

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47 - 051 - 01911 County Marshall District Meade  
Quad Glen Easton 7.5' Pad Name Heaven Hill 2 Field/Pool Name \_\_\_\_\_  
Farm name Charles R. Hagedorn, Jr., Et Ux Well Number Heaven Hill 2-7HU  
Operator (as registered with the OOG) Tug Hill Operating, LLC  
Address 1320 S. University Drive, Suite 215 City Ft. Worth State TX Zip 76107

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,406,713.22 Easting 524,572.67  
Landing Point of Curve Northing 4,406,640.5 Easting 524,597.9  
Bottom Hole Northing 4,404,400.7 Easting 525,872.6  
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Elevation (ft) 1331' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
SOBM; Base oil, osmotic inhibitor, weighting agent, viscosifer, emulsifier, hardness buffer, fluid loss additive, LCM, shae inhibitor, de-foamer, soaping agent, coagulant, flocculant; Specific additives per WSSP and Permit.

Date permit issued 5/9/2017 Date drilling commenced 6/22/2017 Date drilling ceased 4/4/2018  
Date completion activities began 9/24/2018 Date completion activities ceased 2/9/2019  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 1073' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1595' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 974' - 980', 1064' - 1072' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) Y

Reviewed by: \_\_\_\_\_

API 47- 051 - 01911 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2-7HU

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/fl	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	36"	30"	120'	NEW	94.5#	N/A	Y
Surface	26"	20"	1157'	NEW	106.5#	N/A	Y
Coal							
Intermediate 1	17 1/2"	13 3/8"	2,871'	NEW	54.5#	N/A	Y
Intermediate 2	12 1/4"	9 5/8"	10,346'	NEW	47#	N/A	Y
Intermediate 3							
Production	8 1/2"	5 1/2"	20,337'	NEW	23#	N/A	Y
Tubing		2 7/8"	10,169'	NEW	4.7#	N/A	Y
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	A		15.6	1.2		0	8
Surface	A	2126	15.6	1.2	2551	0	8
Coal							
Intermediate 1	A	2303	15.6	1.19	2879	0	8
Intermediate 2	A	3846	14.5	1.19	4576	0	8
Intermediate 3							
Production	A	4553	16.5	1.17	5018	0	8
Tubing							

Drillers TD (ft) 20,420' Loggers TD (ft) n/a RECEIVED Office of Oil and Gas  
 Deepest formation penetrated Trenton Plug back to (ft) \_\_\_\_\_ JUL 10 2020  
 Plug back procedure n/a

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Kick off depth (ft) 10,455'

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING 3 centralizers on surface casing at equal distance  
Intermediate - 1 centralizer every other joint  
 Production - one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

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**PERFORATION RECORD**

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	<b>*see attached</b>				

Please insert additional pages as applicable.

**STIMULATION INFORMATION PER STAGE**

Complete a separate record for each stimulation stage.

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Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
			<b>*see attached</b>					

Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Point Pleasant</u>	<u>11,568' - 11,724'</u> TVD	<u>11,652' - 20,420'</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 8000 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 500 mcfpd Oil 0 bpd NGL 0 bpd Water 550 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	
<u>*see attachment</u>	<u>0</u>		<u>0</u>		

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Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA  
Address 505 Greens Road, Suite 100 City Houston State TX Zip 77067

Logging Company n/a  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Cementing Company C&J Well Services  
Address 380 Southpointe Boulevard, Suite 210 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy Services  
Address 121 Champion Way, Suite 200 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Amy L. Miller Telephone 304-376-0111  
Signature *Amy L. Miller* Title Engineer Date 4/15/2020

**Heaven Hill 2W-7HU  
PEFORATION RECORD**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	12/22/2018	20245	20290	12	Utica
2	12/22/2018	19959	20107	48	Utica
3	12/23/2018	19760	19909	48	Utica
4	12/23/2018	19562	19710	48	Utica
5	12/24/2018	19363	19512	48	Utica
6	12/24/2018	19165	19313	48	Utica
7	12/24/2018	18966	19115	48	Utica
8	12/25/2018	18768	18916	48	Utica
9	12/26/2018	18569	18718	48	Utica
10	12/26/2018	18371	18519	48	Utica
11	12/26/2018	18172	18321	48	Utica
12	12/27/2018	17974	18122	48	Utica
13	12/27/2018	17775	17924	48	Utica
14	12/28/2018	17577	17725	48	Utica
15	12/29/2018	17378	17527	48	Utica
16	12/29/2018	17180	17328	48	Utica
17	1/8/2019	16981	17130	48	Utica
18	1/14/2019	16783	16931	48	Utica
19	1/15/2019	16584	16733	48	Utica
20	1/16/2019	16386	16534	48	Utica
21	1/17/2019	16187	16336	48	Utica
22	1/18/2019	15989	16137	48	Utica
23	1/19/2019	15790	15939	48	Utica
24	1/20/2019	15592	15740	48	Utica
25	1/22/2019	15393	15542	48	Utica
26	1/23/2019	15195	15343	48	Utica
27	1/25/2019	14996	15145	48	Utica
28	1/26/2019	14798	14946	48	Utica
29	1/26/2019	14599	14748	48	Utica
30	1/27/2019	14401	14549	48	Utica
31	1/29/2019	14202	14351	48	Utica
32	1/29/2019	14004	14152	48	Utica
33	1/30/2019	13805	13954	48	Utica
34	2/1/2019	13607	13755	48	Utica
35	2/1/2019	13408	13557	48	Utica
36	2/2/2019	13210	13358	48	Utica
37	2/3/2019	13011	13160	48	Utica
38	2/3/2019	12813	12961	48	Utica
39	2/4/2019	12614	12763	48	Utica
40	2/4/2019	12416	12564	48	Utica
41	2/4/2019	12217	12366	48	Utica

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Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
42	2/5/2019	12019	12167	48	Utica

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**Heaven Hill 2W-7HU**  
**STIMULATION INFORMATION PER STAGE**

Stage No.	Ave. Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	84.6	11110	8139	6776	400580	9492	0
2	83.3	11352	9037	7117	509545	11919	0
3	82.5	11268	10679	7532	509105	11472	0
4	80.7	11203	8995	7698	508200	12537	0
5	84.4	11601	8233	7886	511490	11418	0
6	81.2	11002	8646	7668	510730	11534	0
7	82	11375	8701	7534	509530	11336	0
8	79.4	11191	8860	7650	504030	11654	0
9	83.6	11087	8722	7833	512505	11478	0
10	82.6	11060	8940	7824	510525	11978	0
11	83.9	10857	8853	7755	491765	1573	0
12	83.6	11479	9114	7813	511395	11593	0
13	80.3	10742	8007	7636	505670	10665	0
14	80.8	11074	8579	7606	510250	10699	0
15	83.7	10734	8113	8075	506980	11544	0
16	82	10912	8735	7832	509870	10915	0
17	78.2	11973	11890	7764	495740	9686	0
18	81.9	11489	8620	8157	506635	10304	0
19	84.1	10845	8300	7685	506315	10084	0
20	84.1	10850	8517	7861	495960	10224	0
21	84	10562	7857	7478	510460	10628	0
22	83.5	11134	8378	9853	507995	9853	0
23	77.8	10811	8146	7683	511440	10059	0
24	83.7	11157	7963	7788	509265	10015	0
25	77.7	10477	7886	7729	500620	12525	0
26	82	10778	8115	7656	511680	9950	0
27	84.5	10429	8128	7761	518145	9924	0
28	84.5	10506	8173	7779	504860	10591	0
29	84.4	10306	8105	7852	508970	9997	0

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Stage No.	Ave. Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
30	83.5	10837	8013	7811	510645	9965	0
31	84.2	10499	7890	7966	497595	10227	0
32	77.9	10165	7895	7791	516645	14723	0
33	83.3	10664	8275	7771	512795	10178	0
34	78.4	10368	9313	7737	472085	11451	0
35	82.4	10721	8200	7560	507595	9726	0
36	81.2	10573	8100	7773	508815	11045	0
37	81.5	10400	8155	8045	512230	9854	0
38	80.5	10356	8121	7891	504620	9694	0
39	83.1	10536	8500	7601	510945	9841	0
40	80.3	10489	8594	7914	511495	8866	0
41	81.7	10243	8361	7709	511350	8849	0
42	80.2	10271	8200	7495	514370	9082	0
43	79.4	10414	8279	7699	409285	9811	0

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	12/22/2018
Job End Date:	2/13/2019
State:	West Virginia
County:	Marshall
API Number:	47-051-01911-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Heaven Hill Unit 2W 7HU
Latitude:	39.80995750
Longitude:	-80.71300270
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	11,723
Total Base Water Volume (gal):	19,614,929
Total Base Non Water Volume:	0

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## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.73247	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.45306	

Produced Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	0.10641	Density = 9.000
HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
SAND-CRC PREMIUM-40/70, 100 LB SACK	Halliburton	Proppant					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
FDP-S1296-17	Halliburton	Corrosion Inhibitor					
				Listed Below			
OILPERM A	Halliburton	Non-ionic Surfactant					

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				Listed Below			
LD-2850	MultiChem	Friction Reducer					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

			Crystalline silica, quartz	14808-60-7	100.00000	11.61680	
			Phenol / formaldehyde resin	9003-35-4	5.00000	0.05492	
			Hydrochloric acid	7647-01-0	7.50000	0.03398	
			Hexamethylenetetramine	100-97-0	2.00000	0.02197	
			Sodium chloride	7647-14-5	30.00000	0.02112	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02112	
			Guar gum	9000-30-0	100.00000	0.01951	
			Alcohols, C12-16, ethoxylated	68551-12-2	5.00000	0.00352	
			Ammonium chloride	12125-02-9	5.00000	0.00352	
			9-Octadecenamide, n, n-bis-2(hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00352	
			Sodium persulfate	7775-27-1	100.00000	0.00065	
			Methanol	67-56-1	100.00000	0.00033	
			Ethanol	64-17-5	60.00000	0.00021	
			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00014	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00010	
			Modified thiourea	Proprietary	30.00000	0.00010	

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			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)- omega-hydroxy-, branched	127087-87-0	5.00000	0.00002	
			Naphthalene	91-20-3	5.00000	0.00002	
			Propargyl alcohol	107-19-7	5.00000	0.00002	
			Ethoxylated alcohols	Proprietary	5.00000	0.00002	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00000	
			Sodium sulfate	7757-82-6	0.10000	0.00000	

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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LITHOLOGY/FORMATION	TOP DEPTH IN FT/ Name TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID
Maxton	1903	2075	1903	2075	Sandstone
Big Lime	2075	2207	2075	2207	Limestone
Big Injun	2207	2501	2207	2501	Sandstone
Weir	2501	2699	2501	2699	Sandstone
Berea	2699	2961	2699	2961	Sandstone
Gordon	2961	3046	2961	3046	Sandstone
Fifty Foot	3046	3628	3046	3631	Sandstone
Speechley	3628	5138	3631	5151	Sandstone
Benson	5138	5461	5151	5476	Sandstone
Alexander	5461	6167	5476	6184	Siltstone
Rhinstreet	6167	6598	6184	6615	Black shale
Middlesex	6598	6684	6615	6701	Black shale
Geneseo/Burkett	6684	6694	6701	6711	Black shale
Tully	6694	6730	6711	6747	Limestone
Hamilton	6730	6808	6747	6825	Grey shale
Marcellus	6808	6858	6825	6875	Black shale
Onondaga	6858	7082	6875	7099	Limestone
Oriskany	7082	7186	7099	7203	Sandstone
Helderberg	7186	7556	7203	7573	Limestone
Salina	7556	8550	7573	8567	Salt/Anhydrite/LS
Lockport	8550	8924	8567	8941	Dolomite
Rose Hill	8924	9194	8941	9211	Shale
Packer Shell	9194	9401	9211	9418	Limestone
Clinton/Tuscarora	9401	9513	9418	9530	Sandstone
Juniata/Queenston	9513	10367	9530	10385	Red Shale
Reedsville	10367	11310	10385	11331	Grey Shale
Utica	11310	11568	11331	11652	Black Shale
Point Pleasant	11568	-	11652	-	Shale/Limestone

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Well: Heaven Hill 2-07 HU (slot E)  
 Site: Heaven Hill 2  
 Project: Marshall County, West Virginia  
 Design: rev9

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	VSecl	Annotation
1	10365.00	0.40	61.72	10347.09	150.63	-215.64	0.00	0.00	Survey @ 10365.00 MD 10347.09 TVD
2	11095.06	0.40	148.72	11077.09	153.07	-209.98	0.00	0.00	Proj. Begin 10'/100' buildturn
3	11582.06	5.00	148.72	11527.09	-38.29	-209.98	10.00	91.90	Begin 10'/100' build
4	12095.97	89.00	148.72	11550.37	-338.02	61.73	0.00	89.93	Begin 6'/100' turn
5	12095.97	89.00	150.00	11550.37	-338.02	61.73	0.00	89.93	Begin 89.00° lateral
6	20373.32	89.00	150.00	11796.13	-7581.22	4275.05	0.00	0.00	8703.06 MD/11796.13 TVD

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSecl	Annotation
218.00	0.40	344.90	218.00	0.64	-0.45	-0.78	MWD surveys
875.00	0.43	147.50	874.99	1.35	0.65	-0.84	MWD surveys
20366.00	89.10	149.84	11723.48	-7540.28	4237.62	8648.89	Survey @ 20366.00 MD 11723.48 TVD
20420.00	89.10	149.84	11724.33	-7586.97	4284.75	8702.88	Survey projected to 20420.00 MD 11724.33 TVD

Surface Location: RKB=1331+33 @ 1364.00usft (Nabors X08)

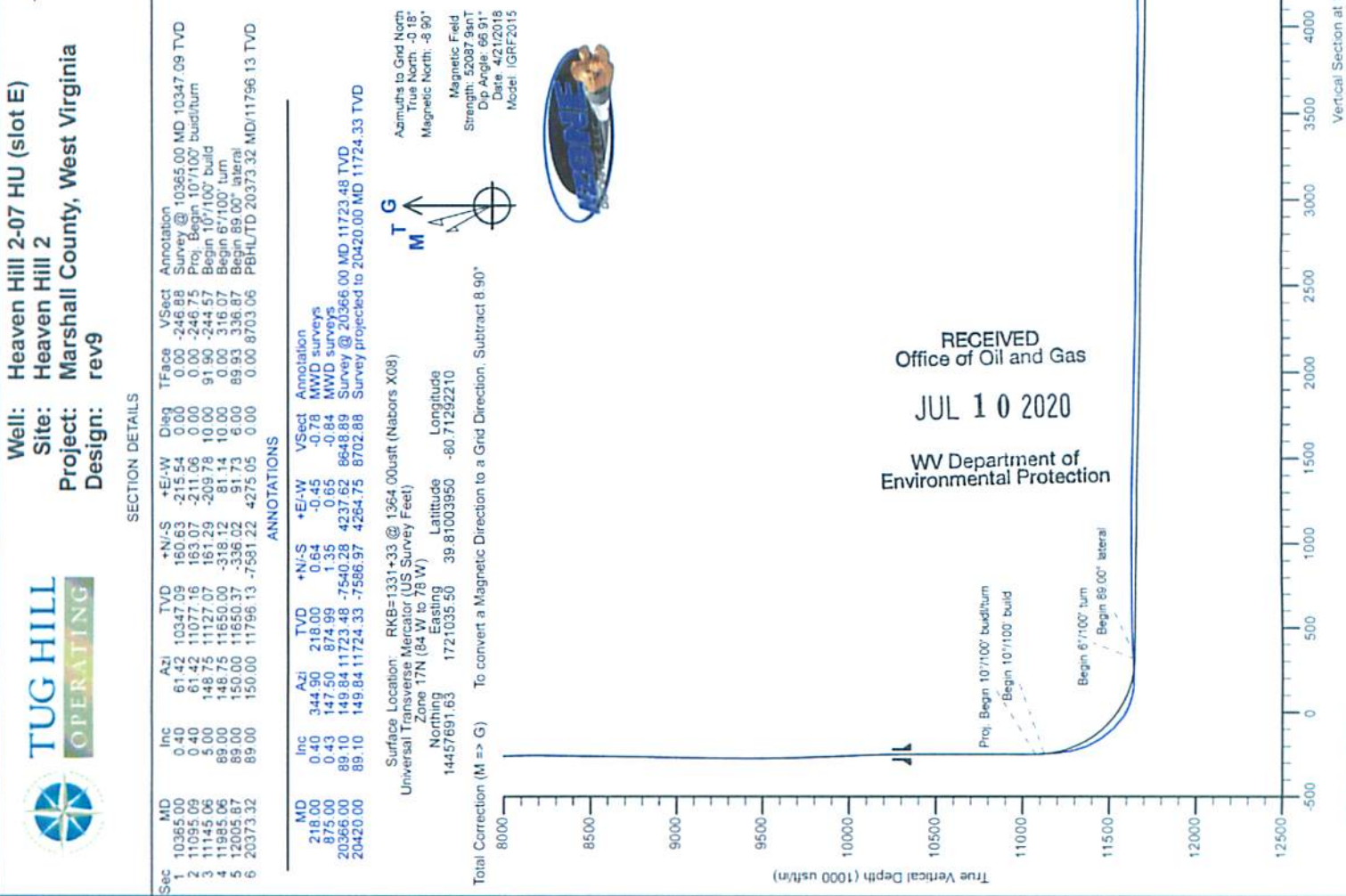
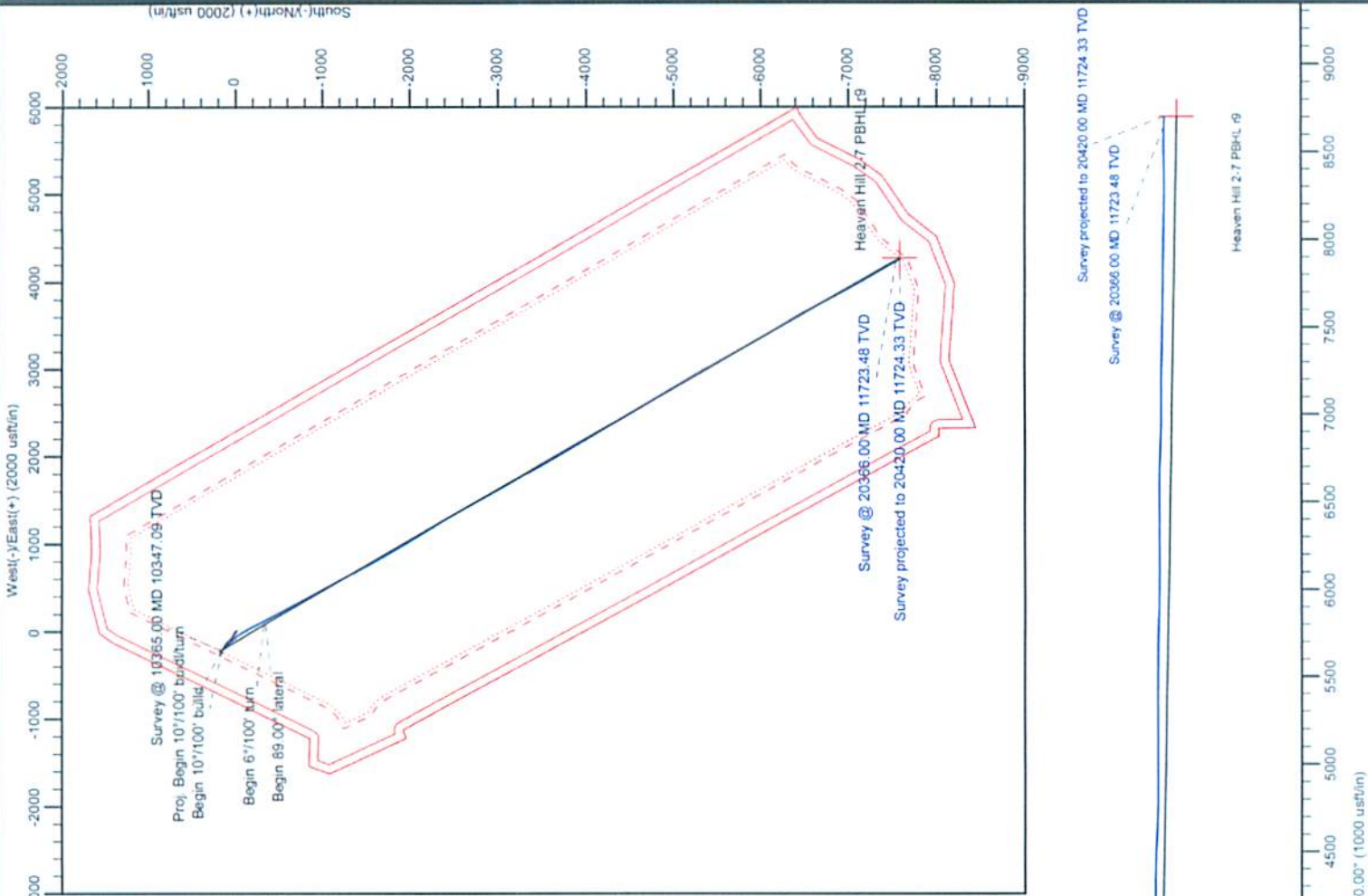
Universal Transverse Mercator (US Survey Feet)

Zone 17N (84 W to 78 W)  
 Northing: 14457691.63  
 Easting: 1721035.50  
 Longitude: -80.71292210

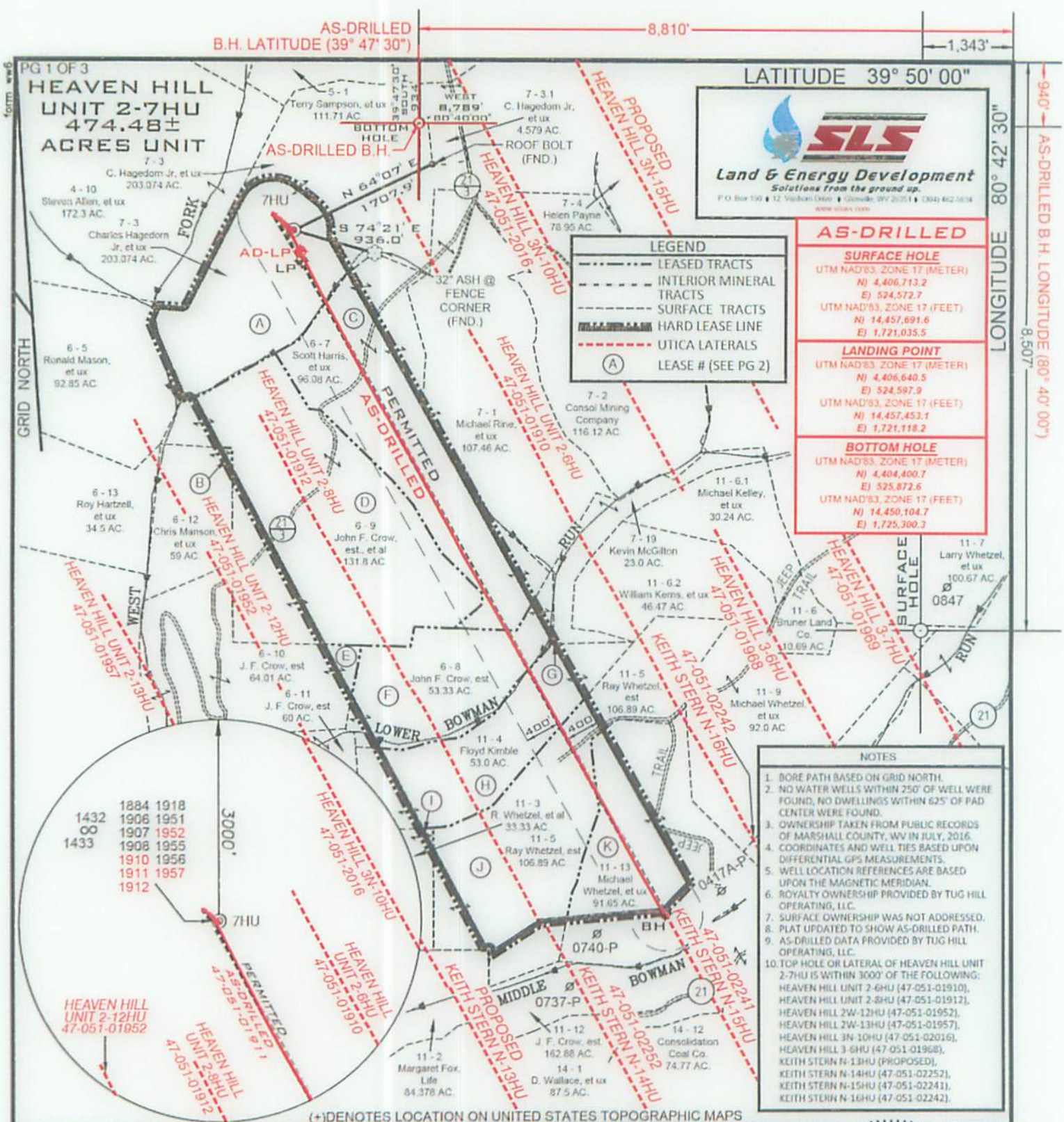
Total Correction (M > G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.90°



Azimuths to Grid North  
 True North: -0.18°  
 Magnetic North: -8.90°  
 Magnetic Field  
 Strength: 52087 gaT  
 Dip Angle: 66.91°  
 Date: 4/21/2018  
 Model: IGRF2015



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AS-DRILLED	
<b>SURFACE HOLE</b>	UTM NAD'83, ZONE 17 (METER) N) 4,406,713.2 E) 524,572.7 UTM NAD'83, ZONE 17 (FEET) N) 14,457,691.6 E) 1,721,035.5
<b>LANDING POINT</b>	UTM NAD'83, ZONE 17 (METER) N) 4,406,640.5 E) 524,597.9 UTM NAD'83, ZONE 17 (FEET) N) 14,457,453.1 E) 1,721,118.2
<b>BOTTOM HOLE</b>	UTM NAD'83, ZONE 17 (METER) N) 4,404,400.7 E) 525,872.6 UTM NAD'83, ZONE 17 (FEET) N) 14,450,104.7 E) 1,725,300.3

LEGEND	
	LEASED TRACTS
	INTERIOR MINERAL TRACTS
	SURFACE TRACTS
	HARD LEASE LINE
	UTICA LATERALS
	LEASE # (SEE PG 2)

- NOTES**
- BORE PATH BASED ON GRID NORTH.
  - NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
  - OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY, 2016.
  - COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
  - WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
  - ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC.
  - SURFACE OWNERSHIP WAS NOT ADDRESSED.
  - PLAT UPDATED TO SHOW AS-DRILLED PATH.
  - AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.
  - TOP HOLE OR LATERAL OF HEAVEN HILL UNIT 2-7HU IS WITHIN 3000' OF THE FOLLOWING:  
 HEAVEN HILL UNIT 2-6HU (47-051-01910),  
 HEAVEN HILL UNIT 2-8HU (47-051-01912),  
 HEAVEN HILL 2W-12HU (47-051-01952),  
 HEAVEN HILL 2W-13HU (47-051-01957),  
 HEAVEN HILL 3N-10HU (47-051-02016),  
 HEAVEN HILL 3-6HU (47-051-01968),  
 KEITH STERN N-13HU (PROPOSED),  
 KEITH STERN N-14HU (47-051-02252),  
 KEITH STERN N-15HU (47-051-02241),  
 KEITH STERN N-16HU (47-051-02242).

FILE NUMBER 163-697

DRAWING NUMBER HHU2\_WP\_7HU

SCALE 1" = 1500'

MINIMUM DEGREE OF ACCURACY 1/2500

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. 849  
*C. Victor Moyers*



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

DATE: OCTOBER 17, 2018 REVISED: SEPTEMBER 6, 2019  
 OPERATORS WELL NO. Heaven Hill Unit 2-7HU As-Drilled

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK

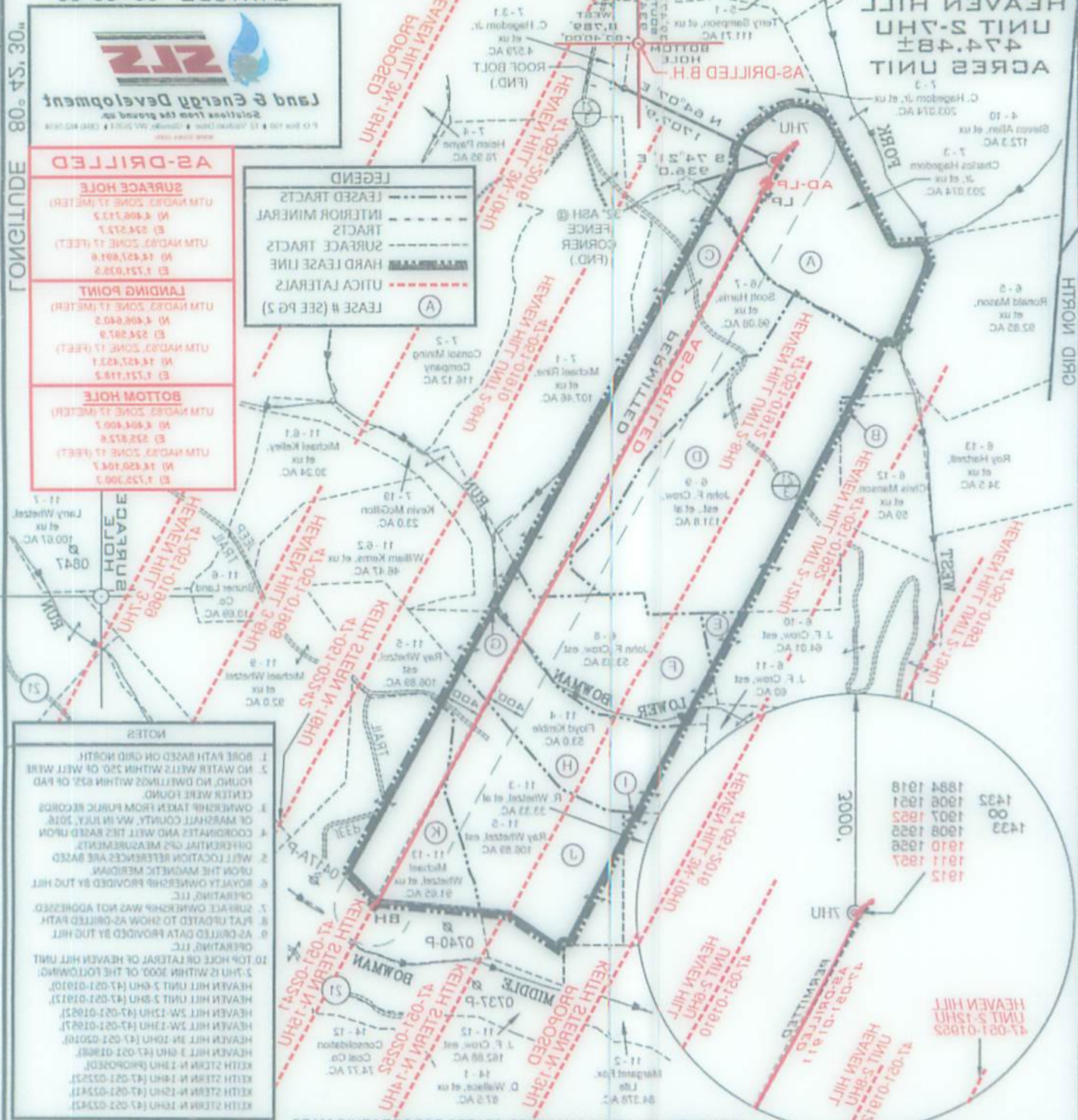
DISTRICT MEADE COUNTY MARSHALL  
 QUADRANGLE GLEN EASTON 7.5' LEASE NUMBER SEE ATTACHED PG 2 AND 3

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074  
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 501.42 UNIT  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION   
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH TVD 11,784' TMD 20,420'  
 WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
CT CORPORATION SYSTEM

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

COUNTY NAME PERMIT



FILE NUMBER 163-697  
 DRAWING NUMBER HHU2\_WP\_7HU  
 SCALE 1" = 1500'  
 MINIMUM DEGREE OF ACCURACY 1/2500  
 PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
 GRADE GPS

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

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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

*C. Victor Molyneux*  
 P.S. 849

DATE: OCTOBER 17, 2018 revised: SEPTEMBER 6, 2019  
 OPERATORS WELL NO. Heaven Hill Unit 2-7HU AS-Drilled

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

LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK

DISTRICT MEADE COUNTY MARSHALL

QUADRANGLE GLEN EASTON 75' LEASE NUMBER SEE ATTACHED PG 2 AND 3

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074  
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 501.42 UNIT

PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REBELL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION

PERFORM NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY)

TARGET FORMATION POINT PLEASANT

WELL OPERATOR TUG HILL OPERATING, LLC  
 1320 SOUTH UNIVERSITY DRIVE, SUITE 200  
 FORT WORTH, TX 76107

DESIGNATED AGENT CT CORPORATION SYSTEM  
 DIANNA STAMPER  
 ADDRESS 5400 D BIG TYLER ROAD  
 CHARLESTON, WV 25213

ESTIMATED DEPTH TVD 11,784', TMD 20,450'  
 PLUG & ABANDON  CLEAN OUT & REPLUG

COUNTY NAME PERMIT



NOTES

- BORE PATH BASED ON GRID NORTH.
- NO WATER WELLS WITHIN 250' OF WELL. NO DWELLINGS WITHIN 625' OF PAD FOUND. NO DWELLINGS WITHIN 625' OF PAD FOUND.
- OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY 2018.
- COORDINATES AND WELL TIES BASED UPON OFFICIAL GPS MEASUREMENTS.
- WELL LOCATION REFERENCES ARE BASED FROM THE MAGNETIC MERIDIAN.
- ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC.
- SURFACE OWNERSHIP WAS NOT ADDRESSED.
- PLAN INTENDED TO SHOW AS-DRILLED PATH.
- AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.
- TOP HOLE OR LATERAL OF HEAVEN HILL UNIT 2-7HU IS WITHIN 3000' OF THE FOLLOWING: HEAVEN HILL UNIT 2-8HU (47-051-01020), HEAVEN HILL UNIT 3-8HU (47-051-01021), HEAVEN HILL 2W-13HU (47-051-01022), HEAVEN HILL 2W-12HU (47-051-01023), HEAVEN HILL 3W-13HU (47-051-01024), HEAVEN HILL 3W-12HU (47-051-01025), HEAVEN HILL 3W-11HU (47-051-01026), HEAVEN HILL 3W-10HU (47-051-01027), KEITH STEIN N-13HU (47-051-01028), KEITH STEIN N-12HU (47-051-01029), KEITH STEIN N-11HU (47-051-01030), KEITH STEIN N-10HU (47-051-01031), KEITH STEIN N-9HU (47-051-01032).

LEGEND

- LEASING TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- HARD LEASE LINE
- UTICA LATERALS
- LEASE # (SEE PG 2)

AS-DRILLED

SURFACE HOLE

UTM NAD83 ZONE 17 (METER)  
 N 4868213  
 E 242317  
 UTM NAD83 ZONE 17 (FEET)  
 N 14451891.8  
 E 7311052.2

LANDING POINT

UTM NAD83 ZONE 17 (METER)  
 N 4868400  
 E 242301.9  
 UTM NAD83 ZONE 17 (FEET)  
 N 14452432.1  
 E 731118.5

BOTTOM HOLE

UTM NAD83 ZONE 17 (METER)  
 N 4864569.7  
 E 252815.8  
 UTM NAD83 ZONE 17 (FEET)  
 N 14450104.7  
 E 732306.7

LATITUDE 39° 50' 00"  
 LONGITUDE 80° 45' 30"  
 AS-DRILLED B.H. LONGITUDE (80° 40' 00")  
 AS-DRILLED B.H. LATITUDE (39° 47' 30")



HEAVEN HILL UNIT 2-7HU  
WELL PLAT LEASE INFORMATION

Lease No.	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book	Deed Page
10*15505	A	9-7-3	RALPH E. WELLMAN	686	412
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722	281
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816	423
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	888	618
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908	541
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
10*15505	A	9-7-3	RALPH E. WELLMAN	686	412
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722	281
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816	423
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	888	618
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908	541
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
10*15525	B	9-6-12	RONALD KEITH MASON ET UX	772	445
10*15541	B	9-6-12	MARY RUTH FROHNAPFEL	781	312
10*15542	B	9-6-12	KENNETH D SIBURT	781	218
10*15543	B	9-6-12	SANDRA FROWEN	781	307
10*15544	B	9-6-12	VICKI J CHERRY A/K/A VICKIE L CHERRY	793	318
10*15545	B	9-6-12	JAMES B SIBURT ET UX	793	332
10*15546	B	9-6-12	ALAN K SIBURT ET UX	793	325
10*15547	B	9-6-12	RODNEY L SIBURT	793	346
10*47051.255.0	C	9-6-7	SCOTT C & CAROLYN R HARRIS	879	296
10*15510	D	9-6-9	ELAINE PHELPS ET VIR	718	326
10*15511	D	9-6-9	DAVID E CROW	718	376
10*15512	D	9-6-9	FRANCES COFFEY	718	378
10*15513	D	9-6-9	KAY KEYES	718	330
10*15514	D	9-6-9	L PAUL CROW	718	336
10*15515	D	9-6-9	DESIRE L CROW	718	334
10*15516	D	9-6-9	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	D	9-6-9	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	D	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	D	9-6-9	JOHN CROW	726	580
10*15520	D	9-6-9	TIMOTHY CROW	726	582
10*47051.123.1	D	9-6-9	LLOYD G BAKER	865	389
10*47051.123.2	D	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*15510	E	9-6-10	ELAINE PHELPS ET VIR	718	326
10*15511	E	9-6-10	DAVID E CROW	718	376
10*15512	E	9-6-10	FRANCES COFFEY	718	378
10*15513	E	9-6-10	KAY KEYES	718	330
10*15514	E	9-6-10	L PAUL CROW	718	336
10*15515	E	9-6-10	DESIRE L CROW	718	334
10*15516	E	9-6-10	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	E	9-6-10	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	E	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	E	9-6-10	JOHN CROW	726	580
10*15520	E	9-6-10	TIMOTHY CROW	726	582
10*47051.123.1	E	9-6-10	LLOYD G BAKER	865	389
10*47051.123.2	E	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*15510	F	9-6-8	ELAINE PHELPS ET VIR	718	326
10*15511	F	9-6-8	DAVID E CROW	718	376
10*15512	F	9-6-8	FRANCES COFFEY	718	378
10*15513	F	9-6-8	KAY KEYES	718	330
10*15514	F	9-6-8	L PAUL CROW	718	336
10*15515	F	9-6-8	DESIRE L CROW	718	334
10*15516	F	9-6-8	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	F	9-6-8	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	F	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	F	9-6-8	JOHN CROW	726	580
10*15520	F	9-6-8	TIMOTHY CROW	726	582
10*47051.123.1	F	9-6-8	LLOYD G BAKER	865	389
10*47051.123.2	F	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143

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

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

**HEAVEN HILL UNIT 2-7HU  
WELL PLAT LEASE INFORMATION**

Lease No.	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book	Deed Page
10*15667	G	9-7-19	KEVIN E MCGILTON ET UX	850	351
10*16517	H	9-11-4	RHDK INVESTMENTS	907	550
10*15561	I	9-11-3	VICKIE MASON	680	413
10*15562	I	9-11-3	MARY A SOUTH	682	231
10*15563	I	9-11-3	MARK L WHETZAL	682	544
10*15564	I	9-11-3	RAY A WHETZAL JR	682	548
10*15565	I	9-11-3	ROBERT L WHETZAL	682	552
10*15566	I	9-11-3	SHARON L WHETZAL	682	556
10*47051.108.1	I	9-11-3	MICHAEL A WHETZEL	885	51
10*47051.108.5	I	9-11-3	BRENDA J WHETZEL	885	55
10*47051.108.6	I	9-11-3	TERRI MCCARDLE	985	23
10*47051.108.7	I	9-11-3	GARY FRANCIS WHETZAL	895	26
10*15584	J	9-11-5	VICKIE MASON	686	239
10*15585	J	9-11-5	SHARON L WHETZAL	687	147
10*15586	J	9-11-5	MARY A SOUTH	690	615
10*15587	J	9-11-5	ROBERT L WHETZAL	690	559
10*15588	J	9-11-5	RAY A WHETZAL JR	693	571
10*15589	J	9-11-5	MARK L WHETZAL	693	576
10*47051.108.1	J	9-11-5	MICHAEL A WHETZEL	885	51
10*47051.108.5	J	9-11-5	BRENDA J WHETZEL	885	55
10*16258	K	9-11-13	CHESTNUT HOLDINGS INC	848	220

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Office of Oil and Gas

JUL 10 2020

WV Department of  
Environmental Protection

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

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