

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

API 47 - 051 - 01908 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 2-4HM
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 4,406,710.2 Easting 524,570.4
Landing Point of Curve Northing 4,406,331.1 Easting 524,513.4
Bottom Hole Northing 4,404,250.0 Easting 525,721.5

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

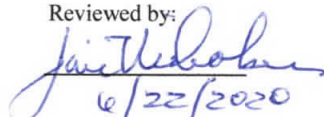
Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
SOBM; Base oil, osmotic inhibitor, weighting agent, viscosifier, emulsifier, hardness buffer, fluid loss additive, LCM, shale inhibitor, de-foamer, soaping agent, coagulant, flocculant; Specific additives per WSSP and Permit.

Date permit issued 2/14/2017 Date drilling commenced 7/26/2017 Date drilling ceased 6/29/2018
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 70' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,595' Void(s) encountered (Y/N) depths N
Coal depth(s) ft Sewickley 974' - Pittsburgh 1064' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

6/22/2020

API 47-051 - 01908 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2-4HM

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	36"	30"	120'	NEW	94.5#	N/A	Y
Surface	17 1/2"	13 3/8"	1,186'	NEW	54.5#	N/A	Y
Coal	17 1/2"	13 3/8"	1,186'	NEW	54.5#	N/A	Y
Intermediate 1	12 1/4"	9 5/8"	2,845'	NEW	36#	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	15,887'	NEW	20#	N/A	Y
Tubing							
Packer type and depth set							

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	A					0	8
Surface	A	1371	15.6	14.5	1371	0	8
Coal	A	1371	15.6	14.5	1371	0	8
Intermediate 1	A	1067	15.6	14.5	1334	0	8
Intermediate 2							
Intermediate 3							
Production	A	2684	14.5	1.17	4676	0	8
Tubing							

Drillers TD (ft) 15,915'
 Deepest formation penetrated Marcellus
 Plug back procedure n/a

Loggers TD (ft) n/a
 Plug back to (ft) n/a

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Kick off depth (ft) 6,159'

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, on 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 _____

API 47-051 - 01908

Farm name Charles R. Hagedorn, Jr., Et Ux

Well number Heaven Hill 2-4HM

PERFORATION RECORD

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

Please insert additional pages as applicable.

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STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

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)
			*see attached					

Please insert additional pages as applicable.

API 47- 051 - 01908 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2-4HM

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6,811'-6,864'	TVD 7,305'-15,915' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1132 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 0 mcfpd Oil 0 bpd NGL 0 bpd Water 600 bpd GAS MEASURED BY Estimated Orifice Pilot

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 (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	0		0		
*see attached					

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Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA
Address 505 West Greens Road, Suite 1000 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, Inc.
Address 121 Champion Way, Suite 200 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Amy L. Miller Telephone 817-632-5200
Signature *Amy L. Miller* Title Permitting Specialist Date 3/23/2020

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**Heaven Hill 2-4HM
PERFORATION RECORD**

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Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	9/29/2018	15742	15790	12	Marcellus
2	9/29/2018	15503	15656	48	Marcellus
3	9/30/2018	15328	15481	48	Marcellus
4	10/1/2018	15153	15306	48	Marcellus
5	10/1/2018	14978	15131	48	Marcellus
6	10/2/2018	14803	14956	48	Marcellus
7	10/3/2018	14628	14781	48	Marcellus
8	10/4/2018	14453	14606	48	Marcellus
9	10/4/2018	14278	14431	48	Marcellus
10	10/5/2018	14103	14256	48	Marcellus
11	10/6/2018	13928	14081	48	Marcellus
12	10/7/2018	13753	13906	48	Marcellus
13	10/7/2018	13578	13731	48	Marcellus
14	10/8/2018	13403	13556	48	Marcellus
15	10/9/2018	13228	13381	48	Marcellus
16	10/9/2018	13053	13206	48	Marcellus
17	10/10/2018	12878	13031	48	Marcellus
18	10/10/2018	12703	12856	48	Marcellus
19	10/11/2018	12528	12681	48	Marcellus
20	10/12/2018	12353	12506	48	Marcellus
21	10/12/2018	12178	12331	48	Marcellus
22	10/13/2018	12003	12156	48	Marcellus
23	10/13/2018	11828	11981	48	Marcellus
24	10/14/2018	11653	11806	48	Marcellus
25	10/14/2018	11478	11631	48	Marcellus
26	10/15/2018	11303	11456	48	Marcellus
27	10/15/2018	11128	11281	48	Marcellus
28	10/16/2018	10953	11106	48	Marcellus
29	10/16/2018	10778	10931	48	Marcellus
30	10/17/2018	10603	10756	48	Marcellus
31	10/17/2018	10428	10581	48	Marcellus
32	10/18/2018	10253	10406	48	Marcellus
33	10/19/2018	10078	10231	48	Marcellus
34	10/20/2018	9903	10056	48	Marcellus
35	10/20/2018	9728	9881	48	Marcellus
36	10/21/2018	9553	9706	48	Marcellus
37	10/21/2018	9378	9531	48	Marcellus
38	10/22/2018	9203	9356	48	Marcellus
39	10/22/2018	9028	9181	48	Marcellus
40	10/23/2018	8853	9006	48	Marcellus
41	10/24/2018	8678	8831	48	Marcellus

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
42	10/25/2018	8503	8656	48	Marcellus
43	10/25/2018	8328	8481	48	Marcellus
44	10/26/2018	8153	8306	48	Marcellus
45	10/27/2018	7978	8131	48	Marcellus
46	10/27/2018	7803	7956	48	Marcellus
47	10/28/2018	7628	7781	48	Marcellus
48	10/28/2018	7453	7606	48	Marcellus

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Heaven Hill 2-4HM

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	80.4	7371	N/A	3852	342195	7887	0
2	80.7	7499	6188	4772	429140	7321	0
3	70.2	8463	5280	4586	346888	7020	0
4	80.7	7580	5306	4725	437470	7417	0
5	80.7	7271	5324	4926	427630	7606	0
6	80.7	7466	5417	4975	433915	7604	0
7	80.7	7144	5180	5035	444364	7479	0
8	80.6	7356	5502	4835	440330	7326	0
9	80.6	7707	5197	4852	440490	7442	0
10	80	7988	5286	5005	421500	7285	0
11	80.7	7356	5179	4967	443040	7539	0
12	80.7	7344	5218	5006	437100	7346	0
13	80.7	7221	5660	4589	435710	7455	0
14	80.7	7484	5384	4816	441260	7426	0
15	80.8	7392	5313	4356	441510	7518	0
16	80.4	7245	5289	4764	440090	7320	0
17	80.7	7198	5498	4400	446570	7372	0
18	80.4	6898	5225	5091	436920	7473	0
19	80.6	6728	4831	4738	436900	7367	0
20	80.3	6838	5578	4918	435350	7183	0
21	80.6	6906	5200	4666	441440	7434	0
22	80.8	6928	5301	4500	451430	7688	0
23	80.6	6531	5243	4790	436680	7562	0
24	80.7	6669	4945	4545	442090	7309	0
25	80.5	6559	5153	4993	439950	7411	0
26	80.7	6715	5036	4335	428400	7410	0
27	80.3	6477	5247	4759	434990	7353	0
28	80.8	6561	5100	4819	441100	7531	0
29	80.4	6433	5069	4892	439130	7398	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	80.8	6494	5073	4934	443100	7560	0
31	80.4	6627	5309	4888	441010	7471	0
32	80.8	6529	5029	4946	443700	7699	0
33	80.5	6589	5260	4569	443310	7488	0
34	80.8	6484	5350	4744	441440	7829	0
35	81	6380	4965	4876	442960	7401	0
36	80.7	6333	5231	4909	441470	7526	0
37	80.7	6443	5317	4983	440540	7762	0
38	80.8	6335	5202	4796	438310	7323	0
39	89.1	6958	5402	5204	440920	7675	0
40	88.2	6846	5871	4877	444330	8053	0
41	89.1	6835	6058	5053	438450	7321	0
42	89.2	6851	5592	4956	436930	7066	0
43	89.2	6722	5502	4633	439790	7248	0
44	89.5	6955	5319	4564	439460	7289	0
45	88.7	6928	5522	4166	440160	7422	0
46	89.6	6875	5891	4517	435300	7141	0
47	88.6	6864	5792	4462	438700	7328	0
48	89.3	6773	5595	4789	438260	7258	0

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HEAVEN HILL 2-4HM

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	1906	2078	1906	2079	Sandstone
Big Lime	2078	2210	2079	2211	Limestone
Big Injun	2210	2504	2211	2505	Sandstone
Weir	2504	2702	2505	2709	Sandstone
Berea	2702	2964	2709	2965	Sandstone
Gordon	2964	3049	2965	3050	Sandstone
Fifty Foot	3049	3631	3050	3632	Sandstone
Speechley	3631	5141	3632	5144	Sandstone
Benson	5141	5464	5144	5484	Sandstone
Alexander	5464	6176	5484	6332	Siltstone
Rhinestreet	6176	6597	6332	6837	Black shale
Middlesex	6597	6683	6837	6972	Black shale
Geneseo/Burkett	6683	6703	6972	7008	Black shale
Tully	6703	6738	7008	7076	Limestone
Hamilton	6738	6811	7076	7305	Grey shale
Marcellus	6811	-	7305	-	Black shale

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Tug Hill Operating LLC
Well: Heaven Hill 2-04 HM (slot F)
Site: Heaven Hill 2
Project: Marshall County, West Virginia
Design: rev9
Rig: Nabors X08

SECTION DETAILS

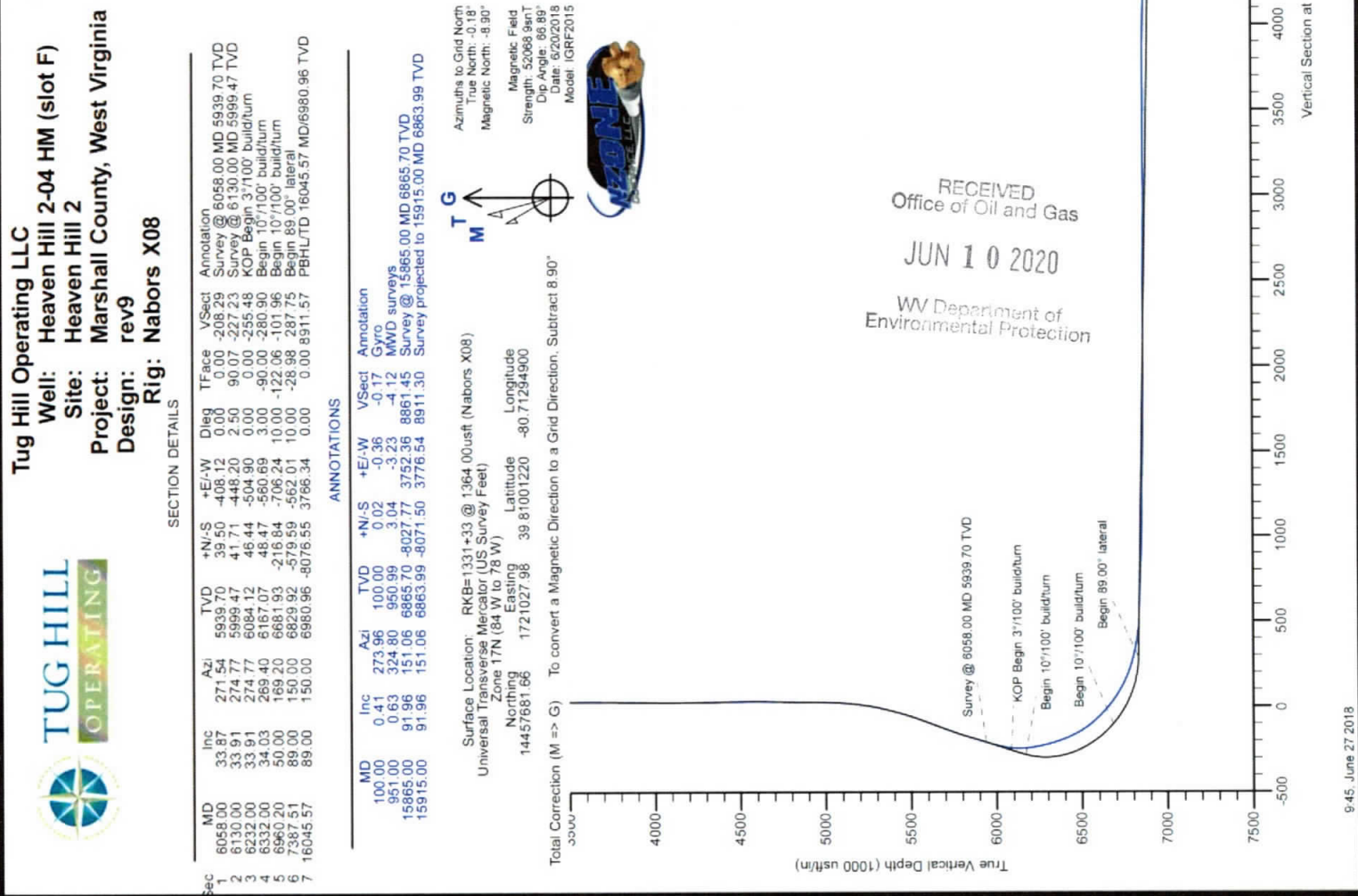
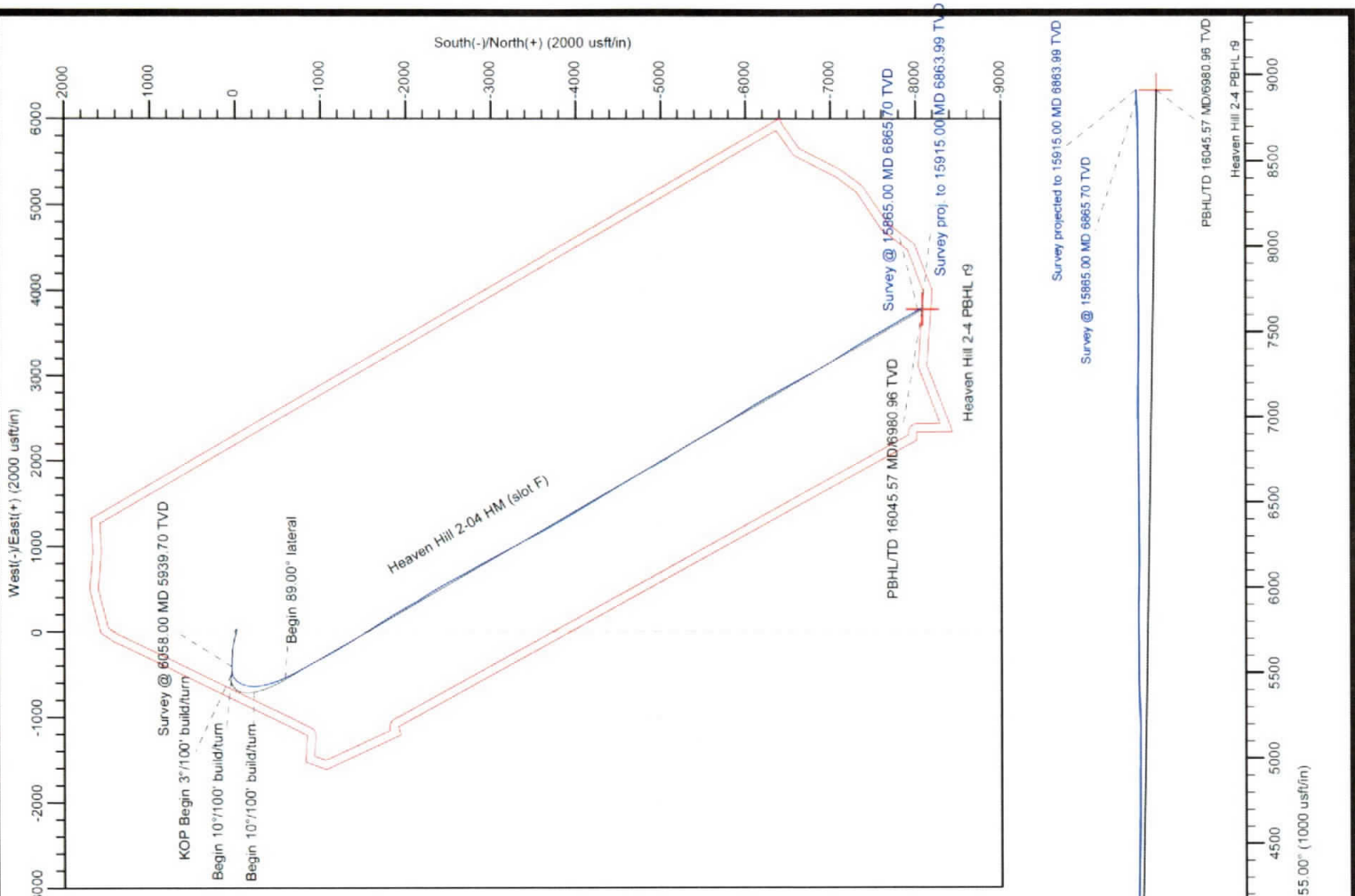
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSEct	Annotation
1	6058.00	33.87	271.54	5939.70	39.50	408.12	0.00	-208.29	Survey @ 6058.00 MD 5939.70 TVD
2	6130.00	33.91	274.77	5999.47	46.71	448.26	2.50	-227.23	Survey @ 6130.00 MD 5999.47 TVD
3	6232.00	33.91	274.77	6084.12	46.44	504.90	0.00	-255.48	KOP Begin 3°/100' build/turn
4	6332.00	34.03	269.40	6167.07	48.87	560.89	3.00	-280.90	Begin 10°/100' build/turn
5	6960.20	50.00	169.20	6681.93	-216.84	-706.24	10.00	-122.06	Begin 10°/100' build/turn
6	7387.51	89.00	150.00	6829.92	-579.59	-562.01	10.00	-28.98	Begin 89.00° lateral
7	16045.57	89.00	150.00	6960.96	-8076.55	3766.34	0.00	0.00	PBHL/TD 16045.57 MD/6960.96 TVD

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSEct	Annotation
100.00	0.41	273.96	100.00	0.02	-0.36	-0.17	Gyro
951.00	0.63	324.80	950.99	3.04	-3.23	-4.12	MWD surveys
15865.00	91.96	151.06	8865.70	-8027.77	3752.36	8861.45	Survey @ 15865.00 MD 8865.70 TVD
15915.00	91.96	151.06	8863.99	-8071.50	3776.54	8911.30	Survey projected to 15915.00 MD 8863.99 TVD

Surface Location: RKB=1331+33 @ 1364.00ust. (Nabors X08)
 Universal Transverse Mercator (US Survey Feet)
 Zone 17N (84 W to 78 W)
 Northing 14457681.66 Easting 1721027.98 Latitude 39.81001220 Longitude -80.71294900
 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: 52068.9nT
 Dip Angle: 66.89°
 Date: 6/20/2018
 Model: IGRF2015



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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/29/2018
Job End Date:	10/28/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01908-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Heaven Hill Unit 2-4HM
Latitude:	39.81001217
Longitude:	-80.71294896
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,881
Total Base Water Volume (gal):	15,398,309
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	85.88599	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.14065	

MC MX 2-2822	Halliburton	Scale Inhibitor						
						Listed Below		
MX 5-2402	Halliburton	Biocide				Listed Below		
						Listed Below		
FDP-S1296-17	Halliburton	Corrosion Inhibitor				Listed Below		
						Listed Below		
OILPERM A	Halliburton	Non-ionic Surfactant				Listed Below		
						Listed Below		
SAND-COMMON WHITE 30/50, BULK	Halliburton	Proppant				Listed Below		
						Listed Below		
LD-2850	Halliburton	Friction Reducer				Listed Below		
						Listed Below		
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant				Listed Below		
						Listed Below		
HYDROCHLORIC ACID	Halliburton	Solvent				Listed Below		
						Listed Below		

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SAND-COMMON WHITE - 100 MESH, 3307 LB BAG	Halliburton	Proppant								
				Listed Below						
MX 8-4543	Halliburton	Biocide								
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	13.86557				
			Sodium Nitrate	7631-99-4	60.00000	0.02108				
			Sodium chloride	7647-14-5	30.00000	0.02055				
			Hydrotreated light Petroleum Distillate	64742-47-8	30.00000	0.01942				
			Hydrochloric acid	7647-01-0	7.50000	0.00922				
			Methanol	67-56-1	100.00000	0.00723				
			Amines, polyethylenepoly-, ethoxylated, phosphonomethylated, sodium salts	70900-16-2	30.00000	0.00677				
			9-Octadecenamide	93-83-4	5.00000	0.00324				
			Alcohols C12-16	68551-12-2	5.00000	0.00324				
			Ammonium Chloride	12125-02-9	5.00000	0.00324				
			Contains no hazardous substances	CAS Not Assigned	100.00000	0.00244				
			Ethanol	64-17-5	60.00000	0.00029				
			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00020				
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00015				
			Modified Thiourea Polymer	Proprietary	30.00000	0.00014				
			Naphthalene	91-20-3	5.00000	0.00002				

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			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)- omega-hydroxy-, branched	127087-87-0	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
			Formaldehyde	50-00-0	0.09000	0.00002	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	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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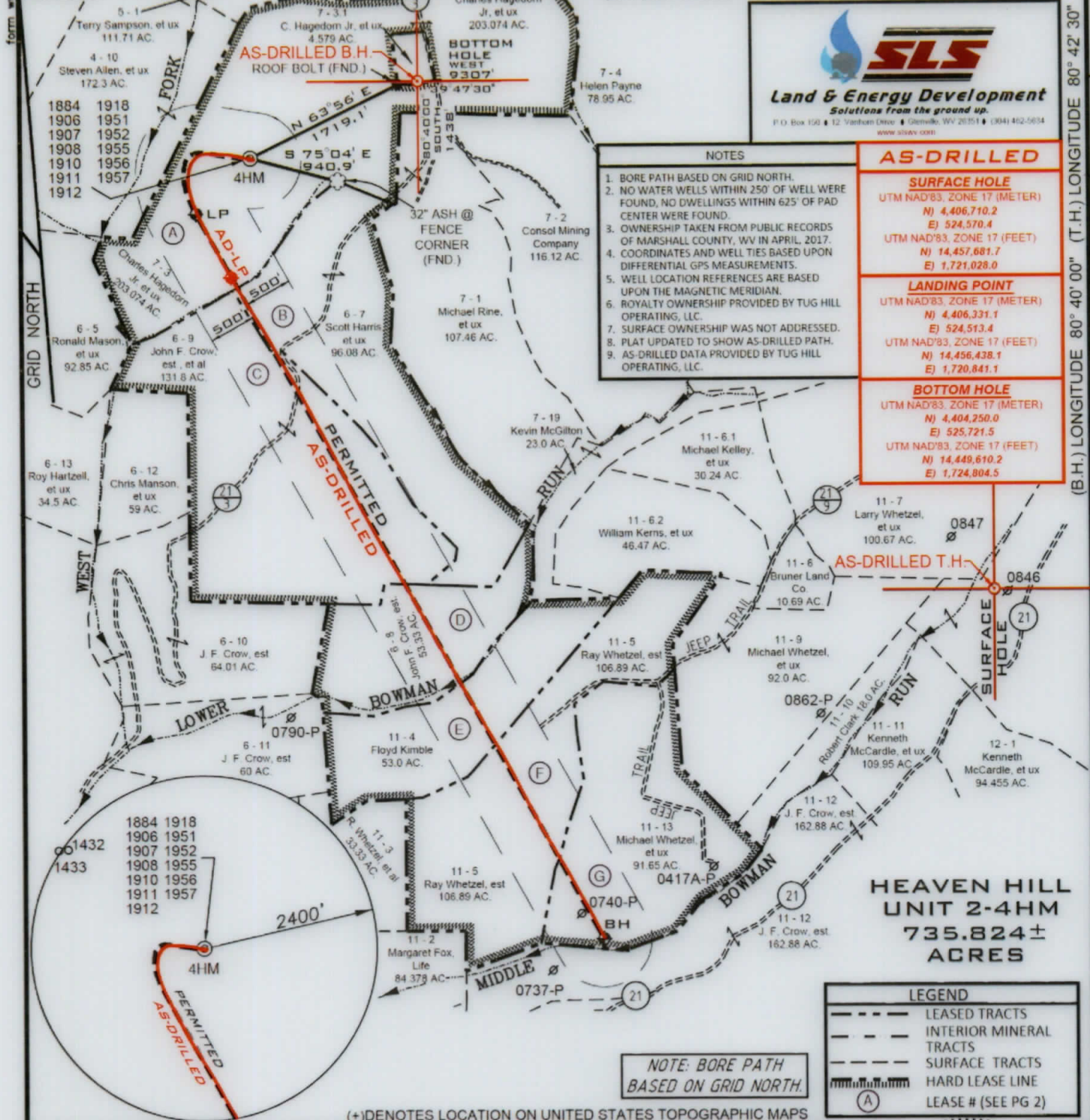
AS-DRILLED B.H. 9,308'

AS-DRILLED T.H. 1,351'

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

form 504

PG 1 OF 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 APRIL 2017.
 - 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.

HEAVEN HILL UNIT 2-4HM
735.824± ACRES

NOTE: BORE PATH BASED ON GRID NORTH.

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER 163-697
DRAWING NUMBER HHU2_WP_4HM_REV1
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
DATE REVISED: OCTOBER 17, 2019
OPERATORS WELL NO. Heaven Hill Unit 2-4HM As-Drilled

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

API WELL NO. 47-051-01908
STATE COUNTY PERMIT

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

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074
OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 735.824
PROPOSED WORK: DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) ___

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,879' TMD:15,972'
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

COUNTY NAME PERMIT

WELL OPERATOR TUG HILL OPERATING, LLC
 DESIGNATED AGENT CT CORPORATION SYSTEM
 DIANNA STAMPER
 ESTIMATED DEPTH TVD 6870, TMD: 15,925'
 PLUG & ABANDON CLEAN OUT & REPLUG
 PERMIT

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

TARGET FORMATION MARCELLUS
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL
 SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX
 QUADRANGLE GLEN EASTON 7'S, LEASE NUMBER SEE ATTACHED PG 2 OF 2
 DISTRICT MEADE COUNTY MARSHALL
 LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 API WELL NO. 47-051-01908
 OPERATORS WELL NO. Heaven Hill Unit 2-4HM As-Drilled
 DATE REVISED: OCTOBER 17, 2019
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WDEP
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 CHARLESTON, WV 25304

GRADE GPS
 SUBMETER MAPPING
 PROVEN SOURCE
 OF ACCURACY 1/2500
 MINIMUM DEGREE
 SCALE 1" = 1500'
 DRAWING NUMBER HHU2_WP_4HM_REV1
 FILE NUMBER 163-697



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 Mays
 P.S. 849



LEGEND

LEASD TRACTS	---
INTERIOR MINERAL TRACTS	---
SURFACE TRACTS	---
HARD LEASE LINE	---
LEASE # (SEE PG 2)	(A)

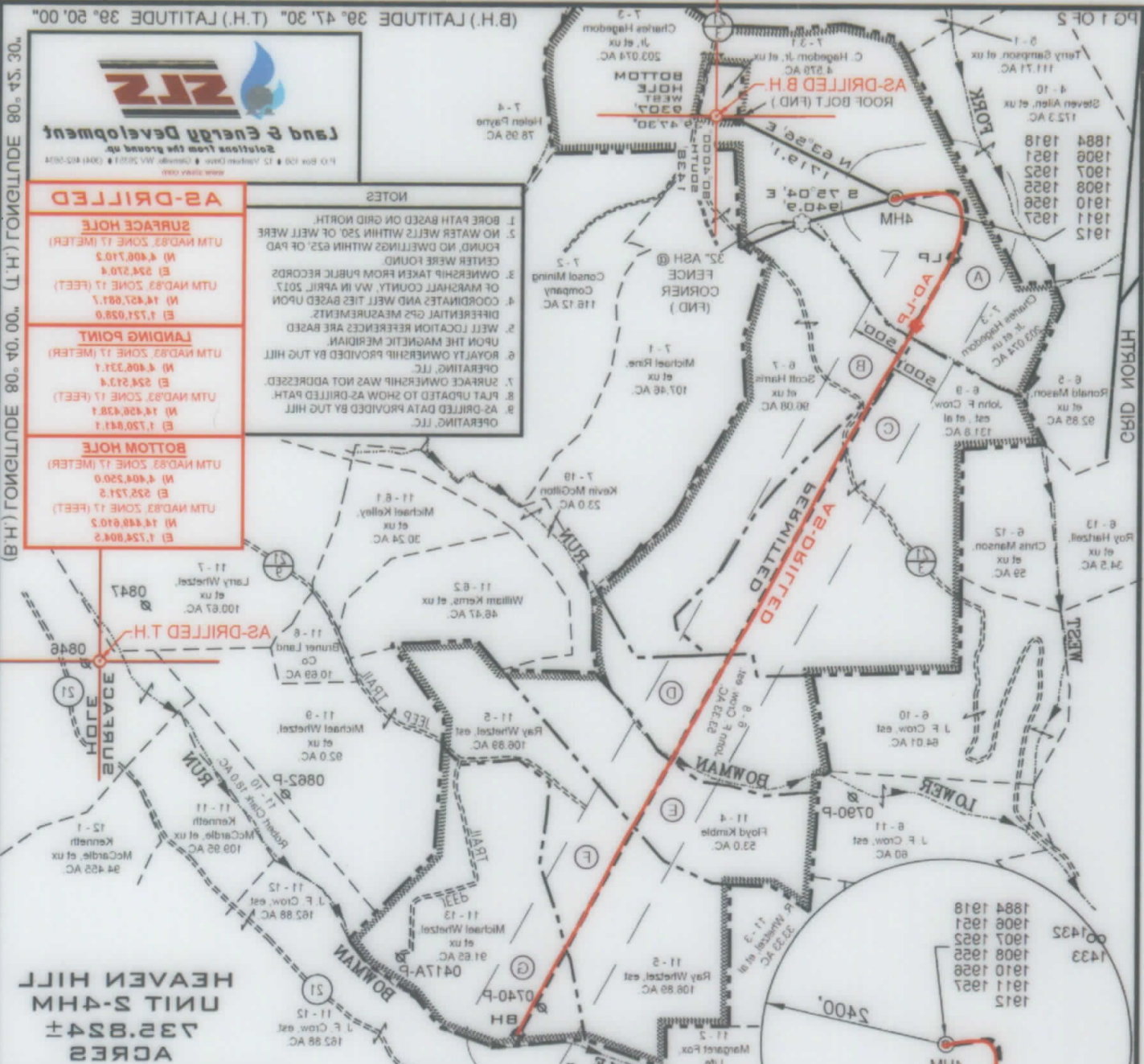
NOTE: BORE PATH BASED ON GRID NORTH
 (+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

AS-DRILLED

BOTTOM HOLE	UTM NAD83 ZONE 17 (FEET) E) 1,724,804.2 N) 14,448,810.2
LANDING POINT	UTM NAD83 ZONE 17 (FEET) E) 1,724,804.2 N) 14,448,810.2
SURFACE HOLE	UTM NAD83 ZONE 17 (FEET) E) 1,724,804.2 N) 14,448,810.2

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 APRIL 2017.
4. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
5. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
6. ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC.
7. SURFACE OWNERSHIP WAS NOT ADDRESSED.
8. PLAN UPDATED TO SHOW AS-DRILLED PATH.
9. AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.



(B.H.) LATITUDE 30° 47' 30" (T.H.) LATITUDE 30° 50' 00"
 1,351' AS-DRILLED T.H. 9,308' AS-DRILLED B.H.

1,433' AS-DRILLED B.H. 8,253' AS-DRILLED T.H.

PG 1 OF 2

HEAVEN HILL UNIT 2-4HM
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*47051.255.0	B	9-6-7	SCOTT C & CAROLYN R HARRIS	879	296
10*15510	C	9-6-9	ELAINE PHELPS ET VIR	718	326
10*15511	C	9-6-9	DAVID E CROW	718	376
10*15512	C	9-6-9	FRANCES COFFEY	718	378
10*15513	C	9-6-9	KAY KEYES	718	330
10*15514	C	9-6-9	L PAUL CROW	718	336
10*15515	C	9-6-9	DESIRE L CROW	718	334
10*15516	C	9-6-9	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	C	9-6-9	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	C	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	C	9-6-9	JOHN CROW	726	580
10*15520	C	9-6-9	TIMOTHY CROW	726	582
10*47051.123.1	C	9-6-9	LLOYD G BAKER	865	389
10*47051.123.2	C	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*15510	D	9-6-8	ELAINE PHELPS ET VIR	718	326
10*15511	D	9-6-8	DAVID E CROW	718	376
10*15512	D	9-6-8	FRANCES COFFEY	718	378
10*15513	D	9-6-8	KAY KEYES	718	330
10*15514	D	9-6-8	L PAUL CROW	718	336
10*15515	D	9-6-8	DESIRE L CROW	718	334
10*15516	D	9-6-8	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	D	9-6-8	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	D	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	D	9-6-8	JOHN CROW	726	580
10*15520	D	9-6-8	TIMOTHY CROW	726	582
10*47051.123.1	D	9-6-8	LLOYD G BAKER	865	389
10*47051.123.2	D	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*16517	E	9-11-4	RHDK INVESTMENTS	907	550
10*15584	F	9-11-5	VICKIE MASON	686	239
10*15585	F	9-11-5	SHARON L WHETZAL	687	147
10*15586	F	9-11-5	MARY A SOUTH	690	615
10*15587	F	9-11-5	ROBERT L WHETZAL	690	559
10*15588	F	9-11-5	RAY A WHETZAL JR	693	571
10*15589	F	9-11-5	MARK L WHETZAL	693	576
10*47051.108.1	F	9-11-5	MICHAEL A WHETZEL	885	51
10*47051.108.5	F	9-11-5	BRENDA J WHETZEL	885	55
10*15604	G	9-11-13	HAYHURST COMPANY A FLORIDA PARTNERSHIP	724	8

WELL OPERATOR TUG HILL OPERATING, LLC
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