

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

API 47-085-10226 County RITCHIE District CLAY  
Quad PENNSBORO 7.5' Pad Name PEN54 Field/Pool Name \_\_\_\_\_  
Farm name Jerry Morton et al Well Number 514476  
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 4,345,388.07 Easting 506,268.12  
Landing Point of Curve Northing 4,345,306.74 Easting 506,415.01  
Bottom Hole Northing 4,342,359.54 Easting 507,850.16

Elevation (ft) 1016 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

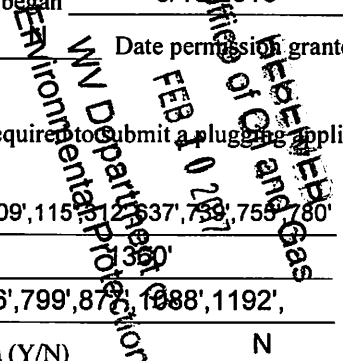
Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine

Mud Type(s) and Additive(s)  
Water based mud 12.9 ppg, barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, sodium hydroxide, chrome lignosulfonate, calcium hydroxide, sodium acid pyrophosphate, bentonite, Methyl ester of sulfonated tannin, treated silica, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, glutaraldehyde, ground walnut shells, calcium carbonate, fibrous cellulose.

Date permit issued 08/17/2015 Date drilling commenced 04/07/2016 Date drilling ceased 07/31/2016  
Date completion activities began 9/15/2016 Date completion activities ceased 10/3/2016  
Verbal plugging (Y/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 109',115',137',153',175',180' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 330' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 336',799',872',1088',1192' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N



**APPROVED**

NAME: Michael Hoff  
DATE: 5/10/17

Reviewed by: \_\_\_\_\_  
REBMS/AX 05/19/2017

API 47-085 - 10226

Farm name Jerry Morton et al

Well number 514476

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"	915'	NEW	J-55 54.5LB/FT	330'	Y
Coal							
Intermediate 1	12.375"	9.625"	5210'	NEW	A-500 & P-110 40lb/ft	5008',3407'	Y
Intermediate 2							
Intermediate 3							
Production	8.75" & 8.5"	5.5"	17553'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set		Davis Lynch casing packer and diverter tool placed at 3388' Two stage cement job performed.					

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	59	15.6	1.18	70	0	8
Surface	CLASS A	739	15.6	1.20	887	0	8
Coal							
Intermediate 1	CLASS A	259/310 & 1230	14.2/15.6 & 15.6	1.24/1.18 & 1.18	2138	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS A / CLASS H	685 / 1380	15.2 / 15.6	1.12 / 2.09	3651	1872'	72+
Tubing							

Drillers TD (ft) 17,554'

Loggers TD (ft) N/A

Deepest formation penetrated MARCELLUS

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 4835'

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- RAN AT LEAST EVERY 25 FEET

INTERMEDIATE- RAN AT LEAST EVERY 500 FEET

PRODUCTION- COMPOSITE BODY CENTRALIZERS RAN EVERY JOINT FROM SHOE TO KOP

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- 085 - 10226 Farm name Jerry Morton et al Well number 514476

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					Please 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)
						Please	See	Attached

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Please insert additional pages as applicable.

API 47- 085 - 10226 Farm name Jerry Morton et al Well number 514476

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>MARCELLUS</u>	<u>6298</u>	<u>TVD</u>	<u>6596</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2,286 psi Bottom Hole N/A psi DURATION OF TEST 33.50 hrs

OPEN FLOW Gas 7,658 mcfpd Oil N/A bpd NGL 35 bpd Water 811 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 <sub>2</sub> S, ETC)
	0		0		

Please insert additional pages as applicable.

Drilling Contractor Savanna Drilling - Rig 803  
Address 125 Industry Road City Waynesburg State PA Zip 15370

Logging Company GYRODATA INC.  
Address 607 MAYER ST. City BRIDGEVILLE State PA Zip 15017

Cementing Company HALLIBURTON ENERGY SERVICES  
Address 121 CHAMPION WAY City CANONSBURG State PA Zip 15317

Stimulating Company FTS International  
Address 301 E. 18th Street City Cisco State TX Zip 76437

Please insert additional pages as applicable.

Completed by Jim Helmick Telephone (412) 395-5518  
Signature \_\_\_\_\_ Title VP Completions Date 1/30/2017

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

05/19/2017

API 47- 085 - 10226 Farm name Jerry Morton et al Well number 514476

Drilling Contractor \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Logging Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Logging Company PRO-DIRECTIONAL  
Address 103 SUDS RUN ROAD City MT. CLARE State WV Zip 26408

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

API 47-085-10226	514476			PEN54
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	336	336
COAL	336	336	344	344
SAND/SHALE	344	344	799	799
COAL	799	799	802	802
SAND/SHALE	802	802	877	877
COAL	877	877	882	882
SAND/SHALE	882	882	1088	1088
COAL	1088	1088	1092	1092
SAND/SHALE	1092	1092	1192	1192
COAL	1192	1192	1197	1197
SAND/SHALE	1197	1197	1426	1426
MAXTON	1426	1426	1621	1621
BIG LIME	1621	1621	2003	2003
WEIR	2003	2003	2221	2221
GANTZ	2221	2221	2366	2366
50F	2366	2366	2461	2461
GORDON	2461	2461	2619	2619
5TH	2619	2619	2633	2633
BAYARD	2633	2633	3088	3088
WARREN	3088	3088	3166	3166
SPEECHLEY	3166	3166	3556	3556
BALLTOWN A	3556	3556	3911	3911
BALLTOWN B	3911	3911	3962	3962
BRADFORD	3962	3962	4212	4212
RILEY	4212	4212	4595	4595
BENSON	4595	4595	4842	4841
ALEXANDER	4842	4841	5381	5370
RHINESTREET	5381	5370	5643	5609
RHINESTREET UPPER	5643	5609	5780	5739
SONYEA	5780	5739	6236	6134
MIDDLESEX	6236	6134	6321	6188
GENESSEE	6321	6188	6427	6243
GENESEO	6427	6243	6526	6279
MULLY	6526	6279	6567	6290
MILTON	6567	6290	6596	6298
MARCELLUS	6596	6298	17554	6389

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# **EQT PRODUCTION**

**Ritchie County, WV**

**PEN54**

**Well #514476 - Slot 514476**

**Main Wellbore**

**Design: 514476 As Drilled Surveys**

## **Standard Survey Report**

**11 August, 2016**

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**Environmental Protection**

05/19/2017

**514476-47-085-10226-0000 - Perforations**

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	9/11/2016	17527	17553	10	MARCELLUS
1	09/15/2016 17:52	17406	17498	32	MARCELLUS
2	09/16/2016 00:30	17256	17376	40	MARCELLUS
3	09/16/2016 05:12	17106	17228	40	MARCELLUS
4	09/16/2016 05:12	16956	17076	40	MARCELLUS
5	09/17/2016 02:03	16806	16928	40	MARCELLUS
6	09/17/2016 07:33	16656	16773	40	MARCELLUS
7	09/17/2016 12:26	16506	16626	40	MARCELLUS
8	09/17/2016 17:10	16356	16478	40	MARCELLUS
9	09/18/2016 01:32	16208	16328	40	MARCELLUS
10	09/18/2016 06:49	16056	16178	40	MARCELLUS
11	09/18/2016 11:58	15906	16028	40	MARCELLUS
12	09/18/2016 16:31	15756	15878	40	MARCELLUS
13	09/18/2016 21:58	15606	15722	40	MARCELLUS
14	09/19/2016 02:40	15456	15574	40	MARCELLUS
15	09/19/2016 07:32	15306	15428	40	MARCELLUS
16	09/19/2016 13:20	15156	15272	40	MARCELLUS
17	09/19/2016 18:09	15006	15128	40	MARCELLUS
18	09/19/2016 23:09	14856	14978	40	MARCELLUS
19	09/20/2016 03:35	14706	14828	40	MARCELLUS
20	09/20/2016 09:13	14556	14678	40	MARCELLUS
21	09/20/2016 13:25	14406	14528	40	MARCELLUS
22	09/20/2016 17:46	14258	14378	40	MARCELLUS
23	09/20/2016 23:13	14106	14228	40	MARCELLUS
24	09/21/2016 03:57	13956	14078	40	MARCELLUS
25	09/21/2016 09:34	13806	13928	40	MARCELLUS
26	09/21/2016 13:47	13656	13775	40	MARCELLUS
27	09/21/2016 18:08	13506	13628	40	MARCELLUS
28	09/21/2016 22:45	13356	13476	40	MARCELLUS
29	09/22/2016 03:00	13206	13328	40	MARCELLUS
30	09/22/2016 07:16	13056	13178	40	MARCELLUS
31	09/23/2016 02:20	12906	13028	40	MARCELLUS
32	09/23/2016 06:38	12756	12878	40	MARCELLUS
33	09/23/2016 11:23	12606	12728	40	MARCELLUS
34	09/23/2016 15:44	12456	12578	40	MARCELLUS
35	09/23/2016 20:40	12306	12428	40	MARCELLUS
36	09/24/2016 00:34	12158	12276	40	MARCELLUS
37	09/24/2016 05:26	12006	12128	40	MARCELLUS
38	09/24/2016 11:49	11856	11978	40	MARCELLUS
39	09/24/2016 15:56	11706	11828	40	MARCELLUS
40	09/24/2016 20:46	11556	11676	40	MARCELLUS
41	09/25/2016 02:40	11406	11528	40	MARCELLUS
42	09/25/2016 06:55	11256	11378	40	MARCELLUS
43	09/25/2016 12:12	11106	11228	40	MARCELLUS
44	09/25/2016 16:08	10956	11078	40	MARCELLUS
45	09/25/2016 20:09	10806	10928	40	MARCELLUS
46	09/25/2016 23:44	10656	10778	40	MARCELLUS
47	09/26/2016 03:31	10506	10628	40	MARCELLUS
48	09/26/2016 22:14	10356	10478	40	MARCELLUS
49	09/27/2016 02:30	10206	10326	40	MARCELLUS
50	09/27/2016 06:00	10056	10178	40	MARCELLUS
51	09/27/2016 10:11	9906	10028	40	MARCELLUS
52	09/27/2016 13:59	9756	9878	40	MARCELLUS
53	09/28/2016 06:43	9606	9728	40	MARCELLUS
54	09/28/2016 12:16	9458	9576	40	MARCELLUS
55	09/28/2016 17:06	9306	9428	40	MARCELLUS
56	09/28/2016 21:12	9155	9278	40	MARCELLUS
57	09/29/2016 00:39	9006	9128	40	MARCELLUS
58	09/29/2016 04:01	8854	8978	40	MARCELLUS
59	09/30/2016 04:52	8706	8828	40	MARCELLUS
60	09/30/2016 09:18	8559	8678	40	MARCELLUS
61	09/30/2016 12:48	8406	8528	40	MARCELLUS
62	09/30/2016 16:30	8257	8378	40	MARCELLUS
63	09/30/2016 21:06	8106	8228	40	MARCELLUS
64	10/01/2016 00:58	7956	8078	40	MARCELLUS
65	10/01/2016 04:17	7806	7928	40	MARCELLUS
66	10/01/2016 08:03	7656	7778	40	MARCELLUS
67	10/01/2016 11:46	7506	7628	40	MARCELLUS
68	10/01/2016 15:24	7356	7478	40	MARCELLUS
69	10/01/2016 18:31	7206	7328	40	MARCELLUS
70	10/01/2016 23:27	7056	7178	40	MARCELLUS
70.1	10/03/2016 23:56	7087	7149	32	MARCELLUS
71	10/03/2016 05:05	6906	7026	40	MARCELLUS
72	10/03/2016 09:43	6756	6878	40	MARCELLUS

05/19/2017



## 514476- 47-085-10226-0000 - Stimulated Stages

Stage Number	Stimulation 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)
Initiation Sleeve	9/15/2016	20	6,380	8,483	4,836	0	1,935	0
1	9/15/2016	86	8,905	9,257	3,443	251,947.00	7,136	0
2	9/16/2016	90	9,028	9,386	3,872	250,201.10	6,892	0
3	9/16/2016	88	8,798	9,292	4,426	250,569.90	7,661	0
4	9/16/2016	86	8,865	9,442	5,661	250,296.90	9,067	0
5	9/17/2016	82	8,746	9,404	3,961	250,299.90	9,015	0
6	9/17/2016	83	8,932	9,259	3,676	250,200.00	7,312	0
7	9/17/2016	86	8,417	9,290	4,727	250,400.20	6,973	0
8	9/17/2016	94	8,743	8,951	4,463	248,972.00	7,136	0
9	9/18/2016	93	8,672	8,979	4,074	250,757.10	6,879	0
10	9/18/2016	90	8,391	9,172	4,095	250,630.10	7,267	0
11	9/18/2016	91	8,282	8,856	4,040	250,600.10	7,199	0
12	9/18/2016	100	8,795	9,081	3,750	249,086.00	6,764	0
13	9/18/2016	100	8,684	8,996	4,759	250,427.10	6,875	0
14	9/19/2016	97	8,591	9,016	4,478	250,430.10	6,830	0
15	9/19/2016	95	8,524	9,006	4,003	250,349.90	6,699	0
16	9/19/2016	100	8,368	8,692	2,731	249,080.90	6,784	0
17	9/19/2016	96	8,335	8,771	4,704	250,522.10	7,355	0
18	9/20/2016	100	8,484	8,727	3,891	250,627.00	6,730	0
19	9/20/2016	100	8,176	8,619	4,183	251,500.10	7,167	0
20	9/20/2016	101	8,440	8,940	4,302	250,180.10	6,967	0
21	9/20/2016	95	8,815	9,436	3,929	250,430.20	6,998	0
22	9/20/2016	101	8,356	8,184	3,693	250,626.00	6,506	0
23	9/21/2016	101	8,332	8,660	4,354	250,149.90	6,503	0
24	9/21/2016	98	8,489	9,045	3,590	250,230.20	6,711	0
25	9/21/2016	98	8,237	8,814	4,532	250,179.90	6,599	0
26	9/21/2016	100	8,154	8,626	4,253	250,399.90	6,586	0
27	9/21/2016	96	8,830	9,319	3,777	249,900.10	6,453	0
28	9/22/2016	102	8,326	8,565	3,739	249,360.10	6,366	0
29	9/22/2016	101	8,479	8,720	3,905	250,358.10	6,243	0
30	9/22/2016	101	8,381	8,955	4,141	249,735.90	6,816	0
31	9/23/2016	101	8,547	9,096	4,553	249,547.80	6,321	0
32	9/23/2016	101	8,595	9,407	4,325	249,436.00	6,663	0
33	9/23/2016	101	8,441	8,822	4,185	249,147.90	6,827	0
34	9/23/2016	100	8,639	9,116	3,856	250,150.10	6,034	0
35	9/23/2016	101	8,587	9,077	4,132	249,574.10	6,056	0
36	9/24/2016	101	8,247	8,520	4,045	250,216.10	6,247	0
37	9/24/2016	101	8,199	8,517	4,273	251,200.90	6,747	0
38	9/24/2016	100	8,807	9,352	3,635	249,186.00	6,756	0
39	9/24/2016	101	8,330	8,947	4,487	249,199.90	6,208	0
40	9/24/2016	100	8,478	8,973	4,046	249,774.90	6,184	0
41	9/25/2016	101	8,567	8,827	4,481	249,188.00	6,226	0
42	9/25/2016	100	8,550	9,297	4,206	249,602.90	6,646	0
43	9/25/2016	101	8,238	9,098	4,353	250,020.90	6,670	0
44	9/25/2016	102	8,256	8,548	4,140	249,080.00	6,121	0
45	9/25/2016	101	8,117	8,309	3,963	250,519.80	6,119	0
46	9/26/2016	101	8,410	9,203	4,941	250,590.20	6,229	0
47	9/26/2016	101	8,115	8,573	4,741	249,252.90	6,329	0
48	9/27/2016	102	8,031	8,316	4,707	250,599.00	6,120	0
49	9/27/2016	100	8,001	8,258	4,502	249,482.20	6,202	0
50	9/27/2016	101	8,155	8,368	4,686	252,263.10	6,396	0
51	9/27/2016	101	8,054	8,280	4,243	250,265.00	6,386	0
52	9/27/2016	96	8,749	9,648	3,841	231,815.90	8,163	0
52.01	9/28/2016	18	6,083	6,799	5,222	0	3,507	0
53	9/28/2016	101	8,106	8,685	4,396	249,572.10	6,471	0
54	9/28/2016	101	8,375	9,067	4,267	250,089.10	6,108	0
55	9/28/2016	102	8,163	8,402	4,277	250,490.10	6,054	0
56	9/28/2016	100	8,231	8,535	3,917	248,724.80	6,058	0
57	9/29/2016	102	8,091	8,798	4,107	248,684.10	6,021	0
58	9/29/2016	97	8,308	10,446	5,168	250,675.10	7,525	0
58.01	9/30/2016	11	4,995	6,644	5,067	0	2,105	0
59	9/30/2016	100	8,261	8,902	4,334	249,500.00	6,061	0
60	9/30/2016	101	7,785	8,432	3,696	249,024.90	6,021	0
61	9/30/2016	101	7,683	7,940	3,910	250,070.10	5,963	0
62	9/30/2016	100	8,029	8,404	4,309	250,850.10	6,544	0
63	9/30/2016	100	7,965	9,105	4,009	248,641.10	5,972	0
64	10/1/2016	101	8,006	8,866	4,421	248,935.20	6,008	0
65	10/1/2016	100	7,816	8,064	4,158	251,078.10	5,970	0
66	10/1/2016	101	7,482	7,678	4,311	249,438.90	5,832	0
67	10/1/2016	101	7,245	7,403	4,448	250,391.10	5,829	0
68	10/1/2016	101	7,458	7,761	5,652	249,442.00	5,892	0
69	10/1/2016	102	7,437	7,847	4,357	248,879.00	5,927	0
70	10/2/2016	0	0	10,031	0	0.00	41	0
70.01	10/2/2016	2	9,077	9,520	0	1,780.00	229	0
70.02	10/2/2016	33	6,912	9,442	4,702	61,654.00	3,368	0
70.03	10/3/2016	79	8,204	9,276	5,854	251,077.90	13,716	0
71	10/3/2016	101	7,416	7,632	4,807	250,481.90	5,815	0
72	10/3/2016	101	7,507	8,321	4,102	186,750.90	5,789	0

05/19/2017

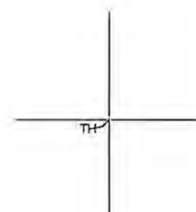
PEN54  
WV 514476  
EQT PRODUCTION COMPANY

ROYALTY OWNERS

MARLE BROADWATER ET AL	380 AC ±	LEASE NO. 105417
DONALD R. REYNOLDS ET AL	128 AC ±	LEASE NO. 102919
DEAN L. FLANAGAN ET AL	153 AC ±	LEASE NO. 102521
EQT PRODUCTION COMPANY ET AL	126 AC ±	LEASE NO. 796317

A	JERRY MORTON ET AL	243.50 ACRES±	C-TM-31-05
B	HEARTWOOD FORESTLAND FUND IV LP	185.30 ACRES±	C-TM-31-14
C	HEARTWOOD FORESTLAND FUND IV LP	196.90 ACRES±	C-TM-31-11
D	HEARTWOOD FORESTLAND FUND IV LP	53 ACRES±	C-TM-31-15
E	RANDALL LAMM	126.32 ACRES±	C-TM-31-19
F	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	42.51 ACRES±	C-TM-32-02
G	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	56.14 ACRES±	C-TM-32-02
H	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	57 ACRES±	C-TM-32-04
I	RANDALL LAMM	44 ACRES±	C-TM-36-5.1
J	RONNIE WAGES	66.95 ACRES±	C-TM-36-05
K	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	66.45 ACRES±	C-TM-32-05
L	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	57.60 ACRES±	C-TM-32-07
M	JACK MACKAY ET AL	235.03 ACRES±	C-TM-37-03
N	RONALD DODD ET AL	70.40 ACRES±	C-TM-37-02
O	JEFFERY JETT	18.31 ACRES±	C-TM-37-04
P	EDWIN G. WILLIAMS	40.77 ACRES±	C-TM-37-05
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R	MARY SIMMONS (LIFE) ET AL	30 ACRES±	C-TM-37-07
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**AS DRILLED COORDINATES**  
**(PEN54 H3)**  
**(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)**  
 NAD27 S.P.C. (FT) N. 279,188.08 E. 1,595,787.72  
 NAD27 GEO. LAT. (N) 39 257719 LONG. (W) 80 927518  
 NAD83 UTM (M) N. 4,345,388.07 E. 506,268.12  
**LANDING POINT**  
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 NAD27 GEO. LAT. (N) 39 256985 LONG. (W) 80 925817  
 NAD83 UTM (M) N. 4,345,306.74 E. 506,415.01  
**BOTTOM HOLE**  
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 NAD27 GEO. LAT. (N) 39 230415 LONG. (W) 80 909217  
 NAD83 UTM (M) N. 4,342,359.54 E. 507,850.16



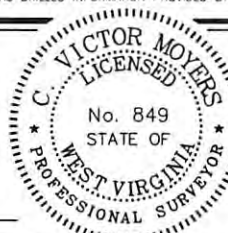
7.130'  
 12.385'  
 BOTTOM HOLE LONGITUDE 80°52'30"  
 TOP HOLE LONGITUDE 80°55'00"

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NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOP MARK SCALE IS 1"=2000'.
- AS DRILLED INFORMATION PROVIDED BY EQT.

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.



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE JUNE 25, 20 15  
 REVISED 07/01/15, 06/23/16 07/12/16 & 08/15/16  
 OPERATORS WELL NO. WV 514476  
 API WELL NO. 47 - 085 - 10226H  
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8083AD514476.dwg  
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE SEE NOTE 2

STATE OF WEST VIRGINIA  
 DIVISION OF ENVIRONMENTAL PROTECTION  
 OFFICE OF OIL AND GAS

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

LOCATION:  
 PAD ELEVATION 1,016' WATERSHED NORTH FORK HUGHES RIVER  
 DISTRICT CLAY COUNTY RITCHIE QUADRANGLES PENNSBORO & PULLMAN 7.5'

SURFACE OWNER JERRY MORTON ET AL ACREAGE 243.50±  
 ROYALTY OWNER ELLEN S. FRANCAVIGLIA ET AL ACREAGE 268±

PROPOSED WORK:  
 DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  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 6,275'

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY  
 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

COUNTY NAME  
 PERMIT

05/19/2017



**PEN54**  
**WV 514476**  
**EQT PRODUCTION COMPANY**

NAD 27 GRID NORTH

BOTTOM HOLE LONGITUDE 80°52'30"

12,365'

TOP HOLE LONGITUDE 80°55'00"

WELL TIES		
ID	BEARING	DISTANCE
L1	S 47°09' W	1628.85'
L2	S 45°29' E	1784.86'

BUILD OUT DATA		
ID	BEARING	DISTANCE
L3	N 06°00' W	209.95'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	167.49'	70.84'	N 63°14' E	131.11'
C2	328.66'	772.30'	S 42°48' E	328.18'

LATERAL		
ID	BEARING	DISTANCE
L4	S 28°46' E	257.47'
L5	S 24°59' E	10,843.46'



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 www.slsurvey.com

**AS DRILLED COORDINATES (PEN54 H3)**  
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 NAD 27 GEO. LAT (N) 39 25 77.19 LONG (W) 80 9 27.519  
 NAD 83 UTM (M) N. 4,345,268.07 E. 506,268.12

**LANDING POINT**  
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 NAD 27 GEO. LAT (N) 39 25 59.95 LONG (W) 80 9 25.917  
 NAD 83 UTM (M) N. 4,345,206.74 E. 506,415.01

**BOTTOM HOLE**  
 NAD 27 S.P.C.(FT) N. 269,162.93 E. 1,600,813.38  
 NAD 27 GEO. LAT (N) 39 23 04.15 LONG (W) 80 9 09.217  
 NAD 83 UTM (M) N. 4,342,359.54 E. 507,650.16

SCALE **1" = 2000'** FILE NO. **8083AD514476**  
 DATE **JUNE 25**, 20 **15**  
 REVISED **07/01/15, 06/23/16 07/12/16 & 08/15/16**  
 OPERATORS WELL NO. **WV 514476**  
 API WELL **47 — 085 — 10226H**  
 NO. STATE COUNTY PERMIT



STATE OF WEST VIRGINIA  
 DIVISION OF ENVIRONMENTAL PROTECTION  
 OFFICE OF OIL AND GAS



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

**LEGEND**

- LEASE LINE
- SURFACE LINE
- PROPOSED PATH
- AS DRILLED PATH
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- STATE ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- CLAY DISTRICT
- TAX MAP-PARCEL

COUNTY NAME

PERMIT

WELL OPERATOR **EQT PRODUCTION COMPANY** DESIGNATED AGENT **REX C. RAY**  
 ADDRESS **115 PROFESSIONAL PLACE P.O. BOX 280** ADDRESS **115 PROFESSIONAL PLACE P.O. BOX 280**  
**BRIDGEPORT, WV 26330** **BRIDGEPORT, WV 26330**

**05/19/2017**

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/15/2016
Job End Date:	10/3/2016
State:	West Virginia
County:	Ritchie
API Number:	47-085-10226-00-00
Operator Name:	EQT Production
Well Name and Number:	514476
Latitude:	39.25771900
Longitude:	-80.92751800
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,298
Total Base Water Volume (gal):	20,701,808
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	FTS International	Carrier/Base Fluid	Water	7732-18-5	100.00000	90.19505	None
Other Chemical (s)	Listed Above	See Trade Name (s) List	Water	7732-18-5	50.00000	0.03097	

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 WV Department of Environmental Protection

			Water	7732-18-5	80.00000	0.01174	
SI-680	FTS International	Scale inhibitor					
			Water	7732-18-5	80.00000	0.01174	None
			Water	7732-18-5	50.00000	0.03097	None
CI-150	FTS International	Acid corrosion inhibitor					
				Listed Below			
ECM FR NI 200	ECM Supply	Friction Reducing Agent					
				Listed Below			
MC MX 8-2544	Multi-Chem Group	Live Culture - Nitrate Reducing Bacteria					
				Listed Below			
CS-500-SI	FTS International	Scale inhibitor					
				Listed Below			
MC MX 5-3886	Multi-Chem Group	Specialty Brine					
				Listed Below			
Hydrochloric Acid (15%)	FTS International	Acid					
				Listed Below			
EMC Surf 200	ECM Supply	Enhancer					

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 Office of Oil and Gas  
 FEB 10 2017  
 WY Department of  
 Environmental Protection



				Listed Below			
APB-1	FTS International	Gel Breaker					
				Listed Below			
HVG-1 4.0	FTS International	Water gelling agent					
				Listed Below			
Sand (Proppant)	FTS International	Proppant					
				Listed Below			

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

			Silica Substrate	14808-60-7	100.00000	9.38974	None
			Calcium Nitrate.4H2O	13477-34-4	100.00000	0.10965	None
			Hydrochloric Acid	7647-01-0	15.00000	0.02972	None
			Copolymer of Two Propenamide	69418-26-4	30.00000	0.01858	None
			Copolymer of Two Propenamide	69418-26-4	30.00000	0.01858	
			Petroleum Distillate	64742-47-8	20.00000	0.01239	None
			Petroleum Distillate	64742-47-8	20.00000	0.01239	
			Sodium chloride	7647-14-5	100.00000	0.00990	
			Sodium chloride	7647-14-5	100.00000	0.00990	None
			Diethylene glycol monobutyl ether	112-34-5	30.00000	0.00329	
			Diethylene glycol monobutyl ether	112-34-5	30.00000	0.00329	None
			Organic Phosphonic Acid	Proprietary	20.00000	0.00294	None
			Organic Phosphonic Acid	Proprietary	20.00000	0.00294	
			Methanol	67-56-1	10.00000	0.00147	None
			Methanol	67-56-1	10.00000	0.00147	

			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00124	None
			Alcohols, C-12-16, Ethoxylated	68551-12-2	2.00000	0.00124	
			Alcohols, C-12-16, Ethoxylated	68551-12-2	2.00000	0.00124	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00124	
			Ethylene glycol	107-21-1	10.00000	0.00091	None
			Ammonium Chloride ((NH4)Cl)	12125-02-9	1.00000	0.00062	
			Ammonium Chloride ((NH4)Cl)	12125-02-9	1.00000	0.00062	None
			Sodium nitrate	7631-99-4	5.00000	0.00049	None
			Sodium nitrate	7631-99-4	5.00000	0.00049	
			Raffinates, Sorption Process	64741-85-1	55.00000	0.00024	None
			Raffinates, Sorption Process	64741-85-1	55.00000	0.00024	
			Guar gum	9000-30-0	50.00000	0.00022	
			Guar gum	9000-30-0	50.00000	0.00022	None
			Ethylene glycol	107-21-1	30.00000	0.00011	None
			Isopropanol	67-63-0	30.00000	0.00011	None
			Organic amine resin salt	Proprietary	30.00000	0.00011	None
			Dimethylformamide	68-12-2	10.00000	0.00004	None
			Aromatic aldehyde	Proprietary	10.00000	0.00004	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00004	None
			Quartz	14808-60-7	4.00000	0.00002	None
			Quartz	14808-60-7	4.00000	0.00002	
			Isotridecanol, ethoxylated	9043-30-5	2.00000	0.00001	
			Isotridecanol, ethoxylated	9043-30-5	2.00000	0.00001	None
			Ammonium Persulfate	7727-54-0	95.00000	0.00000	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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Environmental Protection



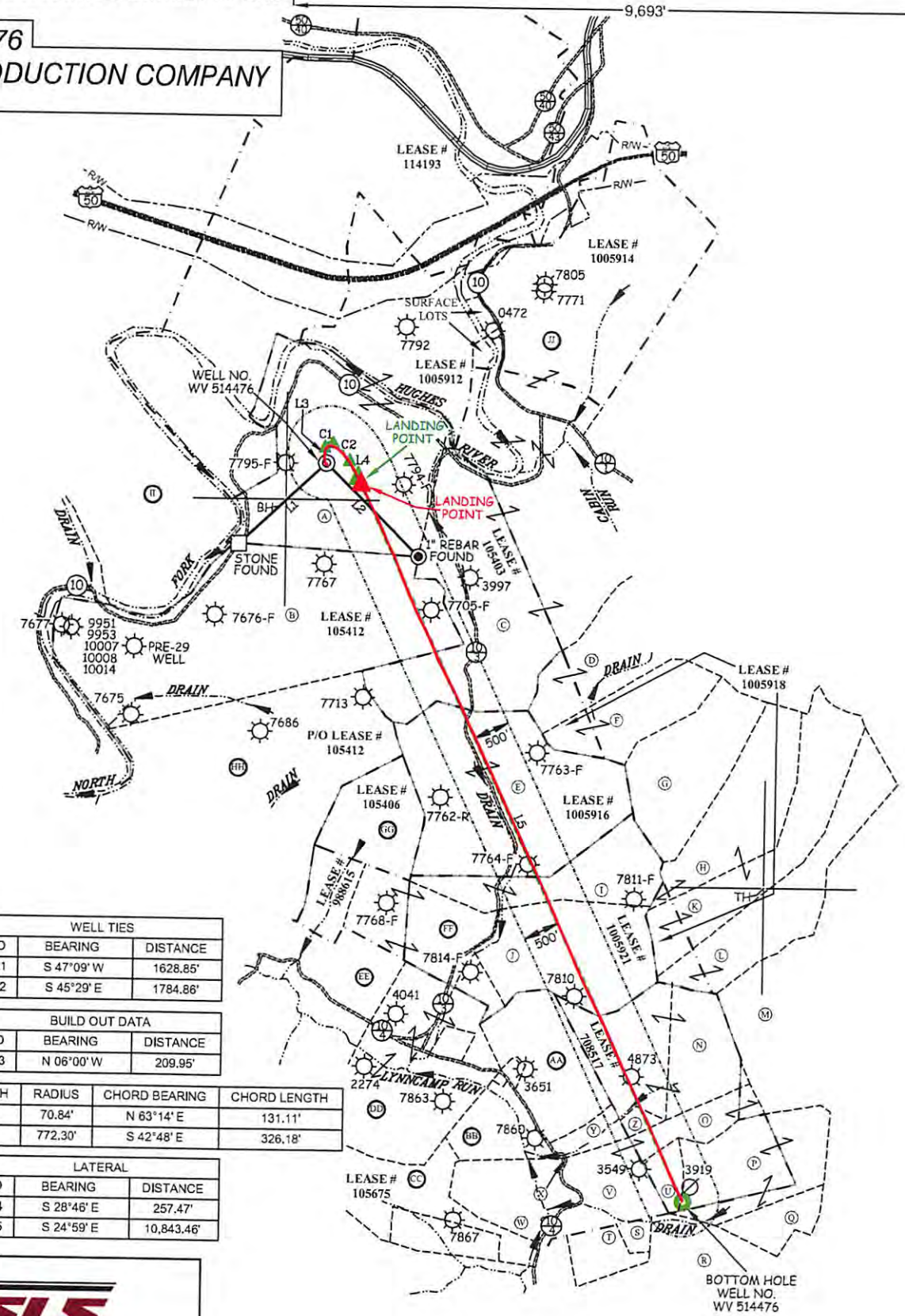
**PEN54**  
**WV 514476**  
**EQT PRODUCTION COMPANY**

BOTTOM HOLE LATITUDE 39°15'00"

NAD'27 GRID NORTH

7,130'  
 12,365'  
 BOTTOM HOLE LONGITUDE 80°52'30"

TOP HOLE LONGITUDE 80°55'00"



WELL TIES		
ID	BEARING	DISTANCE
L1	S 47°09' W	1628.85'
L2	S 45°29' E	1784.86'

BUILD OUT DATA		
ID	BEARING	DISTANCE
L3	N 06°00' W	209.95'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	167.49'	70.84'	N 63°14' E	131.11'
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**AS DRILLED COORDINATES**  
**(PEN54 H3)**

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

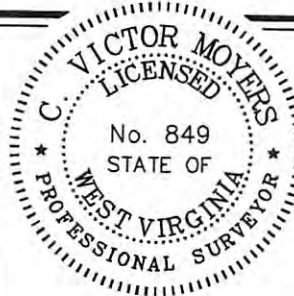
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STATE OF WEST VIRGINIA  
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C-TM-00-00

SCALE 1" = 2000' FILE NO. 8083AD514476

DATE JUNE 25, 20 15

REVISED 07/01/15, 06/23/16 07/12/16 & 08/15/16

OPERATORS WELL NO. WV 514476

API WELL NO. 47 — 085 — 10226H

NO. STATE COUNTY PERMIT

WELL OPERATOR EQT PRODUCTION COMPANY

ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280  
 BRIDGEPORT, WV 26330

DESIGNATED AGENT REX C. RAY

ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280  
 BRIDGEPORT, WV 26330

COUNTY NAME  
 PERMIT

05/19/2017



TOP HOLE LATITUDE 39°17'30" 3,073'

**PEN54**  
**WV 514476**  
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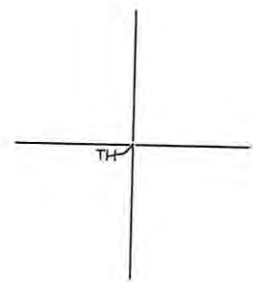
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II	DONALD DEEM ET AL	133.07 ACRES±	C-TM-31-10
JJ	ANTERO TREATMENT LLC	175.85 ACRES±	C-TM-31-06

**AS DRILLED COORDINATES (PEN54 H3)**  
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
NAD'27 S.P.C.(FT) N. 279,188.08 E. 1,595,787.72  
NAD'27 GEO. LAT-(N) 39.257719 LONG-(W) 80.927518  
NAD'83 UTM (M) N. 4,345,388.07 E. 506,268.12

**LANDING POINT**  
NAD'27 S.P.C.(FT) N. 278,913.13 E. 1,596,265.30  
NAD'27 GEO. LAT-(N) 39.256985 LONG-(W) 80.925817  
NAD'83 UTM (M) N. 4,345,306.74 E. 506,415.01

**BOTTOM HOLE**  
NAD'27 S.P.C.(FT) N. 269,162.93 E. 1,600,813.38  
NAD'27 GEO. LAT-(N) 39.230415 LONG-(W) 80.909217  
NAD'83 UTM (M) N. 4,342,359.54 E. 507,850.16



7,130'  
 12,365'  
 80°52'30"  
 80°55'00"



**NOTES ON SURVEY**

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
- AS DRILLED INFORMATION PROVIDED BY EQT.



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.  
849

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE JUNE 25, 20 15  
REVISED 07/01/15, 06/23/16 07/12/16 & 08/15/16  
OPERATORS WELL NO. WV 514476  
API WELL NO. 47 - 085 - 10226H  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8083AD514476.dwg  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE SEE NOTE 2

STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

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

LOCATION:  
PAD ELEVATION 1,016' WATERSHED NORTH FORK HUGHES RIVER  
DISTRICT CLAY COUNTY RITCHIE QUADRANGLES PENNSBORO & PULLMAN 7.5'

SURFACE OWNER JERRY MORTON ET AL ACREAGE 243.50±  
ROYALTY OWNER ELLEN S. FRANCAVIGLIA ET AL ACREAGE 268±  
LEASE NO. 105403

PROPOSED WORK:  
DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  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 6,275'

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY  
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT

05/16/2017