



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

Friday, December 13, 2019
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit Modification Approval for OLD CROW N-17HU
47-051-02122-00-00

Modify to Horizontal Length of 15,811.59' and a TMD of 27,659'

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

A blue ink signature of James A. Martin, written in a cursive style. Below the signature is a blue rectangular stamp.

James A. Martin
Chief

Operator's Well Number: OLD CROW N-17HU
Farm Name: DONNA VIVIAN YOHO (TOD) GARY LANCE YOHO
U.S. WELL NUMBER: 47-051-02122-00-00
Horizontal 6A New Drill
Date Modification Issued: December 13, 2019

Promoting a healthy environment.



west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street SE, Charleston, WV 25304
304-926-0499 Ext 1274

Randall M. Albert, Chairman
dep.wv.gov

December 13, 2019

Department of Environmental Protection
Office of Oil and Gas
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-051-02122

COMPANY: Tug Hill Operating, LLC

FARM: Donna Vivian Yoho (TOD) Gary Lance Yoho Old Crow N-17HU

COUNTY: Marshall DISTRICT: Franklin QUAD: Powhatan Point

The deep well review of the application for the above company is **Approved to drill to Trenton for Point Pleasant completion.**

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Comments to Notice of Deviation filed? No
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: **yes
4. Provided a plat showing that the proposed location is a distance of 228 feet from the heel to the nearest lease line or unit boundary and 10 feet from the toe to the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

A handwritten signature in blue ink that reads 'Susan Rose'.

Susan Rose
Administrator

** Old Crow N-18HU 47-051-02123; Old Crow N-19HU 47-051-02190; Old Crow N-20HU 47-051-02191; Bryan N-14HU 47-051-02031; Bryan N-13HU 47-051-02030; Bryan N-12HU 47-051-02029; Woodford-10HU 47-051-02152; Michter N-6HU 47-051-02206; Michter N-7HU 47-051-02207; Michter N-8HU 47-051-02219; Michter N-9HU 47-051-02220; MND 6 HHS 47-051-01732; MND20AU 47-051-02011; MND20BU 47-051-02012; MND20CU 47-051-02013; MND20DU 47-051-02014; Corley N-9HU 47-051-01983; Corley N-10HU 47-051-01998

WW-6B
(04/15)

API NO. 47-051 -
OPERATOR WELL NO. Old Crow N-17HU
Well Pad Name: Old Crow

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 Franklin Powhatan Point 7
Operator ID County District Quadrangle

2) Operator's Well Number: Old Crow N-17HU Well Pad Name: Old Crow

3) Farm Name/Surface Owner: Donna Vivian Yoho (TOD) Gary Lance Yoho Public Road Access: Rines Ridge Road (County Route 76)

4) Elevation, current ground: 1265' Elevation, proposed post-construction: 1265'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

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7/26/19

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,442' - 11,320' - thickness of 122' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,592'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 27,659'

11) Proposed Horizontal Leg Length: 15,811.59'

12) Approximate Fresh Water Strata Depths: 70' ; 912'

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

14) Approximate Saltwater Depths: 2,167'

15) Approximate Coal Seam Depths: Sewickley Coal - 814' ; Pittsburgh Coal - 906'

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: _____
Depth: _____
Seam: _____
Owner: _____

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WW-6B
(04/15)

4705102122 mod
API NO. 47- 051 -
OPERATOR WELL NO. Old Crow N-17HU
Well Pad Name: Old Crow

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	20"	NEW	J55	106.5#	1020'	1020'	1,644FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2801'	2801'	1,975FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,240'	10,240'	3,346FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	27,659'	27,659'	6,510FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		10,883'	
Liners							

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1/26/19

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	20"	26"	.5	2,410	1,928	SEE # 24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE #24	1.99
Production	5 1/2"	8 1/2"	.415	16,510	10,864	SEE #24	1.18
Tubing	2 7/8"			11,385	11,624		
Liners							

PACKERS

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

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WW-6B
(10/14)

API NO. 47-051 - 02122 MDD
OPERATOR WELL NO. Old Crow N-17HU
Well Pad Name: Old Crow

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

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

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

Well to be completed with approximately 39,522,500 lb proppant and 611,047 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 19.18 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.64 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 third joint. Production casing will have one centralizer every third joint in lateral, one centralizer every joint through curve, one centralizer every third 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.

51-02122
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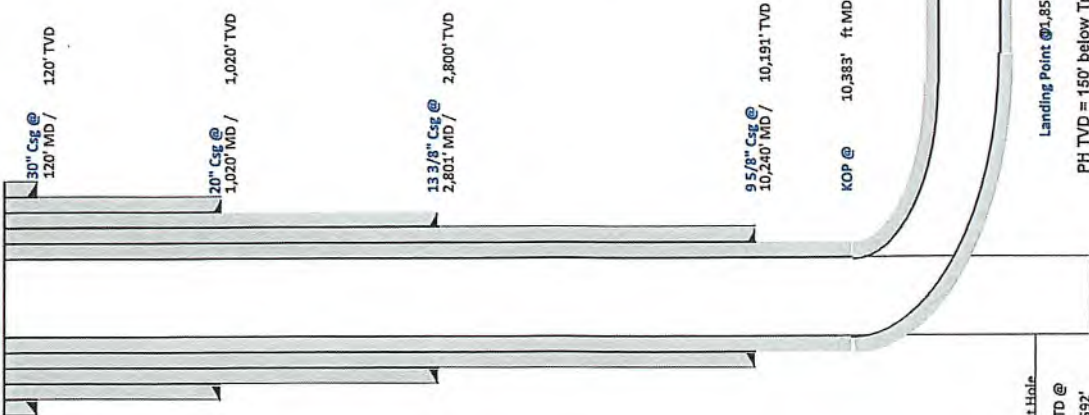
WV Department of
Environmental Protection

WELL NAME: Old Crow N-17HU COUNTY: Marshall
STATE: WV DISTRICT: Franklin
DF Elev: 1,291' GL Elev: 1,265'
TD: 27,659'
TH Latitude: 39.77842996
TH Longitude: -80.76306739
BH Latitude: 39.816996
BH Longitude: -80.799393

CASING SUMMARY						
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Top of Cement
Conductor	36	30	120'	120'	BW	Surface
Surface	26	20	1,020'	1,020'	106.5	Surface
Intermediate 1	17 1/2	13 3/8	2,801'	2,800'	54.5	Surface
Intermediate 2	12 1/4	9 5/8	10,240'	10,191'	47	Surface
Production	8 1/2	5 1/2	27,659'	11,074'	23	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	None	
1,772	A	15.6	Air	3 Centralizers at equal distance	
2,140	A	15	Air	1 Centralizer every other jt	
2,822	A	14.5	Air	1 Centralizer every other jt	
5,810	A	15	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc	

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	912'
Sewidley Coal	814'
Pittsburgh Coal	906'
Big Lime	2,103'
Berea	2,652'
Tully	6,495'
Marcellus	6,576'
Onondaga	6,629'
Silha	7,326'
Lockport	8,362'
Utica	11,048'
Point Pleasant	11,320'
Landing Depth	11,349'
Trenton	11,442'
Pilot Hole TD	11,592'



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7/20/19

Lateral TD @ 27,659' ft MD
11,074' ft TVD

Landing Point @ 1,850' MD / 11,349' TVD
PH TVD = 150' below Trenton Top



47-051-02122 MOD



Tug Hill Operating, LLC Casing and Cement Program

Old Crow N-17HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	1,020'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,801'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,240'	CTS
Production	5 1/2"	HCP110	8 1/2"	27,659'	CTS

Cement

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

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

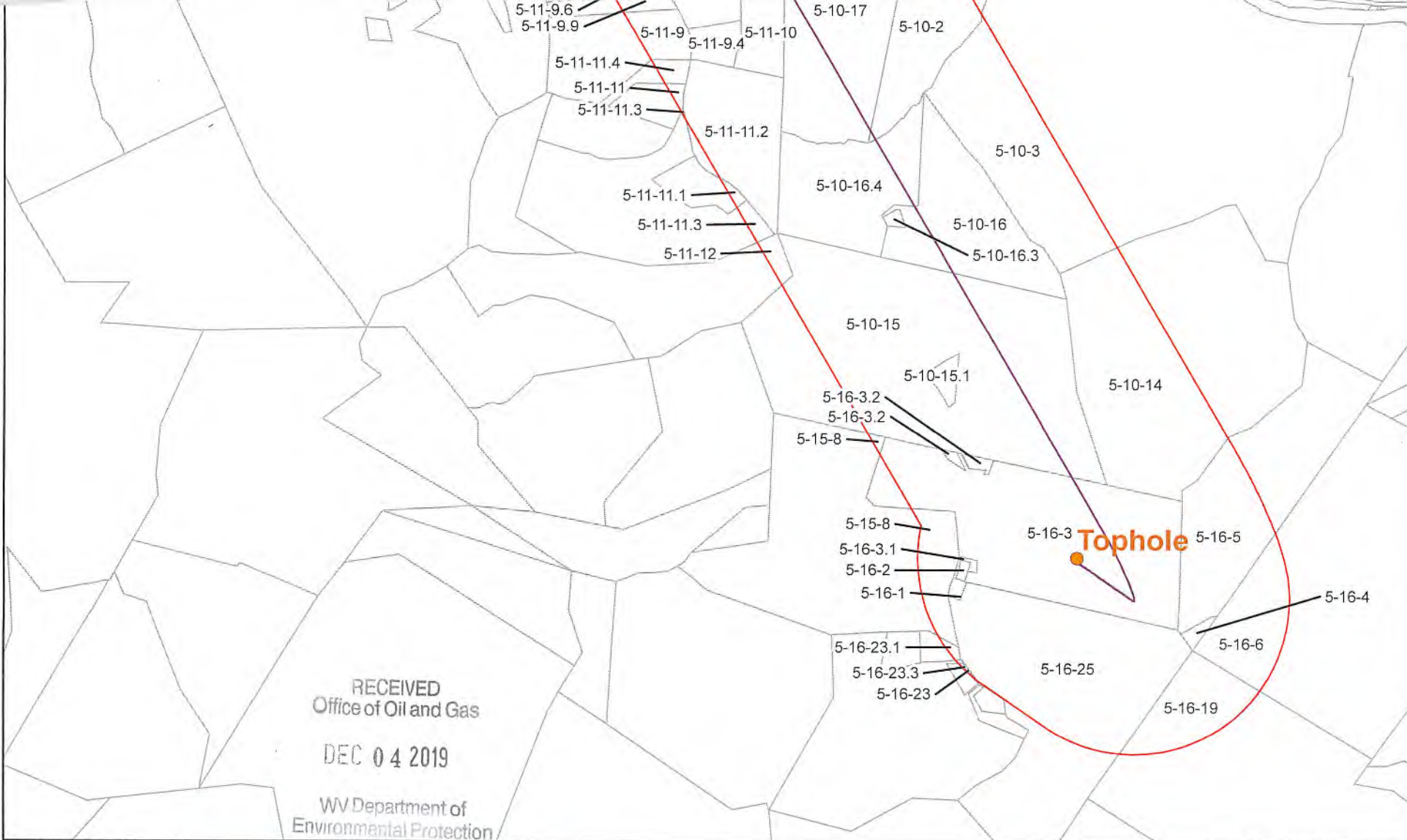
Intermediate 2: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99

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 = 1.18

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Old Crow N-17HU





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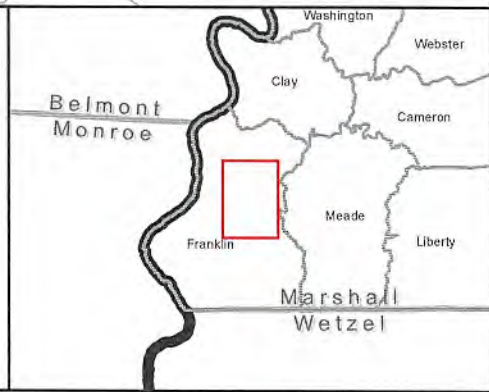
Coordinate System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Datum: North American 1983
False easting: 1,600,000.0000
False northing: 0.0000
Central meridian: -81.0000
Scale factor: 0.9996
Latitude of origin: 0.0000
Units: Feet US

CONFIDENTIAL



 1500 Foot Buffer
 Utica Well

Old Crow N-17HU
Operators within 1500 Feet of Well Borehole





Well: Old Crow N-17 HU (slot O)
 Site: Old Crow Pad
 Project: Marshall County, West Virginia.
 Design: rev7

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1990
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
 Depth Reference: RKB=1265+26 @ 1291.00usft (Neighbors B 2B)

Northing 14446140.48 Easting 17069983.87
 Longitude -80.76306739

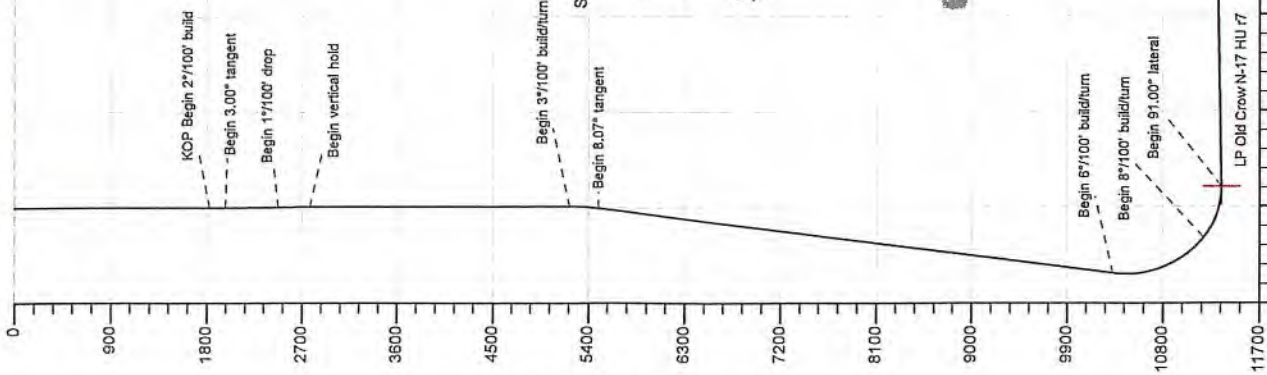
Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.865°



Azimuths to Grid North
 True North: -0.15°
 Magnetic North: -8.86°
 Magnetic Field
 Strength: 51968.68mT
 Dip Angle: 66.16°
 Decline: 71.20016°
 Model: IGRF2015



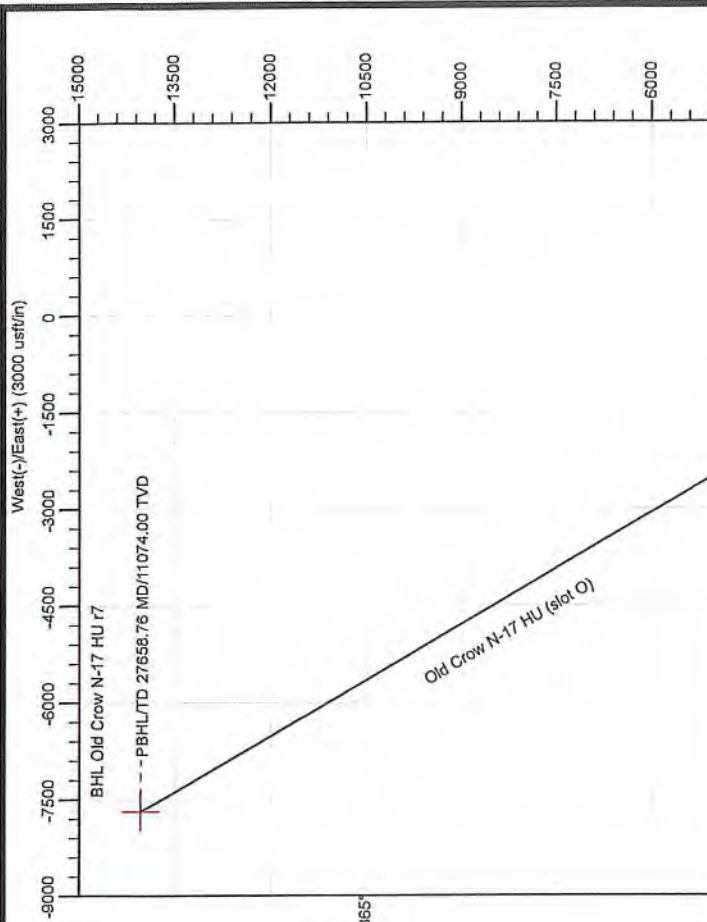
True Vertical Depth (1800 usft/in)



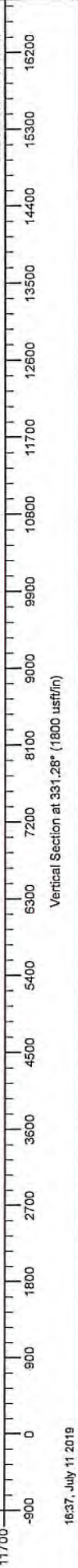
SECTION DETAILS

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	0.00	0.00	
2	1826.00	0.00	0.00	1826.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1976.00	3.00	260.00	1975.93	-0.68	0.00	0.00	0.00	1.26	Begin 3.00° tangent
4	2476.00	3.00	260.00	2475.93	-5.23	-3.87	2.00	260.0000	9.66	Begin 1°/100' drop
5	2776.00	0.00	260.00	2775.11	-6.59	-29.64	0.00	0.00	12.18	Begin vertical hold
6	5226.89	0.00	260.00	5226.00	-6.59	-37.37	1.00	180.0000	12.18	Begin 3°/100' build/turn
7	5495.98	8.07	124.64	5494.20	-17.35	-21.80	3.00	124.635	-4.74	Begin 8.07° tangent
8	10383.19	8.07	124.64	10332.98	-407.41	542.89	0.00	0.00	-618.17	Begin 8°/100' build/turn
9	11333.66	50.00	335.65	11180.10	-86.75	438.97	6.00	-151.934	-287.03	Begin 8°/100' build/turn
10	11850.17	91.00	330.00	11349.00	335.57	218.65	8.00	-8.577	189.21	Begin 91.00° lateral
11	27658.76	91.00	330.00	11074.00	14023.90	-7684.86	0.00	0.00	15991.46	PBHLTD 27658.76 MD/11074.00 TVD

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South(+)North(-) (30000 usft/in)
 4705102122 mod



4705102122 MOD



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-17 HU (slot O)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

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

Site	Old Crow Pad				
Site Position:		Northing:	14,446,179.89 usft	Latitude:	39.77853828
From:	Lat/Long	Easting:	1,706,970.33 usft	Longitude:	-80.76311519
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.152 °

Well	Old Crow N-17 HU (slot O)					
Well Position	+N/-S	0.00 usft	Northing:	14,446,140.48 usft	Latitude:	39.77842996
	+E/-W	0.00 usft	Easting:	1,706,983.86 usft	Longitude:	-80.76306739
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	1,265.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/12/2019	-8.713	66.784	51,936.76447566

Design	rev7			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	331.28

Plan Survey Tool Program	Date 7/11/2019			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	27,658.76 rev7 (Original Hole)	MWD MWD - Standard	

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Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Desgn:	rev7		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,826.00	0.00	0.00	1,826.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,976.00	3.00	260.00	1,975.93	-0.68	-3.87	2.00	2.00	0.00	260.000	
2,476.00	3.00	260.00	2,475.25	-5.23	-29.64	0.00	0.00	0.00	0.000	
2,776.00	0.00	260.00	2,775.11	-6.59	-37.37	1.00	-1.00	0.00	180.000	
5,226.89	0.00	260.00	5,226.00	-6.59	-37.37	0.00	0.00	0.00	260.000	
5,495.98	8.07	124.64	5,494.20	-17.35	-21.80	3.00	3.00	0.00	124.635	
10,383.19	8.07	124.64	10,332.98	-407.41	542.89	0.00	0.00	0.00	0.000	
11,333.66	50.00	335.65	11,180.10	-86.75	438.97	6.00	4.41	-15.67	-151.934	
11,850.17	91.00	330.00	11,349.00	335.57	218.65	8.00	7.94	-1.09	-8.577	
27,658.76	91.00	330.00	11,074.00	14,023.90	-7,684.86	0.00	0.00	0.00	0.000	BHL Old Crow N-17 F

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Planning Report - Geographic

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Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
100.00	0.00	0.00	100.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
200.00	0.00	0.00	200.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
300.00	0.00	0.00	300.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
400.00	0.00	0.00	400.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
500.00	0.00	0.00	500.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
600.00	0.00	0.00	600.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
700.00	0.00	0.00	700.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
800.00	0.00	0.00	800.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
900.00	0.00	0.00	900.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
1,826.00	0.00	0.00	1,826.00	0.00	0.00	14,446,140.48	1,706,983.86	39.77842996	-80.76306739
KOP Begin 2°/100' build									
1,900.00	1.48	260.00	1,899.99	-0.17	-0.94	14,446,140.32	1,706,982.92	39.77842951	-80.76307074
1,976.00	3.00	260.00	1,975.93	-0.68	-3.87	14,446,139.80	1,706,980.00	39.77842812	-80.76308116
Begin 3.00° tangent									
2,000.00	3.00	260.00	1,999.89	-0.90	-5.10	14,446,139.58	1,706,978.76	39.77842753	-80.76308556
2,100.00	3.00	260.00	2,099.76	-1.81	-10.26	14,446,138.67	1,706,973.61	39.77842507	-80.76310392
2,200.00	3.00	260.00	2,199.62	-2.72	-15.41	14,446,137.76	1,706,968.45	39.77842261	-80.76312227
2,300.00	3.00	260.00	2,299.48	-3.63	-20.57	14,446,136.86	1,706,963.30	39.77842015	-80.76314062
2,400.00	3.00	260.00	2,399.35	-4.54	-25.72	14,446,135.95	1,706,958.14	39.77841769	-80.76315898
2,476.00	3.00	260.00	2,475.25	-5.23	-29.64	14,446,135.26	1,706,954.23	39.77841583	-80.76317293
Begin 1°/100' drop									
2,500.00	2.76	260.00	2,499.21	-5.44	-30.82	14,446,135.05	1,706,953.04	39.77841526	-80.76317715
2,599.99	1.76	260.00	2,599.13	-6.12	-34.71	14,446,134.36	1,706,949.16	39.77841341	-80.76319098
2,699.99	0.76	260.00	2,699.11	-6.50	-36.87	14,446,133.98	1,706,946.99	39.77841237	-80.76319869
2,776.00	0.00	0.00	2,775.11	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
Begin vertical hold									
2,799.99	0.00	0.00	2,799.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
2,899.99	0.00	0.00	2,899.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
2,999.99	0.00	0.00	2,999.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,099.99	0.00	0.00	3,099.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,199.99	0.00	0.00	3,199.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,299.99	0.00	0.00	3,299.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,399.99	0.00	0.00	3,399.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,499.99	0.00	0.00	3,499.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,599.99	0.00	0.00	3,599.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,699.99	0.00	0.00	3,699.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,799.99	0.00	0.00	3,799.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,899.99	0.00	0.00	3,899.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
3,999.99	0.00	0.00	3,999.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,099.99	0.00	0.00	4,099.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,199.99	0.00	0.00	4,199.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,299.99	0.00	0.00	4,299.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,399.99	0.00	0.00	4,399.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,499.99	0.00	0.00	4,499.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046



Planning Report - Geographic

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DEC 04 2019

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-17 HU (slot O)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,599.99	0.00	0.00	4,599.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,699.99	0.00	0.00	4,699.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,799.99	0.00	0.00	4,799.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,899.99	0.00	0.00	4,899.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
4,999.99	0.00	0.00	4,999.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
5,099.99	0.00	0.00	5,099.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
5,199.99	0.00	0.00	5,199.10	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
5,226.89	0.00	0.00	5,226.00	-6.59	-37.37	14,446,133.89	1,706,946.49	39.77841214	-80.76320046
Begin 3°/100' build/turn									
5,299.99	2.19	124.64	5,299.08	-7.38	-36.22	14,446,133.10	1,706,947.65	39.77840995	-80.76319637
5,399.99	5.19	124.64	5,398.86	-11.04	-30.92	14,446,129.44	1,706,952.94	39.77839985	-80.76317755
5,495.98	8.07	124.64	5,494.20	-17.35	-21.80	14,446,123.14	1,706,962.07	39.77838248	-80.76314514
Begin 8.07° tangent									
5,499.99	8.07	124.64	5,498.17	-17.67	-21.34	14,446,122.82	1,706,962.53	39.77838160	-80.76314349
5,599.99	8.07	124.64	5,597.18	-25.65	-9.78	14,446,114.83	1,706,974.08	39.77835960	-80.76310244
5,699.99	8.07	124.64	5,696.19	-33.63	1.77	14,446,106.85	1,706,985.64	39.77833760	-80.76306139
5,799.99	8.07	124.64	5,795.20	-41.61	13.33	14,446,098.87	1,706,997.19	39.77831559	-80.76302035
5,899.99	8.07	124.64	5,894.20	-49.59	24.88	14,446,090.89	1,707,008.75	39.77829359	-80.76297930
5,999.99	8.07	124.64	5,993.21	-57.57	36.44	14,446,082.91	1,707,020.30	39.77827159	-80.76293825
6,099.99	8.07	124.64	6,092.22	-65.55	47.99	14,446,074.93	1,707,031.86	39.77824959	-80.76289720
6,199.99	8.07	124.64	6,191.23	-73.53	59.55	14,446,066.95	1,707,043.41	39.77822758	-80.76285615
6,299.99	8.07	124.64	6,290.24	-81.52	71.10	14,446,058.97	1,707,054.96	39.77820558	-80.76281510
6,399.99	8.07	124.64	6,389.25	-89.50	82.65	14,446,050.98	1,707,066.52	39.77818358	-80.76277405
6,499.99	8.07	124.64	6,488.26	-97.48	94.21	14,446,043.00	1,707,078.07	39.77816157	-80.76273300
6,599.99	8.07	124.64	6,587.27	-105.46	105.76	14,446,035.02	1,707,089.63	39.77813957	-80.76269195
6,699.99	8.07	124.64	6,686.28	-113.44	117.32	14,446,027.04	1,707,101.18	39.77811757	-80.76265090
6,799.99	8.07	124.64	6,785.28	-121.42	128.87	14,446,019.06	1,707,112.74	39.77809557	-80.76260985
6,899.99	8.07	124.64	6,884.29	-129.40	140.43	14,446,011.08	1,707,124.29	39.77807356	-80.76256880
6,999.99	8.07	124.64	6,983.30	-137.38	151.98	14,446,003.10	1,707,135.84	39.77805156	-80.76252775
7,099.99	8.07	124.64	7,082.31	-145.37	163.53	14,445,995.12	1,707,147.40	39.77802956	-80.76248670
7,199.99	8.07	124.64	7,181.32	-153.35	175.09	14,445,987.13	1,707,158.95	39.77800755	-80.76244565
7,299.99	8.07	124.64	7,280.33	-161.33	186.64	14,445,979.15	1,707,170.51	39.77798555	-80.76240460
7,399.99	8.07	124.64	7,379.34	-169.31	198.20	14,445,971.17	1,707,182.06	39.77796355	-80.76236355
7,499.99	8.07	124.64	7,478.35	-177.29	209.75	14,445,963.19	1,707,193.62	39.77794154	-80.76232250
7,599.98	8.07	124.64	7,577.36	-185.27	221.31	14,445,955.21	1,707,205.17	39.77791954	-80.76228145
7,699.98	8.07	124.64	7,676.36	-193.25	232.86	14,445,947.23	1,707,216.72	39.77789754	-80.76224041
7,799.98	8.07	124.64	7,775.37	-201.24	244.41	14,445,939.25	1,707,228.28	39.77787554	-80.76219936
7,899.98	8.07	124.64	7,874.38	-209.22	255.97	14,445,931.27	1,707,239.83	39.77785353	-80.76215831
7,999.98	8.07	124.64	7,973.39	-217.20	267.52	14,445,923.28	1,707,251.39	39.77783153	-80.76211726
8,099.98	8.07	124.64	8,072.40	-225.18	279.08	14,445,915.30	1,707,262.94	39.77780953	-80.76207621
8,199.98	8.07	124.64	8,171.41	-233.16	290.63	14,445,907.32	1,707,274.50	39.77778752	-80.76203516
8,299.98	8.07	124.64	8,270.42	-241.14	302.19	14,445,899.34	1,707,286.05	39.77776552	-80.76199411
8,399.98	8.07	124.64	8,369.43	-249.12	313.74	14,445,891.36	1,707,297.60	39.77774352	-80.76195306
8,499.98	8.07	124.64	8,468.44	-257.10	325.29	14,445,883.38	1,707,309.16	39.77772151	-80.76191201
8,599.98	8.07	124.64	8,567.44	-265.09	336.85	14,445,875.40	1,707,320.71	39.77769951	-80.76187096
8,699.98	8.07	124.64	8,666.45	-273.07	348.40	14,445,867.41	1,707,332.27	39.77767751	-80.76182991
8,799.98	8.07	124.64	8,765.46	-281.05	359.96	14,445,859.43	1,707,343.82	39.77765550	-80.76178887
8,899.98	8.07	124.64	8,864.47	-289.03	371.51	14,445,851.45	1,707,355.38	39.77763350	-80.76174782
8,999.98	8.07	124.64	8,963.48	-297.01	383.07	14,445,843.47	1,707,366.93	39.77761150	-80.76170677
9,099.98	8.07	124.64	9,062.49	-304.99	394.62	14,445,835.49	1,707,378.48	39.77758949	-80.76166572
9,199.98	8.07	124.64	9,161.50	-312.97	406.17	14,445,827.51	1,707,390.04	39.77756749	-80.76162467
9,299.98	8.07	124.64	9,260.51	-320.95	417.73	14,445,819.53	1,707,401.59	39.77754549	-80.76158362
9,399.98	8.07	124.64	9,359.52	-328.94	429.28	14,445,811.55	1,707,413.15	39.77752348	-80.76154257
9,499.98	8.07	124.64	9,458.52	-336.92	440.84	14,445,803.56	1,707,424.70	39.77750148	-80.76150152



Planning Report - Geographic

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-17 HU (slot O)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,599.98	8.07	124.64	9,557.53	-344.90	452.39	14,445,795.58	1,707,436.26	39.77747948	-80.76146048
9,699.98	8.07	124.64	9,656.54	-352.88	463.95	14,445,787.60	1,707,447.81	39.77745747	-80.76141943
9,799.98	8.07	124.64	9,755.55	-360.86	475.50	14,445,779.62	1,707,459.36	39.77743547	-80.76137838
9,899.98	8.07	124.64	9,854.56	-368.84	487.05	14,445,771.64	1,707,470.92	39.77741347	-80.76133733
9,999.98	8.07	124.64	9,953.57	-376.82	498.61	14,445,763.66	1,707,482.47	39.77739146	-80.76129628
10,099.98	8.07	124.64	10,052.58	-384.80	510.16	14,445,755.68	1,707,494.03	39.77736946	-80.76125523
10,199.98	8.07	124.64	10,151.59	-392.79	521.72	14,445,747.70	1,707,505.58	39.77734746	-80.76121418
10,299.98	8.07	124.64	10,250.60	-400.77	533.27	14,445,739.71	1,707,517.14	39.77732545	-80.76117314
10,383.19	8.07	124.64	10,332.98	-407.41	542.89	14,445,733.07	1,707,526.75	39.77730714	-80.76113898
Begin 6°/100' build/turn									
10,399.98	7.20	120.85	10,349.62	-408.62	544.76	14,445,731.86	1,707,528.62	39.77730381	-80.76113232
10,499.98	3.79	64.37	10,449.21	-410.40	553.13	14,445,730.08	1,707,536.99	39.77729885	-80.76110256
10,599.98	6.99	5.17	10,548.82	-402.91	556.66	14,445,737.57	1,707,540.52	39.77731940	-80.76108992
10,699.98	12.46	349.91	10,647.36	-386.22	555.32	14,445,754.26	1,707,539.18	39.77736524	-80.76109454
10,799.98	18.26	344.04	10,743.75	-360.52	549.12	14,445,779.96	1,707,532.98	39.77743587	-80.76111636
10,899.98	24.16	340.96	10,836.94	-326.09	538.12	14,445,814.39	1,707,521.99	39.77753051	-80.76115516
10,999.98	30.09	339.03	10,925.91	-283.30	522.46	14,445,857.18	1,707,506.32	39.77764813	-80.76121051
11,099.98	36.05	337.69	11,009.67	-232.63	502.30	14,445,907.85	1,707,486.16	39.77778744	-80.76128179
11,199.98	42.01	336.68	11,087.32	-174.62	477.85	14,445,965.86	1,707,461.72	39.77794691	-80.76136823
11,299.98	47.99	335.88	11,158.00	-109.93	449.40	14,446,030.55	1,707,433.27	39.77812480	-80.76146889
11,333.66	50.00	335.65	11,180.10	-86.75	438.97	14,446,053.73	1,707,422.83	39.77818852	-80.76150580
Begin 8°/100' build/turn									
11,399.98	55.25	334.69	11,220.34	-38.95	416.83	14,446,101.54	1,707,400.70	39.77831997	-80.76158414
11,499.98	63.18	333.45	11,271.49	38.23	379.26	14,446,178.71	1,707,363.12	39.77853220	-80.76171714
11,599.98	71.12	332.37	11,310.29	120.19	337.30	14,446,260.67	1,707,321.17	39.77875759	-80.76186570
11,699.98	79.06	331.39	11,336.00	205.34	291.78	14,446,345.82	1,707,275.64	39.77899176	-80.76202694
11,799.98	87.01	330.46	11,348.12	292.02	243.57	14,446,432.50	1,707,227.43	39.77923015	-80.76219771
11,850.17	91.00	330.00	11,349.00	335.57	218.65	14,446,476.05	1,707,202.52	39.77934993	-80.76228597
Begin 91.00° lateral									
11,899.98	91.00	330.00	11,348.13	378.70	193.75	14,446,519.18	1,707,177.62	39.77946855	-80.76237420
11,999.98	91.00	330.00	11,346.39	465.28	143.76	14,446,605.76	1,707,127.62	39.77970671	-80.76255133
12,099.98	91.00	330.00	11,344.65	551.87	93.76	14,446,692.35	1,707,077.63	39.77994487	-80.76272846
12,199.98	91.00	330.00	11,342.91	638.46	43.77	14,446,778.94	1,707,027.63	39.78018303	-80.76290559
12,299.98	91.00	330.00	11,341.17	725.05	-6.23	14,446,865.53	1,706,977.64	39.78042118	-80.76308273
12,399.98	91.00	330.00	11,339.43	811.63	-56.22	14,446,952.12	1,706,927.64	39.78065934	-80.76325986
12,499.98	91.00	330.00	11,337.69	898.22	-106.22	14,447,038.70	1,706,877.65	39.78089750	-80.76343700
12,599.98	91.00	330.00	11,335.95	984.81	-156.21	14,447,125.29	1,706,827.65	39.78113565	-80.76361414
12,699.97	91.00	330.00	11,334.21	1,071.40	-206.21	14,447,211.88	1,706,777.66	39.78137381	-80.76379128
12,799.97	91.00	330.00	11,332.47	1,157.98	-256.20	14,447,298.47	1,706,727.66	39.78161196	-80.76396842
12,899.97	91.00	330.00	11,330.73	1,244.57	-306.20	14,447,385.05	1,706,677.67	39.78185012	-80.76414556
12,999.97	91.00	330.00	11,328.99	1,331.16	-356.19	14,447,471.64	1,706,627.67	39.78208827	-80.76432271
13,099.97	91.00	330.00	11,327.26	1,417.75	-406.19	14,447,558.23	1,706,577.68	39.78232643	-80.76449985
13,199.97	91.00	330.00	11,325.52	1,504.34	-456.18	14,447,644.82	1,706,527.68	39.78256458	-80.76467700
13,299.97	91.00	330.00	11,323.78	1,590.92	-506.18	14,447,731.41	1,706,477.69	39.78280274	-80.76485414
13,399.97	91.00	330.00	11,322.04	1,677.51	-556.17	14,447,817.99	1,706,427.69	39.78304089	-80.76503129
13,499.97	91.00	330.00	11,320.30	1,764.10	-606.17	14,447,904.58	1,706,377.70	39.78327905	-80.76520844
13,599.97	91.00	330.00	11,318.56	1,850.69	-656.16	14,447,991.17	1,706,327.70	39.78351720	-80.76538559
13,699.97	91.00	330.00	11,316.82	1,937.27	-706.16	14,448,077.76	1,706,277.71	39.78375535	-80.76556274
13,799.97	91.00	330.00	11,315.08	2,023.86	-756.15	14,448,164.34	1,706,227.71	39.78399351	-80.76573990
13,899.97	91.00	330.00	11,313.34	2,110.45	-806.15	14,448,250.93	1,706,177.72	39.78423166	-80.76591705
13,999.97	91.00	330.00	11,311.60	2,197.04	-856.14	14,448,337.52	1,706,127.72	39.78446981	-80.76609421
14,099.97	91.00	330.00	11,309.86	2,283.63	-906.14	14,448,424.11	1,706,077.73	39.78470796	-80.76627136
14,199.97	91.00	330.00	11,308.12	2,370.21	-956.13	14,448,510.69	1,706,027.73	39.78494611	-80.76644852
14,299.97	91.00	330.00	11,306.38	2,456.80	-1,006.13	14,448,597.28	1,705,977.74	39.78518427	-80.76662568



Planning Report - Geographic

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-17 HU (slot O)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,399.97	91.00	330.00	11,304.64	2,543.39	-1,056.12	14,448,683.87	1,705,927.74	39.78542242	-80.76680284	
14,499.97	91.00	330.00	11,302.90	2,629.98	-1,106.12	14,448,770.46	1,705,877.75	39.78586057	-80.76698000	
14,599.97	91.00	330.00	11,301.16	2,716.56	-1,156.11	14,448,857.05	1,705,827.75	39.78589872	-80.76715716	
14,699.97	91.00	330.00	11,299.42	2,803.15	-1,206.11	14,448,943.63	1,705,777.76	39.78613687	-80.76733433	
14,799.97	91.00	330.00	11,297.68	2,889.74	-1,256.10	14,449,030.22	1,705,727.76	39.78637502	-80.76751149	
14,899.97	91.00	330.00	11,295.94	2,976.33	-1,306.10	14,449,116.81	1,705,677.77	39.78661317	-80.76768866	
14,999.97	91.00	330.00	11,294.20	3,062.92	-1,356.09	14,449,203.40	1,705,627.77	39.78685132	-80.76786583	
15,099.97	91.00	330.00	11,292.46	3,149.50	-1,406.09	14,449,289.98	1,705,577.78	39.78708947	-80.76804300	
15,199.97	91.00	330.00	11,290.72	3,236.09	-1,456.08	14,449,376.57	1,705,527.78	39.78732762	-80.76822017	
15,299.97	91.00	330.00	11,288.99	3,322.68	-1,506.08	14,449,463.16	1,705,477.79	39.78756577	-80.76839734	
15,399.97	91.00	330.00	11,287.25	3,409.27	-1,556.07	14,449,549.75	1,705,427.79	39.78780392	-80.76857451	
15,499.97	91.00	330.00	11,285.51	3,495.85	-1,606.07	14,449,636.34	1,705,377.80	39.78804206	-80.76875168	
15,599.97	91.00	330.00	11,283.77	3,582.44	-1,656.06	14,449,722.92	1,705,327.80	39.78828021	-80.76892886	
15,699.97	91.00	330.00	11,282.03	3,669.03	-1,706.06	14,449,809.51	1,705,277.81	39.78851836	-80.76910603	
15,799.97	91.00	330.00	11,280.29	3,755.62	-1,756.05	14,449,896.10	1,705,227.81	39.78875651	-80.76928321	
15,899.97	91.00	330.00	11,278.55	3,842.20	-1,806.05	14,449,982.69	1,705,177.82	39.78899465	-80.76946039	
15,999.97	91.00	330.00	11,276.81	3,928.79	-1,856.04	14,450,069.27	1,705,127.82	39.78923280	-80.76963757	
16,099.97	91.00	330.00	11,275.07	4,015.38	-1,906.04	14,450,155.86	1,705,077.83	39.78947095	-80.76981475	
16,199.97	91.00	330.00	11,273.33	4,101.97	-1,956.03	14,450,242.45	1,705,027.83	39.78970909	-80.76999193	
16,299.97	91.00	330.00	11,271.59	4,188.56	-2,006.03	14,450,329.04	1,704,977.84	39.78994724	-80.77016912	
16,399.97	91.00	330.00	11,269.85	4,275.14	-2,056.02	14,450,415.63	1,704,927.84	39.79018538	-80.77034630	
16,499.97	91.00	330.00	11,268.11	4,361.73	-2,106.02	14,450,502.21	1,704,877.85	39.79042353	-80.77052349	
16,599.97	91.00	330.00	11,266.37	4,448.32	-2,156.01	14,450,588.80	1,704,827.85	39.79066168	-80.77070067	
16,699.97	91.00	330.00	11,264.63	4,534.91	-2,206.01	14,450,675.39	1,704,777.86	39.79089982	-80.77087786	
16,799.97	91.00	330.00	11,262.89	4,621.49	-2,256.00	14,450,761.98	1,704,727.86	39.79113797	-80.77105505	
16,899.97	91.00	330.00	11,261.15	4,708.08	-2,306.00	14,450,848.56	1,704,677.87	39.79137611	-80.77123224	
16,999.97	91.00	330.00	11,259.41	4,794.67	-2,355.99	14,450,935.15	1,704,627.87	39.79161425	-80.77140944	
17,099.97	91.00	330.00	11,257.67	4,881.26	-2,405.99	14,451,021.74	1,704,577.88	39.79185240	-80.77158663	
17,199.97	91.00	330.00	11,255.93	4,967.85	-2,455.98	14,451,108.33	1,704,527.88	39.79209054	-80.77176382	
17,299.97	91.00	330.00	11,254.19	5,054.43	-2,505.98	14,451,194.91	1,704,477.89	39.79232868	-80.77194102	
17,399.97	91.00	330.00	11,252.46	5,141.02	-2,555.97	14,451,281.50	1,704,427.89	39.79256683	-80.77211822	
17,499.97	91.00	330.00	11,250.72	5,227.61	-2,605.97	14,451,368.09	1,704,377.90	39.79280497	-80.77229541	
17,599.97	91.00	330.00	11,248.98	5,314.20	-2,655.96	14,451,454.68	1,704,327.90	39.79304311	-80.77247261	
17,699.96	91.00	330.00	11,247.24	5,400.78	-2,705.96	14,451,541.27	1,704,277.91	39.79328125	-80.77264981	
17,799.96	91.00	330.00	11,245.50	5,487.37	-2,755.95	14,451,627.85	1,704,227.91	39.79351940	-80.77282702	
17,899.96	91.00	330.00	11,243.76	5,573.96	-2,805.95	14,451,714.44	1,704,177.92	39.79375754	-80.77300422	
17,999.96	91.00	330.00	11,242.02	5,660.55	-2,855.94	14,451,801.03	1,704,127.92	39.79399568	-80.77318142	
18,099.96	91.00	330.00	11,240.28	5,747.14	-2,905.94	14,451,887.62	1,704,077.93	39.79423382	-80.77335863	
18,199.96	91.00	330.00	11,238.54	5,833.72	-2,955.93	14,451,974.20	1,704,027.93	39.79447196	-80.77353583	
18,299.96	91.00	330.00	11,236.80	5,920.31	-3,005.93	14,452,060.79	1,703,977.94	39.79471010	-80.77371304	
18,399.96	91.00	330.00	11,235.06	6,006.90	-3,055.92	14,452,147.38	1,703,927.94	39.79494824	-80.77389025	
18,499.96	91.00	330.00	11,233.32	6,093.49	-3,105.92	14,452,233.97	1,703,877.95	39.79518638	-80.77406746	
18,599.96	91.00	330.00	11,231.58	6,180.07	-3,155.91	14,452,320.56	1,703,827.95	39.79542452	-80.77424467	
18,699.96	91.00	330.00	11,229.84	6,266.66	-3,205.91	14,452,407.14	1,703,777.96	39.79566266	-80.77442189	
18,799.96	91.00	330.00	11,228.10	6,353.25	-3,255.90	14,452,493.73	1,703,727.96	39.79590080	-80.77459910	
18,899.96	91.00	330.00	11,226.36	6,439.84	-3,305.90	14,452,580.32	1,703,677.97	39.79613894	-80.77477632	
18,999.96	91.00	330.00	11,224.62	6,526.42	-3,355.89	14,452,666.91	1,703,627.97	39.79637708	-80.77495353	
19,099.96	91.00	330.00	11,222.88	6,613.01	-3,405.89	14,452,753.49	1,703,577.98	39.79661522	-80.77513075	
19,199.96	91.00	330.00	11,221.14	6,699.60	-3,455.88	14,452,840.08	1,703,527.98	39.79685335	-80.77530797	
19,299.96	91.00	330.00	11,219.40	6,786.19	-3,505.88	14,452,926.67	1,703,477.99	39.79709149	-80.77548519	
19,399.96	91.00	330.00	11,217.66	6,872.78	-3,555.87	14,453,013.26	1,703,427.99	39.79732963	-80.77566241	
19,499.96	91.00	330.00	11,215.93	6,959.36	-3,605.87	14,453,099.85	1,703,378.00	39.79756777	-80.77583963	
19,599.96	91.00	330.00	11,214.19	7,045.95	-3,655.86	14,453,186.43	1,703,328.00	39.79780590	-80.77601686	
19,699.96	91.00	330.00	11,212.45	7,132.54	-3,705.86	14,453,273.02	1,703,278.01	39.79804404	-80.77619408	
19,799.96	91.00	330.00	11,210.71	7,219.13	-3,755.85	14,453,359.61	1,703,228.01	39.79828218	-80.77637131	

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Planning Report - Geographic

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-17 HU (slot O)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
19,899.96	91.00	330.00	11,208.97	7,305.71	-3,805.84	14,453,446.20	1,703,178.02	39.79852031	-80.77654853
19,999.96	91.00	330.00	11,207.23	7,392.30	-3,855.84	14,453,532.78	1,703,128.02	39.79875845	-80.77672576
20,099.96	91.00	330.00	11,205.49	7,478.89	-3,905.83	14,453,619.37	1,703,078.03	39.79899658	-80.77690299
20,199.96	91.00	330.00	11,203.75	7,565.48	-3,955.83	14,453,705.96	1,703,028.03	39.79923472	-80.77708022
20,299.96	91.00	330.00	11,202.01	7,652.07	-4,005.82	14,453,792.55	1,702,978.04	39.79947285	-80.77725746
20,399.96	91.00	330.00	11,200.27	7,738.65	-4,055.82	14,453,879.13	1,702,928.04	39.79971099	-80.77743469
20,499.96	91.00	330.00	11,198.53	7,825.24	-4,105.81	14,453,965.72	1,702,878.05	39.79994912	-80.77761192
20,599.96	91.00	330.00	11,196.79	7,911.83	-4,155.81	14,454,052.31	1,702,828.05	39.80018726	-80.77778916
20,699.96	91.00	330.00	11,195.05	7,998.42	-4,205.80	14,454,138.90	1,702,778.06	39.80042539	-80.77796640
20,799.96	91.00	330.00	11,193.31	8,085.00	-4,255.80	14,454,225.49	1,702,728.06	39.80066352	-80.77814364
20,899.96	91.00	330.00	11,191.57	8,171.59	-4,305.79	14,454,312.07	1,702,678.07	39.80090166	-80.77832088
20,999.96	91.00	330.00	11,189.83	8,258.18	-4,355.79	14,454,398.66	1,702,628.07	39.80113979	-80.77849812
21,099.96	91.00	330.00	11,188.09	8,344.77	-4,405.78	14,454,485.25	1,702,578.08	39.80137792	-80.77867536
21,199.96	91.00	330.00	11,186.35	8,431.36	-4,455.78	14,454,571.84	1,702,528.08	39.80161606	-80.77885260
21,299.96	91.00	330.00	11,184.61	8,517.94	-4,505.77	14,454,658.42	1,702,478.09	39.80185419	-80.77902985
21,399.96	91.00	330.00	11,182.87	8,604.53	-4,555.77	14,454,745.01	1,702,428.09	39.80209232	-80.77920709
21,499.96	91.00	330.00	11,181.13	8,691.12	-4,605.76	14,454,831.60	1,702,378.10	39.80233045	-80.77938434
21,599.96	91.00	330.00	11,179.40	8,777.71	-4,655.76	14,454,918.19	1,702,328.10	39.80256858	-80.77956159
21,699.96	91.00	330.00	11,177.66	8,864.29	-4,705.75	14,455,004.78	1,702,278.11	39.80280671	-80.77973884
21,799.96	91.00	330.00	11,175.92	8,950.88	-4,755.75	14,455,091.36	1,702,228.11	39.80304484	-80.77991609
21,899.96	91.00	330.00	11,174.18	9,037.47	-4,805.74	14,455,177.95	1,702,178.12	39.80328297	-80.78009334
21,999.96	91.00	330.00	11,172.44	9,124.06	-4,855.74	14,455,264.54	1,702,128.12	39.80352110	-80.78027059
22,099.96	91.00	330.00	11,170.70	9,210.65	-4,905.73	14,455,351.13	1,702,078.13	39.80375923	-80.78044785
22,199.96	91.00	330.00	11,168.96	9,297.23	-4,955.73	14,455,437.71	1,702,028.13	39.80399736	-80.78062510
22,299.96	91.00	330.00	11,167.22	9,383.82	-5,005.72	14,455,524.30	1,701,978.14	39.80423549	-80.78080236
22,399.96	91.00	330.00	11,165.48	9,470.41	-5,055.72	14,455,610.89	1,701,928.15	39.80447362	-80.78097962
22,499.96	91.00	330.00	11,163.74	9,557.00	-5,105.71	14,455,697.48	1,701,878.15	39.80471175	-80.78115688
22,599.96	91.00	330.00	11,162.00	9,643.58	-5,155.71	14,455,784.07	1,701,828.16	39.80494988	-80.78133414
22,699.96	91.00	330.00	11,160.26	9,730.17	-5,205.70	14,455,870.65	1,701,778.16	39.80518801	-80.78151140
22,799.95	91.00	330.00	11,158.52	9,816.76	-5,255.70	14,455,957.24	1,701,728.17	39.80542614	-80.78168866
22,899.95	91.00	330.00	11,156.78	9,903.35	-5,305.69	14,456,043.83	1,701,678.17	39.80566426	-80.78186592
22,999.95	91.00	330.00	11,155.04	9,989.93	-5,355.69	14,456,130.42	1,701,628.18	39.80590239	-80.78204319
23,099.95	91.00	330.00	11,153.30	10,076.52	-5,405.68	14,456,217.00	1,701,578.18	39.80614052	-80.78222046
23,199.95	91.00	330.00	11,151.56	10,163.11	-5,455.68	14,456,303.59	1,701,528.19	39.80637865	-80.78239772
23,299.95	91.00	330.00	11,149.82	10,249.70	-5,505.67	14,456,390.18	1,701,478.19	39.80661677	-80.78257499
23,399.95	91.00	330.00	11,148.08	10,336.29	-5,555.67	14,456,476.77	1,701,428.20	39.80685490	-80.78275226
23,499.95	91.00	330.00	11,146.34	10,422.87	-5,605.66	14,456,563.36	1,701,378.20	39.80709302	-80.78292953
23,599.95	91.00	330.00	11,144.60	10,509.46	-5,655.66	14,456,649.94	1,701,328.21	39.80733115	-80.78310681
23,699.95	91.00	330.00	11,142.86	10,596.05	-5,705.65	14,456,736.53	1,701,278.21	39.80756928	-80.78328408
23,799.95	91.00	330.00	11,141.13	10,682.64	-5,755.65	14,456,823.12	1,701,228.22	39.80780740	-80.78346135
23,899.95	91.00	330.00	11,139.39	10,769.22	-5,805.64	14,456,909.71	1,701,178.22	39.80804553	-80.78363863
23,999.95	91.00	330.00	11,137.65	10,855.81	-5,855.64	14,456,996.29	1,701,128.23	39.80828365	-80.78381591
24,099.95	91.00	330.00	11,135.91	10,942.40	-5,905.63	14,457,082.88	1,701,078.23	39.80852178	-80.78399319
24,199.95	91.00	330.00	11,134.17	11,028.99	-5,955.63	14,457,169.47	1,701,028.24	39.80875990	-80.78417047
24,299.95	91.00	330.00	11,132.43	11,115.58	-6,005.62	14,457,256.06	1,700,978.24	39.80899802	-80.78434775
24,399.95	91.00	330.00	11,130.69	11,202.16	-6,055.62	14,457,342.64	1,700,928.25	39.80923615	-80.78452503
24,499.95	91.00	330.00	11,128.95	11,288.75	-6,105.61	14,457,429.23	1,700,878.25	39.80947427	-80.78470231
24,599.95	91.00	330.00	11,127.21	11,375.34	-6,155.61	14,457,515.82	1,700,828.26	39.80971239	-80.78487960
24,699.95	91.00	330.00	11,125.47	11,461.93	-6,205.60	14,457,602.41	1,700,778.26	39.80995052	-80.78505688
24,799.95	91.00	330.00	11,123.73	11,548.51	-6,255.60	14,457,689.00	1,700,728.27	39.81018864	-80.78523417
24,899.95	91.00	330.00	11,121.99	11,635.10	-6,305.59	14,457,775.58	1,700,678.27	39.81042676	-80.78541146
24,999.95	91.00	330.00	11,120.25	11,721.69	-6,355.59	14,457,862.17	1,700,628.28	39.81066488	-80.78558875
25,099.95	91.00	330.00	11,118.51	11,808.28	-6,405.58	14,457,948.76	1,700,578.28	39.81090300	-80.78576604
25,199.95	91.00	330.00	11,116.77	11,894.87	-6,455.58	14,458,035.35	1,700,528.29	39.81114113	-80.78594333
25,299.95	91.00	330.00	11,115.03	11,981.45	-6,505.57	14,458,121.93	1,700,478.29	39.81137925	-80.78612063



Planning Report - Geographic

4705102122 MOD

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-17 HU (slot O)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+26 @ 1291.00usft (Nabors B 28)
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-17 HU (slot O)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
25,399.95	91.00	330.00	11,113.29	12,068.04	-6,555.57	14,458,208.52	1,700,428.30	39.81161737	-80.78629792	
25,499.95	91.00	330.00	11,111.55	12,154.63	-6,605.56	14,458,295.11	1,700,378.30	39.81185549	-80.78647522	
25,599.95	91.00	330.00	11,109.81	12,241.22	-6,655.56	14,458,381.70	1,700,328.31	39.81209361	-80.78665251	
25,699.95	91.00	330.00	11,108.07	12,327.80	-6,705.55	14,458,468.29	1,700,278.31	39.81233173	-80.78682981	
25,799.95	91.00	330.00	11,106.33	12,414.39	-6,755.55	14,458,554.87	1,700,228.32	39.81256985	-80.78700711	
25,899.95	91.00	330.00	11,104.60	12,500.98	-6,805.54	14,458,641.46	1,700,178.32	39.81280797	-80.78718441	
25,999.95	91.00	330.00	11,102.86	12,587.57	-6,855.54	14,458,728.05	1,700,128.33	39.81304609	-80.78736171	
26,099.95	91.00	330.00	11,101.12	12,674.15	-6,905.53	14,458,814.64	1,700,078.33	39.81328421	-80.78753902	
26,199.95	91.00	330.00	11,099.38	12,760.74	-6,955.53	14,458,901.22	1,700,028.34	39.81352232	-80.78771632	
26,299.95	91.00	330.00	11,097.64	12,847.33	-7,005.52	14,458,987.81	1,699,978.34	39.81376044	-80.78789363	
26,399.95	91.00	330.00	11,095.90	12,933.92	-7,055.52	14,459,074.40	1,699,928.35	39.81399856	-80.78807093	
26,499.95	91.00	330.00	11,094.16	13,020.51	-7,105.51	14,459,160.99	1,699,878.35	39.81423668	-80.78824824	
26,599.95	91.00	330.00	11,092.42	13,107.09	-7,155.51	14,459,247.58	1,699,828.36	39.81447480	-80.78842555	
26,699.95	91.00	330.00	11,090.68	13,193.68	-7,205.50	14,459,334.16	1,699,778.36	39.81471291	-80.78860286	
26,799.95	91.00	330.00	11,088.94	13,280.27	-7,255.50	14,459,420.75	1,699,728.37	39.81495103	-80.78878017	
26,899.95	91.00	330.00	11,087.20	13,366.86	-7,305.49	14,459,507.34	1,699,678.37	39.81518915	-80.78895748	
26,999.95	91.00	330.00	11,085.46	13,453.44	-7,355.49	14,459,593.93	1,699,628.38	39.81542726	-80.78913480	
27,099.95	91.00	330.00	11,083.72	13,540.03	-7,405.48	14,459,680.51	1,699,578.38	39.81566538	-80.78931211	
27,199.95	91.00	330.00	11,081.98	13,626.62	-7,455.48	14,459,767.10	1,699,528.39	39.81590349	-80.78948943	
27,299.95	91.00	330.00	11,080.24	13,713.21	-7,505.47	14,459,853.69	1,699,478.39	39.81614161	-80.78966675	
27,399.95	91.00	330.00	11,078.50	13,799.80	-7,555.47	14,459,940.28	1,699,428.40	39.81637973	-80.78984407	
27,499.95	91.00	330.00	11,076.76	13,886.38	-7,605.46	14,460,026.86	1,699,378.40	39.81661784	-80.79002139	
27,599.95	91.00	330.00	11,075.02	13,972.97	-7,655.46	14,460,113.45	1,699,328.41	39.81685596	-80.79019871	
27,658.76	91.00	330.00	11,074.00	14,023.90	-7,684.86	14,460,164.38	1,699,299.00	39.81699600	-80.79030300	

PBHL/TD 27658.76 MD/11074.00 TVD

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
BHL Old Crow N-17 HU - hit/miss target - Shape - Point	0.00	0.00	11,074.00	14,023.90	-7,684.86	14,460,164.38	1,699,299.00	39.81699600	-80.79030300	
LP Old Crow N-17 HU r̄ - plan misses target center by 0.03usft at 11850.23usft MD (11348.99 TVD, 335.62 N, 218.62 E) - Point	0.00	0.00	11,349.00	335.61	218.60	14,446,476.09	1,707,202.46	39.77935004	-80.76228618	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,826.00	1,826.00	0.00	0.00	KOP Begin 2°/100' build	
1,976.00	1,975.93	-0.68	-3.87	Begin 3.00° tangent	
2,476.00	2,475.25	-5.23	-29.64	Begin 1°/100' drop	
2,776.00	2,775.11	-6.59	-37.37	Begin vertical hold	
5,226.89	5,226.00	-6.59	-37.37	Begin 3°/100' build/turn	
5,495.98	5,494.20	-17.35	-21.80	Begin 8.07° tangent	
10,383.19	10,332.98	-407.41	542.89	Begin 6°/100' build/turn	
11,333.66	11,180.10	-86.75	438.97	Begin 8°/100' build/turn	
11,850.17	11,349.00	335.57	218.65	Begin 91.00° lateral	
27,658.76	11,074.00	14,023.90	-7,684.86	PBHL/TD 27658.76 MD/11074.00 TVD	

RECEIVED
Office of Oil and Gas

DEC 04 2019

WV Department of
Environmental Protection

4705102122 mod

WW-6A1
(5/13)

Operator's Well No. Old Crow N-17HU

**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 *Amy L. Miller*
 Its: Permitting Specialist - Appalachia Region

**OLD CROW N LEASE
UTICA UNIT - 494.33 AC±
WELL 17HU
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°50'00"

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

NAD'83 S.P.C.(FT) N. 468,139.24 E. 1,613,525.64
NAD'83 GEO. LAT-(N) 39.778430 LONG-(W) 80.763067
NAD'83 UTM (M) N. 4,403,192.43 E. 520,289.72

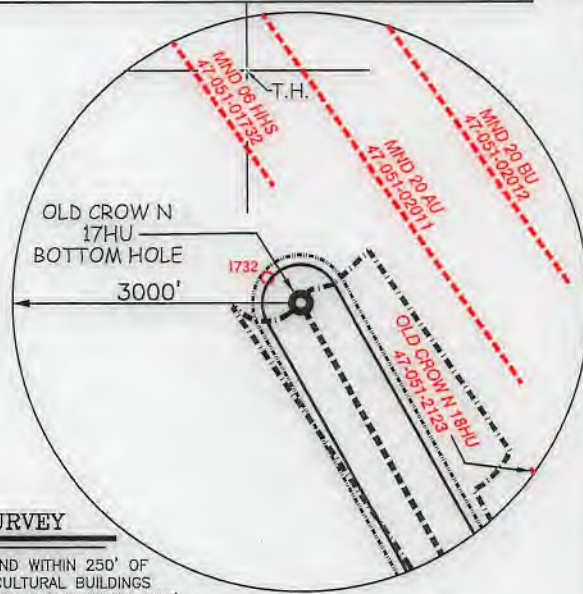
LANDING POINT

NAD'83 S.P.C.(FT) N. 468,471.2 E. 1,613,749.9
NAD'83 GEO. LAT-(N) 39.779350 LONG-(W) 80.762286
NAD'83 UTM (M) N. 4,403,294.7 E. 520,356.4

BOTTOM HOLE

NAD'83 S.P.C.(FT) N. 462,294.4 E. 1,606,073.6
NAD'83 GEO. LAT-(N) 39.816996 LONG-(W) 80.790303
NAD'83 UTM (M) N. 4,407,466.9 E. 517,947.4

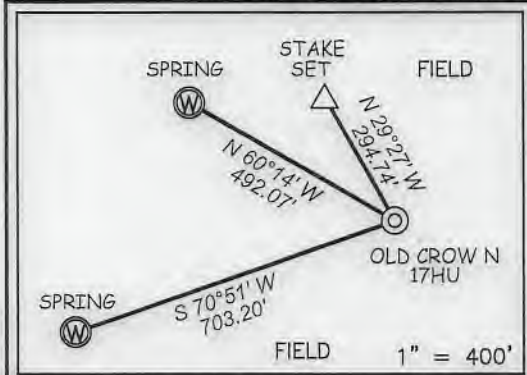
TAG	SURFACE OWNER	PARCEL	ACRES
A	JOHN SWIERKOS	5-16-25	79.04
B	DONNA VIVIAN YOHO - TOD	5-16-3	71.205
C	JOHN SWIERKOS	5-16-5	52.07
D	JOHN SWIERKOS	5-10-14	100.00
E	JIMMY OSTRANDER, SR., ET UX	5-16-3.2	1.435
F	PAUL ANDREW & DEBRA A. RINE	5-10-15	120.80
G	DONALD T. MILLER	5-10-15.1	2.095
H	TIMOTHY SR. & LINDA MCGINNIS	5-10-16	30.87
I	MELVIN E. JR., & ELIZABETH FERGUSON	5-10-16.4	30.87
J	WILLIAM A. PRASCIK, ET AL	5-10-2	52.00
K	ALVIN A. YODER	5-10-17	57.28
L	WESLEY R. BRYAN & WESLEY R. BRYAN, II	5-11-11.2	25.03
M	ALVIN A. YODER	5-11-10	31.91
N	JACK S. HUGGINS, ET UX	5-11-9.4	4.129
O	JACK SHEPARD HUGGINS, JR., ET AL	5-11-9.1	10.92
P	EDWIN C. MILLER	5-10-1	49.96
Q	SEAN F. MOORE	5-11-9.7	2.03
R	EDWIN C. & KIMBERLY A. MILLER	5-11-9	54.625
S	SEAN F. MOORE	5-11-9.8	2.070
T	JAMES M. & ROBERT L. STERN	5-9-29	3.1777
U	TRUSTEES OF LIGHTHOUSE TABERNACLE CHURCH	5-9-30.2	1.954
V	JOHN D. & MARSHA J. ROBERTS	5-9-38.6	0.719
W	JOHN D. & MARSHA J. ROBERTS	5-9-38.7	0.795
X	JOHN D. & MARSHA J. ROBERTS	5-9-38.5	0.619
Y	JOHN D. & MARSHA J. ROBERTS	5-9-38.4	0.669
Z	FISH CREEK-WV DIVISION OF NATURAL RESOURCES	N/A	N/A
AA	DAVID ARRICK, ET UX	5-11-4	31.5
BB	SHELVA G. SMITH, ET UX	5-9-38.3	0.706
CC	SHELVA G. SMITH, ET UX	5-9-38.2	0.735
DD	JOHN H. LONG, ET UX	5-9-38.1	0.815
EE	ROBERT S. COWGILL	5-9-38.10	0.920
FF	DALISON LUMBER COMPANY	5-9-31	32.10
GG	JOHN D. ROBERTS, ET UX	5-9-38.8	0.903
HH	JOHN D. ROBERTS, ET UX	5-9-38.9	1.017
II	SHIRLEY A. HILL ESTATE	5-9-38	3.331
JJ	FRANK T. & ANNA M. WALKER	5-9-37	10.857
KK	RUBY M. HENRY ESTATE (C/O GEORGE E. HENRY)	5-9-32.4	0.379
LL	JOHN DRAKE ALBAUGH	5-9-32.12	1.09
MM	JOHN DRAKE ALBAUGH	5-9-32.1	1.002
NN	JOHN DRAKE ALBAUGH	5-9-32.2	0.231
OO	RUBY M. HENRY ESTATE (C/O GEORGE E. HENRY)	5-9-32.6	0.474
PP	JOHN D. ALBAUGH	5-9-32.13	0.848
QQ	JOHN D. ALBAUGH	5-9-32.7	0.729
RR	SANDRA J. BONETTE	5-9-32	2.321
SS	JAMES EDWARD FRANCIS, ET UX	5-8-8	28.3
TT	JAMES B. JACKSON, JR., ET UX	5-8-9	89.723
UU	EDWIN C. MILLER	5-8-7	180.31
VV	RICHARD L. GATTS (LIFE)	5-8-5	97.819
WW	WAYNE C. BERISFORD	5-8-4	23.355
XX	JARED C. SELLS	5-8A-35	2.78
YY	JOHN F. ARRUDA, ET UX	5-5-4.1	1.399
ZZ	TAMMY L. MITCHELL	5-8-3	35.07
A1	ROBERT L. & DONALD SHIELDS	5-8-23	48 POLES
A2	BOARD OF EDUCATION	5-8A-14	137 9/2 RODS
A3	LETHA I. RUCKMAN	5-8A-13	2.993
A4	MARY D. RUCKMAN	5-8A-12	1.137



NOTES ON SURVEY

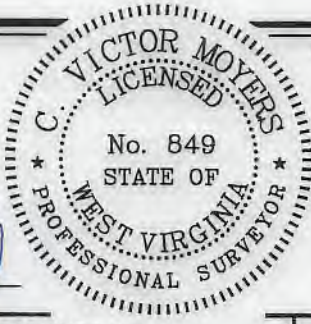
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE ARE 1"=2000'
- PROPOSED LATERAL OR TOP HOLE OF OLD CROW N-17HU (47-051-02122) IS WITHIN 3000' OF THE TOP HOLES OR LATERALS OF EXISTING WELLS BRYAN N 13HU (47-051-02030), BRYAN N 14HU (47-051-02031), OLD CROW N-18HU (47-051-02123), & PROPOSED OLD CROW N-19HU (47-051-02190), MND 06 HHS (47-051-01732), MND 20AU (47-051-02011), MND 20BU (47-051-02012).

REFERENCES



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

P.S. 849 *C. Victor Moyers*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE OCTOBER 3, 20 18
REVISED 03/05/19, 04/25/19, 05/14/19, 07/24/19, 08/27/19
OPERATORS WELL NO. OLD CROW N-17HU
API WELL NO. 47 - 051 - 02122
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8796P17HUR5.dwg
OLD CROW NORTH 17HU_REV7
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: GROUND = 1286.73' ELEVATION PROPOSED = 1264.99' WATERSHED TRIBUTARY OF FISH CREEK (HUC-10)
DISTRICT FRANKLIN COUNTY MARSHALL QUADRANGLE POWHATAN POINT 7.5'

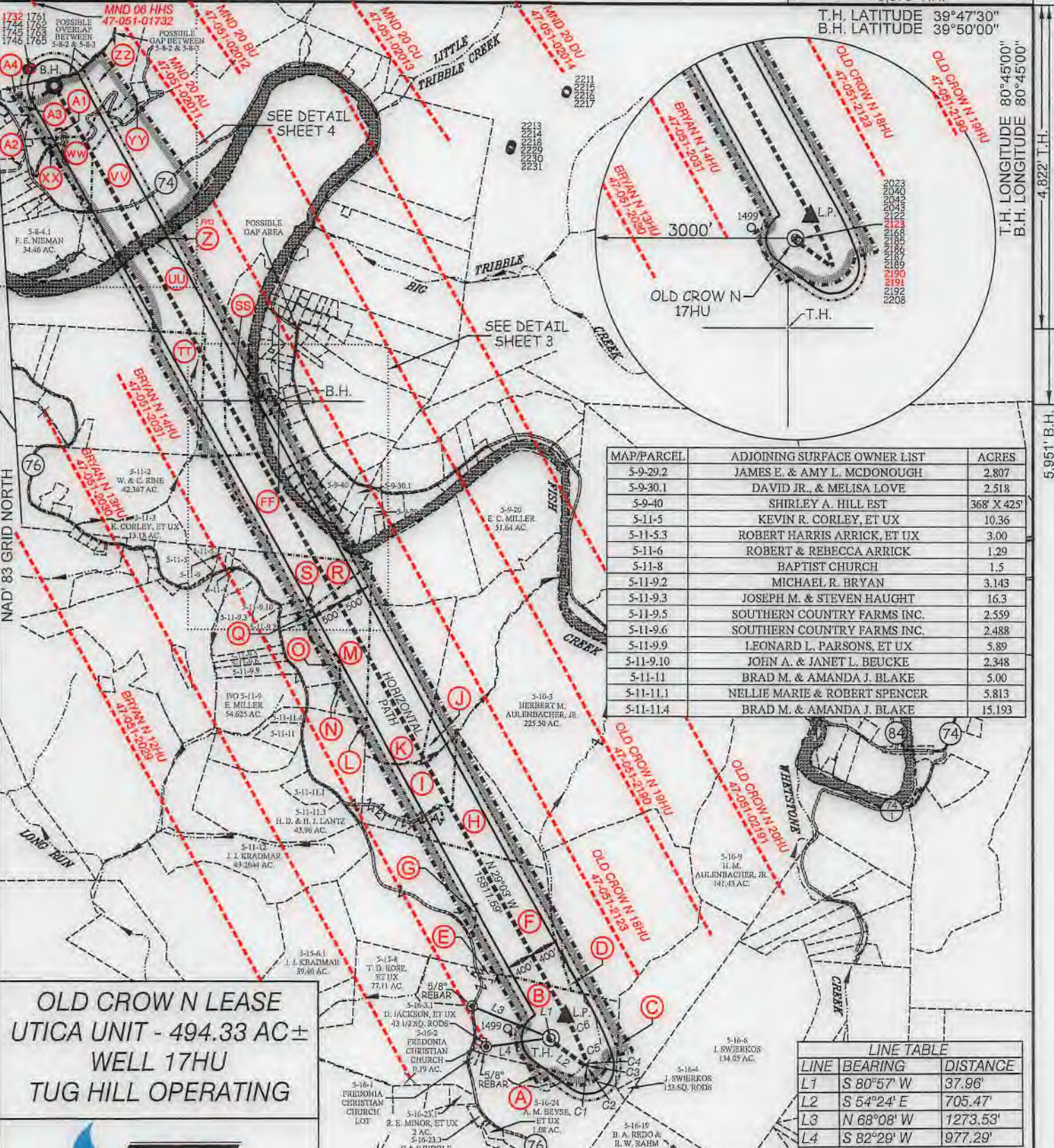
SURFACE OWNER DONNA VIVIAN YOHO (TOD) GARY LANCE YOHO ACREAGE 71.205±
ROYALTY OWNER DONNA VIVIAN YOHO, ET AL - SEE ADDITIONAL SHEETS ACREAGE 71.205±

PROPOSED WORK: LEASE NO. SEE ADDITIONAL SHEETS
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 POINT PLEASANT
ESTIMATED DEPTH TVD: 11,592' / TMD: 27,659'

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



MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
5-9-29.2	JAMES E. & AMY L. MCDONOUGH	2.807
5-9-30.1	DAVID JR., & MELISA LOVE	2.518
5-9-40	SHIRLEY A. HILL EST	368' X 425'
5-11-5	KEVIN R. CORLEY, ET UX	10.36
5-11-5.3	ROBERT HARRIS ARRICK, ET UX	3.00
5-11-6	ROBERT & REBECCA ARRICK	1.29
5-11-8	BAPTIST CHURCH	1.5
5-11-9.2	MICHAEL R. BRYAN	3.143
5-11-9.3	JOSEPH M. & STEVEN HAUGHT	16.3
5-11-9.5	SOUTHERN COUNTRY FARMS INC.	2.559
5-11-9.6	SOUTHERN COUNTRY FARMS INC.	2.488
5-11-9.9	LEONARD L. PARSONS, ET UX	5.89
5-11-9.10	JOHN A. & JANET L. BEUCKE	2.348
5-11-11	BRAD M. & AMANDA J. BLAKE	5.00
5-11-11.1	NELLIE MARIE & ROBERT SPENCER	5.813
5-11-11.4	BRAD M. & AMANDA J. BLAKE	15.193

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S 80°57' W	37.96'
L2	S 54°24' E	705.47'
L3	N 68°08' W	1273.53'
L4	S 82°29' W	977.29'

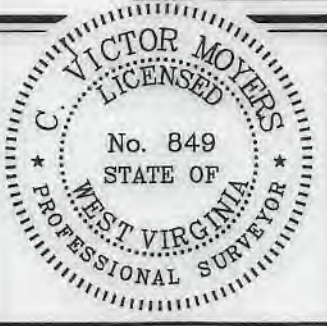
CURVE TABLE				
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	9.12'	16.72'	S 68°45' E	9.01'
C2	7.58'	5.63'	N 43°28' E	7.02'
C3	19.28'	51.10'	N 01°20' W	19.16'
C4	62.62'	479.64'	N 15°00' W	62.57'
C5	259.22'	3170.98'	N 21°33' W	259.14'
C6	476.67'	5125.24'	N 26°36' W	476.49'

**OLD CROW N LEASE
UTICA UNIT - 494.33 AC±
WELL 17HU
TUG HILL OPERATING**

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

P.S. 849 *C. Victor Moyers*

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 468,199.24	E. 1,613,525.64
NAD'83 GEO.	LAT-(N) 39.778430	LONG-(W) 80.763067
NAD'83 UTM (M)	N. 4,403,192.43	E. 520,289.72
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 468,471.2	E. 1,613,749.9
NAD'83 GEO.	LAT-(N) 39.779350	LONG-(W) 80.762286
NAD'83 UTM (M)	N. 4,403,294.7	E. 520,356.4
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 482,294.4	E. 1,606,073.6
NAD'83 GEO.	LAT-(N) 39.816996	LONG-(W) 80.790303
NAD'83 UTM (M)	N. 4,407,466.9	E. 517,947.4



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

LEGEND	
UNIT BOUNDARY	
LEASED TRACTS INSIDE	
UNIT BOUNDARY	
SURFACE LINE	
PROPOSED UTICA	
WELL LATERAL	
400' OFFSET LINE	
500' OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
SURFACE OWNER (SEE TABLE)	
LEASE # (SEE ADDITIONAL SHEETS)	

SCALE 1" = 2000' FILE NO. 8798P17HU5.dwg
 DATE OCTOBER 3, 2018
 REVISED 03/05/19, 04/25/19, 05/14/19, 07/24/19, 08/27/19
 OPERATORS WELL NO. OLD CROW N-17HU
 API WELL NO. 47-051-02122
 STATE COUNTY PERMIT

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

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

COUNTY NAME PERMIT

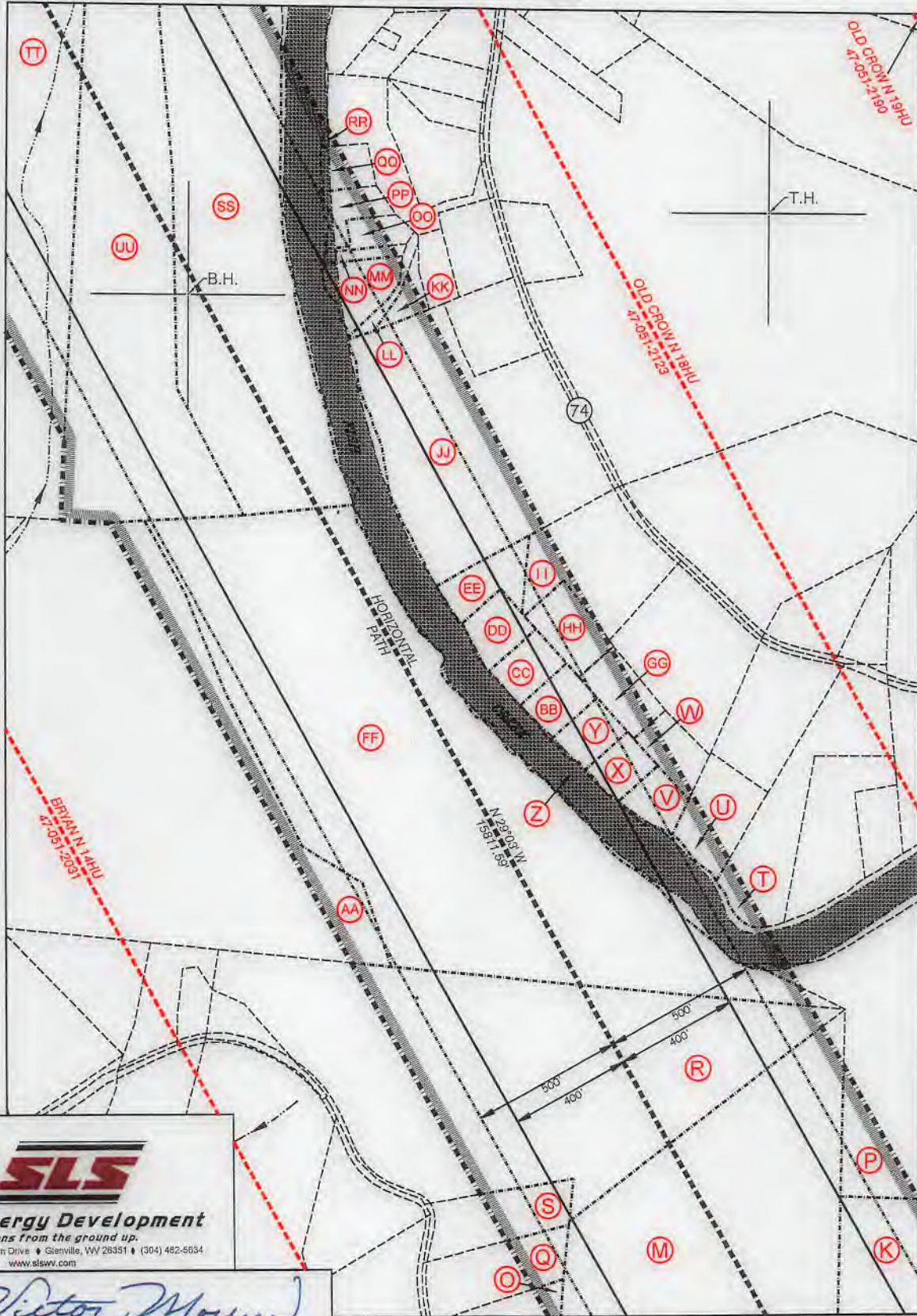
OLD CROW N LEASE
UTICA UNIT - 494.33 AC ±
WELL 17HU
TUG HILL OPERATING

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°50'00"

T.H. LONGITUDE 80°45'00"
B.H. LONGITUDE 80°45'00"

SHEET 2 DETAIL
SCALE - 1" = 500'

NAD '83 GRID NORTH



SLS
Land & Energy Development
Solutions from the ground up.
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P.S. 849 *C. Victor Moyers*

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

NAD'83 S.P.C.(FT) N. 468,139.24 E. 1,613,525.64
NAD'83 GEO. LAT-(N) 39.778430 LONG-(W) 80.763067
NAD'83 UTM (M) N. 4,403,192.43 E. 520,289.72

LANDING POINT

NAD'83 S.P.C.(FT) N. 468,471.2 E. 1,613,749.9
NAD'83 GEO. LAT-(N) 39.779350 LONG-(W) 80.762286
NAD'83 UTM (M) N. 4,403,294.7 E. 520,356.4

BOTTOM HOLE

NAD'83 S.P.C.(FT) N. 482,294.4 E. 1,606,073.6
NAD'83 GEO. LAT-(N) 39.816996 LONG-(W) 80.790303
NAD'83 UTM (M) N. 4,407,466.9 E. 517,947.4

SCALE 1" = 2000' FILE NO. 8796P17HUR5.dwg
OLD CROW NORTH 17HU_REV7

DATE OCTOBER 3, 20 18

REVISED 03/05/19, 04/25/19, 05/14/19, 07/24/19, 08/27/19

OPERATORS WELL NO. OLD CROW N-17HU

API WELL NO. 47 - 051 - 02122
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(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

- UNIT BOUNDARY
- LEASED TRACTS INSIDE UNIT BOUNDARY
- SURFACE LINE
- PROPOSED UTICA
- WELL LATERAL
- 400' OFFSET LINE
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE ADDITIONAL SHEETS)

COUNTY NAME

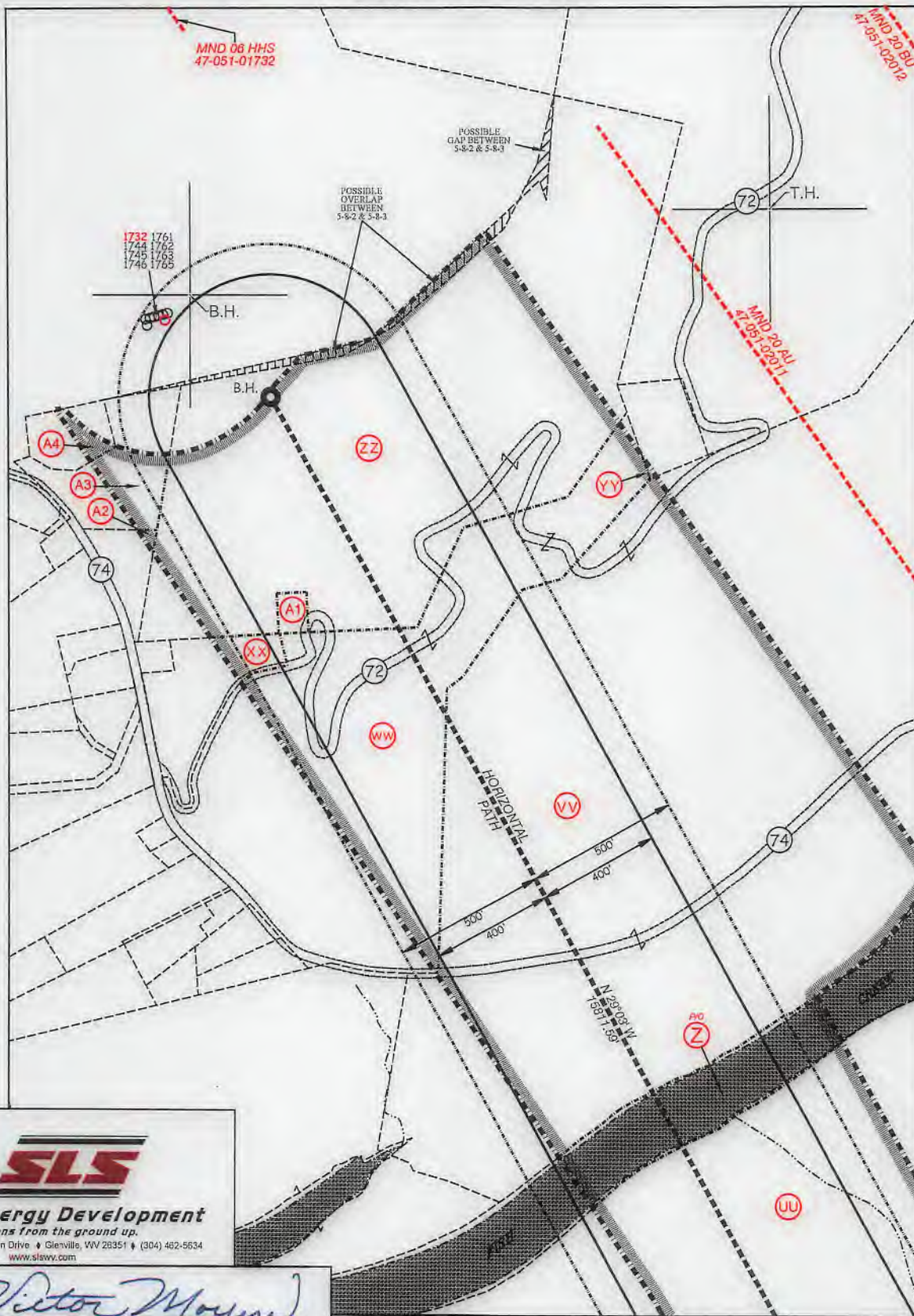
PERMIT

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

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

**OLD CROW N LEASE
UTICA UNIT - 494.33 AC±
WELL 17HU
TUG HILL OPERATING**

**SHEET 2 DETAIL
SCALE - 1" = 500'**

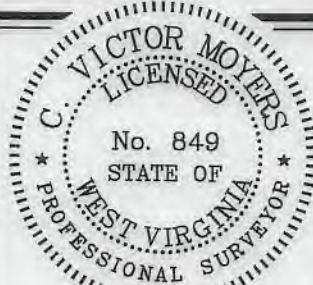


NAD'83 GRID NORTH

P.S. 849 *C. Victor Moyers*



(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 468,139.24	E. 1,613,525.64	
NAD'83 GEO.	LAT-(N) 39.778430	LONG-(W) 80.763067	
NAD'83 UTM (M)	N. 4,403,192.43	E. 520,289.72	
<u>LANDING POINT</u>			
NAD'83 S.P.C.(FT)	N. 468,471.2	E. 1,613,749.9	
NAD'83 GEO.	LAT-(N) 39.779350	LONG-(W) 80.762286	
NAD'83 UTM (M)	N. 4,403,294.7	E. 520,356.4	
<u>BOTTOM HOLE</u>			
NAD'83 S.P.C.(FT)	N. 482,294.4	E. 1,606,079.6	
NAD'83 GEO.	LAT-(N) 39.816996	LONG-(W) 80.790303	
NAD'83 UTM (M)	N. 4,407,466.9	E. 517,947.4	



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

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- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE ADDITIONAL SHEETS)

SCALE 1" = 2000' FILE NO. 8796P17HUR5.dwg
 OLD CROW NORTH 17HU REV7
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**OLD CROW N LEASE
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WELL 17HU
TUG HILL OPERATING**



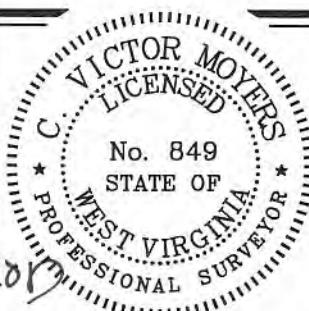
NO.	Lease ID	Tag	Parcel	Grantor, Lessor, Etc.	Deed Book/Page
1	10*21468	A	5-16-25	JOHN A SWIERKOS	953 317
2	10*19340	B	5-16-3	DONNA V YOHO	665 407
3	10*14919	C	5-16-5	CHESTNUT HOLDINGS INC	836 117
4	10*14920	D	5-10-14	CHESTNUT HOLDINGS INC	836 119
5	10*19340	E	5-16-3.2	DONNA V YOHO	665 407
6	10*19017	F	5-10-15	PAULA RINE AND DEBRA A RINE	796 24
7	10*19223	G	5-10-15.1	DONALD T MILLER	737 284
8	10*19126	H	5-10-16	KEVIN R. CORLEY AND ANITA L. CORLEY, HUSBAND AND WIFE	859 44
9	10*19109	I	5-10-16.4	JOHN W. MILLER AND MARY ALICE MILLER, HUSBAND AND WIFE	863 275
10	10*47051.260.0	J	5-10-2	WILLIAM A PRASCIK, ET AL	879 302
11	10*19021	K	5-10-17	MARCELLUS TX MINERAL PARTNERS LTD, et al	800 216
12	10*19336	L	5-11-11.2	BONNIE JEAN DAWSON	665 397
13	10*19021	M	5-11-10	MARCELLUS TX MINERAL PARTNERS LTD, et al	800 216
14	10*19153	N	5-11-9.4	JACK S HUGGINS JR AND TERRY L HUGGINS	700 396
15	10*19153	O	5-11-9.1	JACK S HUGGINS JR	700 396
16	10*18970	P	5-10-1	DONALD E BERISFORD, et al	941 287
17	10*14099	Q	5-11-9.7	SOUTHERN COUNTRY FARMS INC	666 489
18	10*14099	R	5-11-9	SOUTHERN COUNTRY FARMS INC	666 489
19	10*19172	S	5-11-9.8	SEAN F MOORE LINDA MOORE	706 581
20	10*17512	T	5-9-29	BONNIE LOU POSTLEWAIT, et al	917 68
21	10*21547	U	5-9-30.2	GARY A MILLER AND MARCELLE T MILLER, et al	952 370
22	CVX935271	V	5-9-38.6	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
23	CVX935271	W	5-9-38.7	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
24	CVX935271	X	5-9-38.5	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
25	CVX935271	Y	5-9-38.4	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
26	Q091960000	Z	FISH CREEK	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	865 558
27	10*19098	AA	5-11-4	DAVID H ARRICK AND LELAH M ARRICK, et al	800 505
28	CVX935271	BB	5-9-38.3	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
29	CVX935271	CC	5-9-38.2	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
30	CVX935271	DD	5-9-38.1	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
31	CVX935271	EE	5-9-38.10	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
32	10*19217	FF	5-9-31	JAY DEE DALLISON EDDIE D DALLISON	676 463
33	CVX935271	GG	5-9-38.8	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
34	CVX935271	HH	5-9-38.9	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
35	CVX935271	II	5-9-38	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
36	CVX935271	JJ	5-9-37	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
37	CVX935271	KK	5-9-32.4	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
38	CVX935271	LL	5-9-32.12	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
39	CVX935271	MM	5-9-32.1	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
40	CVX935271	NN	5-9-32.2	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
41	CVX935271	OO	5-9-32.6	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
42	CVX935271	PP	5-9-32.13	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
43	CVX935271	QQ	5-9-32.7	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
44	CVX935271	RR	5-9-32	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	853 59
45	10*25370	SS	5-8-8	JAMES EDWARD & LAURA J FRANCIS et al	1030 377
46	10*47051.105.0	TT	5-8-9	JAMES B JACKSON JR AND MARION L JACKSON	859 478
47	10*21546	UU	5-8-7	EDWIN C MILLER AND KIMBERLY ANN MILLER	957 257
48	CVX946510	VV	5-8-5	NICOLE GATTS-SFX	899 470
49	CVX866629	WW	5-8-4	FRANCES E NIEMAN ET AL	685 283
50	10*26024	XX	5-8A-35	WILLIAM MCGLUMPHY	752 370
51	CVX920045	YY	5-5-4.1	GENEVA BASSETT SANCHEZ AKA GENEVA A BASSETT SANCHEZ	813 593
52	Q081033000	ZZ	5-8-3	TAMMY L MITCHELL ET VIR	816 176
53	Q077350000	A1	5-8-23	ROBERT SHIELDS AND REBECCA A SHIELDS	806 355
54	Q092606000	A2	5-8A-14	THE BOARD OF EDUCATION OF COUNTY OF MARSHALL	896 501
55	Q088946000	A3	5-8A-13	LETHA I RUCKMAN	765 219
56	Q083860000	A4	5-8A-12	MARY D RUCKMAN	765 224

RECEIVED
Office of Oil and Gas

DEC 04 2019

WV Department of
Environmental Protection

FILE NO. 8796P17HUR5.dwg
OLD CROW NORTH 17HU_REV7
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849

C. Victor Moyers

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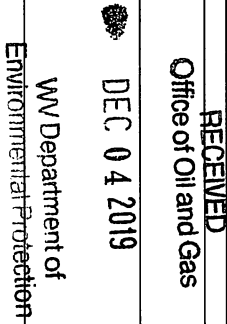
DESIGNATED AGENT DIANNA STAMPER
ADDRESS CT CORPORATION SYSTEM
5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

COUNTY NAME

PERMIT

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Dead Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*19340	5-16-3	B	DONNA V YOHO	GASTAR EXPLORATION USA INC	1/8+	655	407	Gastar Exploration USA Inc to Athnum Marcellus I LLC: 23/353	Gastar & Athnum to AB Resources LLC: 23/617	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000: 24/319	Chief, Chief Oil & Gas LLC, Radler & Enerplus Resources (USA) Corp to Chevron USA Inc: 25/1 & 25/105	AB Resources LLC to Chevron USA Inc: 756/397	Chevron USA Inc to TH Exploration II LLC: 40/57
10*14920	5-10-14	D	CHESTNUT HOLDINGS INC	GASTAR EXPLORATION INC	1/8+	836	119	N/A	N/A	N/A	Gastar Exploration Inc to Athnum Marcellus I LLC: 32/428	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Athnum Marcellus I LLC to TH Exploration II LLC: 43/65
10*14919	5-16-5	C	CHESTNUT HOLDINGS INC	GASTAR EXPLORATION INC	1/8+	836	117	N/A	N/A	N/A	Gastar Exploration Inc to Athnum Marcellus I LLC: 32/428	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Athnum Marcellus I LLC to TH Exploration II LLC: 43/65
10*19340	5-16-3-2	E	DONNA V YOHO	GASTAR EXPLORATION USA INC	1/8+	655	407	Gastar Exploration USA Inc to Athnum Marcellus I LLC: 23/353	Gastar & Athnum to AB Resources LLC: 23/617	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000: 24/319	Chief, Chief Oil & Gas LLC, Radler & Enerplus Resources (USA) Corp to Chevron USA Inc: 25/1 & 25/105	AB Resources LLC to Chevron USA Inc: 756/397	Chevron USA Inc to TH Exploration II LLC: 40/57
10*19017	5-10-15	F	PAUL A RINE AND DEBRA A RINE	CHEVRON USA INC	1/8+	796	24	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19223	5-10-15.1	G	DONALD T MILLER	THEENERGY HOLDINGS LLC	1/8+	737	284	N/A	N/A	N/A	N/A	THEENERGY LLC & THEENERGY Inc to Chevron USA Inc: 28/356	Chevron USA Inc to TH Exploration LLC: 40/127
10*19226	5-10-16	H	KEVIN R. CORLEY AND ANITA L. CORLEY, HUSBAND AND WIFE	CHEVRON USA INC	1/8+	859	44	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19109	5-10-16.4	I	JOHN W. MILLER AND MARY ALICE MILLER, HUSBAND AND WIFE	CHEVRON USA INC	1/8+	863	275	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*47051.260.0	5-10-2	J	WILLIAM A PRASCIK, ET AL	TH EXPLORATION LLC	1/8+	879	302	N/A	N/A	N/A	N/A	N/A	N/A
10*19021	5-10-17	K	MARCELLUSTX MINERAL PARTNERS LTD, et al	CHEVRON USA INC	1/8+	800	216	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19034	5-10-17	K	JMK IRREVOCABLE TRUST	CHEVRON USA INC	1/8+	813	145	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19035	5-10-17	K	PURPLEBURGH VENTURES, LLC	CHEVRON USA INC	1/8+	813	138	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19336	5-11-11.2	L	BONNIE JEAN DAVISON	GASTAR EXPLORATION USA INC	1/8+	655	397	Gastar Exploration USA Inc to Athnum Marcellus I LLC: 23/353	Gastar & Athnum to AB Resources LLC: 23/617	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000: 24/319	Chief, Chief Oil & Gas LLC, Radler & Enerplus Resources (USA) Corp to Chevron USA Inc: 25/1 & 25/105	AB Resources LLC to Chevron USA Inc: 756/397	Chevron USA Inc to TH Exploration II LLC: 40/57
10*19021	5-11-10	M	MARCELLUSTX MINERAL PARTNERS LTD, et al	CHEVRON USA INC	1/8+	800	216	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19034	5-11-10	M	JMK IRREVOCABLE TRUST	CHEVRON USA INC	1/8+	813	145	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127

4705102122 MOD

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Dead Book/Pages	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19035	5-11-10	M	PURPLEBURGH VENTURES, LLC	CHEVRON USA INC	1/8+	813 138	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19153	5-11-9-4	N	JACK S HUGGINS JR AND TERRY L HUGGINS	GASTAR EXPLORATION USA INC	1/8+	700 396	N/A	N/A	Gastar Exploration USA Inc to Athlum Marcellus I LLC: 23/353	Merger of Gastar Exploration Inc & Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc & Athlum Marcellus I LLC to Chevron USA Inc: 32/362	Chevron USA Inc to TH Exploration LLC: 40/127
												
10*19133	5-11-9-1	O	JACK S HUGGINS JR	GASTAR EXPLORATION USA INC	1/8+	700 396	N/A	N/A	Gastar Exploration USA Inc to Athlum Marcellus I LLC: 23/353	Merger of Gastar Exploration Inc & Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc & Athlum Marcellus I LLC to Chevron USA Inc: 32/362	Chevron USA Inc to TH Exploration LLC: 40/127
10*18970	5-10-1	P	DONALD E BERISFORD, et al	TH EXPLORATION LLC	1/8+	941 287	N/A	N/A	N/A	N/A	N/A	N/A
10*19036	5-10-1	P	HAROLD W HOWARD JR	CHEVRON USA INC	1/8+	813 91	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19037	5-10-1	P	NEVELLE SEELEY	CHEVRON USA INC	1/8+	813 116	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19039	5-10-1	P	RALPH B RUSSELL MARY ANN RUSSELL	CHEVRON USA INC	1/8+	813 106	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19040	5-10-1	P	RUTHANNE RUSSELL TOPPING	CHEVRON USA INC	1/8+	813 79	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19041	5-10-1	P	CHERYL L HILL	CHEVRON USA INC	1/8+	813 101	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19043	5-10-1	P	JACK R BERISFORD LINDA JO BERISFORD	CHEVRON USA INC	1/8+	813 96	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19045	5-10-1	P	JOHN W MURDOCK HELEN CAROLINA MURDOCK	CHEVRON USA INC	1/8+	814 327	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19049	5-10-1	P	RUTH ANN FERRIS	CHEVRON USA INC	1/8+	814 313	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19050	5-10-1	P	LARRY F JEFFERSON CATHY L JEFFERSON	CHEVRON USA INC	1/8+	814 473	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19059	5-10-1	P	MARY VANESSA GILSON	CHEVRON USA INC	1/8+	815 464	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19060	5-10-1	P	ALVISA JORDAN	CHEVRON USA INC	1/8+	815 135	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19503	5-10-1	P	FRANK DALE BERISFORD AND KATHLEEN BERISFORD	TH EXPLORATION LLC	1/8+	942 625	N/A	N/A	N/A	N/A	N/A	N/A
10*19610	5-10-1	P	BRENT BERISFORD AND JEAN MARIE COSTA	TH EXPLORATION LLC	1/8+	944 207	N/A	N/A	N/A	N/A	N/A	N/A
10*22637	5-10-1	P	HOWARD T CONNER AND NANETTE CONNER	TH EXPLORATION LLC	1/8+	968 219	N/A	N/A	N/A	N/A	N/A	N/A
10*22639	5-10-1	P	EDWIN MARK KNABENSHUE	TH EXPLORATION LLC	1/8+	968 217	N/A	N/A	N/A	N/A	N/A	N/A
10*22640	5-10-1	P	JESSICA M CREWEANS	TH EXPLORATION LLC	1/8+	964 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22641	5-10-1	P	CHRISTOPHER STALEY & MICHAEL ANNE STALEY	TH EXPLORATION LLC	1/8+	968 221	N/A	N/A	N/A	N/A	N/A	N/A
10*22772	5-10-1	P	BILIE J STALEY AND APRIL STALEY	TH EXPLORATION LLC	1/8+	970 8	N/A	N/A	N/A	N/A	N/A	N/A
10*23040	5-10-1	P	MARY L WHITTINGTON	TH EXPLORATION LLC	1/8+	977 300	N/A	N/A	N/A	N/A	N/A	N/A
10*23725	5-10-1	P	GRAYSVILLE CALVARY UNITED METHODIST	TH EXPLORATION LLC	1/8+	1011 550	N/A	N/A	N/A	N/A	N/A	N/A
10*24029	5-10-1	P	MICHAEL L STEWART	TH EXPLORATION LLC	1/8+	1020 353	N/A	N/A	N/A	N/A	N/A	N/A
10*24261	5-10-1	P	GREG STEWART	TH EXPLORATION LLC	1/8+	1020 351	N/A	N/A	N/A	N/A	N/A	N/A

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*24514	5-10-1	P	GALE F BRITTON TRUST	THE EXPLORATION LLC	1/8+	1026	N/A	N/A	N/A	N/A	N/A	N/A
10*24515	5-10-1	P	AARON M BROWN	THE EXPLORATION LLC	1/8+	1024	N/A	N/A	N/A	N/A	N/A	N/A
10*24525	5-10-1	P	DAVID E BOWYER	THE EXPLORATION LLC	1/8+	1027	N/A	N/A	N/A	N/A	N/A	N/A
10*24554	5-10-1	P	IOSH D AND LAUREN K HALE	THE EXPLORATION LLC	1/8+	1024	N/A	N/A	N/A	N/A	N/A	N/A
10*24555	5-10-1	P	DAVID W HALE JR	THE EXPLORATION LLC	1/8+	1024	N/A	N/A	N/A	N/A	N/A	N/A
10*24556	5-10-1	P	BETTY L KEAN	THE EXPLORATION LLC	1/8+	1024	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.1	5-10-1	P	EDWIN C MILLER AND KIMBERLY ANN MILLER	THE EXPLORATION LLC	1/8+	885	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.2	5-10-1	P	JANE S BLANEY	THE EXPLORATION LLC	1/8+	898	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.3	5-10-1	P	IOANNE SCHALL FOSTER	THE EXPLORATION LLC	1/8+	895	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.4	5-10-1	P	RAYMOND E SCHALL	THE EXPLORATION LLC	1/8+	898	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.5	5-10-1	P	FIRST CHRISTIAN CHURCH OF MOUNDSVILLE BY ROGER FRANCIS AND ROBERT ALBERT TRUSTEES	THE EXPLORATION LLC	1/8+	898	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.6	5-10-1	P	BARBARA GODWIN AND CHARLES RODNEY GODWIN	THE EXPLORATION LLC	1/8+	902	N/A	N/A	N/A	N/A	N/A	N/A
PENDING	5-10-1	P	FORREST O MILLER	HG ENERGY II APPALACHIA LLC	1/8+	1029	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
10*25617	5-10-1	P	GLEN DALE UNITED METHODIST CHURCH	AMERICAN PETROLEUM PARTNERS OPERATING LLC	1/8+	1031	N/A	N/A	N/A	N/A	N/A	American Petroleum Partners Operating LLC to TH Exploration LLC: Recordation Pending
10*14099	5-11-9-7	Q	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8+	666	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*14099	5-11-9	R	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8+	666	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19172	5-11-9-8	S	SEAN F MOORE LINDA MOORE	GASTAR EXPLORATION USA INC	1/8+	706	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*17512	5-9-29	T	BONNIE LOU POSTLEWAIT, et al	THE EXPLORATION LLC	1/8+	917	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-29	T	WOODROW N WARD AND HILDA A WARD	THE EXPLORATION LLC	1/8+	916	N/A	N/A	N/A	N/A	N/A	N/A
10*17916	5-9-29	T	MARY E BISHOP	THE EXPLORATION LLC	1/8+	927	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-29	T	GERALD L BISHOP III	THE EXPLORATION LLC	1/8+	943	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-29	T	DWG OIL & GAS ACQUISITIONS LLC	THE EXPLORATION LLC	1/8+	938	N/A	N/A	N/A	N/A	N/A	N/A
10*19193	5-9-29	T	LARRY A GUMP	TRIENERGY HOLDINGS LLC	1/8+	717	N/A	N/A	N/A	N/A	N/A	TriEnergy Holdings LLC & NPAR LLC to Chevron: 28/355
10*19572	5-9-29	T	DOUGLAS R BISHOP	THE EXPLORATION LLC	1/8+	943	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-29	T	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	THE EXPLORATION LLC	1/8+	960	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-29	T	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	THE EXPLORATION LLC	1/8+	960	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-29	T	MICHAEL A BISHOP	THE EXPLORATION LLC	1/8+	960	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-29	T	NOAH BAKER AND ALISA BAKER	THE EXPLORATION LLC	1/8+	962	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-29	T	NOAH BAKER AND ALISA BAKER	THE EXPLORATION LLC	1/8+	962	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-29	T	RACHEL SONDA AND SCOTT SONDA	THE EXPLORATION LLC	1/8+	962	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-29	T	BRADLEY MURPHY	THE EXPLORATION LLC	1/8+	964	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-29	T	DEBORAH VANVRANKEN	THE EXPLORATION LLC	1/8+	972	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-29	T	FAITH MARIE FREESTONE AND ERIC FREESTONE	THE EXPLORATION LLC	1/8+	966	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-29	T	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	THE EXPLORATION LLC	1/8+	966	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-29	T	ROBERT B MURPHY AND LINDA MURPHY	THE EXPLORATION LLC	1/8+	966	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-29	T	CHANDA WILSON AND DANIEL WILSON	THE EXPLORATION LLC	1/8+	977	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-29	T	DEAN S CARR	THE EXPLORATION LLC	1/8+	1009	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-29	T	MICHAEL A MURPHY	THE EXPLORATION LLC	1/8+	1009	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-29	T	ARTHUR LEE MILLER ET AL	THE EXPLORATION LLC	1/8+	1027	N/A	N/A	N/A	N/A	N/A	N/A

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10*24984	5-9-29	T	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 562	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-29	T	CARLA JO ALLEN AND KENNETH ALLEN	TH EXPLORATION LLC	1/8+	916 129	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PENDING	5-9-29	T	SANDRA PARDINI AKA KATHERINE SPARDINI AND ALLEN F PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A	N/A
009032003	5-9-29	T	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
009032003	5-9-29	T	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
009032007	5-9-29	T	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
10*21547	5-9-30.2	U	GARY A MILLER AND MARCELE T MILLER, et al	TH EXPLORATION LLC	1/8+	952 370	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21548	5-9-30.2	U	JEANNE M MILLER	TH EXPLORATION LLC	1/8+	952 386	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21719	5-9-30.2	U	ROBERT A MILLER	TH EXPLORATION LLC	1/8+	952 389	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22566	5-9-30.2	U	KENNETH A MILLER	TH EXPLORATION LLC	1/8+	954 233	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CVX935271	5-9-30.2	U	CHARLES W. MILLER AND ESTHER JEAN MILLER	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935273	5-9-30.2	U	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935276	5-9-30.2	U	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935969	5-9-30.2	U	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	854 47	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CV986959	5-9-38.2	U	PAUL SCHEIBLHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9935271	5-9-38.6	V	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9935273	5-9-38.6	V	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9935276	5-9-38.6	V	SHARON LYNN RUSSELL RECEIVED Office of Oil and Gas DEC 04 2019 WV Department of Environmental Protection	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9935969	5-9-38.6	V	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9936053	5-9-38.6	V	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9936054	5-9-38.6	V	MARY JO CRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV9936058	5-9-38.6	V	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	

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CV936061	5-9-38.6	V	CARA MAE CLIFTON	CHEVRON USA INC	1/8+	853	426	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CV935062	5-9-38.6	V	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853	418	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CV936112	5-9-38.6	V	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853	449	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CV936113	5-9-38.6	V	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853	445	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CV986958	5-9-38.6	V	ANITA L SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696	7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CV986959	5-9-38.6	V	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CV935271	5-9-38.7	W	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853	59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CV935273	5-9-38.7	W	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853	430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286

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CX935276	5-9-38.7	W	SHARON LYN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX935988 4705108	5-9-38.7	W	TIMOTHY HUFE ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936058	5-9-38.7	W	LOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936054	5-9-38.7	W	MARY JO GRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936058	5-9-38.7	W	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936061	5-9-38.7	W	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936062	5-9-38.7	W	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936112	5-9-38.7	W	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286



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CY936054	5-9-38.5	X	MARY JO CRONIN	CHEVRON USA INC	1/8+	864	43	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936054	5-9-38.5	X	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863	594	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936054	5-9-38.5	X	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853	426	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936062	5-9-38.5	X	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853	418	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936112	5-9-38.5	X	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853	449	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936113	5-9-38.5	X	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853	445	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936958	5-9-38.5	X	ANITA L. SLOUGH AND WILLIAM O. JOHNS	AB RESOURCES LLC	1/8+	696	7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc; 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc; 25/105	AB Resources LLC to NPAR LLC; 25/484	NPAR LLC to Chevron USA; 756/332	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286
CY936959	5-9-38.5	X	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc; 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc; 25/105	AB Resources LLC to NPAR LLC; 25/484	NPAR LLC to Chevron USA; 756/332	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC; 988/286

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CV935271	5-9-38.4	Y	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	353	59	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935273	5-9-38.4	Y	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	353	430	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935275	5-9-38.4	Y	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	353	422	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935969	5-9-38.4	Y	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	353	47	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936053	5-9-38.4	Y	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	353	39	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936054	5-9-38.4	Y	MARY JO CRONIN	CHEVRON USA INC	1/8+	353	43	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936058	5-9-38.4	Y	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	353	594	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936061	5-9-38.4	Y	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	353	426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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CX935273	5-9-38.3	BB	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853	430	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX935276	5-9-38.3	BB	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853	422	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX935275	5-9-38.3	BB	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864	47	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936053	5-9-38.3	BB	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864	39	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936054	5-9-38.3	BB	MARY JO CRONIN	CHEVRON USA INC	1/8+	864	43	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936058	5-9-38.3	BB	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863	594	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936061	5-9-38.3	BB	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853	426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936062	5-9-38.3	BB	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853	418	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286

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CVX935276	5-9-38.2	CC	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853	422	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935273	5-9-38.2	CC	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853	430	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935271	5-9-38.2	CC	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853	59	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX866959	5-9-38.3	BB	PAUL SCHREIBHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	41/154	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX866958	5-9-38.3	BB	ANITA L. SLOUGH AND WILLIAM O. JORES	AB RESOURCES LLC	1/8+	696	7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	41/154	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935113	5-9-38.3	BB	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853	445	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935112	5-9-38.3	BB	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853	449	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CX936053	5-9-38.2	CC	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936054	5-9-38.2	CC	MARY JO CROVIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936058	5-9-38.2	CC	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936061	5-9-38.2	CC	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936062	5-9-38.2	CC	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936112	5-9-38.2	CC	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936113	5-9-38.2	CC	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX866958	5-9-38.2	CC	ANITA L. SLOUGH AND WILLIAM O. JOES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286

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CVX866959	5-9-38.2	CC	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935276	5-9-38.1	DD	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935276	5-9-38.1	DD	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935276	5-9-38.1	DD	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935969	5-9-38.1	DD	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936053	5-9-38.1	DD	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936054	5-9-38.1	DD	MARY JO CRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936058	5-9-38.1	DD	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CW93661 50212	5-9-38.1	DD	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CW93662	5-9-38.1	DD	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CW93612 4705	5-9-38.1	DD	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CW936113	5-9-38.1	DD	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CW86958	5-9-38.1	DD	ANITA L. SLOUGH AND WILLIAM C. JOBES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CW86959	5-9-38.1	DD	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CW935271	5-9-38.10	EE	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CW935273	5-9-38.10	EE	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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CV936053	5-9-38.10	EE	LOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936059	5-9-38.10	EE	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936056	5-9-38.10	EE	SHARON LYN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936062	5-9-38.10	EE	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936061	5-9-38.10	EE	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936112	5-9-38.10	EE	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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CYX936113	5-9-38.10	EE	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX866958	5-9-38.10	EE	ANITA L. SLOUGH AND WILLIAM O. JORES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX866959	5-9-38.10	EE	PAUL SCHEIBLHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
10*19217	5-9-31	FF	JAY DEE DALLISON EDDIE D DALLISON	CHEESAPEAKE APPALACHIA LLC	1/8+	676 463	N/A	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 22/536	Chesapeake to Chevron USA Inc: 30/392	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935271	5-9-38.8	GG	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935273	5-9-38.8	GG	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935276	5-9-38.8	GG	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935969	5-9-38.8	GG	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286



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CYX936061	5-9-38.8	GG	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
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CV936658	5-9-38.8	GG	PAUL SCHEIBLHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV935271	5-9-38.9	HH	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV935273	5-9-38.9	HH	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV935276	5-9-38.9	HH	SHARON LYN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV935969	5-9-38.9	HH	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV936053	5-9-38.9	HH	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV936054	5-9-38.9	HH	MARY JO GRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CV936058	5-9-38.9	HH	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	

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CX936962	5-9-38.9	HH	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936112	5-9-38.9	HH	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX936113	5-9-38.9	HH	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX866958	5-9-38.9	HH	ANITA L. SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc. 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc. 25/105	AB Resources LLC to NPAR LLC 25/484	NPAR LLC to Chevron USA. 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX866959	5-9-38.9	HH	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc. 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc. 25/105	AB Resources LLC to NPAR LLC 25/484	NPAR LLC to Chevron USA. 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX935271	5-9-38	II	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CX935273	5-9-38	II	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286

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CV935276	5-9-38	II	SHARON LYN RUSSELL	CHEVRON USA INC	1/8+	853	422	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935969	5-9-38	II	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864	47	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936053	5-9-38	II	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864	39	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936054	5-9-38	II	MARY JO CRONIN	CHEVRON USA INC	1/8+	864	43	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936058	5-9-38	II	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863	594	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936061	5-9-38	II	CARA MAE CLIFTON	CHEVRON USA INC	1/8+	853	426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936062	5-9-38	II	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853	418	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936112	5-9-38	II	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853	449	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CX936113	5-9-38	II	ANITA L. SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696	7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.	
CX936113	5-9-38	II	PAUL SCHEIBLHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.	
CX935271	5-9-37	JI	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853	59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.	
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CX936058	5-9-37	J1	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863	594	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
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CX936062	5-9-37	J1	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853	418	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
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CV935271	5-9-32.4	KK	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
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CV935276	5-9-32.4	KK	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935969	5-9-32.4	KK	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
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CV936061	5-9-32.4	KK	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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470 1021 2	5-9-32.1	MM	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853	59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935273	5-9-32.1	MM	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853	430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935276	5-9-32.1	MM	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853	422	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935969	5-9-32.1	MM	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864	47	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX936053	5-9-32.1	MM	LYOND C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864	39	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX936054	5-9-32.1	MM	MARY JO CRONIN	CHEVRON USA INC	1/8+	864	43	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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CYX936058	5-9-32.1	MM	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	853 594	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX936061	5-9-32.1	MM	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX936062	5-9-32.1	MM	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX936112	5-9-32.1	MM	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX936113	5-9-32.1	MM	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX866958	5-9-32.1	MM	ANITA L SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX866959	5-9-32.1	MM	PAUL SCHEIBHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CYX935271	5-9-32.2	NN	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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CV935273	5-9-32.2	NN	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935276	5-9-32.2	NN	SHARON LYN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935969	5-9-32.2	NN	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936053	5-9-32.2	NN	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936054	5-9-32.2	NN	MARY JO CRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936058	5-9-32.2	NN	RICHARD KURPL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936051	5-9-32.2	NN	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936062	5-9-32.2	NN	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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CY936053	5-9-32.6	OO	LOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY936054	5-9-32.6	OO	MARY JO CRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY936058	5-9-32.6	OO	RICHARD KURPL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY936061	5-9-32.6	OO	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY936062	5-9-32.6	OO	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY936112	5-9-32.6	OO	DONNA FAE KYE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY936113	5-9-32.6	OO	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286
CY986958	5-9-32.6	OO	ANITA L. SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc. 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc. 25/105	AB Resources LLC to NPAR LLC. 25/484	NPAR LLC to Chevron USA. 756/332	Chevron USA Inc to HG Energy II Appalachia LLC. 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC. 988/286

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CVX866959	5-9-32.6	OO	PAUL SCHEIBLHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935271	5-9-32.13	PP	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935273	5-9-32.13	PP	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935276	5-9-32.13	PP	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935969	5-9-32.13	PP	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936053	5-9-32.13	PP	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936054	5-9-32.13	PP	MARY JO CRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936058	5-9-32.13	PP	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CX936051	5-9-32.13	PP	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853	426	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936062	5-9-32.13	PP	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853	418	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936112	5-9-32.13	PP	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853	449	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX936113	5-9-32.13	PP	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853	445	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX866958	5-9-32.13	PP	ANITA L SLOUGH AND WILLIAM O. JOBS	AB RESOURCES LLC	1/8+	696	7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX866959	5-9-32.13	PP	PAUL SCHEBELHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX935271	5-9-32.7	QQ	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853	59	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CX935273	5-9-32.7	QQ	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853	430	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CV935276 4705102122	5-9-32.7	QQ	SHARON LYN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV935906	5-9-32.7	QQ	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936053	5-9-32.7	QQ	LLOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936054	5-9-32.7	QQ	MARY JO GRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936058	5-9-32.7	QQ	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936061	5-9-32.7	QQ	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936062	5-9-32.7	QQ	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CV936112	5-9-32.7	QQ	DONNA FAE KYE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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CX936113	5-9-327	QQ	JUDITH MAAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX866958	4705102122 5-9-327	QQ	ANITA L. SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX866959	5-9-327	QQ	PAUL SCHEIBLHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX935271	5-9-32	RR	CHARLES W. MILLER AND ESTHER JEAN MILLER, et al	CHEVRON USA INC	1/8+	853 59	N/A	N/A	N/A	N/A	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX935273	5-9-32	RR	PAUL PARSONS ET UX	CHEVRON USA INC	1/8+	853 430	N/A	N/A	N/A	N/A	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX935276	5-9-32	RR	SHARON LYNN RUSSELL	CHEVRON USA INC	1/8+	853 422	N/A	N/A	N/A	N/A	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX935969	5-9-32	RR	TIMOTHY HUFF ET UX	CHEVRON USA INC	1/8+	864 47	N/A	N/A	N/A	N/A	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CX936053	5-9-32	RR	LOYD C. ARNOLD ET UX	CHEVRON USA INC	1/8+	864 39	N/A	N/A	N/A	N/A	41/154	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.

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CY936054	5-9-32	RR	MARY JO CRONIN	CHEVRON USA INC	1/8+	864 43	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CY936058	5-9-32	RR	RICHARD KURPIL ET UX	CHEVRON USA INC	1/8+	863 594	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CY936061	5-9-32	RR	CLARA MAE CLIFTON	CHEVRON USA INC	1/8+	853 426	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CY936062	5-9-32	RR	GEORGE EDWARDS ET UX	CHEVRON USA INC	1/8+	853 418	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CY936112	5-9-32	RR	DONNA FAE KYLE	CHEVRON USA INC	1/8+	853 449	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CY936113	5-9-32	RR	JUDITH MAY CONNER	CHEVRON USA INC	1/8+	853 445	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC. 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC.
CY866958	5-9-32	RR	ANITA L SLOUGH AND WILLIAM O. JOBES	AB RESOURCES LLC	1/8+	696 7	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CY866959	5-9-32	RR	PAUL SCHEBEHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/105	AB Resources LLC to NPAR LLC: 25/484	NPAR LLC to Chevron USA: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/154	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
10*25370	5-8-8	SS	JAMES EDWARD & LAURAJ FRANCIS	TH EXPLORATION LLC	1/8+	1030 377	N/A	N/A	N/A	N/A	N/A	N/A
PENDING	5-8-8	SS	STONE HILL MINERAL HOLDINGS LLC	TH EXPLORATION LLC	1/8+	1031 538	N/A	N/A	N/A	N/A	N/A	N/A

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Dead Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*47051.105.9	5-8-9	TT	JAMES B JACKSON JR AND MARION L JACKSON	TH EXPLORATION LLC	1/8+	859	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21548.105.9	5-8-7	UU	EDWIN C MILLER AND KIMBERLY ANN MILLER	TH EXPLORATION LLC	1/8+	957	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CY946510	5-8-5	VV	NICOLE GATTS-SFX	CHEVRON USA INC	1/8+	899	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
4705102128	5-8-5	VV	RICHARD J. GATTS	CHEVRON USA INC	1/8+	899	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CY947094	5-8-5	VV	LOIS ZWOLENSKY-SFX	CHEVRON USA INC	1/8+	899	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CY866629	5-8-4	WW	FRANCES E NIEMAN ET AL	AB RESOURCES LLC	1/8+	685	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
10*26024	5-8A-35	XX	WILLIAM MCGILMURPHY	TRIENERGY HOLDINGS LLC	1/8+	752	N/A	N/A	N/A	N/A	N/A	N/A	TriEnergy Holdings Inc & TriEnergy Inc to Chevron USA Inc: 28/348
CY920045	5-5-4.1	YY	GENEVA BASSETT SANCHEZ AKA GENEVA A BASSETT SANCHEZ	CHEVRON USA INC	1/8+	813	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
Q086805001	5-5-4.1	YY	ROGER B ROSE ET UX	NOBLE ENERGY INC	1/8+	841	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
Q086805002	5-5-4.1	YY	MARY E BASSETT	NOBLE ENERGY INC	1/8+	841	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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0086805003	5-5-4.1	YY	RUTH ANN WALLACE ET VIR	NOBLE ENERGY INC	1/8+	841 364	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805004	5-5-4.1	YY	CHARLES HOWARD BASSETT JR ET UX	NOBLE ENERGY INC	1/8+	842 1	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805005	5-5-4.1	YY	RUTH E BASSETT MEADOWS ET VIR	NOBLE ENERGY INC	1/8+	842 38	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805006	5-5-4.1	YY	ROBERT B THOMAS ET UX	NOBLE ENERGY INC	1/8+	842 28	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805007	5-5-4.1	YY	ELIZABETH A STRAUSBAUGH ET VIR	NOBLE ENERGY INC	1/8+	841 370	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805008	5-5-4.1	YY	CYNTHIA P HOPKINS REVOCABLE TRUST UTA	NOBLE ENERGY INC	1/8+	841 366	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805009	5-5-4.1	YY	JANET BLANKENSHIP ET VIR	NOBLE ENERGY INC	1/8+	841 368	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0086805010	5-5-4.1	YY	JEAN C THOMAS	NOBLE ENERGY INC	1/8+	841 449	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286


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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
0086805011	5-5-4.1	YY	BARBARA KAY EWING ET VIR	NOBLE ENERGY INC	1/8+	842 34	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0081030000	5-8-3	ZZ	TAMMY L MITCHELL ET VIR	NOBLE ENERGY INC	1/8+	816 176	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 34/189	CNX Gas Company LLC to Noble Energy Inc: 37/169	CNX Gas Company LLC to Noble Energy Inc: 37/169	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0077350000	5-8-23	A1	ROBERT SHIELDS AND REBECCA A SHIELDS	NOBLE ENERGY INC	1/8+	806 355	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 33/28	CNX Gas Company LLC to Noble Energy Inc: 37/169	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1	Noble Energy Inc to HG Energy II Appalachia LLC: 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0082606000	5-8A-14	A2	THE BOARD OF EDUCATION OF COUNTY OF MARSHALL	NOBLE ENERGY INC	1/8+	896 501	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1	Noble Energy Inc to HG Energy II Appalachia LLC: MB 34/392	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0088946000	5-8A-13	A3	LETHA I RUCKMAN	TRIENERGY HOLDINGS LLC	1/8+	765 219	TRIENERGY Holdings LLC & TRIENERGY Inc to Chevron USA Inc: 28/348	Chevron USA Inc to Noble Energy Inc & CNX Gas Company LLC: 39/1	CNX Gas Company LLC to Noble Energy Inc: 37/169	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1	Noble Energy Inc to HG Energy II Appalachia LLC: MB 34/392	Noble Energy Inc to HG Energy II Appalachia LLC: 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
0083866000	5-8A-12	A4	MARY D RUCKMAN	TRIENERGY HOLDINGS LLC	1/8+	765 224	TRIENERGY Holdings LLC & TRIENERGY Inc to Chevron USA Inc: 28/348	Chevron USA Inc to Noble Energy Inc & CNX Gas Company LLC: 39/1	CNX Gas Company LLC to Noble Energy Inc: 37/169	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1	Noble Energy Inc to HG Energy II Appalachia LLC: MB 34/392	Noble Energy Inc to HG Energy II Appalachia LLC: 988/286	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286

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STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

4705102122

ASSIGNMENT AND CONVEYANCE

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

WITNESSETH:

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

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

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

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

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

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

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MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

This Memorandum of Operating Agreement and Financing Statement (hereinafter referred to as "Memorandum") is executed to be effective concurrently with that certain Operating Agreement (the "Operating Agreement") by and between TH Exploration, LLC, as Operator, and HG Energy II Appalachia, LLC and TH Exploration II, LLC, as Non-Operators, covering, among other things, the development and production of crude oil, natural gas and associated substances from the leases (hereinafter called the "Contract Area") described on Exhibit "A-1" and Exhibit "A-2" attached hereto and owned by Operator and Non-Operator in the respective percentages of shares indicated on Exhibit "A" to the Operating Agreement.

The Operating Agreement contains an Accounting Procedure, along with provisions giving the parties hereto mutual liens and security interests where one or more parties hereto are or may become Debtors to one or more other parties hereto. This Memorandum incorporates by reference all of the terms and conditions of the Operating Agreement, including but not limited to the lien and security interest provisions.

The purpose of this Memorandum is to place third parties on notice of the Operating Agreement, and to secure and perfect the mutual liens and security interests of the parties hereto.

The Operating Agreement specifically provides and the parties do hereby confirm and agree that:

1. The Operator shall conduct and direct and have full control of all operations on the Contract Area as permitted and required by, and within the limits of, the Operating Agreement.
2. The liability of the parties under the Operating Agreement shall be several, not joint or collective. Each party shall be responsible only for its obligations and shall be liable only for its proportionate share of costs.
3. Each Non-Operator grants to Operator a lien upon its oil and gas rights, oil and gas leases and mineral interests in the Contract Area, and a security interest in its share of oil and/or gas when extracted and its interest in all fixtures, inventory, personal property and equipment located on or used on the Contract Area and in all its contract rights and receivables related thereto and arising therefrom to secure payment of its present and future share of costs and expenses, together with interest thereon at the rate provided in the Accounting Procedure referred to above. To the extent that Operator has a security interest under the Uniform Commercial Code ("Code") of the state or states in which the Contract Area is located, Operator without prejudice and in addition to all other legal, equitable and contractual remedies which are expressly reserved, shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the rights or security interests for the payment thereof.
4. The Operator grants to Non-Operator a lien and security interest equivalent to that granted to Operator as described in Paragraph 3 above, to secure payment by Operator of its own share of costs and expenses when due.

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west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street SE, Charleston, WV 25304
304-926-0499 Ext 1274

Barry K. Lay, Chairman
dep.wv.gov

**BEFORE THE OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF WEST VIRGINIA**

**IN THE MATTER OF THE REQUEST BY TUG
HILL OPERATING, LLC FOR AN ORDER FROM THE
COMMISSION ESTABLISHING DRILLING UNIT
AND POOLING OF UNLEASED TRACTS AND INTERESTS
OF OIL AND GAS OWNERS AND OPERATORS WHO HAVE
NOT ENTERED VOLUNTARY AGREEMENTS ALLOWING
FOR THE DEVELOPMENT AND OPERATION OF THE
OLD CROW N-18HU DRILLING UNIT CONSISTING OF 439.09
ACRES, OPERATOR IS ALSO REQUESTING MODIFICATION
TO EXISTING PERMIT FOR THE OLD CROW N-17HU,
AND OLD CROW N-18HU,
AND FOR EXCEPTION TO RULE W. Va. C.S.R. § 39-1.4.2 FOR THE
PROPOSED WELLS OLD CROW N-18HU, OLD CROW N-17HU, AND
OLD CROW N-19HU, TO BE LOCATED IN FRANKLIN DISTRICT,
MARSHALL COUNTY, WEST VIRGINIA**

**DOCKET NO. 282-258
ORDER NO. 1**

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REPORT OF THE COMMISSION

On July 9, 2019, the applicant, Tug Hill Operating, LLC (“Tug Hill”), appeared by George A. Patterson, III, of Bowles Rice LLP, its counsel, before the West Virginia Oil and Gas Conservation Commission (the “Commission”) upon Tug Hill’s request to form a drilling unit, and for spacing exceptions, all in connection with three proposed deep horizontal oil and gas wells in Marshall County, West Virginia. Upon presentation of evidence, and based upon testimony and exhibits, the Commission hereby forms one drilling unit, grants variances from Commission requirements, and grants deep well approval for the Old Crow N-18HU, Old Crow N-17HU, and Old Crow N-19HU wells (collectively the “Old Crow Wells”). More specifically, the Commission forms a unit for the Old Crow N-18HU well pursuant to West Virginia Code §

22C-9-7 and approves exceptions to W. Va. C.S.R. § 39-1-4.2 that states in relevant part, “each deep well drilled shall be not less than 3,000 feet from a permitted deep well location . . .” The spacing variances granted permit the Old Crow Wells to be drilled within three thousand feet of wells previously permitted in the same geologic formation, within 3,000 feet of each other, and within 400 feet of lease or unit boundaries. Regarding the exceptions to W.Va. C.S.R. § 39-1-4.2, the Commission imposes a restriction regarding completion when two wells are within 800 feet of each other in the target formation. The Commission authorizes Tug Hill to intentionally deviate and drill the Old Crow Wells with laterals approximately as depicted on each well’s plat. The unit formed hereby is shown on Exhibit A-1 attached, and is a 439.09 acre unit to drill and operate a deep well in the unit for the production of oil and gas from property located in Franklin District, Marshall County, West Virginia, to be known as the Old Crow N-18HU well and unit.

At the hearing, the Commission received and admitted evidence in the form of exhibits and the testimony of four witnesses. Mr. Jonathan White, a Licensed Surveyor, testified as to the distance of each Old Crow well from the lease or unit boundary. Mr. White provided exhibits, which were admitted in evidence, showing the distances between wells in the area and the proposed unit boundaries. The well plats are on a scale of 1” equals 2,000 feet, show surface tracts and ownership, and otherwise comply with Commission requirements.

Mr. James Pancake, a Certified Petroleum Geologist who holds a Bachelor of Science in Geology from West Virginia University and master’s degree in Geology from Texas Christian University, testified that the Old Crow Wells were deep horizontal wells which would be drilled and completed in a geologic formation below the top of the Onondaga formation, would in his opinion be economic, and recover a maximum amount of oil and gas from the area. Mr. Pancake described the target Point Pleasant geological formation as a tight formation with low permeability and porosity. Mr. Pancake was of the opinion that the spacing and units proposed are appropriate for these Point Pleasant formation wells, particularly in light of existing and planned wells in the area. Tug Hill may extend the N-17HU lateral. Drilling the Old Crow Wells as proposed prevents waste, protects correlative rights, encourages the maximum recovery of oil and gas, promotes exploration and development, and provides oil and gas owners a just and equitable share of production.

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Mr. Sean Willis, a Petroleum Engineering graduate of Texas A&M University, with a master's degree in Business Administration from Rice University, testified that Tug Hill drilled and operates wells in shale formations in the Appalachian Basin and other areas. Mr. Willis described Tug Hill's intention to intentionally deviate the wells as horizontal wells. Tug Hill is a qualified, experienced operator, and takes safety precautions in drilling. Mr. Willis also testified regarding Tug Hill's well completion plans. If the Commission does not form the unit requested, in Mr. Willis' view, waste would be committed.

Mr. Tim Rakoczy testified that he holds a bachelor's degree from Texas Christian University and a law degree from Capital University Law School. Mr. Rakoczy is admitted to practice law in Texas and has experience in the horizontal oil and gas well industry. Mr. Rakoczy testified that Tug Hill had obtained the consent of the surface owners to construct the Old Crow Wells pad where drilling would begin.

Tug Hill holds voluntarily granted rights to unitize all the property in the Old Crow proposed units except the oil and gas underlying the surface tracts identified on the Marshall County tax maps for Franklin District of Marshall County as tracts numbers 5-9-4.6, 5-9-4.1 and 5-9-4.3. That property is proposed for inclusion in the Old Crow N-18HU Unit. As to tract 5-9-4.6 record title to the oil and gas is vested in Harry E. Karr, Jr. and Michaela L. Karr, as to tract 5-9-4.1 record title is vested in Harry E. Karr, Jr. and Michaela L. Karr, and as to tract 5-9-4.3, record title to the oil and gas is vested in Harry E. Karr, Jr. Tug Hill had attempted to lease these tracts without success.

Mr. Rakoczy testified about Point Pleasant formation leases Tug Hill acquired in the proposed Old Crow Units, and in West Virginia, and recommended that the Point Pleasant/Utica formation in the unleased property in the proposed Old Crow N-18HU Unit be deemed leased for a single lease bonus payment of \$3,500 per net mineral acre and an 18% production royalty proportionally reduced by ownership. Tug Hill proposed to allocate and pay revenue from the unit in accordance with West Virginia law. In Mr. Rakoczy's opinion, the proposed units would protect correlative rights.

No other person or entity objected to the relief Tug Hill requested. The Commission vigorously cross examined the witnesses.

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Following the testimony and examination by Commissioners, the Commission adjourned for deliberation. After deliberation a motion was made, seconded and passed to grant the relief requested, subject to the restriction as to completion of the Old Crow N-17HU well ordered below. The Commission makes the following findings of fact and conclusions of law.

FINDINGS OF FACT

1. Members of the Commission present at the hearing were Barry Lay, Chair, Robert Radabaugh and James Martin. John S. Gray, counsel to the Commission, was present. Susan Rose attended as Commission staff.

2. Tug Hill is an operator within the meaning of paragraph (4) subsection (a) of West Virginia Code § 22C-9-2.

3. The Old Crow Wells are deep wells within the meaning of West Virginia Code § 22C-9 *et. seq.* and the Commission has jurisdiction to consider and grant the relief requested. Through testimony and exhibits introduced, the Commission has adequate information to evaluate and approve Tug Hill's request.

4. The Old Crow Wells are proposed to be within 3,000 feet of other permitted Point Pleasant wells, and within 3,000 feet of each other. Thus, exceptions or variances to the W. Va. C.S.R. § 39-1-4.2 is required.

5. The Commission has jurisdiction to form the unit and grant the relief requested.

6. No objection was filed or made to the relief requested by Tug Hill.

7. Commissioner Radabaugh moved to grant the relief requested, subject to the restrictions regarding completion hereinafter provided, and with the unleased property deemed leased with a lease bonus and royalty hereinafter provided, Commissioner Martin seconded the motion, and the motion was unanimously passed by the Commission.

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CONCLUSIONS OF LAW

1. West Virginia Code §22C- 9-1 *et. seq.* permits the Commission to form drilling units upon notice and hearing. W. Va. C.S.R § 39-1-4.2 requires that all deep wells drilled shall be not less than 3,000 feet from a permitted deep well location for the same formation. W. Va. C.S.R. § 39-1-4.3 allows for exceptions to that requirement upon notice and hearing.

2. Due and proper notice of time, place and purpose of hearing has been given in all respects as required by law.

3. The Commission has jurisdiction over the subject matter and the authority to grant the relief requested.

4. The hearing was properly convened, and a quorum of Commissioners were present.

5. Tug Hill is an experienced, qualified operator of deep horizontal wells and units.

6. The requested unit, deviation and spacing variances are necessary to promote the exploration for and development, production, utilization and conservation of oil and gas resources.

7. Tug Hill presented exhibits which showed proposed wells and the unit Tug Hill intends to form, and testimony regarding that unit and the wells, adequate for the Commission to review and approve the unit, deviations, and spacing requested.

8. Forming the unit, and the spacing variations requested, will prevent waste, promote conservation, exploration, development and maximum recovery of oil and gas, and protect correlative rights of owners and operators such that each will receive a just and equitable share of production.

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THE COMMISSION HEREBY ORDERS

With respect to the Point Pleasant geologic formation, the Commission hereby forms the following unit for production and sale of oil and gas:

Old Crow N-18HU. A 439.09 acre unit to drill and operate a deep well in the unit for the production of oil and gas from property located in Franklin District, Marshall County, West Virginia, to be known as the Old Crow N-18HU well and unit, more particularly described and depicted in *Exhibit A1* attached.

The applicant is hereby appointed Operator of said Point Pleasant unit and is hereby granted deep well approval to drill, complete, and produce a horizontal deep well which targets the Point Pleasant formation in the unit. Regardless of the tract or tracts in said unit from which oil or gas is produced, the Operator shall divide and allocate revenue from production from said well to tracts in the unit on the basis the acreage in a tract, or portion thereof, included in the unit bears to the total acreage in the unit, and then the royalty with respect to that tract, or portion thereof, shall be allocated to royalty owners in that tract (calculating partial interests on a pro rata basis for royalty interests on any parcel owned in common).

All operations, including, but not limited to, the commencement, drilling or operation of a deep well upon any portion of each unit shall be deemed for all purposes the conduct of such operations upon each separately owned tract in the unit by the owners thereof. That portion of the production allocated to a tract included in a drilling unit shall, when produced, be deemed for all purposes to have been actually produced from such tract by a deep well drilled thereon.

With respect to that portion of the tracts, or interests therein, owned of record by Harry E. Karr, Jr. and/or Harry E. Karr, Jr. and Michaela L. Karr, each tract shall be deemed leased to the Applicant for a lease bonus payment of \$4,250 per net acre, with a 19% production royalty proportionally allocated according to ownership, payable on revenues received from sales to a bona fide, arms' length third party purchaser without deduction of post-production expenses, payable as Applicant pays royalties to other lessors in in the unit in the regular course of business. In the event there is any dispute regarding royalty payments, the parties shall apply to the Commission for resolution of the dispute. Provided however, that should either or both of

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Harry E. Karr, Jr. or Michaela L. Karr request, then they be afforded the opportunity to make elections pursuant to West Virginia Code § 22C-9-7(b)(5) by petitioning this Commission for the relief specified in West Virginia Code §22C- 9-7(b)(5), and the Commission will consider such petition. Advance notice to Tug Hill, its successor and assigns, shall be required before any hearing, and the petitioning owner(s) shall be considered an operator to the extent of seven eighths of its interest in oil and gas, and as royalty owner with respect to one eighth of its interest.

This pooling and unitization of the property within the unit as shown on Exhibit A1 for production of oil and gas from the Point Pleasant formation shall exist until the Commission orders otherwise. The Old Crow Wells may be drilled and spaced approximately as proposed in the permit applications therefore.

Should it elect to do so, Tug Hill may extend the Old Crow N-17HU lateral and associated voluntarily created unit without additional hearings before the Commission. At the closest point in formation, the Old Crow N-17HU well is planned to be within eight hundred feet (800') of Tug Hill's Michter N-9HU well. Within the Point Pleasant formation, in the limited area where the Old Crow N-17HU well is within eight hundred feet (800') or less from the Michter N-9HU well, then only one of those two wells may be completed. At the toe end of the laterals near the northern unit boundaries, the Old Crow N-17HU, N-18HU and N-19HU wells shall not be perforated for completion within one hundred seventy-five feet (175') of each well's unit boundary.

Within 90 days of the respective completion of each of the Old Crow Wells, Tug Hill is directed to comply with W. Va. C.S.R § 39-1-4.6 regarding provision of well records and drilling logs to the West Virginia Department of Environmental Protection, Oil and Gas Conservation Commission, and with W. Va. C.S.R § 39-1-4.5 regarding annual reports of production.

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IT IS SO ORDERED.

IN THE NAME OF THE STATE OF WEST VIRGINIA

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF WEST VIRGINIA

By: Barry K. Lay
Barry K. Lay, Chairman

Dated this 23rd day of July, 2019, at Charleston, West Virginia.

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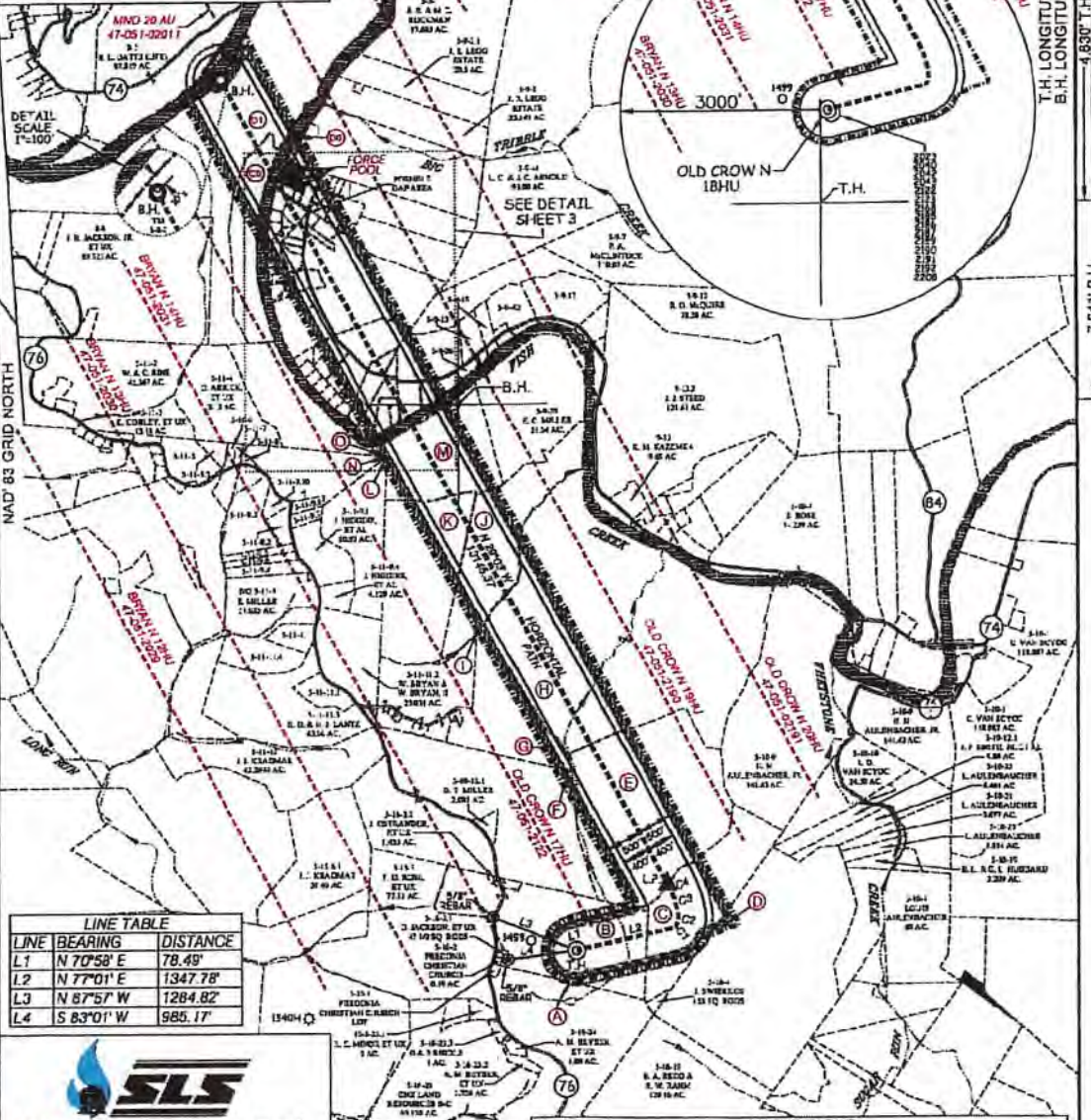
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FORM NW 6 - SHEET 2

**OLD CROW N LEASE
UTICA UNIT - 439.09 AC ±
WELL 18HU
TUG HILL OPERATING**



LINE TABLE

LINE	BEARING	DISTANCE
L1	N 70°58' E	78.49'
L2	N 77°01' E	1347.78'
L3	N 87°57' W	1284.82'
L4	S 83°01' W	985.17'

CURVE TABLE

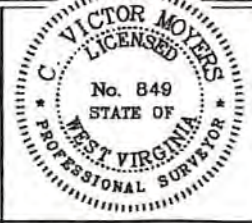
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	84.95'	88.17'	N 47°06' E	81.02'
C2	143.86'	315.71'	N 04°40' E	142.72'
C3	351.75'	1128.17'	N 17°28' W	350.32'
C4	98.16'	159.13'	N 27°16' W	98.15'

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 115 & 17 Warren Drive | Chesapeake, WV 25831 | (304) 462-3634
www.slsenergy.com

P.S. 849 *C. Victor Moyers*

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

NAD83 S.P.C.(FT)	N. 468,131.25	E. 1,613,534.56
NAD83 GEO.	LAT. (N) 39.778408	LONG. (W) 80.763035
NAD83 UTM (M)	N. 4,403,150.04	E. 523,292.49
LANDING POINT		
NAD83 S.P.C.(FT)	N. 469,078.3	E. 1,614,543.1
NAD83 GEO.	LAT. (N) 39.781058	LONG. (W) 80.758427
NAD83 UTM (M)	N. 4,403,485.2	E. 520,888.3
BOTTOM HOLE		
NAD83 S.P.C.(FT)	N. 480,570.6	E. 1,608,461.3
NAD83 GEO.	LAT. (N) 39.812358	LONG. (W) 80.781710
NAD83 UTM (M)	N. 4,408,958.9	E. 518,983.6



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

LEGEND

UNIT BOUNDARY	—
LEASED TRACTS INSIDE UNIT BOUNDARY	—
SURFACE LINE	—
PROPOSED UTICA	—
WELL LATERAL	—
400' OFFSET LINE	—
500' OFFSET LINE	—
TIE LINE	—
CREEK	—
ROAD	—
COUNTY ROUTE	—
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
SURFACE OWNER (SEE TABLE)	⊙
LEASE # (SEE ADDITIONAL SHEETS)	⊙

SCALE 1" = 2000'
FILE NO. 8796P18HUR3.dwg
OLD CROW NORTH 18HU, REV3
DATE SEPTEMBER 26, 2018
REVISED APRIL 25, MAY 14, JUNE 18, 2019
OPERATORS WELL NO. OLD CROW N-18HU
API WELL 47-051-02123
NO. STATE COUNTY PERMIT

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

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

RECEIVED
Office of Oil and Gas
DEC 04 2019
WV Department of Environmental Protection

Exhibit A1