

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

API 47 - 051 - 01975 County Marshall District Meade
Quad Glen Easton 7.5' Pad Name Ten High Field/Pool Name _____
Farm name Lawrence & Shirley Conkle, ests. Well Number Ten High 1S-8HM
Operator (as registered with the OOG) Tug Hill Operating, LLC
Address 1320 S. University Drive, Suite 500 City Ft. Worth State TX Zip 76107

As Drilled location NAD 83 UTM Attach an as-drilled plat, profile view, and deviation survey
Top of Hole Northing 4,406,358.84 Easting 527,327.77
Landing Point of Casing Northing 4,406,401.3 Easting 527,648.4
Bottom Hole Northing 4,403,754.3 Easting 529,167.1

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Elevation (ft) 1310' 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

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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 Additives
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 3/6/2018 Date drilling commenced 1/20/2019 Date drilling ceased 2/5/2019
Date completion activities began 3/26/2019 Date completion activities ceased 6/19/2019
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 1595' Void(s) encountered (Y/N) depths N
Coal depth(s) ft Sewickley Coal - 968 - 974' and Pittsburgh Coal - 1053 - 1058' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
Jim Nicholson
6/23/2020

API 47-051 - 01975

Farm name Lawrence & Shirley Conkle, ests. Well number Ten High 1S-8HM

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"	1,135'	NEW	54.5#	N/A	Y
Coal	17 1/2"	13 3/8"	1,135'	NEW	54.5#	N/A	Y
Intermediate 1	12 1/4"	9 5/8"	2,863'	NEW	36#	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	17,535'	NEW	20#	N/A	Y
Tubing		2 3/8"	8,768'	NEW	4.7#	N/A	
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		15.6	1.19		0	8
Surface	A	1189	15.6	1.19	1436	0	8
Coal	A	1189	15.6	1.19	1436	0	8
Intermediate 1	A	897	15.6	1.19	1236	0	8
Intermediate 2							
Intermediate 3							
Production	A	4122	14.5	1.17	4802	0	8
Tubing							

Drillers TD (ft) 17,561'

Loggers TD (ft) n/a

Deepest formation penetrated Marcellus

Plug back to (ft) n/a

Plug back procedure n/a

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Kick off depth (ft) 6,653'

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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

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 AS OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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Farm name Lawrence & Shirley Conkle, ests. Well number Ten High 1S-8HM

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.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pumping Rate (GPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
	attached							

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Please insert additional pages as applicable.

API 47- 051 - 01975 Farm name Lawrence & Shirley Conkle, ests. Well number Ten High 1S-8HM

PRODUCING FORMATION(S)	DEPTHS
<u>Marcellus</u>	<u>6922' - 6971'</u> TVD <u>7560' - 17561'</u> 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 mcpd Oil 0 bpd NGL 0 bpd Water 600 bpd GAS MEASURED BY Estimated Orifice Pilot

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

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 Hartman Energy Services, Inc.
 Address 121 Champion Way, Suite 200 City Canonsburg State PA Zip 15317

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Please insert additional pages as applicable.

Completed by Amy L. Miller Telephone 304-376-0111
 Signature Amy L. Miller Title Permitting Specialist Date 3-23-2020

**Ten High 1S-8HM
PERFORATION RECORD**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
Toe	4/27/2019	17,395	17,442	48	Marcellus
1	4/27/2019	17,161	17,322	48	Marcellus
2	4/27/2019	16,986	17,147	48	Marcellus
3	4/27/2019	16,810	16,971	48	Marcellus
4	4/27/2019	16,634	16,795	48	Marcellus
5	4/27/2019	16,459	16,620	48	Marcellus
6	4/28/2019	16,283	16,444	48	Marcellus
7	4/28/2019	16,107	16,268	48	Marcellus
8	4/27/2019	15,931	16,092	48	Marcellus
9	4/28/2019	15,756	15,917	48	Marcellus
10	4/28/2019	15,580	15,741	48	Marcellus
11	4/29/2019	15,404	15,565	48	Marcellus
12	4/29/2019	15,229	15,390	48	Marcellus
13	4/30/2019	15,053	15,214	48	Marcellus
14	4/30/2019	14,877	15,038	48	Marcellus
15	5/1/2019	14,702	14,863	48	Marcellus
16	5/2/2019	14,526	14,687	48	Marcellus
17	5/2/2019	14,350	14,511	48	Marcellus
18	5/3/2019	14,174	14,335	48	Marcellus
19	5/3/2019	13,999	14,160	48	Marcellus
20	5/4/2019	13,823	13,984	48	Marcellus
21	5/5/2019	13,647	13,808	48	Marcellus
22	5/6/2019	13,472	13,633	48	Marcellus
23	5/6/2019	13,296	13,457	48	Marcellus
24	5/7/2019	13,120	13,281	48	Marcellus
25	5/8/2019	12,945	13,106	48	Marcellus
26	5/9/2019	12,769	12,930	48	Marcellus
27	5/10/2019	12,593	12,754	48	Marcellus
28	5/10/2019	12,417	12,578	48	Marcellus
29	5/11/2019	12,242	12,403	48	Marcellus
30	5/12/2019	12,066	12,227	48	Marcellus
31	5/12/2019	11,890	12,051	48	Marcellus
32	5/13/2019	11,715	11,876	48	Marcellus
33	5/14/2019	11,539	11,700	48	Marcellus
34	5/15/2019	11,363	11,524	48	Marcellus
35	5/15/2019	11,188	11,349	48	Marcellus
36	5/16/2019	11,012	11,173	48	Marcellus
37	5/17/2019	10,836	10,997	48	Marcellus
38	5/17/2019	10,660	10,821	48	Marcellus
39	5/18/2019	10,485	10,646	48	Marcellus
40	5/18/2019	10,309	10,470	48	Marcellus
41	5/19/2019	10,133	10,294	48	Marcellus
42	5/19/2019	9,958	10,119	48	Marcellus
43	5/20/2019	9,782	9,943	48	Marcellus
44	5/21/2019	9,606	9,767	48	Marcellus
45	5/22/2019	9,431	9,592	48	Marcellus

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46	5/23/2019	9,255	9,416	48	Marcellus
47	5/23/2019	9,079	9,240	48	Marcellus
48	5/24/2019	8,903	9,064	48	Marcellus
49	5/24/2019	8,728	8,889	48	Marcellus
50	5/25/2019	8,552	8,713	48	Marcellus
51	5/25/2019	8,376	8,537	48	Marcellus
52	5/26/2019	8,201	8,362	48	Marcellus
53	5/26/2019	8,025	8,186	48	Marcellus
54	5/27/2019	7,849	8,010	48	Marcellus
55	5/27/2019	7,674	7,835	48	Marcellus
56	5/28/2019	7,498	7,659	48	Marcellus

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Ten High 1S-8HM

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 (bbbls)	Amount of Nitrogen/other (units)
Toe	36.1	7118	6149	4701	0	743	0
1	86.4	7672	5252	4678	44825	8991	0
2	71.1	8016	6001	4151	412160	21277	0
3	89.5	7689	5795	4803	441350	7938	0
4	89.6	7673	5579	5088	439000	7979	0
5	89.7	7655	5544	4762	439550	7830	0
6	89.3	7530	5523	5060	439840	8639	0
7	89.3	7626	5569	5335	438810	7739	0
8	88.9	7882	5279	4916	438110	7827	0
9	81.3	8041	5299	5044	442540	10588	0
10	86.2	7700	5518	4900	440410	8071	0
11	89.5	7508	5308	4882	439290	7798	0
12	89.2	7570	5536	5054	438600	8054	0
13	89.6	7509	5445	4861	441140	7990	0
14	89.7	7399	5623	5182	438690	8143	0
15	88.7	7647	5823	4901	354020	7316	0
16	88.9	7360	5289	4918	439120	7713	0
17	89.4	7612	5533	4880	438670	8629	0
18	89.3	7334	5434	5188	437150	7679	0
19	84.2	7581	5651	4893	420720	7844	0
20	88.6	7389	5288	5041	439610	7979	0
21	84.4	7699	5494	4568	367100	9358	0
22	88.8	7351	5333	4850	433940	8704	0
23	87.9	7202	5269	4869	438270	10196	0
24	88.4	7274	5523	4998	441340	8029	0
25	84.2	7040	5868	5002	440970	7824	0
26	84.6	7783	5591	5140	434610	7476	0
27	83.7	7322	5536	5330	399600	7162	0
28	84.5	7428	5573	5830	439560	8191	0
29	84.1	6951	5556	5147	439410	7505	0
30	89	7015	5491	5117	443690	180	0
31	89.2	5297	5513	5066	438950	7555	0
32	89.4	5083	5130	4984	440550	7886	0

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33	89.5	7039	5373	4875	440820	7704	0
34	89.3	7055	5485	4883	438900	7557	0
35	89.4	7041	5359	4852	441840	7533	0
36	89.6	6979	5248	4901	441120	7556	0
37	89	7350	5464	4676	436670	7503	0
38	89.4	7228	5322	4968	441350	7610	0
39	89.7	7280	5285	4795	437760	7568	0
40	89.4	7177	5287	4911	441060	7609	0
41	89.8	7345	5760	5077	442920	7705	0
42	89.8	7176	5327	4831	438700	7925	0
43	88.4	7246	5394	5043	434300	7454	0
44	89.4	6966	5630	4922	440870	7884	0
45	89.3	7055	5750	5004	441310	7540	0
46	89.7	6845	5484	4875	441080	7361	0
47	89.4	6697	5293	4873	442940	7519	0
48	89.7	6861	5988	4834	440550	7419	0
49	88.4	6898	5389	4732	442635	8645	0
50	89.7	6805	5814	4942	441750	7893	0
51	89.3	6671	6068	4848	440510	7493	0
52	89.2	6713	6036	4674	410800	7035	0
53	89.5	6800	5667	5068	442820	7393	0
54	89.2	6567	5789	5229	440560	7802	0
55	89.7	6863	5954	5145	440060	7313	0
56	89.7	6385	5470	4995	440750	7314	0

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TEN HIGH 1S-8HM

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	2035	2207	2036	2207	2036	2208	2208	2208	Sandstone
Big Lime	2207	2338	2208	2338	2208	2340	2340	2340	Limestone
Big Injun	2338	2633	2340	2633	2340	2635	2635	2635	Sandstone
	2633	3093	2634	3093	2634	3096	3096	3096	Sandstone
Berea	2634	3093	2634	3093	2634	3096	3096	3096	Sandstone
Gordon	3093	3178	3096	3178	3096	3181	3181	3181	Sandstone
Fifty Foot	3178	3760	3181	3760	3181	3764	3764	3764	Sandstone
Speechley	3760	5221	3764	5221	3764	5275	5275	5275	Sandstone
Benson	5221	5593	5275	5593	5275	5686	5686	5686	Sandstone
Alexander	5593	6215	5686	6215	5686	6367	6367	6367	Siltstone
Rhinestreet	6215	6677	6367	6677	6367	6880	6880	6880	Black shale
Middlesex	6677	6751	6880	6751	6880	6976	6976	6976	Black shale
Geneseo/Burkett	6751	6778	6976	6778	6976	7017	7017	7017	Black shale
Tully	6778	6805	7017	6805	7017	7058	7058	7058	Limestone
Hamilton	6805	6892	7058	6892	7058	7259	7259	7259	Grey shale
Marcellus	6892	-	7259	-	7259	-	-	-	Black shale

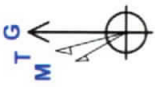
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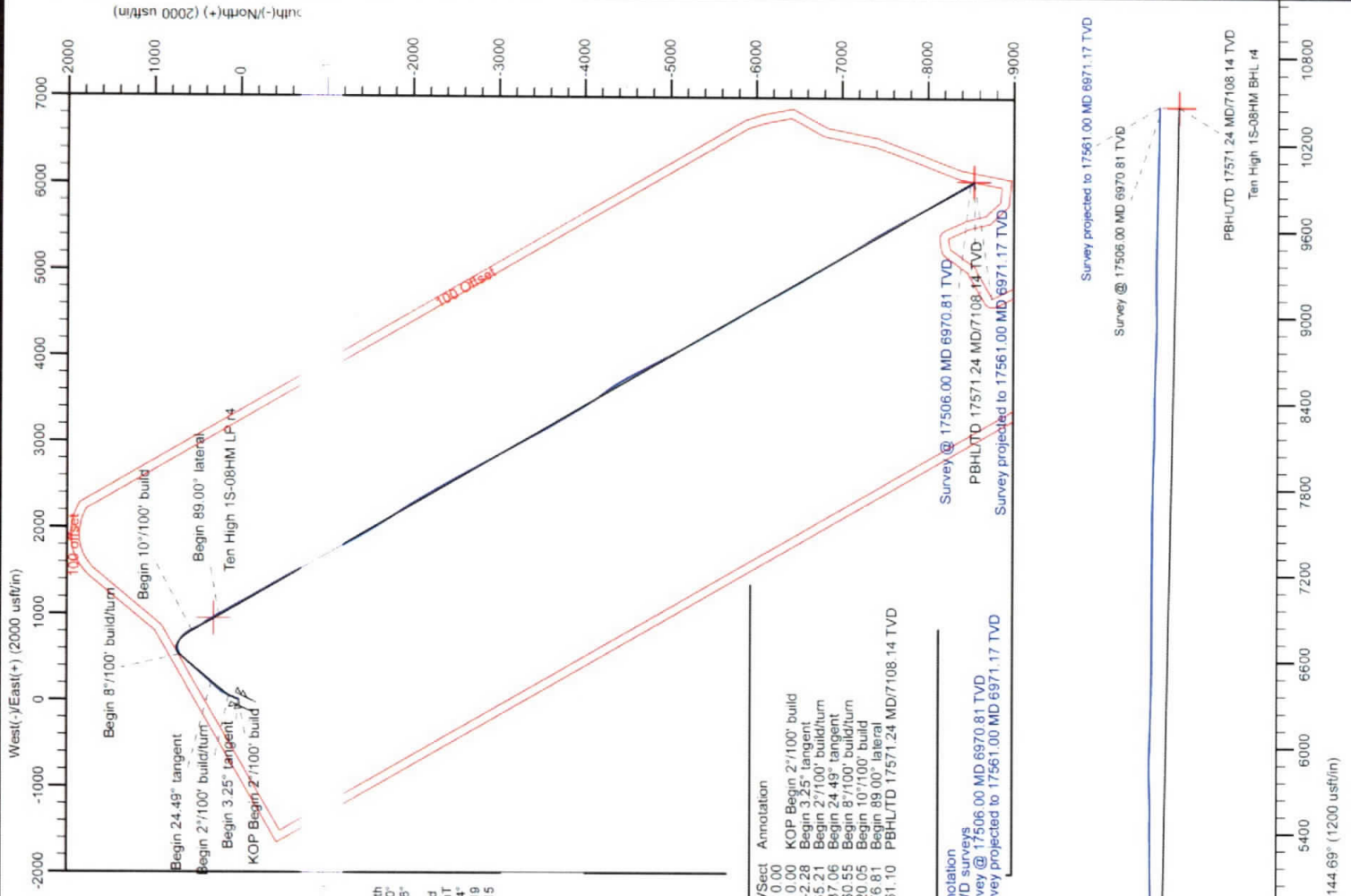
Well: Ten High 1S-08HM (G)
Site: Ten High
Project: Marshall County, West Virginia.
Design: rev4
Rig: Nabors X08

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: RKB=1310+33 @ 1343.00usft (Nabors X08)

Northing: 14456528.97
 Easting: 1730074.52
 Latitude: 39.80676247
 Longitude: -80.68075001



Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.95°
 Magnetic Field
 Strength: 51966.9nT
 Dip Angle: 66.84°
 Date: 1/18/2019
 Model: IGRF2015



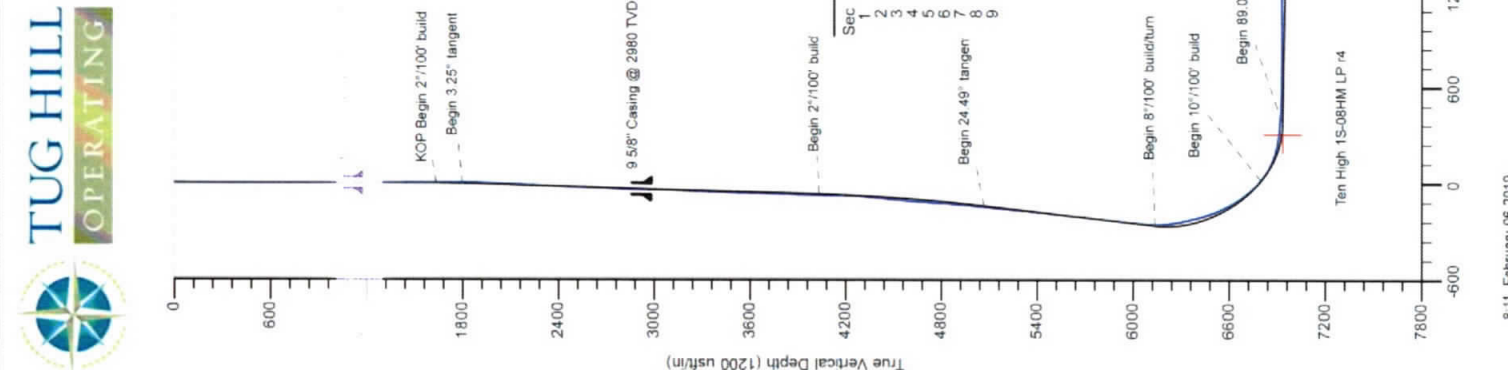
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dieg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1633.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1795.50	3.25	25.00	1795.41	4.18	1.95	2.00	25.00	-2.28	Begin 3.25° tangent
4	4036.69	3.25	25.00	4033.00	119.33	55.64	0.00	0.00	-65.21	Begin 2°/100' build/turm
5	5105.07	24.49	40.03	5064.44	318.65	212.71	2.00	17.17	-137.06	Begin 24.48° tangent
6	6282.61	24.49	40.03	6136.03	692.40	526.71	0.00	0.00	-260.55	Begin 8°/100' build/turm
7	7051.93	50.00	150.00	6798.25	544.81	803.80	8.00	125.02	20.05	Begin 10°/100' build
8	7441.93	89.00	150.00	6932.18	234.51	982.95	10.00	0.00	376.81	Begin 89.00° lateral
9	17571.24	89.00	150.00	7108.14	-8536.41	6046.84	0.00	0.00	0461.10	PBHLTD 17571.24 MD/7108.14 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
187.00	0.56	26.73	187.00	0.82	0.41	-0.43	MWD surveys
17506.00	89.63	150.56	6970.81	-8497.22	6007.63	10406.45	Survey @ 17506.00 MD 6970.81 TVD
17561.00	89.63	150.56	6971.17	-8545.12	6034.66	10461.16	Survey projected to 17561.00 MD 6971.17 TVD

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/22/2019
Job End Date:	5/28/2019
State:	West Virginia
County:	Marshall
API Number:	47-051-01975-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Ten High 1S-08HM
Latitude:	39.80676247
Longitude:	-80.68075001
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,969
Total Base Water Volume (gal):	19,368,875
Total Base Non Water Volume:	0



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	86.69297	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.12751	

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SAND- PREMIUM WHITE-30/50 BULK	Halliburton	Proppant		Listed Below				
SAND-COMMON WHITE-100 MESH; SSA-2, BULK (100003676)	Halliburton	Proppant		Listed Below				
SAND- PREMIUM WHITE-40/70, BULK	Halliburton	Proppant		Listed Below				
LD 2850	Halliburton	Friction Reducer		Listed Below				
HYDROCHLORI C ACID	Halliburton	Solvent		Listed Below				
FDP-S1296-17	Halliburton	Corrosion Inhibitor		Listed Below				
MX 8-4743	Halliburton	Biocide		Listed Below				
LD-7750W	Halliburton	Scale Inhibitor		Listed Below				

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OILPERM A	Halliburton	Non-ionic Surfactant			Listed Below				
LD-2950	Halliburton	Friction Reducer			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	13.09374			
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02276			
			Ethanaminium N,N,N-trimethyl-2-[(1-oxo-2-propen-1-yl)oxy]-chloride (1:1) poly	69418-26-4	30.00000	0.01670			
			Hydrotreated light petroleum distillates	64742-47-8	30.00000	0.01670			
			Complex amine compound	Proprietary	60.00000	0.01213			Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Hydrochloric acid	7647-01-0	7.50000	0.00956			
			Ammonium chloride	12125-02-9	10.00000	0.00557			
			Sodium chloride	7647-14-5	10.00000	0.00557			
			Sodium nitrate	7631-99-4	60.00000	0.00412			
			9-Octadecenamide, n,n-bis-2(hydroxy-ethyl)-(Z)	93-83-4	5.00000	0.00278			
			Methanol	67-56-1	100.00000	0.00172			
			Ethoxylated alcohol	Proprietary	5.00000	0.00101			
			Poly(oxy-1,2-ethanediyl), alpha-, tridecyl-, omega-, hydroxy-, branched	69011-36-5	5.00000	0.00101			
			Ethanol	64-17-5	60.00000	0.00028			

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			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00019
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00014
			Modified thiourea polymer	Proprietary	30.00000	0.00013
			Phosphoric Acid Salt	Proprietary	5.00000	0.00011
			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
			Ethoxylated alcohols	Proprietary	5.00000	0.00002
			Propargyl alcohol	107-19-7	5.00000	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)

RECEIVED
Office of Oil and Gas
JUN 10 2020
WV Department of
Environmental Protection

**TEN HIGH 1S LEASE
WELL 8HM
TUG HILL OPERATING**

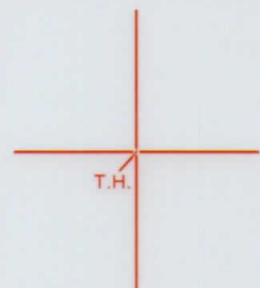
T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°47'30"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 478,143.88	E. 1,636,794.50
NAD'83 GEO.	LAT-(N) 39.806762	LONG-(W) 80.680750
NAD'83 UTM (M)	N. 4,406,358.84	E. 527,327.77
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 478,376.0	E. 1,637,712.9
NAD'83 GEO.	LAT-(N) 39.807433	LONG-(W) 80.677492
NAD'83 UTM (M)	N. 4,406,434.2	E. 527,606.4
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 469,504.7	E. 1,642,699.8
NAD'83 GEO.	LAT-(N) 39.783258	LONG-(W) 80.659335
NAD'83 UTM (M)	N. 4,403,756.9	E. 529,170.8



T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°37'30"

AS DRILLED COORDINATES FOR WELL NO. 8HM		
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 478,143.88	E. 1,636,794.50
NAD'83 GEO.	LAT-(N) 39.806762	LONG-(W) 80.680750
NAD'83 UTM (M)	N. 4,406,358.84	E. 527,327.77
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 478,265.6	E. 1,637,848.9
NAD'83 GEO.	LAT-(N) 39.807135	LONG-(W) 80.677003
NAD'83 UTM (M)	N. 4,406,401.3	E. 527,848.4
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 469,496.2	E. 1,642,687.5
NAD'83 GEO.	LAT-(N) 39.783234	LONG-(W) 80.659378
NAD'83 UTM (M)	N. 4,403,754.3	E. 529,167.1



9,679' T.H. AS DRILLED

NOTES ON SURVEY

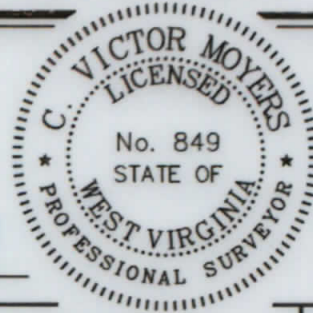
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS > 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'
- AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.
- PLAT UPDATED TO SHOW AS-DRILLED PATH.



12 Vashon Drive | P.O. Box 150 | Glenville, WV 26034 | 304-462-3634
1412 Kanawha Boulevard, East | Charleston, WV 25304 | 304-346-3952
254 East Beckley Bypass | Beckley, WV 25801 | 304-255-5296
slsrv.com

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

P.S. 849 C. Victor Moyers



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE MARCH 24, 20 20
REVISED _____, 20 ____
OPERATORS WELL NO. TEN HIGH 1S-8HM
API WELL NO. 47 - 051 - 1975
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1" = 2500' FILE NO. 8655P8HMAD.dwg
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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



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

LOCATION: GROUND = 1,320.20' ELEVATION PROPOSED = 1,310.06' WATERSHED MIDDLE BOWMAN RUN OF FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER LAWRENCE & SHIRLEY CONKLE ESTS ACREAGE 139.79±
ROYALTY OWNER ANDY PAUL & JACKIE KUHN, ET AL - WW-6A1 ACREAGE 139.79±

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER
PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH TVD: 6,865' / TMD: 17,364'

COUNTY NAME PERMIT

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

TUG HILL OPERATING
WELL 8HM
TEN HIGH 12 LEASE

B.H. LATITUDE 39°47.30"
T.H. LATITUDE 39°50.00"

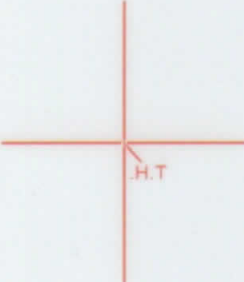
BOTTOM HOLE	
NAD83 UTM (M)	N 4408725.9 E 259170.8
NAD83 GEO	LAT (N) 39.783258 LONG (W) 80.883932
NAD83 S.P.C. (FT)	N 488204.7 E 184288.8
LANDING POINT	
NAD83 UTM (M)	N 4408725.9 E 259170.8
NAD83 GEO	LAT (N) 39.783258 LONG (W) 80.883932
NAD83 S.P.C. (FT)	N 488204.7 E 184288.8
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NAD83 GEO	LAT (N) 39.783258 LONG (W) 80.883932
NAD83 S.P.C. (FT)	N 488204.7 E 184288.8

B.H. LONGITUDE 80°31.30"
T.H. LONGITUDE 80°40.00"

3.957' T.H. AS DRILLED
3.015' B.H. AS DRILLED

3.957' T.H. AS DRILLED



NOTES ON SURVEY

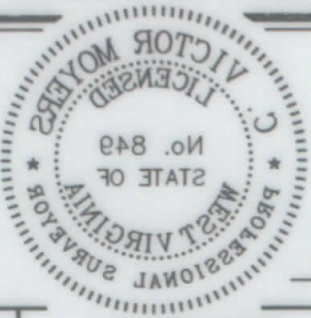
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL NO AGRICULTURAL BUILDINGS > 2500 SQ FT OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOP MARK SCALE IS 1"=2000'
- AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.
- PLAT UPDATED TO SHOW AS-DRILLED PATH.



12 Westport Drive | P.O. Box 100 | Glenview, WV 26021 | 304.462.5834
 110 Kanawha Boulevard East | Charleston, WV 25301 | 304.348.3922
 224 East Buckley Square | Buckeye, WV 26001 | 304.322.2296
 sls.com

BY THE DIVISION OF ENVIRONMENTAL PROTECTION THE INFORMATION REQUIRED BY LAW AND THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE UNDERIGNED, HEREBY CERTIFY THAT

P.S. 849
C. Victor Moyers



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

MINIMUM DEGREE OF ACCURACY 1:2500
 SCALE 1" = 2000'
 CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL "GAS" PRODUCTION STORAGE DEEP SHALLOW

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

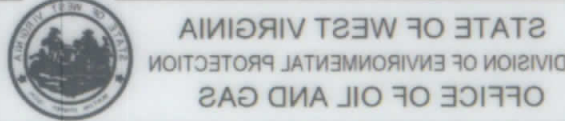
PHYSICAL CHANGE IN WELL (SPECIFY) _____
 ESTIMATED DEPTH TVD: 6,885' \ TMD: 17,384'
 MARCELLUS TARGET FORMATION

ROYALTY OWNER ANDY PAUL & JACKIE KUHN, ET AL - WW-6A1
 SURFACE OWNER LAWRENCE & SHIRLEY CONKLE ESTS
 DISTRICT MEADE COUNTY MARSHALL
 ELEVATION PROPOSED = 1,310.06', GROUND = 1,320.20'
 MIDDLE BOWMAN RUN OF FISH CREEK (HUC 10)

LEASE NO. SEE WW-6A1
 ACRES 139.79±
 ACRES 139.79±
 QUADRANGLE GLEN EASTON T.S.

STATE NO. 47 - 051 - 1975
 WELL NO. TEN HIGH 12-8HM
 COUNTY PERMIT

DATE MARCH 24, 2020
 (+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS



COUNTY NAME

PERMIT

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

DESIGNATED AGENT DIANNA STAMPER
 CT CORPORATION SYSTEM
 ADDRESS 8400 D BIG TYLER ROAD
 CHARLESTON, WV 25313

**TEN HIGH 1S LEASE
WELL 8HM
TUG HILL OPERATING**

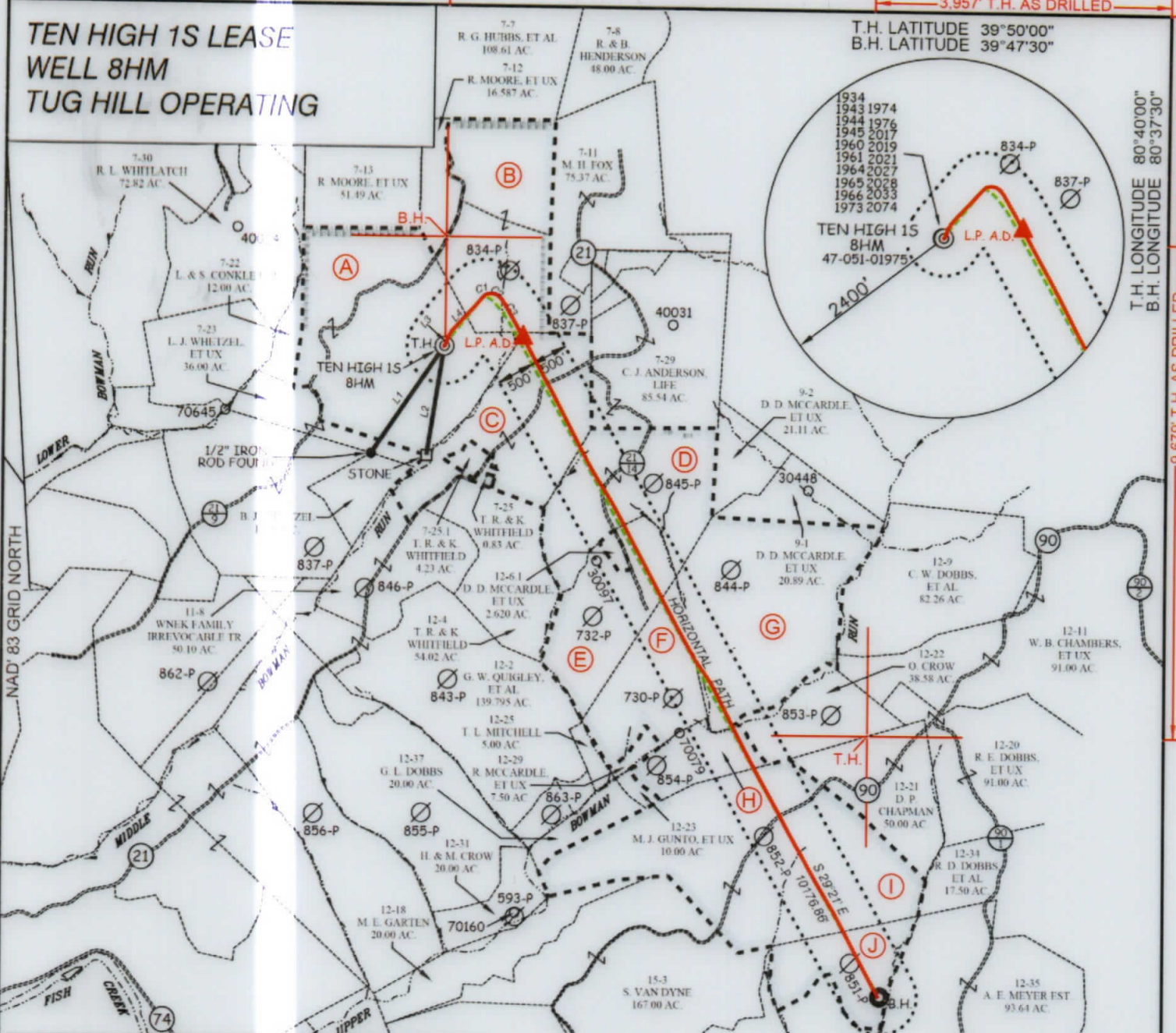
9,661' B.H. AS DRILLED

3,957' T.H. AS DRILLED

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

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°37'30"

3,072' B.H. AS DRILLED



TAG	SURFACE OWNER	PARCEL	ACRES
A	LAWRENCE & SHIRLEY COMBES ESTS	9-7-24	139.79
B	ROBERT G. & SCARLETT DOBBS	9-7-12.1	86.36
C	THOMAS R. & KIMBERLY WHITFIELD	9-7-25.2	76.40
D	DONALD DALE MCCARDLE ET UX	9-12-5	75.28
E	DONALD DALE MCCARDLE ET UX	9-12-6	53.38
F	DONALD DALE MCCARDLE ET UX	9-12-7	53.00
G	DONALD DALE MCCARDLE ET UX	9-12-8	117.85
H	EVERETT F. MOORE HUBBS ET UX	9-12-24	70.00
I	DAVID P. CHAPMAN ET UX	9-12-32	150.00
J	DAVID P. CHAPMAN ET UX	9-12-33	32.00

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	38.63'	43.38'	N 51°5' E	37.36'
C2	148.91'	297.14'	S 52°3' E	145.42'
C3	425.89'	1750.31'	S 52°2' E	424.64'

LEGEND

AS DRILLED ——— (Red line)

PROPOSED ——— (Green dashed line)

AS DRILLED COORDINATES FOR WELL NO. 8HM

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD83 S.P.C.(FT)	N 478,143.88	E 1,636,794.50
NAD83 GEO.	LAT-(N) 39.806762	LONG-(W) 80.680750
NAD83 UTM (M)	N 4,406,358.84	E 527,327.77

LANDING POINT

NAD83 S.P.C.(FT)	N 478,265.6	E 1,637,848.9
NAD83 GEO.	LAT-(N) 39.807135	LONG-(W) 80.677003
NAD83 UTM (M)	N 4,406,401.3	E 527,648.4

BOTTOM HOLE

NAD83 S.P.C.(FT)	N 469,496.2	E 1,642,687.5
NAD83 GEO.	LAT-(N) 39.783234	LONG-(W) 80.659376
NAD83 UTM (M)	N 4,403,754.3	E 529,167.1

SLS
FROM THE GROUND UP

12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 25851 | 62.5634
 1412 Kanawha Boulevard, East | Charleston, WV 25330 | 46.3952
 254 East Beckley Bypass | Beckley, WV 25801 | 39.296

slswv.com

LINE	BEARING	DISTANCE
L1	S 34°00' W	1730.51'
L2	S 08°50' W	1475.13'
L3	N 31°08' E	106.20'
L4	N 39°28' E	724.85'

P.S. 849 *C. Victor Moyers*

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

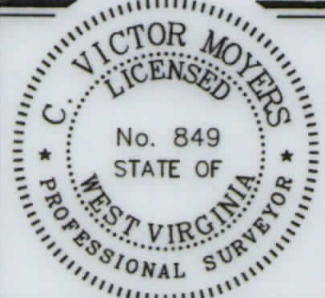
NAD83 S.P.C.(FT)	N 478,143.88	E 1,636,794.50
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BOTTOM HOLE

NAD83 S.P.C.(FT)	N 469,504.7	E 1,642,699.8
NAD83 GEO.	LAT-(N) 39.783258	LONG-(W) 80.659335
NAD83 UTM (M)	N 4,403,756.9	E 529,170.8



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

LEGEND

- LEASE LINE: Dashed line
- SURFACE LINE: Solid line
- WELL LATERAL: Dotted line
- OFFSET LINE: Long-dashed line
- TIE LINE: Short-dashed line
- CREEK: Arrow with wavy lines
- ROAD: Double line
- COUNTY ROUTE: Circle with 'R'
- PROPOSED WELL: Circle with 'P'
- EXISTING WELL: Circle with 'E'
- PERMITTED WELL: Circle with 'P' and 'E'
- TAX MAP-PARCEL: Circle with '00-00'
- SURFACE OWNER (SEE TABLE): Circle with 'A'
- LEASE # (SEE WW-6A1): Circle with 'A'

SCALE 1" = 2000' FILE NO. 8655P8HMAD.dwg

DATE MARCH 24, 20 20

REVISED _____, 20 _____

OPERATORS WELL NO. TEN HIGH 1S-8HM

API WELL NO. 47 — 051 — 1975

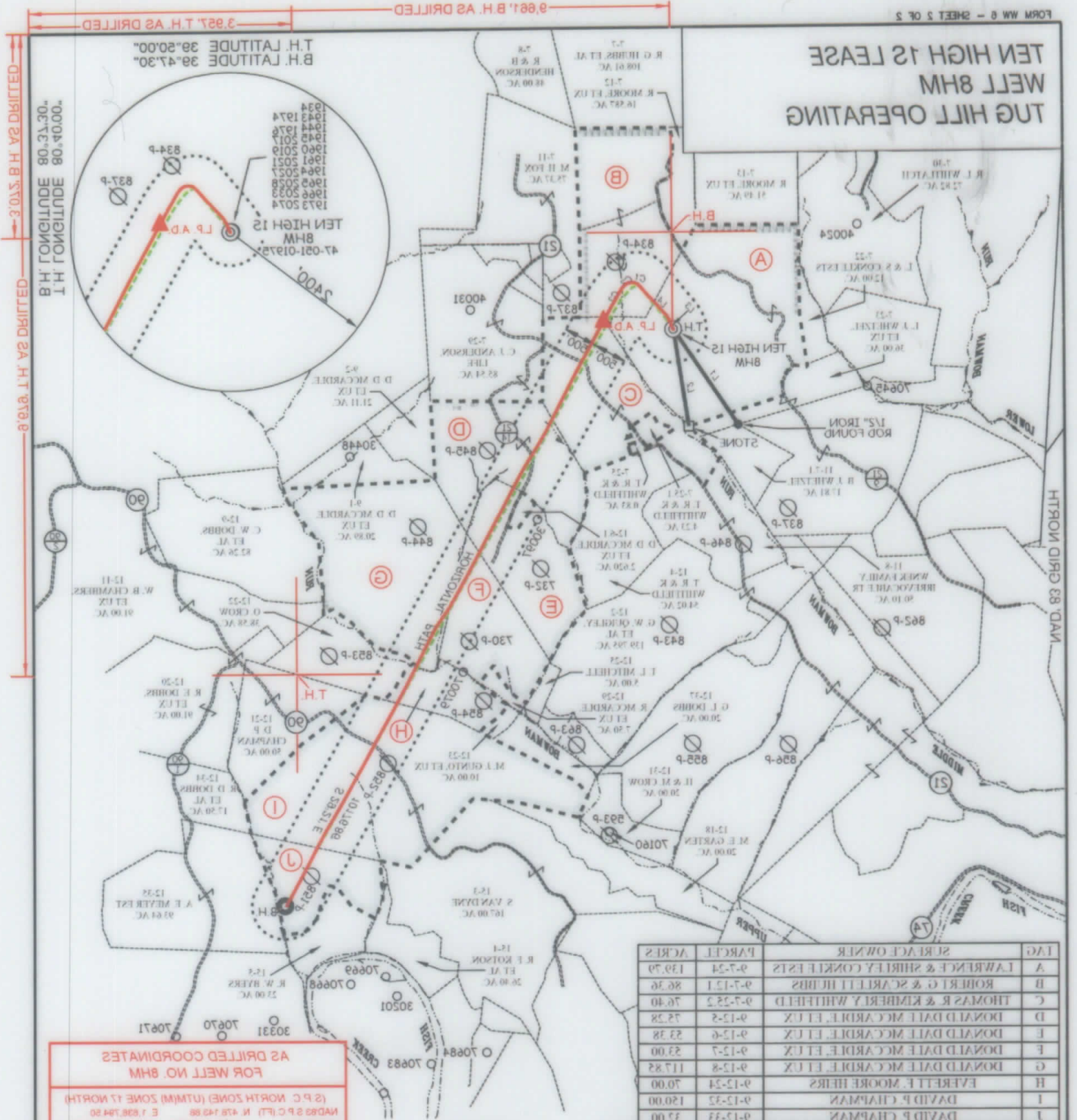
NO. STATE COUNTY PERMIT

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

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

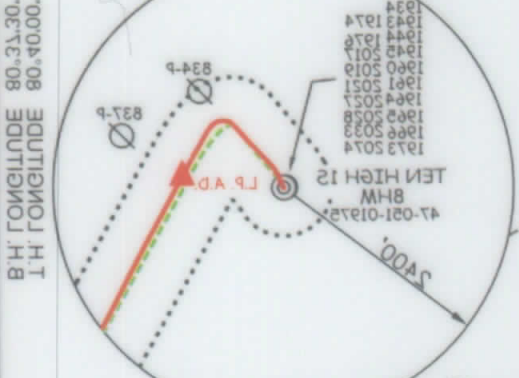
DESIGNATED AGENT DIANNA STAMPER
ADDRESS CT CORPORATION SYSTEM 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

**TEN HIGH 12 LEASE
WELL 8HM
TUG HILL OPERATING**



3 0 1 5 ' B . H . AS DRILLED
3 9 5 7 ' T . H . AS DRILLED

B.H. LATITUDE 39°47.30'
T.H. LATITUDE 39°50.00'



AS DRILLED COORDINATES FOR WELL NO. 8HM

POINT	NAD83 UTM (M)	E	NAD83 GEO	NAD83 S.P.C. (FT)
BOTTOM HOLE	408 401.3	527 848.4	39 50 17.8	485 496.2
LANDING POINT	408 328.84	527 327.77	39 50 17.8	478 496.2
2 P.C. NORTH ZONE (UTM) ZONE 17 NORTH	408 328.84	527 327.77	39 50 17.8	478 496.2

LAG	SURFACE OWNER	PARCEL ACRES
1	DAVID P. CHAPMAN	37.00
2	DAVID P. CHAPMAN	120.00
3	EVERETT F. MOORE HEIRS	70.00
4	DONALD DALE MCCARDLE ET UX	117.83
5	DONALD DALE MCCARDLE ET UX	23.00
6	DONALD DALE MCCARDLE ET UX	23.00
7	DONALD DALE MCCARDLE ET UX	23.00
8	ROBERT G. & SCARLETT HEIRS	76.40
9	ROBERT G. & SCARLETT HEIRS	86.76
10	LAWRENCE & SHIRLEY CONLEY ESTS	139.70

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	38.83	43.38	N 75.18 E	37.38
C2	148.91	297.14	S 82.28 E	142.42
C3	425.88	1750.31	S 25.32 E	424.84

LINE	BEARING	DISTANCE
L1	S 34°00' W	1730.51
L2	S 08°50' W	1425.13
L3	N 31°08' E	108.20
L4	N 39°28' E	724.85



254 East Buckley Street | Beckley, WV 26011 | 204.222.2288
1475 Kanawha Boulevard East | Charleston, WV 25301 | 204.244.2042
12 Veterans Drive | P.O. Box 100 | Glenville, WV 26031 | 204.852.9834

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- THE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-8A1)



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

(2 P.C. NORTH ZONE) (UTM) ZONE 17 NORTH

POINT	NAD83 UTM (M)	E	NAD83 GEO	NAD83 S.P.C. (FT)
BOTTOM HOLE	408 401.3	527 848.4	39 50 17.8	485 496.2
LANDING POINT	408 328.84	527 327.77	39 50 17.8	478 496.2
2 P.C. NORTH ZONE (UTM) ZONE 17 NORTH	408 328.84	527 327.77	39 50 17.8	478 496.2

SCALE 1" = 2000'
DATE MARCH 24, 2020
REVISED _____
OPERATORS WELL NO. TEN HIGH 12-8HM
WELL NO. 47-051-1975
COUNTY PERMIT

WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76102

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

DIANNA STAMPER
CT CORPORATION SYSTEM