



west virginia department of environmental protection

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

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

Thursday, July 18, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for OLD CROW N-19HU
47-051-02190-00-00

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

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

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

James A. Martin
Chief

A handwritten signature in blue ink, appearing to read 'James A. Martin', is written over the typed name and title.

Operator's Well Number: OLD CROW N-19HU
Farm Name: DONNA VIVIAN YOHO (TO)
U.S. WELL NUMBER: 47-051-02190-00-00
Horizontal 6A New Drill
Date Issued: 7/18/2019

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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



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

July 10, 2019

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

RE: Application for Deep Well Permit – API #47-051-02190

COMPANY: Tug Hill Operating, LLC

FARM: Donna Vivian Yoho (TOD) Gary Lance Yoho Old Crow N-19HU

COUNTY: Marshall DISTRICT: Franklin QUAD: Powhatan Point

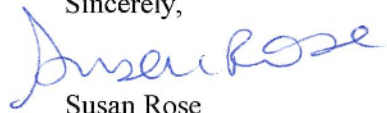
The deep well review of the application for the above company is **Approved to drill to Trenton for Point Pleasant completion.**

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; Docket 282-258 Exception Location Hearing
4. Provided a plat showing that the proposed location is a distance of 234 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.

** Old Crow N-18HU 47-051-02123; Old Crow N-17HU 47-051-02122; 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; 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

Sincerely,



Susan Rose
Administrator

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WW-6B
(04/15)

API NO. 47-051 - 02190
OPERATOR WELL NO. Old Crow N-19HU
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-19HU 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

Handwritten signature and date: 5/14/19

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,397' - 11,276' - thickness of 121' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,547'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 26,335'

11) Proposed Horizontal Leg Length: 13,932.81'

12) Approximate Fresh Water Strata Depths: 70' ; 886'

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 - 788' ; Pittsburgh Coal - 880'

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: _____

WW-6B
(04/15)

API NO. 47-051 - 02190
 OPERATOR WELL NO. Old Crow N-19HU
 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#	986'	986'	1,592FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2801'	2801'	1,975FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,677'	10,677'	3,483FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	25,335'	25,335'	6,214'FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,493'	
Liners							

Handwritten signature
2/14/19

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			

WW-6B
(10/14)

API NO. 47- 051 - 02190
OPERATOR WELL NO. Old Crow N-19HU
Well Pad Name: Old Crow

ju
5/12/19

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 34,825,000 lb proppant and 538,420 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

*Note: Attach additional sheets as needed.

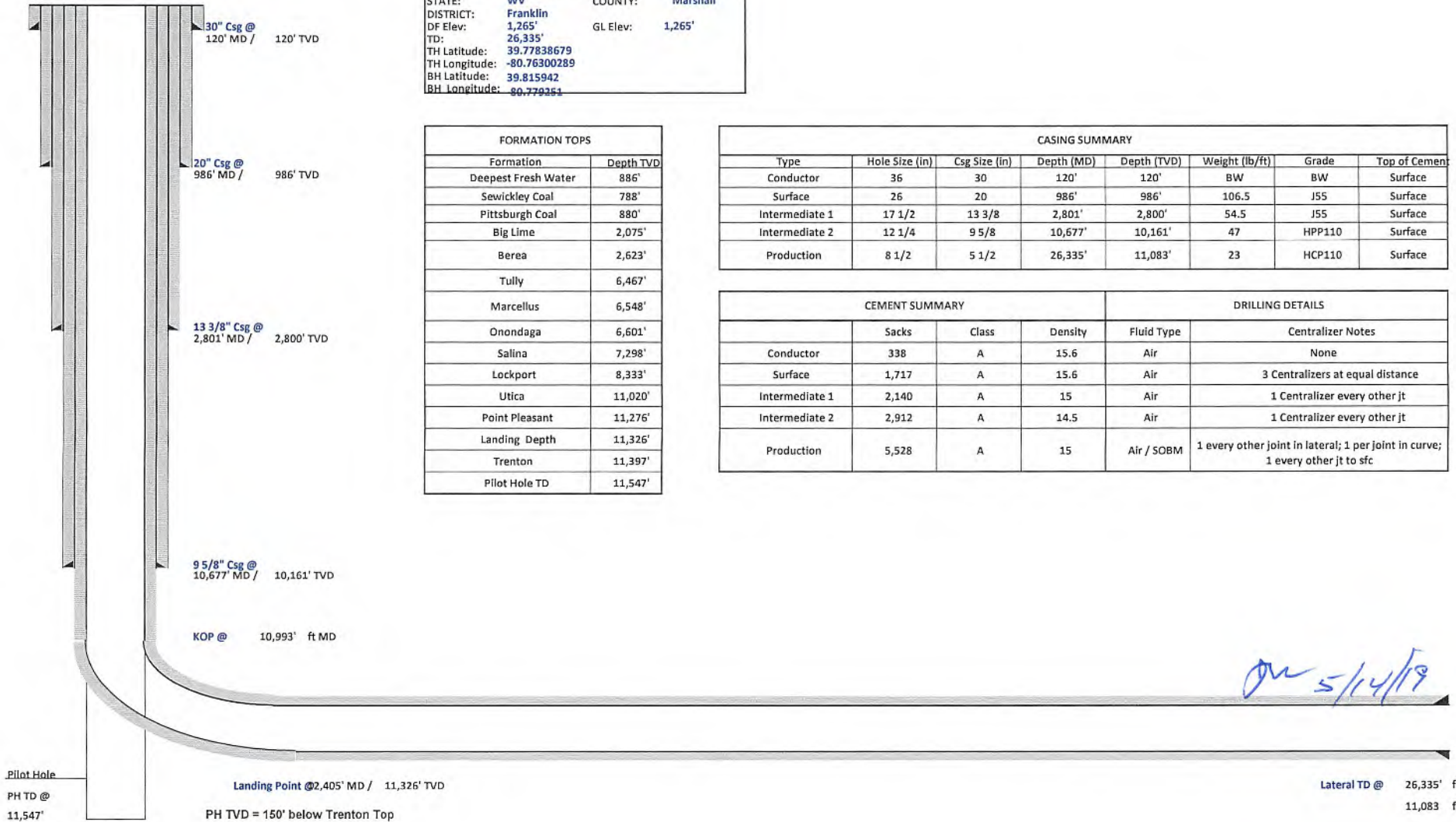


WELL NAME: Old Crow N-19HU
 STATE: WV COUNTY: Marshall
 DISTRICT: Franklin
 DF Elev: 1,265' GL Elev: 1,265'
 TD: 26,335'
 TH Latitude: 39.77838679
 TH Longitude: -80.76300289
 BH Latitude: 39.815942
 BH Longitude: 80.779251

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	886'
Sewickley Coal	788'
Pittsburgh Coal	880'
Big Lime	2,075'
Berea	2,623'
Tully	6,467'
Marcellus	6,548'
Onondaga	6,601'
Salina	7,298'
Lockport	8,333'
Utica	11,020'
Point Pleasant	11,276'
Landing Depth	11,326'
Trenton	11,397'
Pilot Hole TD	11,547'

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	26	20	986'	986'	106.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,801'	2,800'	54.5	J55	Surface
Intermediate 2	12 1/4	9 5/8	10,677'	10,161'	47	HPP110	Surface
Production	8 1/2	5 1/2	26,335'	11,083'	23	HCP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,717	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,140	A	15	Air	1 Centralizer every other jt
Intermediate 2	2,912	A	14.5	Air	1 Centralizer every other jt
Production	5,528	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Handwritten signature and date: 5/14/19

SI-02190

Lateral TD @ 26,335' ft MD
 11,083' ft TVD

Landing Point @ 2,405' MD / 11,326' TVD
 PH TVD = 150' below Trenton Top

Pilot Hole
 PH TD @
 11,547'



Tug Hill Operating, LLC Casing and Cement Program

Old Crow N-19HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	986'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,801'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,677'	CTS
Production	5 1/2"	HCP110	8 1/2"	26,335'	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

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (12/10/2018) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Permit well - Old Crow N-19HU

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705102040	Tug Hill Operating	6689' TVD	None	None	No, existing Marcellus permit. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Currently a permit.
4705102023	Tug Hill Operating	6681' TVD	None	None	No, existing Marcellus permit. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Currently a permit.
4705102042	Tug Hill Operating	6693' TVD	None	None	No, existing Marcellus permit. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Currently a permit.
4705102043	Tug Hill Operating	6699' TVD	None	None	No, existing Marcellus permit. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Currently a permit.

WV Geological & Economic Survey Well: County = 51 Permit = 02040

Location Information View Map
 API: 4705102040 COUNTY: PUTNAM PERMIT: 02040 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000
 Bottom Hole Location Information
 API: 4705102040 COUNTY: PUTNAM PERMIT: 02040 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000

Owner Information
 API: 4705102040 COUNTY: PUTNAM PERMIT: 02040 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000

Completion Information
 API: 4705102040 COUNTY: PUTNAM PERMIT: 02040 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000

There is no Pay data for this well.
 There is no Production Gas data for this well.
 There is no Production Oil data for this well. ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well. ** some operators may have reported NGL under Oil
 There is no Production Water data for this well.
 There is no Stratigraphy data for this well.
 There is no Wireline (E-Log) data for this well.
 There is no Plugging data for this well.
 There is no Sample data for this well.

WV Geological & Economic Survey Well: County = 51 Permit = 02023

Location Information View Map
 API: 4705102023 COUNTY: PUTNAM PERMIT: 02023 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000
 Bottom Hole Location Information
 API: 4705102023 COUNTY: PUTNAM PERMIT: 02023 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000

Owner Information
 API: 4705102023 COUNTY: PUTNAM PERMIT: 02023 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000

Completion Information
 API: 4705102023 COUNTY: PUTNAM PERMIT: 02023 SURFACE_OWNER: STATE SURFACE_OWNER: STATE WELL_NUM: 00-0000 LEASE: LEASE_NUM: 0000000000 OPERATOR: TUG HILL OPERATING PROP_NUM: 0000000000 TRAIL_NUM: 0000000000

There is no Pay data for this well.
 There is no Production Gas data for this well.
 There is no Production Oil data for this well. ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well. ** some operators may have reported NGL under Oil
 There is no Production Water data for this well.
 There is no Stratigraphy data for this well.
 There is no Wireline (E-Log) data for this well.
 There is no Plugging data for this well.
 There is no Sample data for this well.

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WV Geological & Economic Survey Well: County = 51 Permit = 02042

Location Information View Map

COUNTY PERMIT DISTRICT DISTRICT COACD LEAS NO LOC NO TIME UTM
 MORGANTHAU 5262 5262 5262 5262 5262 5262 5262 5262

Bottom Hole Location Information

WELL_NAME TIME UTM LOC NO LAT DEG
 5262042 5262 5262 5262 5262

Owner Information

WELL_NAME CO LEASE LEASE_NUM OPERATOR OPERATOR_ID COMPLETION PROP_OG PROP_PROD PROD_PROD TIME UTM

Completion Information

WELL_NAME FIELD DEEPEN_FTH DEEPEN_FTH INITIAL_CLASS FINAL_CLASS TYPE NO COMP UTM TD TD NUC ROD S_CURF S_CURF S_CURF S_CURF NO

There is no Pay data for this well.

There is no Production Gas data for this well.

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

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

There is no Production Water data for this well.

There is no Stratigraphy data for this well.

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

There is no Plugging data for this well.

There is no Sample data for this well.

WV Geological & Economic Survey Well: County = 51 Permit = 02043

Location Information View Map

COUNTY PERMIT DISTRICT DISTRICT COACD LEAS NO LOC NO TIME UTM
 MORGANTHAU 5263 5263 5263 5263 5263 5263 5263 5263

Bottom Hole Location Information

WELL_NAME TIME UTM LOC NO LAT DEG
 5263043 5263 5263 5263 5263

Owner Information

WELL_NAME CO LEASE LEASE_NUM OPERATOR OPERATOR_ID COMPLETION PROP_OG PROP_PROD PROD_PROD TIME UTM

Completion Information

WELL_NAME FIELD DEEPEN_FTH DEEPEN_FTH INITIAL_CLASS FINAL_CLASS TYPE NO COMP UTM TD TD NUC ROD S_CURF S_CURF S_CURF S_CURF NO

There is no Pay data for this well.

There is no Production Gas data for this well.

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

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

There is no Production Water data for this well.

There is no Stratigraphy data for this well.

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

There is no Plugging data for this well.

There is no Sample data for this well.

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February 22, 2019

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

RE: Old Crow N-19HU

Subject: Proposed Voluntary Pooling and Unitization

Dear Susan:

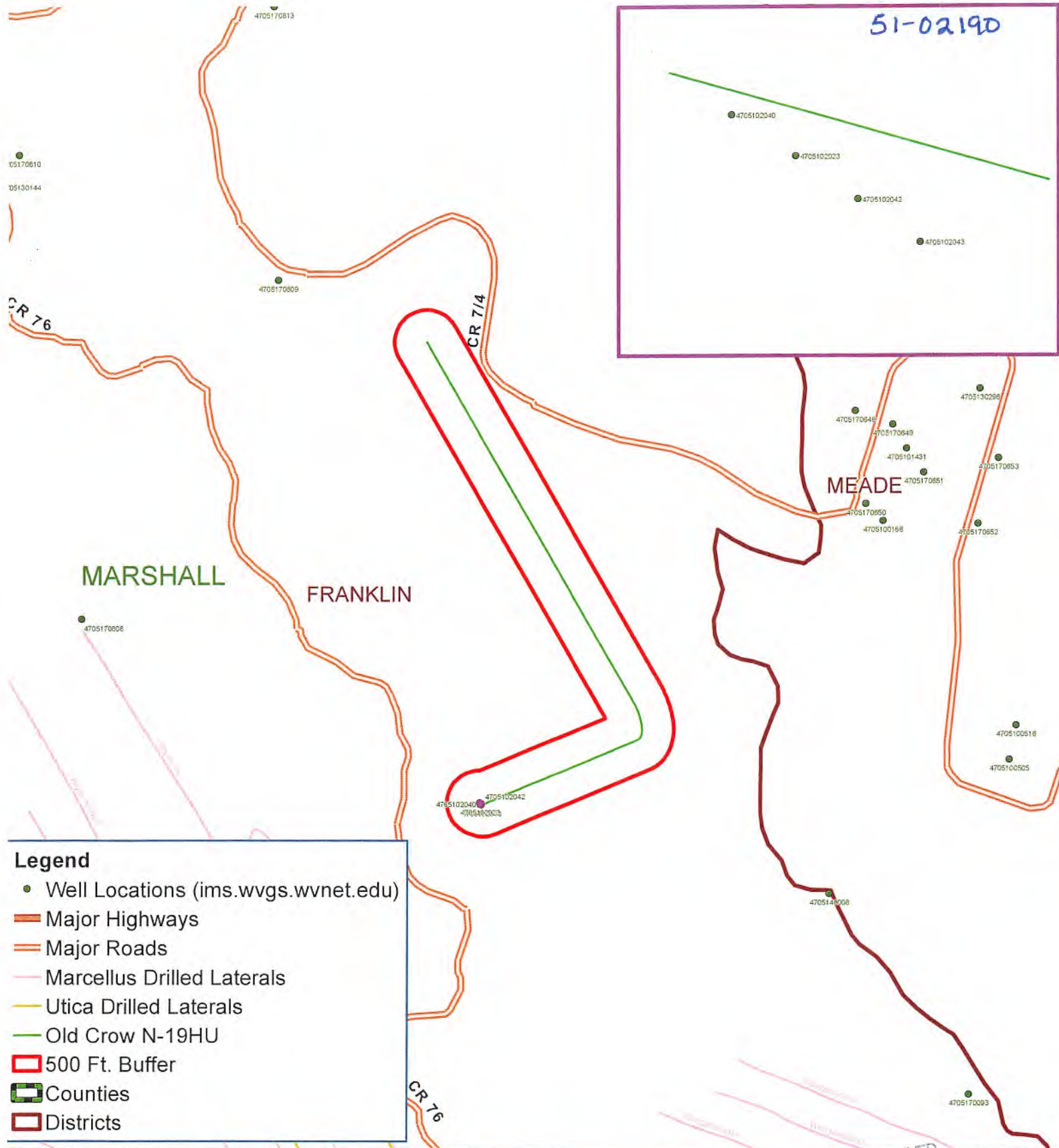
Tug Hill Operating, LLC is authorized through, either lease or other agreement, to unitize and pool all lands falling within the boundaries of the proposed voluntary unit included with this submission.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 724-749-8388, or by email at amiller@tug-hilop.com.

Sincerely,

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

Amy L. Miller
Permitting Specialist
Tug Hill Operating



Legend

- Well Locations (ims.wvgs.wvnet.edu)
- Major Highways
- Major Roads
- Marcellus Drilled Laterals
- Utica Drilled Laterals
- Old Crow N-19HU
- 500 Ft. Buffer
- Counties
- Districts



Old Crow N - 19HU
 Franklin District
 Marshall County, WV



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

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Well: Old Crow N-19 HU (slot Q)
 Site: Old Crow Pad
 Project: Marshall County, West Virginia.
 Design: rev4

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	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 1 1/100' build
3	2100.00	3.00	180.00	2099.86	-7.85	0.00	1.00	180.000	-7.44	Begin 3.00° tangent
4	2700.00	3.00	180.00	2699.04	-39.25	0.00	0.00	0.000	-37.20	Begin 1 1/100' drop
5	3000.00	0.00	180.00	2998.90	-47.11	0.00	1.00	180.000	-44.65	Begin vertical hold
6	4501.10	0.00	180.00	4500.00	-47.11	0.00	0.00	180.000	-44.65	Begin 2 1/100' build
7	5771.66	25.41	72.56	5729.31	35.96	264.42	2.00	72.560	-50.26	Begin 25.41° tangent
8	10993.43	25.41	72.56	10445.89	707.54	2402.14	0.00	0.000	-95.68	Begin 6 1/100' build/turn
9	11827.29	50.00	353.39	11134.82	1103.94	2545.27	6.00	-100.968	234.35	Begin 8 1/100' build/turn
10	12405.16	91.00	330.00	11325.99	1601.27	2365.48	8.00	-33.346	763.05	Begin 91.00° lateral
11	26335.34	91.00	330.00	11083.00	13863.24	-4598.70	0.00	0.000	14416.39	PBHL/TD 26335.34 MD/11083.00 TVD

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

System Datum: Mean Sea Level
 Depth Reference: GL @ 1265.00usft

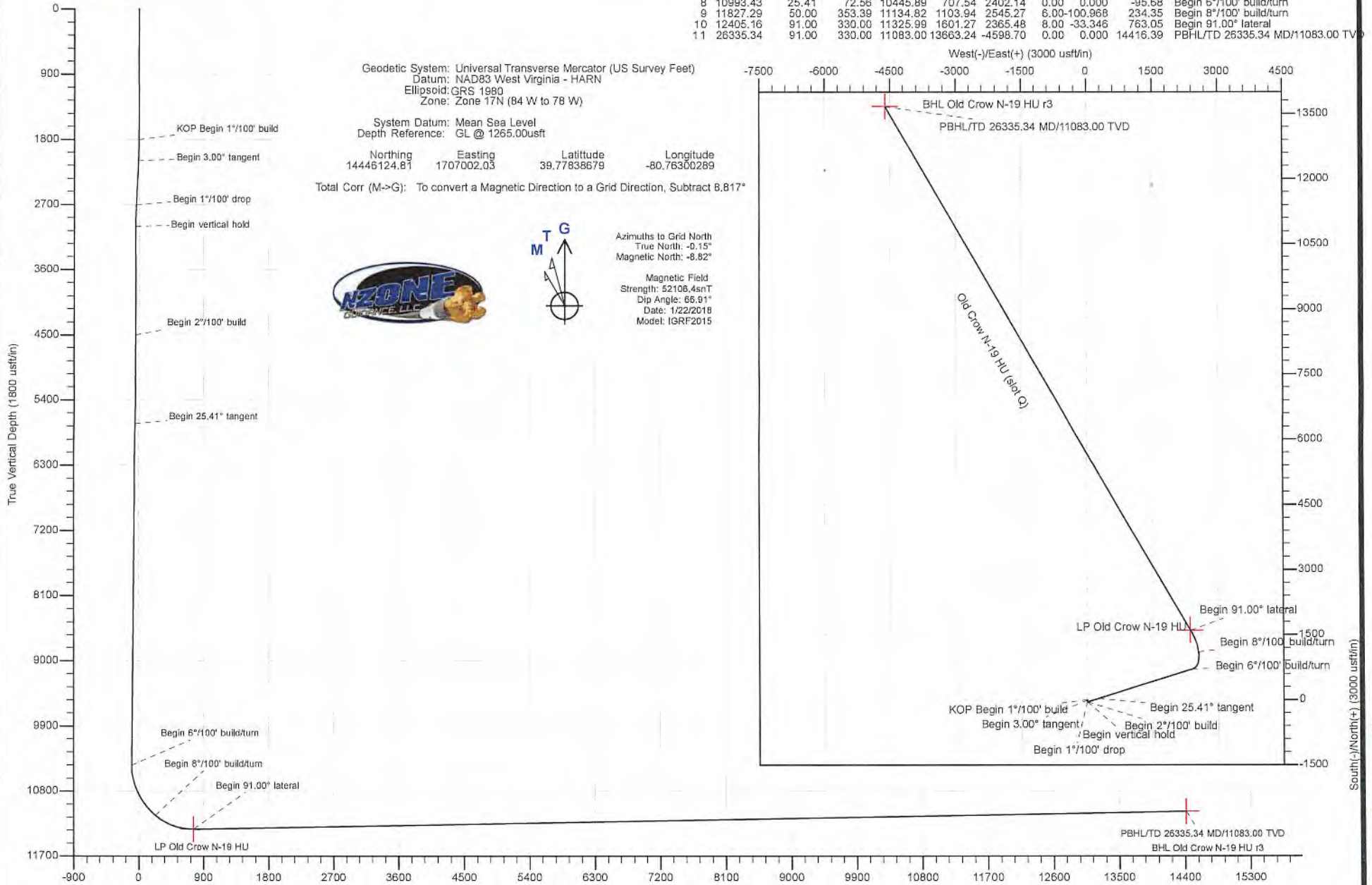
Northing: 14446124.81 Easting: 1707002.03 Latitude: 39.77838679 Longitude: -80.76300289

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.817°



Azimuths to Grid North
 True North: -0.15°
 Magnetic North: -8.82°

Magnetic Field
 Strength: 52108.4snT
 Dip Angle: 66.91°
 Date: 1/22/2018
 Model: IGRF2015



Vertical Section at 341.40° (1800 usft/in)

SI-02190



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

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-19 HU (slot Q)					
Well Position	+N/-S	0.00 usft	Northing:	14,446,124.81 usft	Latitude:	39.77838679
	+E/-W	0.00 usft	Easting:	1,707,002.03 usft	Longitude:	-80.76300289
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	1/22/2018	-8.666	66.908	52,106.39358496

Design	rev4			
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	341.40

Plan Survey Tool Program	Date	5/5/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	26,335.34 rev4 (Original Hole)	MWD	
			MWD - Standard	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

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		
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.000		
2,100.00	3.00	180.00	2,099.86	-7.85	0.00	1.00	1.00	0.00	180.000		
2,700.00	3.00	180.00	2,699.04	-39.25	0.00	0.00	0.00	0.00	0.000		
3,000.00	0.00	180.00	2,998.90	-47.11	0.00	1.00	-1.00	0.00	180.000		
4,501.10	0.00	180.00	4,500.00	-47.11	0.00	0.00	0.00	0.00	180.000		
5,771.66	25.41	72.56	5,729.31	35.96	264.42	2.00	2.00	0.00	72.560		
10,993.43	25.41	72.56	10,445.89	707.54	2,402.14	0.00	0.00	0.00	0.000		
11,827.29	50.00	353.39	11,134.82	1,103.94	2,545.27	6.00	2.95	-9.49	-100.968		
12,405.16	91.00	330.00	11,325.99	1,601.27	2,365.48	8.00	7.09	-4.05	-33.346		
26,335.34	91.00	330.00	11,083.00	13,663.24	-4,598.70	0.00	0.00	0.00	0.000	BHL Old Crow N-19 F	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

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	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
100.00	0.00	0.00	100.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
200.00	0.00	0.00	200.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
300.00	0.00	0.00	300.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
400.00	0.00	0.00	400.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
500.00	0.00	0.00	500.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
600.00	0.00	0.00	600.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
700.00	0.00	0.00	700.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
800.00	0.00	0.00	800.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
900.00	0.00	0.00	900.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,446,124.81	1,707,002.03	39.77838679	-80.76300289
KOP Begin 1°/100' build									
1,900.00	1.00	180.00	1,899.99	-0.87	0.00	14,446,123.94	1,707,002.03	39.77838440	-80.76300290
2,000.00	2.00	180.00	1,999.96	-3.49	0.00	14,446,121.32	1,707,002.03	39.77837721	-80.76300292
2,100.00	3.00	180.00	2,099.86	-7.85	0.00	14,446,116.96	1,707,002.03	39.77836523	-80.76300296
Begin 3.00° tangent									
2,200.00	3.00	180.00	2,199.73	-13.09	0.00	14,446,111.72	1,707,002.03	39.77835085	-80.76300301
2,300.00	3.00	180.00	2,299.59	-18.32	0.00	14,446,106.49	1,707,002.03	39.77833648	-80.76300306
2,400.00	3.00	180.00	2,399.45	-23.55	0.00	14,446,101.26	1,707,002.03	39.77832211	-80.76300311
2,500.00	3.00	180.00	2,499.31	-28.79	0.00	14,446,096.02	1,707,002.03	39.77830774	-80.76300316
2,600.00	3.00	180.00	2,599.18	-34.02	0.00	14,446,090.79	1,707,002.03	39.77829336	-80.76300321
2,700.00	3.00	180.00	2,699.04	-39.25	0.00	14,446,085.56	1,707,002.03	39.77827899	-80.76300326
Begin 1°/100' drop									
2,800.00	2.00	180.00	2,798.94	-43.62	0.00	14,446,081.19	1,707,002.03	39.77826701	-80.76300330
2,900.00	1.00	180.00	2,898.91	-46.23	0.00	14,446,078.58	1,707,002.03	39.77825982	-80.76300333
3,000.00	0.00	180.00	2,998.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
Begin vertical hold									
3,100.00	0.00	0.00	3,098.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,200.00	0.00	0.00	3,198.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,300.00	0.00	0.00	3,298.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,400.00	0.00	0.00	3,398.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,500.00	0.00	0.00	3,498.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,600.00	0.00	0.00	3,598.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,700.00	0.00	0.00	3,698.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,800.00	0.00	0.00	3,798.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
3,900.00	0.00	0.00	3,898.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,000.00	0.00	0.00	3,998.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,100.00	0.00	0.00	4,098.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,200.00	0.00	0.00	4,198.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,300.00	0.00	0.00	4,298.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,400.00	0.00	0.00	4,398.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,500.00	0.00	0.00	4,498.90	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
4,501.10	0.00	0.00	4,500.00	-47.11	0.00	14,446,077.70	1,707,002.03	39.77825743	-80.76300333
Begin 2°/100' build									
4,600.00	1.98	72.56	4,598.88	-46.59	1.63	14,446,078.22	1,707,003.66	39.77825882	-80.76299753
4,700.00	3.98	72.56	4,698.74	-45.04	6.58	14,446,079.77	1,707,008.61	39.77826306	-80.76297988



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,800.00	5.98	72.56	4,798.36	-42.44	14.86	14,446,082.37	1,707,016.89	39.77827014	-80.76295039	
4,900.00	7.98	72.56	4,897.62	-38.80	26.45	14,446,086.01	1,707,028.48	39.77828006	-80.76290910	
5,000.00	9.98	72.56	4,996.39	-34.12	41.34	14,446,090.69	1,707,043.37	39.77829279	-80.76285607	
5,100.00	11.98	72.56	5,094.55	-28.41	59.51	14,446,096.40	1,707,061.53	39.77830833	-80.76279136	
5,200.00	13.98	72.56	5,191.99	-21.68	80.93	14,446,103.13	1,707,082.96	39.77832666	-80.76271504	
5,300.00	15.98	72.56	5,288.59	-13.94	105.59	14,446,110.88	1,707,107.61	39.77834775	-80.76262721	
5,400.00	17.98	72.56	5,384.23	-5.18	133.44	14,446,119.63	1,707,135.47	39.77837159	-80.76252798	
5,500.00	19.98	72.56	5,478.79	4.56	164.47	14,446,129.37	1,707,166.50	39.77839813	-80.76241746	
5,600.00	21.98	72.56	5,572.15	15.29	198.62	14,446,140.10	1,707,200.65	39.77842734	-80.76229580	
5,700.00	23.98	72.56	5,664.21	26.99	235.86	14,446,151.80	1,707,237.89	39.77845920	-80.76216314	
5,771.66	25.41	72.56	5,729.31	35.96	264.42	14,446,160.77	1,707,266.45	39.77848363	-80.76206140	
Begin 25.41° tangent										
5,800.00	25.41	72.56	5,754.92	39.61	276.03	14,446,164.42	1,707,278.05	39.77849356	-80.76202006	
5,900.00	25.41	72.56	5,845.24	52.47	316.96	14,446,177.28	1,707,318.99	39.77852858	-80.76187423	
6,000.00	25.41	72.56	5,935.57	65.33	357.90	14,446,190.14	1,707,359.93	39.77856360	-80.76172840	
6,100.00	25.41	72.56	6,025.89	78.19	398.84	14,446,203.00	1,707,400.87	39.77859862	-80.76158257	
6,200.00	25.41	72.56	6,116.22	91.05	439.78	14,446,215.86	1,707,441.81	39.77863364	-80.76143673	
6,300.00	25.41	72.56	6,206.54	103.91	480.72	14,446,228.73	1,707,482.75	39.77866866	-80.76129090	
6,400.00	25.41	72.56	6,296.87	116.78	521.66	14,446,241.59	1,707,523.68	39.77870368	-80.76114506	
6,500.00	25.41	72.56	6,387.19	129.64	562.60	14,446,254.45	1,707,564.62	39.77873870	-80.76099923	
6,600.00	25.41	72.56	6,477.52	142.50	603.53	14,446,267.31	1,707,605.56	39.77877372	-80.76085340	
6,700.00	25.41	72.56	6,567.84	155.36	644.47	14,446,280.17	1,707,646.50	39.77880874	-80.76070756	
6,800.00	25.41	72.56	6,658.17	168.22	685.41	14,446,293.03	1,707,687.44	39.77884376	-80.76056173	
6,900.00	25.41	72.56	6,748.49	181.08	726.35	14,446,305.89	1,707,728.38	39.77887878	-80.76041589	
7,000.00	25.41	72.56	6,838.82	193.94	767.29	14,446,318.75	1,707,769.32	39.77891380	-80.76027006	
7,100.00	25.41	72.56	6,929.14	206.80	808.23	14,446,331.61	1,707,810.25	39.77894882	-80.76012422	
7,200.00	25.41	72.56	7,019.47	219.66	849.17	14,446,344.47	1,707,851.19	39.77898384	-80.75997839	
7,300.00	25.41	72.56	7,109.79	232.53	890.10	14,446,357.34	1,707,892.13	39.77901886	-80.75983255	
7,400.00	25.41	72.56	7,200.12	245.39	931.04	14,446,370.20	1,707,933.07	39.77905388	-80.75968672	
7,500.00	25.41	72.56	7,290.44	258.25	971.98	14,446,383.06	1,707,974.01	39.77908890	-80.75954088	
7,600.00	25.41	72.56	7,380.77	271.11	1,012.92	14,446,395.92	1,708,014.95	39.77912391	-80.75939505	
7,700.00	25.41	72.56	7,471.09	283.97	1,053.86	14,446,408.78	1,708,055.88	39.77915893	-80.75924921	
7,800.00	25.41	72.56	7,561.42	296.83	1,094.80	14,446,421.64	1,708,096.82	39.77919395	-80.75910338	
7,900.00	25.41	72.56	7,651.74	309.69	1,135.73	14,446,434.50	1,708,137.76	39.77922897	-80.75895754	
8,000.00	25.41	72.56	7,742.07	322.55	1,176.67	14,446,447.36	1,708,178.70	39.77926398	-80.75881170	
8,100.00	25.41	72.56	7,832.39	335.41	1,217.61	14,446,460.22	1,708,219.64	39.77929900	-80.75866587	
8,200.00	25.41	72.56	7,922.72	348.28	1,258.55	14,446,473.09	1,708,260.58	39.77933402	-80.75852003	
8,300.00	25.41	72.56	8,013.04	361.14	1,299.49	14,446,485.95	1,708,301.52	39.77936904	-80.75837420	
8,400.00	25.41	72.56	8,103.37	374.00	1,340.43	14,446,498.81	1,708,342.45	39.77940405	-80.75822836	
8,500.00	25.41	72.56	8,193.70	386.86	1,381.37	14,446,511.67	1,708,383.39	39.77943907	-80.75808252	
8,600.00	25.41	72.56	8,284.02	399.72	1,422.30	14,446,524.53	1,708,424.33	39.77947408	-80.75793668	
8,700.00	25.41	72.56	8,374.35	412.58	1,463.24	14,446,537.39	1,708,465.27	39.77950910	-80.75779085	
8,800.00	25.41	72.56	8,464.67	425.44	1,504.18	14,446,550.25	1,708,506.21	39.77954412	-80.75764501	
8,900.00	25.41	72.56	8,555.00	438.30	1,545.12	14,446,563.11	1,708,547.15	39.77957913	-80.75749917	
9,000.00	25.41	72.56	8,645.32	451.16	1,586.06	14,446,575.97	1,708,588.09	39.77961415	-80.75735334	
9,100.00	25.41	72.56	8,735.65	464.03	1,627.00	14,446,588.84	1,708,629.02	39.77964916	-80.75720750	
9,200.00	25.41	72.56	8,825.97	476.89	1,667.93	14,446,601.70	1,708,669.96	39.77968418	-80.75706166	
9,300.00	25.41	72.56	8,916.30	489.75	1,708.87	14,446,614.56	1,708,710.90	39.77971919	-80.75691582	
9,400.00	25.41	72.56	9,006.62	502.61	1,749.81	14,446,627.42	1,708,751.84	39.77975421	-80.75676998	
9,500.00	25.41	72.56	9,096.95	515.47	1,790.75	14,446,640.28	1,708,792.78	39.77978922	-80.75662414	
9,600.00	25.41	72.56	9,187.27	528.33	1,831.69	14,446,653.14	1,708,833.72	39.77982424	-80.75647831	
9,700.00	25.41	72.56	9,277.60	541.19	1,872.63	14,446,666.00	1,708,874.65	39.77985925	-80.75633247	
9,800.00	25.41	72.56	9,367.92	554.05	1,913.57	14,446,678.86	1,708,915.59	39.77989427	-80.75618663	
9,900.00	25.41	72.56	9,458.25	566.91	1,954.50	14,446,691.72	1,708,956.53	39.77992928	-80.75604079	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,000.00	25.41	72.56	9,548.57	579.78	1,995.44	14,446,704.59	1,708,997.47	39.77996429	-80.75589495	
10,100.00	25.41	72.56	9,638.90	592.64	2,036.38	14,446,717.45	1,709,038.41	39.77999931	-80.75574911	
10,200.00	25.41	72.56	9,729.22	605.50	2,077.32	14,446,730.31	1,709,079.35	39.78003432	-80.75560327	
10,300.00	25.41	72.56	9,819.55	618.36	2,118.26	14,446,743.17	1,709,120.29	39.78006933	-80.75545743	
10,400.00	25.41	72.56	9,909.87	631.22	2,159.20	14,446,756.03	1,709,161.22	39.78010435	-80.75531159	
10,500.00	25.41	72.56	10,000.20	644.08	2,200.14	14,446,768.89	1,709,202.16	39.78013936	-80.75516575	
10,600.00	25.41	72.56	10,090.52	656.94	2,241.07	14,446,781.75	1,709,243.10	39.78017437	-80.75501991	
10,700.00	25.41	72.56	10,180.85	669.80	2,282.01	14,446,794.61	1,709,284.04	39.78020938	-80.75487407	
10,800.00	25.41	72.56	10,271.17	682.66	2,322.95	14,446,807.47	1,709,324.98	39.78024440	-80.75472823	
10,900.00	25.41	72.56	10,361.50	695.53	2,363.89	14,446,820.34	1,709,365.92	39.78027941	-80.75458239	
10,993.43	25.41	72.56	10,445.89	707.54	2,402.14	14,446,832.35	1,709,404.17	39.78031212	-80.75444614	
Begin 6°/100' build/turn										
11,000.00	25.34	71.66	10,451.83	708.41	2,404.82	14,446,833.22	1,709,406.84	39.78031447	-80.75443659	
11,100.00	24.94	57.53	10,542.43	726.48	2,442.95	14,446,851.29	1,709,444.98	39.78036381	-80.75430067	
11,200.00	25.88	43.69	10,632.84	753.60	2,475.85	14,446,878.41	1,709,477.88	39.78043805	-80.75418332	
11,300.00	28.01	31.29	10,722.05	789.48	2,503.14	14,446,914.29	1,709,505.17	39.78053638	-80.75408582	
11,400.00	31.09	20.83	10,809.09	833.72	2,524.54	14,446,958.53	1,709,526.56	39.78065772	-80.75400924	
11,500.00	34.87	12.25	10,893.00	885.84	2,539.80	14,447,010.65	1,709,541.82	39.78080074	-80.75395441	
11,600.00	39.15	5.24	10,972.87	945.27	2,548.75	14,447,070.08	1,709,550.78	39.78096387	-80.75392195	
11,700.00	43.77	359.45	11,047.82	1,011.35	2,551.31	14,447,136.16	1,709,553.34	39.78114533	-80.75391220	
11,800.00	48.64	354.59	11,117.03	1,083.36	2,547.44	14,447,208.17	1,709,549.47	39.78134313	-80.75392528	
11,827.29	50.00	353.39	11,134.82	1,103.94	2,545.27	14,447,228.75	1,709,547.30	39.78139966	-80.75393280	
Begin 8°/100' build/turn										
11,900.00	54.93	349.49	11,179.12	1,160.91	2,536.63	14,447,285.72	1,709,538.66	39.78155618	-80.75396300	
12,000.00	61.88	344.83	11,231.50	1,243.84	2,517.59	14,447,368.65	1,709,519.62	39.78178407	-80.75402995	
12,100.00	68.97	340.75	11,273.08	1,330.60	2,490.62	14,447,455.41	1,709,492.65	39.78202254	-80.75412511	
12,200.00	76.14	337.04	11,303.05	1,419.50	2,456.24	14,447,544.31	1,709,458.26	39.78226694	-80.75424662	
12,300.00	83.37	333.56	11,320.83	1,508.81	2,415.12	14,447,633.62	1,709,417.14	39.78251253	-80.75439212	
12,400.00	90.63	330.17	11,326.06	1,596.80	2,368.05	14,447,721.61	1,709,370.08	39.78275452	-80.75455878	
12,405.16	91.00	330.00	11,325.99	1,601.27	2,365.48	14,447,726.08	1,709,367.51	39.78276681	-80.75456789	
Begin 91.00° lateral										
12,500.00	91.00	330.00	11,324.34	1,683.39	2,318.07	14,447,808.20	1,709,320.09	39.78299270	-80.75473586	
12,600.00	91.00	330.00	11,322.59	1,769.98	2,268.07	14,447,894.79	1,709,270.10	39.78323088	-80.75491297	
12,700.00	91.00	330.00	11,320.85	1,856.57	2,218.08	14,447,981.38	1,709,220.11	39.78346905	-80.75509008	
12,800.00	91.00	330.00	11,319.10	1,943.16	2,168.09	14,448,067.97	1,709,170.11	39.78370722	-80.75526719	
12,900.00	91.00	330.00	11,317.36	2,029.75	2,118.09	14,448,154.56	1,709,120.12	39.78394539	-80.75544430	
13,000.00	91.00	330.00	11,315.61	2,116.34	2,068.10	14,448,241.15	1,709,070.13	39.78418356	-80.75562142	
13,100.00	91.00	330.00	11,313.87	2,202.92	2,018.11	14,448,327.73	1,709,020.13	39.78442173	-80.75579853	
13,200.00	91.00	330.00	11,312.12	2,289.51	1,968.11	14,448,414.32	1,708,970.14	39.78465990	-80.75597565	
13,300.00	91.00	330.00	11,310.38	2,376.10	1,918.12	14,448,500.91	1,708,920.15	39.78489807	-80.75615276	
13,400.00	91.00	330.00	11,308.64	2,462.69	1,868.13	14,448,587.50	1,708,870.15	39.78513624	-80.75632988	
13,500.00	91.00	330.00	11,306.89	2,549.28	1,818.13	14,448,674.09	1,708,820.16	39.78537441	-80.75650700	
13,600.00	91.00	330.00	11,305.15	2,635.87	1,768.14	14,448,760.68	1,708,770.17	39.78561258	-80.75668412	
13,700.00	91.00	330.00	11,303.40	2,722.46	1,718.14	14,448,847.27	1,708,720.17	39.78585075	-80.75686124	
13,800.00	91.00	330.00	11,301.66	2,809.05	1,668.15	14,448,933.86	1,708,670.18	39.78608892	-80.75703837	
13,900.00	91.00	330.00	11,299.91	2,895.63	1,618.16	14,449,020.44	1,708,620.19	39.78632709	-80.75721549	
14,000.00	91.00	330.00	11,298.17	2,982.22	1,568.16	14,449,107.03	1,708,570.19	39.78656526	-80.75739261	
14,100.00	91.00	330.00	11,296.43	3,068.81	1,518.17	14,449,193.62	1,708,520.20	39.78680342	-80.75756974	
14,200.00	91.00	330.00	11,294.68	3,155.40	1,468.18	14,449,280.21	1,708,470.21	39.78704159	-80.75774687	
14,300.00	91.00	330.00	11,292.94	3,241.99	1,418.18	14,449,366.80	1,708,420.21	39.78727976	-80.75792400	
14,400.00	91.00	330.00	11,291.19	3,328.58	1,368.19	14,449,453.39	1,708,370.22	39.78751793	-80.75810113	
14,500.00	91.00	330.00	11,289.45	3,415.17	1,318.20	14,449,539.98	1,708,320.22	39.78775609	-80.75827826	
14,600.00	91.00	330.00	11,287.70	3,501.76	1,268.20	14,449,626.57	1,708,270.23	39.78799426	-80.75845539	
14,700.00	91.00	330.00	11,285.96	3,588.34	1,218.21	14,449,713.15	1,708,220.24	39.78823243	-80.75863253	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,800.00	91.00	330.00	11,284.22	3,674.93	1,168.22	14,449,799.74	1,708,170.24	39.78847059	-80.75880966	
14,900.00	91.00	330.00	11,282.47	3,761.52	1,118.22	14,449,886.33	1,708,120.25	39.78870876	-80.75898680	
15,000.00	91.00	330.00	11,280.73	3,848.11	1,068.23	14,449,972.92	1,708,070.26	39.78894692	-80.75916394	
15,100.00	91.00	330.00	11,278.98	3,934.70	1,018.24	14,450,059.51	1,708,020.26	39.78918509	-80.75934108	
15,200.00	91.00	330.00	11,277.24	4,021.29	968.24	14,450,146.10	1,707,970.27	39.78942325	-80.75951822	
15,300.00	91.00	330.00	11,275.49	4,107.88	918.25	14,450,232.69	1,707,920.28	39.78966142	-80.75969536	
15,400.00	91.00	330.00	11,273.75	4,194.47	868.26	14,450,319.28	1,707,870.28	39.78989958	-80.75987250	
15,500.00	91.00	330.00	11,272.01	4,281.05	818.26	14,450,405.86	1,707,820.29	39.79013775	-80.76004964	
15,600.00	91.00	330.00	11,270.26	4,367.64	768.27	14,450,492.45	1,707,770.30	39.79037591	-80.76022679	
15,700.00	91.00	330.00	11,268.52	4,454.23	718.28	14,450,579.04	1,707,720.30	39.79061407	-80.76040393	
15,800.00	91.00	330.00	11,266.77	4,540.82	668.28	14,450,665.63	1,707,670.31	39.79085224	-80.76058108	
15,900.00	91.00	330.00	11,265.03	4,627.41	618.29	14,450,752.22	1,707,620.32	39.79109040	-80.76075823	
16,000.00	91.00	330.00	11,263.28	4,714.00	568.29	14,450,838.81	1,707,570.32	39.79132856	-80.76093538	
16,100.00	91.00	330.00	11,261.54	4,800.59	518.30	14,450,925.40	1,707,520.33	39.79156672	-80.76111253	
16,200.00	91.00	330.00	11,259.79	4,887.18	468.31	14,451,011.99	1,707,470.34	39.79180489	-80.76128968	
16,300.00	91.00	330.00	11,258.05	4,973.76	418.31	14,451,098.57	1,707,420.34	39.79204305	-80.76146684	
16,400.00	91.00	330.00	11,256.31	5,060.35	368.32	14,451,185.16	1,707,370.35	39.79228121	-80.76164399	
16,500.00	91.00	330.00	11,254.56	5,146.94	318.33	14,451,271.75	1,707,320.35	39.79251937	-80.76182115	
16,600.00	91.00	330.00	11,252.82	5,233.53	268.33	14,451,358.34	1,707,270.36	39.79275753	-80.76199830	
16,700.00	91.00	330.00	11,251.07	5,320.12	218.34	14,451,444.93	1,707,220.37	39.79299569	-80.76217546	
16,800.00	91.00	330.00	11,249.33	5,406.71	168.35	14,451,531.52	1,707,170.37	39.79323385	-80.76235262	
16,900.00	91.00	330.00	11,247.58	5,493.30	118.35	14,451,618.11	1,707,120.38	39.79347201	-80.76252978	
17,000.00	91.00	330.00	11,245.84	5,579.89	68.36	14,451,704.70	1,707,070.39	39.79371017	-80.76270694	
17,100.00	91.00	330.00	11,244.10	5,666.47	18.37	14,451,791.28	1,707,020.39	39.79394833	-80.76288411	
17,200.00	91.00	330.00	11,242.35	5,753.06	-31.63	14,451,877.87	1,706,970.40	39.79418649	-80.76306127	
17,300.00	91.00	330.00	11,240.61	5,839.65	-81.62	14,451,964.46	1,706,920.41	39.79442465	-80.76323843	
17,400.00	91.00	330.00	11,238.86	5,926.24	-131.61	14,452,051.05	1,706,870.41	39.79466281	-80.76341561	
17,500.00	91.00	330.00	11,237.12	6,012.83	-181.61	14,452,137.64	1,706,820.42	39.79490097	-80.76359277	
17,600.00	91.00	330.00	11,235.37	6,099.42	-231.60	14,452,224.23	1,706,770.43	39.79513913	-80.76376994	
17,700.00	91.00	330.00	11,233.63	6,186.01	-281.59	14,452,310.82	1,706,720.43	39.79537729	-80.76394711	
17,800.00	91.00	330.00	11,231.89	6,272.59	-331.59	14,452,397.41	1,706,670.44	39.79561544	-80.76412428	
17,900.00	91.00	330.00	11,230.14	6,359.18	-381.58	14,452,483.99	1,706,620.45	39.79585360	-80.76430146	
18,000.00	91.00	330.00	11,228.40	6,445.77	-431.58	14,452,570.58	1,706,570.45	39.79609176	-80.76447863	
18,100.00	91.00	330.00	11,226.65	6,532.36	-481.57	14,452,657.17	1,706,520.46	39.79632991	-80.76465581	
18,200.00	91.00	330.00	11,224.91	6,618.95	-531.56	14,452,743.76	1,706,470.47	39.79656807	-80.76483298	
18,300.00	91.00	330.00	11,223.16	6,705.54	-581.56	14,452,830.35	1,706,420.47	39.79680623	-80.76501016	
18,400.00	91.00	330.00	11,221.42	6,792.13	-631.55	14,452,916.94	1,706,370.48	39.79704438	-80.76518734	
18,500.00	91.00	330.00	11,219.67	6,878.72	-681.54	14,453,003.53	1,706,320.48	39.79728254	-80.76536452	
18,600.00	91.00	330.00	11,217.93	6,965.30	-731.54	14,453,090.12	1,706,270.49	39.79752069	-80.76554170	
18,700.00	91.00	330.00	11,216.19	7,051.89	-781.53	14,453,176.70	1,706,220.50	39.79775885	-80.76571889	
18,800.00	91.00	330.00	11,214.44	7,138.48	-831.52	14,453,263.29	1,706,170.50	39.79799700	-80.76589607	
18,900.00	91.00	330.00	11,212.70	7,225.07	-881.52	14,453,349.88	1,706,120.51	39.79823516	-80.76607325	
19,000.00	91.00	330.00	11,210.95	7,311.66	-931.51	14,453,436.47	1,706,070.52	39.79847331	-80.76625044	
19,100.00	91.00	330.00	11,209.21	7,398.25	-981.50	14,453,523.06	1,706,020.52	39.79871147	-80.76642763	
19,200.00	91.00	330.00	11,207.46	7,484.84	-1,031.50	14,453,609.65	1,705,970.53	39.79894962	-80.76660482	
19,300.00	91.00	330.00	11,205.72	7,571.43	-1,081.49	14,453,696.24	1,705,920.54	39.79918778	-80.76678201	
19,400.00	91.00	330.00	11,203.98	7,658.01	-1,131.48	14,453,782.82	1,705,870.54	39.79942593	-80.76695920	
19,500.00	91.00	330.00	11,202.23	7,744.60	-1,181.48	14,453,869.41	1,705,820.55	39.79966408	-80.76713639	
19,600.00	91.00	330.00	11,200.49	7,831.19	-1,231.47	14,453,956.00	1,705,770.56	39.79990223	-80.76731359	
19,700.00	91.00	330.00	11,198.74	7,917.78	-1,281.46	14,454,042.59	1,705,720.56	39.80014039	-80.76749078	
19,800.00	91.00	330.00	11,197.00	8,004.37	-1,331.46	14,454,129.18	1,705,670.57	39.80037854	-80.76766798	
19,900.00	91.00	330.00	11,195.25	8,090.96	-1,381.45	14,454,215.77	1,705,620.58	39.80061669	-80.76784517	
20,000.00	91.00	330.00	11,193.51	8,177.55	-1,431.44	14,454,302.36	1,705,570.58	39.80085484	-80.76802237	
20,100.00	91.00	330.00	11,191.77	8,264.14	-1,481.44	14,454,388.95	1,705,520.59	39.80109299	-80.76819957	
20,200.00	91.00	330.00	11,190.02	8,350.72	-1,531.43	14,454,475.53	1,705,470.60	39.80133114	-80.76837677	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
20,300.00	91.00	330.00	11,188.28	8,437.31	-1,581.43	14,454,562.12	1,705,420.60	39.80156930	-80.76855398	
20,400.00	91.00	330.00	11,186.53	8,523.90	-1,631.42	14,454,648.71	1,705,370.61	39.80180745	-80.76873118	
20,500.00	91.00	330.00	11,184.79	8,610.49	-1,681.41	14,454,735.30	1,705,320.61	39.80204560	-80.76890838	
20,600.00	91.00	330.00	11,183.04	8,697.08	-1,731.41	14,454,821.89	1,705,270.62	39.80228375	-80.76908559	
20,700.00	91.00	330.00	11,181.30	8,783.67	-1,781.40	14,454,908.48	1,705,220.63	39.80252190	-80.76926280	
20,800.00	91.00	330.00	11,179.56	8,870.26	-1,831.39	14,454,995.07	1,705,170.63	39.80276005	-80.76944001	
20,900.00	91.00	330.00	11,177.81	8,958.85	-1,881.39	14,455,081.66	1,705,120.64	39.80299819	-80.76961721	
21,000.00	91.00	330.00	11,176.07	9,043.43	-1,931.38	14,455,168.24	1,705,070.65	39.80323634	-80.76979443	
21,100.00	91.00	330.00	11,174.32	9,130.02	-1,981.37	14,455,254.83	1,705,020.65	39.80347449	-80.76997164	
21,200.00	91.00	330.00	11,172.58	9,216.61	-2,031.37	14,455,341.42	1,704,970.66	39.80371264	-80.77014885	
21,300.00	91.00	330.00	11,170.83	9,303.20	-2,081.36	14,455,428.01	1,704,920.67	39.80395079	-80.77032607	
21,400.00	91.00	330.00	11,169.09	9,389.79	-2,131.35	14,455,514.60	1,704,870.67	39.80418894	-80.77050328	
21,500.00	91.00	330.00	11,167.34	9,476.38	-2,181.35	14,455,601.19	1,704,820.68	39.80442708	-80.77068050	
21,600.00	91.00	330.00	11,165.60	9,562.97	-2,231.34	14,455,687.78	1,704,770.69	39.80466523	-80.77085772	
21,700.00	91.00	330.00	11,163.86	9,649.56	-2,281.33	14,455,774.37	1,704,720.69	39.80490338	-80.77103494	
21,800.00	91.00	330.00	11,162.11	9,736.14	-2,331.33	14,455,860.95	1,704,670.70	39.80514152	-80.77121216	
21,900.00	91.00	330.00	11,160.37	9,822.73	-2,381.32	14,455,947.54	1,704,620.71	39.80537967	-80.77138938	
22,000.00	91.00	330.00	11,158.62	9,909.32	-2,431.31	14,456,034.13	1,704,570.71	39.80561782	-80.77156660	
22,100.00	91.00	330.00	11,156.88	9,995.91	-2,481.31	14,456,120.72	1,704,520.72	39.80585596	-80.77174382	
22,200.00	91.00	330.00	11,155.13	10,082.50	-2,531.30	14,456,207.31	1,704,470.73	39.80609411	-80.77192105	
22,300.00	91.00	330.00	11,153.39	10,169.09	-2,581.30	14,456,293.90	1,704,420.73	39.80633225	-80.77209828	
22,400.00	91.00	330.00	11,151.65	10,255.68	-2,631.29	14,456,380.49	1,704,370.74	39.80657040	-80.77227550	
22,500.00	91.00	330.00	11,149.90	10,342.27	-2,681.28	14,456,467.08	1,704,320.75	39.80680854	-80.77245273	
22,600.00	91.00	330.00	11,148.16	10,428.85	-2,731.28	14,456,553.66	1,704,270.75	39.80704669	-80.77262996	
22,700.00	91.00	330.00	11,146.41	10,515.44	-2,781.27	14,456,640.25	1,704,220.76	39.80728483	-80.77280720	
22,800.00	91.00	330.00	11,144.67	10,602.03	-2,831.26	14,456,726.84	1,704,170.76	39.80752298	-80.77298443	
22,900.00	91.00	330.00	11,142.92	10,688.62	-2,881.26	14,456,813.43	1,704,120.77	39.80776112	-80.77316166	
23,000.00	91.00	330.00	11,141.18	10,775.21	-2,931.25	14,456,900.02	1,704,070.78	39.80799926	-80.77333890	
23,100.00	91.00	330.00	11,139.44	10,861.80	-2,981.24	14,456,986.61	1,704,020.78	39.80823741	-80.77351613	
23,200.00	91.00	330.00	11,137.69	10,948.39	-3,031.24	14,457,073.20	1,703,970.79	39.80847555	-80.77369337	
23,300.00	91.00	330.00	11,135.95	11,034.98	-3,081.23	14,457,159.79	1,703,920.80	39.80871369	-80.77387061	
23,400.00	91.00	330.00	11,134.20	11,121.56	-3,131.22	14,457,246.37	1,703,870.80	39.80895183	-80.77404785	
23,500.00	91.00	330.00	11,132.46	11,208.15	-3,181.22	14,457,332.96	1,703,820.81	39.80918997	-80.77422509	
23,600.00	91.00	330.00	11,130.71	11,294.74	-3,231.21	14,457,419.55	1,703,770.82	39.80942812	-80.77440233	
23,700.00	91.00	330.00	11,128.97	11,381.33	-3,281.20	14,457,506.14	1,703,720.82	39.80966626	-80.77457958	
23,800.00	91.00	330.00	11,127.23	11,467.92	-3,331.20	14,457,592.73	1,703,670.83	39.80990440	-80.77475682	
23,900.00	91.00	330.00	11,125.48	11,554.51	-3,381.19	14,457,679.32	1,703,620.84	39.81014254	-80.77493407	
24,000.00	91.00	330.00	11,123.74	11,641.10	-3,431.18	14,457,765.91	1,703,570.84	39.81038068	-80.77511132	
24,100.00	91.00	330.00	11,121.99	11,727.69	-3,481.18	14,457,852.50	1,703,520.85	39.81061882	-80.77528857	
24,200.00	91.00	330.00	11,120.25	11,814.27	-3,531.17	14,457,939.09	1,703,470.86	39.81085696	-80.77546582	
24,300.00	91.00	330.00	11,118.50	11,900.86	-3,581.17	14,458,025.67	1,703,420.86	39.81109510	-80.77564307	
24,400.00	91.00	330.00	11,116.76	11,987.45	-3,631.16	14,458,112.26	1,703,370.87	39.81133324	-80.77582032	
24,500.00	91.00	330.00	11,115.01	12,074.04	-3,681.15	14,458,198.85	1,703,320.88	39.81157138	-80.77599757	
24,600.00	91.00	330.00	11,113.27	12,160.63	-3,731.15	14,458,285.44	1,703,270.88	39.81180952	-80.77617483	
24,700.00	91.00	330.00	11,111.53	12,247.22	-3,781.14	14,458,372.03	1,703,220.89	39.81204766	-80.77635208	
24,800.00	91.00	330.00	11,109.78	12,333.81	-3,831.13	14,458,458.62	1,703,170.89	39.81228579	-80.77652934	
24,900.00	91.00	330.00	11,108.04	12,420.40	-3,881.13	14,458,545.21	1,703,120.90	39.81252393	-80.77670660	
25,000.00	91.00	330.00	11,106.29	12,506.98	-3,931.12	14,458,631.79	1,703,070.91	39.81276207	-80.77688386	
25,100.00	91.00	330.00	11,104.55	12,593.57	-3,981.11	14,458,718.38	1,703,020.91	39.81300021	-80.77706112	
25,200.00	91.00	330.00	11,102.80	12,680.16	-4,031.11	14,458,804.97	1,702,970.92	39.81323834	-80.77723838	
25,300.00	91.00	330.00	11,101.06	12,766.75	-4,081.10	14,458,891.56	1,702,920.93	39.81347648	-80.77741564	
25,400.00	91.00	330.00	11,099.32	12,853.34	-4,131.09	14,458,978.15	1,702,870.93	39.81371462	-80.77759291	
25,500.00	91.00	330.00	11,097.57	12,939.93	-4,181.09	14,459,064.74	1,702,820.94	39.81395275	-80.77777017	
25,600.00	91.00	330.00	11,095.83	13,026.52	-4,231.08	14,459,151.33	1,702,770.95	39.81419089	-80.77794744	
25,700.00	91.00	330.00	11,094.08	13,113.10	-4,281.07	14,459,237.92	1,702,720.95	39.81442903	-80.77812471	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Old Crow N-19 HU (slot Q)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1265.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1265.00usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
25,800.00	91.00	330.00	11,092.34	13,199.69	-4,331.07	14,459,324.50	1,702,670.96	39.81466716	-80.77830198
25,900.00	91.00	330.00	11,090.59	13,286.28	-4,381.06	14,459,411.09	1,702,620.97	39.81490530	-80.77847925
26,000.00	91.00	330.00	11,088.85	13,372.87	-4,431.05	14,459,497.68	1,702,570.97	39.81514343	-80.77865652
26,100.00	91.00	330.00	11,087.11	13,459.46	-4,481.05	14,459,584.27	1,702,520.98	39.81538157	-80.77883379
26,200.00	91.00	330.00	11,085.36	13,546.05	-4,531.04	14,459,670.86	1,702,470.99	39.81561970	-80.77901107
26,300.00	91.00	330.00	11,083.62	13,632.64	-4,581.03	14,459,757.45	1,702,420.99	39.81585784	-80.77918834
26,335.34	91.00	330.00	11,083.00	13,663.24	-4,598.70	14,459,788.05	1,702,403.32	39.81594200	-80.77925100
PBHL/TD 26335.34 MD/11083.00 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-19 HU - hit/miss target - Shape - Point	0.00	0.00	11,083.00	13,663.24	-4,598.70	14,459,788.05	1,702,403.32	39.81594200	-80.77925100
LP Old Crow N-19 HU - plan misses target center by 0.01usft at 12405.16usft MD (11325.99 TVD, 1601.27 N, 2365.48 E) - Point	0.00	0.00	11,326.00	1,601.27	2,365.48	14,447,726.08	1,709,367.50	39.78276681	-80.75456791

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,800.00	1,800.00	0.00	0.00	KOP Begin 1°/100' build	
2,100.00	2,099.86	-7.85	0.00	Begin 3.00° tangent	
2,700.00	2,699.04	-39.25	0.00	Begin 1°/100' drop	
3,000.00	2,998.90	-47.11	0.00	Begin vertical hold	
4,501.10	4,500.00	-47.11	0.00	Begin 2°/100' build	
5,771.66	5,729.31	35.96	264.42	Begin 25.41° tangent	
10,993.43	10,445.89	707.54	2,402.14	Begin 6°/100' build/turn	
11,827.29	11,134.82	1,103.94	2,545.27	Begin 8°/100' build/turn	
12,405.16	11,325.99	1,601.27	2,365.48	Begin 91.00° lateral	
26,335.34	11,083.00	13,663.24	-4,598.70	PBHL/TD 26335.34 MD/11083.00 TVD	

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Fish Creek Quadrangle Powhatan Point 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

Company Official Signature Jim Pancake

Company Official (Typed Name) Jim Pancake

Company Official Title Vice President, Geoscience

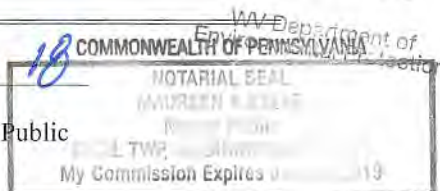
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Office of Oil and Gas
FEB 26 2019

Subscribed and sworn before me this 26 day of SEPT., 2018

Maureen A Stead

Notary Public

My commission expires 4/28/19



Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 19.18 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]
Comments:

Title: Oil and Gas Inspector

Date: 2/20/19

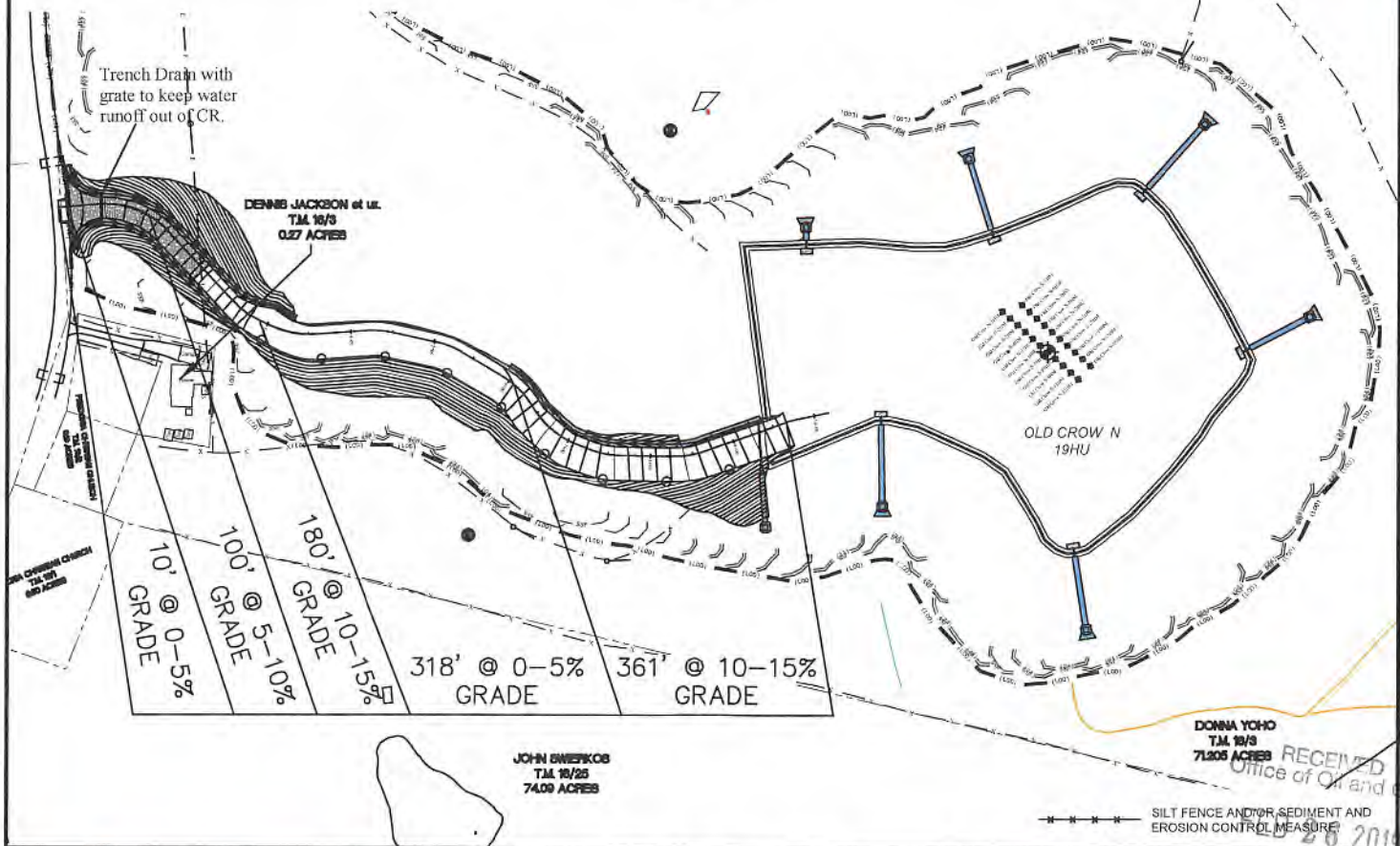
Field Reviewed? (X) Yes () No

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WV Department of Environmental Protection

PROPOSED OLD CROW N - 19HU

NOTES:

1. DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE OLD CROW N SITE PLAN PREPARED BY KELLEY SURVEYING, FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



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www.slsurveyors.com

TOPO SECTION:		OPERATOR:	
POWHATAN POINT 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	FRANKLIN		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8769	01/23/19	NONE

WV Department of
Environmental Protection
TUG HILL
OPERATING



Well Site Safety Plan

Tug Hill Operating, LLC

5/14/19

Well Name: Old Crow N-19HU

Pad Location: Old Crow Pad

Marshall County, West Virginia

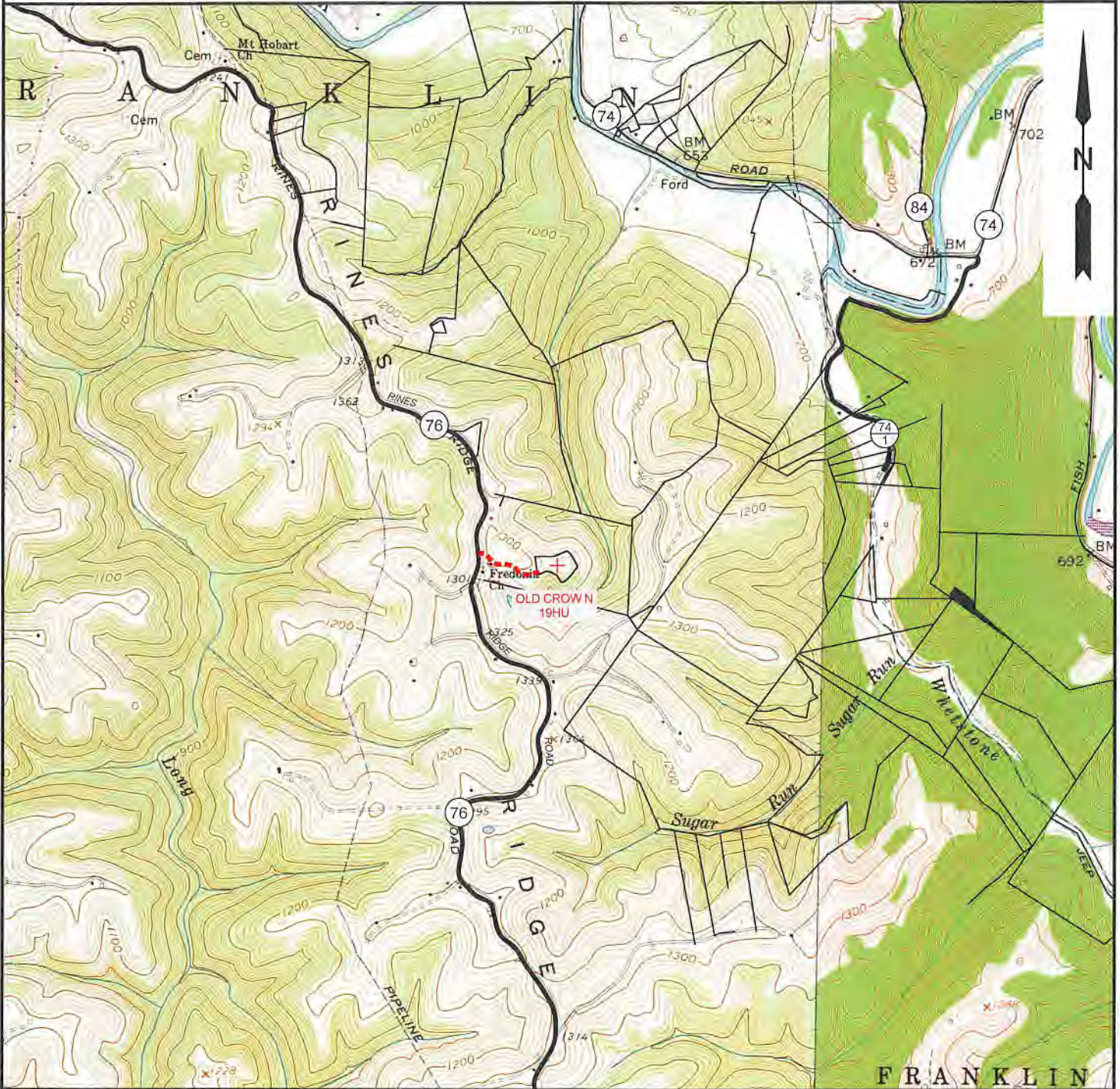
UTM (meters), NAD83, Zone 17:

Northing: 4,403,187.65

Easting: 520,295.26

Updated May 2019

PROPOSED OLD CROWN - 19HU



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT
PROCTOR, WV

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 37°39'00" W AT 29,404.13' FROM OLD CROWN - 19HU SURFACE LOCATION

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TOPO SECTION:		OPERATOR:	
GLEN EASTON & POWHATAN POINT 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	FRANKLIN	380 SOUTHPOINTE BLVD	
DRAWN BY		SUITE 200	
K.G.M.		CANONSBURG, PA 15317	
JOB NO.	DATE	SCALE	
8796	01/23/19	1" = 2000'	

WV Department of Environmental Protection
TUG HILL OPERATING

**OLD CROW N LEASE
UTICA UNIT - 484.05 AC ±
WELL 19HU
TUG HILL OPERATING**

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 00°57' W	47.13'
L2	N 67°46' W	1296.13'
L3	S 83°32' W	993.12'

MND 20 AU
47-051-02011
MND 20 BU
47-051-02012



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

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

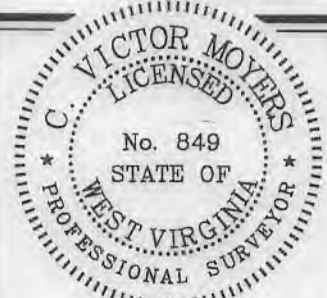
NAD'83 GRID NORTH

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	5-10-14	100.00
D	JOHN SWIERKOS	5-16-5	52.07
E	JOHN SWIERKOS	5-16-6	134.05
F	LOUIS AULENBAUCHER	5-10-22	6.461
G	JOHN PAUL SMITH, JR., ET AL	5-10-12.1	8.86
H	LOUIS DELBERT VAN SCYOC	5-10-10	24.50
I	HERBERT M. AULENBAUCHER, JR.	5-10-9	141.43
J	HERBERT M. AULENBAUCHER, JR.	5-10-3	225.50
K	FISH CREEK-WV DIVISION OF NATURAL RESOURCES	N/A	N/A
L	JASON J. STEED	5-9-13.2	135.61
M	WILLIAM A. PRASCIK, ET AL	5-10-2	52.00
N	EDWIN C. MILLER	5-9-20	51.64
O	EDWIN C. MILLER	5-10-1	49.96
P	JOHN F. KAZEMKA	5-9-27	4.02
Q	EDWIN C. MILLER	5-9-26	1.00
R	ALBERT F. KAZEMKA	5-9-22	0.50
S	ALBERT F. KAZEMKA	5-9-21	100' PCL
T	MARK S. STOCKLASK	5-9-17.1	1.187
U	MALCOMB H. BROWNLEE, ET AL	5-9-18	23,300 SQ FT
V	DENNIS P. CADMUS	5-9-42	5.42
W	MARK STEPHEN STOCKLASK	5-9-19	2.38
X	DELBERT K. & LINDA K. MYERS	5-9-23	7.00
Y	DELBERT K. & LINDA K. MYERS	5-9-25	14.49
Z	DENNIS P. CADMUS	5-9-24	21AC 49P
AA	DENNIS P. CADMUS	5-9-39	9.50
BB	KEITH D. DANIELS, ET UX	5-9-33	40.331
CC	LLOYD C. & JUDITH C. ARNOLD	5-9-41	93.00
DD	LLOYD C. & JUDITH C. ARNOLD	5-9-4	18.854
EE	SAMUEL L. CANTERBURY, ET UX	5-9-4.19	2.078
FF	SAMUEL L. CANTERBURY, ET UX	5-9-4.17	0.500
GG	PAUL G. BROWN	5-9-4.18	0.657
HH	PAUL G. BROWN	5-9-4.15	0.500
II	PAUL G. BROWN	5-9-4.14	0.500
JJ	DEBORAH S. MIDCAP	5-9-4.10	0.819
KK	LLOYD C. & JUDITH C. ARNOLD	5-9-35	47.00
LL	THOMAS MIDCAR, ET UX	5-9-4.8	0.376
MM	GEORGE F. MINOR, ET AL - LIFE	5-9-35.1	0.641
NN	JAMES R. LEGG ESTATE	5-9-2	23.141
OO	KENNETH E. WHITE, ET UX	5-9-2.2	0.359
PP	JEFFREY L. LEGG ESTATE	5-9-2.1	20.5
QQ	EDWIN C. MILLER	5-8-7	180.31

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 482-5634
www.slsenv.com

P.S. 849 *C. Victor Moyers*

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 488,123.26 E. 1,613,543.55
 NAD'83 GEO. LAT-(N) 39.778387 LONG-(W) 80.7763003
 NAD'83 UTM (M) N. 4,403,187.65 E. 520,295.28
LANDING POINT
 NAD'83 S.P.C.(FT) N. 469,685.3 E. 1,615,936.3
 NAD'83 GEO. LAT-(N) 39.782767 LONG-(W) 80.754568
 NAD'83 UTM (M) N. 4,403,675.7 E. 521,016.3
BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 481,888.1 E. 1,609,172.2
 NAD'83 GEO. LAT-(N) 39.815942 LONG-(W) 80.779251
 NAD'83 UTM (M) N. 4,407,352.2 E. 518,893.6



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

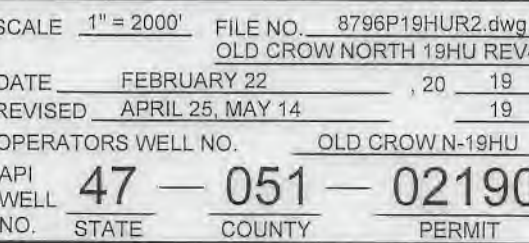
(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

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

SCALE 1" = 2000' FILE NO. 8796P19HUR2.dwg
 OLD CROW NORTH 19HU REV4
 DATE FEBRUARY 22, 2019
 REVISED APRIL 25, MAY 14, 2019
 OPERATORS WELL NO. OLD CROW N-19HU
 API WELL NO. 47-051-02190
 NO. STATE COUNTY PERMIT

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



CURVE TABLE

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	57.50'	110.44'	N 50°53' E	56.85'
C2	74.82'	198.86'	N 21°05' E	74.38'
C3	174.43'	508.37'	N 02°06' W	173.58'
C4	374.35'	1231.73'	N 20°50' W	372.91'

**OLD CROW N LEASE
UTICA UNIT - 484.05 AC±
WELL 19HU
TUG HILL OPERATING**

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

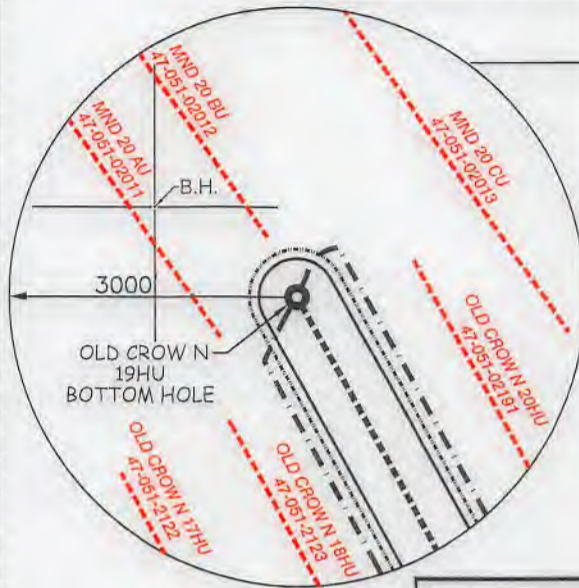
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 468,123.26 E. 1,613,543.55
 NAD'83 GEO. LAT-(N) 39.778387 LONG-(W) 80.763003
 NAD'83 UTM (M) N. 4,403,187.65 E. 520,295.26

LANDING POINT
 NAD'83 S.P.C.(FT) N. 469,685.3 E. 1,615,936.3
 NAD'83 GEO. LAT-(N) 39.782767 LONG-(W) 80.754568
 NAD'83 UTM (M) N. 4,403,675.7 E. 521,016.3

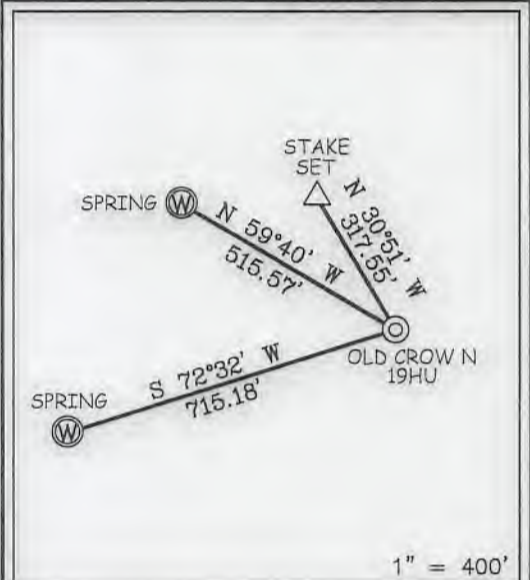
BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 481,866.1 E. 1,609,172.2
 NAD'83 GEO. LAT-(N) 39.815942 LONG-(W) 80.779251
 NAD'83 UTM (M) N. 4,407,352.2 E. 518,893.6

T.H. LONGITUDE 80°45'00"
B.H. LONGITUDE 80°45'00"
4,838' T.H.

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
5-9-4.3	HARRY E. JR. & MICHELA KARR	1.471
5-9-4.5	DYLAN AULENBACHER	0.991
5-9-4.7	FRANCIS D. BARR, ET UX	0.481
5-9-4.9	THOMAS MIDCAP, ET UX	0.375
5-9-4.11	GARY PORTER	1.00
5-9-4.12	SAMUEL L. & DEBRA N. CANTERBURY	0.650
5-9-4.13	SAMUEL LEB CANTERBURY, ET UX	0.9284
5-9-4.16	SAMUEL L. & DEBRA N. CANTERBURY	0.517
5-9-13	KAREN M. KAZEMKA (N.K.A. KAREN M. WILSON)	3.69
5-9-14	DENNIS P. CADMUS	136 POLES
5-9-15	DENNIS P. CADMUS	3.85
5-9-16	SHEENA ROSE	1.65
5-9-17	DENNIS P. CADMUS	28.063
5-9-28	WILLIAM N. & DELORES E. MCDONOUGH - LIFE	4.01
5-9-29	JAMES M. & ROBERTA L. STERN	3.1777
5-9-30	MATTHEW B. GRIFFITH	2.708
5-9-30.1	DAVID JR. & MELISSA LOVE	2.518
5-9-30.3	MATTHEW B. GRIFFITH	0.82
5-9-32	MILLARD JUNIOR BONNETTE, ET UX	2.321
5-9-32.3	RUBY M. HENRY ESTATE	0.552
5-9-32.4	DAVID D. & CHRISTINE S. DANIELS	1.025
5-9-32.5	GARNET D. MIDCAP	270x390'
5-9-32.8	TIMOTHY Q. HOYT, ET UX	0.711
5-9-32.10	TIMOTHY Q. HOYT, ET UX	0.588
5-9-32.11	TIMOTHY Q. HOYT, ET UX	1.717
5-9-32.12	JOHN DRAKE ALBAUGH	1.09
5-9-33.1	KEITH D. & BEVERLY A. DANIELS	1.00
5-9-33.2	KEITH D. & BEVERLY A. DANIELS	1.534
5-9-33.4	DAVID D. & CHRISTINE S. DANIELS	1.025
5-9-36	FRANK T. & ANNA M. WALKER	1.55
5-9-37	FRANK T. & ANNA M. WALKER	10.857
5-9-38	SHIRLEY A. HILL ESTATE	3.331
5-9-38.10	ROBERT S. COWGILL	0.920
5-9-40	SHIRLEY A. HILL ESTATE	3.92
5-10-4.2	JACK E. RECTOR	2.887
5-10-4.3	ANTHONY A. & KAREN L. ANKROM	5.697
5-10-4.7	LINDA BECHTOLD, ET AL	2.110
5-10-4.8	SAMUEL FRANKLIN	1.8808
5-10-4.9	JAMES E. KAREN M. WILSON	0.8692
5-10-4.10	SHEENA ROSE	0.803
5-10-4.11	JASON E. BONNETTE	1.50
5-10-11	JOSEPH LEE CROW	LOT
5-10-19	BRADLEY L. & CONNIE L. HUBBARD	3.209
5-10-20	LOUIS AULENBAUCHER	3.554
5-10-21	LOUIS AULENBAUCHER	3.667



REFERENCES



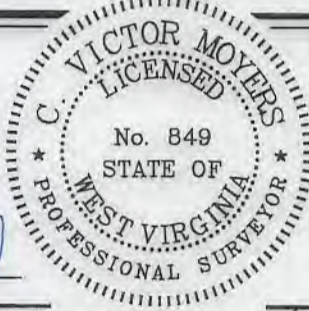
NOTES ON SURVEY

- 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-19HU (47-051-02190) 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-17HU (47-051-02122),
 OLD CROW N-18HU (47-051-02123),
 MND20 AU (47-051-02011),
 MND20 BU (47-051-02012),
 MND20 CU (47-051-02013),
 MND20 DU (47-051-02014) &
 PROPOSED OLD CROW N-20HU (47-051-02191).
- THE ASSESSMENT OF THE 1/10 ACRE LOT, OWNED BY JASON J. STEED AND DESCRIBED AS THE SECOND PARCEL IN DEED BOOK 643 PAGE 319 AND CORRECTIVE DEED 643 PAGE 300, IS NOT CURRENTLY ACCOUNTED FOR WITHIN THE 135.61 ACRE ASSESSMENT OF SURFACE TAX MAP 5-9-13.2



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 FEBRUARY 22, 2019
 REVISED APRIL 25, MAY 14, 2019
 OPERATORS WELL NO. OLD CROW N-19HU
 API WELL NO. 47 - 051 - 02190 HGA
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8796P19HUR2.dwg
OLD CROW NORTH 19HU REV4
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

WELL TYPE: OIL GAS INJECTION WASTE DISPOSAL "GAS" PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: GROUND = 1,286.80' ELEVATION PROPOSED = 1,264.99' 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: 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: 11,547' / TMD: 26,335'

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

COUNTY NAME
PERMIT

OLD CROW N LEASE
UTICA UNIT - 484.05 AC ±
WELL 19HU
TUG HILL OPERATING



Table with columns: NO., Lease ID, Tag, Parcel, Grantor, Lessor, Etc., Deed Book/Page. Contains lease data for 201-278 and 279-400.

Table with columns: NO., Lease ID, Tag, Parcel, Grantor, Lessor, Etc., Deed Book/Page. Contains lease data for 301-400.

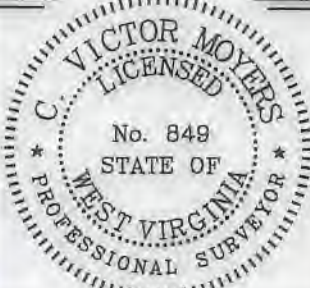
FILE NO. 8796P19HUR2.dwg
OLD CROW NORTH 19HU REV4

DATE FEBRUARY 22 20 19

REVISED APRIL 25, MAY 14 20 19

OPERATORS WELL NO. OLD CROW N-19HU

API WELL NO. 47 - 051 - 02190
STATE COUNTY PERMIT # GA



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



P.S. 849
C. Victor Moyers

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

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

COUNTY NAME

PERMIT

**OLD CROW N LEASE
UTICA UNIT - 484.05 AC±
WELL 19HU
TUG HILL OPERATING**



NO.	Lease ID	Tag	Parcel	Grantor, Lessor, Etc.	Deed Book/Page
403	CVX935969	MM	5-9-35.1	TIMOTHY HUFF ET UX	864 47
404	CVX936053	MM	5-9-35.1	LLOYD C. ARNOLD ET UX	864 39
405	CVX936054	MM	5-9-35.1	MARY JO CRONIN	864 43
406	CVX936058	MM	5-9-35.1	RICHARD KURPILET UX	863 594
407	CVX936061	MM	5-9-35.1	CLARA MAE CLIFTON	853 426
408	CVX936062	MM	5-9-35.1	GEORGE EDWARDS ET UX	853 418
409	CVX936112	MM	5-9-35.1	DONNA FAE KYLE	853 449
410	CVX936113	MM	5-9-35.1	JUDITH MAY CONNER	853 445
411	CVX866958	MM	5-9-35.1	ANITA L. SLOUGH ET AL	696 7
412	CVX866959	MM	5-9-35.1	PAUL SCHEIBELHOOD ET AL	695 629
413	Q081124002	NN	5-9-2	JAMES REDMAN LEGG II ET AL	879 580
414	Q080154002	OO	5-9-2.2	KENNETH EUGENE WHITE AND LESLIE A WHITE	879 577
415	Q081123002	PP	5-9-2.1	JEFFREY L LEGG	879 575
416	10*21546	QQ	5-8-7	EDWIN C MILLER AND KIMBERLY ANN MILLER	957 257

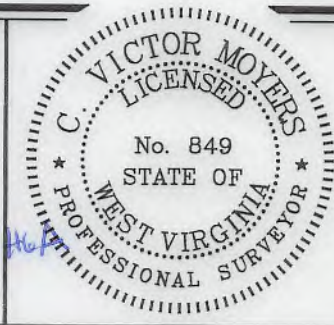
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DATE FEBRUARY 22, 20 19

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API WELL NO. 47 — 051 — 02190
STATE COUNTY PERMIT



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



P.S. C. Victor Moyers
849

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

COUNTY NAME

PERMIT

WW-6A1
(5/13)

Operator's Well No. Old Crow N-19HU

**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 Miller*
 Its: Permitting Specialist - Appalachia Region

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*21468	5-16-25	A	JOHN A SWIERKOS	TH EXPLORATION LLC	1/8+	953 317	N/A	N/A	N/A	N/A	N/A	N/A
10*19340	5-16-3	B	DONNA V YOHO	GASTAR EXPLORATION USA INC	1/8+	665 407	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 23/353	Gastar & Atinum 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	C	CHESTNUT HOLDINGS INC	GASTAR EXPLORATION INC	1/8+	836 119	N/A	N/A	N/A	N/A	Gastar Exploration Inc to Atinum Marcellus I LLC: 32/428	Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14919	5-16-5	D	CHESTNUT HOLDINGS INC	GASTAR EXPLORATION INC	1/8+	836 117	N/A	N/A	N/A	N/A	Gastar Exploration Inc to Atinum Marcellus I LLC: 32/428	Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*21468	5-16-6	E	JOHN A SWIERKOS	TH EXPLORATION LLC	1/8+	953 317	N/A	N/A	N/A	N/A	N/A	N/A
10*18396	5-10-22	F	LOUIS AULENBACHER	TH EXPLORATION LLC	1/8+	932 468	N/A	N/A	N/A	N/A	N/A	N/A
10*21468	5-10-22	F	JOHN A SWIERKOS	TH EXPLORATION LLC	1/8+	953 317	N/A	N/A	N/A	N/A	N/A	N/A
10*21468	5-10-12.1	G	JOHN A SWIERKOS	TH EXPLORATION LLC	1/8+	953 317	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.261.1	5-10-12.1	G	WILLIAM HUBBARD	TH EXPLORATION LLC	1/8+	882 536	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.261.2	5-10-12.1	G	BONNIE G ZELIC	TH EXPLORATION LLC	1/8+	882 539	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.261.3	5-10-12.1	G	JOHN P SMITH JR	TH EXPLORATION LLC	1/8+	882 542	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.261.4	5-10-12.1	G	BRADLEY L HUBBARD AND CONNIE L HUBBARD	TH EXPLORATION LLC	1/8+	898 573	N/A	N/A	N/A	N/A	N/A	N/A
10*21468	5-10-10	H	JOHN A SWIERKOS	TH EXPLORATION LLC	1/8+	953 317	N/A	N/A	N/A	N/A	N/A	N/A
10*22295	5-10-10	H	RACHEL B OSTRANDER	FOSSIL CREEK OHIO, LLC	1/8+	822 210	N/A	N/A	N/A	Fossil Creek Ohio LLC to Gulfport Energy Corp.: 34/366	Gulfport Energy Corp & Fossil Creek Ohio LLC to American Petroleum Partners Operating LLC: 36/588	American Petroleum Partners Operating LLC to TH Exploration LLC: 40/408
10*22319	5-10-10	H	SHARON G VAN SCYOC	FOSSIL CREEK OHIO, LLC	1/8+	822 204	N/A	N/A	N/A	Fossil Creek Ohio LLC to Gulfport Energy Corp.: 34/366	Gulfport Energy Corp & Fossil Creek Ohio LLC to American Petroleum Partners Operating LLC: 36/588	American Petroleum Partners Operating LLC to TH Exploration LLC: 40/408
10*26004	5-10-10	H	VAN SCYOC LOUIS ET UX	AB RESOURCES LLC	1/8+	697 461	N/A	AB Resources LLC to NPAR LLC: 25/484	Chief Exploration & Development LLC & Radler 2000 LP: 24/382	Chief Exploration & Development LLC & Radler 2000 LP, et al to Chevron USA Inc: 25/1 & 25/105	NPAR LLC to Chevron USA Inc: 765/332	Chevron USA Inc to TH Exploration LLC: 43/95
10*19249	5-10-9	I	HERBERT M AULENBACHER	CHEVRON USA INC	1/8+	914 551	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*14918	5-10-3	J	CHESTNUT HOLDINGS INC	GASTAR EXPLORATION INC	1/8+	836 115	N/A	N/A	N/A	N/A	Gastar Exploration Inc to Atinum Marcellus I LLC: 32/428	Gastar Exploration Inc to TH Exploration II LLC: 36/9

WW-6A1 Supplement

Operator's Well No. Old Crow N - 19HU

RECEIVED
Office of Oil and Gas
APR 26 2019
WV Department of Environmental Protection

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
Q091960000	FISH CREEK	K	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	NOBLE ENERGY INC	1/8+	865 558	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*47051.170.0	5-9-13.2	L	JASON J STEED	TH EXPLORATION LLC	1/8+	865 344	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.260.0	5-10-2	M	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*47051.127.1	5-9-20	N	EDWIN C MILLER AND KIMBERLY ANN MILLER	TH EXPLORATION LLC	1/8+	885 61	N/A	N/A	N/A	N/A	N/A	N/A
10*18970	5-10-1	O	DONALD E BERISFORD	TH EXPLORATION LLC	1/8+	941 287	N/A	N/A	N/A	N/A	N/A	N/A
10*19036	5-10-1	O	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	O	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	O	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	O	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	O	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	O	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	O	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	O	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	O	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	O	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	O	ALYSIA 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	O	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	O	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	O	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	O	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	O	JESSICA M CREMEANS	TH EXPLORATION LLC	1/8+	984 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22641	5-10-1	O	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	O	BILLIE 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	O	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	O	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	O	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	O	GREG STEWART	TH EXPLORATION LLC	1/8+	1020 351	N/A	N/A	N/A	N/A	N/A	N/A
10*24514	5-10-1	O	GAYLE F BRITTON TRUST	TH EXPLORATION LLC	1/8+	1026 253	N/A	N/A	N/A	N/A	N/A	N/A
10*24515	5-10-1	O	AARON M BROWN	TH EXPLORATION LLC	1/8+	1024 269	N/A	N/A	N/A	N/A	N/A	N/A
10*24525	5-10-1	O	DAVID E BOWYER	TH EXPLORATION LLC	1/8+	1027 285	N/A	N/A	N/A	N/A	N/A	N/A
10*24554	5-10-1	O	JOSH D AND LAUREN K HALE	TH EXPLORATION LLC	1/8+	1024 254	N/A	N/A	N/A	N/A	N/A	N/A
10*24555	5-10-1	O	DAVID W HALE JR	TH EXPLORATION LLC	1/8+	1024 257	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*24556	5-10-1	O	BETTY L KEAN	TH EXPLORATION LLC	1/8+	1024	263	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.1	5-10-1	O	EDWIN C MILLER AND KIMBERLY ANN MILLER	TH EXPLORATION LLC	1/8+	885	61	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.2	5-10-1	O	JANE S BLANEY	TH EXPLORATION LLC	1/8+	898	547	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.3	5-10-1	O	JOANNE SCHALL FOSTER	TH EXPLORATION LLC	1/8+	895	29	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.4	5-10-1	O	RAYMOND E SCHALL	TH EXPLORATION LLC	1/8+	898	550	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.5	5-10-1	O	FIRST CHRISTIAN CHURCH OF MOUNDSVILLE BY ROGER FRANCIS AND ROBERT ALBERT TRUSTEES	TH EXPLORATION LLC	1/8+	898	600	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.6	5-10-1	O	BARBARA GODWIN AND CHARLES RODNEY GODWIN	TH EXPLORATION LLC	1/8+	902	419	N/A	N/A	N/A	N/A	N/A	N/A
PENDING	5-10-1	O	FORREST O MILLER	HG ENERGY II APPALACHIA, LLC	1/8+	1029	581	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	O	GLEN DALE UNITED METHODIST CHURCH	AMERICAN PETROLEUM PARTNERS OPERATING LLC	1/8+	1031	610	N/A	N/A	N/A	N/A	N/A	American Petroleum Partners Operating LLC to TH Exploration LLC: Recordation Pending
10*17512	5-9-27	P	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	917	68	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-27	P	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	916	208	N/A	N/A	N/A	N/A	N/A	N/A
10*17916	5-9-27	P	MARY E BISHOP	TH EXPLORATION LLC	1/8+	927	167	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-27	P	GERALD L BISHOP III	TH EXPLORATION, LLC	1/8+	943	10	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-27	P	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938	476	N/A	N/A	N/A	N/A	N/A	N/A
10*18836	5-9-27	P	JOHN W MIDCAP AND ELDA FAYE MIDCAP	TH EXPLORATION LLC	1/8+	941	450	N/A	N/A	N/A	N/A	N/A	N/A
10*19572	5-9-27	P	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	943	12	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-27	P	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960	173	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-27	P	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960	33	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-27	P	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
10*22044	5-9-27	P	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960	421	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-27	P	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962	200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-27	P	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962	532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-27	P	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962	575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-27	P	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964	510	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-27	P	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972	50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-27	P	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966	628	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-27	P	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966	469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-27	P	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968	226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-27	P	DEAN S CARR	TH EXPLORATION LLC	1/8+	977	364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-27	P	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009	98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-27	P	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027	187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-27	P	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027	562	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-27	P	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031	544	N/A	N/A	N/A	N/A	N/A	N/A

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Q090332002	5-9-27	P	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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
Q090332003	5-9-27	P	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
Q090332007	5-9-27	P	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
10*17512	5-9-26	Q	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	917 68	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-26	Q	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	916 208	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-26	Q	KENNETH ALLEN AND CARLA JO ALLEN	TH EXPLORATION LLC	1/8+	916 129	N/A	N/A	N/A	N/A	N/A	N/A
10*17916	5-9-26	Q	MARY E BISHOP	TH EXPLORATION LLC	1/8+	927 167	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-26	Q	GERALD L BISHOP III	TH EXPLORATION, LLC	1/8+	943 10	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-26	Q	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*19572	5-9-26	Q	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	943 12	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-26	Q	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-26	Q	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-26	Q	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-26	Q	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-26	Q	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-26	Q	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-26	Q	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-26	Q	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-26	Q	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-26	Q	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-26	Q	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-26	Q	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-26	Q	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-26	Q	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-26	Q	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-26	Q	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.127.1	5-9-26	Q	EDWIN C MILLER AND KIMBERLY ANN MILLER	TH EXPLORATION LLC	1/8+	885 61	N/A	N/A	N/A	N/A	N/A	N/A
Q090332002	5-9-26	Q	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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

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Q090332003	5-9-26	Q	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
Q090332007	5-9-26	Q	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
10*17512	5-9-22	R	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	917 68	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-22	R	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	916 208	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-22	R	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
10*17916	5-9-22	R	MARY E BISHOP	TH EXPLORATION LLC	1/8+	927 167	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-22	R	GERALD L BISHOP III	TH EXPLORATION, LLC	1/8+	943 10	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-22	R	DWVG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*19107	5-9-22	R	ALBERT F KAZEMKA	CHEVRON USA INC	1/8+	853 73	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 40/127
10*19572	5-9-22	R	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	943 12	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-22	R	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-22	R	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-22	R	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-22	R	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-22	R	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-22	R	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-22	R	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-22	R	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-22	R	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-22	R	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-22	R	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-22	R	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-22	R	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-22	R	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-22	R	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-22	R	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332002	5-9-22	R	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332003	5-9-22	R	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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

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Q090332007	5-9-22	R	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
10*18796	5-9-21	S	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*21414	5-9-21	S	CHARLES R STOCKTON AND BETTY M HUDSON	TH EXPLORATION LLC	1/8+	959 310	N/A	N/A	N/A	N/A	N/A	N/A
10*21473	5-9-21	S	MARY E BISHOP	TH EXPLORATION LLC	1/8+	957 232	N/A	N/A	N/A	N/A	N/A	N/A
10*21475	5-9-21	S	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	957 124	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-21	S	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21547	5-9-21	S	GARY A MILLER AND MARCELLE T MILLER	TH EXPLORATION LLC	1/8+	952 370	N/A	N/A	N/A	N/A	N/A	N/A
10*21548	5-9-21	S	JEANNE M MILLER	TH EXPLORATION LLC	1/8+	952 386	N/A	N/A	N/A	N/A	N/A	N/A
10*21608	5-9-21	S	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	959 313	N/A	N/A	N/A	N/A	N/A	N/A
10*21719	5-9-21	S	ROBERT A MILLER	TH EXPLORATION LLC	1/8+	952 389	N/A	N/A	N/A	N/A	N/A	N/A
10*21835	5-9-21	S	KENNETH ALLEN AND CARLA JO ALLEN	TH EXPLORATION LLC	1/8+	962 572	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-21	S	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-21	S	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22045	5-9-21	S	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	961 417	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-21	S	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-21	S	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-21	S	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-21	S	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22451	5-9-21	S	GERALD L BISHOP III	TH EXPLORATION LLC	1/8+	964 31	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-21	S	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-21	S	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22566	5-9-21	S	KENNETH A MILLER	TH EXPLORATION LLC	1/8+	964 233	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-21	S	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-21	S	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-21	S	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-21	S	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-21	S	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-21	S	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-21	S	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332001	5-9-21	S	WILLIAM E MILLER AND KAREN S MILLER	NOBLE ENERGY INC	1/8+	858 256	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332002	5-9-21	S	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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

51-02190

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Q090332003	5-9-21	S	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
Q090332007	5-9-21	S	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
10*18796	5-9-17.1	T	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*21414	5-9-17.1	T	CHARLES R STOCKTON AND BETTY M HUDSON	TH EXPLORATION LLC	1/8+	959 310	N/A	N/A	N/A	N/A	N/A	N/A
10*21473	5-9-17.1	T	MARY E BISHOP	TH EXPLORATION LLC	1/8+	957 232	N/A	N/A	N/A	N/A	N/A	N/A
10*21475	5-9-17.1	T	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	957 124	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-17.1	T	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21547	5-9-17.1	T	GARY A MILLER AND MARCELLE T MILLER	TH EXPLORATION LLC	1/8+	952 370	N/A	N/A	N/A	N/A	N/A	N/A
10*21548	5-9-17.1	T	JEANNE M MILLER	TH EXPLORATION LLC	1/8+	952 386	N/A	N/A	N/A	N/A	N/A	N/A
10*21608	5-9-17.1	T	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	959 313	N/A	N/A	N/A	N/A	N/A	N/A
10*21719	5-9-17.1	T	ROBERT A MILLER	TH EXPLORATION LLC	1/8+	952 389	N/A	N/A	N/A	N/A	N/A	N/A
10*21835	5-9-17.1	T	KENNETH ALLEN AND CARLA JO ALLEN	TH EXPLORATION LLC	1/8+	962 572	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-17.1	T	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-17.1	T	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22045	5-9-17.1	T	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	961 417	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-17.1	T	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-17.1	T	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-17.1	T	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-17.1	T	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22451	5-9-17.1	T	GERALD L BISHOP III	TH EXPLORATION LLC	1/8+	964 31	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-17.1	T	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-17.1	T	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22566	5-9-17.1	T	KENNETH A MILLER	TH EXPLORATION LLC	1/8+	964 233	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-17.1	T	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-17.1	T	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-17.1	T	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-17.1	T	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-17.1	T	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-17.1	T	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-17.1	T	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332001	5-9-17.1	T	WILLIAM E MILLER AND KAREN S MILLER	NOBLE ENERGY INC	1/8+	858 256	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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

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Q090332002	5-9-17.1	T	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332003	5-9-17.1	T	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
Q090332007	5-9-17.1	T	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
10*18796	5-9-18	U	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*21414	5-9-18	U	CHARLES R STOCKTON AND BETTY M HUDSON	TH EXPLORATION LLC	1/8+	959 310	N/A	N/A	N/A	N/A	N/A	N/A
10*21473	5-9-18	U	MARY E BISHOP	TH EXPLORATION LLC	1/8+	957 232	N/A	N/A	N/A	N/A	N/A	N/A
10*21475	5-9-18	U	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	957 124	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-18	U	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21547	5-9-18	U	GARY A MILLER AND MARCELLE T MILLER	TH EXPLORATION LLC	1/8+	952 370	N/A	N/A	N/A	N/A	N/A	N/A
10*21548	5-9-18	U	JEANNE M MILLER	TH EXPLORATION LLC	1/8+	952 386	N/A	N/A	N/A	N/A	N/A	N/A
10*21608	5-9-18	U	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	959 313	N/A	N/A	N/A	N/A	N/A	N/A
10*21719	5-9-18	U	ROBERT A MILLER	TH EXPLORATION LLC	1/8+	952 389	N/A	N/A	N/A	N/A	N/A	N/A
10*21835	5-9-18	U	KENNETH ALLEN AND CARLA JO ALLEN	TH EXPLORATION LLC	1/8+	962 572	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-18	U	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-18	U	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22045	5-9-18	U	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	961 417	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-18	U	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-18	U	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-18	U	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-18	U	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22451	5-9-18	U	GERALD L BISHOP III	TH EXPLORATION LLC	1/8+	964 31	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-18	U	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-18	U	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22566	5-9-18	U	KENNETH A MILLER	TH EXPLORATION LLC	1/8+	964 233	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-18	U	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-18	U	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-18	U	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-18	U	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-18	U	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-18	U	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-18	U	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A

WW-6A1 Supplement

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Q090332002	5-9-18	U	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A		Noble Energy Inc to CNX Gas Company LLC: 35/172	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
Q090332003	5-9-18	U	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A		Noble Energy Inc to CNX Gas Company LLC: 35/313	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
Q090332007	5-9-18	U	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A		Noble Energy Inc to CNX Gas Company LLC: 35/313	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
10*18796	5-9-42	V	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A		N/A	N/A	N/A	N/A
10*21414	5-9-42	V	CHARLES R STOCKTON AND BETTY M HUDSON	TH EXPLORATION LLC	1/8+	959 310	N/A		N/A	N/A	N/A	N/A
10*21473	5-9-42	V	MARY E BISHOP	TH EXPLORATION LLC	1/8+	957 232	N/A		N/A	N/A	N/A	N/A
10*21475	5-9-42	V	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	957 124	N/A		N/A	N/A	N/A	N/A
10*21478	5-9-42	V	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A		N/A	N/A	N/A	N/A
10*21547	5-9-42	V	GARY A MILLER AND MARCELLE T MILLER	TH EXPLORATION LLC	1/8+	952 370	N/A		N/A	N/A	N/A	N/A
10*21548	5-9-42	V	JEANNE M MILLER	TH EXPLORATION LLC	1/8+	952 386	N/A		N/A	N/A	N/A	N/A
10*21608	5-9-42	V	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	959 313	N/A		N/A	N/A	N/A	N/A
10*21719	5-9-42	V	ROBERT A MILLER	TH EXPLORATION LLC	1/8+	952 389	N/A		N/A	N/A	N/A	N/A
10*21835	5-9-42	V	KENNETH ALLEN AND CARLA JO ALLEN	TH EXPLORATION LLC	1/8+	962 572	N/A		N/A	N/A	N/A	N/A
10*21937	5-9-42	V	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A		N/A	N/A	N/A	N/A
10*22044	5-9-42	V	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A		N/A	N/A	N/A	N/A
10*22045	5-9-42	V	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	961 417	N/A		N/A	N/A	N/A	N/A
10*22296	5-9-42	V	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A		N/A	N/A	N/A	N/A
10*22326	5-9-42	V	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A		N/A	N/A	N/A	N/A
10*22407	5-9-42	V	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A		N/A	N/A	N/A	N/A
10*22430	5-9-42	V	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A		N/A	N/A	N/A	N/A
10*22451	5-9-42	V	GERALD L BISHOP III	TH EXPLORATION LLC	1/8+	964 31	N/A		N/A	N/A	N/A	N/A
10*22492	5-9-42	V	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A		N/A	N/A	N/A	N/A
10*22547	5-9-42	V	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A		N/A	N/A	N/A	N/A
10*22566	5-9-42	V	KENNETH A MILLER	TH EXPLORATION LLC	1/8+	964 233	N/A		N/A	N/A	N/A	N/A
10*22606	5-9-42	V	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A		N/A	N/A	N/A	N/A
10*22636	5-9-42	V	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A		N/A	N/A	N/A	N/A
10*23035	5-9-42	V	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A		N/A	N/A	N/A	N/A
10*23508	5-9-42	V	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A		N/A	N/A	N/A	N/A
10*24888	5-9-42	V	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A		N/A	N/A	N/A	N/A

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WW-6A1 Supplement

Operator's Well No. Old Crow N - 19HU

51-02190

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*24984	5-9-42	V	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 562	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-42	V	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332001	5-9-42	V	WILLIAM E MILLER AND KAREN S MILLER	NOBLE ENERGY INC	1/8+	858 256	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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
Q090332002	5-9-42	V	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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
Q090332003	5-9-42	V	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
Q090332007	5-9-42	V	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
10*18796	5-9-19	W	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*21414	5-9-19	W	CHARLES R STOCKTON AND BETTY M HUDSON	TH EXPLORATION LLC	1/8+	959 310	N/A	N/A	N/A	N/A	N/A	N/A
10*21473	5-9-19	W	MARY E BISHOP	TH EXPLORATION LLC	1/8+	957 232	N/A	N/A	N/A	N/A	N/A	N/A
10*21475	5-9-19	W	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	957 124	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-19	W	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21547	5-9-19	W	GARY A MILLER AND MARCELLE T MILLER	TH EXPLORATION LLC	1/8+	952 370	N/A	N/A	N/A	N/A	N/A	N/A
10*21548	5-9-19	W	JEANNE M MILLER	TH EXPLORATION LLC	1/8+	952 386	N/A	N/A	N/A	N/A	N/A	N/A
10*21608	5-9-19	W	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	959 313	N/A	N/A	N/A	N/A	N/A	N/A
10*21719	5-9-19	W	ROBERT A MILLER	TH EXPLORATION LLC	1/8+	952 389	N/A	N/A	N/A	N/A	N/A	N/A
10*21835	5-9-19	W	KENNETH ALLEN AND CARLA JO ALLEN	TH EXPLORATION LLC	1/8+	962 572	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-19	W	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-19	W	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22045	5-9-19	W	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	961 417	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-19	W	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-19	W	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-19	W	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-19	W	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22451	5-9-19	W	GERALD L BISHOP III	TH EXPLORATION LLC	1/8+	964 31	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-19	W	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-19	W	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22566	5-9-19	W	KENNETH A MILLER	TH EXPLORATION LLC	1/8+	964 233	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-19	W	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-19	W	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-19	W	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A

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SI-02190

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10*23508	5-9-19	W	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-19	W	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-19	W	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-19	W	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332001	5-9-19	W	WILLIAM E MILLER AND KAREN S MILLER	NOBLE ENERGY INC	1/8+	858 256	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332002	5-9-19	W	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332003	5-9-19	W	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
Q090332007	5-9-19	W	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
10*17512	5-9-23	X	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	917 68	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-23	X	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	916 208	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-23	X	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
10*17916	5-9-23	X	MARY E BISHOP	TH EXPLORATION LLC	1/8+	927 167	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-23	X	GERALD L BISHOP III	TH EXPLORATION, LLC	1/8+	943 10	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-23	X	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*19572	5-9-23	X	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	943 12	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-23	X	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-23	X	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-23	X	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-23	X	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-23	X	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-23	X	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-23	X	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-23	X	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-23	X	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-23	X	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-23	X	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-23	X	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-23	X	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-23	X	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A

51-02190

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*24984	5-9-23	X	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25250	5-9-23	X	LINDA KAY MYERS	TH EXPLORATION LLC	1/8+	1030 118	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-23	X	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332002	5-9-23	X	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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
Q090332003	5-9-23	X	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
Q090332007	5-9-23	X	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
10*17512	5-9-25	Y	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	917 68	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-25	Y	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	916 208	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-25	Y	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
10*17916	5-9-25	Y	MARY E BISHOP	TH EXPLORATION LLC	1/8+	927 167	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-25	Y	GERALD L BISHOP III	TH EXPLORATION, LLC	1/8+	943 10	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-25	Y	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*19572	5-9-25	Y	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	943 12	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-25	Y	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-25	Y	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-25	Y	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-25	Y	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-25	Y	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-25	Y	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-25	Y	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-25	Y	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-25	Y	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-25	Y	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-25	Y	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-25	Y	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-25	Y	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-25	Y	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-25	Y	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25250	5-9-25	Y	LINDA KAY MYERS	TH EXPLORATION LLC	1/8+	1030 118	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-25	Y	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A

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51-0219D

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
Q090332002	5-9-25	Y	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332003	5-9-25	Y	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
Q090332007	5-9-25	Y	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
CVX935271	5-9-24	Z	CHARLES W. MILLER	CHEVRON U.S.A., INC.	1/8+	853 59	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	5-9-24	Z	PAUL PARSONS ET UX	CHEVRON U.S.A., INC.	1/8+	853 430	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	5-9-24	Z	SHARON LYN RUSSELL	CHEVRON U.S.A., INC.	1/8+	853 422	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	5-9-24	Z	TIMOTHY HUFF ET UX	CHEVRON U.S.A., INC.	1/8+	864 47	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	5-9-24	Z	LLOYD C. ARNOLD ET UX	CHEVRON U.S.A., INC.	1/8+	864 39	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	5-9-24	Z	MARY JO CRONIN	CHEVRON U.S.A., INC.	1/8+	864 43	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

51-02190

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*24984	5-9-23	X	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25250	5-9-23	X	LINDA KAY MYERS	TH EXPLORATION LLC	1/8+	1030 118	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-23	X	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	N/A	N/A	N/A	N/A	N/A	N/A
Q090332002	5-9-23	X	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	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
Q090332003	5-9-23	X	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
Q090332007	5-9-23	X	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	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
10*17512	5-9-25	Y	BONNIE LOU POSTLEWAIT	TH EXPLORATION LLC	1/8+	917 68	N/A	N/A	N/A	N/A	N/A	N/A
10*17530	5-9-25	Y	WOODROW N WARD AND HILDA A WARD	TH EXPLORATION LLC	1/8+	916 208	N/A	N/A	N/A	N/A	N/A	N/A
10*17600	5-9-25	Y	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
10*17916	5-9-25	Y	MARY E BISHOP	TH EXPLORATION LLC	1/8+	927 167	N/A	N/A	N/A	N/A	N/A	N/A
10*18270	5-9-25	Y	GERALD L BISHOP III	TH EXPLORATION, LLC	1/8+	943 10	N/A	N/A	N/A	N/A	N/A	N/A
10*18796	5-9-25	Y	DWG OIL & GAS ACQUISITIONS LLC	TH EXPLORATION LLC	1/8+	938 476	N/A	N/A	N/A	N/A	N/A	N/A
10*19572	5-9-25	Y	DOUGLAS R BISHOP	TH EXPLORATION LLC	1/8+	943 12	N/A	N/A	N/A	N/A	N/A	N/A
10*21478	5-9-25	Y	CHILDRENS HOME SOCIETY OF WEST VIRGINIA	TH EXPLORATION LLC	1/8+	960 173	N/A	N/A	N/A	N/A	N/A	N/A
10*21937	5-9-25	Y	WHEELING SOCIETY FOR CRIPPLED CHILDREN JAY E PRAGER PRESIDENT	TH EXPLORATION LLC	1/8+	960 33	N/A	N/A	N/A	N/A	N/A	N/A
10*22044	5-9-25	Y	MICHAEL A BISHOP	TH EXPLORATION LLC	1/8+	960 421	N/A	N/A	N/A	N/A	N/A	N/A
10*22296	5-9-25	Y	NOAH BAKER AND ALISA BAKER	TH EXPLORATION LLC	1/8+	962 200	N/A	N/A	N/A	N/A	N/A	N/A
10*22326	5-9-25	Y	RACHEL SONDA AND SCOTT SONDA	TH EXPLORATION LLC	1/8+	962 532	N/A	N/A	N/A	N/A	N/A	N/A
10*22407	5-9-25	Y	BRADLEY MURPHY	TH EXPLORATION LLC	1/8+	962 575	N/A	N/A	N/A	N/A	N/A	N/A
10*22430	5-9-25	Y	DEBORAH VANVRANKEN	TH EXPLORATION LLC	1/8+	964 510	N/A	N/A	N/A	N/A	N/A	N/A
10*22492	5-9-25	Y	FAITH MARIE FREESTONE AND ERIC FREESTONE	TH EXPLORATION LLC	1/8+	972 50	N/A	N/A	N/A	N/A	N/A	N/A
10*22547	5-9-25	Y	LAWRENCE EDWARD MURPHY AND JOAN MARIE MURPHY	TH EXPLORATION LLC	1/8+	966 628	N/A	N/A	N/A	N/A	N/A	N/A
10*22606	5-9-25	Y	ROBERT B MURPHY AND LINDA MURPHY	TH EXPLORATION LLC	1/8+	966 469	N/A	N/A	N/A	N/A	N/A	N/A
10*22636	5-9-25	Y	CHANDA WILSON AND DANIEL WILSON	TH EXPLORATION LLC	1/8+	968 226	N/A	N/A	N/A	N/A	N/A	N/A
10*23035	5-9-25	Y	DEAN S CARR	TH EXPLORATION LLC	1/8+	977 364	N/A	N/A	N/A	N/A	N/A	N/A
10*23508	5-9-25	Y	MICHAEL A MURPHY	TH EXPLORATION LLC	1/8+	1009 98	N/A	N/A	N/A	N/A	N/A	N/A
10*24888	5-9-25	Y	ARTHUR LEE MILLER ET AL	TH EXPLORATION LLC	1/8+	1027 187	N/A	N/A	N/A	N/A	N/A	N/A
10*24984	5-9-25	Y	JONATHAN BAKER	TH EXPLORATION LLC	1/8+	1027 558	N/A	N/A	N/A	N/A	N/A	N/A
10*25250	5-9-25	Y	LINDA KAY MYERS	TH EXPLORATION LLC	1/8+	1030 118	N/A	N/A	N/A	N/A	N/A	N/A
10*25488	5-9-25	Y	SANDRA AKA KATHERINE S PARDINI	TH EXPLORATION LLC	1/8+	1031 544	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
Q090332002	5-9-25	Y	LORETTA JEAN RIGGLE ET VIR	NOBLE ENERGY INC	1/8+	860 538	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/172	CNX Gas Company 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
Q090332003	5-9-25	Y	PATTY BERISFORD ET VIR	NOBLE ENERGY INC	1/8+	860 555	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
Q090332007	5-9-25	Y	ROBERT RANDOLPH WOODBURN ET UX	NOBLE ENERGY INC	1/8+	860 568	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 35/313	CNX Gas Company 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
CVX935271	5-9-24	Z	CHARLES W. MILLER	CHEVRON U.S.A., 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	5-9-24	Z	PAUL PARSONS ET UX	CHEVRON U.S.A., 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	5-9-24	Z	SHARON LYN RUSSELL	CHEVRON U.S.A., 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	5-9-24	Z	TIMOTHY HUFF ET UX	CHEVRON U.S.A., 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	5-9-24	Z	LLOYD C. ARNOLD ET UX	CHEVRON U.S.A., 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	5-9-24	Z	MARY JO CRONIN	CHEVRON U.S.A., 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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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
CVX936058	5-9-24	Z	RICHARD KURPIL ET UX	CHEVRON U.S.A., 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
CVX936061	5-9-24	Z	CLARA MAE CLIFTON	CHEVRON U.S.A., 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
CVX936062	5-9-24	Z	GEORGE EDWARDS ET UX	CHEVRON U.S.A., 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
CVX936112	5-9-24	Z	DONNA FAE KYLE	CHEVRON U.S.A., 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
CVX936113	5-9-24	Z	JUDITH MAY CONNER	CHEVRON U.S.A., 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
CVX866958	5-9-24	Z	ANITA L. SLOUGH ET AL	AB RESOURCES LLC	1/8+	696 7	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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
CVX866959	5-9-24	Z	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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	5-9-39	AA	CHARLES W. MILLER	CHEVRON U.S.A., 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

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CVX935273	5-9-39	AA	PAUL PARSONS ET UX	CHEVRON U.S.A., 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	5-9-39	AA	SHARON LYN RUSSELL	CHEVRON U.S.A., 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	5-9-39	AA	TIMOTHY HUFF ET UX	CHEVRON U.S.A., 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	5-9-39	AA	LLOYD C. ARNOLD ET UX	CHEVRON U.S.A., 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	5-9-39	AA	MARY JO CRONIN	CHEVRON U.S.A., 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	5-9-39	AA	RICHARD KURPIL ET UX	CHEVRON U.S.A., 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
CVX936061	5-9-39	AA	CLARA MAE CLIFTON	CHEVRON U.S.A., 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
CVX936062	5-9-39	AA	GEORGE EDWARDS ET UX	CHEVRON U.S.A., 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
CVX936112	5-9-39	AA	DONNA FAE KYLE	CHEVRON U.S.A., 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

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CVX936113	5-9-39	AA	JUDITH MAY CONNER	CHEVRON U.S.A., 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
CVX866958	5-9-39	AA	ANITA L. SLOUGH ET AL	AB RESOURCES LLC	1/8+	696	7	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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
CVX866959	5-9-39	AA	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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
PENDING	5-9-33	BB	STONE HILL MINERALS HOLDINGS	TH EXPLORATION LLC	1/8+	1034	626	N/A	N/A	N/A	N/A	N/A	N/A
10*26046	5-9-41	CC	ARNOLD LLOYD C ET UX	CHEVRON USA INC	1/8+	915	628	N/A	N/A	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 43/95
CVX939752	5-9-4	DD	LLOYD C ARNOLD AND JUDITH C ARNOLD	CHEVRON U.S.A., INC.	1/8+	915	582	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936589	5-9-4.19	EE	LLOYD C. ARNOLD AND JUDITH C ARNOLD	CHEVRON U.S.A., INC.	1/8+	863	511	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936591	5-9-4.19	EE	CHARLES W. MILLER AND ESTHER JEAN MILLER	CHEVRON U.S.A., INC.	1/8+	861	595	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936589	5-9-4.17	FF	LLOYD C. ARNOLD AND JUDITH C ARNOLD	CHEVRON U.S.A., INC.	1/8+	863	511	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936591	5-9-4.17	FF	CHARLES W. MILLER AND ESTHER JEAN MILLER	CHEVRON U.S.A., INC.	1/8+	861	595	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	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
CVX936589	5-9-4.18	GG	LLOYD C. ARNOLD AND JUDITH C ARNOLD	CHEVRON U.S.A., INC.	1/8+	863	511	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936591	5-9-4.18	GG	CHARLES W. MILLER AND ESTHER JEAN MILLER	CHEVRON U.S.A., INC.	1/8+	861	595	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936589	5-9-4.15	HH	LLOYD C. ARNOLD AND JUDITH C ARNOLD	CHEVRON U.S.A., INC.	1/8+	863	511	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936591	5-9-4.15	HH	CHARLES W. MILLER AND ESTHER JEAN MILLER	CHEVRON U.S.A., INC.	1/8+	861	595	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936589	5-9-4.14	II	LLOYD C. ARNOLD AND JUDITH C ARNOLD	CHEVRON U.S.A., INC.	1/8+	863	511	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX936591	5-9-4.14	II	CHARLES W. MILLER AND ESTHER JEAN MILLER	CHEVRON U.S.A., INC.	1/8+	861	595	N/A	N/A	N/A	N/A	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX868468	5-9-4.10	JJ	DEBORAH S. MIDCAP	TRIENERGY HOLDINGS, LLC	1/8+	737	260	N/A	N/A	TriEnergy Holdings LLC to NPAR LLC: 25/449	NPAR LLC to Chevron USA Inc: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935273	5-9-35	KK	PAUL PARSONS ET UX	CHEVRON U.S.A., 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	5-9-35	KK	SHARON LYN RUSSELL	CHEVRON U.S.A., 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

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
CVX935969	5-9-35	KK	TIMOTHY HUFF ET UX	CHEVRON U.S.A., 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	5-9-35	KK	LLOYD C. ARNOLD ET UX	CHEVRON U.S.A., 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	5-9-35	KK	MARY JO CRONIN	CHEVRON U.S.A., 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	5-9-35	KK	RICHARD KURPIL ET UX	CHEVRON U.S.A., 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
CVX936061	5-9-35	KK	CLARA MAE CLIFTON	CHEVRON U.S.A., 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
CVX936062	5-9-35	KK	GEORGE EDWARDS ET UX	CHEVRON U.S.A., 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
CVX936112	5-9-35	KK	DONNA FAE KYLE	CHEVRON U.S.A., 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
CVX936113	5-9-35	KK	JUDITH MAY CONNER	CHEVRON U.S.A., 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

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
CVX866958	5-9-35	KK	ANITA L. SLOUGH ET AL	AB RESOURCES LLC	1/8+	696	7	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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
CVX866959	5-9-35	KK	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695	629	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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
CVX868688	5-9-4.8	LL	THOMAS E. MIDCAP FRED A M MIDCAP	TRIENERGY HOLDINGS, LLC	1/8+	738	482	N/A	N/A	TriEnergy Holdings LLC to NPAR LLC: 25/449	NPAR LLC to Chevron USA Inc: 756/332	Chevron USA Inc to HG Energy II Appalachia LLC: 41/145	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
CVX935271	5-9-35.1	MM	CHARLES W. MILLER	CHEVRON U.S.A., 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	5-9-35.1	MM	PAUL PARSONS ET UX	CHEVRON U.S.A., 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	5-9-35.1	MM	SHARON LYN RUSSELL	CHEVRON U.S.A., 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	5-9-35.1	MM	TIMOTHY HUFF ET UX	CHEVRON U.S.A., 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	5-9-35.1	MM	LLOYD C. ARNOLD ET UX	CHEVRON U.S.A., 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

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
CVX936054	5-9-35.1	MM	MARY JO CRONIN	CHEVRON U.S.A., 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	5-9-35.1	MM	RICHARD KURPIL ET UX	CHEVRON U.S.A., 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
CVX936061	5-9-35.1	MM	CLARA MAE CLIFTON	CHEVRON U.S.A., 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
CVX936062	5-9-35.1	MM	GEORGE EDWARDS ET UX	CHEVRON U.S.A., 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
CVX936112	5-9-35.1	MM	DONNA FAE KYLE	CHEVRON U.S.A., 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
CVX936113	5-9-35.1	MM	JUDITH MAY CONNER	CHEVRON U.S.A., 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
CVX866958	5-9-35.1	MM	ANITA L. SLOUGH ET AL	AB RESOURCES LLC	1/8+	696 7	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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
CVX866959	5-9-35.1	MM	PAUL SCHEIBELHOOD ET AL	AB RESOURCES LLC	1/8+	695 629	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/484	Chief Exploration & Development LLC, Radler 2000, & Enerplus Resources Corp to Chevron USA Inc: 25/1 & 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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WW-6A1 Supplement

Operator's Well No. Old Crow N - 19HU

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
Q081124002	5-9-2	NN	JAMES REDMAN LEGG II ET AL	NOBLE ENERGY INC	1/8+	879	580	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 36/395	CNX Gas Company 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
Q080154002	5-9-2.2	OO	KENNETH EUGENE WHITE AND LESLIE A WHITE	NOBLE ENERGY INC	1/8+	879	577	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 36/395	CNX Gas Company 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
Q081123002	5-9-2.1	PP	JEFFREY L LEGG	NOBLE ENERGY INC	1/8+	879	575	N/A	N/A	Noble Energy Inc to CNX Gas Company LLC: 36/395	CNX Gas Company 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
10*21546	5-8-7	QQ	EDWIN C MILLER AND KIMBERLY ANN MILLER	TH EXPLORATION LLC	1/8+	957	257	N/A	N/A	N/A	N/A	N/A	N/A

COPY

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Marshall County
Jan Pest, Clerk
Instrument 1453305
04/24/2019 @ 11:51:22 AM
ASSIGNMENTS
Book 43 @ Page 503
Pages Recorded 10
Recording Cost \$ 17.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 23rd day of April, 2019 (the "Effective Date"), by and between AMERICAN PETROLEUM PARTNERS OPERATING, LLC, (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated November 15, 2018 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit A-2, attached hereto and made a part hereof (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 the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

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

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Leases since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

Assignor represents and warrants that Assignor has paid any and all bonuses, rentals, royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period, free and clear of all Encumbrances, except for and subject only to Permitted Encumbrances.

3. Successors and Assigns. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors

COPY

AFFIDAVIT

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

On this 18th day of October, 2016, before me, the undersigned authority, personally appeared David D. Kalish ("Affiant") who being first duly sworn under oath, deposes and saith:

1. TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC are wholly owned subsidiaries of THQ Appalachia I, LLC.
2. Tug Hill Operating, LLC provides oil and gas operations services to THQ Appalachia I, LLC under an Operating Services Agreement dated July 23, 2014.
3. David D. Kalish, the Affiant, is the Vice President of Tug Hill Operating, LLC, THQ Appalachia I, LLC, TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC, and;
3. Tug Hill Operating, LLC is authorized to operate and maintain the assets owned by THQ Appalachia I, LLC, including, as referenced above, TH Exploration, LLC, TH Exploration II, LLC, and TH Exploration III, LLC, including oil and gas leases, wells, pipelines, surface facilities, and other all other assets that support the business of THQ Appalachia I, LLC, and;
4. Specifically, Tug Hill Operating, LLC is authorized to submit and obtain well work permits and carry out all activities pursuant to such work permits for assets owned by TH Exploration, LLC, TH Exploration II, LLC, TH Exploration III, LLC.

FURTHER, AFFIANT SAITH NOT.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this 18th day of October, 2016.

David D. Kalish
Affiant: David D. Kalish

JURAT

Jan Pest
 MARSHALL County 03:44:28 PM
 Instrument No 1416299
 Date Recorded 10/19/2016
 Document Type HIS
 Pages Recorded 1
 Book-Page 28-62
 Recording Fee \$5.00
 Additional \$6.00

STATE OF TEXAS §
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COUNTY OF TARRANT §

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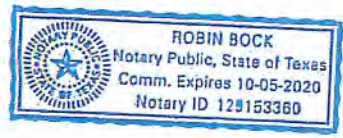
Sworn and subscribed to (or affirmed) before me on this, the 18th day of October, 2016, by David D. Kalish

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission Expires: 10-05-2020

Signature/Notary Public: Robin Bock

Name/Notary Public (Print): Robin Bock



STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

ASSIGNMENT AND BILL OF SALE

This **ASSIGNMENT AND BILL OF SALE** (this "Assignment") dated as of August 1, 2017 (the "Signing Date"), but effective from and after 7:00 a.m., Eastern Standard Time on August 2, 2017 being the day immediately following the Signing Date (the "Effective Date"), is made by **Chevron U.S.A. Inc.**, a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 ("Chevron" or "Assignor") to **TH Exploration II, LLC** and **TH Exploration, LLC**, Texas limited liability companies, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (collectively "Assignee") and is accepted by Assignee upon the following terms and conditions.

RECITALS

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

1. DEFINITIONS

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

"Acreage Trade Agreement" means that certain Acreage Trade Agreement by and between Chevron U.S.A. Inc. and TH Exploration, LLC with an Effective Date of August 1, 2017 to be contemporaneously executed with this Assignment.

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

"Affiliate" means any legal entity which controls, is controlled by, or is under common control with, another legal entity. An entity is deemed to "control" another if it owns directly or indirectly at least fifty percent of either of the following: (A) the shares entitled to vote at a general election of directors of such other entity or (B) the voting interest in such other entity if such entity does not have either shares or directors.

"Applicable Law(s)" means all laws, principles of common law, regulations, statutes, codes, rules, orders, ordinances, permits, enforceable policies, licenses, certifications, decrees, constitutions, standards or other requirements with similar effect of any Government Entity and any binding interpretations of the foregoing.

"Assets" has the meaning given to such term in Section 2.1 of this Assignment.

"Assigned Hydrocarbons" means all Hydrocarbons produced and severed from, or allocable, after severance, to the Leases, Units, and Wells on and after the Effective Date.

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FEB 26 2019
WV Department of
Environmental Protection

Jan Pest
MARSHALL County 01:22:38 PM
Instrument No 1407489
Date Recorded 04/27/2016
Document Type AEN
Pages Recorded 77
Book Page 36-9
Recording Fee \$77.00
Additional 413.00

51-02190

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

Execution Version

ASSIGNMENT AND BILL OF SALE

STATE OF WV

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF MARSHALL

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

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

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

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

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

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

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WV Department of
Environmental Protection

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 7th day of February, 2019 (the "Effective Date"), by and between CHEVRON U.S.A. INC. (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated the 1st day of February, 2019 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

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

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

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor excepts and reserves from this Assignment the following:

A. The Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia, and

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

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

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WV Department of
Environmental Protection

ASHLEY FAVINGER
AMERICAN PETROLEUM PARTNERS OPERATING LLC
4600 J BARRY COURT STE 310
CANDONSBURG PA 15317-5854

BOOK 0042 PAGE 0109

STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 18th day of May, 2018, and made effective December 12, 2017 (the "Effective Date"), by and between AMERICAN PETROLEUM PARTNERS OPERATING, LLC, (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated December 12, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", attached hereto and made a part hereof (hereinafter the "Leases"); 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 the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

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

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the

Marshall County
Jan Pest, Clerk
Instrument 1440860
05/25/2018 @ 02:36:09 PM
ASSIGNMENTS
Book 42 @ Page 109
Pages Recorded 9
Recording Cost \$ 15.00

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WV-AGR-0009

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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February 22, 2019

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

RE: Old Crow N-19HU

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Old Crow N-19HU well plat.

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

Sincerely,

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

Amy L. Miller
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 02/21/2019

API No. 47- 051

Operator's Well No. Old Crow N-20HU

Well Pad Name: Old Crow

Notice has been given:

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

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>520,299.44</u>
County: <u>Marshall</u>	Northing: <u>4,403,192.49</u>
District: <u>Franklin</u>	Public Road Access: <u>Rines Ridge Road (CR 76)</u>
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>Donna Yoho</u>
Watershed: <u>Fish Creek (HUC 10)</u>	

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

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:

*PLEASE CHECK ALL THAT APPLY

- 1. NOTICE OF SEISMIC ACTIVITY or NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED
- 2. NOTICE OF ENTRY FOR PLAT SURVEY or NO PLAT SURVEY WAS CONDUCTED
- 3. NOTICE OF INTENT TO DRILL or NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or
 WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)
- 4. NOTICE OF PLANNED OPERATION
- 5. PUBLIC NOTICE
- 6. NOTICE OF APPLICATION

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NOT REQUIRED

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Required Attachments:

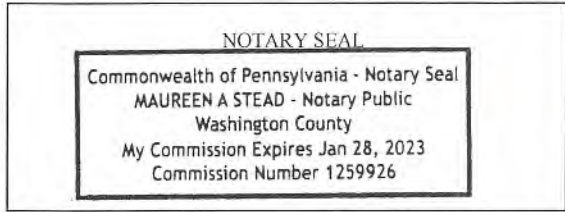
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

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Certification of Notice is hereby given:

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

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



Subscribed and sworn before me this 21 day of FEB., 2019.
Maureen A Stead Notary Public
My Commission Expires 1/28/23

Oil and Gas Privacy Notice:

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

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WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Old Crow N-19HU
Well Pad Name: Old Crow

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

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

Date of Notice: 2/21/2019 **Date Permit Application Filed:** 2/22/2019

Notice of:

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

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

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

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

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

SURFACE OWNER(s) J
 Name: Donna Yoho
 Address: 3682 Rines Ridge Road
Proctor, WV 26055
 Name: _____
 Address: _____

COAL OWNER OR LESSEE J
 Name: Consol Energy, Inc. Leatherwood, Inc. Attn: Casey Saunders
 Address: 1000 CONSOL Energy DRive
Canonsburg, PA 15317
 COAL OPERATOR
 Name: _____
 Address: _____

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

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

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

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

*Please attach additional forms if necessary

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Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

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Well Location Restrictions

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

WV Department of
Environmental Protection

WW-6A
(8-13)

API NO. 47- 051 - _____
OPERATOR WELL NO. Old Crow N-19HU
Well Pad Name: Old Crow

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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WV Department of
Environmental Protection

WW-6A
(8-13)

4705102190
API NO. 47-051
OPERATOR WELL NO. Old Crow N-19HU
Well Pad Name: Old Crow

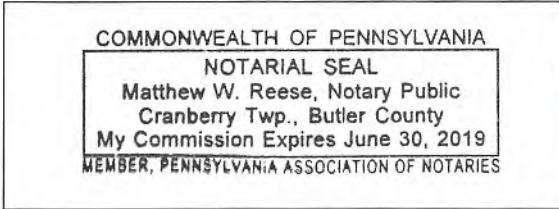
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 21 day of Feb, 2019.
Matthew W. Reese Notary Public
My Commission Expires 6-30-2019

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Environmental Protection

Exhibit WW-6A

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

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

Well: Old Crow N – 19HU
 District: Franklin (Residence #'s 1-7)
 State: WV

There are seven (7) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

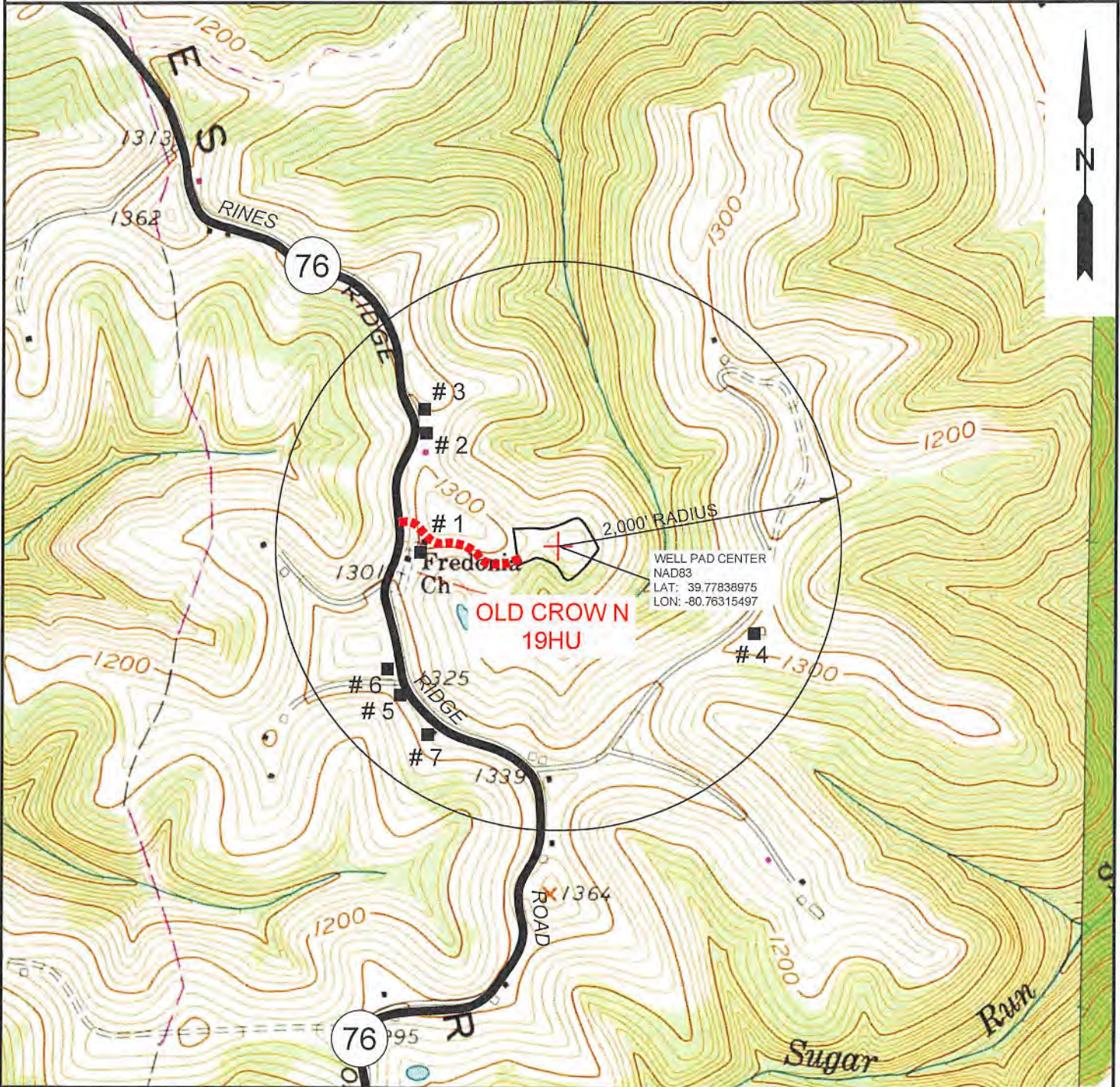
Residence 1 TM 16 Pcl. 3.1 Dennis Jackson, Et Ux ✓ Phone: 304-843-1762 Physical Address: 4004 Rines Ridge Rd. Proctor, WV 26055 Tax Address: P.O. Box 109 Woodsfield, OH 43793	Residence 2 TM 16 Pcl. 3 Donna Vivian Yoho - TOD ✓ Phone: 304-845-5590 (Rev. Address) Physical Address: 3862 Rines Ridge Rd. Proctor, WV 26055 Tax Address: Same	Residence 3 TM 16 Pcl. 3.2 Jimmy Ostrander, Sr., Et Ux Phone: 304-845-5599, 304-845-5590 Physical Address: 3810 Rines Ridge Rd. ✓ Proctor, WV 26055 Tax Address: Same
Residence 4 TM 16 Pcl. 6 John Swierkos ✓ Phone: 304-810-4092 Physical Address: 110 Rahm Dr. Proctor, WV 26055 Tax Address: Same	Residence 5 TM 16 Pcl. 23.3 Greg & Christina Riddle ✓ Phone: 304-843-0173 Physical Address: 4205 Rines Ridge Rd. Proctor, WV 26055 Tax Address: Same	Residence 6 TM 16 Pcl. 23.1 Ray E. Minor, Et Ux Phone: 304-843-1713 ✓ Physical Address: 4193 Rines Ridge Rd. Proctor, WV 26055 Tax Address: Same
Residence 7 TM 16 Pcl. 24 Alan M. Beyser, Et Ux Phone: 304-810-0617 Physical Address: 4271 Rines Ridge Rd. Proctor, WV 26055 Tax Address: Same		

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PROPOSED OLD CROW N - 19HU



NOTE: THERE APPEARS TO BE SEVEN (7) POSSIBLE WATER SOURCES WITHIN 2,000'.

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SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26031 • (304) 462-5634
www.slssurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON & POWHATAN POINT 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	FRANKLIN	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8796	01/23/19	1" = 1000'

WV Department of Environmental Protection
TUG HILL
OPERATING

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

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

Date of Notice: 11/16/2018 **Date of Planned Entry:** 11/17/2018

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Donna Yoho ✓
 Address: 3682 Rines Ridge Road
Proctor, WV 26055
 Name: _____
 Address: _____
 Name: _____
 Address: _____

COAL OWNER OR LESSEE

Name: Consol Energy, Inc. Leatherwood, Inc. Attn: Casey Saunders ✓
 Address: 1000 CONSOL Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: _____
 Address: _____

*please attach additional forms if necessary

Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.7784004; -80.7631353</u>
County: <u>Marshall</u>	Public Road Access: <u>Rines Ridge Road (County Route 76)</u>
District: <u>Franklin</u>	Watershed: <u>TrIBUTARY OF Fish Creek (HUC 10)</u>
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>Donna Yoho</u>

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

Notice is hereby given by:

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

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

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Oil and Gas Privacy Notice:

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

WW-6A5
(1/12)

Operator Well No. Old Crow N-19HU

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

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

Date of Notice: 02/22/2019 **Date Permit Application Filed:** 02/22/2019

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)

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

Name: Donna Yoho ✓ Name: _____
Address: 3862 Rines Ridge Road Address: _____
Proctor, WV 26055 _____

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Eastings:	<u>520,295.26</u>
County:	<u>Marshall</u>		Northing:	<u>4,403,187.65</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Donna Yoho</u>	
Watershed:	<u>Tributary of Fish Creek (HUC 10)</u>			

This Notice Shall Include:

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

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

Oil and Gas Privacy Notice:

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



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

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

March 2, 2018 ✓

Jill M. Newman
Deputy Commissioner

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

Subject: DOH Permit for the Old Crow Pad, Marshall County
Old Crow N-19HU Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2018-0130 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 76 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

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

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

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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

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

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FEB 26 2019

WV Department of
Environmental Protection

WEST VIRGINIA COUNTY MAP



**WVDEP OOG
ACCEPTED AS-BUILT**

NAD 3/4/2019

Old Crow Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Franklin District
Latitude 39.77838678°
Longitude -80.76316840°
Lower Fish Creek Watershed

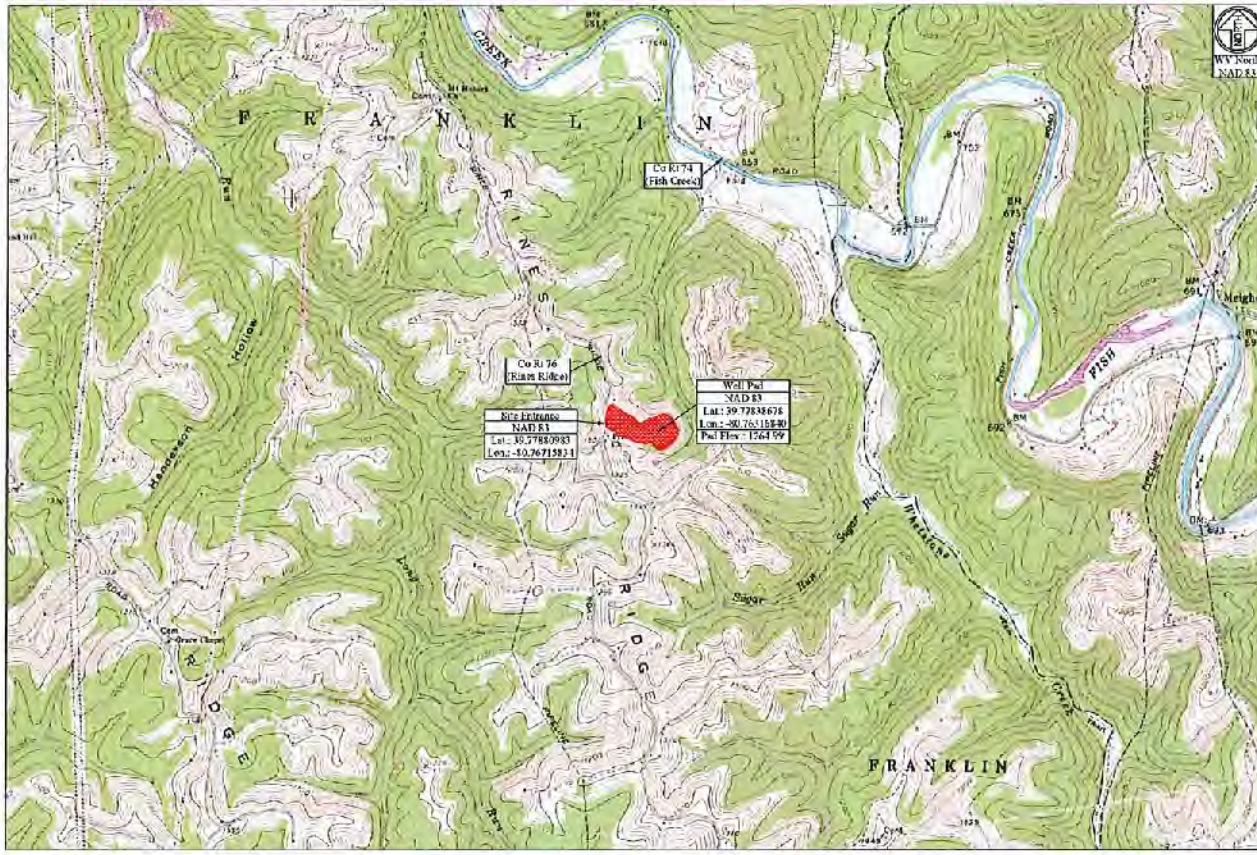
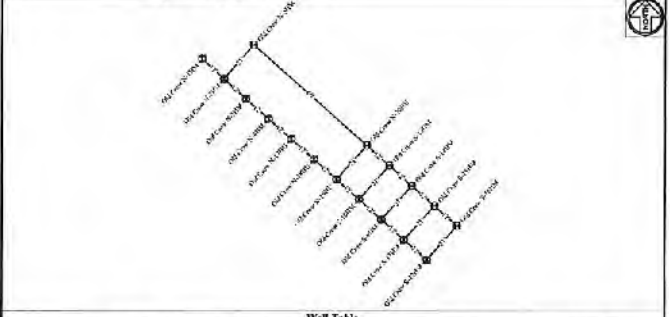
Pertinent Site Information
Old Crow Well Site
Emergency Number: 304-845-1920
Franklin District, Marshall County, WV
Watershed: Lower Fish Creek Watershed
Tug Hill Contact Number: 1-817-632-3400

Property Owner Information - Old Crow Well Site

Owner	EM Parcel	Well Pad	Access Road	Topsoil Excav	Acc. Clearing	Total Disturbed
Dwain Yoho	16-3	6-4	1-1	1-0	6-92	19-18
Site Total (AC)	6-4	1-1	1-0	6-92	19-18	

Exhibit A: Site As-Built

Site Entrance	Center of Well Pad
WV-NAD 83 E: 1612377.51	WV-NAD 83 E: 1614 09.03
WV-NAD 27 N: 408257.31	WV-NAD 27 N: 40887.62
WV-NAD 77 E: 1748 15.36	WV-NAD 77 E: 174894.41
Lat. NAD 83: 39.77838678	Lat. NAD 83: 39.77838678
Lat. NAD 27: 39.7783224	Lat. NAD 27: 39.7783091
Lon. NAD 83: 30.761584	Lon. NAD 83: 30.761584
Lon. NAD 27: 30.7615625	Lon. NAD 27: 30.7615625
UTM 17 NAD 83 E: 440123.67	UTM 17 NAD 83 E: 440123.67
UTM 17 NAD 83 E: 51999.28	UTM 17 NAD 83 E: 52021.09



WV State Plane Coordinate System
North Zone, NAD 83
Elevations Based on NAVD83
Established By Survey Grade GPS
and OPUS Post Processing

Access Road

Surface Owner	TM Parcel	Well Pad	Type
Dwain Yoho	16-3	6-4	New Access Road Construction

Disturbed Area

Well Pad Construction	6.51 AC
Access Road Construction	1.11 AC
Topsoil Excav Material	1.91 AC
Additional Clearing	1.92 AC
Total Disturbed Area	19.18 AC

Additional Information

Total Disturbed Area Excluding	18.59 AC
Total Area of Access Road	1.01 AC

Old Crow Well Site Quantities

Description	Quantity	Unit	Notes
Well Pad	6.51	AC	
Access Road	1.11	AC	
Topsoil Excav Material	1.91	AC	
Totals	19.18	AC	

Well Pads

OH Well Pad	OH Well Pad	OH Well Pad	OH Well Pad	OH Well Pad	OH Well Pad
WV-NAD 83 E: 1612377.51	WV-NAD 83 E: 1614 09.03	WV-NAD 83 E: 1614 09.03	WV-NAD 83 E: 1614 09.03	WV-NAD 83 E: 1614 09.03	WV-NAD 83 E: 1614 09.03
WV-NAD 27 N: 408257.31	WV-NAD 27 N: 40887.62	WV-NAD 27 N: 40887.62	WV-NAD 27 N: 40887.62	WV-NAD 27 N: 40887.62	WV-NAD 27 N: 40887.62
WV-NAD 77 E: 1748 15.36	WV-NAD 77 E: 174894.41	WV-NAD 77 E: 174894.41	WV-NAD 77 E: 174894.41	WV-NAD 77 E: 174894.41	WV-NAD 77 E: 174894.41
Lat. NAD 83: 39.77838678	Lat. NAD 83: 39.77838678	Lat. NAD 83: 39.77838678	Lat. NAD 83: 39.77838678	Lat. NAD 83: 39.77838678	Lat. NAD 83: 39.77838678
Lat. NAD 27: 39.7783224	Lat. NAD 27: 39.7783091	Lat. NAD 27: 39.7783091	Lat. NAD 27: 39.7783091	Lat. NAD 27: 39.7783091	Lat. NAD 27: 39.7783091
Lon. NAD 83: 30.761584	Lon. NAD 83: 30.761584	Lon. NAD 83: 30.761584	Lon. NAD 83: 30.761584	Lon. NAD 83: 30.761584	Lon. NAD 83: 30.761584
Lon. NAD 27: 30.7615625	Lon. NAD 27: 30.7615625	Lon. NAD 27: 30.7615625	Lon. NAD 27: 30.7615625	Lon. NAD 27: 30.7615625	Lon. NAD 27: 30.7615625
UTM 17 NAD 83 E: 440123.67	UTM 17 NAD 83 E: 440123.67	UTM 17 NAD 83 E: 440123.67	UTM 17 NAD 83 E: 440123.67	UTM 17 NAD 83 E: 440123.67	UTM 17 NAD 83 E: 440123.67
UTM 17 NAD 83 E: 51999.28	UTM 17 NAD 83 E: 52021.09	UTM 17 NAD 83 E: 52021.09	UTM 17 NAD 83 E: 52021.09	UTM 17 NAD 83 E: 52021.09	UTM 17 NAD 83 E: 52021.09

EXISTING API NUMBERS

- 47-051-02023
- 47-051-02040
- 47-051-02042
- 47-051-02043
- 47-051-02122
- 47-051-02123

John
2/20/19

Project Contacts

Tug Hill Operating Jonathan White - Regulatory Analyst 724 853-2000 Cell, 301-649-7676 Cell Gail Butler - V.P. Production 817-632-5200 Cell	Survey and Engineer Kewell Kelly 784-338-4933 Cell John P. Siz 304-497-0210 Cell Zachary C. Sumner 304-318-6787 Cell
--	---

Environmental:
Weed & Defoliation as provided by Alliant Ecology dated November 6, 2017

Toxicologic Information:
The geographic information system is based on aerial photography by Dins Mountain Aerial Mapping, Barre, WV

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
8:00am - 5:00pm
Call before you dig.

811
Know what's below.
Call before you dig.

Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities.

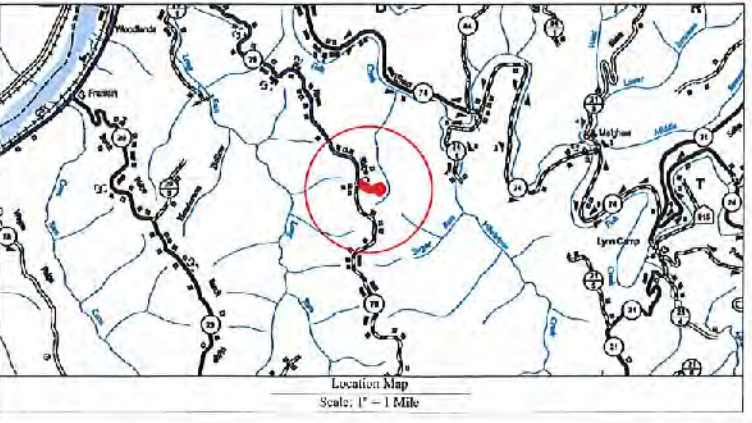
The WV Mines Website was consulted. Previous (Current) mining activities are not within the ADO.

WVDEP Website files show that there are no active and/or abandoned gas wells within the ADO.

Floodplain Conditions

Do site construction activities take place in a floodplain?	NO
Permit needed from county floodplain coordinator?	NO
Flood Hazard Zone	NA
Flood Hazard Study completed?	NO
Floodplain shown on drawings?	NO
FIRM Map Number for site	50810413E
Average of construction in floodplain	NA

Site Locations (NAD 27)			Site Locations (NAD 83)		
Structure	Latitude (DD)	Longitude (DD)	Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.7783224	-80.7615625	Site Entrance	39.77838678	-80.76316840
Center of Well Pad	39.7783091	-80.7615625	Center of Well Pad	39.77838678	-80.76316840



Well Location Restrictions

All land and construction complies with the following restrictions:

- *250' from an existing well or developed spring used for human or domestic animals.
- *625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy inventory from the center of the pad.
- *50' from the edge of a disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
- *500' from the edge of a disturbance to a naturally reproducing trout stream.
- *1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6-12)

As-Built Confirmation

The as-built conditions of this project are confirmed to be in accordance with the design drawings. It is recommended that the as-built drawings include a complete comprehensive as-built map program for gas well drilling jobs on this site to ensure compliance and proper location for development in accordance with the as-built information.

Zachary C. Sumner
Professional Engineer
No. 22214
State of West Virginia
CVA 0020259



THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

Kelly Surveying
Professional Surveyors
1000 W. Main St.
Martinsburg, WV 26150

Old Crow Well Site
Franklin District
Marshall County, WV

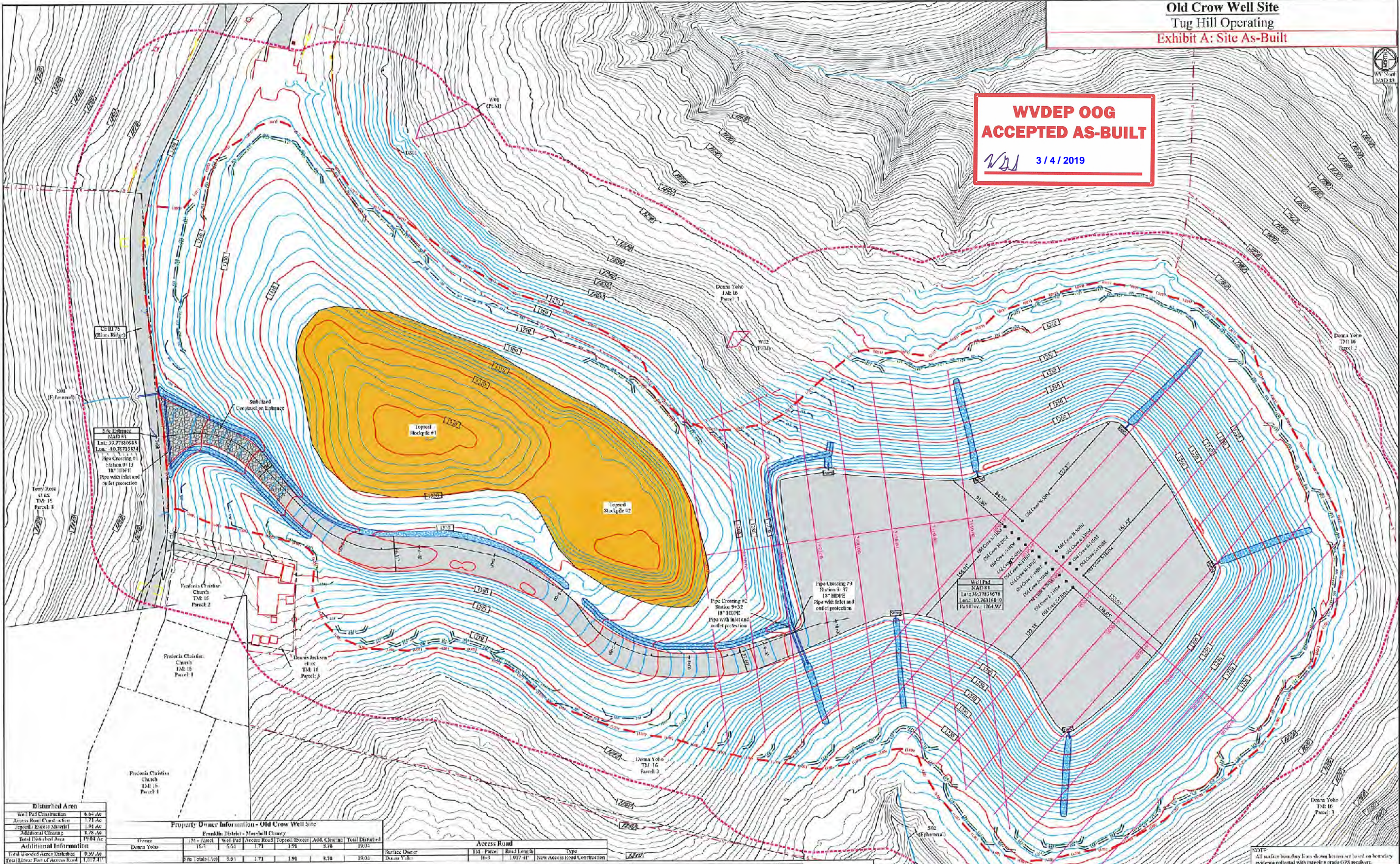
Cover Sheet

Date:	02/20/2018
Scale:	As Shown
Designed By:	ZS
File No.:	
Sheet 1 of 9	

Scale: 1" = 1000'
 Date: 02-20-2018
 Design: WVDEP Composites
 As-Built: 01-24-2019

**WVDEP OOG
ACCEPTED AS-BUILT**

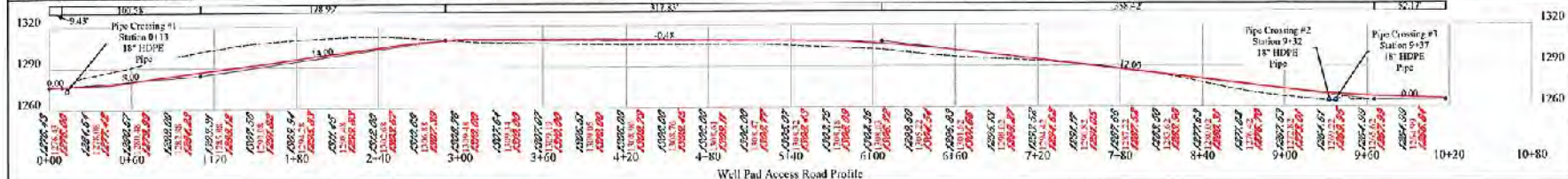
WJ 3/4/2019



Disturbed Area	
Well Pad Construction	6.64 Ac
Access Road Construction	1.74 Ac
Topsoil Stockpile	1.09 Ac
Site Preparation	8.78 Ac
Total Disturbed Area	19.04 Ac

Property Owner Information - Old Crow Well Site						
Owner	1/4 - 1/2 Acre	Well Pad	Access Road	Topsoil Stockpile	Area Cleared	Total Disturbed
Dennis Yoho	16.1	6.64	1.74	1.09	8.78	19.04

Access Road			
TM	Parcel	Road Length	Notes
1320	1	1,017.48'	New Access Road Construction



Legend

- Original Ground 2' Contour
- Original Ground 10' Contour
- As-Built 2' Contour
- As-Built 10' Contour
- Center of Structure
- 12" Waifu
- 24" Compact Filter Sock
- 8" Sp. Silt Fence
- Line of Disturbance
- Area of Interest
- Existing Gas Line
- Existing Utility Pick-Up
- Drain E
- Existing Fence
- PFM Wetland
- OTW Wetland
- OTW Well Pad
- Perennial Stream
- Intermittent Stream
- Epifaunal Stream
- Stream Check Dam
- Head Loss Ditch

Scale: 0 60 120 180

NOT: All surface boundary lines shown herein are based on boundary evidence collected with mapping grade GPS receivers.

Scale: As Shown

Date: 02/28/2018

Drawn By: JZS

File No.

Sheet 5 of 9

Overall Plan View

Old Crow Well Site

Franklin District

Marshall County, WV

TUG HILL OPERATING

THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

Kelly Surveys, Inc.