

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

RECEIVED
Office of Oil and Gas

SEP 30 2022

API 47 - 103 - 03006 County Wetzel District Magnolia WV Department of Environmental Protection
Quad Porter Falls 7.5' Pad Name Lackawanna Field/Pool Name _____
Farm name M.B. Investments Well Number Lackawanna 3H
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 4,384,049.11 Easting 512,301.95
Landing Point of Curve Northing 4,383,875.63 Easting 512,386.98
Bottom Hole Northing 4,386,555.99 Easting 510,838.88

Elevation (ft) 1305.44' 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 10/26/2018 Date drilling commenced ^{spud: 11/3/2014 big rig: 7/18/2019} _____ Date drilling ceased 8/10/2019
Date completion activities began 10/27/2021 Date completion activities ceased 12/28/2021
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 1134' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1595' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 1034-1040', 1129-1135' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

APPROVED OCT 01 2022 10/14/2022

Ernest L. Reynolds

API 47- 103 - 03006

Farm name M.B. Investments

Well number Lackawanna 3H

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	26"	20"	40"	NEW	BW	N/A	Y
Surface	17 1/2"	13 3/8"	1,264'	NEW	48#	N/A	Y
Coal	17 1/2"	13 1/8"	1,264'	NEW	48#	N/A	Y
Intermediate 1	12 1/4"	9 5/8"	2,886'	NEW	36#	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 7/8"	5 1/2"	17,599'	NEW	20#	N/A	Y
Tubing		2 3/8"	8,800'	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	933	15.6	1.21	1,128	0	8
Coal	A	933	15.6	1.21	1,128	0	8
Intermediate 1	A	954	15.6	1.19	1,135	0	8
Intermediate 2							
Intermediate 3							
Production	A	4,901	14.5	1.17	5,756	0	8
Tubing							

Drillers TD (ft) 17,622'

Loggers TD (ft) n/a

Deepest formation penetrated Marcellus

Plug back to (ft) n/a

Plug back procedure n/a

RECEIVED
Office of Oil and Gas

SEP 30 2022

Kick off depth (ft) 5,994'

WV Department of
Environmental Protection

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 _____

10/14/2022

API 47- 103 - 03006 Farm name M.B. Investments Well number Lackawanna 3H

PERFORATION RECORD

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

RECEIVED
Office of Oil and Gas
SEP 30 2022
WV Department of
Environmental Protection

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							

Please insert additional pages as applicable.

API 47- 103 - 03006 Farm name M.B. Investments Well number Lackawanna 3H

PRODUCING FORMATION(S)	DEPTHS	
MARCELLUS	6,750'-6,604' TVD	7,354'-17,622' MD

RECEIVED
Office of Oil and Gas

SEP 30 2022

WV Department of
Environmental Protection

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1300 psi Bottom Hole _____ psi DURATION OF TEST 4 hrs

OPEN FLOW Gas 923 mcfpd Oil 5 bpd NGL _____ bpd Water 21 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 FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
*See attached	0		0		

Please insert additional pages as applicable.

Drilling Contractor Precision
Address 10350 Richmond Avenue, Suite 700 City Houston State TX Zip 77042

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

Cementing Company BJ Services
Address 4000 Town Center Boulevard City Canonsburg State PA Zip 15317

Stimulating Company Stingray
Address 66680 Executive Drive City St. Clairsville State OH Zip 43950

Please insert additional pages as applicable.

Completed by Amy L. Morris Telephone 304-376-0111
Signature Amy L. Morris Title Permitting Specialist Date 9/29/2022

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

10/14/2022

SEP 30 2022

LACKAWANNA 3H
PERFORATION RECORD

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	WV Department of Environmental Protection Formation(s)
1	10/27/2021	17,200	17,346	48	Marcellus
2	10/28/2021	17,024	17,171	48	Marcellus
3	10/29/2021	16,848	16,995	48	Marcellus
4	10/30/2021	16,672	16,819	48	Marcellus
5	10/31/2021	16,497	16,643	48	Marcellus
6	11/1/2021	16,321	16,467	48	Marcellus
7	11/2/2021	16,145	16,292	48	Marcellus
8	11/3/2021	15,969	16,116	48	Marcellus
9	11/4/2021	15,793	15,940	48	Marcellus
10	11/5/2021	15,618	15,764	48	Marcellus
11	11/6/2021	15,442	15,588	48	Marcellus
12	11/7/2021	15,020	15,167	48	Marcellus
13	11/8/2021	15,090	15,237	48	Marcellus
14	11/9/2021	14,914	15,061	48	Marcellus
15	11/10/2021	14,493	14,639	48	Marcellus
16	11/12/2021	14,563	14,709	48	Marcellus
17	11/13/2021	14,387	14,534	48	Marcellus
18	11/14/2021	14,211	14,358	48	Marcellus
19	11/15/2021	14,035	14,182	48	Marcellus
20	11/16/2021	13,860	14,006	48	Marcellus
21	11/17/2021	13,684	13,830	48	Marcellus
22	11/18/2021	13,508	13,655	48	Marcellus
23	11/21/2021	13,332	13,479	48	Marcellus
24	11/22/2021	13,156	13,303	48	Marcellus
25	11/25/2021	12,981	13,127	48	Marcellus
26	11/26/2021	12,805	12,951	48	Marcellus
27	11/27/2021	12,629	12,776	48	Marcellus
28	11/28/2021	12,453	12,600	48	Marcellus
29	11/29/2021	12,277	12,424	48	Marcellus
30	11/30/2021	12,102	12,248	48	Marcellus
31	12/1/2021	11,926	12,072	48	Marcellus
32	12/3/2021	11,750	11,897	48	Marcellus
33	12/4/2021	11,574	11,721	48	Marcellus
34	12/5/2021	11,398	11,545	48	Marcellus
35	12/6/2021	11,223	11,369	48	Marcellus
36	12/7/2021	11,047	11,193	48	Marcellus
37	12/8/2021	10,871	11,018	48	Marcellus
38	12/9/2021	10,695	10,842	48	Marcellus
39	12/10/2021	10,519	10,666	48	Marcellus
40	12/11/2021	10,344	10,490	48	Marcellus
41	12/12/2021	10,168	10,314	48	Marcellus
42	12/13/2021	9,992	10,139	48	Marcellus

10/14/2022

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
43	12/14/2021	9,816	9,963	48	Marcellus
44	12/15/2021	9,640	9,787	48	Marcellus
45	12/16/2021	9,465	9,611	48	Marcellus
46	12/17/2021	9,289	9,435	48	Marcellus
47	12/18/2021	9,113	9,260	48	Marcellus
48	12/19/2021	8,937	9,084	48	Marcellus
49	12/20/2021	8,761	8,908	48	Marcellus
50	12/21/2021	8,586	8,732	48	Marcellus
51	12/22/2021	8,410	8,556	48	Marcellus
52	12/23/2021	8,234	8,381	48	Marcellus
53	12/24/2021	8,058	8,205	48	Marcellus
54	12/25/2021	7,882	8,029	48	Marcellus
55	12/26/2021	7,707	7,853	48	Marcellus
56	12/27/2021	7,531	7,677	48	Marcellus
57	12/28/2021	7,355	7,502	48	Marcellus

RECEIVED
Office of Oil and Gas

SEP 30 2022

WV Department of
Environmental Protection

10/14/2022

**LACKAWANNA N-3HM
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	82.40	8893	6388	4400	45827	2898	0
2	89.90	7495	4910	4595	444080	8583	0
3	88.60	7191	4696	5000	443500	8425	0
4	89.90	7017	5038	4200	436580	8464	0
5	89.10	7071	5067	4300	446400	8536	0
6	90.10	7076	4782	3876	445220	8540	0
7	90.00	6927	4633	4398	444060	8411	0
8	88.70	6891	4693	4321	444880	8522	0
9	89.60	6800	4787	4555	444520	8414	0
10	89.00	6770	4692	4096	440640	8358	0
11	89.90	6685	4696	3925	443040	7862	0
12	90.00	6798	4558	3812	439240	7865	0
13	89.90	6934	4693	4172	449380	7959	0
14	90.50	6886	4789	4819	448080	7847	0
15	89.70	6885	4832	4396	443900	7869	0
16	90.20	6853	4627	4870	446640	7963	0
17	89.80	6964	4998	4600	438120	7802	0
18	90.00	6907	4865	4400	437920	7743	0
19	90.30	7033	4911	4800	443520	7775	0
20	90.30	6831	4721	4575	441120	7690	0
21	89.40	6958	4784	4200	438760	7722	0
22	91.20	6765	4763	5000	445620	7743	0
23	89.90	6668	4709	4278	445760	7728	0
24	89.60	6911	4591	4505	444820	7850	0
25	89.90	6677	4580	4597	445260	7816	0
26	89.60	6538	4567	4164	441160	7627	0
27	91.50	6767	4567	4276	443510	7752	0
28	90.00	7133	4621	4546	400300	8527	0
29	90.80	6694	4701	4584	441600	7647	0
30	90.50	6659	4629	4649	445760	7664	0
31	88.80	6835	4924	4453	445200	7603	0
32	89.50	6893	4901	4847	447280	8279	0

WY Department of
 Environmental Protection

SEP 30 2022

RECEIVED
 Office of Oil and Gas

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	90.30	6652	4878	4787	440980	8130	0
34	89.60	6909	4892	4810	402980	7783	0
35	89.50	6622	4929	4821	441680	8385	0
36	89.50	6781	5000	4227	447860	8096	0
37	89.90	6676	5054	4571	444700	8186	0
38	89.90	6600	5110	4762	442440	8115	0
39	90.50	6750	5206	4471	445940	8161	0
40	88.70	6907	5347	4634	447340	8179	0
41	89.30	6674	4973	4172	438360	8167	0
42	89.40	6621	5137	4293	440340	8172	0
43	89.90	6558	5233	3716	439740	8113	0
44	91.50	6598	5790	3962	445000	8164	0
45	90.00	6589	6059	5021	443100	8147	0
46	89.90	6547	5147	4842	439080	8091	0
47	89.90	6615	5647	4411	442800	8177	0
48	89.60	6451	5492	3790	446100	8107	0
49	90.20	6403	5659	3916	440660	8054	0
50	89.40	6238	5450	4642	445820	8019	0
51	90.40	6137	5329	4210	447810	8196	0
52	90.30	6213	5177	4291	438380	8068	0
53	90.30	6050	4905	4570	447260	8308	0
54	89.50	6145	5371	4298	447240	8010	0
55	90.90	6104	5193	3991	438380	8185	0
56	89.80	6121	5432	4427	428100	7759	0
57	89.50	6266	5208	4800	438060	7865	0

RECEIVED
 Office of Oil and Gas
SEP 30 2022
 WV Department of
 Environmental Protection

Lackawanna 3H

Lithology Informtion

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 QUQANTITY AND TYPE OF FLUID
Maxton	2072	2188	2072	2188	Sandstone
Big Lime	2188	2311	2188	2312	Limestone
Big Injun	2311	2649	2312	2651	Sandstone
Weir	2649	2841	2651	2843	Sandstone
Berea	2841	3222	2843	3226	Sandstone
Gordon	3222	3281	3226	3286	Sandstone
Fifty Foot	3281	3796	3286	3832	Sandstone
Speechley	3796	5160	3832	5363	Sandstone
Benson	5160	5545	5363	5794	Sandstone
Alexander	5545	6132	5794	6413	Siltstone
Rhinestreet	6132	6573	6413	6894	Black Shale
Middlesex	6573	6655	6894	7025	Black Shale
Geneseo/Burkett	6655	6675	7025	7065	Black Shale
Tully	6675	6707	7065	7146	Limestone
Hamilton	6707	6720	7146	7189	Gray Shale
Marcellus	6720	-	7189	-	Black Shale

RECEIVED
 Office of Oil and Gas
SEP 30 2022
 WV Department of
 Environmental Protection

**LACKAWANNA N-3HM
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	82.40	8893	6388	4400	45827	2898	0
2	89.90	7495	4910	4595	444080	8583	0
3	88.60	7191	4696	5000	443500	8425	0
4	89.90	7017	5038	4200	436580	8464	0
5	89.10	7071	5067	4300	446400	8536	0
6	90.10	7076	4782	3876	445220	8540	0
7	90.00	6927	4633	4398	444060	8411	0
8	88.70	6891	4693	4321	444880	8522	0
9	89.60	6800	4787	4555	444520	8414	0
10	89.00	6770	4692	4096	440640	8358	0
11	89.90	6685	4696	3925	443040	7862	0
12	90.00	6798	4558	3812	439240	7865	0
13	89.90	6934	4693	4172	449380	7959	0
14	90.50	6886	4789	4819	448080	7847	0
15	89.70	6885	4832	4396	443900	7869	0
16	90.20	6853	4627	4870	446640	7963	0
17	89.80	6964	4998	4600	438120	7802	0
18	90.00	6907	4865	4400	437920	7743	0
19	90.30	7033	4911	4800	443520	7775	0
20	90.30	6831	4721	4575	441120	7690	0
21	89.40	6958	4784	4200	438760	7722	0
22	91.20	6765	4763	5000	445620	7743	0
23	89.90	6668	4709	4278	445760	7728	0
24	89.60	6911	4591	4505	444820	7850	0
25	89.90	6677	4580	4597	445260	7816	0
26	89.60	6538	4567	4164	441160	7627	0
27	91.50	6767	4567	4276	443510	7752	0
28	90.00	7133	4621	4546	400300	8527	0
29	90.80	6694	4701	4584	441600	7647	0
30	90.50	6659	4629	4649	445760	7664	0
31	88.80	6835	4924	4453	445200	7603	0
32	89.50	6893	4901	4847	447280	8279	0

RECEIVED
 Office of Oil and Gas
 SEP 30 2022
 WV Department of
 Environmental Protection

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	90.30	6652	4878	4787	440980	8130	0
34	89.60	6909	4892	4810	402980	7783	0
35	89.50	6622	4929	4821	441680	8385	0
36	89.50	6781	5000	4227	447860	8096	0
37	89.90	6676	5054	4571	444700	8186	0
38	89.90	6600	5110	4762	442440	8115	0
39	90.50	6750	5206	4471	445940	8161	0
40	88.70	6907	5347	4634	447340	8179	0
41	89.30	6674	4973	4172	438360	8167	0
42	89.40	6621	5137	4293	440340	8172	0
43	89.90	6558	5233	3716	439740	8113	0
44	91.50	6598	5790	3962	445000	8164	0
45	90.00	6589	6059	5021	443100	8147	0
46	89.90	6547	5147	4842	439080	8091	0
47	89.90	6615	5647	4411	442800	8177	0
48	89.60	6451	5492	3790	446100	8107	0
49	90.20	6403	5659	3916	440660	8054	0
50	89.40	6238	5450	4642	445820	8019	0
51	90.40	6137	5329	4210	447810	8196	0
52	90.30	6213	5177	4291	438380	8068	0
53	90.30	6050	4905	4570	447260	8308	0
54	89.50	6145	5371	4298	447240	8010	0
55	90.90	6104	5193	3991	438380	8185	0
56	89.80	6121	5432	4427	428100	7759	0
57	89.50	6266	5208	4800	438060	7865	0

RECEIVED
 Office of Oil and Gas
SEP 30 2022
 WV Department of
 Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/27/2021
Job End Date:	12/28/2021
State:	West Virginia
County:	Wetzel
API Number:	47-103-03006-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Lackawanna N-3HM
Latitude:	-80.85670585
Longitude:	39.60609798
Datum:	NAD27
Federal Well:	YES
Indian Well:	NO
True Vertical Depth:	6,758
Total Base Water Volume (gal):	19,890,024
Total Base Non Water Volume:	0

RECEIVED
Office of Oil and Gas
SEP 30 2022
WV Department of
Environmental Protection



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	69.40657	None
Sand (30/50 Mesh Proppant)	JS Silica	Proppant	Silica Substrate	14808-60-7	100.00000	21.08902	None
Sand (40/70 Mesh Proppant)	JS Silica	Proppant	Silica Substrate	14808-60-7	100.00000	6.99618	None
Sand (100 Mesh Proppant)	JS Silica	Proppant	Silica Substrate	14808-60-7	100.00000	2.40869	None
StimSTREAM FR 9800	Chemstream Oilfield Services	Friction Reduction	copolymer of 2-propenamide	Proprietary	25.00000	0.01105	None
			Petroleum Distillate	64742-47-8	18.00000	0.00796	None
			Oleic Acid Diethanolamide	93-83-4	3.00000	0.00133	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00088	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00044	None
Hydrochloric Acid (28%)	Dover	Acidizing					

			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	28.00000	0.01545	None
Plexhib 166	Chemplex Solvay	Corrosion Inhibitor/Iron Control					
			Methanol	67-56-1	96.00000	0.00015	None
			Proargyl alcohol	107-19-7	3.00000	0.00000	None
			Formaldehyde	50-00-0	1.00000	0.00000	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					
			Petroleum Distillate	64742-47-8	18.00000	0.00796	
			Oleic Acid Diethanolamide	93-83-4	3.00000	0.00133	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00088	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00044	
			Proargyl alcohol	107-19-7	3.00000	0.00000	
			Formaldehyde	50-00-0	1.00000	0.00000	

* 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)

RECEIVED
 Office of Oil and Gas
SEP 30 2022
 WV Department of
 Environmental Protection

LACKAWANNA LEASE
WELL 3H
875.41 ±
ACRES

LINE	BEARING	DISTANCE
L1	N 50°35' W	1498.61'
L2	N 06°05' W	784.44'
L3	S 05°25' W	40.78'
L4	S 28°56' E	207.65'
L5	S 30°06' E	811.66'
L6	N 29°40' W	451.19'

TOP HOLE LATITUDE: 39°37'30"
 BOTTOM HOLE LATITUDE: 39°40'00"

DETAIL SKETCH "A"

SCALE 1"=100'

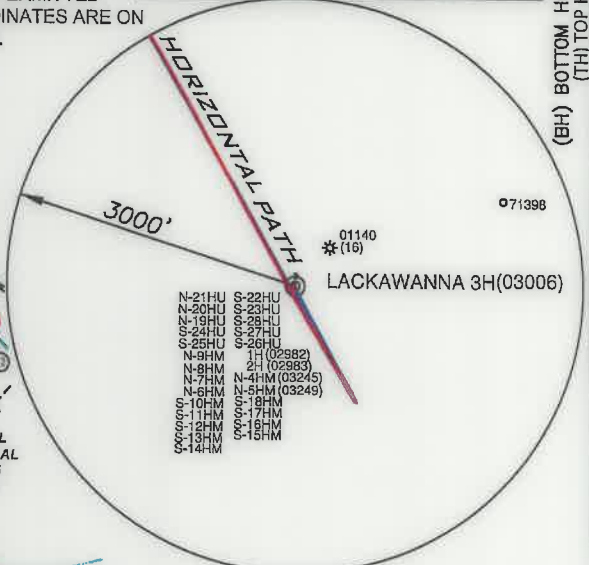
LACKAWANNA 3H

- N-21HU O-22HU
- N-20HU O-23HU
- N-19HU O-24HU
- S-24HU O-27HU
- S-25HU O-26HU
- N-9HM O-1H (02982)
- N-9HM O-2H (02983)
- N-5HM O-3H (03006)
- N-7HM O-4HM (03245)
- N-10HM O-5HM (03249)
- N-11HM O-6HM
- N-12HM O-7HM
- N-13HM O-8HM
- N-14HM O-9HM

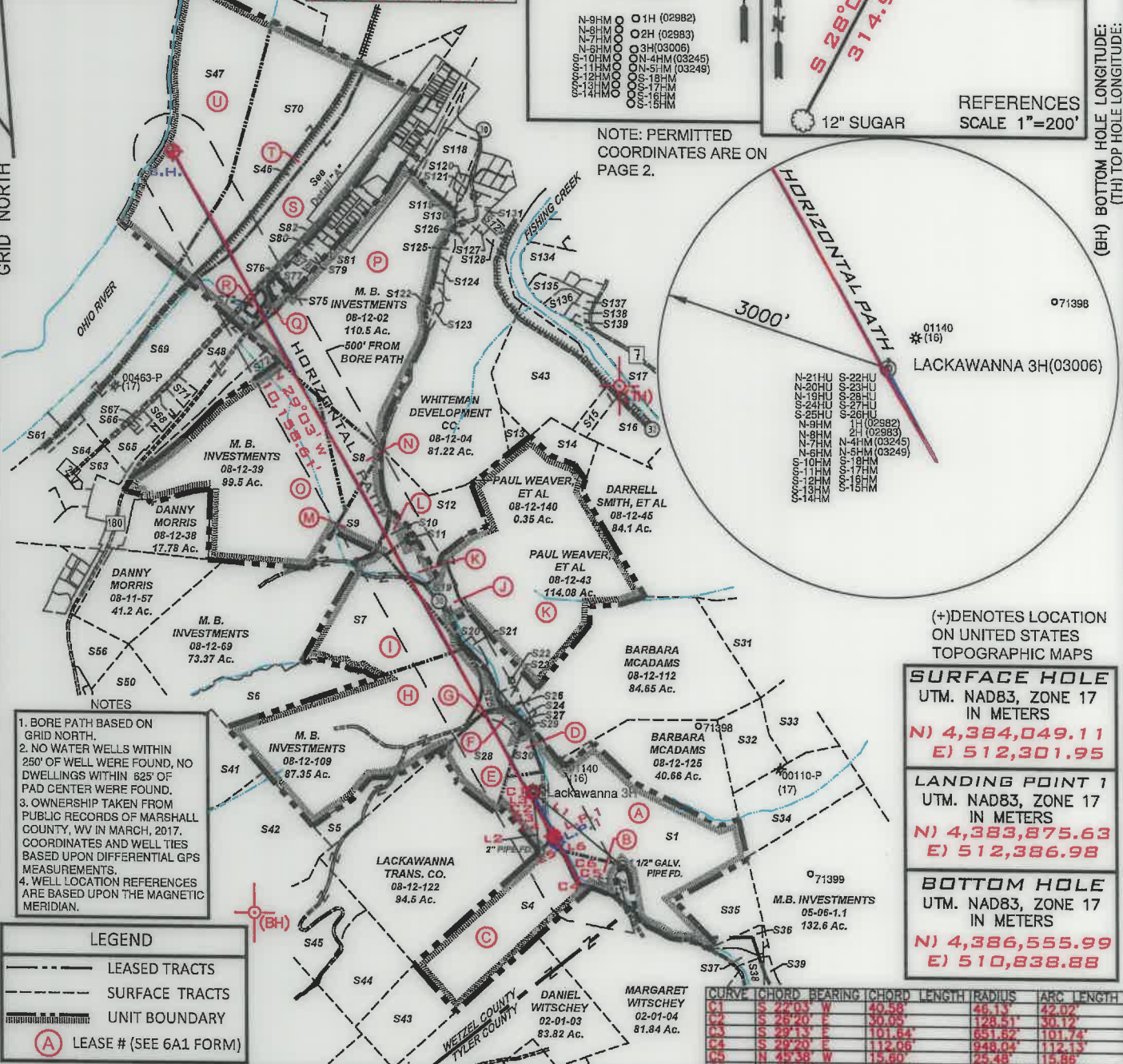
12" SUGAR

REFERENCES SCALE 1"=200'

NOTE: PERMITTED COORDINATES ARE ON PAGE 2.



ASDRILLED LEG
 PERMITTED LEG



- 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 MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 - WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LEGEND

- LEASED TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- LEASE # (SEE 6A1 FORM)

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE
 UTM. NAD83, ZONE 17 IN METERS
N) 4,384,049.11
E) 512,301.95

LANDING POINT 1
 UTM. NAD83, ZONE 17 IN METERS
N) 4,383,875.63
E) 512,386.98

BOTTOM HOLE
 UTM. NAD83, ZONE 17 IN METERS
N) 4,386,555.99
E) 510,838.88

FILE NUMBER _____

DRAWING NUMBER LACKAWANNA_3H_REV 1

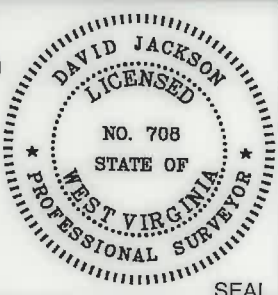
SCALE 1" = 2000'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

David L Jackson



JACKSON SURVEYING INC.
 P.O. Box 1460
 Clarksburg, WV 26302
 304-823-8851

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

DATE: MAY 26, 2021

OPERATORS WELL NO. LACKAWANNA 3H

API WELL NO. 47-103-03006

STATE COUNTY PERMIT STATE COUNTY PERMIT

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

LOCATION ELEVATION 1305.44' WATERSHED (HUC 10) OUTLET MIDDLE ISLAND CREEK

DISTRICT MAGNOLIA COUNTY WETZEL

QUADRANGLE PORTER FALLS 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER M. B. INVESTMENTS ACREAGE 88.09

OIL & GAS ROYALTY OWNER M. B. INVESTMENTS, ET AL LEASE ACREAGE 88.09

PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___ PLUG OFF OLD FORMATION ___
 PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) ASDRILLED

PLUG & ABANDON ___ CLEAN OUT & REPLUG ___

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,604' TMD: 17,622'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER

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

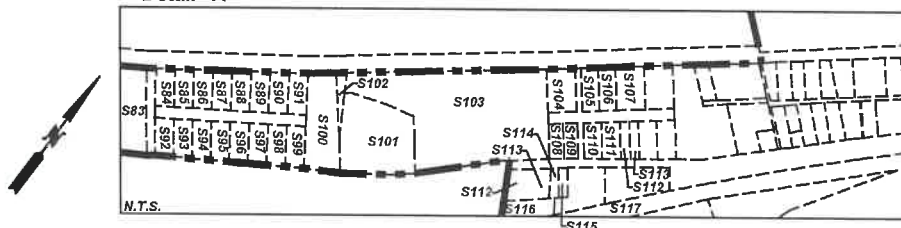
10/14/2022

COUNTY NAME PERMIT

form ww6

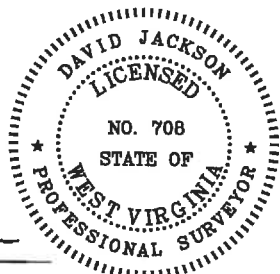
LACKAWANNA LEASE
WELL 3H
875.41 ± ACRES

Detail "A"



SURFACE HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,384,049.34 E) 512,301.60
LANDING POINT 1 UTM. NAD83, ZONE 17 IN METERS N) 4,383,854.26 E) 512,396.85
BOTTOM HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,386,556.16 E) 510,836.86

RECEIVED
Office of Oil and Gas
SEP 30 2022
WV Department of
Environmental Protection



P.S.
708

David L Jackson

10/14/2022



TUG HILL
OPERATING

OPERATOR'S
WELL #: LACKAWANNA 3H
DISTRICT: Magnolia
COUNTY: Wetzel
STATE: WV
API #: 47-103-03006

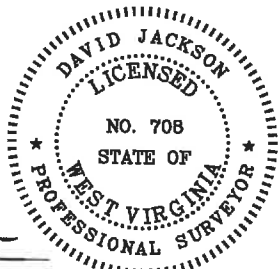
WELL PLAT
PAGE 2 OF 3
DATE: 05/26/2021

form wv6

**LACKAWANNA LEASE
WELL 3H
875.41 ± ACRES**

Number	TAX MAP-PARCEL	SURFACE OWNER	ACRES
S1	08-12-134	M. B. Investments	88.09
S2	08-12-134.1	Raymond L. & Elizabeth Pibble	2.14
S3	08-12-134.3	M. B. Investments	5.55
S4	08-17-04	M. B. Investments	46.75
S5	08-12-109.1	M. B. Investments	10.0019
S6	08-12-108	M. B. Investments	24.0
S7	08-12-70	M. B. Investments	50.37
S8	08-12-14	Thomas & Helena McLaughlin	10.5
S9	08-12-40	Timothy Doty & Helena McLaughlin	8.83
S10	08-12-41	Michael A. & Annabelle Corbin & Paul E. & Christine Weaver	3.39
S11	08-12-42	Shriver Cemetery	1.0
S12	08-12-43.1	Michael A. & Annabelle Corbin & Paul E. & Christine Weaver	22.25
S13	08-12-15	Michael A. & Annabelle Corbin & Paul E. & Christine Weaver	2.6
S14	08-12-44	Richard L. Armstrong	8.0
S15	08-12-5.1	Michael & Joyce Durig	4.0
S16	08-12-16	Russell Dalrymple, et al	11.87
S17	08-12-08	Calvin Dean Cross	14.96
S18	08-12-17	Virgie E. Kuhns	1.25
S19	08-12-43.2	Michael A. & Annabelle Corbin & Paul E. & Christine Weaver	7.25
S20	08-12-43.5	M. B. Investments	8.774
S21	08-12-43.4	Michael A. & Annabelle Corbin & Paul E. & Christine Weaver	0.996
S22	08-12-43.3	Geraldine C. Cross	0.13
S23	08-12-111	WV Conservation Comm.	1.0
S24	08-12-112.1	M. B. Investments	0.82
S25	08-12-110	Lackawanna Transport Company	3.59
S26	08-12-72	Paul E. & Christine Weaver	0.50
S27	08-12-124	M. B. Investments	2.23
S28	08-12-123	Lackawanna Transport Company	18.55
S29	08-12-134.2	M. B. Investments	0.23
S30	08-12-134.4	M. B. Investments	3.51
S31	08-12-113	Jacob Presley Morgan III	16.30
S32	08-12-126	Jacob Presley Morgan III	16.06
S33	08-12-127	Jacob Presley Morgan III	10.0
S34	08-12-136	Jacob Presley Morgan III	28.25
S35	08-12-135	Timothy J. Haynes & Gary W. Wooffer	21.0
S36	02-01-5.2	Mark K. & Teresa J. Loy	2.94
S37	02-01-5.3	Mark K. & Teresa J. Loy	1.939
S38	02-01-5.1	Mark K. & Teresa J. Loy	4.56
S39	05-06-01	Mark K. & Teresa J. Loy	2.37
S40	02-01-05	Daniel A. Witschey	21.5
S41	08-12-121	Charles E. & Mary Elizabeth Clegg	31.94
S42	08-12-129	Charles E. & Mary Elizabeth Clegg	20.0
S43	08-12-05	Michael Lloyd & Joyce Diana Durig	30.5
S44	08-17-07	Lackawanna Transport Company	21.37
S45	08-17-7.1	Lackawanna Transport Company	25.64
S46		CSX Railroad	
S47	Ohio River	State of WV, Department of Commerce, Division of Natural Resources	
S48	Rt 180	State Road Commission	15.96
S49	08-12-106	Thomas C. Pennell	15.96
S50	08-12-106.1	Thomas R. & Tamera D. Pennell	14.04
S56	08-11-61	Hunter B. McAdams & Doug McAdams	7.61
S61	08-11-19	Lisa Straight & Edwin Rial	6.3
S62	08-11-39.1	William L. & Beulah Talkington	1.83
S63	08-11-41	A+A Supply, LLC	1.83
S64	08-11-35	Lisa Straight & Edwin Rial	5.9
S65	08-12-11	Calvin T. Hedrick	6.64
S66	08-12-11.1	Larry D. McCaman	0.25
S67	08-12-11.3	Larry McCaman	0.807
S68	08-12-11.4	Paul Andrew James Simmons, Jr.	1.94
S69	08-12-01	Mount Clare Properties, Inc	50.71
S70	08-07-105	Mount Clare Properties, Inc	116.08
S71	08-12-11.2	Ascent Resources Marcellus Minerals, LLC	1.811
S72	08-12-13	M. B. Investments	8.18
S73	08-12-139	Department of Public Safety	1.37
S75	08-07-87.2	H. Lee Scott Jr.	1.110
S76	08-07-87.1	H. Lee Scott Jr.	0.95
S77	08-07-87	H. Lee Scott Jr. & Stephen A. & Betty A. Davis	2.221

Number	TAX MAP-PARCEL	SURFACE OWNER	ACRES
S78	08-07-88	Living Quarters, LLC	1.08
S79	08-07-89.3	Living Quarters, LLC	0.94
S80	08-07-89.2	Barbara S. Nice	0.89
S81	08-07-89	Barbara S. Nice	0.40
S82	08-07-89.1	Barbara S. Nice	0.40
S83	08-07-90	Barbara Shank	0.70
S84	08-07-91	Dennis Phillips	0.20
S85	08-07-92	Karen D. Pugh	0.20
S86	08-07-93	Darrell S. & Diana Lynn Hartwig	0.20
S87	08-07-94	Ronald D. & Carole Dawson	0.21
S88	08-07-95	Debra Barrile, (Leslie L. Debolt, land contract)	0.21
S89	08-07-96	Rita E. Barrick	0.21
S90	08-07-102	Michael Vaughn Skeen & Patricia Ann Sawyer	0.22
S91	08-07-103.1	Charlotte M. Adams	0.22
S92	08-07-97	David Ray Christian	0.20
S93	08-07-98	David Ray Christian	0.20
S94	08-07-98.1	Lionel Kent, Helen A. Potts & Deloris Potts (Life)	0.20
S95	08-07-99	Lionel Kent, Helen A. Potts & Deloris Potts (Life)	0.20
S96	08-07-100	James J. & Carol Clark	0.21
S97	08-07-101	Doris A. Fannin & Richard S. Williamson	0.21
S98	08-07-102.1	Ronald E. Jr. & Lori J McCoy	0.21
S99	08-07-103	Michael L. & Joyce D. Durig	0.21
S100	08-07-104	Lisa Denise Bridge	0.12
S101	08-07-106.1	Tiona Henthorn	1.49
S102	08-07-104.1	Lisa Denise Bridge	0.06
S103	08-07-108	Route 2 South, LLC	4.33
S104	08-07-107	Route 2 South, LLC	0.36
S105	08-07-108	Donald W. Owens, Jr.	0.21
S106	08-07-109	Douglas E. & Amber L. Straight	0.21
S107	08-07-110	Allen R. & Malinda J. Laugh	0.34
S108	08-07-114	William & Ruth Leek	0.14
S109	08-07-115	William J. Leek	0.14
S110	08-07-116	Betty J. Yoho (Life), Sandra M. Hardman	0.20
S111	08-07-117	Jerry W. & Elizabeth Southerly	0.21
S112	08-07-123.1	William & Ruth Ann Leek	0.23
S113	08-07-123.2	William & Ruth Ann Leek	0.01
S114	08-07-124	William & Ruth Ann Leek	0.08
S115	08-07-125	William & Ruth Ann Leek	0.07
S116	08-07-129	Mary Burton, et al	1.10
S117	08-07-127	William Sherman & Ruth Ann Leek	0.49
S118	08-07-131.3	Nancy J. Todd	9.726
S119	08-07-131.1	Edgar W. Whiteman, Jr.	1.25
S120	08-07-131.4	Nancy J. Todd	0.989
S121			
S122	08-12-03	O. Terrell Coffield Family Trust	0.98
S123	08-12-4.1	Whiteman Development Co., LLC & PRN, LLC	2.59
S124	08-07-142	Pamela E. Weisenbarger	1.35
S125	08-07-142.1	Thomas W, II & Teena B. Emch	1.35
S126	08-07-160	Frank L. Price, Jr.	1.28
S127	08-07-144	Roger Hall, et al	5.58
S128	08-07-143	Dominic D. Yost	1.0
S129	08-07-144.1	Donald J. & Debby J. Powell	2.25
S130	08-07-137	462 Properties, LLC	1.836
S131	08-07-137.1	Anna E. McPeak	0.94
S134	08-07-145	Lois J. Day	8.008
S135	08-07-145.5	Jodi Forni	3.65
S136	08-07-145.3	Jodi Forni	2.641
S137	08-07-145.2	David J. Jackson,(Life), James & Ruth Jackson	0.813
S138	08-12-06	David J. Jackson,(Life), James & Ruth Jackson	1.74
S139	08-12-07	David J. Jackson,(Life), James & Ruth Jackson	0.35
S140	08-07-126	William Sherman & Ruth Ann Leek	0.30
S141	08-07-117.1	Donald L. Larsen, Jr.	0.21
S142	08-07-119	Joshua D. Larsen, Jr.	0.22
S143	08-07-111	Allen R. & Malinda J. Laugh	0.34
S144	08-07-120	William D. Lawrence	1.51
S145	08-07-112	Charles D. & Shirley L. White	0.17
S146	08-07-113	Joe's Tire III, LLC	0.60
S147	08-07-122	Moser & Moser Associates, Inc.	0.50
S148	08-07-121	Moser & Moser Associates, Inc.	0.10
S149	08-07-123	M.B. Investments	8.50



P.S. 708

David L Jackson

RECEIVED
Office of Oil and Gas
SEP 30 2022
WV Department of
Environmental Protection

10/14/2022



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: LACKAWANNA 3H
DISTRICT: Magnolia
COUNTY: Wetzel
STATE: WV
API #: 47-103-03006

WELL PLAT
PAGE 3 OF 3
DATE: 05/26/2021