

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

API 47-051-02375 County Marshall District Mead
Quad Glen Easton 7.5' Pad Name Keith Stern Field/Pool Name _____
Farm name TH Exploration, LLC Well Number Keith Stern N-4HM
Operator (as registered with the OOG) Tug Hill Operating, LLC
Address 380 Southpointe Boulevard, Plaza II, Suite 200 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,402,827.33 Easting 526,370.77
Landing Point of Curve Northing 4,402,678.6 Easting 526,630.5
Bottom Hole Northing 4,404,247.5 Easting 525,728.7

Elevation (ft) 741.40' 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 4/13/2021 Date drilling commenced spud: 11/16/2021 big rig: 5/25/2022 Date drilling ceased 6/5/2022
Date completion activities began 1/29/2023 Date completion activities ceased 2/12/2023
Verbal plugging (Y/N) N Date permission granted n/a Granted by n/a RECEIVED
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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 440' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 933' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 341-347', 434-440' Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) N

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APPROVED

Reviewed by:
[Signature] 10/27/2023

API 47- 051 - 02375 Farm name TH Exploration, LLC Well number Keith Stern N-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"	552'	NEW	54.5#	N/A	Y
Coal	17 1/2"	13 3/8"	552'	NEW	54.5#	N/A	Y
Intermediate 1	12 1/4"	9 5/8"	2,255'	NEW	36#	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	13,149'	NEW	20#	N/A	Y
Tubing		2 7/8"	6,575'	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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	A	65	15.6	1.21	78	0	8
Surface	A	787	15.6	1.2	944.4	0	8
Coal	A	787	15.6	1.2	944.4	0	8
Intermediate 1	A	800	15	1.38	1,104	0	8
Intermediate 2							
Intermediate 3							
Production	A	3165	14.5	1.16	3671.4	0	8
Tubing							

Drillers TD (ft) 13,175' Loggers TD (ft) n/a
 Deepest formation penetrated Marcellus Plug back to (ft) n/a
 Plug back procedure n/a

Kick off depth (ft) 5,631'

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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API 47- 051 - 02375 Farm name TH Exploration, LLC Well number Keith Stern N-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.

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)
	attached							

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PRODUCING FORMATION(S)	DEPTHS	
MARCELLUS	6,301'-6,256'	7,151'-13,175'
	TVD	MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3541 psi Bottom Hole _____ psi DURATION OF TEST 4 hrs

OPEN FLOW Gas 1002 mcfpd Oil 48 bpd NGL 0 bpd Water 1752 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					

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA
Address 505 West Greens Road, Suite 1000 City Houston State TX Zip 77067

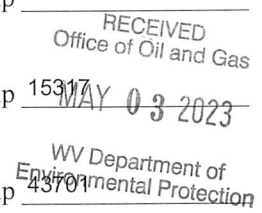
Logging Company n/a
Address _____ City _____ State _____ Zip _____

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

Stimulating Company Producers Service Corp.
Address 109 S. Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Amy L. Morris Telephone 304-376-0111
Signature Amy L. Morris Title Permitting Specialist - Appalachia Region Date 5/11/2023



**KEITH STERN N-4HM
PEFORATION RECORD**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	1/29/2023	12,969	13,015	30	MARCELLUS
2	1/30/2023	12,768	12,914	30	MARCELLUS
3	1/30/2023	12,593	12,739	30	MARCELLUS
4	1/30/2023	12,417	12,563	30	MARCELLUS
5	1/30/2023	12,242	12,387	30	MARCELLUS
6	1/31/2023	12,067	12,211	30	MARCELLUS
7	1/31/2023	11,891	12,035	30	MARCELLUS
8	2/1/2023	11,716	11,859	30	MARCELLUS
9	2/1/2023	11,540	11,683	30	MARCELLUS
10	2/2/2023	11,365	11,507	30	MARCELLUS
11	2/3/2023	11,190	11,331	30	MARCELLUS
12	2/3/2023	11,014	11,155	30	MARCELLUS
13	2/3/2023	10,838	10,979	30	MARCELLUS
14	2/3/2023	10,662	10,803	30	MARCELLUS
15	2/4/2023	10,486	10,627	30	MARCELLUS
16	2/4/2023	10,310	10,451	30	MARCELLUS
17	2/5/2023	10,134	10,275	30	MARCELLUS
18	2/5/2023	9,958	10,099	30	MARCELLUS
19	2/5/2023	9,782	9,923	30	MARCELLUS
20	2/6/2023	9,606	9,747	30	MARCELLUS
21	2/6/2023	9,430	9,571	30	MARCELLUS
22	2/7/2023	9,254	9,395	30	MARCELLUS
23	2/7/2023	9,078	9,219	30	MARCELLUS
24	2/7/2023	8,902	9,043	30	MARCELLUS
25	2/8/2023	8,726	8,867	30	MARCELLUS
26	2/8/2023	8,550	8,691	30	MARCELLUS
27	2/9/2023	8,374	8,515	30	MARCELLUS
28	2/9/2023	8,198	8,339	30	MARCELLUS
29	2/9/2023	8,022	8,163	30	MARCELLUS
30	2/10/2023	7,846	7,987	30	MARCELLUS
31	2/10/2023	7,670	7,811	30	MARCELLUS
32	2/11/2023	7,494	7,635	30	MARCELLUS
33	2/11/2023	7,318	7,459	30	MARCELLUS
34	2/12/2023	7,142	7,283	30	MARCELLUS

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KEITH STERN N-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	80.00	7565	6312	4061	251700	7,796	0
2	89.00	6988	5078	4888	445360	8,528	0
3	89.00	6765	4975	5189	448540	7,594	0
4	89.00	6816	5143	5025	443000	7,773	0
5	89.00	6947	5210	5077	444280	8,474	0
6	88.00	6747	5278	5098	440300	7,742	0
7	90.00	6970	5088	5110	447500	7,640	0
8	90.00	6771	4792	4899	436218	7,789	0
9	89.00	6812	4955	4945	436580	7,761	0
10	89.00	6903	5016	4926	441600	7,863	0
11	89.00	6938	5284	5139	446440	8,274	0
12	90.00	6748	5736	5078	443920	7,815	0
13	89.00	6821	5365	5165	442900	7,767	0
14	88.00	6747	5351	5145	445960	8,431	0
15	90.00	6746	5145	5115	445420	7,877	0
16	88.00	6726	5331	5065	445200	8,335	0
17	88.00	6704	5346	5126	448080	7,996	0
18	90.00	6559	5064	4836	433320	7,768	0
19	88.00	6421	4996	5071	448930	7,936	0
20	90.00	6588	5135	5064	443740	8,146	0
21	90.00	6573	4851	4750	446820	7,912	0
22	90.00	6698	4826	5099	444000	7,883	0
23	91.00	6476	4932	4643	437740	7,877	0
24	89.00	6427	4829	4687	441640	8,018	0
25	90.00	6680	5050	4977	448960	7,892	0
26	90.00	6715	5081	4633	444830	7,866	0
27	90.00	6796	5480	5283	443400	7,871	0
28	89.00	6889	5393	5113	440700	7,807	0
29	90.00	6763	5330	5215	444640	8,032	0
30	90.00	6687	5082	5345	445040	7,945	0
31	90.00	6453	4897	5395	447360	7,846	0
32	90.00	6280	4870	4747	441560	7,958	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)
33	90.00	6284	4718	4988	445100	8,000	0
34	90.00	6179	5080	4574	448520	8,014	0

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KEITH STERN N-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	1530	1704	1530	1705	Sandstone
Big Lime	1704	1770	1705	1771	Limestone
Big Injun	1770	1988	1771	1990	Sandstone
Weir	1988	2191	1990	2194	Sandstone
Berea	2191	2454	2194	2458	Sandstone
Gordon	2454	2534	2458	2538	Sandstone
Fifty Foot	2534	3116	2538	3123	Sandstone
Speechley	3116	4597	3123	4885	Sandstone
Benson	4597	4972	4885	5383	Sandstone
Alexander	4972	5600	5383	6110	Siltstone
Rhinestreet	5600	6070	6110	6619	Black Shale
Middlesex	6070	6142	6619	6717	Black Shale
Geneseo/Burkett	6142	6169	6717	6759	Black Shale
Tully	6169	6197	6759	6808	Limestone
Hamilton	6197	6279	6808	7030	Gray Shale
Marcellus	6279	-	7030	-	Black Shale

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/29/2023
Job End Date:	2/12/2023
State:	West Virginia
County:	Marshall
API Number:	47-051-02375-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Keith Stern N-4HM
Latitude:	39.77497372
Longitude:	-80.69207172
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,293
Total Base Water Volume (gal):	11,349,492
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
Water	Tug Hill Operating	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.10660	None
Sand (Proppant)	Tug Hill Operating	Proppant	Silica Substrate	14808-60-7	100.00000	13.54564	None
Hydrochloric Acid (7.5%)	Producers Service Corp.	Acidizing	Water	7732-18-5	85.00000	0.22748	None
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	37.00000	0.09902	None
StimStream FR 9800	Chemstream	Friction Reducer	Butene, homopolymer	9003-29-6	25.00000	0.01768	None
			Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01768	None
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00212	None
LD-7750W	Multi-Chem	Scale Inhibitor	Methanol	67-56-1	60.00000	0.00534	None
			Phosphonic Acid Salt	Proprietary	5.00000	0.00045	None
4-N-1	Producers Service Corp.	Corrosion Inhibitor	Acetic acid	64-19-7	90.00000	0.00047	None

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			Methanol	67-56-1	10.00000	0.00005	None
			2-Ethylhexanol	104-76-7	10.00000	0.00005	None
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00003	None
			Diethanolamine	111-42-2	1.00000	0.00001	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	37.00000	0.09902	
			Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01768	
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00212	
			Phosphonic Acid Salt	Proprietary	5.00000	0.00045	
			2-Ethylhexanol	104-76-7	10.00000	0.00005	
			Methanol	67-56-1	10.00000	0.00005	
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00003	
			Diethanolamine	111-42-2	1.00000	0.00001	

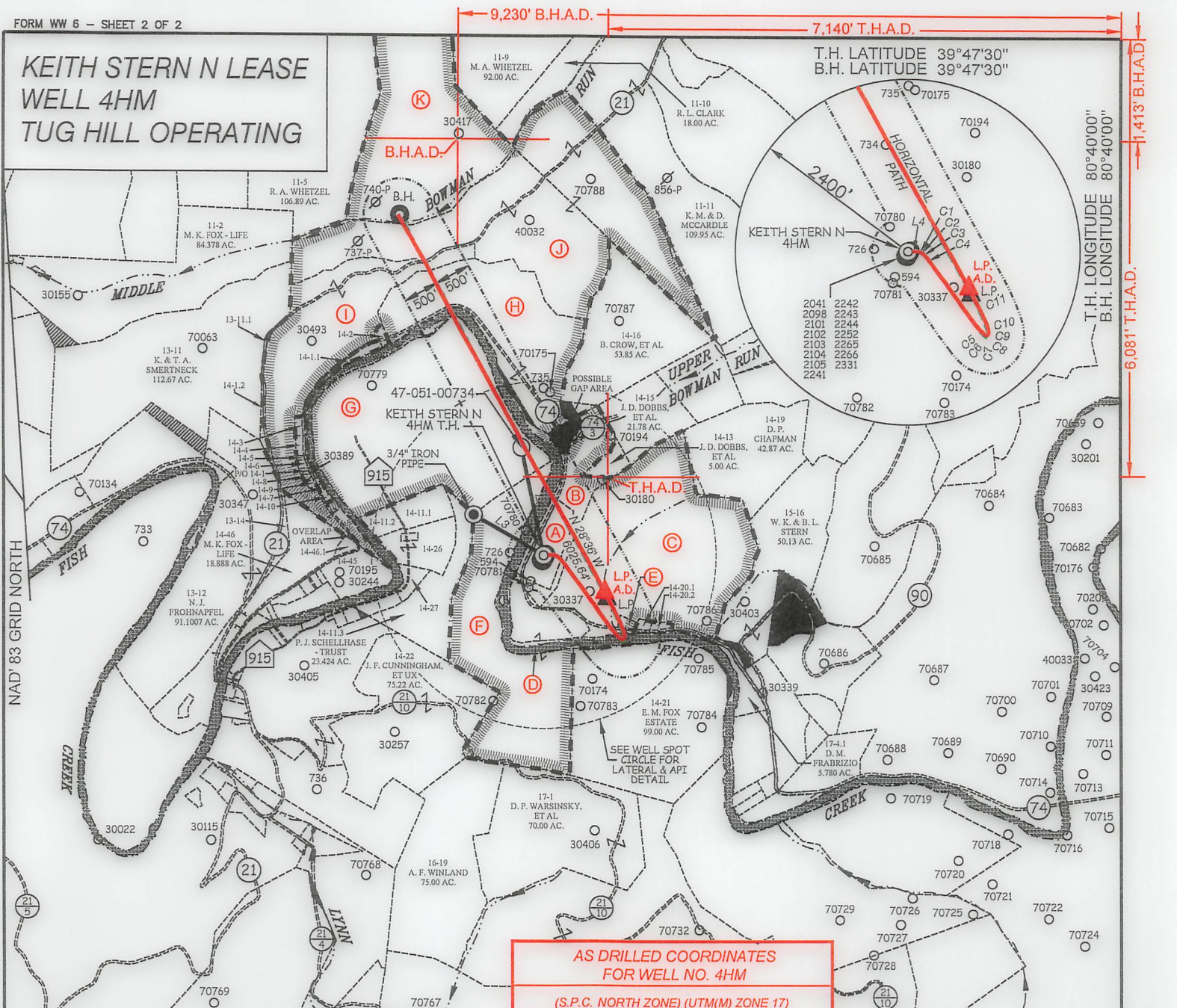
* Total Water Volume sources may include fresh water, produced water, and/or recycled water

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

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)

**KEITH STERN N LEASE
WELL 4HM
TUG HILL OPERATING**



**AS DRILLED COORDINATES
FOR WELL NO. 4HM**

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

NAD83 S.P.C.(FT)	N. 466,607.76	E. 1,633,460.46
NAD83 GEO.	LAT-(N) 39.774974	LONG-(W) 80.692072
NAD83 UTM (M)	N. 4,402,827.33	E. 526,370.77

LANDING POINT

NAD83 S.P.C.(FT)	N. 466,105.5	E. 1,634,304.6
NAD83 GEO.	LAT-(N) 39.773626	LONG-(W) 80.689045
NAD83 UTM (M)	N. 4,402,678.6	E. 526,630.5

BOTTOM HOLE

NAD83 S.P.C.(FT)	N. 471,303.1	E. 1,631,431.4
NAD83 GEO.	LAT-(N) 39.787789	LONG-(W) 80.699513
NAD83 UTM (M)	N. 4,404,247.5	E. 525,728.7

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 89°03' E	163.48'
L2	S 36°22' E	1093.25'
L3	N 60°06' W	1125.89'
L4	N 11°42' W	1523.65'

CURVE TABLE

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	17.86'	27.12'	S 70°21' E	17.54'
C2	22.76'	167.62'	S 50°00' E	22.74'
C3	74.37'	707.84'	S 42°11' E	74.33'
C4	143.55'	2606.12'	S 37°36' E	143.53'
C5	125.44'	787.54'	S 40°30' E	125.31'
C6	39.31'	120.13'	S 55°05' E	39.14'
C7	13.83'	17.57'	N 88°32' E	13.47'
C8	14.60'	20.99'	N 28°22' E	14.31'
C9	24.67'	87.76'	N 00°01' E	24.59'
C10	85.59'	501.33'	N 13°42' W	85.48'
C11	523.44'	3139.20'	N 24°34' W	522.83'

TAG	SURFACE OWNER	PARCEL	ACRES
A	TH EXPLORATION, LLC	9-14-24.1	10.05
B	WILLIAM K. STERN, ET UX	9-14-24	RES. OF 37.06
C	WILLIAM K. STERN, ET UX	9-14-20	120.323
D	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
E	WILLIAM K. STERN, ET UX	9-14-20.3	0.831
F	WILLIAM K. STERN, ET UX	9-14-23	107.133
G	HOY GLENN CROW	9-14-11	141.559
H	CONSOLIDATION COAL COMPANY MURRAY ENERGY	9-14-12	74.47
I	SAMUEL & HEATHER SUHODOLSKI	9-14-1	86.48
J	J. F. CROW ESTATE, ET AL	9-11-12	162.88
K	MICHAEL WHETZEL	9-11-13	91.65



LEGEND

AS DRILLED —

PROPOSED ---

12 Vanhorn Drive | P.O. Box 150 | Glenview, WV 26351 | 304.462.5634
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
 254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
 slsw.com

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

NAD83 S.P.C.(FT)	N. 466,607.76	E. 1,633,460.46
NAD83 GEO.	LAT-(N) 39.774974	LONG-(W) 80.692072
NAD83 UTM (M)	N. 4,402,827.33	E. 526,370.77

LANDING POINT

NAD83 S.P.C.(FT)	N. 466,013.8	E. 1,634,339.8
NAD83 GEO.	LAT-(N) 39.773375	LONG-(W) 80.688915
NAD83 UTM (M)	N. 4,402,650.9	E. 526,641.7

BOTTOM HOLE

NAD83 S.P.C.(FT)	N. 471,304.0	E. 1,631,454.8
NAD83 GEO.	LAT-(N) 39.787792	LONG-(W) 80.699430
NAD83 UTM (M)	N. 4,404,247.8	E. 525,735.8



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

P.S. 677 *Gregory A. Smith*

LEGEND

LEASE LINE

SURFACE LINE

WELL LATERAL

OFFSET LINE

TIE LINE

CREEK

ROAD

COUNTY ROUTE

PROPOSED WELL +

EXISTING WELL ○

PERMITTED WELL ○

TAX MAP-PARCEL 00-00

LEASE # (SEE WW-6A1) A

SURFACE OWNER (SEE TABLE)

SCALE 1" = 2000' FILE NO. 8811P4HMR-AD.dwg
 KEITH STERN N-4HM-REV1

DATE FEBRUARY 15, 20 23
 REVISED _____, 20 _____

OPERATORS WELL NO. KEITH STERN N-4HM
 API WELL NO. **47-051-02375**
 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 DARREN BROWN - CT CORPORATION
 ADDRESS 5098 WASHINGTON ST. W, STE 407 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

**KEITH STERN N LEASE
WELL 4HM
TUG HILL OPERATING**

B.H.A.D.

9,230' B.H.A.D.

7,140' T.H.A.D.

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

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

6,081' T.H.A.D.

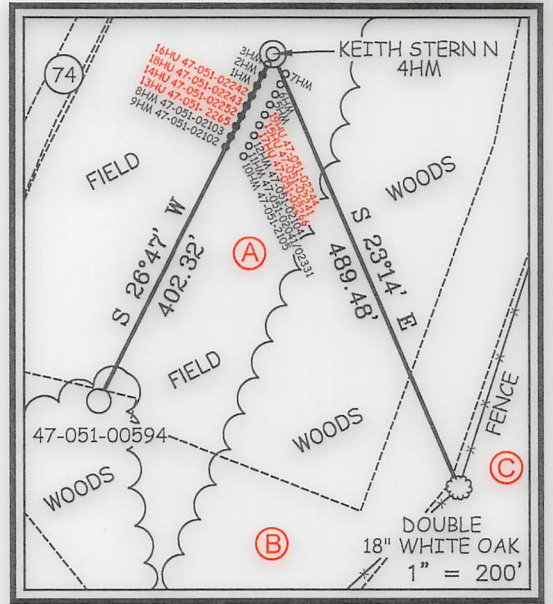
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17)

NAD'83 S.P.C.(FT)	N. 466,607.76	E. 1,633,460.46
NAD'83 GEO.	LAT-(N) 39.774974	LONG-(W) 80.692072
NAD'83 UTM (M)	N. 4,402,827.33	E. 526,370.77
<u>LANDING POINT</u>		
NAD'83 S.P.C.(FT)	N. 466,013.8	E. 1,634,339.8
NAD'83 GEO.	LAT-(N) 39.773375	LONG-(W) 80.688915
NAD'83 UTM (M)	N. 4,402,650.9	E. 526,641.7
<u>BOTTOM HOLE</u>		
NAD'83 S.P.C.(FT)	N. 471,304.0	E. 1,631,454.8
NAD'83 GEO.	LAT-(N) 39.787792	LONG-(W) 80.699430
NAD'83 UTM (M)	N. 4,404,247.8	E. 525,735.8

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-13-11.1	SAMUEL & HEATHER SUHODOLSKI	0.49
9-13-14	MARGARET K. FOX - LIFE	3.00
9-14-1.1	MICHAEL L. ALVAREZ	1.6
9-14-1.2	KENNETH N. & TERESA A. SMERTNECK	1.02
9-14-2	MICHAEL L. ALVAREZ	0.75
9-14-3	MICHAEL L. ALVAREZ	NORTH P/O 3 PCLS
9-14-4	MICHAEL L. ALVAREZ	3 PCLS & 1/8 AC.
9-14-5	MICHAEL L. ALVAREZ	200 X 60 PCL
9-14-6	MICHAEL L. ALVAREZ	120 X 200 PCL
9-14-7	JOHN T. ERAZMUS, III	0.25
9-14-8	JOHNNY C. HOLCOMB & JOHNNY C. HOLCOMB, II	2/5 AC.
9-14-9	JOHN E. DUFFY, ET UX	2/5 AC.
9-14-10	ROBERT I. DUFFY - LIFE	25/100 AC.
9-14-11.1	PATRICK J. SCHELLHASE EST - TRUST	7.617
9-14-11.2	LOYE A. BLAKE	4.00
9-14-20.1	WILLIAM K. STERN, ET UX	1.321
9-14-20.2	WILLIAM K. STERN, ET UX	1.525
9-14-26	PATRICK J. SCHELLHASE EST - TRUST	12.588
9-14-27	PATRICK J. SCHELLHASE EST - TRUST	3.004
9-14-28	CHARLES R. SCHELLHASE, ET UX	3.029
9-14-45	GEORGE R. TAYLOR, ET UX	10.98
9-14-46.1	MARHA JANE FAZZARO	1.512

T.H. A.D.

REFERENCES



NOTES ON SURVEY

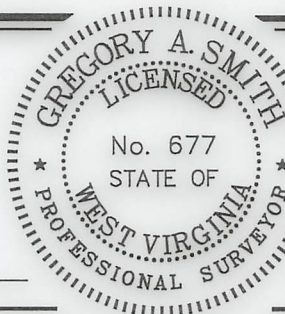
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS OR DWELLINGS > 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
- BASED ON WV DOT COUNTY ROUTE 74 IS A 40' STRIP OF LAND ACQUIRED IN NUMEROUS DEEDS.
- PLAT UPDATED TO SHOW AS-DRILLED PATH.
- AS DRILLED DATA PROVIDED BY TUG HILL OPERATING.



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slsww.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. 677 Gregory A. Smith



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE FEBRUARY 15, 20 23
REVISED _____, 20 ____
OPERATORS WELL NO. KEITH STERN N-4HM
API WELL NO. 47 - 051 - 02375
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8811P4HMR-AD.dwg
KEITH STERN N-4HM-REV1
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 X LIQUID INJECTION ___ WASTE DISPOSAL ___ IF "GAS" PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: GROUND = 741.40' ELEVATION PROPOSED = 744.65' WATERSHED FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'
SURFACE OWNER TH EXPLORATION, LLC ACREAGE 10.05±
ROYALTY OWNER ISAAC CROW, ET AL - SEE WW-6A1 ACREAGE 10.05±
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X 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: 6,408' / TMD: 13,203'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W, STE 407
FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

10/27/2023