

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

API 47 - 051 - 01978 County Marshall District Franklin
Quad Powhatan Point 7.5' Pad Name Bryan Field/Pool Name _____
Farm name CNX Land Resources, Inc. Well Number Bryan N-7HM
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 4,402,891.75 Easting 519,134.22
Landing Point of Curve Northing 4,403,423.83 Easting 519,845.63
Bottom Hole Northing 4,406,838.75 Easting 517,878.75

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Elevation (ft) 1191.6' 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 2/7/2018 Date drilling commenced 9/21/2018 Date drilling ceased 3/10/2019
Date completion activities began 8/27/2020 Date completion activities ceased 9/12/2020
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 831' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1595' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 729-735', 824-830' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

API 47-051 - 01978 Farm name CNX Land Resources, Inc. Well number Bryan N-7HM

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"	925'	NEW	54.5#	N/A	Y
Coal	17 1/2"	13 3/8"	925'	NEW	54.5#	N/A	Y
Intermediate 1	12 1/4"	9 5/8"	2,657'	NEW	36#	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	20,766'	NEW	20#	N/A	Y
Tubing		2 3/8"	10,383'	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		15.6	1.19		0	8
Surface	A	1024	15.6	1.19	1226	0	8
Coal	A	1024	15.6	1.19	1226	0	8
Intermediate 1	A	1062	15.6	1.19	1259	0	8
Intermediate 2							
Intermediate 3							
Production	A	5003	14.5	1.17	5879	0	8
Tubing							

Drillers TD (ft) 20,806' 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) 6,726'

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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 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 _____

API 47- 051 - 01978 Farm name CNX Land Resources, Inc. Well number Bryan N-7HM

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>MARCELLUS</u>	<u>6530' - 6373'</u> TVD	<u>7737' - 20806'</u> MD

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 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)
	<u>0</u>		<u>0</u>		
<u>see attached</u>					

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 _____

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

Stimulating Company PRO-FRAC
Address 333 Shops Boulevard City Willow Park State TX Zip 76087

Please insert additional pages as applicable.

Completed by Amy L. Morris Telephone 304-376-0111
Signature *Amy L. Morris* Title Permitting Specialist Date 12-28-2020

Bryan N-7HM
PEFORATION RECORD

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	8/27/2020	20365	20511	48	Marcellus
2	8/27/2020	20189	20336	48	Marcellus
3	8/27/2020	20014	20160	48	Marcellus
4	8/28/2020	19839	19985	48	Marcellus
5	8/28/2020	19663	19809	48	Marcellus
6	8/28/2020	19488	19634	48	Marcellus
7	8/28/2020	19312	19459	48	Marcellus
8	8/29/2020	19137	19283	48	Marcellus
9	8/29/2020	18962	19108	48	Marcellus
10	8/29/2020	18786	18932	48	Marcellus
11	8/29/2020	18611	18757	48	Marcellus
12	8/30/2020	18435	18582	48	Marcellus
13	8/30/2020	18260	18406	48	Marcellus
14	8/30/2020	18085	18231	48	Marcellus
15	8/30/2020	17909	18055	48	Marcellus
16	8/31/2020	17734	17880	48	Marcellus
17	8/31/2020	17558	17705	48	Marcellus
18	8/31/2020	17383	17529	48	Marcellus
19	8/31/2020	17208	17354	48	Marcellus
20	8/31/2020	17032	17178	48	Marcellus
21	9/1/2020	16857	17003	48	Marcellus
22	9/1/2020	16681	16828	48	Marcellus
23	9/1/2020	16506	16652	48	Marcellus
24	9/1/2020	16331	16477	48	Marcellus
25	9/2/2020	16155	16301	48	Marcellus
26	9/2/2020	15980	16126	48	Marcellus
27	9/2/2020	15804	15951	48	Marcellus
28	9/2/2020	15629	15775	48	Marcellus
29	9/3/2020	15454	15600	48	Marcellus
30	9/3/2020	15278	15424	48	Marcellus
31	9/3/2020	15103	15249	48	Marcellus
32	9/3/2020	14927	15074	48	Marcellus
33	9/3/2020	14752	14898	48	Marcellus
34	9/4/2020	14577	14723	48	Marcellus
35	9/4/2020	14401	14547	48	Marcellus
36	9/4/2020	14226	14372	48	Marcellus
37	9/4/2020	14050	14197	48	Marcellus
38	9/5/2020	13875	14021	48	Marcellus
39	9/5/2020	13700	13846	48	Marcellus
40	9/5/2020	13524	13670	48	Marcellus
41	9/6/2020	13349	13495	48	Marcellus

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42	9/6/2020	13173	13320	48	Marcellus
43	9/6/2020	12998	13144	48	Marcellus
44	9/6/2020	12823	12969	48	Marcellus
45	9/6/2020	12647	12793	48	Marcellus
46	9/7/2020	12472	12618	48	Marcellus
47	9/7/2020	12296	12443	48	Marcellus
48	9/7/2020	12121	12267	48	Marcellus
49	9/7/2020	11946	12092	48	Marcellus
50	9/7/2020	11770	11916	48	Marcellus
51	9/8/2020	11595	11741	48	Marcellus
52	9/8/2020	11419	11566	48	Marcellus
53	9/8/2020	11244	11390	48	Marcellus
54	9/8/2020	11069	11215	48	Marcellus
55	9/9/2020	10893	11039	48	Marcellus
56	9/9/2020	10718	10864	48	Marcellus
57	9/9/2020	10542	10689	48	Marcellus
58	9/9/2020	10367	10513	48	Marcellus
59	9/9/2020	10192	10338	48	Marcellus
60	9/9/2020	10016	10162	48	Marcellus
61	9/10/2020	9841	9987	48	Marcellus
62	9/10/2020	9665	9812	48	Marcellus
63	9/10/2020	9490	9636	48	Marcellus
64	9/10/2020	9315	9461	48	Marcellus
65	9/11/2020	9139	9285	48	Marcellus
66	9/11/2020	8964	9110	48	Marcellus
67	9/11/2020	8788	8935	48	Marcellus
68	9/11/2020	8613	8759	48	Marcellus
69	9/11/2020	8438	8584	48	Marcellus
70	9/12/2020	8262	8408	48	Marcellus
71	9/12/2020	8087	8248	48	Marcellus
72	9/12/2020	7911	8072	48	Marcellus
73	9/12/2020	7736	7897	48	Marcellus

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STIMULATION INFORMATION PER STAGE

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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)
1	90	7929	8457	5182	434120	8350	0
2	86	7453	4787	4836	442800	8796	0
3	86	7378	4888	4887	449140	8870	0
4	90	7519	4907	4825	451100	8704	0
5	90	7281	5507	4900	446400	8599	0
6	90	7268	4979	4610	431743	8698	0
7	90	7190	4866	5140	444930	9542	0
8	90	7428	5664	4656	438020	8507	0
9	90	7345	5000	7620	442140	8525	0
10	86	7016	5349	4723	450700	8904	0
11	87	7154	4672	4698	442860	8748	0
12	89	7374	5222	4737	443840	8500	0
13	90	7228	5062	4894	463660	8732	0
14	89	7203	5451	4733	450380	8855	0
15	90	7391	5294	4263	437740	10909	0
16	90	7472	5655	5217	446940	8540	0
17	90	7696	4982	4552	443880	8444	0
18	89	7493	5456	4735	453180	8549	0
19	88	7196	5077	4091	450040	8674	0
20	87	7135	5438	4687	444500	8685	0
21	89	7283	4978	4982	446820	8553	0
22	89	7373	5733	4603	435540	8407	0
23	87	7275	5254	4572	448200	8804	0
24	90	7250	5968	4750	445540	8546	0
25	90	7325	5485	4462	442580	8537	0
26	90	7276	5268	4544	445000	8495	0
27	90	7214	5252	4677	453980	8603	0
28	90	7520	5416	5799	447780	8520	0
29	90	7114	5255	4930	443560	8417	0
30	90	7089	5263	5449	437080	8337	0
31	90	7051	5099	4969	449940	8501	0
32	90	7125	5246	4719	440620	8411	0

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	6971	4916	4340	449610	8550	0
34	90	7313	5161	4218	447980	8446	0
35	89	7212	5524	4719	437920	8436	0
36	90	7082	5109	4579	437820	8407	0
37	90	7313	4855	4463	428700	8417	0
38	89	7333	5362	4502	448700	8493	0
39	90	7360	5352	4355	441600	8449	0
40	89	7521	5251	3769	440480	9102	0
41	90	7059	5383	4326	436380	10395	0
42	89	7209	5756	4871	435280	8254	0
43	90	7005	5260	4801	440180	8278	0
44	90	7053	5241	4770	440000	8311	0
45	89	7267	5674	4382	383520	7830	0
46	90	6809	5100	4799	440020	8328	0
47	90	6873	5726	4360	447280	8656	0
48	90	6659	4969	4465	438440	8359	0
49	90	6837	5659	4584	440540	8344	0
50	90	6878	5455	4685	436160	8218	0
51	90	6629	5409	4528	443880	8231	0
52	89	6570	5497	4816	437200	8131	0
53	90	6578	5482	4432	434040	8088	0
54	88	6398	7045	4484	447280	8279	0
55	90	6456	5047	4349	451620	8330	0
56	90	6859	4866	4306	441420	8187	0
57	90	6535	5234	4428	439740	8221	0
58	90	6629	6262	4600	438060	8094	0
59	90	6502	6141	4541	444160	8238	0
60	89	6627	5705	4719	443980	8181	0
61	90	6548	5592	5246	445660	8191	0
62	90	6600	5620	4568	445620	8241	0
63	89	6647	6455	3945	387420	7874	0
64	89	6346	5391	4369	448140	8027	0
65	90	6420	4817	5325	440040	9209	0
66	90	6506	5101	4918	446680	8334	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)
67	89	6609	5536	4361	402100	7932	0
68	88	6451	7380	3609	446180	8254	0
69	89	6458	6192	4411	441262	7987	0
70	90	6368	5200	4803	442520	8200	0
71	90	6366	4602	4018	439220	8251	0
72	90	6209	6378	4523	443000	7989	0
73	89	6110	5409	4504	445200	8122	0

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 for the

BRYAN N-7HM

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	1934	2024	1939	2032	Sandstone
Big Lime	2024	2094	2032	2105	Limestone
Big Injun	2094	2378	2105	2396	Sandstone
Weir	2378	2573	2396	2594	Sandstone
Berea	2573	2918	2594	2948	Sandstone
Gordon	2918	2972	2948	3005	Sandstone
Fifty Foot	2972	3520	3005	3583	Sandstone
Speechley	3520	4942	3583	5369	Sandstone
Benson	4942	5317	5369	5867	Sandstone
Alexander	5317	5883	5867	6599	Siltstone
Rhinestreet	5883	6313	6599	7182	Black shale
Middlesex	6313	6388	7182	7320	Black shale
Geneseo/Burkett	6388	6413	7320	7371	Black shale
Tully	6413	6451	7371	7451	Limestone
Hamilton	6451	6498	7451	7574	Grey shale
Marcellus	6498	-	7574	-	Black shale

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Tug Hill Operating LLC
Well: Bryan N-07HM (Slot A)
Site: Bryan Pad
Project: Marshall County, West Virginia.
Design: rev6

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1228.00	0.00	0.00	1228.00	0.00	0.00	0.00	0.00	0.00	KO{ Begin 2°/100' build
3	1828.00	12.00	68.23	1823.62	23.22	58.14	2.00	68.23	4.58	Begin 12.00° tangent
4	2957.05	12.00	68.23	2928.00	110.28	276.14	0.00	0.00	21.76	Begin 2°/100' build/turn
5	4378.24	40.42	69.10	4190.02	334.07	855.71	2.00	1.18	60.13	Begin 40.42° tangent
6	6725.51	40.42	69.10	5976.98	877.09	2277.54	0.00	0.00	148.54	Begin 8°/100' build/turn
7	7200.34	50.00	16.08	6323.10	1115.57	2479.17	8.00	-96.15	315.01	Begin 10°/100' build/turn
8	7785.82	91.00	330.17	6523.97	1630.59	2387.60	10.00	-57.33	833.64	Begin 91.00° lateral
9	20833.13	91.00	330.17	6297.00	12948.04	-4100.55	0.00	0.00	3581.84	PBHL/TD 20833.13 MD/6297.00 TVD

ANNOTATIONS SURVEYS

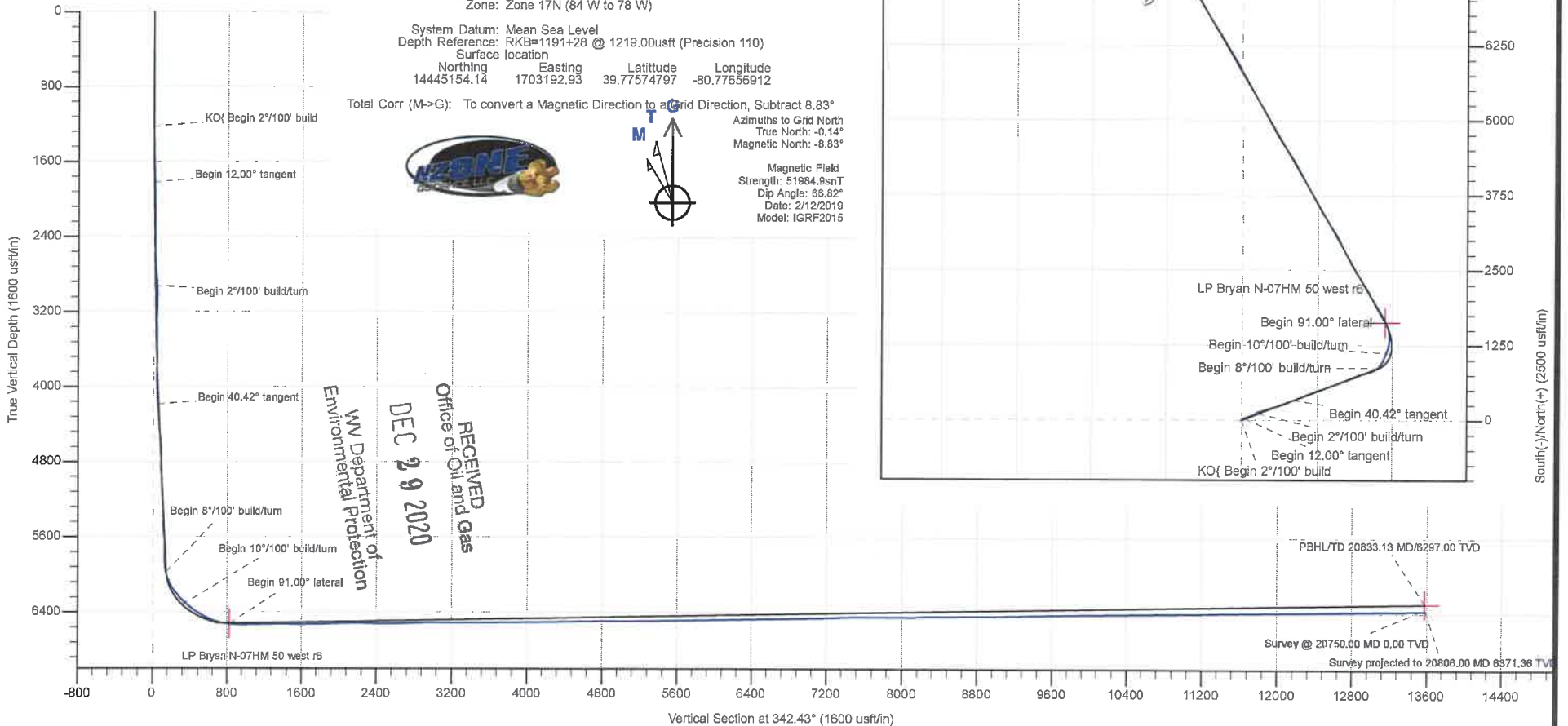
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Annotation
269.00	0.48	316.34	269.00	0.82	-0.78	1.01	MWD surveys
20750.00	91.52	330.60	6372.84	12900.86	-4091.53	13533.95	Survey @ 20750.00 MD 0.00 TVD
20806.00	91.52	330.60	6371.36	12949.43	-4119.01	13588.74	Survey projected to 20806.00 MD 6371.36 TVD

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=1191+28 @ 1219.00usft (Precision 110)
 Surface location
 Northing 14445154.14 Easting 1703192.93 Latitude 39.77574797 Longitude -80.77656912

Total Corr (M>G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.83°
 Azimuths to Grid North
 True North: -0.14°
 Magnetic North: -8.83°

Magnetic Field
 Strength: 51984.9snT
 Dip Angle: 65.82°
 Date: 2/12/2019
 Model: IGRF2015



Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/27/2020
Job End Date:	9/12/2020
State:	West Virginia
County:	Marshall
API Number:	47-051-01978-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Bryan N 7HM
Latitude:	39.77574797
Longitude:	-80.77656912
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,371
Total Base Water Volume (gal):	26,045,292
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
Water	Tug Hill Operating	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.73793	None
Sand (40/70 White Proppant)	ProFrac	Proppant	Silica Substrate	14808-60-7	100.00000	8.67711	None
Sand (100 Mesh Proppant)	ProFrac	Proppant	Silica Substrate	14808-60-7	100.00000	3.02034	None
Sand (30/50 White Proppant)	ProFrac	Proppant	Silica Substrate	14808-60-7	100.00000	1.15664	None
Hydrochloric Acid (7.5%)	PVS	Acidizing	Water	7732-18-5	85.00000	0.24355	None
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	37.00000	0.10602	None
StimStream FR 9800	Chemstream	Friction Reducer	Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01857	None
			Butene, homopolymer	9003-29-6	25.00000	0.01857	None
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00223	None

MC MX 9-4743	Multi-Chem	Biocide					
			Sodium Nitrate	7631-99-4	60.00000	0.02206	None
LD-7750W	Multi-Chem	Scale Inhibitor					
			Methanol	67-56-1	60.00000	0.00502	None
			Phosphonic Acid Salt	Proprietary	5.00000	0.00042	None
ProFE 105	ProFrac	Iron Control					
			Citric Acid	77-92-9	100.00000	0.00112	None
ProHib 100	ProFrac	Acid Inhibitor					
			2-Propyn-1-ol compound w/ methyloxirane	38172-91-7	15.00000	0.00014	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					
			Water	7732-18-5	85.00000	0.24355	
			Butene, homopolymer	9003-29-6	25.00000	0.01857	
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00223	
			Phosphonic Acid Salt	Proprietary	5.00000	0.00042	

* 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)

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BRYAN LEASE BRYAN WELL N-7HM 921.878± ACRES

Kentucky Power Company
& A.E.F. Generation
Resources, Inc.
05-5-12
165.0

John F. Arruda, Et Ux
05-5-4.1
1,399

Edwin C. Miller
05-08-07
180.31 Ac.

James E. Jackson
Jr. et ux
05-08-09
89.723

Edwin Miller
05-09-31
32.10Ac.

Karen Reed,
et al
05-11-21
112.67 Ac.

0688-P
M(17)

Lionel L. Persinger,
Et Ux
05-12-12.1
148.09 Ac.

Lionel L. Persinger, Et Ux
05-13-15
93.0 Ac.

Hiram's Estate
Family, LTD LLP
02000 05-11-14
(16) 158.054 Ac.

Joseph J. Kramer, Et Ux
05-16-04
41.106 Ac.

Joseph J. Kramer, Et Ux
06-16-05
35 Ac.

John David Patrook et ux
05-16-12
150.23 Ac.

Mark Stanley Ruckman
05-15-10
183.79 Ac.

John Swierkos
05-16-25
79.04 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-05
62.07 Ac.

John Swierkos
05-16-06
134.05 Ac.

John Swierkos
05-16-04
100 Ac.

John Swierkos
05-16-03
71.205 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

John Swierkos
05-16-04
0.96 Ac.

14" RED MAPLE
14" RED MAPLE
SCALE 1"=600'

TOP HOLE LATITUDE: 39°47'30"
BOTTOM HOLE LATITUDE: 39°50'00"

- S-11HM(02022) O
- S-9HM(01979) O
- S-9HM(01980) O
- S-10HM(02006) O
- N-4HM(02076) O
- 1H(01340) O
- N-2HM(01889) O
- N-3HM(02000) O
- N-7HM(01978) O
- N-6HM(01977) O
- N-5HM(02077) O
- N-14HU(02031) O
- N-13HU(02030) O
- N-12HU(02026) O

DETAIL SKETCH "A"
SCALE 1"=800'

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

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	N 67°13' E	105.40'	719.54'	105.49'
C2	N 61°35' E	47.65'	151.74'	47.85'
C3	N 53°39' E	48.53'	373.18'	48.56'
C4	N 73°21' E	141.32'	1547.08'	141.37'
C5	N 68°33' E	132.73'	801.06'	132.88'
C6	N 71°02' E	532.87'	7503.57'	532.98'
C7	N 46°36' E	183.36'	238.76'	188.20'
C8	N 23°30' E	278.85'	2393.83'	279.01'

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,402,891.75
E) 519,134.22

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,403,423.83
E) 519,845.63

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,406,838.75
E) 517,878.75

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

LINE	BEARING	DISTANCE
L1	N 42°54' E	2906.37'
L2	N 83°09' E	1982.75'
L3	N 54°45' E	30.61'
L4	N 74°48' E	68.94'
L5	N 69°14' E	31.95'
L6	N 77°52' E	85.80'
L7	N 71°39' E	81.62'
L8	N 74°30' E	83.84'
L9	N 69°00' E	474.55'
L10	N 70°47' E	496.09'

FILE NUMBER _____

DRAWING NUMBER BRYAN_WP_N-7HM

SCALE 1" = 2500'

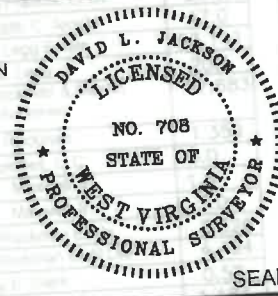
MINIMUM DEGREE OF ACCURACY 1/200

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
304-623-5851



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

DATE: OCTOBER 27, 2020

OPERATORS WELL NO. BRYAN N-7HM

API WELL NO. 47-051-01978

STATE WV COUNTY MARSHALL PERMIT SEE WW-6A1 FORM

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

LOCATION ELEVATION 1191.6' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall

QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 FORM

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98

OIL & GAS ROYALTY OWNER MICHAEL R. BRYAN - SEE WW 6A1 OPERATOR'S LEASE ACREAGE 81.98

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

PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) As Drilled

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,371' TMD: 20,806'

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

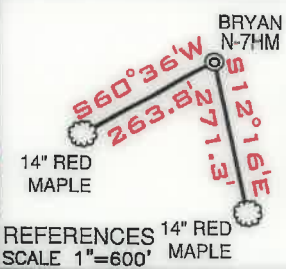
BRYAN LEASE WELL N-7HM 921.878± ACRES

Kentucky Power Company
& A.E.P. Generation
Resources, Inc.
05-5-12
165.0

OP HOLE LATITUDE: 39°47'30"
BOTTOM HOLE LATITUDE: 39°50'00"

- S-11HM(02022) ○
- S-8HM(01979) ○
- S-8HM(01980) ○
- S-10HM(02006) ○
- N-4HM(02076) ○
- 1H (01340) ○
- N-2HM(01995) ○
- N-3HM(02000) ○
- N-7HM(01978) ○
- N-6HM(01977) ○
- N-5HM(02077) ○
- N-14HU(02031) ○
- N-13HU(02030) ○
- N-12HU(02029) ○

DETAIL
SKETCH "A"
SCALE 1"=800'



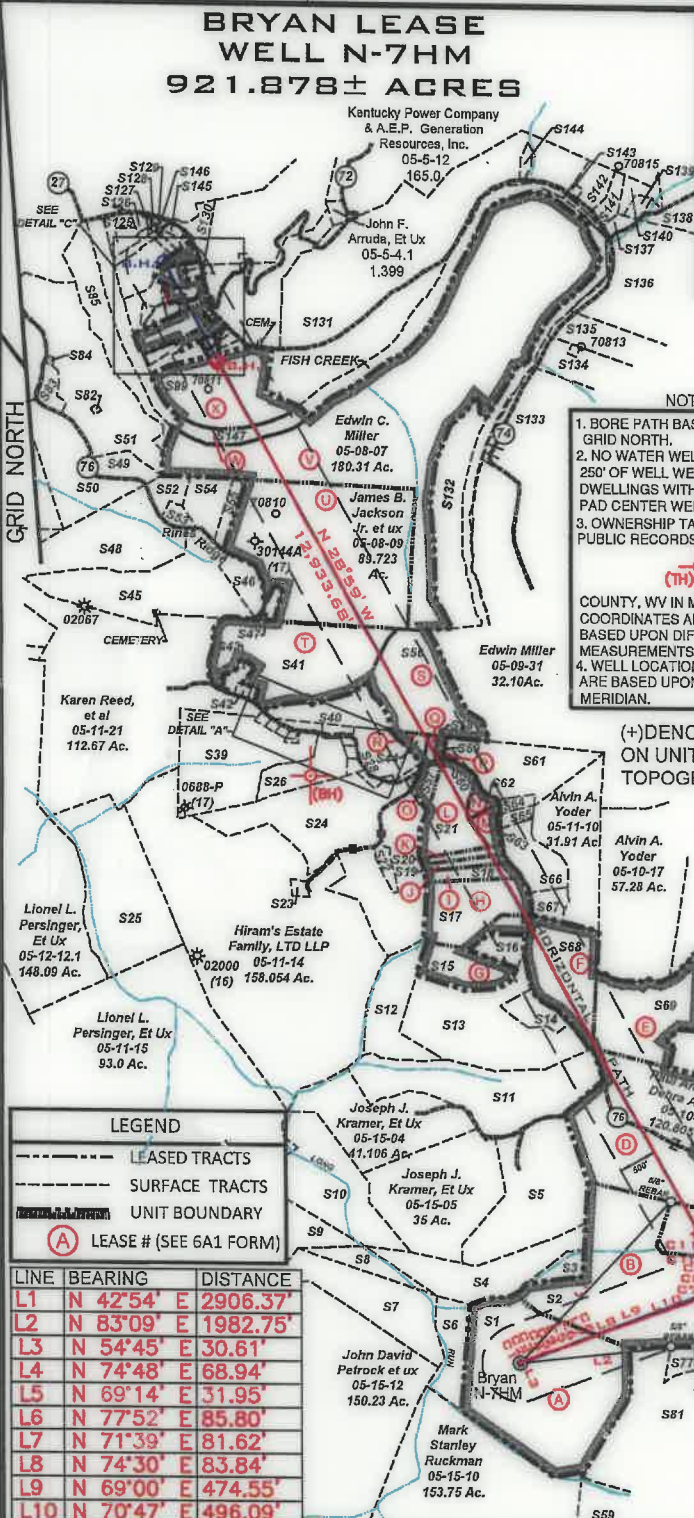
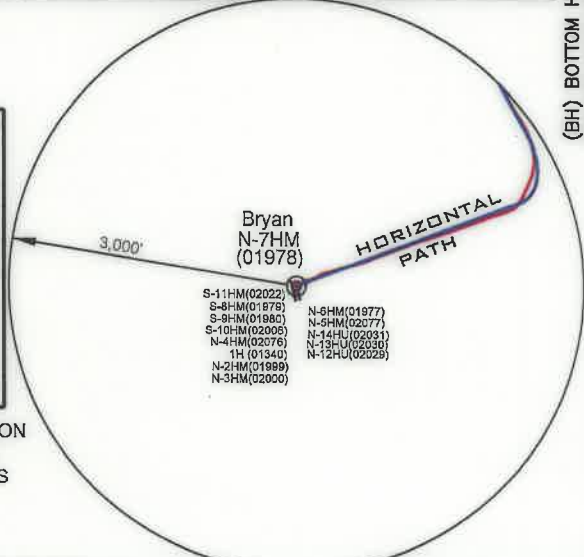
REFERENCES 14" RED
MAPLE
SCALE 1"=600' MAPLE

(BH) 11,606'
(TH) 7,523'
(BH) 5,030'
(TH) 5,818'

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

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS



CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
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C2	N 61°35' E	47.65'	151.74'	47.85'
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C7	N 46°36' E	183.36'	238.76'	188.20'
C8	N 23°30' E	278.85'	2393.83'	279.01'

LEGEND

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

LINE	BEARING	DISTANCE
L1	N 42°54' E	2906.37'
L2	N 83°09' E	1982.75'
L3	N 54°45' E	30.61'
L4	N 74°48' E	68.94'
L5	N 69°14' E	31.95'
L6	N 77°52' E	85.80'
L7	N 71°39' E	81.62'
L8	N 74°30' E	83.84'
L9	N 69°00' E	474.55'
L10	N 70°47' E	496.09'

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,402,891.75
E) 519,134.22

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,403,423.83
E) 519,845.63

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,406,838.75
E) 517,878.75

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C9	N 03°24' E	237.71'	532.69'	239.73'
C10	N 16°33' W	175.22'	946.51'	175.47'
C11	N 27°09' W	133.82'	1478.85'	133.87'

FILE NUMBER _____

DRAWING NUMBER BRYAN_WP_N-7HM

SCALE 1" = 2500'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

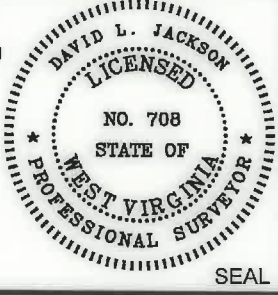
I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

David L Jackson

P.S. 708



JACKSON SURVEYING INC.
P.O. Box 1460
Clarksburg, WV 26302
304-623-6851



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

DATE: OCTOBER 27, 2020

OPERATORS WELL NO. BRYAN N-7HM
API WELL NO. 47-051-01978

STATE WV COUNTY MARSHALL PERMIT 81978

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

LOCATION ELEVATION 1191.6' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall

QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98

OIL & GAS ROYALTY OWNER MICHAEL R. BRYAN - SEE WW 6A1 LEASE ACREAGE 81.98

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

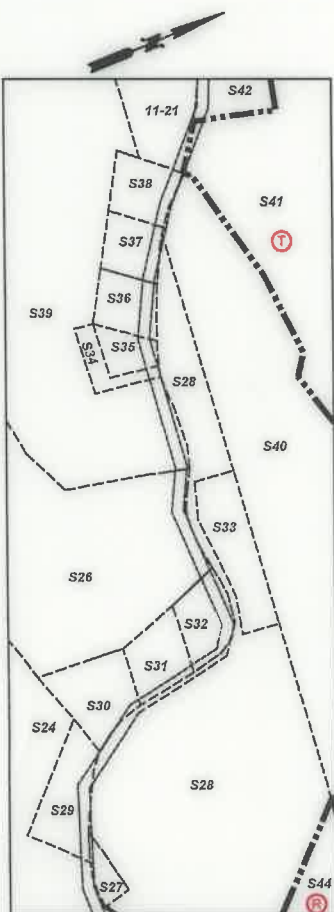
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,371' TMD: 20,806'

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

COUNTY NAME
PERMIT

**BRYAN LEASE
WELL N-7HM
921.878± ACRES**



DETAIL "A"
SCALE 1"=500'



DETAIL "C"
SCALE 1"=500'



DETAIL "B"
SCALE 1"=250'

SURFACE HOLE

UTM. NAD83, ZONE 17
IN METERS

N) 4,402,891.79

E) 519,134.24

LANDING POINT 1

UTM. NAD83, ZONE 17
IN METERS

N) 4,403,388.76

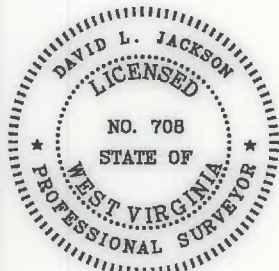
E) 519,861.96

BOTTOM HOLE

UTM. NAD83, ZONE 17
IN METERS

N) 4,407,228.96

E) 517,660.52



P.S.
708

David L Jackson



**TUG HILL
OPERATING**

OPERATOR'S

WELL #: Bryan N-7HM

DISTRICT: Franklin

COUNTY: Marshall

STATE: WV

API #: 047-051-01978

WELL PLAT

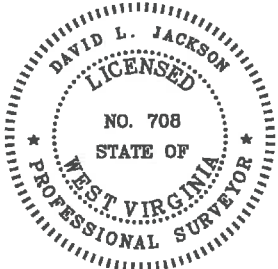
PAGE 2 OF 3

DATE: 10/27/2020

**BRYAN LEASE
WELL N-7HM
921.878± ACRES**

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	05-15-9	CNX Land Resources, Inc.	81.98
S2	05-15-8	Terry D. Rose, et ux	77.11
S3	05-15-7	Terry D. Rose, et ux	4.5
S4	05-15-6.1	Joseph J. Kramar, et ux	39.40
S5	05-15-6	Joseph J. Kramar, et ux	42.5
S6	05-15-13	CNX Land Resources, Inc.	11.0
S7	05-15-14	John David Petrock, et ux	25.0
S8	05-15-2	John David Petrock, et ux	5.0
S9	05-15-1	Marcus Sharp & David Schlabach, Hrs.	121.0
S10	05-15-3	Joseph J. Kramar, et ux	36.10
S11	05-11-12	Joseph J. Kramar, et ux	43.2188
S12	05-11-13	Joy D. Gartman & Arlin Gatts	12.29
S13	05-11-11.3	Herman D. Lantz	43.96
S14	05-11-11.1	Nellie Marie & Robert W. Spencer	5.813
S15	05-11-11.4	Brad M. & Amanda J. Blake	15.193
S16	05-11-11	Brad M. & Amanda J. Blake	5.0
S17	05-11-9	Edwin C. & Kimberly A. Miller	54.625
S18	05-11-9.9	Leonard L. Parsons, et ux	5.89
S19	05-11-9.6	Southern Country Farms, Inc	2.488
S20	05-11-9.5	Southern Country Farms, Inc	2.559
S21	05-11-9.3	Joseph M. & Steven Haught	16.3
S22	05-11-16.2	Joseph Haught	2.181
S23	05-11-14.1	Dennis F. Moore, et ux	1.056
S24	05-11-16	Keith E. Haught, et al	83.674
S25	05-12-11	Wesley R. Bryan & Wesley R. Bryan II	52.478
S26	05-11-17.2	Brenda & Michael Bryan	11.504
S27	05-11-5.1	James R. Anderson, et ux	0.205
S28	05-11-5	Kevin R. Corley, et ux	10.36
S29	05-11-16.1	Susan Marie Smith, (Life)	0.876
S30	05-11-25	Owen Michael Barr	0.598
S31	05-11-23	Owen Michael Barr	0.845
S32	05-11-24	Charles Edward Furbee, et ux	0.603
S33	05-11-5.2	Rickey Lynn & Victoria Rose Cross	1.0
S34	05-11-17.1	David Gray	0.297
S35	05-11-22	David Gray	0.353
S36	05-11-18	David E. Gray	0.569
S37	05-11-19	David E. Gray	0.532
S38	05-11-20	David E. Gray	0.569
S39	05-11-17	Kevin R. Corley, et ux	36.13
S40	05-11-3	Kevin R. Corley, et ux	13.18
S41	05-11-2	Walter C. Cheryl A. Rine	42.367
S42	05-11-2.1	Walter C. & Cheryl A. Rine	1.19
S43	05-11-2.2	Joshua A. Myers	2.193
S44	05-11-5.3	Robert Harris Arrick, et ux	3.0
S45	05-11-1.1	Larry W. Dunlap & Charles Lee Dunlap	34.405
S46	05-11-1.2	Jay A. Conner, et ux	5.824
S47	05-8-9.1	Scott E. Jackson, Tammy S. South & Marion Jackson	1.957
S48	05-11-1.4	Larry W. Dunlap, et al	32.493
S49	05-7-32	William N. & Virginia A. Roupe	4.2
S50	05-7-33	William N. Roupe	24.60
S51	05-7-31	William N. Roupe et ux	43.147
S52	05-11-1	William N. & Virginia A. Roupe	4.527
S53	05-11-1.6	Debra Morris	2.093
S54	05-11-1.7	William S. & Mary K. Adams	8.0
S55	05-11-1.5	Paul & Sandy Whitt	3.507
S56	05-11-4	David H. Arrick, et ux	31.5
S57	05-11-16.3	Kegan Michael Haught - Life	3.265
S58	05-11-6	Robert & Rebecca Arrick	1.29
S59	05-11-7	Baptist Cemetery	1.0
S60	05-11-8	Baptist Church	0.8
S61	05-11-9	Edwin C. & Kimberly A. Miller	54.625
S62	05-11-9.10	John A. & Janet L. Beucke	2.348
S63	05-11-9.2	Michael R. Bryan	3.143
S64	05-11-9.8	Sean F. Moore	2.070
S65	05-11-9.7	Sean F. Moore	2.026
S66	05-11-9.1	Jack Shephard Huggins Jr., et al	10.92
S67	05-11-9.4	Jack S. Huggins, et ux	4.129
S68	05-11-11.2	Wesley R. Bryan & Wesley R. Bryan II	25.031
S69	05-10-16.4	Melvin E. Jr. & Elizabeth Ferguson	30.87
S70	05-10-15.1	Donald T. Miller	2.095

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S71	05-16-3.2	Jimmy Lee Ostrander Jr., Sheena Lynn Ostrander & Brody Ray Ostrander	1.435
S72	05-16-3.1	Dennis Jackson, et ux	0.27
S73		Cemetery - No Deed	
S74	05-16-2	Christian Church	0.19
S75	05-16-1	Christian Church	0.50
S76	05-16-23.1	Ray E. Minor, et ux	2.0
S77	05-16-23.4	Michael R. & Brenda K. Bryan	3.0
S78	05-16-23.3	Greg & Christina Riddle	1.0
S79	05-16-24	Alan M. Beyser, et ux	1.083
S80	05-16-23.2	Alan M. Beyser, et ux	1.726
S81	05-16-23	CNX Land Resources, Inc.	60.138
S82	05-7-31.4	Grandview-Doolen PSD	0.23
S83	05-7-31.2	William N. Roupe Et Ux	3.304
S84	05-7-31.3	William N. & Virginia A. Roupe	0.230
S85	05-7-31.1	David L. & Lori M. Yoders	30.115
S86	05-8A-16	Jon David Fromhart	2.0
S87	05-8A-26	Albert James Anderson Jr.	1.605
S88	05-8A-27	Clarence S. Siburt, Et Ux	8.296
S89	05-8A-39	Barbara L. Daniels & Elaine Wills	3.223
S90	05-8A-38	William J. Gamble, Et Ux	0.354
S91	05-8A-40	Barbara L. Daniels & Elaine Wills	0.627
S92	05-8A-41	William J. Gamble, Et ux	0.046
S93	05-8A-37	William J. Gamble, Et Ux	0.706
S94	05-8A-42	Robert M. White	7.23
S95	05-8A-49	Raymond Scott, Jr. & Larriette	0.159
S96	05-8A-45	Raymond Scott, Jr. & Larriette	0.305
S97	05-8A-46	Barbara L. & Mary L. Rose	1.5
S98	05-8A-47	Barbara L. & Mary L. Rose	3.0
S99	05-8-4.1	Frances E. Nieman	33.46
S100	05-8A-53	Frances E. Nieman	0.422
S101	05-8A-52	Barbara L. & Mary L. Rose	0.59
S102	05-8A-48	Raymond Scott, Jr. + Larriette	2.12
S103	05-8A-36	William J. & Linda E. & Erin R. Gamble	1.031
S104	05-8A-33	Elaine Wills & Jeffrey D. Brooks	2.517
S105	05-8A-31	Randall K. Keener, Et Ux	2.346
S106	05-8A-28	Norman G. Johnson (Life)	2.0
S107	05-8A-24	Clarence Paul Siburt	0.653
S108	05-8A-23	Danny Lee & Leona May Darrah	0.738
S109	05-8A-25	Charles & Whitney Woods	2.6
S110	05-8A-14	Board Of Education	1.0
S111	05-8A-30	Randall Keith Keener, Et Ux	0.059
S112	05-8A-29	Catherine P. Rine	0.394
S113	05-8A-32	Jonathan David Bopp	0.580
S114	05-8A-34	Norman G Johnson, Et Ux (Life)	0.25
S115	05-8-3	Tammy L. Mitchell	35.07
S116	05-8-23	Robert L. & Donald Shields	0.46
S117	05-8A-35	Jared C. Sells	2.780
S118	05-8-4	C. Wayne Berisford	23.355
S119	05-8A-43	Charles G. Stein & Eva A. Wade	0.17
S120	05-8A-44	Charles G. Stein & Eva A Wade	0.18
S121	05-8A-50	Lucretia M. Harrison	0.277
S122	05-8A-51	Lucretia M. Harrison	0.210
S123	05-8A-54	David D. & Christine S. Daniels	0.68
S124	05-8A-54.1	David D. & Christine S. Daniels	0.69
S125	05-8A-15	June Morris	2.06
S126	05-8A-17	Isaac Luke Vansycoc	1.44
S127	05-8A-18	David D. & Christine S. Daniels	0.25
S128	05-8A-19	David D. & Christine S. Daniels	0.25
S129	05-8A-21	David D. & Christine S. Daniels	0.122
S130	05-8A-13	Letha I. Ruckman	2.993
S131	05-8-5	Richard L. Gatts (Life)	98.819
S132	05-8-8	James Edward Francis, Et Ux	28.3
S133	05-9-35	Lloyd C. & Judith C. Arnold	47.0
S134	05-9-2	James R. Legg Estate	23.141
S135	05-9-2.1	Jeffery L. Legg	20.5
S136	05-9-1	Sheldon Ray Ruckman & Marvin Edgar Ruckman	57.683
S137	05-9-1.2	Marvin E. Ruckman	1.359
S138	05-4-17	JPM Properties, LLC	5.0
S139	05-4-19	William L. Maxwell Jr.	1.5
S140	05-4-18	William L. Maxwell Jr.	3.0
S141	05-9-1.3	Marvin E. Ruckman Et Ux	3.326
S142	05-9-1.4	Sheldon R. Ruckman Et Al Life	4.494
S143	05-9-1.1	Beverly E. Clark	0.52
S144	05-8-6	Richard L. Gatts - Life	1.181
S145	05-8A-22	Whitney Woods	0.715
S146	05-8A-10	David D. & Christine S. Daniels	0.20
S147	Fish Creek	State of W.V.	8.16



P.S. 708 *David L Jackson*



OPERATOR'S
WELL #: Bryan N-7HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API #: 047-051-01978

WELL PLAT
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DATE: 10/27/2020