



west virginia department of environmental protection

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

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

Thursday, June 14, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

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

Re: Permit approval for WELLER 4HM
47-051-02020-00-00

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: WELLER 4HM
Farm Name: ULA F. NELSON
U.S. WELL NUMBER: 47-051-02020-00-00
Horizontal 6A New Drill
Date Issued: 6/14/2018

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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

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 New Martinsville 7
Operator ID County District Quadrangle

2) Operator's Well Number: Weller 4HM Well Pad Name: Lily

3) Farm Name/Surface Owner: Ula F. Nelson Public Road Access: Route 2/2

4) Elevation, current ground: 1273' Elevation, proposed post-construction: 1273'

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

Other _____

(b) If Gas Shallow Deep _____

Horizontal _____

6) Existing Pad: Yes or No Yes

JW 6/7/18

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6464' - 6517', thickness of 53' and an anticipated approx. pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6617'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 13,404'

11) Proposed Horizontal Leg Length: 5,261'

12) Approximate Fresh Water Strata Depths: 60' ; 871'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 778' and Pittsburgh Coal - 866'

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

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

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

Depth: _____

Seam: _____

Owner: _____

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	110'	110'	238ft^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	971'	971'	966ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	971'	971'	966ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2629'	2629'	872ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	13,404'	13,404'	3447ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	8,127'		
Liners							

JW 6/7/18

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

PACKERS

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

JW 6/7/18

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

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

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

Well to be completed with approximately 16,645,000 lb. proppant and 247,344 barrels of water. Max rate = 80bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 11.08 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.96 acres

23) Describe centralizer placement for each casing string:

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

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

*See attachment

25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

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

47 US 02020

WV Geological & Economic Survey **Well: County = 51 Permit = 01552** Report Time: Friday, January 12, 2018 12:35

Location Information [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_76	LAT_DD	LONG_DD	UTME	UTMN
4705101552	Marshall	01552	Franklin	New Martinsville	New Martinsville	35.75731	-80.05017	614984.4	4705011.2

Bottom Hole Location Information

API	BP_FLAG	UTME	UTMN	LONG_DD	LAT_DD
4705101552	1	64.890665	4705011.2	-80.05017	35.75731

Owner Information

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TRM_EST_FM
4705101552	12/17/2012		Original Log	Completed	Ula Mitheny	1	Ula Mitheny	4705101552	Ula Mitheny	Ula Mitheny	0	0	0

Completion Information

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMI	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTD	G_BEP	G_APT	O_BEP	O_APT	NGL_BEP	NGL_A
4705101552	12/17/2012	8/20/12	1273 Ground Level	Complete Group	Marshall Sh.	Marshall Sh.	Development Well	Development Well	Oil and Gas	Rotary	Rotary	6921	12689	12689	1732	2411	112	124		

Comment: 12/17/2012 Additional Lease Numbers: 1254031-001

WV Geological & Economic Survey **Well: County = 51 Permit = 01553** Report Time: Friday, January 12, 2018 12:34

Location Information [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_76	LAT_DD	LONG_DD	UTME	UTMN
4705101553	Marshall	01553	Franklin	New Martinsville	New Martinsville	35.77149	-80.05349	615521.1	4705013.2

Bottom Hole Location Information

API	BP_FLAG	UTME	UTMN	LONG_DD	LAT_DD
4705101553	1	64.890665	4705013.2	-80.05349	35.77149

Owner Information

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TRM_EST_FM
4705101553	12/17/2012		Original Log	Completed	Ula Mitheny	1	Ula Mitheny	4705101553	Ula Mitheny	Ula Mitheny	0	0	0

Completion Information

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMI	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTD	G_BEP	G_APT	O_BEP	O_APT	NGL_BEP	NGL_A
4705101553	12/17/2012	8/20/12	1273 Ground Level	Complete Group	Marshall Sh.	Marshall Sh.	Development Well	Development Well	Oil and Gas	Rotary	Rotary	6921	12689	12689	1732	2411	112	124		

Comment: 12/17/2012 Additional Lease Numbers: 1256293-001

WV Geological & Economic Survey **Well: County = 51 Permit = 01554** Report Time: Friday, January 12, 2018 12:33

Location Information [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_76	LAT_DD	LONG_DD	UTME	UTMN
4705101554	Marshall	01554	Franklin	New Martinsville	New Martinsville	35.77459	-80.05359	615593.3	4705013.2

Bottom Hole Location Information

API	BP_FLAG	UTME	UTMN	LONG_DD	LAT_DD
4705101554	1	64.890665	4705013.2	-80.05359	35.77459

Owner Information

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TRM_EST_FM
4705101554	12/17/2012		Original Log	Completed	Ula Mitheny	1	Ula Mitheny	4705101554	Ula Mitheny	Ula Mitheny	0	0	0

Completion Information

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMI	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTD	G_BEP	G_APT	O_BEP	O_APT	NGL_BEP	NGL_A
4705101554	12/17/2012	8/20/12	1273 Ground Level	Complete Group	Marshall Sh.	Marshall Sh.	Development Well	Development Well	Oil and Gas	Rotary	Rotary	6921	12689	12689	1732	2411	112	124		

WV Geological & Economic Survey **Well: County = 51 Permit = 00213** Report Time: Friday, January 12, 2018 12:33

Location Information [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_76	LAT_DD	LONG_DD	UTME	UTMN
4705100213	Marshall	00213	Franklin	New Martinsville	New Martinsville	35.735135	-80.037445	616469	4705016.9

There is no Bottom Hole Location data for this well

Owner Information

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TRM_EST_FM
4705100213	7/11/1950		Original Log	Completed	Ula Mitheny	1	Ula Mitheny	4705100213	Ula Mitheny	Ula Mitheny	0	0	0

Completion Information

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMI	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTD	G_BEP	G_APT	O_BEP	O_APT	NGL_BEP	NGL_A
4705100213	7/11/1950	8/16/1950	1242 Ground Level	Unnamed	Harpers Gap	Harpers Gap	Outcrop (Extension)	Test	Unsuccessful	Dry	Unknown	N/A	2094	2094						

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705100213	Original Loc	Pittsburgh coal	CBII: Criteria Met	750	Reasonable	2	Reasonable	1242 Ground Level
4705100213	Original Loc	unidentified coal	Well Record	838	Reasonable	2	Reasonable	1242 Ground Level
4705100213	Original Loc	1st Cow Run/under	Well Record	1335	Reasonable	45	Reasonable	1242 Ground Level
4705100213	Original Loc	Mohrwood Sta: Cow Run	Well Record	1420	Reasonable	40	Reasonable	1242 Ground Level
4705100213	Original Loc	Salt Sand (under)	Well Record	1530	Reasonable	114	Reasonable	1242 Ground Level
4705100213	Original Loc	Manson	Well Record	1635	Reasonable	80	Reasonable	1242 Ground Level
4705100213	Original Loc	Big Lime	Well Record	1873	Reasonable	87	Reasonable	1242 Ground Level
4705100213	Original Loc	Greenriver Group	Well Record	1973	Reasonable	122	Reasonable	1242 Ground Level
4705100213	Original Loc	Keener	Well Record	1960	Reasonable	12	Reasonable	1242 Ground Level
4705100213	Original Loc	Big Injun (Pre-Salt)	Well Record	1972	Reasonable	236	Reasonable	1242 Ground Level

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

Plugging Information

API	PLG_DT	DEPTH_PBT
4705100213	7/20/1950	0

There is no Sample data for this well

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Office of Oil and Gas
MAR 2 2018
WV Department of Environmental Protection

06/15/2018

47051 02020

Permit well - Weller-4HM

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101551	Tug Hill Operating	6508' TVD 12497' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101552	Tug Hill Operating	6508' TVD 12544' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101553	Tug Hill Operating	6503' TVD 12434' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101554	Tug Hill Operating	6512' TVD 12142' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705100213	Elored Linigen	2894' TVD	Hampshire Group	Unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. The well is plugged	Well was plugged on 7/20/1950
4710300408	Earnest A Strakosch	2880' TVD	Gordon	Unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well has been plugged	Well was plugged on 5/23/1962
4710371600	Manufacturers Light and Heat Co	Unknown	Unknown	Unknown	Unknown but unlikely. Well is likely an old shallow oil or gas well, or a coal test bore.	State records are incomplete.

WV Pipeline

Well: County = 51 Permit = 01551

Report Date: Friday, January 12, 2018 12:13

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_76	EAT_00	LOW_00	TIME	ORAN
4705101551	Marshall	1551	Prattville	11p	11p	11p	11p	11p	11p

Bottom Hole Location Information

API	EP	PCAD	ORAN	ECN_00	EAT_00
4705101551	1	24	Prattville	11p	11p

Owner Information

API	CMP_01	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	COLL_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR	AT_COMPLETION	PROP_VD	PROP_PROD_YM	WELL_EST_YR
4705101551				Prattville	11p	11p	11p	11p	Prattville	Prattville	11p	11p	11p	11p

Completion Information

API	CMP_01	CMP_02	PROD	ORAN	FIELD	DISPERST	FM	DESIGN1	FM	INITIAL_CLASS	FINAL_CLASS	TYPE	NO	CMP_MTHD	TVD	THD	REV	FTO	G_BEP	O_BEP	U_BEP	D_LAFE	NDR_BEP	NDR_1
4705101551	1	24	Prattville	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p	11p

Comment: 12/17/2012 Additional Lease Numbers 1256203-001

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MAR 2 2018

WV Department of
Environmental Protection

06/15/2018

47051 02020

WVGES
"Pipeline"

Select County: (103) Wetzel
Enter Permit #: 00408
Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/ShowWater Logs Stem Hole Log

Table Descriptions
[County Code Transactions](#)
[Permit Transactions](#)
[Lease Notes](#)
[Contact Information](#)
[WVGES Main](#)
[Pipeline Page New](#)

WV Geological & Economic Survey. Well: County = 103 Permit = 00408

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
471030408	Wetzel	408	Propper	New Martinsville	New Martinsville	30 7 19 315	-80 40 00 006	617135 S	4366521 E

There is no Bottom Hole Location data for this well.

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TROT_FM	TRM_EST_PR
471030408	10/30/1954		Complete	Pay V Smith			J & Pear V Smith		Pay V Smith	SHMSHO, ETALCA			

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	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
471030408	10/30/1954	10/31/1954	1231	Brand-Leist	Samson-Samson Gordon	Gordon		Development Well	Development Well	Oil	Unknown	Shel	2000	2000						111

Pay/ShowWater Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOT	FM_TOT	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
471030408	10/30/1954	Pay	Gas	Vertical	2845	Gordon	2003	Gordon	0	0			

There is no Production Gas data for this well.

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

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

There is no Production Water data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
471030408	5/23/1952	0

WVGES
"Pipeline"

Select County: (103) Wetzel
Enter Permit #: 71600
Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/ShowWater Logs Stem Hole Log

Table Descriptions
[County Code Transactions](#)
[Permit Transactions](#)
[Lease Notes](#)
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[WVGES Main](#)
[Pipeline Page New](#)

WV Geological & Economic Survey. Well: County = 103 Permit = 71600

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
4710371600	Wetzel	71600	Propper	New Martinsville	New Martinsville	30 7 16 526	-80 7 04 656	617456 S	4356217 E

There is no Bottom Hole Location data for this well.

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TROT_FM	TRM_EST_PR
4710371600	Whitman, Probs Mas, George Smith			1233		Man-Reservoir Light & Heat Co.				

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	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4710371600

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

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

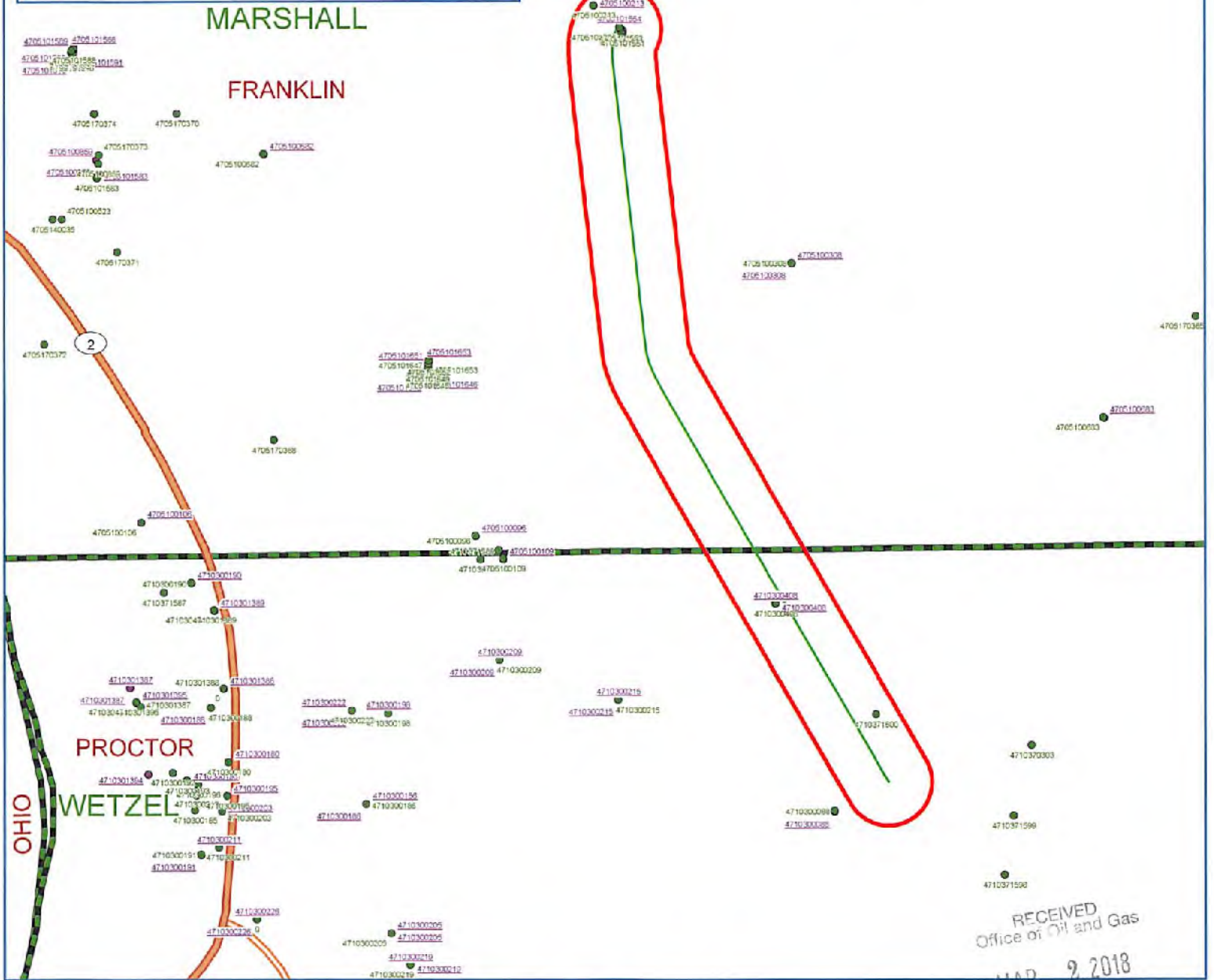
There is no Plugging data for this well

There is no Sample data for this well

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Legend

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Weller - 4HM
- ▭ 500 Ft Buffer
- ▭ Counties
- ▭ Districts



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Weller-4HM Franklin District Marshall County, WV



Map Created: February 9, 2016
Map Current As Of: February 9, 2018

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

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Map Prepared by:
PS
LAND SERVICES
06/15/2018

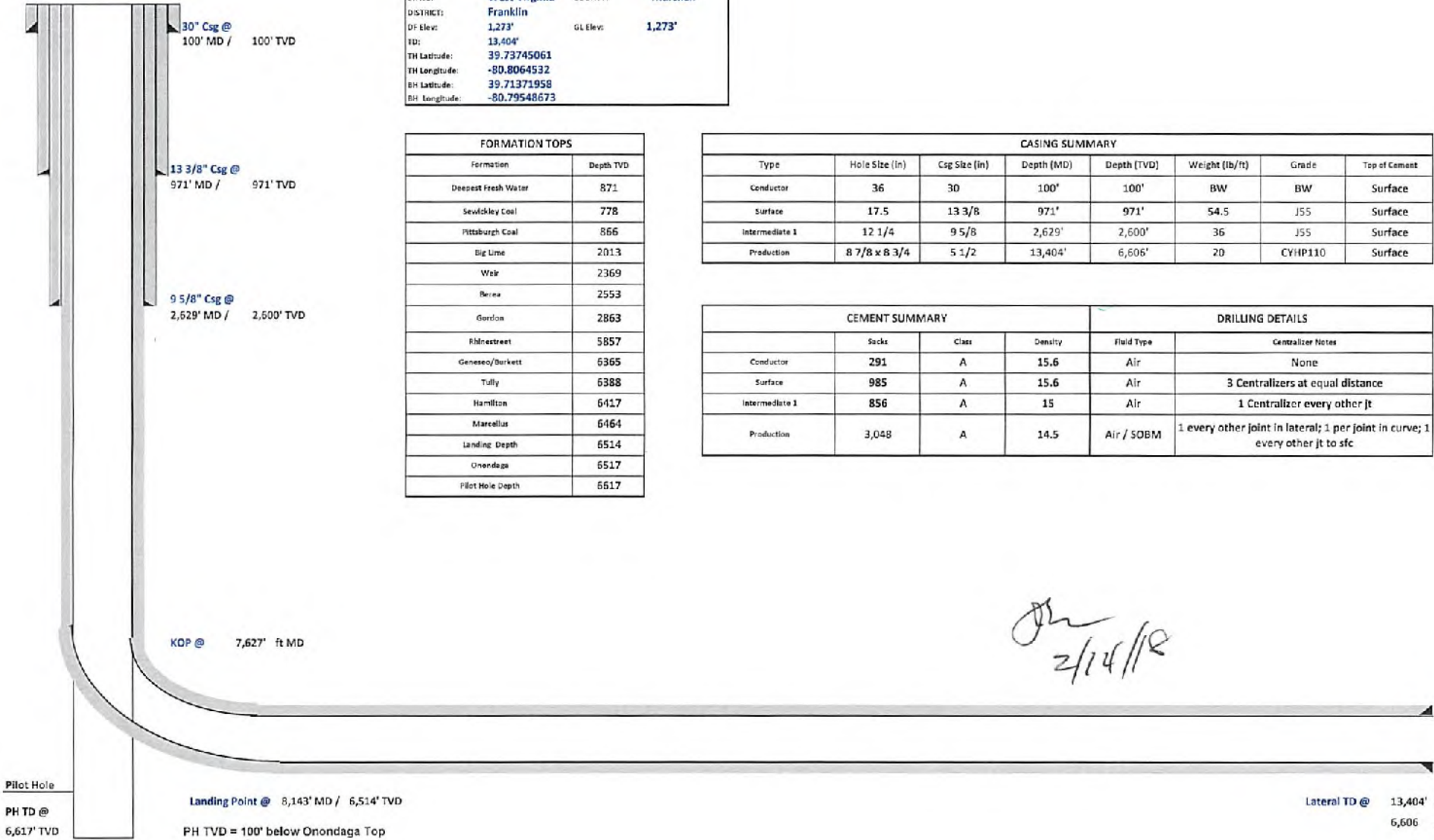


WELL NAME: **Weller-4HM**
 STATE: **West Virginia** COUNTY: **Marshall**
 DISTRICT: **Franklin**
 DF Elev: **1,273'** GL Elev: **1,273'**
 TD: **13,404'**
 TH Latitude: **39.73745061**
 TH Longitude: **-80.8064532**
 BH Latitude: **39.71371958**
 BH Longitude: **-80.79548673**

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	871
Sewickley Coal	778
Pittsburgh Coal	856
Big Lime	2013
Wet	2369
Berea	2553
Gordon	2863
Rhinestreet	5857
Genesee/Darkest	6365
Tully	6388
Hamilton	6417
Marcellus	6464
Landing Depth	6514
Onondaga	6517
Pilot Hole Depth	6517

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	17.5	13 3/8	971'	971'	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	13,404'	6,606'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	291	A	15.6	Air	None
Surface	985	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	856	A	15	Air	1 Centralizer every other jt
Production	3,048	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



John
2/14/18

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Tug Hill Operating, LLC Casing and Cement Program

Weller-4HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	100'	CTS
Surface	13 3/8"	J55	17 1/2"	971'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,629'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	13,404'	CTS

Cement

- Conductor: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
- Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19
- Kick Off Plug: Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug
- Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19

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Well: Weller 4HM (A)
 Site: Lily/Weller
 Project: Marshall County, West Virginia
 Design: rev0

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 3°/100' build
3	1633.33	10.00	225.00	1631.64	-20.52	-20.52	3.00	225.00	12.37	Begin 3°/100' build/turn
4	2830.90	41.43	173.44	2705.67	-503.62	-49.71	3.00	-62.06	457.14	Begin 41.43° tangent
5	7526.68	41.43	173.44	6301.16	-3866.46	313.04	0.00	0.00	3646.90	Begin 10°/100' build/turn
6	8143.39	85.00	150.00	6514.00	-4079.05	472.71	10.00	-30.46	3698.58	Begin 89.00° lateral section
7	13404.01	85.00	150.00	6606.00	-8634.18	3102.62	0.00	0.00	9174.71	PBHL/TD 13404.01 MD/6606.00 TVD

Azimuths to Grid North
 True North: -0.12°
 Magnetic North: -8.75°

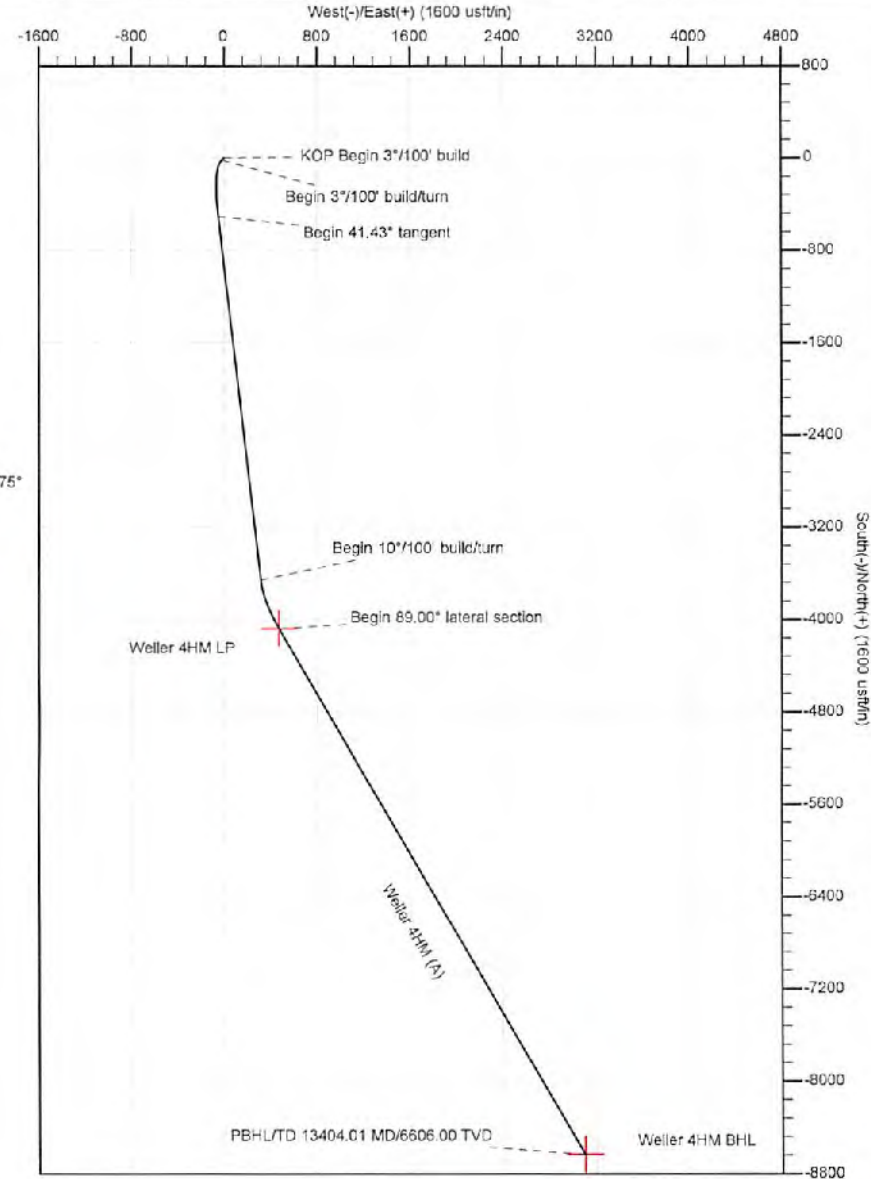
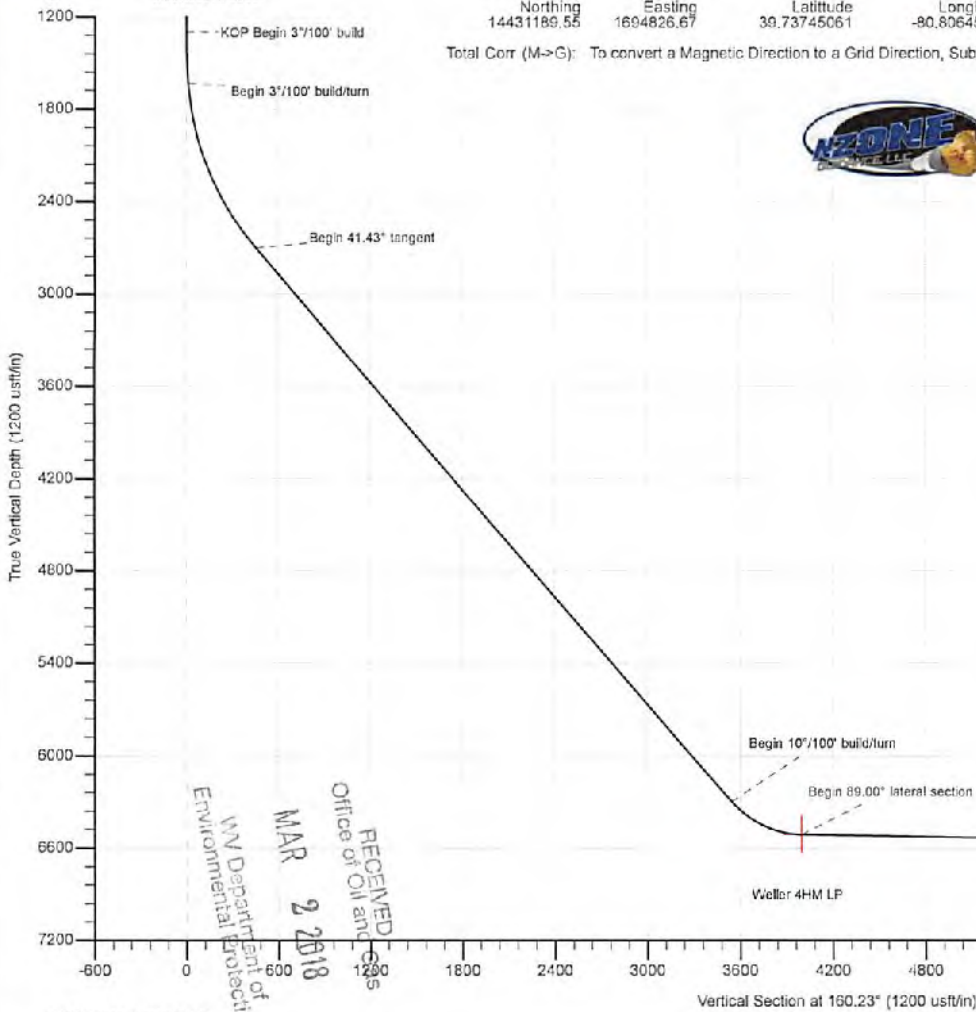
Magnetic Field
 Strength: 52102.1nT
 Dip Angle: 66.89°
 Date: 12/16/2017
 Model: IGRF2015

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 @ 1273.00usft

Northing: 14431189.55 Easting: 1694826.67 Latitude: 39.73745061 Longitude: -80.80645320

Total Corr (M→G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.75°



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4705/02020

47051 02020



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Weller 4HM (A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1273.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1273.00usft
Site:	Lily/Weller	North Reference:	Grid
Well:	Weller 4HM (A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	Lily/Weller				
Site Position:		Northing:	14,431,189.55 usft	Latitude:	39.73745061
From:	Lat/Long	Easting:	1,694,826.67 usft	Longitude:	-80.80645320
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.12 "

Well	Weller 4HM (A)					
Well Position	+N-S	0.00 usft	Northing:	14,431,189.55 usft	Latitude:	39.73745061
	+E-W	0.00 usft	Easting:	1,694,826.67 usft	Longitude:	-80.80645320
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	1,273.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/16/2017	-8.62	66.89	52,102.11585248

Design	rev0			
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	160.23

Plan Survey Tool Program	Date	12/17/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	13,404.01 rev0 (Original Hole)	MWD	
			MWD - Standard	

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Plan Sections	WV Department of Environmental Protection									
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	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,633.33	10.00	225.00	1,631.64	-20.52	-20.52	3.00	3.00	0.00	225.00	
2,830.90	41.43	173.44	2,705.67	-503.62	-49.71	3.00	2.62	-4.31	-62.06	
7,626.68	41.43	173.44	6,301.16	-3,656.46	313.04	0.00	0.00	0.00	0.00	
8,143.39	89.00	150.00	6,514.00	-4,079.05	472.71	10.00	9.21	-4.54	-30.46	Weller 4HM LP
13,404.01	89.00	150.00	6,606.00	-8,634.18	3,102.62	0.00	0.00	0.00	0.00	Weller 4HM BHL

47051 02020



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Weller 4HM (A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1273.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1273.00usft
Site:	Lily/Weller	North Reference:	Grid
Well:	Weller 4HM (A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
100.00	0.00	0.00	100.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
200.00	0.00	0.00	200.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
300.00	0.00	0.00	300.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
400.00	0.00	0.00	400.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
500.00	0.00	0.00	500.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
600.00	0.00	0.00	600.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
700.00	0.00	0.00	700.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
800.00	0.00	0.00	800.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
900.00	0.00	0.00	900.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,431,189.55	1,694,826.67	39.73745061	-80.80645320	
KOP Begin 3°/100' build										
1,400.00	3.00	225.00	1,399.95	-1.85	-1.85	14,431,187.70	1,694,824.82	39.73744554	-80.80645980	
1,500.00	6.00	225.00	1,499.63	-7.40	-7.40	14,431,182.16	1,694,819.27	39.73743034	-80.80647957	
1,600.00	9.00	225.00	1,598.77	-16.63	-16.63	14,431,172.93	1,694,810.04	39.73740505	-80.80651247	
1,633.33	10.00	225.00	1,631.64	-20.52	-20.52	14,431,169.04	1,694,806.15	39.73739439	-80.80652634	
Begin 3°/100' build/tum										
1,700.00	11.08	215.77	1,697.19	-29.81	-28.35	14,431,159.75	1,694,798.31	39.73736892	-80.80655429	
1,800.00	13.10	205.14	1,794.96	-47.87	-36.79	14,431,141.69	1,694,787.88	39.73731938	-80.80659154	
1,900.00	15.44	197.50	1,891.89	-70.83	-47.81	14,431,118.73	1,694,779.08	39.73725638	-80.80662310	
2,000.00	17.98	191.89	1,987.67	-98.63	-54.79	14,431,090.92	1,694,771.87	39.73718006	-80.80664887	
2,100.00	20.63	187.66	2,082.04	-131.20	-60.32	14,431,058.36	1,694,766.35	39.73709068	-80.80666879	
2,200.00	23.37	184.37	2,174.76	-168.44	-64.18	14,431,021.11	1,694,762.49	39.73698840	-80.80668280	
2,300.00	26.16	181.73	2,265.56	-210.28	-66.38	14,430,979.30	1,694,760.31	39.73687358	-80.80669086	
2,400.00	28.99	179.58	2,354.19	-256.53	-66.85	14,430,933.03	1,694,759.82	39.73674651	-80.80669295	
2,500.00	31.85	177.78	2,440.42	-307.13	-65.65	14,430,882.42	1,694,761.02	39.73660752	-80.80669907	
2,600.00	34.73	176.25	2,524.01	-361.93	-62.76	14,430,827.63	1,694,763.91	39.73645702	-80.80667923	
2,700.00	37.62	174.93	2,604.73	-420.77	-58.20	14,430,768.79	1,694,768.47	39.73629540	-80.80666345	
2,800.00	40.53	173.77	2,682.35	-483.49	-51.97	14,430,706.07	1,694,774.70	39.73612312	-80.80664178	
2,830.90	41.43	173.44	2,705.67	-503.62	-49.71	14,430,685.93	1,694,776.98	39.73606780	-80.80663390	
Begin 41.43° tangent										
2,900.00	41.43	173.44	2,757.48	-549.05	-44.48	14,430,640.50	1,694,782.18	39.73594301	-80.80661566	
3,000.00	41.43	173.44	2,832.45	-614.78	-36.92	14,430,574.76	1,694,789.75	39.73576242	-80.80658925	
3,100.00	41.43	173.44	2,907.42	-680.54	-29.36	14,430,509.02	1,694,797.31	39.73558183	-80.80656285	
3,200.00	41.43	173.44	2,982.40	-746.28	-21.79	14,430,443.28	1,694,804.87	39.73540123	-80.80653645	
3,300.00	41.43	173.44	3,057.37	-812.02	-14.23	14,430,377.53	1,694,812.44	39.73522064	-80.80651005	
3,400.00	41.43	173.44	3,132.34	-877.76	-6.67	14,430,311.79	1,694,820.00	39.73504005	-80.80648365	
3,500.00	41.43	173.44	3,207.31	-943.50	0.90	14,430,246.05	1,694,827.57	39.73485948	-80.80645725	
3,600.00	41.43	173.44	3,282.28	-1,009.25	8.46	14,430,180.31	1,694,835.13	39.73467887	-80.80643085	
3,700.00	41.43	173.44	3,357.26	-1,074.99	16.03	14,430,114.57	1,694,842.69	39.73449828	-80.80640445	
3,800.00	41.43	173.44	3,432.23	-1,140.73	23.59	14,430,048.83	1,694,850.26	39.73431768	-80.80637805	
3,900.00	41.43	173.44	3,507.20	-1,206.47	31.15	14,429,983.08	1,694,857.82	39.73413708	-80.80635165	
4,000.00	41.43	173.44	3,582.17	-1,272.21	38.72	14,429,917.34	1,694,865.39	39.73395650	-80.80632525	
4,100.00	41.43	173.44	3,657.14	-1,337.95	46.28	14,429,851.60	1,694,872.95	39.73377591	-80.80629885	
4,200.00	41.43	173.44	3,732.12	-1,403.70	53.85	14,429,785.86	1,694,880.51	39.73359532	-80.80627245	
4,300.00	41.43	173.44	3,807.09	-1,469.44	61.41	14,429,720.12	1,694,888.08	39.73341472	-80.80624606	
4,400.00	41.43	173.44	3,882.06	-1,535.18	68.97	14,429,654.37	1,694,895.64	39.73323413	-80.80621966	
4,500.00	41.43	173.44	3,957.03	-1,600.92	76.54	14,429,588.63	1,694,903.21	39.73305354	-80.80619326	
4,600.00	41.43	173.44	4,032.00	-1,666.66	84.10	14,429,522.89	1,694,910.77	39.73287295	-80.80616686	
4,700.00	41.43	173.44	4,106.98	-1,732.41	91.67	14,429,457.15	1,694,918.33	39.73269236	-80.80614046	
4,800.00	41.43	173.44	4,181.95	-1,798.15	99.23	14,429,391.41	1,694,925.90	39.73251176	-80.80611406	

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Weller 4HM (A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1273.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1273.00usft
Site:	Lily/Weller	North Reference:	Grid
Well:	Weller 4HM (A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,900.00	41.43	173.44	4,256.92	-1,863.69	108.79	14,429,325.67	1,694,933.46	39.73233117	-80.80808766	
5,000.00	41.43	173.44	4,331.89	-1,929.63	114.36	14,429,259.92	1,694,941.03	39.73215058	-80.80606127	
5,100.00	41.43	173.44	4,406.86	-1,995.37	121.92	14,429,194.18	1,694,948.59	39.73195999	-80.80603487	
5,200.00	41.43	173.44	4,481.84	-2,061.11	129.48	14,429,128.44	1,694,956.15	39.73178940	-80.80600847	
5,300.00	41.43	173.44	4,556.81	-2,126.86	137.05	14,429,062.70	1,694,963.72	39.73160880	-80.80598207	
5,400.00	41.43	173.44	4,631.78	-2,192.60	144.61	14,428,996.96	1,694,971.28	39.73142821	-80.80595567	
5,500.00	41.43	173.44	4,706.75	-2,258.34	152.18	14,428,931.21	1,694,978.84	39.73124762	-80.80592928	
5,600.00	41.43	173.44	4,781.72	-2,324.08	159.74	14,428,865.47	1,694,986.41	39.73106703	-80.80590288	
5,700.00	41.43	173.44	4,856.70	-2,389.82	167.30	14,428,799.73	1,694,993.97	39.73088644	-80.80587648	
5,800.00	41.43	173.44	4,931.67	-2,455.57	174.87	14,428,733.99	1,695,001.54	39.73070584	-80.80585009	
5,900.00	41.43	173.44	5,006.64	-2,521.31	182.43	14,428,668.25	1,695,009.10	39.73052525	-80.80582369	
6,000.00	41.43	173.44	5,081.61	-2,587.05	190.00	14,428,602.51	1,695,016.66	39.73034466	-80.80579729	
6,100.00	41.43	173.44	5,156.58	-2,652.79	197.56	14,428,536.76	1,695,024.23	39.73016407	-80.80577089	
6,200.00	41.43	173.44	5,231.56	-2,718.53	205.12	14,428,471.02	1,695,031.79	39.72998348	-80.80574450	
6,300.00	41.43	173.44	5,306.53	-2,784.27	212.69	14,428,405.28	1,695,039.36	39.72980288	-80.80571810	
6,400.00	41.43	173.44	5,381.50	-2,850.02	220.25	14,428,339.54	1,695,046.92	39.72962229	-80.80569171	
6,500.00	41.43	173.44	5,456.47	-2,915.76	227.82	14,428,273.80	1,695,054.48	39.72944170	-80.80566531	
6,600.00	41.43	173.44	5,531.44	-2,981.50	235.38	14,428,208.05	1,695,062.05	39.72926111	-80.80563891	
6,700.00	41.43	173.44	5,606.42	-3,047.24	242.94	14,428,142.31	1,695,069.61	39.72908052	-80.80561252	
6,800.00	41.43	173.44	5,681.39	-3,112.98	250.51	14,428,076.57	1,695,077.18	39.72889993	-80.80558612	
6,900.00	41.43	173.44	5,756.36	-3,178.73	258.07	14,428,010.83	1,695,084.74	39.72871933	-80.80555973	
7,000.00	41.43	173.44	5,831.33	-3,244.47	265.63	14,427,945.09	1,695,092.30	39.72853874	-80.80553333	
7,100.00	41.43	173.44	5,906.30	-3,310.21	273.20	14,427,879.35	1,695,099.87	39.72835815	-80.80550694	
7,200.00	41.43	173.44	5,981.28	-3,375.95	280.76	14,427,813.60	1,695,107.43	39.72817755	-80.80548054	
7,300.00	41.43	173.44	6,056.25	-3,441.69	288.33	14,427,747.86	1,695,114.99	39.72799696	-80.80545415	
7,400.00	41.43	173.44	6,131.22	-3,507.43	295.89	14,427,682.12	1,695,122.56	39.72781637	-80.80542775	
7,500.00	41.43	173.44	6,206.19	-3,573.18	303.45	14,427,616.38	1,695,130.12	39.72763578	-80.80540136	
7,600.00	41.43	173.44	6,281.16	-3,638.92	311.02	14,427,550.64	1,695,137.69	39.72745519	-80.80537496	
7,626.68	41.43	173.44	6,301.16	-3,656.46	313.04	14,427,533.10	1,695,139.70	39.72740701	-80.80536792	
Begin 10°/100' build/turn										
7,700.00	47.67	168.43	6,353.31	-3,707.26	321.27	14,427,467.29	1,695,147.94	39.72726742	-80.80533902	
7,800.00	56.92	163.05	6,414.29	-3,783.87	340.97	14,427,405.69	1,695,167.64	39.72705693	-80.80526955	
7,900.00	66.16	158.69	6,461.91	-3,866.77	369.87	14,427,322.79	1,695,196.54	39.72682909	-80.80516739	
8,000.00	75.51	154.92	6,494.71	-3,953.44	407.10	14,427,238.11	1,695,233.77	39.72659063	-80.80503565	
8,100.00	84.91	151.46	6,511.70	-4,041.26	451.53	14,427,148.29	1,695,278.20	39.72634938	-80.80487833	
8,143.39	89.00	150.00	6,514.00	-4,078.05	472.71	14,427,110.51	1,695,299.37	39.72624549	-80.80480330	
Begin 89.00° lateral section										
8,200.00	89.00	150.00	6,514.99	-4,128.07	501.01	14,427,061.49	1,695,327.88	39.72611069	-80.80470302	
8,300.00	89.00	150.00	6,516.74	-4,214.66	551.00	14,426,974.90	1,695,377.67	39.72587259	-80.80452589	
8,400.00	89.00	150.00	6,518.49	-4,301.25	600.99	14,426,888.31	1,695,427.66	39.72563449	-80.80434876	
8,500.00	89.00	150.00	6,520.24	-4,387.84	650.99	14,426,801.72	1,695,477.65	39.72539639	-80.80417163	
8,600.00	89.00	150.00	6,521.99	-4,474.43	700.98	14,426,715.13	1,695,527.65	39.72515829	-80.80399450	
8,700.00	89.00	150.00	6,523.73	-4,561.01	750.97	14,426,628.54	1,695,577.64	39.72492019	-80.80381738	
8,800.00	89.00	150.00	6,525.48	-4,647.60	800.96	14,426,541.95	1,695,627.63	39.72468209	-80.80364025	
8,900.00	89.00	150.00	6,527.23	-4,734.19	850.96	14,426,455.36	1,695,677.62	39.72444399	-80.80346313	
9,000.00	89.00	150.00	6,528.98	-4,820.78	900.95	14,426,368.77	1,695,727.62	39.72420589	-80.80328601	
9,100.00	89.00	150.00	6,530.73	-4,907.37	950.94	14,426,282.18	1,695,777.61	39.72396778	-80.80310889	
9,200.00	89.00	150.00	6,532.48	-4,993.96	1,000.93	14,426,195.59	1,695,827.60	39.72372968	-80.80293177	
9,300.00	89.00	150.00	6,534.23	-5,080.55	1,050.93	14,426,109.00	1,695,877.59	39.72349158	-80.80275465	
9,400.00	89.00	150.00	6,535.98	-5,167.14	1,100.92	14,426,022.41	1,695,927.59	39.72325347	-80.80257753	
9,500.00	89.00	150.00	6,537.73	-5,253.73	1,150.91	14,425,935.83	1,695,977.58	39.72301537	-80.80240041	
9,600.00	89.00	150.00	6,539.47	-5,340.32	1,200.90	14,425,849.24	1,696,027.57	39.72277727	-80.80222330	
9,700.00	89.00	150.00	6,541.22	-5,426.91	1,250.89	14,425,762.65	1,696,077.56	39.72253916	-80.80204618	
9,800.00	89.00	150.00	6,542.97	-5,513.50	1,300.89	14,425,676.06	1,696,127.56	39.72230106	-80.80186907	

MAR 2 2018

West Virginia Department of Energy, Mineral and Natural Resources

47051 02020



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Weller 4HM (A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1273.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1273.00usft
Site:	Lily/Weller	North Reference:	Grid
Well:	Weller 4HM (A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,900.00	89.00	150.00	6,544.72	-5,600.09	1,350.88	14,425,589.47	1,696,177.55	39.72206295	-80.80169196	
10,000.00	89.00	150.00	6,546.47	-5,686.68	1,400.87	14,425,502.88	1,696,227.54	39.72182485	-80.80151485	
10,100.00	89.00	150.00	6,548.22	-5,773.26	1,450.88	14,425,416.29	1,696,277.53	39.72158675	-80.80133774	
10,200.00	89.00	150.00	6,549.97	-5,859.85	1,500.86	14,425,329.70	1,696,327.52	39.72134864	-80.80116063	
10,300.00	89.00	150.00	6,551.72	-5,946.44	1,550.85	14,425,243.11	1,696,377.52	39.72111053	-80.80098353	
10,400.00	89.00	150.00	6,553.46	-6,033.03	1,600.84	14,425,156.52	1,696,427.51	39.72087243	-80.80080642	
10,500.00	89.00	150.00	6,555.21	-6,119.62	1,650.83	14,425,069.93	1,696,477.50	39.72063432	-80.80062932	
10,600.00	89.00	150.00	6,556.96	-6,206.21	1,700.83	14,424,983.34	1,696,527.49	39.72039622	-80.80045221	
10,700.00	89.00	150.00	6,558.71	-6,292.80	1,750.82	14,424,896.75	1,696,577.49	39.72015811	-80.80027511	
10,800.00	89.00	150.00	6,560.46	-6,379.39	1,800.81	14,424,810.16	1,696,627.48	39.71992000	-80.80009801	
10,900.00	89.00	150.00	6,562.21	-6,465.98	1,850.80	14,424,723.58	1,696,677.47	39.71968190	-80.79992091	
11,000.00	89.00	150.00	6,563.96	-6,552.57	1,900.80	14,424,636.99	1,696,727.46	39.71944379	-80.79974382	
11,100.00	89.00	150.00	6,565.71	-6,639.16	1,950.79	14,424,550.40	1,696,777.46	39.71920568	-80.79956672	
11,200.00	89.00	150.00	6,567.46	-6,725.75	2,000.78	14,424,463.81	1,696,827.45	39.71896757	-80.79938962	
11,300.00	89.00	150.00	6,569.20	-6,812.34	2,050.77	14,424,377.22	1,696,877.44	39.71872946	-80.79921253	
11,400.00	89.00	150.00	6,570.95	-6,898.93	2,100.77	14,424,290.63	1,696,927.43	39.71849135	-80.79903544	
11,500.00	89.00	150.00	6,572.70	-6,985.51	2,150.76	14,424,204.04	1,696,977.43	39.71825325	-80.79885834	
11,600.00	89.00	150.00	6,574.45	-7,072.10	2,200.75	14,424,117.45	1,697,027.42	39.71801514	-80.79868125	
11,700.00	89.00	150.00	6,576.20	-7,158.69	2,250.74	14,424,030.86	1,697,077.41	39.71777703	-80.79850416	
11,800.00	89.00	150.00	6,577.95	-7,245.28	2,300.73	14,423,944.27	1,697,127.40	39.71753892	-80.79832707	
11,900.00	89.00	150.00	6,579.70	-7,331.87	2,350.73	14,423,857.68	1,697,177.40	39.71730081	-80.79814999	
12,000.00	89.00	150.00	6,581.45	-7,418.46	2,400.72	14,423,771.09	1,697,227.39	39.71706270	-80.79797290	
12,100.00	89.00	150.00	6,583.20	-7,505.05	2,450.71	14,423,684.50	1,697,277.38	39.71682459	-80.79779582	
12,200.00	89.00	150.00	6,584.94	-7,591.64	2,500.70	14,423,597.92	1,697,327.37	39.71658648	-80.79761873	
12,300.00	89.00	150.00	6,586.69	-7,678.23	2,550.70	14,423,511.33	1,697,377.36	39.71634836	-80.79744165	
12,400.00	89.00	150.00	6,588.44	-7,764.82	2,600.69	14,423,424.74	1,697,427.36	39.71611025	-80.79726457	
12,500.00	89.00	150.00	6,590.19	-7,851.41	2,650.68	14,423,338.15	1,697,477.35	39.71587214	-80.79708749	
12,600.00	89.00	150.00	6,591.94	-7,938.00	2,700.67	14,423,251.56	1,697,527.34	39.71563403	-80.79691041	
12,700.00	89.00	150.00	6,593.69	-8,024.59	2,750.67	14,423,164.97	1,697,577.33	39.71539592	-80.79673333	
12,800.00	89.00	150.00	6,595.44	-8,111.18	2,800.66	14,423,078.38	1,697,627.33	39.71515781	-80.79655626	
12,900.00	89.00	150.00	6,597.19	-8,197.76	2,850.65	14,422,991.79	1,697,677.32	39.71491969	-80.79637918	
13,000.00	89.00	150.00	6,598.93	-8,284.35	2,900.64	14,422,905.20	1,697,727.31	39.71468156	-80.79620211	
13,100.00	89.00	150.00	6,600.68	-8,370.94	2,950.64	14,422,818.61	1,697,777.30	39.71444347	-80.79602504	
13,200.00	89.00	150.00	6,602.43	-8,457.53	3,000.63	14,422,732.02	1,697,827.30	39.71420535	-80.79584797	
13,300.00	89.00	150.00	6,604.18	-8,544.12	3,050.62	14,422,645.43	1,697,877.29	39.71396724	-80.79567090	
13,400.00	89.00	150.00	6,605.93	-8,630.71	3,100.61	14,422,558.84	1,697,927.28	39.71372912	-80.79549383	
13,404.01	89.00	150.00	6,606.00	-8,634.18	3,102.62	14,422,555.37	1,697,929.28	39.71371958	-80.79548673	

PBHL/TD 13404.01 MD/6606.00 TVD

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Weller 4HM LP - hit/miss target - Shape - Point	0.00	0.00	6,514.00	-4,079.05	472.71	14,427,110.51	1,695,299.37	39.72624549	-80.80480330	
Weller 4HM BHL - plan hits target center - Point	0.00	0.00	6,606.00	-8,634.18	3,102.62	14,422,555.37	1,697,929.28	39.71371958	-80.79548673	

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WV Department of Environmental Protection
COMPASS 5000.14 Build 85
06/15/2018

47 051 02020



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Weller 4HM (A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1273.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1273.00usft
Site:	Lily/Weller	North Reference:	Grid
Well:	Weller 4HM (A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,300.00	1,300.00	0.00	0.00	KOP Begin 3°/100' build
1,633.33	1,631.64	-20.52	-20.52	Begin 3°/100' build/turn
2,830.90	2,705.67	-503.62	-49.71	Begin 41.43° tangent
7,626.68	6,301.16	-3,656.46	313.04	Begin 10°/100' build/turn
8,143.39	6,514.00	-4,079.05	472.71	Begin 89.00° lateral section
13,404.01	6,606.00	-8,634.18	3,102.62	PBHL/TD 13404.01 MD/6606.00 TVD

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Environmental Protection

47051 02020

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Weller 4HM

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) French Creek - Ohio River Quadrangle New Martinsville 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109105) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1356426)

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 _____

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

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WV Department of
Environmental Protection

Subscribed and sworn before me this 14th day of February, 2018

Kaitlin McCawley Kaitlin McCawley Notary Public

My commission expires 5/8/2021



47051 02020

Form WW-9

Operator's Well No. Weller 4HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 11.08 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Annual Ryegrass	40
Spring Oats	96

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

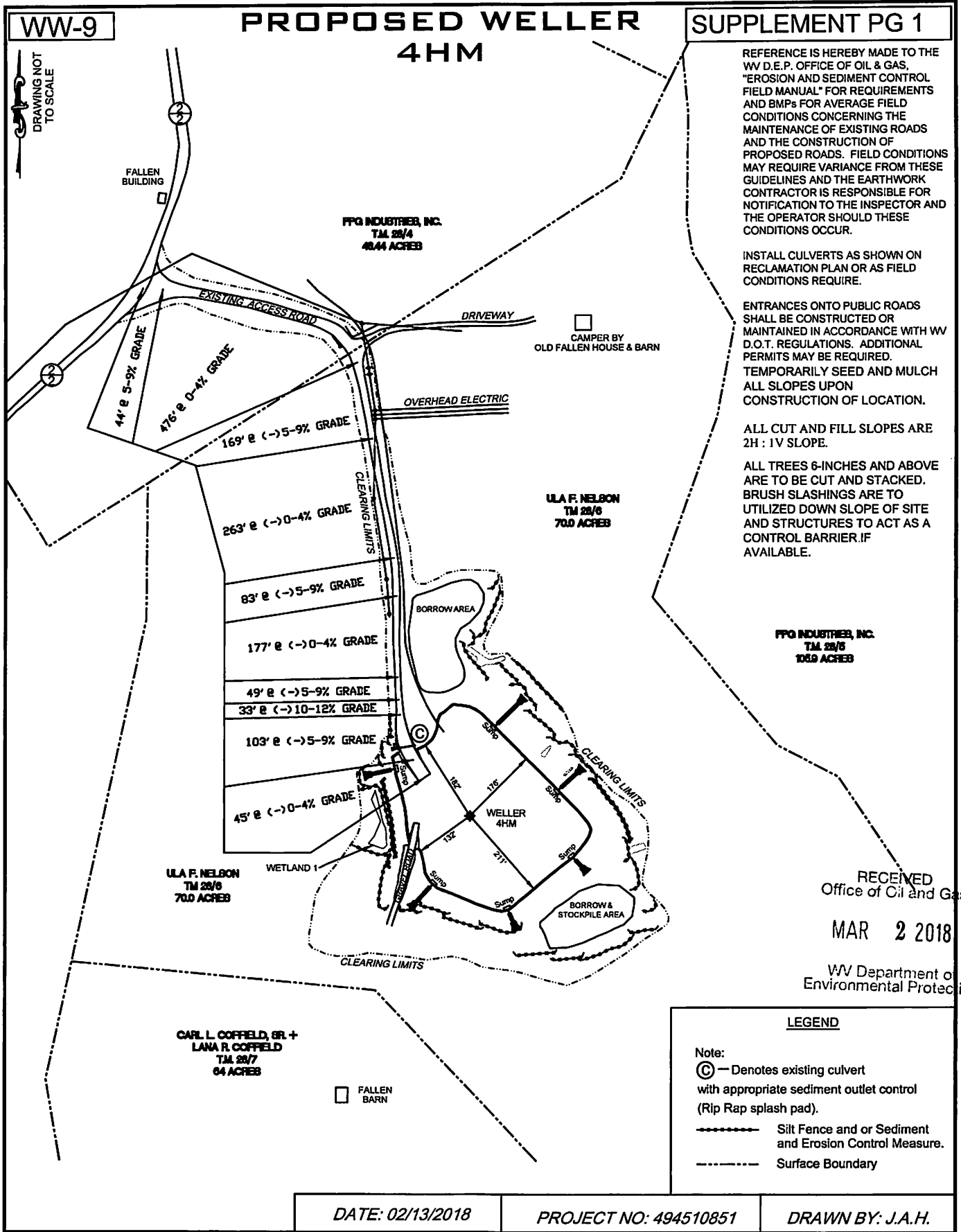
Plan Approved by: *Jim Nicholson*

Comments: _____

Title: Oil & Gas Inspector

Date: 5/29/18

Field Reviewed? Yes No

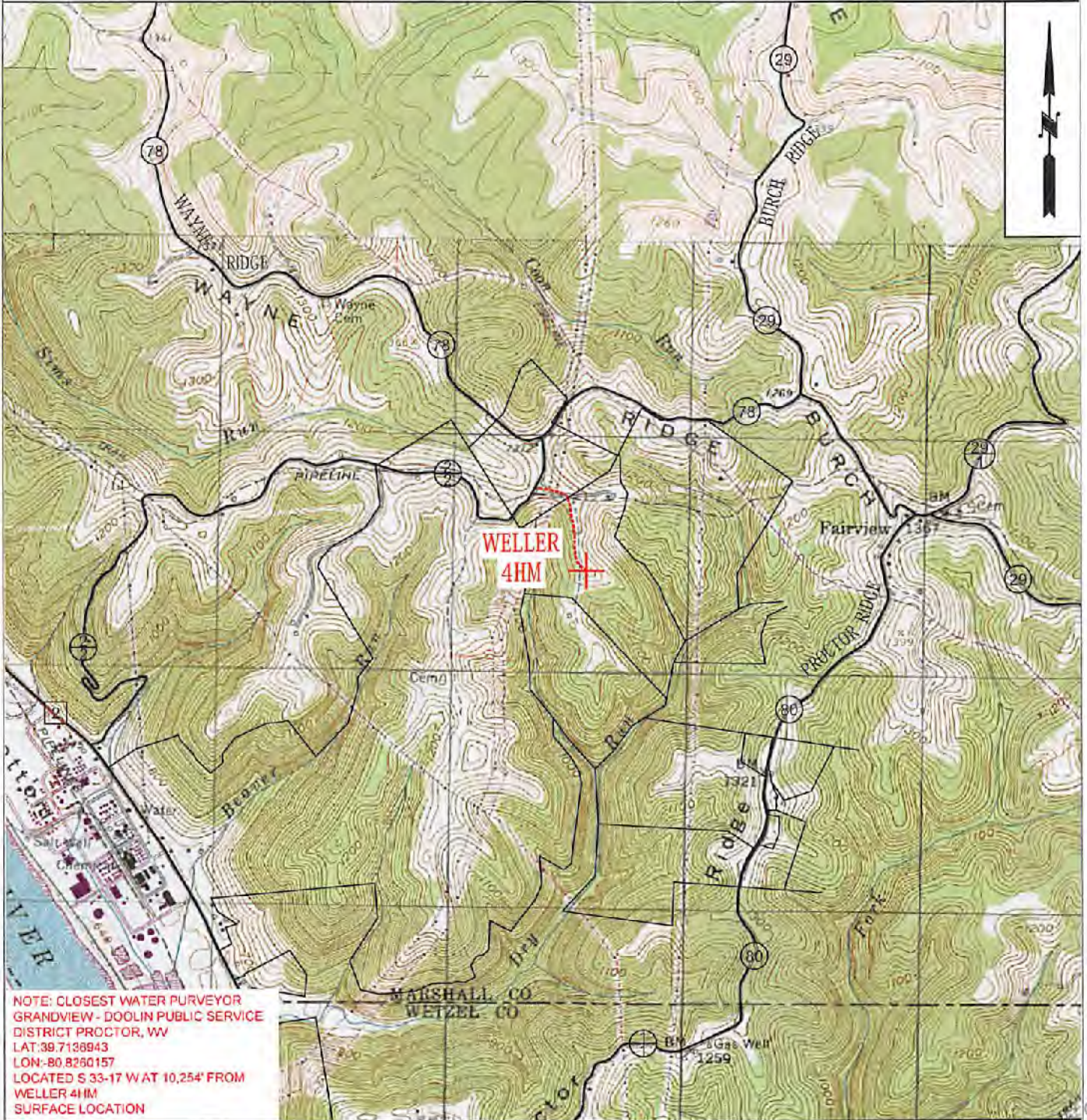


47 051 02020


WW-9

PROPOSED WELLER 4HM

SUPPLEMENT PG 2



NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN PUBLIC SERVICE
 DISTRICT PROCTOR, WV
 LAT: 39.7138943
 LON: -80.8250157
 LOCATED S 33-17 W AT 10,254' FROM
 WELLER 4HM
 SURFACE LOCATION

 TUG HILL OPERATING	OPERATOR	494510851	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		NEW MARTINSVILLE 7.5'	WELLER
	SCALE:		DATE:	
	1" = 2000'		DATE: 02/13/2018	

06/15/2018

47 051 02020



Well Site Safety Plan
Tug Hill Operating, LLC

JW
2/14/18

Well Name:Weller 4HM

Pad Location: Weller Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

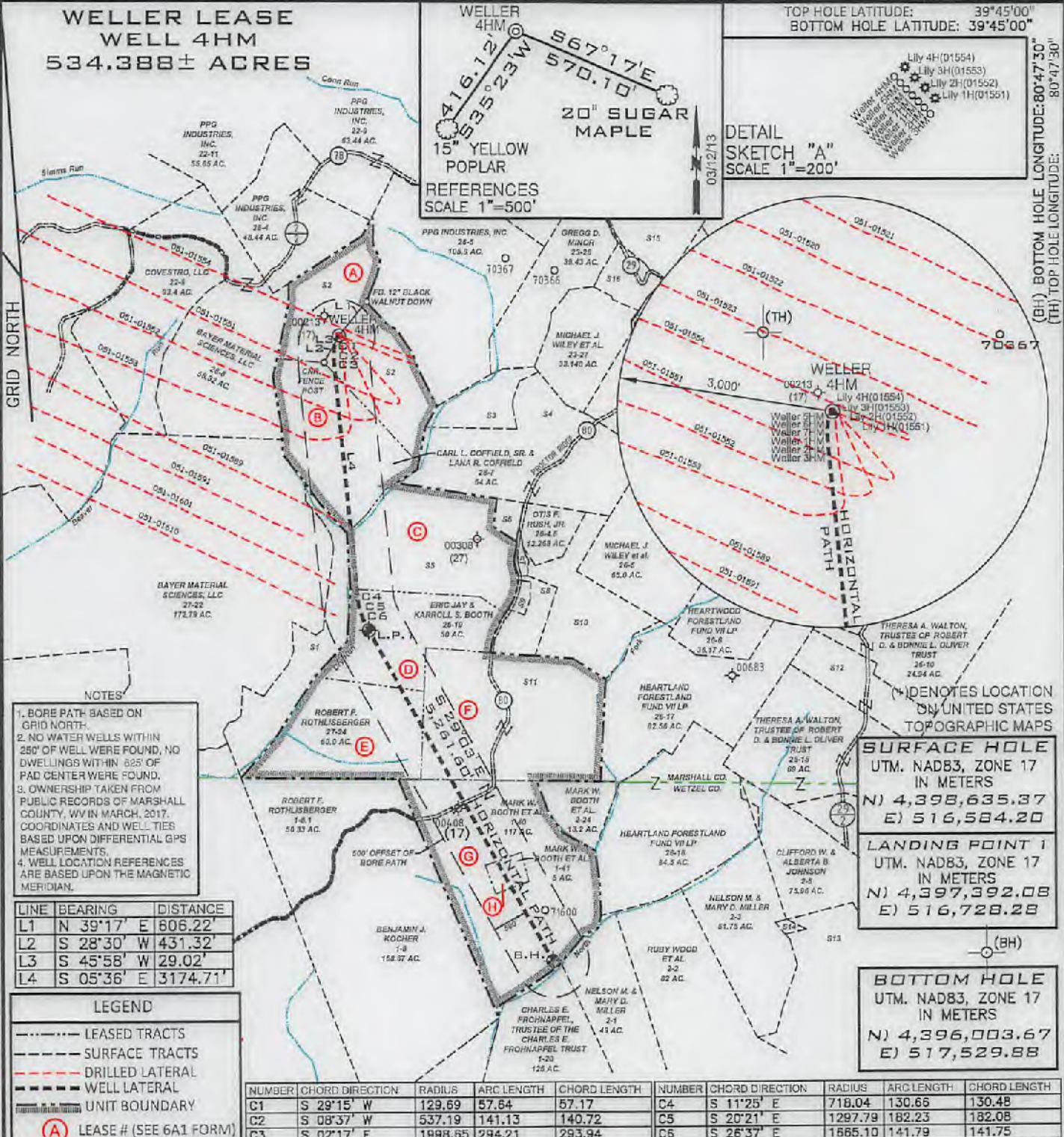
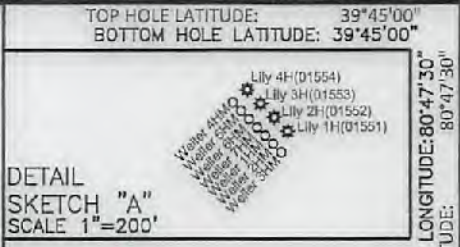
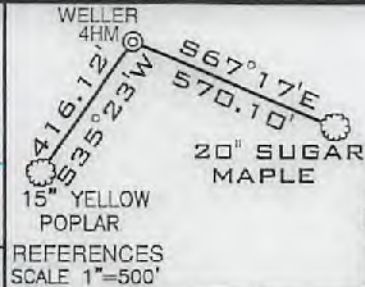
Northing: 4,398,635.37

Easting: 516,584.20

February 2018
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WV Department of
Environmental Protection

06/15/2018

**WELLER LEASE
WELL 4HM
534.388± ACRES**



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

LINE	BEARING	DISTANCE
L1	N 39°17' E	806.22'
L2	S 28°30' W	431.32'
L3	S 45°58' W	29.02'
L4	S 05°36' E	3174.71'

LEGEND

- LEASED TRACTS
- - - SURFACE TRACTS
- - - DRILLED LATERAL
- - - WELL LATERAL
- UNIT BOUNDARY

(A) LEASE # (SEE 6A1 FORM)

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH	NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	S 29°15' W	129.69	57.64	57.17	C4	S 11°25' E	718.04	130.66	130.48
C2	S 08°37' W	537.19	141.13	140.72	C5	S 20°21' E	1297.79	182.23	182.08
C3	S 02°17' E	1998.65	294.21	293.94	C6	S 26°37' E	1865.10	141.79	141.75

(TH) TOP HOLE LONGITUDE: 80°47'30"
(BH) BOTTOM HOLE LONGITUDE: 80°47'30"

(TH) 4,204'
(BH) 1121'

(BH) 13,235'

(TH) 4,591'

IDENTIFIES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,398,635.37
E) 516,584.20

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,397,392.08
E) 516,728.28

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,396,003.67
E) 517,529.88

FILE NUMBER _____

DRAWING NUMBER WELLER_WP_4HM

SCALE 1" = 2000'

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
304-623-6651

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

DATE: February 14, 2018

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

LOCATION ELEVATION 1273.0' WATERSHED (HUC 10) French Creek - Ohio River

DISTRICT Franklin COUNTY Marshall

QUADRANGLE New Martinsville 7 1/2' LEASE NUMBER SEE WW-6A1 Royalty Owners

SURFACE OWNER Ula F. Nelson ACREAGE 70.0

OIL & GAS ROYALTY OWNER Ula F. Nelson - See WW-6A1 Royalty Owners LEASE ACREAGE 70.0

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: 6,617' TMD: 13,404'

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

06/15/2018

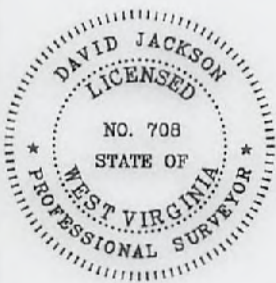
COUNTY NAME
PERMIT

47 051 02020 Hbk

form. wv6

WELLER LEASE
WELL N-4HM
534.388± ACRES

Number	TAX MAP-PARCEL	SURFACE OWNERS	ACRES
S1	27-23	ROBERT F. ROTH LISBERGER	35.77
S2	28-6	ULA F. NELSON	70.00
S3	26-1	EDWIN BOOTH ANDERSON & MARK W. ANDERSON	12.94
S4	26-2	EDWIN BOOTH ANDERSON & MARK W. ANDERSON	67.50
S5	26-4.5	ERIC JAY BOOTH	74.388
S6	26-4	JAMES R. & MELODY A. ANDERSON	3.887
S7	26-4.2	OTIS S. & GLENDA RUSH	1.58
S8	26-4.1	OTIS S. RUSH ET UX.	12.188
S9	26-4.3	CRYSTAL & RANDOPH F. MATASK	2.253
S10	26-4.4	OTIS F. & GLENDA M. RUSH	39.436
S11	26-18	ERIC JAY BOOTH	94.00
S12	26-14	THERESA A. WALTON, TRUSTEE OF ROBERT D. & BONNIE L. OLIVER TRUST	27.56
S13	2-4	EDITH SALEM & LISA G. LARSON	56.25
S14	2-4.1	TYRONE SULTZBACH & RICHARD WOLF	1.00
S15	22-1	PATRICIA ACCETTOLO ET AL.	146.66
S16	23-26.2	MARK W. TENNANT ET AL.	10.80



P.S. 708 *David L Jackson*

06/15/2018



TUG HILL
OPERATING

OPERATOR'S
WELL #: Weller 4HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV

WELL PLAT
PAGE 2 OF 2
DATE: 02/14/2018

47 051 02028

WW-6A1
(5/13)

Operator's Well No. Weller 4HM

**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
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*See attached pages

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

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

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

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

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

Lease No.	Tags		Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*14572	A	5-28-6	VICKI LYNN WOOD	CHESAPEAKE APPALACHIA LLC	1/8+	681	326	N/A	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14573	A	5-28-6	AARON D LITMAN	CHESAPEAKE APPALACHIA LLC	1/8+	681	317	N/A	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14574	A	5-28-6	KLOVA ANN MORRIS	CHESAPEAKE APPALACHIA LLC	1/8+	681	320	22/200 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc 32.5%	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14575	A	5-28-6	REVA JUNE ICARD	CHESAPEAKE APPALACHIA LLC	1/8+	681	323	22/200 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc 32.5%	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14576	A	5-28-6	WILLIAM L LITMAN	CHESAPEAKE APPALACHIA LLC	1/8+	681	329	22/200 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc 32.5%	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14577	A	5-28-6	ULA NELSON	CHESAPEAKE APPALACHIA LLC	1/8+	681	332	22/200 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc 32.5%	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14578	A	5-28-6	BETTY KNOWLES	GASTAR EXPLORATION USA INC	1/8+	767	36	N/A	27/639 Gastar to Atinum Marcellus I LLC (partial assign 50%)	21/41 Gastar Exploration USA, Inc merger Gastar Exploration Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A
10*14065	B	5-28-7	CARL L COFFIELD SR	GASTAR EXPLORATION USA, INC.	1/8+	665	363	36/9 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A	N/A	N/A	N/A

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Lease No.	Tags		Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
724736/000.1	C	5-26-4.5	MARK E AND VALERIE J SMITH	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia, LLC to SWN Production Company, LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merge SWN Production Company, LLC	41/256 SWN Production Company, LLC to TH Exploration, LLC	N/A
725704/000.1	C	5-26-4.5	ALLEN J AND BARBARA A SMITH	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia, LLC to SWN Production Company, LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merge SWN Production Company, LLC	41/256 SWN Production Company, LLC to TH Exploration, LLC	N/A
10*21935	D	5-26-19	KARROLL S & LOIS E BOOTH	AMERICAN PETROLEUM PARTNERS OPERATING, LLC	1/8+	940	493	41/224 American Petroleum Partners Operating, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A	N/A
10*22015	D	5-26-19	ERIC JAY BOOTH	AMERICAN PETROLEUM PARTNERS OPERATING, LLC	1/8+	942	217	41/224 American Petroleum Partners Operating, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A	N/A
10*19908	D	5-26-19	GOLDA K ANDERSON	TH EXPLORATION LLC	1/8+	945	434	N/A	N/A	N/A	N/A	N/A	N/A
10*14504	E	5-27-24	GEORGE A. STICKLER, ET UX.	GASTAR EXPLORATION USA INC	1/8+	756	83	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A
10*19733	F	5-26-18	GEORGE E BOOTH SR AND MARGARET E BOOTH	TH EXPLORATION LLC	1/8+	944	575	N/A	N/A	N/A	N/A	N/A	N/A
10*19910	F	5-26-18	GOLDA KATHLEEN BOOTH ANDERSON	TH EXPLORATION LLC	1/8+	945	440	N/A	N/A	N/A	N/A	N/A	N/A

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Lease No.	Tags		Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*21450	F	5-26-18	ERIC JAY BOOTH	TH EXPLORATION LLC	1/8+	953	258	N/A	N/A	N/A	N/A	N/A	N/A
10*15087	G	12-1-40	RICHARD KEITH REYNOLDS, ET UX	TH EXPLORATION LLC	1/8+	198A	347	N/A	N/A	N/A	N/A	N/A	N/A
10*21165	G	12-1-40	GARNET IRENE ROBINSON	TH EXPLORATION, LLC	1/8+	198A	349	N/A	N/A	N/A	N/A	N/A	N/A
10*15088	G	12-1-40	MARK W BOOTH	GASTAR EXPLORATION INC	1/8+	154A	122	173A/431 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A
10*15089	G	12-1-40	MAGGIE ANN ROCKWELL	GASTAR EXPLORATION INC	1/8+	152A	437	173A/431 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A
10*15090	G	12-1-40	GEORGE E BOOTH JR	GASTAR EXPLORATION INC	1/8+	152A	440	173A/431 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A
10*15088	H	12-1-41	MARK W BOOTH	GASTAR EXPLORATION INC	1/8+	154A	122	173A/431 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A
10*15089	H	12-1-41	MAGGIE ANN ROCKWELL	GASTAR EXPLORATION INC	1/8+	152A	437	173A/431 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A

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Lease No.	Tags		Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*15090	H	12-1-41	GEORGE E BOOTH JR	GASTAR EXPLORATION INC	1/8+	152A	440	173A/431 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	N/A	N/A	N/A	N/A

06/15/2018

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from SWN PRODUCTION COMPANY, LLC, a Texas limited liability company ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on December 18, 2017 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated August 24, 2017 (the "*Acreage Trade Agreement*").

ARTICLE 1 ASSIGNMENT OF ASSETS

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") INSOFAR AND ONLY INSOFAR as they cover those lands described on Exhibit A (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.2 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2 SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR

RECEIVED
Office of Oil and Gas
MAR 2 2018
WV Department of
Environmental Protection

ASSIGNMENT OF OIL AND GAS LEASES

This ASSIGNMENT OF OIL AND GAS LEASES (the "Assignment") is made and entered into this 29th day of November, 2017 (the "Effective Date"), from TH Exploration II, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "Assignor"), and TH Exploration, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "Assignee").

WITNESSETH:

WHEREAS, Assignor is the owner of the right, title, and interest in those certain Oil and Gas Leases situated in Marshall County, West Virginia, which are described in Exhibit "A" and Exhibit "A-1" attached hereto and made a part hereof (hereinafter the "Leases"); and

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

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

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, subject to the terms, reservations, waivers and provisions as hereinafter set forth, an undivided interest of all of Assignor's right, title and interest in and to the Leases and all oil, natural gas, natural gas liquids, condensate, casinghead gas and other liquefied or gaseous hydrocarbons or products ("Hydrocarbons") thereby held, in any and all depths and formations ("Assigned Formations"), together with any and all other rights that are reasonably necessary or convenient to explore for and produce Hydrocarbons from the Assigned Formations, including, but not limited to, the right of surface access, use and occupancy, the right of ingress and egress, the right to conduct geophysical and other exploratory activities, the right to lay pipeline, the right to drill through, but not perforate or stimulate, all other depths and formations necessary for the purpose of reaching the Assigned Formations and to conduct operations therein.

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

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

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

Assignor represents and warrants that, as to its interests in the Leases, Assignor shall not, by virtue of this Assignment or otherwise, retain any interest in the Assigned Formations, including, without limitation, any overriding royalty interest or working interest therein or with respect thereto.

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

DPS LAND SERVICES CORP - JESSICA LEHMAN
6000 TOWN CENTER BLVD STE 145
CANDLERBURG PA 15317-5870

RECEIVED
Office of Oil and Gas
MAR 2 2018
WV Department of
Environmental Protection

47 051 02020



February 19, 2018

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

RE: Weller 4HM

Subject: Marshall County Route 80 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 80 in the area reflected on the Weller 4HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

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

RECEIVED
Office of Oil and Gas
MAR 2 2018
WV Department of
Environmental Protection

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

Date of Notice Certification: 02/19/2018

API No. 47- 051 -

Operator's Well No. Weller 4HM

Well Pad Name: Lily

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:	West Virginia	UTM NAD 83	Easting:	516,584.20
County:	Marshall		Northing:	4,390,635.37
District:	Franklin	Public Road Access:		Route 2/2
Quadrangle:	New Martinsville 7.5'	Generally used farm name:		Ula F. Nelson
Watershed:	French Creek (Ohio River)			

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 checked="" type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input checked="" type="checkbox"/> RECEIVED <input checked="" type="checkbox"/> RECEIVED <input checked="" type="checkbox"/> RECEIVED
--	--

RECEIVED
Office of Oil and Gas
MAR 2 2018
WV Department of
Environmental Protection

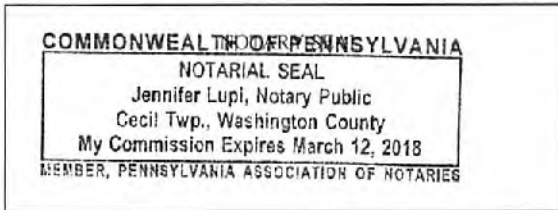
Required Attachments:

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

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



Subscribed and sworn before me this 19th day of Feb 2018.

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 deprivacyofficer@wv.gov.

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Environmental Protection

WW-6A
(9-13)

API NO. 47-051-02020
OPERATOR WELL NO. Weller 4HM
Well Pad Name: Lily

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

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

Date of Notice: 2/19/2018 Date Permit Application Filed: 2/20/2018

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: Ula F. Nelson ✓

Address: 7101 W. Yale Avenue, Unit # 3703

Denver, CO 80227

Name: Carl L. Coffield, Sr. and Lana R. Coffield ✓

Address: 970 Allendale Avenue

Akron, OH 44036

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

Name: PPG Industries, Inc. ✓

Address: One PPG Place

Pittsburgh, PA 15272

Name: Ula F. Nelson

Address: 7101 W. Yale Avenue, Unit # 3703

Denver, CO 80227 *See attached list

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: PPG Industries, Inc.

Address: One PPG Place

Pittsburgh, PA 15272 *See attached list

COAL OPERATOR

Name: _____

Address: _____

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

Name: Ula F. Nelson

Address: 7101 W. Yale Avenue, Unit #3703

Denver, CO 80227

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____

Address: _____

*Please attach additional forms if necessary

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MAR 2 2018
WV Department of
Environmental Protection

06/15/2018

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

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2018
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Well Location Restrictions

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

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(8-13)

API NO. 47- 051-02020
OPERATOR WELL NO. Weller 4HM
Well Pad Name: Lily

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

06/15/2018

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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API NO. 47- 051 - 02020
OPERATOR WELL NO. Weller 4HM
Well Pad Name: Lily

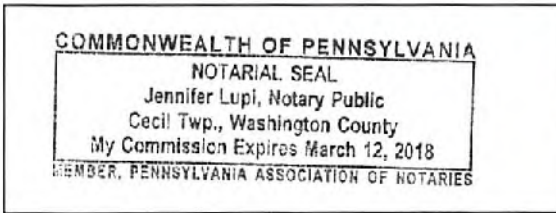
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 19th day of Feb, 2018.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

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WW-6A Notice of Application Attachment

Weller 4HM

Surface Owner(s) Access Road

PPG Industries, LLC
One PPG Place
Pittsburgh, PA 15272

Coal Owner or Lessee (Well Pad)

✓ Appalachian Power Company
P.O. Box 16428
Columbus, OH 43216-6428

✓ Betty Knowles
1230 Elm Street
Mountain Home, ID 83647

✓ William L. Litman
15 Linden Avenue
Wheeling, WV 26003

✓ Vicki Lynn Wood
1204 Center Street
Moundsville, WV 26041

✓ Aaron D. Litman
67 Olive Street
Moundsville, WV 26041

✓ Klova Morris
1681 Rivermont Road
Columbus, OH 43223

✓ Reva Junne Icard
319 7th Street
Moundsville, WV 26041

✓ Professional Land Resources, LLC
P.O. Box 965
Dellslow, WV 26531

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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: 12/5/2017 **Date of Planned Entry:** 12/12/2017

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: Ula F. Nelson (Pad and Access Road)
Address: P.O. Box 27439
Denver, CO 80227

Name: Carl L. Coffield, Sr. and Lana R. Coffield (Pad and Access Road)
Address: 970 Allendale Avenue
Akron, OH 44036

Name: PPG Industries, Inc. (Access Road)
Address: One PPG Place
Pittsburgh, PA 15272

COAL OWNER OR LESSEE

Name: *See attached list
Address: _____

MINERAL OWNER(s)

Name: *See attached list
Address: _____

**please attach additional forms if necessary*

Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.7374506; -80.8064532</u>
County: <u>Marshall</u>	Public Road Access: <u>Wells Hill Road - County Route 2/2</u>
District: <u>Franklin</u>	Watershed: <u>HUC-10: French Creek - Ohio River</u>
Quadrangle: <u>New Martinsville 7.5'</u>	Generally used farm name: <u>Nelson, Ula F.</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-hilltop.com</u>	Facsimile: <u>724-338-2030</u>

12-12-2018
WV Department of Environmental Protection

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.

4705102020

**WW-6A3 Attachment
4HM**

Weller

Mineral Owner (s) Well Pad

Ula F. Nelson
P.O. Box 27439
Denver, CO 80227

Aaron D. Litman
67 Olive Street
Moundsville, WV 26041

Betty Knowles
1230 Elm Street
Mountain Home, ID 83647

Reva June Icard
379 7th Street
Moundsville, WV 26041

William L. Litman
15 Linden Avenue
Wheeling, WV 26003

Klova Ann Morris
1681 Rivermont Road
Columbus, OH 43223

Vicki Lynn Wood
1204 Center Street
Moundsville, WV 26041

Professional Land Resources, LLC
P.O. Box 965
Dellslow, WV 26531

Coal Owner or Lessee(s) Well Pad

Appalachian Power Company
P.O. Box 16428
Columbus, OH 43216-6428

Aaron D. Litman
67 Olive Street
Moundsville, WV 26041

Ula F. Nelson
P.O. Box 27439
Denver, CO 80227

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379 7th Street
Moundsville, WV 26041

Betty Knowles
1230 Elm Street
Mountain Home, ID 83647

Klova Ann Morris
1581 Wyandotte Road
Columbus, OH 43212

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Wheeling, WV 26003

Professional Land Resources, LLC
P.O. Box 965
Dellslow, WV 26531

Vicki Lynn Wood
1204 Center Street
Moundsville, WV 26041

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06/15/2018

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

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

Date of Notice: 02/19/2018 **Date Permit Application Filed:** 02/20/2018

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: Ula F. Nelson
Address: 7101 Yale Avenue, Unit # 3703
Denver, CO 80227

Name: Carl L. Coffield, Sr. and Lana R. Coffield
Address: 970 Allendale Avenue
Akron, OH 44036

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>516,584.20</u>
County: <u>Marshall</u>	Northing: <u>4,398,635.37</u>
District: <u>Franklin</u>	Public Road Access: <u>Route 2/2</u>
Quadrangle: <u>New Martinsville 7.5'</u>	Generally used farm name: <u>Ula F. Nelson</u>
Watershed: <u>Fish Creek (Ohio River)</u>	

This Notice Shall Include:

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

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

Address: 380 Southpointe Boulevard, Plaza II, Suite 300
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.

RECEIVED
Office of Oil and Gas
MAR 2 2018
WV Department of
Environmental Protection
06/15/2018

47 051 02020



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

December 7, 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 Lily Well Pad, Marshall County

Weller 4HM Well Site

Dear Mr. Martin,

This well site will be accessed from Permit #06-2012-0131 transferred to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 2/2 SLS.

The operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated 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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WV Department of
Environmental Protection

06/15/2018

47 051 02020



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Weller 4HM

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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Office of Oil and Gas
MAR 2 2018
WV Department of
Environmental Protection

WEST VIRGINIA COUNTY MAP



WYDEP OOG
ACCEPTED AS-BUILT

WJL 3/19/2018

Lily Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Franklin District
Latitude 39.73743325°
Longitude -80.80632501°
Haynes Run - Ohio River Watershed

Pertinent Site Information
Lily Well Site
Emergency Number: 304-845-9730
Franklin District, Marshall County, WV
Watershed: Haynes Run - Ohio River Watershed
Tug Hill Contact Number: 1-817-652-3450

Property Owner Information for Lily Well Site

OWNER	PROPERTY	ADDRESS	CITY	STATE	ZIP
WV DEP	10000	10000	10000	10000	10000

Access Road

Access Road	Width	Surface
Access Road	10'	Gravel

Historical Data

Year	Area (Acres)
1980	1.2
1985	1.5
1990	1.8
1995	2.1
2000	2.4
2005	2.7
2010	3.0

Exhibit A: Final Design: Issue for Permitting



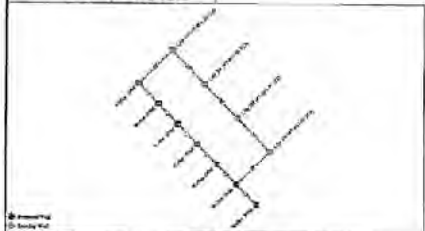
Note: The boundaries will take into account the existing limits of disturbance for the Lily Well Site. It is advised that the boundaries will take into account the existing LID. Additional required information will be provided within the LID. All work shall be done within the LID. The project is located in the site and is not an additional area. Only the work in the site is shown.

Lily Well Site Quantities

Item	Quantity	Unit
Gravel	1000	cu yd
Grass Seed	1000	lb
Soil	1000	cu yd

Site Erosion Control Measures

Measure	Description
1	Install silt fence along all disturbed areas.
2	Install straw bales along all disturbed areas.
3	Install erosion control blankets on all disturbed areas.



Site Erosion Control Measures (continued)

Measure	Description
4	Install sediment traps along all disturbed areas.
5	Install check dams along all disturbed areas.
6	Install riprap along all disturbed areas.

Project Contacts

WV DEP
Franklin District
Marshall County

MISS UTILITY OF WEST VIRGINIA
10000
10000
10000

From the intersection of OH 917 and WV 262, one-half mile north, WV, Travel North on WV 262 to 0.3 mi. Turn right onto CA 8121 (Haynes Run Rd). Follow CA 8121 for 0.3 mi. The site entrance will be on the right (east) side of the road.



Site Locations (MAD 2)

Station	Location
10000	10000



The design of this project was prepared by the undersigned in accordance with the provisions of the Professional Engineers Act of 1962, as amended, and the rules and regulations of the Board of Professional Engineers of the State of West Virginia.

Sheet Description

Sheet	Description
1	Cover Sheet
2	Site Plan
3	Grading Plan
4	Erosion Control Plan
5	Site Map
6	Grading Plan
7	Site Plan
8	Site Plan
9	Site Plan
10	Site Plan
11	Site Plan
12	Site Plan
13	Site Plan
14	Site Plan
15	Site Plan
16	Site Plan
17	Site Plan
18	Site Plan
19	Site Plan
20	Site Plan
21	Site Plan
22	Site Plan
23	Site Plan
24	Site Plan
25	Site Plan

TUG HILL OPERATING



THIS DOCUMENT IS VALID FOR PROJECT ONLY

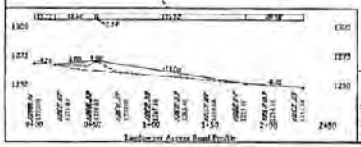
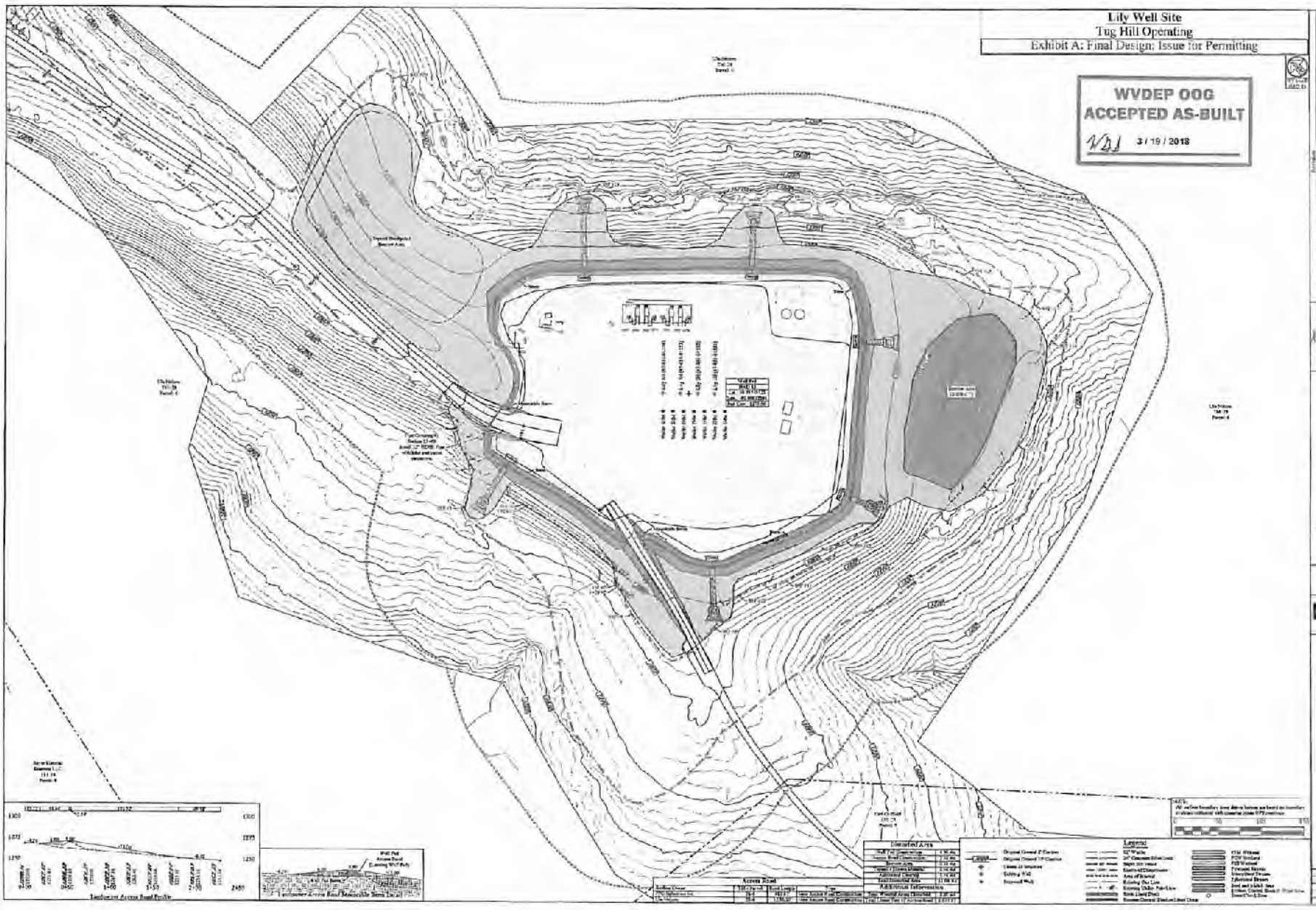
Key Signature

Cover Sheet
Lily Well Site
Franklin District
Marshall County, WV

2020 150 67

Lily Well Site
 Tug Hill Operating
 Exhibit A: Final Design: Issue for Permitting

**WVDEP OOG
 ACCEPTED AS-BUILT**
WJ 3/19/2018



Shaded Area	
131.72	131.72
131.70	131.70
131.68	131.68
131.66	131.66
131.64	131.64
131.62	131.62
131.60	131.60
131.58	131.58
131.56	131.56
131.54	131.54
131.52	131.52
131.50	131.50
131.48	131.48
131.46	131.46
131.44	131.44
131.42	131.42
131.40	131.40
131.38	131.38
131.36	131.36
131.34	131.34
131.32	131.32
131.30	131.30
131.28	131.28
131.26	131.26
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131.18	131.18
131.16	131.16
131.14	131.14
131.12	131.12
131.10	131.10
131.08	131.08
131.06	131.06
131.04	131.04
131.02	131.02
131.00	131.00

Legend	
Original Ground (2' Contour)	131.00
Original Ground (1' Contour)	131.00
131.00	131.00
131.02	131.02
131.04	131.04
131.06	131.06
131.08	131.08
131.10	131.10
131.12	131.12
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131.70	131.70
131.72	131.72

Legend	
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131.56	131.56
131.58	131.58
131.60	131.60
131.62	131.62
131.64	131.64
131.66	131.66
131.68	131.68
131.70	131.70
131.72	131.72

Vertical title block containing:
 - TUG HILL OPERATING logo
 - K&S Engineering logo
 - Lily Well Site
 - Final Design: Issue for Permitting
 - Exhibit A: Final Design: Issue for Permitting
 - WVDEP OOG ACCEPTED AS-BUILT stamp
 - Date: 3/19/2018
 - Scale: 1" = 100'

47051 02020