	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	HIGGINS ALVA ET UX	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	HIGGINS DEAN ET UX	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	MANN JOELENE M	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	CREWS SHAWN ET UX	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	A	CONE JOYCE ET VIR	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	CURRY MARK L	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	MUNSON CHRISTINA C	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	BEYSER DAVID L	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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10*26098	9-3-1	A	HOLDER KIMBERLY	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	TROWBRIDGE CAROL 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	MAUPIN JOSEPH ET UX	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	A	YOCUM JAMES ET UX	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	BRYNER BETTY	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	QUIGLEY VICKI ET VIR SFX	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	CAMPBELL FREDA L SFX	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	MERCER MARSHA L SFX	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	BLAKE IVAN R ET UX	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	BLAKE REBECCA J	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	A	FROMHART DUANETTA B	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*26290	9-3-1	A	BLAKE WANDA M	CHEVRON USA INC	1/8+	889	43	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	MASON BARBARA A	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

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10*26292	9-3-1	A	BLAKE JUDITH L	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	CURRY JAY C	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	GIEGER JOAN A	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	WARYCK ARTHUR ET AL	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	CALDWELL CARL G	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	A	MCKINNEY DIANA L	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	HENDRICKSON JANE	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	WILKINSON BETTY AIF D A M	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*27180	9-3-1	A	TAMALA SCOLLICK	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 MAXINNE MOORE TRUST	TH EXPLORATION LLC	1/8+	1061	255	N/A	N/A	N/A	N/A
10*26300	9-3-1	A	HENNEN JILL LORI	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*26044	9-3-1.1	B	WALLACE JOYCE A	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	BLAKE ROBERT ET UX	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	ELIAS LOIS ET VIR	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	HUBBS MARY H	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	CROW BERNARD ET UX	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	KIDNER ROBERT W	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	BLAKE BETTY	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*26053	9-3-1.1	B	MOORE ANTHONY T	CHEVRON USA INC	1/8+	854	343	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26054	9-3-1.1	B	MOORE HIRAM V	CHEVRON USA INC	1/8+	854	353	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26055	9-3-1.1	B	MOORE LARRY SR	CHEVRON USA INC	1/8+	854	348	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
10*26056	9-3-1.1	B	MOORE RONALD W	CHEVRON USA INC	1/8+	854	338	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	PURDY BRENDA ET VIR	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	WOOD CAROLE JEAN	CHEVRON USA INC	1/8+	854	414	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	BLAKE TERRY L	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	9-3-1.1	B	BLAKE ROBERT ET UX	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	HUBBS RODNEY ET UX	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

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10*26062	9-3-1.1	B	HUBBS SHANNON ET UX	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	RINE PATTY ET VIR	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	BLAKE CATHARINE LEE	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*26065	9-3-1.1	B	MOORE DENNIS ET UX	CHEVRON USA INC	1/8+	857	646	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	BEYSER DANNY ET UX	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	BEYSER DONALD D	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	9-3-1.1	B	BLAKE GARY ET UX	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	REILLEY MARILYN SUE	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	HOLMES MARY W	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	BAKER CHARLENE	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	BLAKE JAMES L	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	BEYSER DARLENE L	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*26074	9-3-1.1	B	MOORE RANDYLYN	CHEVRON USA INC	1/8+	860	166	N/A	N/A	N/A	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95

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10*26075	9-3-1.1	B	CECIL BETTY JOANN	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	9-3-1.1	B	GARRISON DORIS I	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	BLAKE DOROTHY J ET VIR	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	HARRIS VELMA RUTH	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	LOUDEN MARY ET VIR	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	JAHN SHARON D ET VIR	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	WILSON CYNTHIA ET VIR	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	LUTZ BRIAN C ET UX	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	9-3-1.1	B	BLAKE WILLIAMS 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	DAVIDSON CYNTHIA ET VIR	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	HIGGINS CLYDE ET UX	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	HIGGINS DELMAS ET UX	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	HIGGINS JERRY ET UX	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

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Operator's Well No. Hudson S - 5HM

Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26088	9-3-1.1	B	HIGGINS SHIRL ET UX	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	HIGGINS ALVA ET UX	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	9-3-1.1	B	HIGGINS DEAN ET UX	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	MANN JOELENE M	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	CREWS SHAWN ET UX	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	CONE JOYCE ET VIR	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	CURRY MARK L	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	MUNSON CHRISTINA C	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	BEYSER DAVID L	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	9-3-1.1	B	HOLDER KIMBERLY	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	TROWBRIDGE CAROL 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	MAUPIN JOSEPH ET UX	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	YOCUM JAMES ET UX	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

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Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26121	9-3-1.1	B	BRYNER BETTY	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	QUIGLEY VICKI ET VIR SFX	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	CAMPBELL FREDA L SFX	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	9-3-1.1	B	MERCER MARSHA L SFX	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	BLAKE IVAN R ET UX	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	BLAKE REBECCA J	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	FROMHART DUANETTA B	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*26290	9-3-1.1	B	BLAKE WANDA M	CHEVRON USA INC	1/8+	889	43	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	MASON BARBARA A	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	BLAKE JUDITH L	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	CURRY JAY C	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	9-3-1.1	B	GIEGER JOAN A	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	WARYCK ARTHUR ET AL	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

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Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26296	9-3-1.1	B	CALDWELL CARL G	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	MCKINNEY DIANA L	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	HENDRICKSON JANE	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	WILKINSON BETTY AIF D A M	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	HENNEN JILL LORI	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*26304	9-3-1.1	B	CNX GAS COMPANY ET AL	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 SCOLICK	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 MAXINNE MOORE TRUST	TH EXPLORATION LLC	1/8+	1061	255	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	TH Exploration LLC to Chevron USA Inc: 36/168	Chevron USA Inc to TH Exploration II LLC & TH Exploration LLC: 43/95
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	MURRAY DAVID D	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	DOTY JUDITH ELLEN	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	CHAPMAN DANIEL	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

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Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26028	9-8-11	D	CHAPMAN DAVID	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
10*26029	9-8-11	D	CHAPMAN GREGORY	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	CARMICHAEL DONALD	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	MCGLONE SARAH	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	JONES MARGARET ANN	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	COLEMAN LINDA S	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	HIMMELFARB LUANN	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	TRUEX PATRICK P	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
10*26038	9-8-11	D	WAYSON DOUGLAS A	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	WAYSON DAWNETTA M	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	WAYSON ROBERT B	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	PETERSON SHARON ANN	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	CHAPMAN GREGORY A	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


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Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment
10*26204	9-8-11	D	GRIMM COLE DALE	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 II LLC & TH Exploration LLC: 43/95
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 II LLC & TH Exploration LLC: 43/95

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IPS LAND SERVICES CORP
6000 TOWN CENTER BOULEVARD, SUITE 145
CANDLERBURG PA 15317-5841

BOOK-0043 PAGE0095

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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TUG HILL

4705 02291

June 21, 2019

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

RE: Hudson S-5HM

Subject: Marshall County Route 62 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 62 in the area reflected on the Hudson S-5HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

Amy Miller
Permit Specialist – Appalachia Region
Cell 304-376-0111
Email: amiller@tug-hilop.com

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

Date of Notice Certification: 06/28/2019

API No. 47- 051
Operator's Well No. Hudson S-5HM
Well Pad Name: Hudson

Notice has been given:

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

State:	<u>West Virginia</u>	UTM NAD-83 Easting:	<u>4,408,802.91</u>
County:	<u>Marshall</u>	UTM NAD-83 Northing:	<u>528,013.85</u>
District:	<u>Meade</u>	Public Road Access:	<u>Roberts Ridge Road (CR 21)</u>
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>CNX Land, LLC</u>
Watershed:	<u>Grave Creek (HUC 10)</u>		

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
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Required Attachments:

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

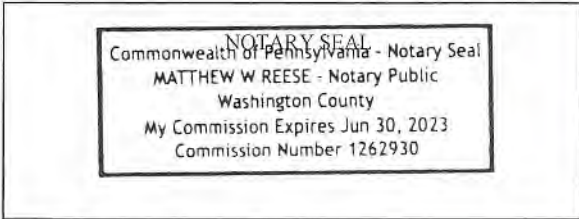
WV Department of
Environmental Protection

Certification of Notice is hereby given:

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

Well Operator: Tug Hill Operating, LLC
By: Amy L. Miller *Amy Miller*
Its: Permitting Specialist - Appalachia Region
Telephone: 724-749-8388

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030
Email: amiller@tug-hillop.com



Subscribed and sworn before me this 28 day of June 2019.
Matthew W. Reese Notary Public
My Commission Expires 6-30-2023

Oil and Gas Privacy Notice:

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

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

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

Date of Notice: 6/28/2019 **Date Permit Application Filed:** 6/28/2019

Notice of:

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

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

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

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 Environmental Protection

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

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

SURFACE OWNER(s)

Name: CNX Land Resources, LLC Attn: Casey Saunders (Well Pad)
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317
 Name: _____
 Address: _____

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

Name: Robert L. and Melinda J. White (Access Road)
 Address: 129 Freddie's Lane
Glen Easton, WV 26039
 Name: _____
 Address: _____

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____
 Address: _____

COAL OWNER OR LESSEE

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

COAL OPERATOR

Name: Murray American Energy, Inc. attn: Mason Smith
 Address: 46226 National Road
St. Clairsville, OH 43905

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)

Name: *See attached list
 Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
 Address: _____

*Please attach additional forms if necessary

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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(8-13)

4705-02291

API NO. 47-051 - _____
OPERATOR WELL NO. Hudson S-5HM
Well Pad Name: Hudson

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

WV Department of
Environmental Protection

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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



WW-6A
(8-13)

API NO. 47-051 470502201
OPERATOR WELL NO. Hudson S-5HM
Well Pad Name: Hudson

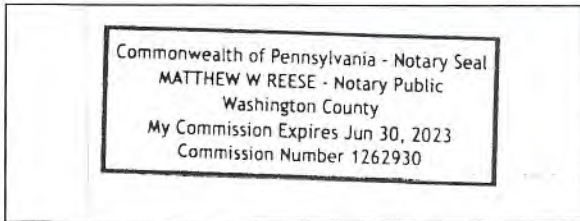
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 28 day of June 2019.

[Signature] Notary Public

My Commission Expires 6-30-2023

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Exhibit WW-6A**Supplement Pg. 1A**

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

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

Well: Hudson S – 5HM
 District: Meade
 State: WV

There are four (4) residences, no business or commercial sites, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p>Residence (#1) TM 3 Pcl. 1.3 CNX Land LLC Phone: None Found Physical Address: 143 Freddie's Ln Proctor, WV 26055 Tax Address: 1000 Consol Energy Dr. Canonsburg, PA 15317-6506</p>	<p>Residence (#2) TM 5 Pcl. 11 Robert L. & Melinda J. White Phone: 740-667-3018; 304-845-2703 (Robert Andrew Williams – Reverse Address); 304-845-3756 (Melinda J. White); 304-845-4858 (Robert L. White) Physical Address: 129 Freddie's Ln Proctor, WV 26055 Tax Address: 129 Freddie's Ln Glen Easton, WV 26039</p>	<p>Residence (#3) TM 5 Pcl. 10 Robert L. & Melinda J. White Phone: 304-845-0562 (Charlotte A. Streight – Reverse Address) Physical Address: 443 Freddie's Ln Proctor, WV 26055 Tax Address: 129 Freddie's Ln Glen Easton, WV 26039</p>
<p>Residence (#4) TM 5 Pcl. 10 Robert L. & Melinda J. White Phone: 304-845-6068; 304-845-3756 (Robert L. White Jr. – Reverse Address); 304-845-3759 (Melinda J. White) Physical Address: 642 Freddie's Ln Proctor, WV 26055 Tax Address: 129 Freddie's Ln Glen Easton, WV 26039</p>		

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PROPOSED HUDSON S - 5HM



NOTE: THERE APPEARS TO BE FOUR (4) POSSIBLE WATER SOURCES WITHIN 2,000'.

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5634
www.slsww.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8911	06/14/2019	1" = 1000'



TUG HILL
OPERATING

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

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

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

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

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

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

Notice is hereby provided to:

SURFACE OWNER(S)

Name: CNX Land Resources, LLC Altn: Casey Saunders (Well Pad)
 Address: 1000 Consol Energy Drive
 Canonsburg, PA 15317
 Name: Robert L. and Melinda J. White (Access Road)
 Address: 129 Freddie's Lane
 Glen Easton, WV 26039
 Name: _____
 Address: _____

COAL OWNER OR LESSEE

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

MINERAL OWNER(S)

Name: Charlene L. Baker *See attached list
 Address: 5523 Roberts Ridge Road
 Moundsville, WV 26041

*please attach additional forms if necessary

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Notice is hereby given:

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

State: West Virginia	Approx. Latitude & Longitude: 39.82881036; -80.67262857
County: Marshall	Public Road Access: Co, Route 21
District: Meade	Watershed: Grave Creek
Quadrangle: Glen Easton	Generally used farm name: CNX Land Resources, LLC

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

Notice is hereby given by:

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

Oil and Gas Privacy Notice:

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

Additional Mineral Owners for Notice**WW-6A3****Hudson Pad**

Black Gold Group
P.O. Box 85
Strasburg, OH 44680

Catherine Lee Blake
101 Tomlinson Ave.
Moundsville, WV 26041

Ivan R. Blake
2315 Wolf Run Rd.
Cameron, WV 26033

Judith L. Blake
515 Meade Ave.
Akron, OH 44305

Robert C. Blake
1400 Third St.
Moundsville, WV 26041

Terry L. Blake
213 Birch Ave.
Moundsville, WV 26041

Betty Joan Cecil
200 Simmons Dr.
Moundsville, WV 26041

Bernard R. Crow
78 Dwight Ave.
Moundsville, WV 26041

Mark L. Curry
14 Pilgrims Way
Bentonville, VA 22610

Lois J. Elias
17 East Paxton Ave.
Wheeling, WV 26033

Dorothy J. Harris
2212 Turkey Run Rd.
Buckhannon, WV 26201

Jane Lynn Hendrickson
236 Westwood Dr.
Circleville, OH 43113

Betty J. Blake
2 Portsmouth Rd.
Front Royal, VA 22630

Gary F. Blake
3801 Needham Rd.
Mansfield, OH 44904

James L. Blake
P.O. Box 124
Farson, WY 82932

Rebecca J. Blake
1506 6th St.
Moundsville, WV 26041

Robert D. Blake
3757 Main St.
Weirton, WV 26062

William S. Blake Jr.
P.O. Box 349
Comfort, WV 25049

Shawn J. Crews
39 Branch Ln.
Broadway, NC 27505

Jay C. Curry
635 Minebanck Rd.
Middletown, VA 22645

Cynthia A. Davidson
7079 Hayes Orangeville Road NE
Burghill, OH 44404

Daunetta B. Fromhart
1309 Center St.
Moundsville, WV 26041

Velma Ruth Harris
3307 Bowman Ridge Rd.
Glen Easton, WV 26039

Jill Lori Hennen
2004 Baxter Ave.
Orlando, FL 32806

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Alva L. Higgins
4466 Templeton Road NW
Warren, OH 44481

H. Dean Higgins
9729 Gladstone Rd.
North Jackson, OH 44451

Jerry L. Higgins
3460 Park Avenue Ext.
Warren, OH 44481

Kimberly J. Holder
5815 Highway 217
Erwin, NC 28339

Rodney W. Hubbs
305 Sentimental Dr.
Moundsville, WV 26041

Robert W. Kidner
7757 Hansgrove Ct.
Dublin, OH 43016

Brian C. Lutz
364 Roseberry Ln.
Wheeling, WV 26003

Barbara A. Mason
363 Ridgeview Lane
Moundsville, WV 26041

Joseph L. Maupin
34626 Morning Glory Glen
Zephyrhills, FL 33541

Christina C. Munson
14 Pilgrims Way
Bentonville, VA 22610

Brenda S. Purdy
1404 Third St.
Moundsville, WV 26041

Carol J. Trowbridge
34710 Morning Glory Glen
Zephyrhills, FL 33541

Carol Jean Wood
106 Arlington Ave.
Moundsville, WV 26041

Clyde R. Higgins
2601 Milton Newton Rd.
Newton Falls, OH 44444

Delmas W. Higgins
7316 Elm St.
Newton Falls, OH 44444

Shirl W. Higgins
5241 Pritchard Ohltown Rd.
Newton Falls, OH 44444

Mary H. Hubbs
17 Hubbs Ln.
Moundsville, WV 26041

Shannon Roger Hubbs
27 Bowman Ridge
Moundsville, WV 26041

Mary O. Louden
10 Sandy Ave.
Moundsville, WV 26041

Jolene M. Mann
494 Longfellow Ave.
Worthington, OH 43085

Master Mineral Holdings II, L.P.
P.O. Box 10886
Midland, TX 79702

Diana L. McKinney
275 Skyline Dr.
Moundsville, WV 26041

Potomac Mineral Group LLC
615 Washington Rd. Ste 201
Pittsburgh, PA 15228

Patty L. Rine
801 Benton St.
Apt. 2204
Searcy, AR 72143

Cynthia Jean Wilson
1709 Bennis Church Place
Virginia Beach, VA 23455

Betty Bryner
P.O. Box 270
Bruceton Mills, WV 26525

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Betty Wilkinson
9271 Barn Swallow Lane
Marshall, VA 20115

Carl Caldwell
501 Morgantown Avenue
Apartment 201
Barnesville, OH 43713

Doris Garrison
28 Hickory Avenue
Moundsville, WV 26041

Crystal Thomas
1402 Sixth Street
Moundsville, WV 26041

Arthur Lee Waryck
912 Tomlinson Avenue
Glen Dale, WV 26038

Hiram Vernon Moore
609 Pink Apartment Rd
Davenport, FL 33837

Larry Vernon Moore, Sr.
135 Clover Hill Ln
Newport, VA 24128

Ronald Wayne Moore
434 Moores Ln
New Cumberland, WV 26047

Dennis F. Moore
471 Peal Dr, 104
Proctor, WV 26055

Anthony T. Moore
215 Ash Avenue
Moundsville, WV 26041

Freda L. Campbell
307 Elizabeth Street
Glen Dale, WV 26038

James D. Yocum
5200 NW 31st Avenue
Apartment B 38
Ft. Lauderdale, FL 33309

Joan A. Gieger
621 Pepperdine Avenue
Edmond, OK 33013

Joyce Elaine Cone
1831 Old Westminster Pike
Finksburg, MD 21048

Mary W. Holmes
197 Spindle Lane
Moundsville, WV 26041

Marilyn Sue Reilly
197 Spindle Lane
Moundsville, WV 26041

Freddie C. White
RR 1 Box 59A
Glen Easton, WV 26039

Sharon Diane Jahn
2802 Spindle Lane
Bowie, MD 20715

Joyce A. Wallace
4107 Shoemaker Hollow Road
New Philadelphia, OH 44663

Tamala Schollick
112 Jennifer Drive
Moundsville, WV 26041

Linda G. Moore
720 3rd Avenue
Apt. 312
New Cumberland, WV 26047

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

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

Date of Notice: 06/28/2019

Date Permit Application Filed: 06/28/2019

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 **OCT 18 2019**

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

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

HAND
DELIVERY

WV Department of
Environmental Protection

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

Notice is hereby provided to the SURFACE OWNER(s)

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

Name: CNX Land Resources, LLC Attn: Casey Saunders (Well Pad)
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

Name: Robert L. and Melinda J. White (Access Road)
Address: 129 Freddie Lane
Glen Easton, WV 26039

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>4,408,802.91</u>
County:	<u>Marshall</u>		Northing:	<u>528,013.65</u>
District:	<u>Meade</u>	Public Road Access:	<u>Roberts Ridge Road (CR 21)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>CNX Land, LLC</u>	
Watershed:	<u>Grave Creek (HUC 10)</u>			

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: amiller@tug-hill-op.com

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

Oil and Gas Privacy Notice:

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



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Byrd E. White, III
Secretary of Transportation

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

June 21, 2019

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

Subject: DOH Permit for the Hudson Pad, Marshall County
Hudson S-5HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2019-0353 issued to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 21 SLS.

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

Very Truly Yours,

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

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

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OCT 18 2019

WV Department of
Environmental Protection



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Hudson S-5HM

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

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