

Well Operator's Report of Well Work



Well Number: 515876

API: 47 - 017 - 06762

Submission: Initial Amended

Notes:

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JUL 26 2016

WV Department of
Environmental Protection

AX 08/03/16

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

API 47-017-06762 County Doddridge District West Union
Quad West Union 7.5 Pad Name WEU2 Field/Pool Name _____
Farm name Ruth R. Davies Pierce et al C/O Tom Davies Well Number 515876
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 4,347,031.70 Easting 519,739.53
Landing Point of Curve Northing 4,346,561.11 Easting 521,300.48
Bottom Hole Northing 4,345,709.35 Easting 521,782.08

Elevation (ft) 1,156' 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 12.5 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 12/22/2015 Date drilling commenced 03/28/2016 Date drilling ceased 04/09/2016
Date completion activities began 4/24/2016 Date completion activities ceased 4/28/2016
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

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Freshwater depth(s) ft 174',282',546',843',963' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2063' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 256',476',558' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

WV Department of
Environmental Protection

Reviewed by: _____

API 47-017 - 06762 Farm name Ruth R. Davies Pierce et al C/O Tom Davies Well number 515876

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	n/a	Y
Surface	17 1/2"	13 3/8"	1089"	NEW	J-55	876'	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	3069'	NEW	A-500	1635'	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	13,719'	NEW	P-110	N/A	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	940	15.6	1.20	1128	0	8
Coal							
Intermediate 1	Class A	1120	15.6	1.2	1,344	0	8
Intermediate 2							
Intermediate 3							
Production	Class H / Class H	1030 / 813	15.2/15.6	1.11 / 1.84	2369	3500	72
Tubing							

Drillers TD (ft) 13,721' Loggers TD (ft) N/A
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 3668'

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: 4 centralizers ran at 1,045', 876', 541', 122'
 INTERMEDIATE: 7 centralizers ran at 3,025', 2,561', 2,098', 1,635', 1,172', 709', 247'
 PRODUCTION: Composite body spiral centralizers run every joint from TD to 4,400'

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- 017 - 06762 Farm name Ruth R. Davies Pierce et al C/O Tom Davies Well number _____

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6,682</u>	<u>TVD</u>	<u>10,229</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 1,645 psi Bottom Hole N/A psi DURATION OF TEST 65 hrs

OPEN FLOW Gas 11,355 mcfpd Oil N/A bpd NGL 66 bpd Water 756 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	<u>0</u>		<u>0</u>		

Please insert additional pages as applicable.

Drilling Contractor Pioneer 72
Address 1083 N Eighty Eight Rd City Rices Landing State PA Zip 15357

Logging Company Gyro Data
Address 601 MAYER ST City BRIDGEVILLE State PA Zip 15017

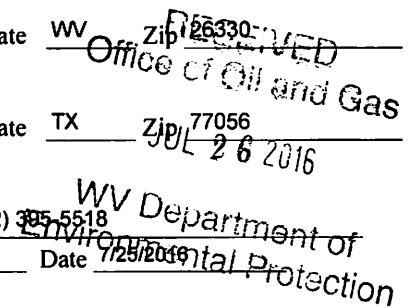
Cementing Company Allied Oil & Gas Services, LLC
Address 1036 E Main St City Bridgeport State WV Zip 26330

Stimulating Company Keane
Address 2121 Sage Road City Houston State TX Zip 77056

Please insert additional pages as applicable.

Completed by Jim Helmick Telephone (412) 385-5518
Signature [Signature] Title VP Completions Date 7/25/2016

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



API 47- 017 - 06762 Farm name Ruth R. Davies Pierce et al C/O Tom Davies Well number 515876

Drilling Contractor _____
Address _____ City _____ State _____ Zip _____

Logging Company _____
Address _____ City _____ State _____ Zip _____

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

Cementing Company C&J Energy Services
Address 8300 Rt. 119 N City Blacklick State PA Zip 15716

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WEU2 515876 API: 47-017-06762 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	256	256
UNIONTOWN COAL	256	256	259	259
SAND/SHALE	259	259	476	476
PITTSBURGH COAL	476	476	479	479
SAND/SHALE	479	479	558	558
COAL	558	558	562	562
SAND/SHALE	562	562	1512	1512
MAXTON	1512	1512	1566	1566
SAND/SHALE	1566	1566	1908	1908
BIG LIME	1908	1908	1977	1977
KEENER	1977	1977	2053	2053
SAND/SHALE	2053	2053	2207	2207
WEIR	2207	2207	2333	2333
SAND/SHALE	2333	2333	2409	2409
GANTZ	2409	2409	2417	2417
SAND/SHALE	2417	2417	2523	2523
50F	2523	2523	2569	2569
SAND/SHALE	2569	2569	2632	2632
30F	2632	2632	2655	2655
GORDON	2655	2655	2952	2952
BAYARD	2952	2952	3286	3286
WARREN	3286	3286	3347	3347
B-5	3347	3347	3355	3355
SPEECHLEY	3355	3355	4041	4040
BALLTOWN B	4041	4040	4041	4040
BALLTOWN A	4041	4040	4233	4232
BRADFORD	4233	4232	4505	4504
RILEY	4505	4504	4943	4898
BENSON	4943	4898	5198	5025
ALEXANDER	5198	5025	5809	5226
RHINESTREET	5809	5226	9009	6311
SONYEA	9009	6311	9553	6504
GENESSEE	9553	6504	9808	6584
GENESEO	9808	6584	9946	6625
TULLY	9946	6625	10067	6654
HAMILTON	10067	6654	10229	6682
MARCELLUS	10229	6682	13721	6664

515876- 47-017-06762-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	4/20/2016	13,718	13,719	10	MARCELLUS
1	4/24/2016	13,571	13,663	32	MARCELLUS
2	4/24/2016	13,421	13,543	40	MARCELLUS
3	4/25/2016	13,271	13,393	40	MARCELLUS
4	4/25/2016	13,121	13,240	40	MARCELLUS
5	4/25/2016	12,971	13,093	40	MARCELLUS
6	4/25/2016	12,821	12,943	40	MARCELLUS
7	4/25/2016	12,671	12,793	40	MARCELLUS
8	4/25/2016	12,523	12,643	40	MARCELLUS
9	4/26/2016	12,371	12,493	40	MARCELLUS
10	4/26/2016	12,223	12,343	40	MARCELLUS
11	4/26/2016	12,071	12,193	40	MARCELLUS
12	4/26/2016	11,921	12,043	40	MARCELLUS
13	4/26/2016	11,771	11,893	40	MARCELLUS
14	4/27/2016	11,624	11,743	40	MARCELLUS
15	4/27/2016	11,471	11,593	40	MARCELLUS
16	4/27/2016	11,321	11,443	40	MARCELLUS
17	4/27/2016	11,171	11,293	40	MARCELLUS
18	4/27/2016	11,021	11,143	40	MARCELLUS
19	4/27/2016	10,871	10,993	40	MARCELLUS
20	4/28/2016	10,721	10,843	40	MARCELLUS
21	4/28/2016	10,571	10,693	40	MARCELLUS
22	4/28/2016	10,421	10,543	40	MARCELLUS

515876- 47-017-06762-0000 - 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	4/24/2016	24.2	7,636	9,344	4,949	0	595	0
1	4/24/2016	89.8	8,817	9,350	4,276	253,440.00	7,611	0
2	4/24/2016	97.8	8,791	9,047	4,946	250,700.00	6,300	0
3	4/25/2016	100.3	8,894	9,063	4,106	253,800.00	6,220	0
4	4/25/2016	99	8,892	9,030	4,421	251,780.00	6,224	0
5	4/25/2016	100.6	8,889	8,992	3,982	249,080.00	5,997	0
6	4/25/2016	100	8,688	8,881	3,978	249,260.00	6,283	0
7	4/25/2016	99.8	8,620	8,907	4,175	252,240.00	6,202	0
8	4/25/2016	99.3	8,700	8,905	4,357	252,560.00	6,284	0
9	4/26/2016	100.8	8,717	8,955	4,526	252,460.00	5,999	0
10	4/26/2016	100.4	8,696	8,836	3,838	252,700.00	6,358	0
11	4/26/2016	100.6	8,628	8,859	4,189	250,520.00	6,034	0
12	4/26/2016	101.2	8,457	8,719	3,990	249,060.00	6,303	0
13	4/26/2016	101.1	8,333	8,537	4,224	252,440.00	6,123	0
14	4/27/2016	100.7	7,903	8,155	4,157	250,980.00	5,901	0
15	4/27/2016	101.1	7,809	7,922	4,520	251,140.00	5,962	0
16	4/27/2016	100.7	8,011	8,147	4,377	253,640.00	6,049	0
17	4/27/2016	101.4	8,099	8,302	4,076	255,280.00	5,926	0
18	4/27/2016	101.98	7,939	8,298	5,151	251,440.00	6,260	0
19	4/27/2016	100.76	7,806	8,082	4,619	254,460.00	5,986	0
20	4/28/2016	100.86	7,808	8,321	4,927	254,820.00	5,965	0
21	4/28/2016	100.4	7,706	7,826	5,181	253,000.00	5,921	0
22	4/28/2016	100.7	7,946	8,098	4,729	254,200.00	6,204	0

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/24/2015
Job End Date:	4/28/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06762-00-00
Operator Name:	EQT Production
Well Name and Number:	515876
Latitude:	39.27233000
Longitude:	-80.77133000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,682
Total Base Water Volume (gal):	5,741,694
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	Keane Group	Carrier/Base Fluid	Water	7732-18-5	100.00000	89.33078	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.34545	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03393	None
FFR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.01901	None
			Alkyl Alcohol	Proprietary	10.00000	0.00634	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00317	None
EC6330A	Keane Group	Scale Inhibitor	Ethylene Glycol	107-21-1	5.00000	0.00124	None
			Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00124	None
Bactron K-139	Keane Group	Biocide	Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	10.00000	0.00088	None
			Glutaraldehyde	111-30-8	5.00000	0.00044	None

			Ethanol	64-17-5	5.00000	0.00044	None
AI 600	Keane Group	Corrosion Inhibitor					
			Ethylene Glycol	107-21-1	40.00000	0.00022	None
			Dimethylformamide	68-12-2	20.00000	0.00011	None
			Cinnamialdehyde	104-55-2	15.00000	0.00008	None
			Pyridine, alkyl derives, quaternized with benzyl chloride	68909-18-2	15.00000	0.00008	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	5.00000	0.00003	None
			1-Decanol	112-30-1	5.00000	0.00003	None
			2-Butoxyethanol	111-76-2	5.00000	0.00003	None
			1-Octanol	111-87-5	5.00000	0.00003	None
			Triethyl Phosphate	78-40-0	2.50000	0.00001	None
			Methanol	67-56-1	2.50000	0.00001	None
			Alkyl Pyridine	68391-11-7	1.00000	0.00001	None

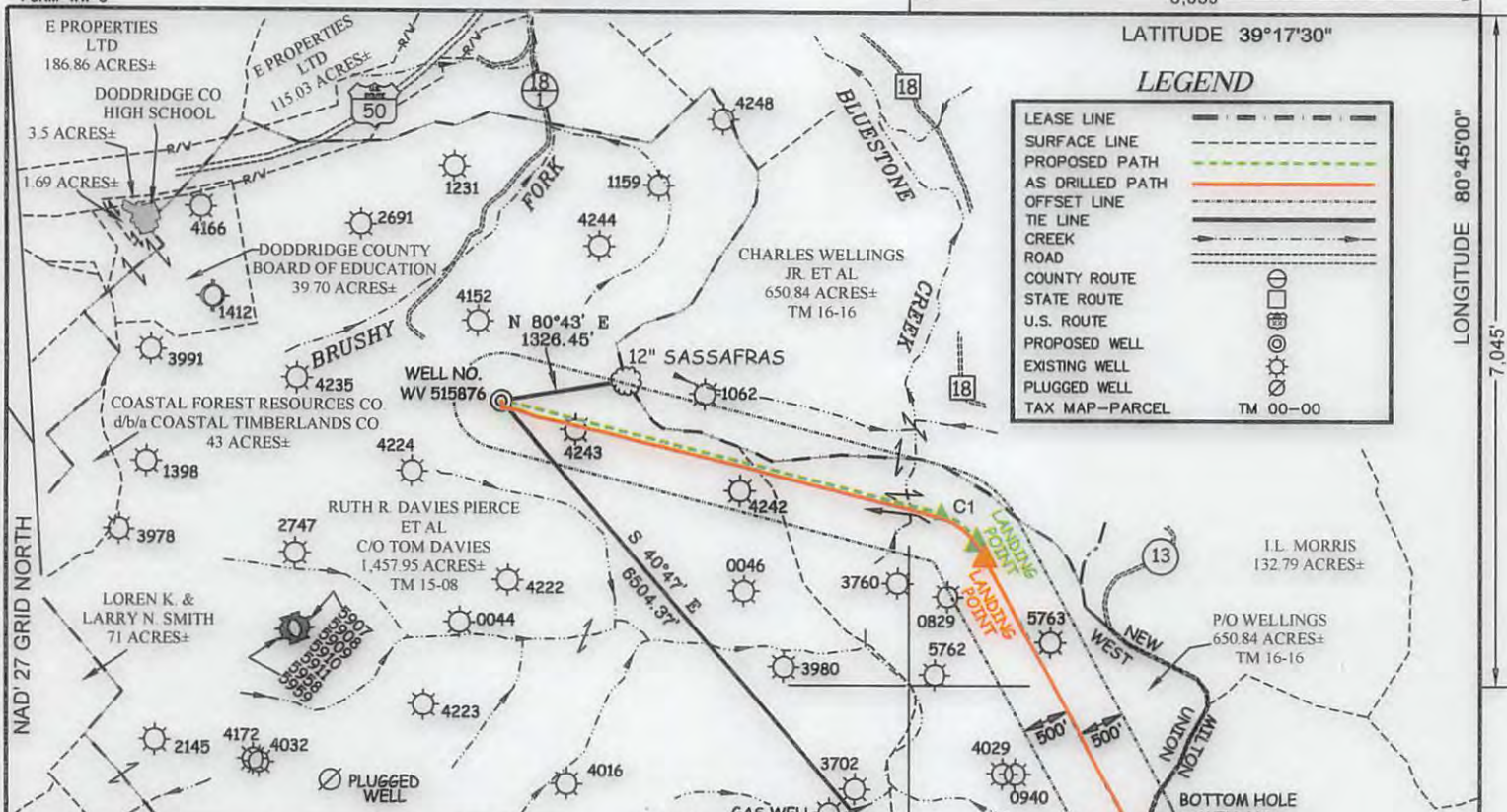
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* 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)



**EQT PRODUCTION COMPANY
LEWIS MAXWELL LEASE
1,562 ACRES±
WELL NO. WV 515876
(WEU2 H9)**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'27 S.P.C.(FT) N. 283,842.92 E. 1,640,085.06
 NAD'27 GEO. LAT-(N) 39.272325 LONG-(W) 80.771332
 NAD'83 UTM (M) N. 4,347,031.70 E. 519,739.53
LANDING POINT
 NAD'27 S.P.C.(FT) N. 282,378.60 E. 1,645,092.31
 NAD'27 GEO. LAT-(N) 39.268498 LONG-(W) 80.753575
 NAD'83 UTM (M) N. 4,346,611.08 E. 521,272.42
BOTTOM HOLE
 NAD'27 S.P.C.(FT) N. 279,384.00 E. 1,646,709.77
 NAD'27 GEO. LAT-(N) 39.260338 LONG-(W) 80.747716
 NAD'83 UTM (M) N. 4,345,707.00 E. 521,780.40

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	494.84'	600.26'	S 51°21'00" E	480.95'

NOTES ON SURVEY
 1. 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.
 2. AS DRILLED INFORMATION PROVIDED BY EQT.

**AS DRILLED COORDINATES
FOR WELL NO. WV 515876**
 (S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'27 S.P.C.(FT) N. 283,842.92 E. 1,640,085.06
 NAD'27 GEO. LAT-(N) 39.272325 LONG-(W) 80.771332
 NAD'83 UTM (M) N. 4,347,031.70 E. 519,739.53
LANDING POINT
 NAD'27 S.P.C.(FT) N. 282,213.08 E. 1,645,181.65
 NAD'27 GEO. LAT-(N) 39.268047 LONG-(W) 80.753252
 NAD'83 UTM (M) N. 4,346,561.11 E. 521,300.48
BOTTOM HOLE
 NAD'27 S.P.C.(FT) N. 279,391.61 E. 1,646,715.41
 NAD'27 GEO. LAT-(N) 39.260359 LONG-(W) 80.747697
 NAD'83 UTM (M) N. 4,345,709.35 E. 521,782.08



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.
2288 *Carl M. Thompson*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE OCTOBER 28, 20 15
 REVISED 04/21/16 & 06/13/16
 OPERATORS WELL NO. WV 515876
 API WELL NO. **47 - 017 - 06762H**
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200 FILE NO. 7245AD515876R
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION:
 ELEVATION 1,155.6' (PAD ELEVATION) WATERSHED BLUESTONE CREEK
 DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE WEST UNION 7.5'
 SURFACE OWNER RUTH R. DAVIES PIERCE ET AL C/O TOM DAVIES ACREAGE 1,457.95±
 ROYALTY OWNER MARY FARR SECRIST ET AL ACREAGE 1,562±
 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 TVD 6,683'

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