



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

Jim Justice . Governor
Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Tuesday, January 02, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
550 BAILEY AVENUE, SUITE 510

FORT WORTH, TX 76107

Re: Permit approval for CORLEY N-5HM
47-051-01970-00-00

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

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

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

James A. Martin
Chief

Operator's Well Number: CORLEY N-5HM
Farm Name: JAMES A. & JILL C. CORLEY, ET AL
U.S. WELL NUMBER: 47-051-01970-00-00
Horizontal 6A / New Drill
Date Issued: 1/2/2018

Promoting a healthy environment.

PERMIT CONDITIONS

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

CONDITIONS

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

API Number: 51-01970

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.

WW-6B
(04/15)

API NO. 47-051 -
OPERATOR WELL NO. Corley N-5HM
Well Pad Name: Corley

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
Operator ID County District Quadrangle

2) Operator's Well Number: Corley N-5HM Well Pad Name: Corley

3) Farm Name/Surface Owner: Corley, James A. & Jill C. Public Road Access: Rines Ridge Road (CR 76)

4) Elevation, current ground: 1254' Elevation, proposed post-construction: 1254'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep _____

Horizontal _____

9/20/17

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6509' - 6562', thickness of 53' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,662'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 16,746'

11) Proposed Horizontal Leg Length: 9,457'

12) Approximate Fresh Water Strata Depths: 865'

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: 2049'

15) Approximate Coal Seam Depths: Sewickly Coal - 764' and Pittsburgh Coal - 859'

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

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

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

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18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125'	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	54.5#	997'	965'	1020ft^3(CTS)
Coal	13 3/8"	NEW	H40	54.5#	997'	965'	1020ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,661'	2,629'	871ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	16,746'	16,736'	4276ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,351'	
Liners	N/A						

Ju 9/20/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	8,000	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners	N/A						

PACKERS

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

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WW-6B
(10/14)

API NO. 47- 051 - 01970
OPERATOR WELL NO. Corley N-5HM
Well Pad Name: Corley

JM
9/20/17

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

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

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

Well to be completed with approximately 23,642,500 lb proppant and 365,530 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 11.70

22) Area to be disturbed for well pad only, less access road (acres): 5.94

23) Describe centralizer placement for each casing string:

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

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

*See Attached

25) Proposed borehole conditioning procedures:

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

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*Note: Attach additional sheets as needed.

WW-6B Attachment to #24

Conductor, Coal and Fresh Water Casing Cement:*Premium NE-1 + 2% CaCl*

- Premium NE-1 – Class A Portland API Spec
- CaCl – Calcium Chloride

Intermediate Casing:*Premium NE-1 + 2% bwoc CaCl₂ + 46.5% Fresh Water*

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Kick Off Plug:*Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L + 38% Fresh Water*

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Production Casing Cement:*Lead: 50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L**Tail: 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*

- Poz – Fly Ash
- Premium NE-1 – Class A Portland API spec
- R-3 – Cement Retarder
- MPA-170 – Gelling Agent
- FP-13L – Anti-Foaming Agent
- ASA-301 – Free Water Control Agent
- BA-10A – Bonding Agent
- ASCA-1 – Solubility Additive

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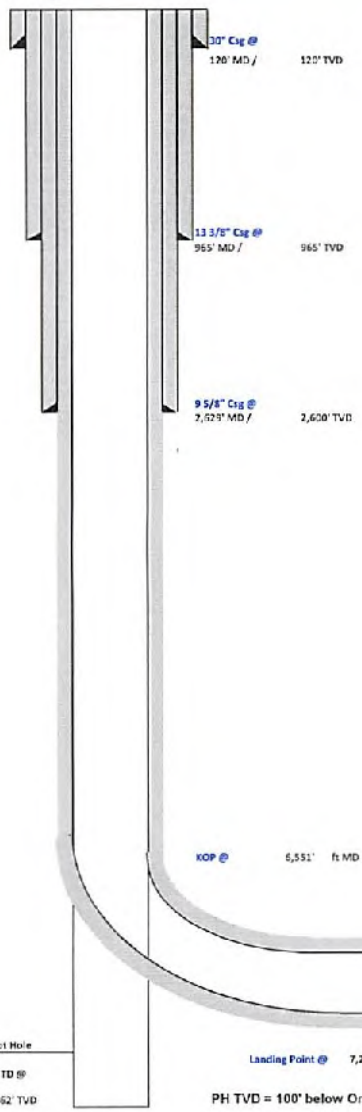
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SI-01970



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WELL NAME:	Corley N-5HM		
STATE:	West Virginia	COUNTY:	Marshall
DISTRICT:	Meade		
DF Elev:	1,254'	GI Elev:	1,254'
TD:	16,736'		
TH Latitude:	39.75294119		
TH Longitude:	-80.78322524		
BH Latitude:	39.77807		
BH Longitude:	-80.787873		



FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	865
Sewickley Coal	764
Pittsburgh Coal	859
Elg Lime	2007
Wela	2356
Berea	2545
Gordon	2825
Finestreet	5885
Genesee/Burkett	6388
Tully	6435
Hamilton	6451
Marcellus	6509
Landing Depth	6533
Onondaga	6562
Pilot Hole Depth	6662

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'	8W	BW	Surface
Surface	17.5	13 3/8	965'	965'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,629'	2,600'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,736'	6,368'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer/Notes
Conductor	338	A	15.6	Air	None
Surface	1,026	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	856	A	15	Air	1 Centralizer every other ft
Production	3,775	A	14.5	Air / SORM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to sfc

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Pilot Hole PH TD @ 6,662' TVD
 Landing Point @ 7,279' MD / 6,533' TVD
 PH TVD = 100' below Onondaga Top
 Lateral TD @ 16,736' H MD / 6,368' H TVD

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

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

Data Sources Reviewed:

1. 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 (12/19/2016) 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

SI-D 1970

Permit well - Corley N-5HM

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

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705101396	Tug Hill Operating	6625' TVD 12408' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore
4705101437	Tug Hill Operating	6632' TVD 12152' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore
4705101397	Tug Hill Operating	6633' TVD 12310' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore
4705101438	Tug Hill Operating	6627' TVD 11388' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore

WV Geological & Economic Survey

Well: County = 51 Permit = 01396

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
4705101396	Marshall	1396	Franklin	Poquatone Park	Clanjoison	39.75295	-80.75317	526287	4403353

Bottom Hole Location Information:

API	SP_FLAG	UTME	UTMN	LONG_DD	LAT_DD
4705101396	1	As Proposed	521821.6	4300237.7	-80.749707

Owner Information:

API	CMP_ID	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR/AT_COMPLETION	PROP_VD	PROP_TRGT_FM	FM_EST_FR
4705101396	11112011		Comp	Orlando Lee	Completed	James A & Jil C Corley et al	24	Corley	WV16-0018-0011-288032-001	WV-0018-000	James A & Jil C Corley et al	Greiner Production USA, Inc	6729

Completion Information:

API	CMP_ID	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FRT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTO	O_BEF	O_AFT	O_BEF	O_AFT	NGL_BEF	NGL_AFT	P_BEF	P_AFT
4705101396	11112011	6/11/2011	1272	Ground Level	Cameron-Garner	Dretnagall St	Marshall St	Development Vns	Development Vns	Gas	Orlando Lee	Fractured	6625	12408	12408	2459	2433	20	24				

Comment: 11/17/2011: Additional Lease #: WV15-0015-000: Rock pressure listed as 2500 csg.

WV Geological & Economic Survey

Well: County = 51 Permit = 01437

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
4705101437	Marshall	1437	Franklin	Poquatone Park	Clanjoison	39.75288	-80.75312	520292.6	4400332.2

Bottom Hole Location Information:

API	SP_FLAG	UTME	UTMN	LONG_DD	LAT_DD
4705101437	1	As Proposed	521859.7	4400114.2	-80.746

Owner Information:

API	CMP_ID	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR/AT_COMPLETION	PROP_VD	PROP_TRGT_FM	FM_EST_FR
4705101437	11172011		Comp	Orlando Lee	Completed	James A & Jil C Corley et al	24	Corley	WV16-0018-0011-288032-001	WV-0018-000	James A & Jil C Corley et al	Greiner Production USA, Inc	6729

Completion Information:

API	CMP_ID	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FRT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTO	O_BEF	O_AFT	O_BEF	O_AFT	NGL_BEF	NGL_AFT	P_BEF	P_AFT
4705101437	11172011	10/29/2011	1272	Ground Level	Cameron-Garner	Orangeburg Ln	Marshall St	Development Vns	Development Vns	Gas	Orlando Lee	Fractured	6632	12152	12152	2459	2433	20	24				

Comment: 11/17/2011: Additional Lease: WV16-0018-002; WV16-0066-000; 1-288032-001

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 Select County: (051) Marshall | Select datatypes: (Check All)

 Location Production Plugging

 Owner/Completion Stratigraphy Sample

 Pay/Show/Visier Logs Blm Hole Log

[Table Descriptions](#)

[County/County Transition](#)

[County/Production Status](#)

[Lease Status](#)

[Operator Information](#)

[Database](#)

[WVGES Main](#)

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WV Geological & Economic Survey Well: County = 51 Permit = 01397

Location Information: [View Map](#)
 API COUNTY PERMIT TAX DISTRICT QUAD_75 QUAD_16 LAY_50 LOR_00 UTMN UTMN
 4709101397 Marshall 1397 Franklin Purchase Point Charleston 39 7575.11 -85 7035.11 4405346

Bottom Hole Location Information:
 API EP FLAG UTMN UTMN LOR_00 LAY_00
 4709101397 1 As Proposed 021470 1 4329789 2 -85 749206 30 747172

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TWT_FM	TRM_EST_FR
4709101397	11/18/2011	Over/Original	Completed	James A & Jil C Conroy et al	3H		Cooley	1-288828-001 R/A/WV16-0018-021/WV-0020-000	James A & Jil C Conroy et al	Qatar Exploration USA, Inc.	8720	Marcellus Sh	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTO	O_BEF	G_AFT	O_BEF	O_AFT	NGL_BEF	NGL_AFT	P_BEF	P_AFT
4709101397	11/18/2011	7/8/2011	4772	Ground Level	Cameron-Cannar	Marcellus Sh	Development Well	Development Well	Oil and Gas	unknown	Fractured	8639	12310	12310	2757	2620	48	41				

Comment: 11/18/2011 Additional Lease #: WV16-0018-002/WV16-0051-000/WV16-0015-000/WV16-0055-000


 Select County: (051) Marshall | Select datatypes: (Check All)

 Location Production Plugging

 Owner/Completion Stratigraphy Sample

 Pay/Show/Visier Logs Blm Hole Log

[Table Descriptions](#)

[County/County Transition](#)

[County/Production Status](#)

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[Operator Information](#)

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WV Geological & Economic Survey Well: County = 51 Permit = 01438

Location Information: [View Map](#)
 API COUNTY PERMIT TAX DISTRICT QUAD_75 QUAD_16 LAY_00 LOR_00 UTMN UTMN
 4709101438 Marshall 1438 Franklin Purchase Point Charleston 39 77281 -85 738054 420203 4 440381 2

Bottom Hole Location Information:
 API EP FLAG UTMN UTMN LOR_00 LAY_00
 4709101438 1 As Proposed 021048 2 440203 3 -85 747223 30 732112

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TWT_FM	TRM_EST_FR
4709101438	11/18/2011	Over/Original	Completed	James A & Jil C Conroy et al	4H		Cooley	WV16-0018-001/WV16-0044/WV16-0018-002/WV16-0006	James A & Jil C Conroy et al	Qatar Exploration USA, Inc.	8720	Marcellus Sh	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTO	O_BEF	G_AFT	O_BEF	O_AFT	NGL_BEF	NGL_AFT	P_BEF	P_AFT
4709101438	11/18/2011	7/8/2011	4772	Ground Level	Cameron-Cannar	Marcellus Sh	Development Well	Development Well	Oil and Gas	Rotary	Fractured	8627	13318	868	1000	5	23					

Comment: 11/18/2011 Other Lease numbers: 1-255280-001/1-298082-001

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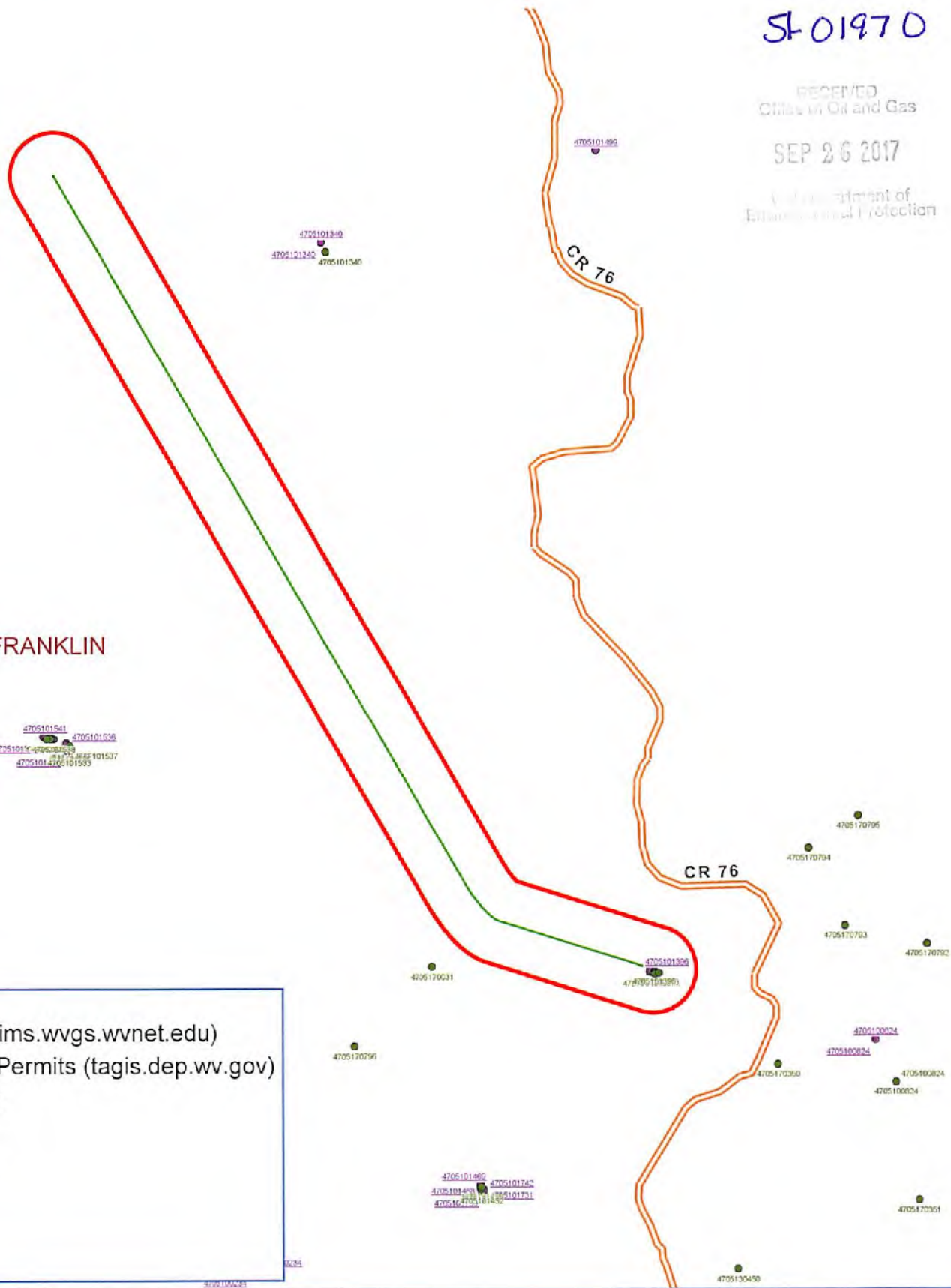
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West Virginia Department of
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MARSHALL FRANKLIN

Legend

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Corley N-5HM
- 500 Ft Buffer
- ▭ Counties
- ▭ Districts



Corley N-5HM Franklin District Marshall County, WV



SI-01970



TUG HILL
OPERATING

Tug Hill Operating LLC

Well: Corley N-05HM (slot F)

Site: Corley Pad

Project: Marshall County, WV

Design: rev1

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dlog	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	2747.01	24.94	287.30	2708.00	79.43	-255.07	2.00	287.30	217.66	Begin 24.94° tangent
4	6551.13	24.94	287.30	6157.38	558.36	-1786.62	0.00	0.00	1524.62	Begin 10°/100' build/turn
5	7279.07	91.00	326.84	6533.00	973.72	-2170.12	10.00	44.83	2088.99	Begin 91.00° lateral section
6	16736.09	91.00	326.84	6368.00	9132.70	-6949.12	0.00	0.00	1475.91	PBHL/TD 16736.08 MD/6368.00 TVD



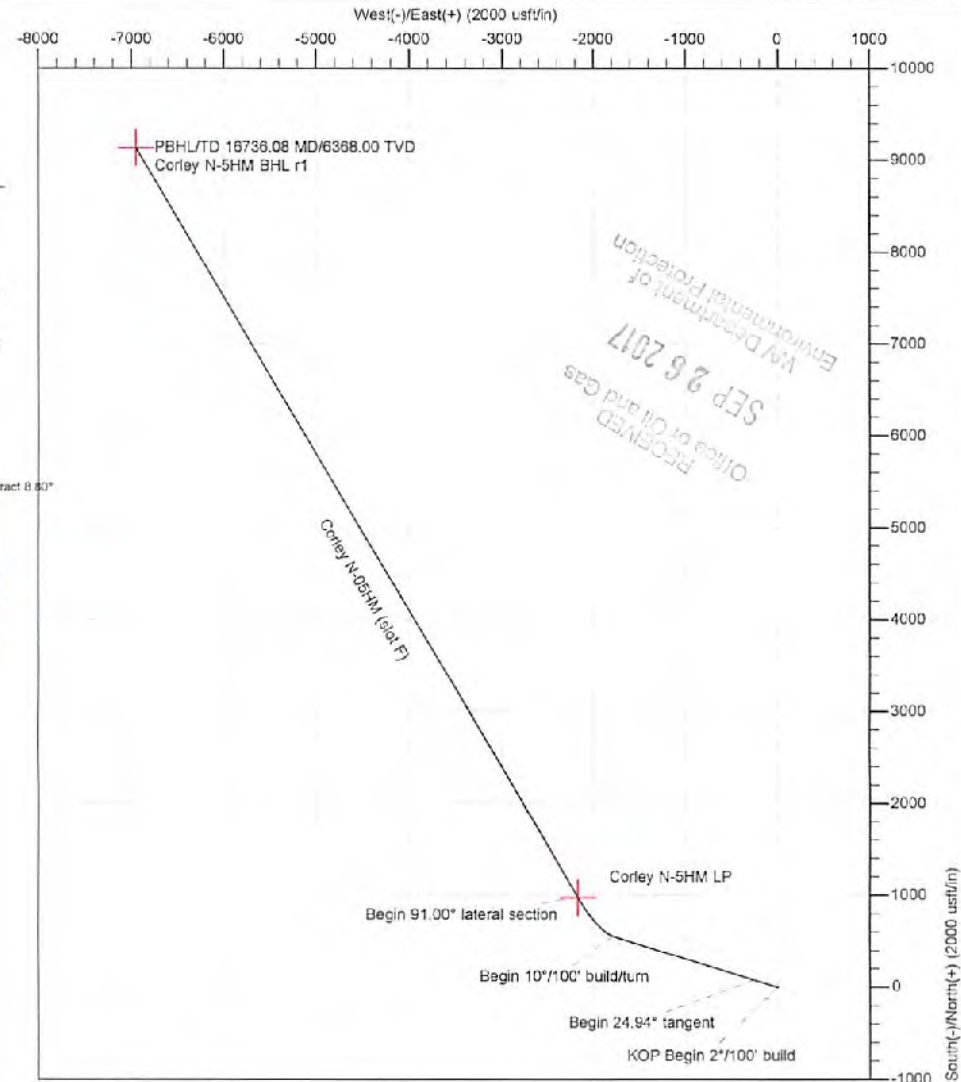
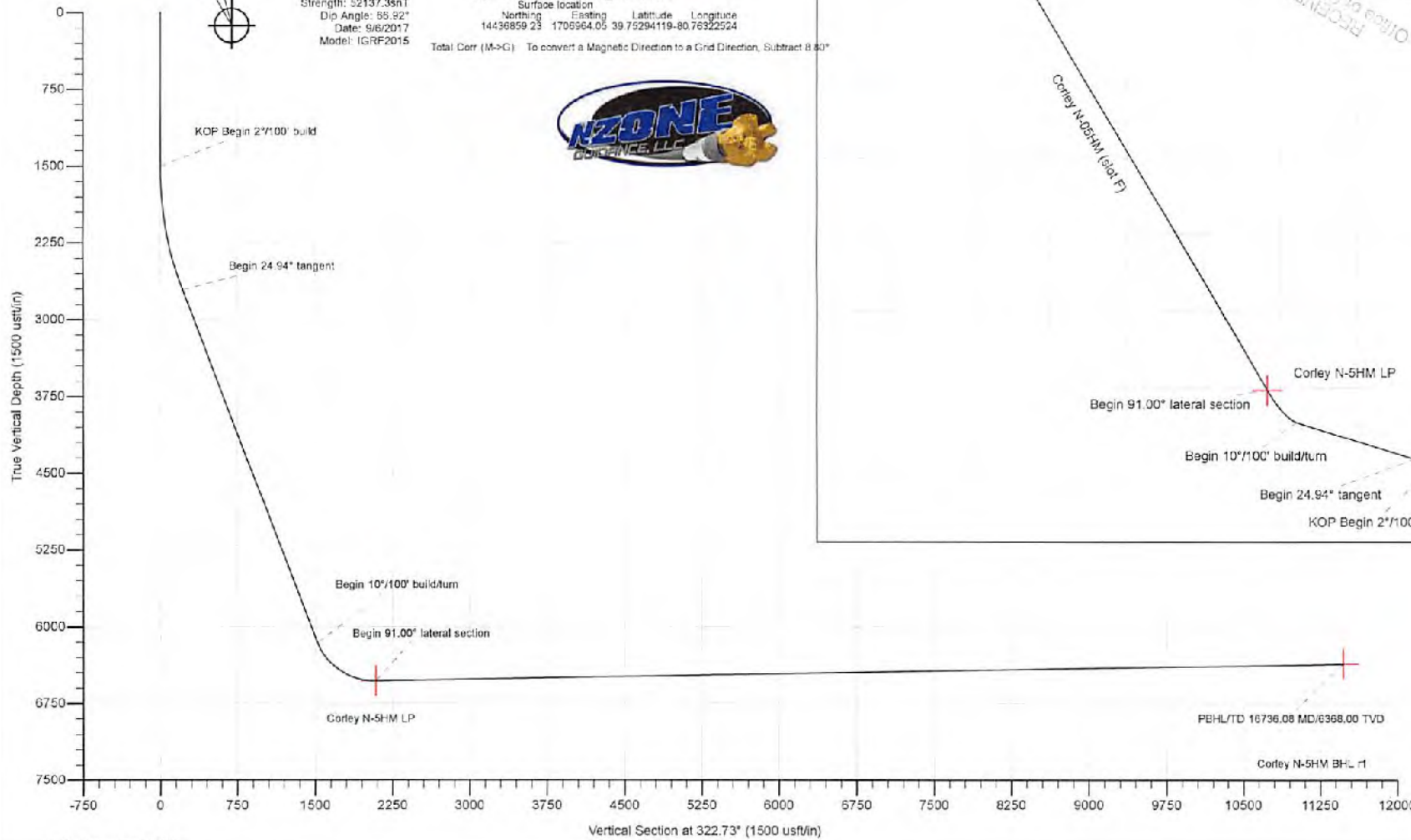
Azimuths to Grid North
True North: -0.15°
Magnetic North: -8.60°

Magnetic Field
Strength: 52137.3snT
Dip Angle: 86.82°
Date: 9/6/2017
Model: IGRF2015

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-1254 @ 1254.00usf
Surface location
Northing Easting Latitude Longitude
14436859.23 1706964.05 39.75294119 -80.76322524

Total Corr (M->G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.80°



REC'D
Office of Oil and Gas
SEP 26 2017
WV Department of Environmental Protection



Planning Report - Geographic

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Corley N-05HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1254 @ 1254.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1254 @ 1254.00usft
Site:	Corley Pad	North Reference:	Grid
Well:	Corley N-05HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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	Corley Pad				
Site Position:		Northing:	14,436,832.02 usft	Latitude:	39.75286638
From:	Lat/Long	Easting:	1,708,973.98 usft	Longitude:	-80.76319015
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.15 "

Well	Corley N-05HM (slot F)					
Well Position	+N/-S	0.00 usft	Northing:	14,436,859.23 usft	Latitude:	39.75294119
	+E/-W	0.00 usft	Easting:	1,708,984.05 usft	Longitude:	-80.76322524
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	1,254.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/6/2017	-8.65	66.92	52,137.28438990

Design	rev1			
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	322.73

Plan Survey Tool Program	Date 9/14/2017			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	16,738.09 rev1 (Original Hole)	MWD	MWD - Standard

Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00		
2,747.01	24.94	287.30	2,708.00	79.43	-255.07	2.00	2.00	0.00	287.30		
6,551.13	24.94	287.30	6,157.38	556.36	-1,788.62	0.00	0.00	0.00	0.00		
7,279.07	91.00	329.64	6,533.00	973.72	-2,170.12	10.00	9.07	5.82	44.83	Corley N-5HM LP	
16,736.09	91.00	329.64	6,368.00	9,132.70	-8,949.12	0.00	0.00	0.00	0.00	Corley N-5HM BHL r1	



Planning Report - Geographic

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Corley N-05HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1254 @ 1254.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1254 @ 1254.00usft
Site:	Corley Pad	North Reference:	Grid
Well:	Corley N-05HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
100.00	0.00	0.00	100.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
200.00	0.00	0.00	200.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
300.00	0.00	0.00	300.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
400.00	0.00	0.00	400.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
500.00	0.00	0.00	500.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
600.00	0.00	0.00	600.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
700.00	0.00	0.00	700.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
800.00	0.00	0.00	800.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
900.00	0.00	0.00	900.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,436,859.23	1,706,964.05	39.75294119	-80.76322524	
KOP Begin 2°/100' build										
1,600.00	2.00	287.30	1,599.98	0.52	-1.67	14,436,859.75	1,706,962.38	39.75294263	-80.76323116	
1,700.00	4.00	287.30	1,699.84	2.07	-6.66	14,436,861.31	1,706,957.39	39.75294694	-80.76324893	
1,800.00	6.00	287.30	1,799.45	4.67	-14.98	14,436,863.90	1,706,949.07	39.75295411	-80.76327651	
1,900.00	8.00	287.30	1,898.70	8.29	-26.62	14,436,867.52	1,706,937.43	39.75296415	-80.76331987	
2,000.00	10.00	287.30	1,997.47	12.94	-41.55	14,436,872.17	1,706,922.49	39.75297703	-80.76337297	
2,100.00	12.00	287.30	2,095.62	18.61	-59.77	14,436,877.85	1,706,904.28	39.75299274	-80.76343773	
2,200.00	14.00	287.30	2,193.08	25.30	-81.25	14,436,884.54	1,706,882.80	39.75301126	-80.76351408	
2,300.00	16.00	287.30	2,289.64	33.00	-105.96	14,436,892.23	1,706,858.09	39.75303258	-80.76360193	
2,400.00	18.00	287.30	2,385.27	41.69	-133.87	14,436,900.92	1,706,830.18	39.75305665	-80.76370116	
2,500.00	20.00	287.30	2,479.82	51.37	-164.96	14,436,910.60	1,706,799.09	39.75308346	-80.76381166	
2,600.00	22.00	287.30	2,573.17	62.02	-199.17	14,436,921.28	1,706,764.88	39.75311296	-80.76393330	
2,700.00	24.00	287.30	2,665.21	73.64	-236.47	14,436,932.87	1,706,727.58	39.75314514	-80.76405591	
2,747.01	24.94	287.30	2,708.00	79.43	-255.07	14,436,938.66	1,706,708.98	39.75316117	-80.76413201	
Begin 24.94° tangent										
2,800.00	24.94	287.30	2,756.05	86.07	-276.40	14,436,945.31	1,706,687.65	39.75317957	-80.76420765	
2,900.00	24.94	287.30	2,846.73	98.61	-316.66	14,436,957.84	1,706,647.39	39.75321429	-80.76435098	
3,000.00	24.94	287.30	2,937.40	111.15	-356.92	14,436,970.38	1,706,607.13	39.75324901	-80.76449411	
3,100.00	24.94	287.30	3,028.07	123.68	-397.18	14,436,982.92	1,706,566.87	39.75328373	-80.76463724	
3,200.00	24.94	287.30	3,118.75	135.22	-437.44	14,436,995.45	1,706,526.61	39.75331845	-80.76478037	
3,300.00	24.94	287.30	3,209.42	148.76	-477.70	14,437,007.99	1,706,486.35	39.75335318	-80.76492349	
3,400.00	24.94	287.30	3,300.10	161.29	-517.96	14,437,020.53	1,706,446.09	39.75338790	-80.76506662	
3,500.00	24.94	287.30	3,390.77	173.83	-558.22	14,437,033.07	1,706,405.83	39.75342262	-80.76520975	
3,600.00	24.94	287.30	3,481.45	186.37	-598.48	14,437,045.60	1,706,365.57	39.75345734	-80.76535288	
3,700.00	24.94	287.30	3,572.12	198.91	-638.74	14,437,058.14	1,706,325.31	39.75349206	-80.76549601	
3,800.00	24.94	287.30	3,662.80	211.44	-679.00	14,437,070.68	1,706,285.05	39.75352678	-80.76563914	
3,900.00	24.94	287.30	3,753.47	223.98	-719.26	14,437,083.21	1,706,244.79	39.75356150	-80.76578227	
4,000.00	24.94	287.30	3,844.15	236.52	-759.52	14,437,095.75	1,706,204.52	39.75359622	-80.76592540	
4,100.00	24.94	287.30	3,934.82	249.05	-799.78	14,437,108.29	1,706,164.26	39.75363094	-80.76606853	
4,200.00	24.94	287.30	4,025.50	261.59	-840.05	14,437,120.83	1,706,124.00	39.75366566	-80.76621166	
4,300.00	24.94	287.30	4,116.17	274.13	-880.31	14,437,133.36	1,706,083.74	39.75370037	-80.76635479	
4,400.00	24.94	287.30	4,206.85	286.67	-920.57	14,437,145.90	1,706,043.48	39.75373509	-80.76649792	
4,500.00	24.94	287.30	4,297.52	299.20	-960.83	14,437,158.44	1,706,003.22	39.75376981	-80.76664105	
4,600.00	24.94	287.30	4,388.20	311.74	-1,001.09	14,437,170.97	1,705,962.96	39.75380453	-80.76678418	
4,700.00	24.94	287.30	4,478.87	324.28	-1,041.35	14,437,183.51	1,705,922.70	39.75383925	-80.76692731	
4,800.00	24.94	287.30	4,569.55	336.81	-1,081.61	14,437,196.05	1,705,882.44	39.75387397	-80.76707044	
4,900.00	24.94	287.30	4,660.22	349.35	-1,121.87	14,437,208.59	1,705,842.18	39.75390868	-80.76721357	
5,000.00	24.94	287.30	4,750.90	361.89	-1,162.13	14,437,221.12	1,705,801.92	39.75394340	-80.76735670	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Corley N-05HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1254 @ 1254.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1254 @ 1254.00usft
Site:	Corley Pad	North Reference:	Grid
Well:	Corley N-05HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,100.00	24.94	287.30	4,841.57	374.43	-1,202.39	14,437,233.66	1,705,761.66	39.75397812	-80.76749983
5,200.00	24.94	287.30	4,932.25	386.96	-1,242.65	14,437,246.20	1,705,721.40	39.75401284	-80.76764297
5,300.00	24.94	287.30	5,022.92	399.50	-1,282.91	14,437,258.73	1,705,681.14	39.75404756	-80.76778610
5,400.00	24.94	287.30	5,113.60	412.04	-1,323.17	14,437,271.27	1,705,640.88	39.75408227	-80.76792923
5,500.00	24.94	287.30	5,204.27	424.57	-1,363.43	14,437,283.81	1,705,600.62	39.75411699	-80.76807236
5,600.00	24.94	287.30	5,294.94	437.11	-1,403.69	14,437,296.35	1,705,560.36	39.75415171	-80.76821549
5,700.00	24.94	287.30	5,385.62	449.65	-1,443.95	14,437,308.88	1,705,520.10	39.75418642	-80.76835863
5,800.00	24.94	287.30	5,476.29	462.19	-1,484.21	14,437,321.42	1,705,479.84	39.75422114	-80.76850176
5,900.00	24.94	287.30	5,566.97	474.72	-1,524.47	14,437,333.96	1,705,439.58	39.75425586	-80.76864489
6,000.00	24.94	287.30	5,657.64	487.26	-1,564.73	14,437,346.49	1,705,399.32	39.75429057	-80.76878802
6,100.00	24.94	287.30	5,748.32	499.80	-1,604.99	14,437,359.03	1,705,359.06	39.75432529	-80.76893116
6,200.00	24.94	287.30	5,838.99	512.33	-1,645.25	14,437,371.57	1,705,318.80	39.75436000	-80.76907429
6,300.00	24.94	287.30	5,929.67	524.87	-1,685.51	14,437,384.11	1,705,278.54	39.75439472	-80.76921742
6,400.00	24.94	287.30	6,020.34	537.41	-1,725.77	14,437,396.64	1,705,238.27	39.75442943	-80.76936055
6,500.00	24.94	287.30	6,111.02	549.95	-1,766.03	14,437,409.18	1,705,198.01	39.75446415	-80.76950369
6,551.13	24.94	287.30	6,157.38	556.36	-1,786.62	14,437,415.59	1,705,177.43	39.75448190	-80.76957687
Begin 10°/100' build/turn									
6,600.00	28.80	294.50	6,201.02	564.28	-1,807.11	14,437,423.51	1,705,156.94	39.75450379	-80.76964972
6,700.00	36.92	304.85	6,295.10	591.43	-1,853.66	14,437,450.67	1,705,110.39	39.75457871	-80.76981508
6,800.00	45.84	311.73	6,380.10	632.57	-1,905.21	14,437,491.81	1,705,058.84	39.75469205	-80.76999812
6,900.00	55.06	316.76	6,423.74	686.45	-1,960.19	14,437,545.68	1,705,003.86	39.75484038	-80.77019327
7,000.00	64.44	320.77	6,474.07	751.41	-2,016.94	14,437,610.65	1,704,947.11	39.75501920	-80.77039459
7,100.00	73.92	324.18	6,509.58	825.50	-2,073.73	14,437,694.73	1,704,890.32	39.75522306	-80.77059598
7,200.00	83.45	327.28	6,529.17	906.45	-2,128.84	14,437,785.69	1,704,835.21	39.75544577	-80.77079132
7,279.07	91.00	329.64	6,533.00	973.71	-2,170.11	14,437,832.95	1,704,793.93	39.75563078	-80.77093756
Begin 91.00° lateral section									
7,300.00	91.00	329.64	6,532.64	991.77	-2,180.69	14,437,851.00	1,704,783.36	39.75568045	-80.77097503
7,400.00	91.00	329.64	6,530.89	1,078.04	-2,231.22	14,437,937.28	1,704,732.82	39.75591773	-80.77115405
7,500.00	91.00	329.64	6,529.15	1,164.32	-2,281.76	14,438,023.55	1,704,682.29	39.75615502	-80.77133307
7,600.00	91.00	329.64	6,527.40	1,250.59	-2,332.29	14,438,109.83	1,704,631.76	39.75639231	-80.77151210
7,700.00	91.00	329.64	6,525.66	1,336.87	-2,382.83	14,438,196.10	1,704,581.22	39.75662960	-80.77169112
7,800.00	91.00	329.64	6,523.91	1,423.14	-2,433.36	14,438,282.38	1,704,530.69	39.75686689	-80.77187015
7,900.00	91.00	329.64	6,522.17	1,509.42	-2,483.89	14,438,368.65	1,704,480.15	39.75710418	-80.77204918
8,000.00	91.00	329.64	6,520.42	1,595.69	-2,534.43	14,438,454.93	1,704,429.62	39.75734146	-80.77222820
8,100.00	91.00	329.64	6,518.68	1,681.97	-2,584.96	14,438,541.20	1,704,379.09	39.75757875	-80.77240723
8,200.00	91.00	329.64	6,516.93	1,768.24	-2,635.50	14,438,627.47	1,704,328.55	39.75781604	-80.77258628
8,300.00	91.00	329.64	6,515.19	1,854.51	-2,686.03	14,438,713.75	1,704,278.02	39.75805332	-80.77276530
8,400.00	91.00	329.64	6,513.44	1,940.79	-2,736.56	14,438,800.02	1,704,227.48	39.75829061	-80.77294433
8,500.00	91.00	329.64	6,511.70	2,027.06	-2,787.10	14,438,886.30	1,704,176.95	39.75852789	-80.77312336
8,600.00	91.00	329.64	6,509.95	2,113.34	-2,837.63	14,438,972.57	1,704,126.42	39.75876518	-80.77330240
8,700.00	91.00	329.64	6,508.21	2,199.61	-2,888.17	14,439,058.85	1,704,075.88	39.75900247	-80.77348144
8,800.00	91.00	329.64	6,506.46	2,285.89	-2,938.70	14,439,145.12	1,704,025.35	39.75923975	-80.77366047
8,900.00	91.00	329.64	6,504.72	2,372.16	-2,989.23	14,439,231.40	1,703,974.81	39.75947704	-80.77383951
9,000.00	91.00	329.64	6,502.97	2,456.44	-3,039.77	14,439,317.67	1,703,924.28	39.75971432	-80.77401855
9,100.00	91.00	329.64	6,501.23	2,544.71	-3,090.30	14,439,403.94	1,703,873.75	39.75995160	-80.77419759
9,200.00	91.00	329.64	6,499.49	2,630.98	-3,140.84	14,439,490.22	1,703,823.21	39.76018889	-80.77437664
9,300.00	91.00	329.64	6,497.74	2,717.26	-3,191.37	14,439,576.49	1,703,772.68	39.76042617	-80.77455568
9,400.00	91.00	329.64	6,496.00	2,803.53	-3,241.90	14,439,662.77	1,703,722.15	39.76066346	-80.77473473
9,500.00	91.00	329.64	6,494.25	2,889.81	-3,292.44	14,439,749.04	1,703,671.61	39.76090074	-80.77491377
9,600.00	91.00	329.64	6,492.51	2,976.08	-3,342.97	14,439,835.32	1,703,621.08	39.76113802	-80.77509282
9,700.00	91.00	329.64	6,490.76	3,062.36	-3,393.51	14,439,921.59	1,703,570.54	39.76137530	-80.77527187
9,800.00	91.00	329.64	6,489.02	3,148.63	-3,444.04	14,440,007.87	1,703,520.01	39.76161259	-80.77545092
9,900.00	91.00	329.64	6,487.27	3,234.91	-3,494.57	14,440,094.14	1,703,469.48	39.76184987	-80.77562997
10,000.00	91.00	329.64	6,485.53	3,321.18	-3,545.11	14,440,180.41	1,703,418.94	39.76208715	-80.77580902



Planning Report - Geographic

WV Department of
Environmental Protection

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Corley N-05HM (slot F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1254 @ 1254.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1254 @ 1254.00usft
Site:	Corley Pad	North Reference:	Grid
Well:	Corley N-05HM (slot F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,600.00	91.00	329.64	6,387.82	8,152.55	-6,375.01	14,445,011.78	1,700,589.04	39.77537447	-80.78583794	
15,700.00	91.00	329.64	6,386.08	8,238.82	-6,425.54	14,445,098.08	1,700,538.51	39.77561174	-80.78601706	
15,800.00	91.00	329.64	6,384.33	8,325.10	-6,476.08	14,445,184.33	1,700,487.97	39.77584900	-80.78619618	
15,900.00	91.00	329.64	6,382.59	8,411.37	-6,526.61	14,445,270.81	1,700,437.44	39.77608627	-80.78637531	
16,000.00	91.00	329.64	6,380.84	8,497.65	-6,577.14	14,445,356.88	1,700,386.90	39.77632353	-80.78655443	
16,100.00	91.00	329.64	6,379.10	8,583.92	-6,627.68	14,445,443.15	1,700,336.37	39.77656080	-80.78673356	
16,200.00	91.00	329.64	6,377.35	8,670.19	-6,678.21	14,445,529.43	1,700,285.84	39.77679806	-80.78691269	
16,300.00	91.00	329.64	6,375.61	8,756.47	-6,728.75	14,445,615.70	1,700,235.30	39.77703532	-80.78709182	
16,400.00	91.00	329.64	6,373.86	8,842.74	-6,779.28	14,445,701.98	1,700,184.77	39.77727259	-80.78727095	
16,500.00	91.00	329.64	6,372.12	8,929.02	-6,829.81	14,445,788.25	1,700,134.23	39.77750985	-80.78745008	
16,600.00	91.00	329.64	6,370.37	9,015.29	-6,880.35	14,445,874.53	1,700,083.70	39.77774711	-80.78762922	
16,700.00	91.00	329.64	6,368.63	9,101.57	-6,930.88	14,445,960.80	1,700,033.17	39.77798438	-80.78780835	
16,736.08	91.00	329.64	6,368.00	9,132.69	-6,949.12	14,445,991.93	1,700,014.93	39.77808998	-80.78787298	
PBHL/TD 16736.08 MD/6368.00 TVD										
16,736.09	91.00	329.64	6,368.00	9,132.70	-6,949.12	14,445,991.94	1,700,014.93	39.77807000	-80.78787300	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Corley N-5HM BHL r1 - hit/miss target - Shape - Point	0.00	0.00	6,368.00	9,132.70	-6,949.12	14,445,991.94	1,700,014.93	39.77807000	-80.78787300	
Corley N-5HM LP - plan hits target center - Point	0.00	0.01	6,533.00	973.72	-2,170.12	14,437,832.95	1,704,793.93	39.75563079	-80.77093757	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,500.00	1,500.00	0.00	0.00	KOP Begin 2°/100' build	
2,747.01	2,708.00	79.43	-255.07	Begin 24.94° tangent	
6,551.13	6,157.38	556.36	-1,786.62	Begin 10°/100' build/turn	
7,279.07	6,533.00	973.71	-2,170.11	Begin 91.00° lateral section	
16,736.08	6,368.00	9,132.69	-6,949.12	PBHL/TD 16736.08 MD/6368.00 TVD	

SEP 26 2017

WW-9
(4/16)

WV Department of
Environmental Protection

API Number 47 - 051 - 01970
Operator's Well No. Corley N-5HM

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 - Ohio River (Undefined) 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 containment

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings to be disposed of in Wetzel County Sanitary 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)

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 [Signature]
Company Official (Typed Name) Sean Gasser
Company Official Title Engineer

Subscribed and sworn before me this 18th day of September, 2017

Robin Bock



My commission expires 10-05-2020

51-01970

Form WW-9

Operator's Well No. Corley N-5HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 17.78 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

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Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Rye Grain	140	Tall Fescue	40
		Ladino Clover	5

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: _____

John T. ...

Comments: _____

Title: Oil + Gas Inspector

Date: 9/20/17

Field Reviewed? Yes No

51-01970

WW-9

PROPOSED CORLEY N-5HM

SUPPLEMENT PG 1

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

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

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

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

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

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Environmental Protection

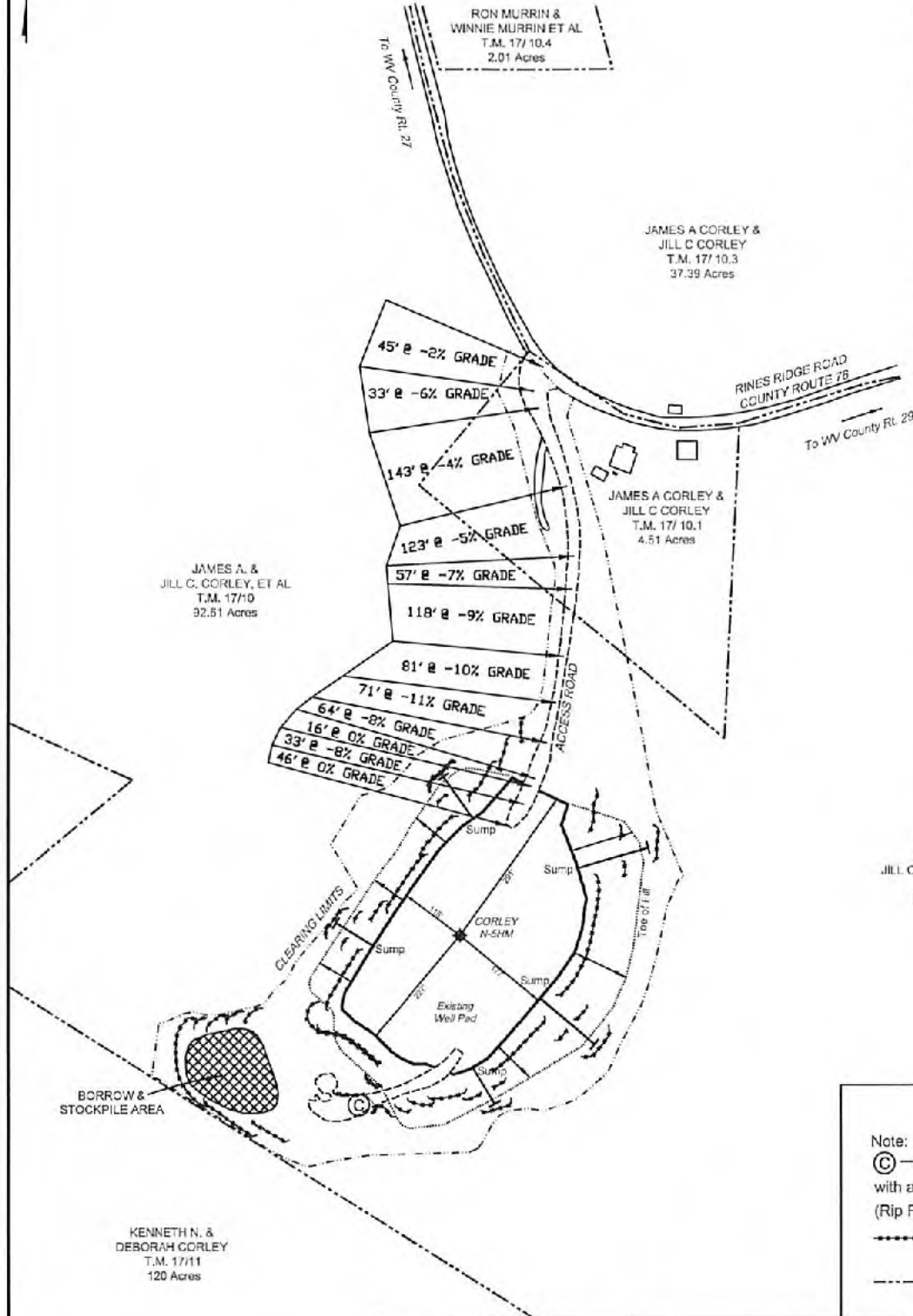
JAMES A. &
JILL C. CORLEY, ET AL
T.M. 17/10
92.61 Acres

LEGEND

Note:

- ⊙ — Denotes existing culvert with appropriate sediment outlet control (Rip Rap splash pad).
- Silt Fence and or Sediment and Erosion Control Measure.
- Surface Boundary

DRAWING NOT TO SCALE



DATE: 09/19/17

PROJECT NO: 494510851

DRAWN BY: J.A.H.



Well Site Safety Plan

Tug Hill Operating, LLC *ju 9/20/17*

Well Name: Corley N-5HM

Pad Location: Corley Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,400,363.49

Easting: 520,283.68

September 2017

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SEP 26 2017

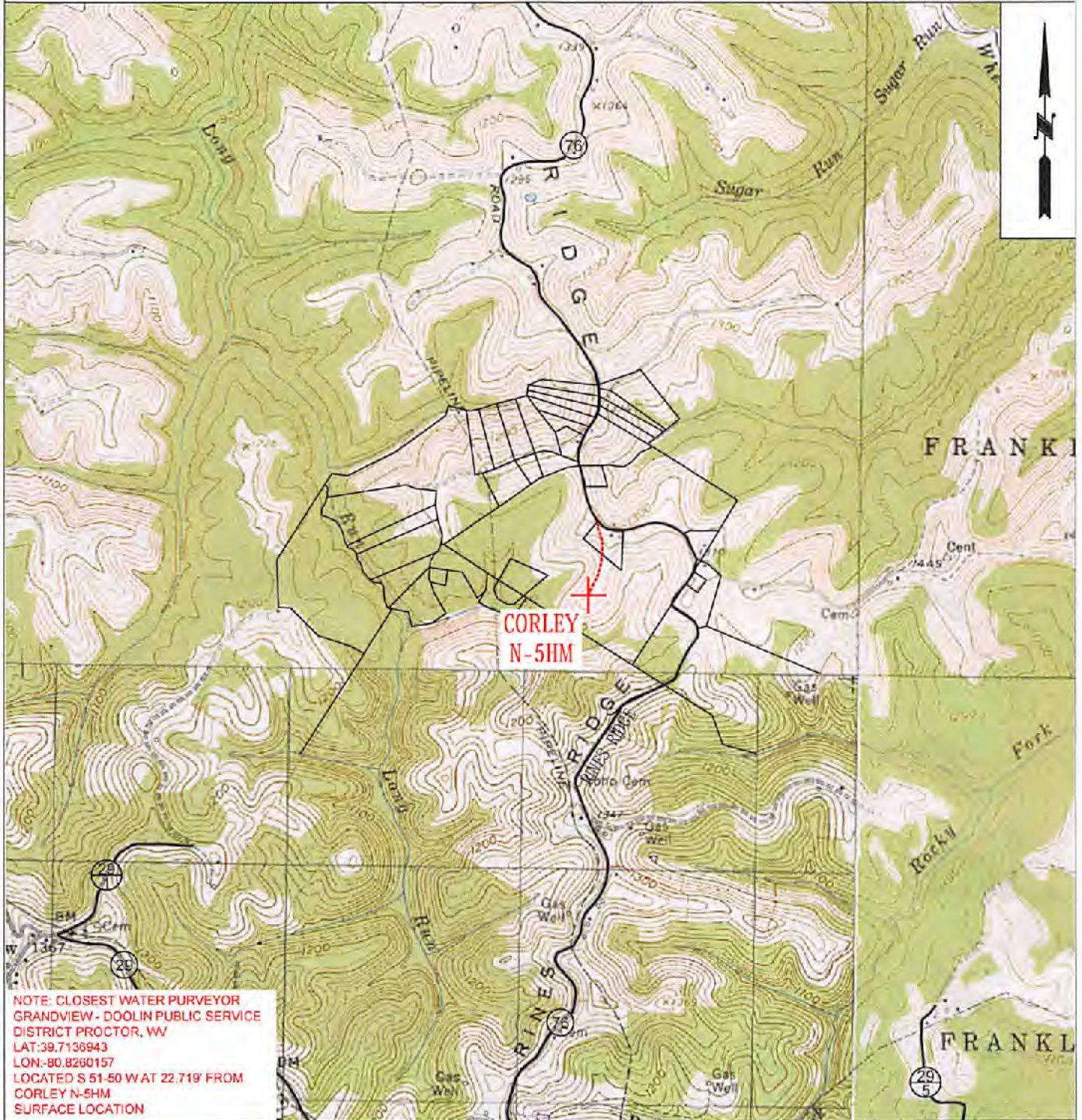
4705101970


WW-9

WV Department of
Environmental Protection

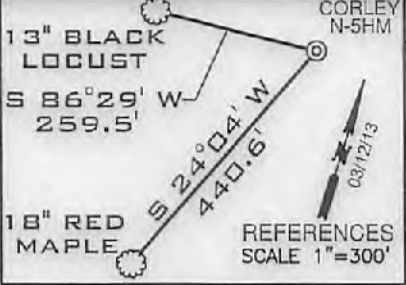
PROPOSED CORLEY N-5HM

SUPPLEMENT PG 2



 TUG HILL OPERATING	OPERATOR	494510851	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	CORLEY
			SCALE: 1" = 2000'	DATE: DATE: 09/19/17

CORLEY LEASE WELL N-5HM
552.127± ACRES

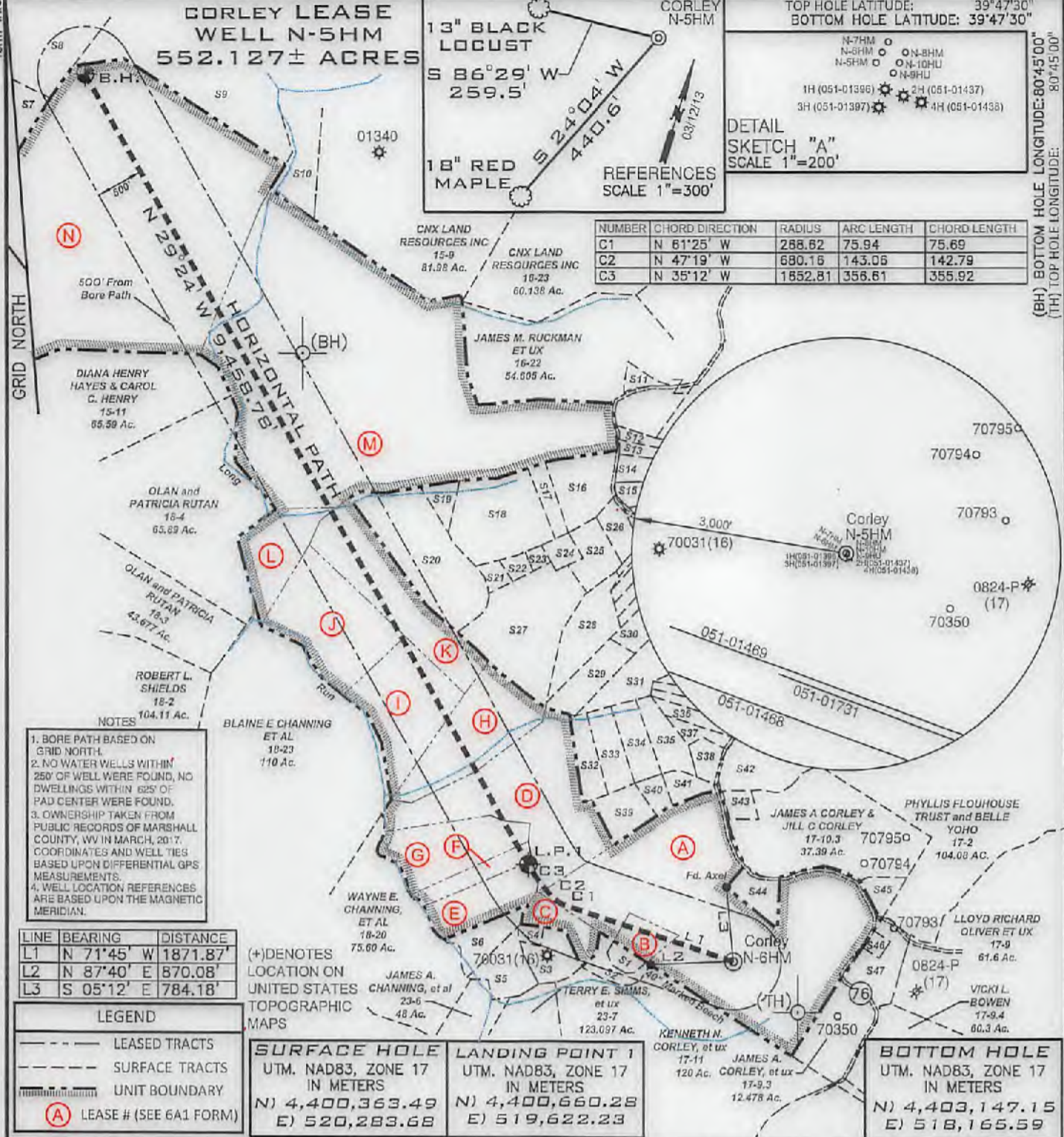


TOP HOLE LATITUDE: 39°47'30"
BOTTOM HOLE LATITUDE: 39°47'30"

1H (051-01396) 2H (051-01437)
3H (051-01397) 4H (051-01438)

DETAIL SKETCH "A"
SCALE 1"=200'

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	N 61°25' W	288.62	75.94	75.69
C2	N 47°19' W	680.16	143.06	142.79
C3	N 35°12' W	1852.81	356.61	355.92



- NOTES**
- BORE PATH BASED ON GRID NORTH.
 - NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
 - OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 - WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LINE	BEARING	DISTANCE
L1	N 71°45' W	1871.87'
L2	N 87°40' E	870.08'
L3	S 05°12' E	784.18'

LEGEND

- LEASED TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,400,363.49
E) 520,283.68

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,400,660.28
E) 519,622.23

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,403,147.15
E) 518,165.59

FILE NUMBER _____

DRAWING NUMBER CORLEY_WP_N-5HM

SCALE 1" = 1500'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

P.S. 708 *David L Jackson*



JACKSON SURVEYING INC.
P.O. Box 1460
Clarksburg, WV 26302
304-623-6851

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

DATE: SEPTEMBER 19, 2017

REVISED DATE: DECEMBER 20, 2017

OPERATORS WELL NO. CORLEY N-5HM

API WELL NO. 47-051-01970

STATE WV COUNTY MARSHALL PERMIT 8074500

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

LOCATION ELEVATION 1254.22' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall

QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE 6A1 Form

SURFACE OWNER James A. & Jill C. Corley, et al ACREAGE 92.61

OIL & GAS ROYALTY OWNER James A. & Jill C. Corley, et al LEASE ACREAGE 92.61

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

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,662' TMD: 16,746'

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

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

COUNTY NAME
PERMIT

**CORLEY LEASE
WELL N-5HM
552.127± ACRES**

GRID NORTH

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	17-12	James A. & Jill C. Corley	3.33
S2	17-12.1	Williams Ohio Valley Midstream LLC	1.67
S3	18-13.8	Lori D. Carpenter	5.545
S4	18-29	Carl G Berg	5.319
S5	18-32	Kenneth E Rastall	5.335
S6	18-32.1	Lori D. Carpenter	1.165
S7	15-15	Robert L. Shields et al	4.90
S8	15-1	Marcus Sharp & David Schlabach	121.0
S9	15-14	John David Petrock et ux	25.0
S10	15-13	CNX Land Resources Inc.	11.0
S11	16-22.1	Heather Burgy	1.465
S12	18-56	William E. O'Hara	3.965
S13	18-55	William E. O'Hara	3.202
S14	18-28	Dotson Harrison et ux	6.36
S15	18-28.1	Carol Diane Helmick	5.696
S16	18-11	Benjamin Robinson	10.883
S17	18-11.2	Edward Lee Burge Jr.	2.0
S18	18-11.1	Edward Lee Burge Jr.	18.0
S19	18-15	Edward Lee Burge Jr.	2.495
S20	18-15.4	Edward Lee Burge Jr.	22.34
S21	18-10.1	David V Anderson Et Ux	1.65
S22	18-10.2	David V Anderson Et Ux	1.377
S23	18-10	David & Nancy Anderson	0.907
S24	18-12	William L Wayne Et Ux	2.270
S25	18-15.1	Jason Blair	5.948
S26	18-15.2	Edward L. Burge	4.171
S27	18-15.5	Darrell & Teresa Boley	23.547
S28	18-13.3	Robert G Closterman	9.813
S29	18-17	Michael Fincham & Kezia Winters	6.555
S30	18-14	Michael Fincham & Kezia Winters	6.386
S31	18-13.1	Cory A Holt	9.248
S32	18-34	Jodi A & Gary A Hall	5.002
S33	18-13.13	Glenn E & Sandra K Whisler	5.59
S34	18-13.6	Glenn Eugene Whisler Et Ux	5.384
S35	18-13.7	Victor W. Woods Jr. & Jessica L. Woods	5.255
S36	18-61	Roger White Jr.	2.984
S37	18-57	Marvin Roberts	2.228
S38	18-18	Linda J. Coen	3.0
S39	18-33	Sandra K & Glenn E Whisler	5.343
S40	18-13.14	Glenn E. & Sandra K. Whisler	2.116
S41	18-48	Marvin Dean Roberts et ux & Brad & Bridget Williams	2.920
S42	18-19	Roger D. White Jr.	10.0
S43	17-10.4	Ron & Winnie Murrin et al	2.01
S44	17-10.1	James A. & Jill C. Corley	4.51
S45	17-10.2	Sidney Pozell Et Ux Ests	2.6
S46	17-9.1	Jeri J White	1.0



TUG HILL
OPERATING

OPERATOR'S

WELL #: Corley N-5HM

DISTRICT:

Franklin

COUNTY:

MarshallSTATE: WV

WELL PLAT

PAGE 2 OF 2

DATE: 09/19/1974

WW-6A1
(5/13)

Operator's Well No. Corley N-5HM

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

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

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

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

*See attached pages

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Office of Oil and Gas
SEP 26 2017
WV Department of Environmental Protection

**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

SI-01970

WW-6A1 Supplement

Operator's Well No. Corley N - 5HM

LM_ID	TAG	SEC	LESSOR	LESSEE	ROYALTY	BOOK	PG		ASSIGNMENT	ASSIGNMENT	ASSIGNMENT
10*14095	A	5-17-10	JAMES A CORLEY AND JILL C CO	GASTAR EXPLORATION USA, INC.	1/8+	666	545	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14096	A	5-17-10	RUTH A CORLEY	GASTAR EXPLORATION USA, INC.	1/8+	666	539	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14095	B	5-17-10.5	JAMES A CORLEY AND JILL C CO	GASTAR EXPLORATION USA, INC.	1/8+	666	545	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14096	B	5-17-10.5	RUTH A CORLEY	GASTAR EXPLORATION USA, INC.	1/8+	666	539	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*17456	C	5-18-13.8	LORI CARPENTER	TH EXPLORATION, LLC	1/8+	941	223	N/A	N/A	N/A	N/A
10*14009	D	5-18-13	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*18898	D	5-18-13	COLBY ANN FLOUHOUSE HOMER AND THE ESTATE OF PHYLLIS J FLOUHOUSE	TH EXPLORATION, LLC	1/8+	940	427	N/A	N/A	N/A	N/A
10*14099	E	5-18-13.10	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*18898	E	5-18-13.10	COLBY ANN FLOUHOUSE HOMER AND THE ESTATE OF PHYLLIS J FLOUHOUSE	TH EXPLORATION, LLC	1/8+	940	427	N/A	N/A	N/A	N/A
10*14009	F	5-18-30	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

WW-6A1 Supplement

Operator's Well No. Corley N - 5HM

LM_ID	TAG	SEC	LESSOR	LESSEE	ROYALTY	BOOK	PG	ASSIGNMENT	ASSIGNMENT	ASSIGNMENT	
10*14009	G	5-18-59	SOUTHERN COUNTRY FARMS INC COLBY ANN FLOUHOUSE HOMER AND THE ESTATE OF PHYLLIS J FLOUHOUSE	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*18898	G	5-18-59	FLOUHOUSE	TH EXPLORATION, LLC	1/8+	940	427	N/A	N/A	N/A	N/A
10*14503	H	5-18-16	IMA LEE YOHO	GASTAR EXPLORATION USA, INC.	1/8+	756	85	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14503	I	5-18-7	IMA LEE YOHO	GASTAR EXPLORATION USA, INC.	1/8+	756	85	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*17454	J	5-18-6	MARGARET A BONNETT	TH EXPLORATION LLC	1/8+	940	431	N/A	N/A	N/A	N/A
10*17452	J	5-18-6	DIANA L WELLMAN	TH EXPLORATION LLC	1/8+	940	434	N/A	N/A	N/A	N/A
10*18051	J	5-18-6	WILLIAM R LEVASSEUR JR	TH EXPLORATION LLC	1/8+	919	257	N/A	N/A	N/A	N/A
10*18054	J	5-18-6	TH EXPLORATION, LLC	TH EXPLORATION, LLC	1/8+	917	124	N/A	N/A	N/A	N/A
10*18068	J	5-18-6	TH EXPLORATION, LLC	TH EXPLORATION LLC	1/8+	919	247	N/A	N/A	N/A	N/A
10*17222	K	5-18-15.3	JAMES W AND DOLIE M FOSTER	TH EXPLORATION LLC	1/8+	940	429	N/A	N/A	N/A	N/A
10*16980	L	5-18-5	TERRELL L MELLOTT	TRIENERGY INC	1/8+	704	26	24/180 TriEnergy Holdings, LLC to NPAR, LLC	24/466 AB Resources LLC and NPAR, LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	25/1 Chief Exploration & Development et al to Chevron USA Inc.	40/127 Chevron USA Inc to TH Exploration, LLC
10*19339	M	5-15-10	MARK STANLEY RUCKMAN	TRIENERGY INC	1/8+	664	495	N/A	N/A	28/356 TriEnergy Inc. & TriEnergy Holdings, LLC to Chevron U.S.A. Inc.	40/57 Chevron U.S.A. Inc to TH Exploration, LLC
10*19337	N	5-15-12	JACK AND HATTIE PETROCK	TRIENERGY INC	1/8+	663	498	N/A	N/A	28/356 TriEnergy Inc. & TriEnergy Holdings, LLC to Chevron U.S.A. Inc.	40/57 Chevron U.S.A. Inc to TH Exploration, LLC

Jan Pest 51-01970
 MARSHALL County 01:22:38 PM
 Instrument No 1403489
 Date Recorded 04/27/2016
 Document Type ASB
 Pages Recorded 77
 Book-Page 36-9
 Recording Fee \$77.00
 Additional \$13.00

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

Execution Version

ASSIGNMENT AND BILL OF SALE

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

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

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

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

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

(a) all oil, gas and/or mineral leases of Assignor, together with any and all other right, title and interest of Assignor in and to the leasehold estates created thereby, including subleases, royalties, overriding royalties, net profits interest, carried interests or similar rights or interests in such leases, and together with all rights, privileges, benefits and powers conferred upon Assignor with respect to the use and occupation of the lands covered thereby that may be necessary, convenient or incidental to the possession and enjoyment of such leases, located in Marshall, 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

2016 MAR 28 2 55 2017
 County of Marshall

MICHAEL HURAN
BRIGHTON RESOURCES
5851 ELLSWORTH AVENUE, #1
PITTSBURGH PA 15232-1707

51-01970
BOOK 0:040 PAGE 0127

STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

Marshall County
Jan Pest, Clerk
Instrument 1428356
08/16/2017 @ 12:08:49 PM
ASSIGNMENTS
Book 40 @ Page 127
Pages Recorded 25
Recording Cost \$ 33.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 1 day of August, 2017 (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 August, 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"), 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. As to each of the Leases and all oil, gas, and associated hydrocarbons produced, saved and sold thereunder, an overriding royalty interest equal to the difference between 82% and the

RECORDING
OFFICE OF MARSHALL COUNTY
SEP 29 2017
A Division of the Department of
Natural Resources and Forestry



91-01970

September 22, 2017

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

RE: Corley N-5HM

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 Corley N-5HM 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-hillop.com.

Sincerely,

Amy L. Miller
Permitting Specialist – Appalachia Region

RECEIVED
Office of Oil and Gas

SEP 26 2017

WV Department of
Environmental Protection

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

Date of Notice Certification: 09/22/2017

API No. 47- 051 - 01970
 Operator's Well No. Corley N-5HM
 Well Pad Name: Corley

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	Eastings: <u>520,283.68</u>
County: <u>Marshall</u>		Northing: <u>4,400,363.49</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>Corley, James A. and Jill C.</u>	
Watershed: <u>HUC-10 Fish Creek</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 <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED <input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED <input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH) <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION <input checked="" type="checkbox"/> 5. PUBLIC NOTICE <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION	OOG OFFICE USE ONLY <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED
--	--

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Office of Oil and Gas
SEP 26 2017
WM Department of
Environmental Protection

Required Attachments:

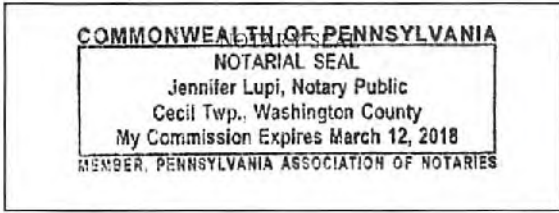
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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.

Certification of Notice is hereby given:

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

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

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



Subscribed and sworn before me this 22nd day of Sept 2017
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

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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SEP 26 2017
WV Department of
Environment & Conservation

WW-6A
(9-13)

API NO. 47- 051 - 01970
OPERATOR WELL NO. Corley N-6HM
Well Pad Name: Corley

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: 9/22/2017 Date Permit Application Filed: 9/22/2017

Notice of:

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

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

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

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

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

- SURFACE OWNER(s)
Name: Charles W. and Ruth A. Corley (Pad and Access Road)
Address: 1495 Ackerman Road
Bangor, PA 18013
Name: James A. and Jill C. Corley (Pad and Access Road)
Address: 208 Flicksville Road
Bangor, PA 18013
 SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Ruth A. Corley (Access Road)
Address: 1495 Ackerman Road
Bangor, PA 18013
Name: _____
Address: _____
 SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

- COAL OWNER OR LESSEE
Name: Ruth A. Corley
Address: 1495 Ackerman Road
Bangor, PA 18013 *See Attached List
 COAL OPERATOR
Name: _____
Address: _____
 SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: *See Attached List
Address: _____
 OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
Address: _____

*Please attach additional forms if necessary

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Office of Oil and Gas

SEP 26 2017

WV Department of
Environmental Protection

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

WW-6A
(8-13)

SEP 26 2017

API NO. 47-051 - 01970

OPERATOR WELL NO. Corley N-5HM

Well Pad Name: Corley

West Virginia Department of
Environmental Protection

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

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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SEP 28 2017
West Department of
Environmental Protection

WW-6A
(8-13)

API NO. 47-051 - 01970
OPERATOR WELL NO. Corley N-5HM
Well Pad Name: Corley

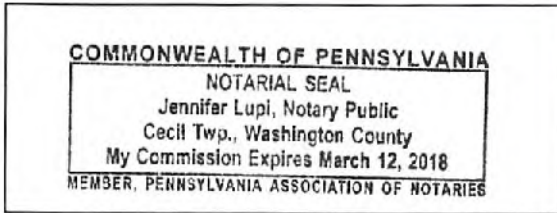
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 2nd day of Sept. 2014.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

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WW-6A NOTICE OF APPLICATION.....CORLEY N-5HM

COAL OWNER OR LESSEE

CNX Land Resources, Inc.
Consol Plaza Tax Level 2
1000 Consol Energy Drive
Canonsburg, PA 15317



CNX Gas Company, LLC
1000 Consol Energy Drive
Canonsburg, PA 15317

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WW-6A

Supplement Pg. 1A

Tug Hill Operating, LLC
 380 Southpointe BLVD, Suite 200
 Canonsburg, PA 15317

WATER WELL REPORT

Well: CORLEY No. N-5HM
 District: Franklin
 County: Marshall
 State: WV

There appears to be seven (7) possible water sources within 2,000 feet of the above referenced well location.

Topo spot #1 (Water Well) TM 17 Par.10.1 James A. & Jill C. Corley / 610-588-7929 208 Flicksville Rd. Bangor, PA 18013	Topo spot #2 (Spring) TM 17 Par.11 Kenneth N. & Deborah Corley / 304-455-5670(H), 304-455-3844(C) 7069 Rines Ridge Rd. Proctor, WV 26055	Topo Spot #3 (House) TM 17 Par.11.1 Randy W. & Jessica Francis / 304-455-5670(H), 304-455-3844(C) 6860 Rines Ridge Rd. Proctor, WV 26055
Topo Spot #4 (House) TM 17 Par.11.1 Randy W. & Jessica Francis 304-455-5670(H), 304-455-3844(C) 6860 Rines Ridge Rd. Proctor, WV 26055	Topo Spot #5 (House) TM 17 Par.9.4 Vicki L. Bowen 304-455-1985(H), 304-830-7846(C), 304-771-0864(C) 6676 Rines Ridge Rd. Proctor, WV 26055	Topo Spot #6 (House) TM 17 Par.9.2 Jeri J. White / 304-455-6002 6316 Rines Ridge Rd. Proctor, WV 26055
Topo Spot #7 (House) TM 17 Par.10.2 Sidney & Lillian Pozell, Estates / 304-281-1491(C) c/o Kevin Pozell 6198 Rines Ridge Rd. Proctor, WV 26055		

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WV Department of
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SEP 26 2017

51-01970

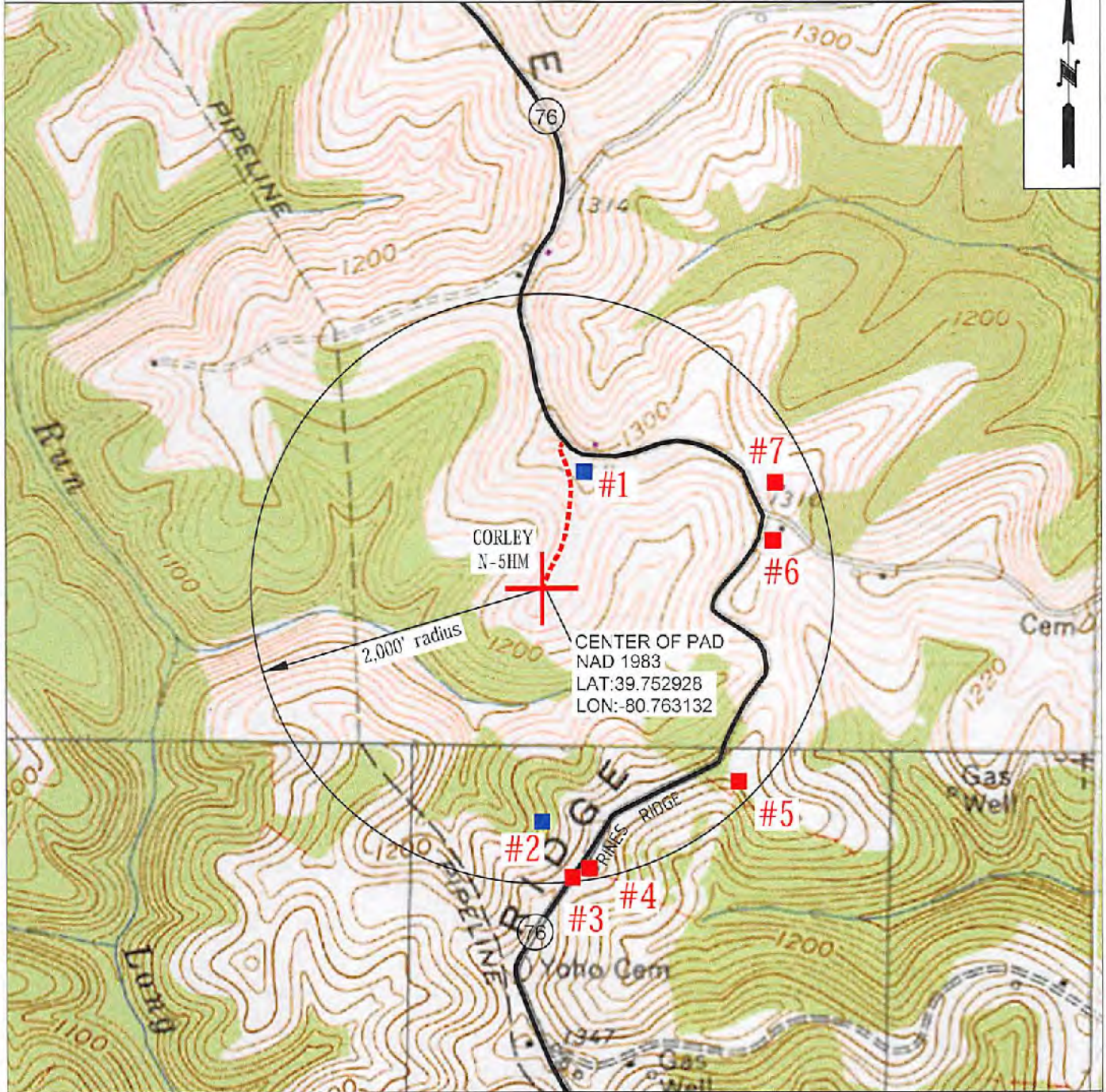
WW-6A

WV Department of
Environmental Protection

PROPOSED CORLEY N-5HM

SUPPLEMENT PG 1

There appears to be Seven (7) possible water sources within 2,000'.



OPERATOR	494510851	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	CORLEY
SCALE:		DATE:	
1" = 1000'		DATE: 09/19/17	

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: 8/30/2017 **Date of Planned Entry:** 9/6/2017

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: Ruth A. Corley (Access Road)
Address: 1495 Ackerman Road
Bangor, PA 18013

Name: James A. and Jill C. Corley (Pad and Access Road) /
Address: 208 Flicksville Road
Bangor, PA 18013

Name: Charles W. and Ruth A. Corley (Pad and Access Road) /
Address: 1495 Ackerman Road
Bangor, PA 18013

COAL OWNER OR LESSEE /

Name: Ruth A. Corley *See attached list /
Address: 1495 Ackerman Road
Bangor, PA 18013

MINERAL OWNER(s) /

Name: Ruth A. Corley *See attached list /
Address: 1495 Ackerman Road
Bangor, PA 18013

*please attach additional forms if necessary

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Oil and Gas
SEP 26 2017
Environmental Protection

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>39.7527964; -80.7631485</u>
County:	<u>Marshall</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>
District:	<u>Franklin</u>	Watershed:	<u>HUC 10 - Fish Creek</u>
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Corley, James A. and Jill C.</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:	<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.

61-01970

WW-6A3 NOTICE OF ENTRY FOR PLAT SURVEY.....CORLEY N-5HM

COAL OWNER OR LESSEE

CNX Land Resources, Inc.
Consol Plaza Tax Level 2
1000 Consol Energy Drive
Canonsburg, PA 15317



CNX Gas Company, LLC
1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER

James A. and Jill C. Corley
208 Flicksville Road
Bangor, PA 18013



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WV Department of
Environmental Protection

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

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

Date of Notice: 03/18/2017 **Date Permit Application Filed:** 09/22/2017

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: Ruth A. Corley
Address: 1495 Ackerman Road
Bangor, PA 18013

Name: James A. and Jill C. Corley
Address: 208 Flicksville Road
Bangor, PA 18013

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83 Easting:	<u>520,283.68</u>
County:	<u>Marshall</u>	Northing:	<u>4,400,363.49</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>Corley, James A. and Jill C.</u>
Watershed:	<u>HUC-10 Fish Creek</u>		

This Notice Shall Include:

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

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-6388
Email: amiller@tug-hill-op.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2630

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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SEP 26 2017
WV DEPARTMENT OF ENVIRONMENTAL PROTECTION

SI-01970

WW-6A5 NOTICE OF PLANNED OPERATION.....CORLEY N-5HM

SURFACE OWNER

Charles W. and Ruth A. Corley
1495 Ackerman Road
Bangor, PA 18013

/

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PA Department of
Environmental Protection



SI-01970

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Jim Justice
Governor

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

September 20, 2017

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

Subject: DOH Permits for the Corley Well Pad, Marshall County
Corley N-5HM Well Site

47-051-01970

Dear Mr. Martin,

This well site will be accessed from Permit #06-2011-0057 transferred to Tug Hill Operating 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
CH, OM, D-6
File

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SEP 26 2017

WV Department of
Environmental Protection

51-0A70



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Corley N-5HM

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

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PA Department of
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WEST VIRGINIA COUNTY MAP

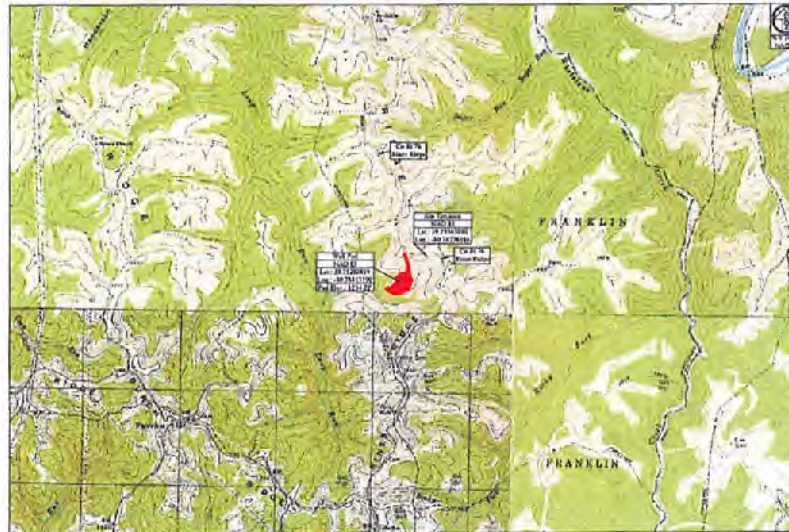


Corley Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Franklin District
Latitude 39.75292819°
Longitude -80.76313190°
Lower Fish Creek Watershed

Pertinent Site Information
Corley Well Site
Emergency Number: 304-845-1920
Franklin District, Marshall County, WV
Watershed: Lower Fish Creek Watershed
Tug Hill Contact Number: 1-877-632-3400

Table with 4 columns: County, Township, Range, Section. Rows include Franklin, Marshall, and Boone counties.

Exhibit A: Final Design: Issue for Permitting



WV State Plane Coordinate System
North Zone, NAD 83
Elevation in Feet
Elevation by Survey Benchmarks and GPS

Table with 4 columns: Station Name, Station ID, Elevation (feet), and Elevation (meters).

Table with 2 columns: Observation Name and Elevation (feet).

Note:
This document is not a permit. It is a design document for the Corley Well Site. No additional permits are required for this project. All additional permit requirements must be obtained from the appropriate agencies. The design is for informational purposes only.

Table with 4 columns: Station Name, Station ID, Elevation (feet), and Elevation (meters).

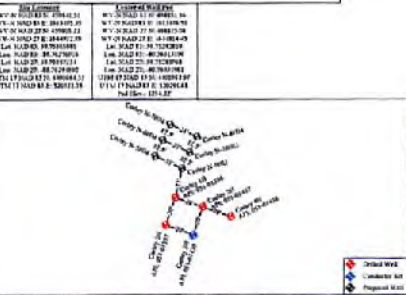


Table with 4 columns: Station Name, Station ID, Elevation (feet), and Elevation (meters).



WVDEP OOG
ACCEPTED AS-BUILT
10/17/2017

Project Contacts
Design Engineer: [Name]
Civil Engineer: [Name]
Professional Engineer: [Name]
811
Call before you dig.

Approach Routes
From the intersection of WV 21 S and US 101 S near River...
The 100' Operating Well is located in the Franklin District...
The WV Motor Vehicle was removed...
WVDEP Website link...

Table with 2 columns: Station Name and Elevation (feet).

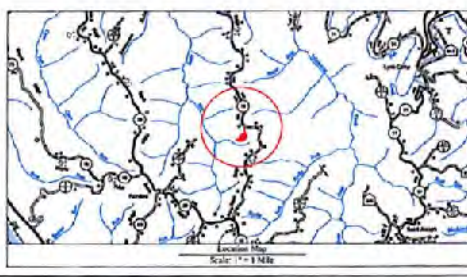


Table with 2 columns: Station Name and Elevation (feet).

TUG HILL OPERATING



THIS DOCUMENT PREPARED FOR TUG HILL OPERATING



Corley Well Site
Franklin District, WV

Date: 10/19/2017
Scale: As Shown
Printed: 10/26/2017
1 of 1

