

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

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Office of Oil and Gas

JUL 28 2020

WV Department of
Environmental Protection

API 47 - 051 - 02115 County Marshall District Franklin
Quad Powhatan Point 7.5' Pad Name Woodford Field/Pool Name _____
Farm name CNX RCPC, LLC Well Number Woodford 3HM
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 4,406,029.82 Easting 516,091.96
Landing Point of Curve Northing 4,406,272.28 Easting 515,839.98
Bottom Hole Northing 4,404,125.57 Easting 517,075.30

Elevation (ft) 1234.08' 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 10/23/2018 Date drilling commenced 4/17/2019 Date drilling ceased 8/30/2019
Date completion activities began 2/6/2020 Date completion activities ceased 2/23/2020
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 838' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1595' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 734-740', 832-838' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
Jennifer Lohman
8/6/2020

API 47-051 - 02115 Farm name CNX RCPC, LLC Well number Woodford 3HM

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"	2,751'	NEW	36#	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	15,642'	NEW	20#	N/A	Y
Tubing		2 3/8"	7,821'	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	1014	15.6	1.19	1225	0	8
Coal	A	1014	15.6	1.19	1225	0	8
Intermediate 1	A	797	15.6	1.19	1098	0	8
Intermediate 2							
Intermediate 3							
Production	A	3724	14.5	1.17	4339	0	8
Tubing							

Drillers TD (ft) 15,662' Loggers TD (ft) n/a
 Deepest formation penetrated Marcellus Plug back to (ft) n/a
 Plug back procedure n/a

Kick off depth (ft) 5,888'

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 _____

**WOODFORD 3HM
LITHOLOGY INFORMATION**

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	2030	2118	2032	2120	Sandstone
Big Lime	2118	2160	2120	2163	Limestone
Big Injun	2160	2506	2163	2511	Sandstone
Weir	2506	2632	2511	2638	Sandstone
Berea	2632	2855	2638	2910	Sandstone
Gordon	2855	2902	2910	2910	Sandstone
Fifty Foot	2902	3462	3496	3496	Sandstone
Speechley	3462	4834	5297	5789	Sandstone
Benson	4834	5203	5789	6459	Sandstone
Alexander	5203	5824	6459	6867	Siltstone
Rhinestreet	5824	6170	6867	6867	Black shale
Middlesex	6170	6257	6867	7014	Black shale
Geneseo/Burkett	6257	6290	7014	7084	Black shale
Tully	6290	6310	7084	7130	Limestone
Hamilton	6310	6328	7130	7178	Grey shale
Marcellus	6328	-	7178	-	Black shale

Woodford 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	90	7366	5041	4856	442340	8521	0
2	90.4	7426	4736	5229	432940	8397	0
3	90.2	7475	5103	5197	439560	8385	0
4	90.4	7206	5044	4687	439320	8254	0
5	90.3	7257	4953	4200	440200	8431	0
6	89.5	7214	4763	4959	438680	8521	0
7	89.7	7276	4788	4729	440140	8348	0
8	90.5	7006	4710	4285	439840	8357	0
9	89.6	7453	4931	4815	440400	8341	0
10	89.8	7298	6194	4682	442400	8556	0
11	88	8245	4710	4664	439380	8418	0
12	90.7	7138	4849	4875	440100	8347	0
13	90.1	7005	4906	4836	440440	8501	0
14	90.4	6876	5121	4838	443640	8230	0
15	88.3	6876	5010	4790	439460	8568	0
16	89	6855	5059	4713	436980	8384	0
17	90.4	6858	5270	4971	438180	8434	0
18	88.1	6842	5121	4690	436080	8350	0
19	90.2	6944	4914	4949	439800	8327	0
20	88.7	6870	4934	4875	440220	8314	0
21	87.1	6771	4811	4617	440700	8579	0
22	88.3	6655	4863	4954	439700	8407	0
23	88	6575	5103	4601	438420	8370	0
24	88.9	6639	4894	4681	439700	8395	0
25	87.2	7562	4729	4588	440180	8339	0
26	88.1	6442	4989	4721	446540	8341	0
27	88.4	6534	5048	4507	437740	8553	0
28	89.4	6530	4823	4723	440320	8211	0
29	90.2	6558	5014	4533	437780	8353	0

46	88.6	6071	5207	4784	442700	8569	0
45	88.6	6036	4947	4621	443680	8085	0
44	88.9	6053	4822	4879	439920	8207	0
43	91.7	6086	5053	4634	445180	8208	0
42	89.8	6137	5090	5180	431700	8365	0
41	89.5	6240	4994	5291	448980	8328	0
40	88.2	6134	5121	4562	443140	8686	0
39	90.6	6353	4893	5190	445240	8272	0
38	90.3	6377	4917	4436	440400	8151	0
37	90	6422	5267	4782	440760	8186	0
36	88.4	6321	4978	5294	445560	8219	0
35	89.9	6340	4995	4716	440940	8523	0
34	88.1	6401	5118	4859	445780	8590	0
33	88.8	6352	4847	4794	441380	8267	0
32	88.1	6318	4742	4987	440700	8626	0
31	88.9	6427	4934	4814	438720	8565	0
30	89.9	6520	4880	5088	442700	8353	0

**Woodford 3HM
PERFORATION RECORD**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	2/6/2020	15247	15401	48	Marcellus
2	2/7/2020	15072	15226	48	Marcellus
3	2/7/2020	14897	15051	48	Marcellus
4	2/8/2020	14722	14876	48	Marcellus
5	2/9/2020	14547	14701	48	Marcellus
6	2/9/2020	14372	14526	48	Marcellus
7	2/9/2020	14197	14351	48	Marcellus
8	2/9/2020	14022	14176	48	Marcellus
9	2/10/2020	13847	14001	48	Marcellus
10	2/10/2020	13672	13826	48	Marcellus
11	2/10/2020	13497	13651	48	Marcellus
12	2/11/2020	13322	13476	48	Marcellus
13	2/11/2020	13147	13301	48	Marcellus
14	2/11/2020	12972	13126	48	Marcellus
15	2/12/2020	12797	12951	48	Marcellus
16	2/12/2020	12622	12776	48	Marcellus
17	2/12/2020	12447	12601	48	Marcellus
18	2/13/2020	12272	12426	48	Marcellus
19	2/13/2020	12097	12251	48	Marcellus
20	2/14/2020	11922	12076	48	Marcellus
21	2/14/2020	11747	11901	48	Marcellus
22	2/14/2020	11572	11726	48	Marcellus
23	2/15/2020	11397	11551	48	Marcellus
24	2/15/2020	11222	11376	48	Marcellus
25	2/15/2020	11047	11201	48	Marcellus
26	2/16/2020	10872	11026	48	Marcellus
27	2/16/2020	10697	10851	48	Marcellus
28	2/16/2020	10522	10676	48	Marcellus
29	2/17/2020	10347	10501	48	Marcellus
30	2/17/2020	10172	10326	48	Marcellus
31	2/18/2020	9997	10151	48	Marcellus
32	2/18/2020	9822	9976	48	Marcellus
33	2/18/2020	9647	9801	48	Marcellus
34	2/19/2020	9472	9626	48	Marcellus
35	2/19/2020	9297	9451	48	Marcellus
36	2/19/2020	9122	9276	48	Marcellus
37	2/20/2020	8947	9101	48	Marcellus
38	2/20/2020	8772	8926	48	Marcellus
39	2/21/2020	8597	8751	48	Marcellus
40	2/21/2020	8422	8576	48	Marcellus
41	2/21/2020	8247	8401	48	Marcellus
42	2/22/2020	8072	8226	48	Marcellus
43	2/22/2020	7897	8051	48	Marcellus
44	2/22/2020	7722	7876	48	Marcellus
45	2/23/2020	7547	7701	48	Marcellus
46	2/23/2020	7372	7526	48	Marcellus

MC MX 9-4743	Multi-Chem	Bicide				
LD-7750W	Multi-Chem	Scale Inhibitor	Methanol	67-56-1	60.00000	0.00408None
PROFE 105	Profrac	Iron Control	Phosphonic Acid Salt	Proprietary	5.00000	0.00034None
Prohib 100	Profrac	Acid Inhibitor	Citric Acid	77-92-9	100.00000	0.00159None
			2-Propyn-1-ol compound w/ methylcyclohexane	38172-91-7	15.00000	0.00020None
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	0.35692
			inorganic salt	PROPRIETARY	10.00000	0.00610
			Oxyalkylated alcohol	PROPRIETARY	5.00000	0.00305
			Phosphonic Acid Salt	Proprietary	5.00000	0.00034

* 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)

