

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

API 47-085-10195 County RITCHIE District UNION
Quad OXFORD 7.5' Pad Name OXF122 Field/Pool Name _____
Farm name RICHARD L. & SHERYL A. RAY Well Number 514082
Operator (as registered with the OOG) EQT Production Company
Address 625 Liberty Ave. EQT Plaza, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,331,469.39 Easting 514,596.11
Landing Point of Curve Northing 4,331,493.68 Easting 515,045.82
Bottom Hole Northing 4,329,095.43 Easting 515,917.16

Elevation (ft) 1111 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)

Water base Mud 11.5 ppg, Synthetic Base Mud 11.5 ppg, barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 03/16/2015 Date drilling commenced 10/06/2014 Date drilling ceased 04/23/2016
Date completion activities began 6/17/2017 Date completion activities ceased 7/2/2017
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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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 236' Open mine(s) (Y/N) depths N
Salt water depth(s) ft NONE Void(s) encountered (Y/N) depths N
Coal depth(s) ft 929' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

APPROVED Reviewed by:

NAME: Michael Gandy
DATE: 10/25/17

API 47-085 - 10195

Farm name RICHARD L. & SHERYL A. RAY Well number 514082

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	24"	20"	40'	NEW	A-500 40LB/FT	NONE	Y
Surface	17.5"	13.375"	1056'	NEW	J-55 54.5LB/FT	212',547'	Y
Coal							
Intermediate 1	12.375"	9.625"	2940'	NEW	A-500 40LB/FT	529',1505'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	16692'	NEW	P-110 20LB/FT	None	N
Tubing							
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	CLASS A	38	15.6	1.18	44.84	0	8
Surface	CLASS A	882	15.6	1.19	1049.58	0	8
Coal							
Intermediate 1	CLASS A	1125	15.6	1.18	1327.5	0	8
Intermediate 2							
Intermediate 3							
Production	Class H/Class H	259/600	15.2/15.6	1.72/1.1	1105	4000	72
Tubing							

Drillers TD (ft) 16,696'

Loggers TD (ft) _____

Deepest formation penetrated ONONDAGA

Plug back to (ft) 4628'

Plug back procedure R/U Allied cement services, TCOH F/ 6800' T/ 6002' Held P/SM. Tested cement lines to 1500 psi. Plugs #1, #2, & #3 (Cement Parameters: 14.2 ppg, Class A, 1% CaCl, 2% C-51, 1.28 yield, 5.98 gal/sk.) Pumped 2 bbl H2O, 33.5 bbl plug #1, followed by 1 bbl H2O, TCOH F/ 6002' T/ 5616', pumped 1 bbl H2O, 33.6 bbl plug #2, followed by 1 bbl H2O, TCOH F/ 5616' T/ 5144', Pumped 1 bbl H2O, 31.8 bbl plug #3, followed by 1 bbl H2O, TCOH F/5144' T/ 4628' Pumped 1 bbl H2O, 31.8 bbl plug #3, followed by 1 bbl H2O, TCOH F/4628' T/ 4199'. Pumped 1 bbl H2O, 37.3 bbl plug #4. (16.0 ppg Class A 1% CaCl, 2% C-51, 1.12 yield, 4.75 gal/sk) followed by 1 bbl H2O, TCOH F/4628' T/4199'. Dropped wiper ball, pumped 20 bbls water to clear drill pipe. R/D Allied Cement Services.

Kick off depth (ft) 6360'

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 _____

CONDUCTOR- NONE

SURFACE- JOINTS: 1,11,22

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET

PRODUCTION- Composite body centralizers run every joint from TD to 4000' and one placed at 2900'

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- 085 - 10195 Farm name RICHARD L. & SHERYL A. RAY Well number 514082

Drilling Contractor Pioneer Drilling
Address 1083 N. Eighty Eight Rd City Rices Landing State PA Zip 15357

Logging Company WEATHERFORD WIRELINE
Address P.O. BOX 200698 City DALLAS State TX Zip 75320-0698

Logging Company Professional Directional
Address 103 Suds Run Rd City Mt Clare State WV Zip 26408

Cementing Company ALLIED SERVICES
Address 116 KIMMEL SCHOOL ROAD City SHELOCTA State PA Zip 15773

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OXF122 Well 514082 API# 47-085-10195

Final Formations				
Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	939	939
COAL	939	939	942	942
SAND/SHALE	942	942	1698	1698
MAXTON	1698	1698	1881	1881
BIG LIME	1881	1881	2156	2156
WEIR	2156	2156	2370	2370
BEREA	2370	2370	2381	2381
GANTZ	2381	2381	2475	2475
50F	2475	2475	2631	2631
GORDON	2631	2631	2894	2894
BAYARD	2894	2894	3214	3214
WARREN	3214	3214	3272	3272
SPEECHLEY	3272	3272	3771	3771
BALLTOWN A	3771	3771	4349	4349
RILEY	4349	4349	4689	4689
BENSON	4689	4689	5021	5021
ALEXANDER	5021	5021	6742	6140
SONYEA	6742	6140	7026	6273
MIDDLESEX	7026	6273	7141	6322
GENESSEE	7141	6322	7349	6400
GENESEO	7349	6400	7471	6437
TULLY	7471	6437	7513	6448
HAMILTON	7513	6448	7558	6457
MARCELLUS	7558	6457	16266	6608

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514082 47-085-10195-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve					
1	6/15/2016	16,667	16,962	10	MARCELLUS
2	6/17/2017	16,506	16,600	32	MARCELLUS
2	6/18/2017	16,306	16,468	40	MARCELLUS
3	6/18/2017	16,266	16,306	40	MARCELLUS
4	6/18/2017	16,066	16,228	40	MARCELLUS
5	6/19/2017	15,866	16,028	40	MARCELLUS
6	6/19/2017	15,666	15,828	40	MARCELLUS
7	6/19/2017	15,466	15,628	40	MARCELLUS
8	6/20/2017	15,266	15,428	40	MARCELLUS
9	6/20/2017	15,066	15,228	40	MARCELLUS
10	6/20/2017	14,866	15,028	40	MARCELLUS
11	6/21/2017	14,666	14,828	40	MARCELLUS
12	6/21/2017	14,466	14,628	40	MARCELLUS
13	6/22/2017	14,266	14,428	40	MARCELLUS
14	6/22/2017	14,066	14,228	40	MARCELLUS
15	6/22/2017	13,866	14,028	40	MARCELLUS
16	6/23/2017	13,666	13,828	40	MARCELLUS
17	6/23/2017	13,466	13,628	40	MARCELLUS
18	6/23/2017	13,266	13,428	40	MARCELLUS
19	6/24/2017	13,066	13,228	40	MARCELLUS
20	6/24/2017	12,866	13,028	40	MARCELLUS
21	6/24/2017	12,666	12,828	40	MARCELLUS
22	6/24/2017	12,466	12,628	40	MARCELLUS
23	6/25/2017	12,266	12,428	40	MARCELLUS
24	6/25/2017	12,066	12,228	40	MARCELLUS
25	6/25/2017	11,866	12,028	40	MARCELLUS
26	6/25/2017	11,666	11,828	40	MARCELLUS
27	6/26/2017	11,466	11,628	40	MARCELLUS
28	6/26/2017	11,266	11,428	40	MARCELLUS
29	6/26/2017	11,066	11,228	40	MARCELLUS
30	6/27/2017	10,866	11,028	40	MARCELLUS
31	6/27/2017	10,666	10,828	40	MARCELLUS
32	6/27/2017	10,466	10,628	40	MARCELLUS
33	6/27/2017	10,266	10,428	40	MARCELLUS
34	6/28/2017	10,066	10,228	40	MARCELLUS
35	6/28/2017	9,866	10,028	40	MARCELLUS
36	6/29/2017	9,666	9,828	40	MARCELLUS
37	6/29/2017	9,466	9,628	40	MARCELLUS
38	6/29/2017	9,266	9,428	40	MARCELLUS
39	6/29/2017	9,066	9,228	40	MARCELLUS
40	6/30/2017	8,866	9,028	40	MARCELLUS
41	7/1/2017	8,666	8,828	40	MARCELLUS
42	7/1/2017	8,466	8,628	40	MARCELLUS
43	7/1/2017	8,266	8,428	40	MARCELLUS
44	7/1/2017	8,066	8,228	40	MARCELLUS
45	7/2/2017	7,866	8,028	40	MARCELLUS
	7/2/2017	7,666	7,828	40	MARCELLUS

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514082 47-085-10195-0000 - Stimulated Stages

Stage Number	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
Initiation Sleeve	6/17/2017	14	7,321	8,010	4,244	0	1,013	0
1	6/18/2017	85	8,792	9,231	3,446	449600	9,570	0
2	6/18/2017	86	9,013	9,330	5,075	219000	6,612	0
2	6/18/2017	72	8,253	8,663	5,475	228000	6,771	0
3	6/19/2017	81	8,683	9,209	5,589	434200	8,799	0
4	6/19/2017	85	8,498	8,835	5,837	432000	9,237	0
5	6/19/2017	84	8,624	9,022	5,659	448000	9,488	0
6	6/20/2017	85	8,715	9,076	5,588	432000	9,235	0
7	6/20/2017	86	8,402	8,815	5,767	452000	9,495	0
8	6/20/2017	84	8,162	8,460	5,324	450200	11,044	0
9	6/20/2017	86	8,462	8,848	4,241	451100	8,920	0
10	6/21/2017	87	8,584	9,014	4,186	452600	9,044	0
11	6/21/2017	89	8,564	8,886	5,700	449500	9,106	0
12	6/21/2017	87	8,616	9,225	4,799	382400	8,152	0
12	6/22/2017	8	4,373	6,256	5,420	0	4,786	0
13	6/22/2017	85	8,441	8,768	4,326	450800	9,350	0
14	6/22/2017	82	8,102	9,398	5,256	457700	12,465	0
15	6/23/2017	85	8,494	8,861	4,262	451400	9,322	0
16	6/23/2017	88	8,297	8,528	3,952	450800	9,102	0
17	6/23/2017	90	8,265	8,532	3,750	450100	8,997	0
18	6/24/2017	91	7,895	8,242	4,166	450300	8,817	0
19	6/24/2017	95	8,236	8,420	4,285	450200	8,412	0
20	6/24/2017	92	8,317	8,607	4,327	450400	8,213	0
21	6/24/2017	83	8,139	8,361	4,678	451600	11,130	0
22	6/25/2017	91	8,104	8,320	4,168	449000	8,451	0
23	6/25/2017	92	8,368	8,759	3,806	451200	9,221	0
24	6/25/2017	97	8,086	8,344	4,049	450100	8,872	0
25	6/25/2017	95	7,954	8,195	4,309	451100	8,542	0
26	6/26/2017	91	8,034	8,418	3,894	450100	8,794	0
27	6/26/2017	100	8,232	8,539	4,313	452400	8,891	0
28	6/26/2017	97	8,153	8,400	4,209	450500	8,498	0
29	6/27/2017	94	8,076	8,242	3,957	445900	8,256	0
30	6/27/2017	96	7,950	8,121	4,154	447200	8,225	0
31	6/27/2017	94	8,184	8,433	4,056	449800	8,348	0
32	6/28/2017	99	8,221	8,588	4,456	448400	8,318	0
33	6/28/2017	100	7,883	8,158	3,936	452200	8,431	0
34	6/28/2017	97	7,853	8,132	3,833	451400	8,195	0
35	6/29/2017	93	7,982	8,735	3,869	450800	8,136	0
36	6/29/2017	91	7,677	8,387	3,854	448900	8,288	0
37	6/29/2017	90	7,958	8,258	3,895	449300	8,741	0
38	6/30/2017	91	7,630	7,993	3,786	453100	9,021	0
39	6/30/2017	98	7,714	8,077	4,246	454220	9,143	0
40	7/1/2017	96	7,451	7,597	3,665	448200	8,156	0
41	7/1/2017	99	7,669	7,915	4,310	450800	10,074	0
42	7/2/2017	100	7,496	7,827	4,516	450100	7,859	0
43	7/2/2017	99	7,458	7,610	3,947	450100	8,098	0
44	7/2/2017	97	7,418	7,805	4,436	448500	8,163	0
45	7/2/2017	98	7,027	7,325	4,105	445100	8,280	0

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/17/2017
Job End Date:	7/2/2017
State:	West Virginia
County:	Ritchie
API Number:	47-085-10195-00-00
Operator Name:	EQT Production
Well Name and Number:	514082
Latitude:	39.13219200
Longitude:	-80.83129700
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,457
Total Base Water Volume (gal):	17,307,402
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
Hydrochloric Acid (15%)	USWS	Acid					
Sand (Proppant)	USWS	Proppant		Listed Below			
				Listed Below			

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LGC-15	USWS	Water Gelling Agent		Listed Below				
				Listed Below				
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.								
		Water		7732-18-5	100.00000	87.41663	None	
		Silica Substrate		14808-60-7	100.00000	12.19298	None	
		Calcium Nitrate.4H2O		13477-34-4	100.00000	0.10702	None	
		Proprietary Activating Agent		Proprietary	100.00000	0.02558		
		Proprietary Activating Agent		Proprietary	100.00000	0.02558	None	
		Cationic copolymer of acrylamide		69418-26-4	30.00000	0.02361		
		Hydrotreated light distillate (petroleum)		64742-47-8	30.00000	0.02361		
		Hydrotreated light distillate (petroleum)		64742-47-8	30.00000	0.02361	None	
		Cationic copolymer of acrylamide		69418-26-4	30.00000	0.02361	None	
		Hydrochloric Acid		7647-01-0	15.00000	0.01986	None	
		Hydrotreated light distillate (petroleum)		64742-47-8	100.00000	0.01295	None	
		Alcohols, C12-16, ethoxylated		68551-12-2	5.00000	0.00394		
		Proprietary Ingredient		Proprietary	5.00000	0.00394	None	
		Alcohols, C12-16, ethoxylated		68551-12-2	5.00000	0.00394	None	
		Proprietary Ingredient		Proprietary	5.00000	0.00394		
		Alkyl phosphonic acid		Proprietary	5.00000	0.00117	None	
		Alkyl phosphonic acid		Proprietary	5.00000	0.00117		
		Sodium nitrate		7631-99-4	5.00000	0.00048	None	
		Petroleum Distillates		64742-47-8	60.00000	0.00037	None	
		Ethylene glycol		107-21-1	40.00000	0.00003	None	

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			Formic acid	64-18-6	20.00000	0.00002	None
			Cinnamaldehyde	104-55-2	20.00000	0.00002	None
			Butyl cellosolve	111-76-2	20.00000	0.00002	None
			Ammonium Persulfate	7727-54-0	100.00000	0.00001	None

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

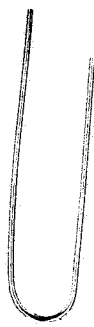
Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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EQT



June 8, 2016

Mr. Gene Smith
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: Modification of 47-085-10195

Dear Mr. Smith,

Please accept the attached updates for the above referenced permit. Upon inspection of our as-drilled plat, we noted the curve geometry crossed into 1 additional lease, #106136. Enclosed is an updated WW-6A1, WW-6B, mylar plat and rec plan reflecting corrections to update the permit file to be consistent with the as-drilled well bore.

If you have any questions, please do not hesitate to contact me at (304) 848-0076.

Sincerely,

Vicki Roark
Permitting Supervisor-WV

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Enc.

