

APPROVED

NAME: *Jacquelin Tharnton*

DATE: *2/11/2016*

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 515682

API: 47 - 017 - 06611

Submission: Initial Amended

Notes:

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02/12/2016

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

API 47-017-06611 County DODDRIDGE District SOUTHWEST
Quad OXFORD Pad Name OXF127 Field/Pool Name _____
Farm name I.L. MORRIS Well Number 515682
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 4,338,827.8 Easting 518,096.8
Landing Point of Curve Northing 4,338,515.0 Easting 517,462.2
→ Bottom Hole Northing 4,337,979.5 Easting 518,016.1
Elevation (ft) 1242 GL 4,337,025 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 13.5 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 12/01/2014 Date drilling commenced 04/11/2015 Date drilling ceased 9/5/2015
Date completion activities began 10/20/2015 Date completion activities ceased 10/25/2015
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 83',394',502' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1034',1263',1386',1442' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 225' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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WV Department of Environmental Protection
02/12/2016

API 47-017 - 06611

Farm name I.L. MORRIS

Well number 515682

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 94LB/FT	NONE	Y
Surface	17.5"	13.375"	1050'	NEW	J-55 54.5LB/FT	NONE	Y
Coal							
Intermediate 1	12.375"	9.625"	2980'	NEW	A-500 40LB/FT	NONE	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	12,636'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set							

Comment Details N/A

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	837	15.6	1.20	1004.4	0	8
Coal							
Intermediate 1	CLASS A	1057	15.6	1.18	1247.26	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS A / CLASS H	935 / 615	14.2 / 15.2	1.23 / 1.95	2349.3	2660	24
Tubing							

Drillers TD (ft) 11,639 MD

Loggers TD (ft) N/A

Deepest formation penetrated Marcellus

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 3,345 MD

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, 21

INTERMEDIATE- 7 CENTRALIZERS RAN AT LEAST EVERY 500' FEET

PRODUCTION- Solid Composite body spiral centralizers placed every joint from bottom to 4,190'

WAS WELL COMPLETED AS SHOT HOLE Yes No

DETAILS

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WAS WELL COMPLETED OPEN HOLE? Yes No

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WERE TRACERS USED Yes No TYPE OF TRACER(S) USED

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API 47- 017 - 06611 Farm name I.L. MORRIS Well number 515682

Drilling Contractor Savanna Drilling (Rig 655)
Address 125 Industry Road City Waynesburg State PA Zip 15357

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

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company C&J Energy Services
Address 2504 Smith Creek Road City Waynesburg State PA Zip 15370

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515682 Final Formations API #47-17006611

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1		227	227
WASHINGTON COAL	227	227	228	228
SAND/SHALE	228	228	1,713.00	1,713.00
MAXTON	1,713.00	1,713.00	1,879.00	1,878.90
BIG LIME	1,879.00	1,878.90	2,172.00	2,171.90
WEIR	2,172.00	2,171.90	2,345.00	2,344.90
BEREA	2,345.00	2,344.90	2,389.00	2,388.90
GANTZ	2,389.00	2,388.90	2,470.00	2,469.90
50F	2,470.00	2,469.90	2,580.00	2,579.80
30F	2,580.00	2,579.80	2,623.00	2,622.80
GORDON	2,623.00	2,622.80	2,727.00	2,726.80
4TH SAND	2,727.00	2,726.80	2,862.00	2,861.80
5TH SAND	2,862.00	2,861.80	2,901.00	2,900.80
BAYARD	2,901.00	2,900.80	3,235.00	3,234.80
WARREN	3,235.00	3,234.80	3,306.00	3,305.80
SPEECHLEY	3,306.00	3,305.80	3,837.00	3,817.70
BALLTOWN A	3,837.00	3,817.70	3,990.00	3,934.20
BALLTOWN B	3,990.00	3,934.20	4,179.00	4,059.10
BRADFORD	4,179.00	4,059.10	4,442.00	4,237.50
RILEY	4,442.00	4,237.50	4,871.00	4,534.00
BENSON	4,871.00	4,534.00	5,102.00	4,694.50
ALEXANDER	5,102.00	4,694.50	5,827.00	5,195.60
RHINESTREET	5,827.00	5,195.60	7,373.00	6,285.00
SONYEA	7,373.00	6,285.00	7,556.00	6,417.70
MIDDLESEX	7,556.00	6,417.70	7,646.00	6,475.80
GENESSEE	7,646.00	6,475.80	7,770.00	6,542.60
GENESE0	7,770.00	6,542.60	7,860.00	6,584.70
TULLY	7,860.00	6,584.70	7,914.00	6,606.30
HAMILTON	7,914.00	6,606.30	7,966.00	6,623.40
MARCELLUS	7,966.00	6,623.40		

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515682-47-017-06611-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	10/20/2015	12,621	12,623	10	MARCELLUS
1	10/20/2015	12,477	12,569	32	MARCELLUS
2	10/20/2015	12,327	12,449	40	MARCELLUS
3	10/21/2015	12,177	12,299	40	MARCELLUS
4	10/21/2015	12,027	12,149	40	MARCELLUS
5	10/21/2015	11,877	11,999	40	MARCELLUS
6	10/22/2015	11,727	11,849	40	MARCELLUS
7	10/22/2015	11,607	11,699	32	MARCELLUS
8	10/22/2015	11,431	11,519	32	MARCELLUS
9	10/22/2015	11,277	11,399	40	MARCELLUS
10	10/22/2015	11,127	11,249	40	MARCELLUS
11	10/22/2015	10,977	11,099	40	MARCELLUS
12	10/23/2015	10,827	10,949	40	MARCELLUS
13	10/23/2015	10,677	10,799	40	MARCELLUS
14	10/23/2015	10,527	10,649	40	MARCELLUS
15	10/23/2015	10,379	10,499	40	MARCELLUS
16	10/23/2015	10,227	10,349	40	MARCELLUS
17	10/23/2015	10,077	10,199	40	MARCELLUS
18	10/24/2015	9,927	10,049	40	MARCELLUS
19	10/24/2015	9,777	9,899	40	MARCELLUS
20	10/24/2015	9,627	9,749	40	MARCELLUS
21	10/24/2015	9,477	9,599	40	MARCELLUS
22	10/24/2015	9,327	9,449	40	MARCELLUS
23	10/24/2015	9,177	9,299	40	MARCELLUS
24	10/24/2015	9,027	9,149	40	MARCELLUS
25	10/24/2015	8,427	8,549	40	MARCELLUS
26	10/25/2015	8,277	8,399	40	MARCELLUS
27	10/25/2015	8,127	8,249	40	MARCELLUS

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515682-017-06611-0000 - 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 (bbbls)	Amount of Nitrogen/other (units)
Initiation Sleeve	10/20/2015	7.4	8,926	9,573	8,319	0	1,499	0
1	10/20/2015	84.9	7,191	7,524	4,367	249,800.00	7,463	0
2	10/20/2015	96.6	7,821	8,327	4,896	252,320.00	6,120	0
3	10/21/2015	99.1	7,540	7,707	4,029	251,600.00	6,124	0
4	10/21/2015	99.4	7,737	7,995	4,492	250,235.00	6,363	0
5	10/21/2015	99.8	7,628	7,794	4,889	250,400.00	6,267	0
6	10/22/2015	99.6	7,769	7,904	4,727	249,990.00	6,059	0
7	10/22/2015	99.2	7,831	8,493	4,883	251,020.00	5,900	0
8	10/22/2015	99	7,855	8,177	5,270	255,435.00	6,335	0
9	10/22/2015	99.7	7,280	7,468	4,970	252,180.00	6,554	0
10	10/22/2015	101	7,498	7,831	4,735	251,095.00	6,127	0
11	10/22/2015	100.3	7,523	7,908	5,044	252,515.00	6,054	0
12	10/23/2015	100.4	7,237	7,607	4,895	251,785.00	6,074	0
13	10/23/2015	99.3	7,332	8,018	4,710	251,165.00	6,241	0
14	10/23/2015	100	7,238	7,975	4,661	252,900.00	6,123	0
15	10/23/2015	92	7,650	8,387	4,432	247,680.00	6,487	0
16	10/23/2015	98.7	7,248	7,447	4,704	254,695.00	6,122	0
17	10/23/2015	98.3	7,468	7,886	4,938	252,905.00	6,047	0
18	10/24/2015	99.4	7,325	7,523	4,067	251,815.00	6,032	0
19	10/24/2015	100.3	7,286	7,920	4,454	250,690.00	5,791	0
20	10/24/2015	99.7	7,202	7,691	5,110	257,275.00	6,212	0
21	10/24/2015	100.5	7,149	7,504	4,649	248,980.00	5,947	0
22	10/24/2015	98.6	7,396	7,667	4,687	251,615.00	5,857	0
23	10/24/2015	100.1	7,456	7,992	4,700	250,655.00	5,900	0
24	10/24/2015	91.8	7,719	8,711	5,678	243,305.00	6,248	0
25	10/24/2015	99.7	7,331	9,812	4,620	257,835.00	6,490	0
26	10/25/2015	100.4	7,163	7,357	4,809	250,985.00	5,857	0
27	10/25/2015	99.5	7,307	7,511	3,029	251,040.00	5,892	0

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Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	10/20/2015
Job End Date:	10/25/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06611-00-00
Operator Name:	EQT Production
Well Name and Number:	515682
Longitude:	-80.79059700
Latitude:	39.19843400
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,623
Total Base Water Volume (gal):	7,063,770
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	89.29539	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.28865	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05713	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03600	None
FFR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.01531	None
			Alkyl Alcohol	Proprietary	10.00000	0.00510	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00255	None
EC6330A	Keane Group	Scale Inhibitor	Ethylene Glycol	107-21-1	5.00000	0.00146	None
			Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00146	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00024	None
			Dimethylformamide	68-12-2	20.00000	0.00012	None

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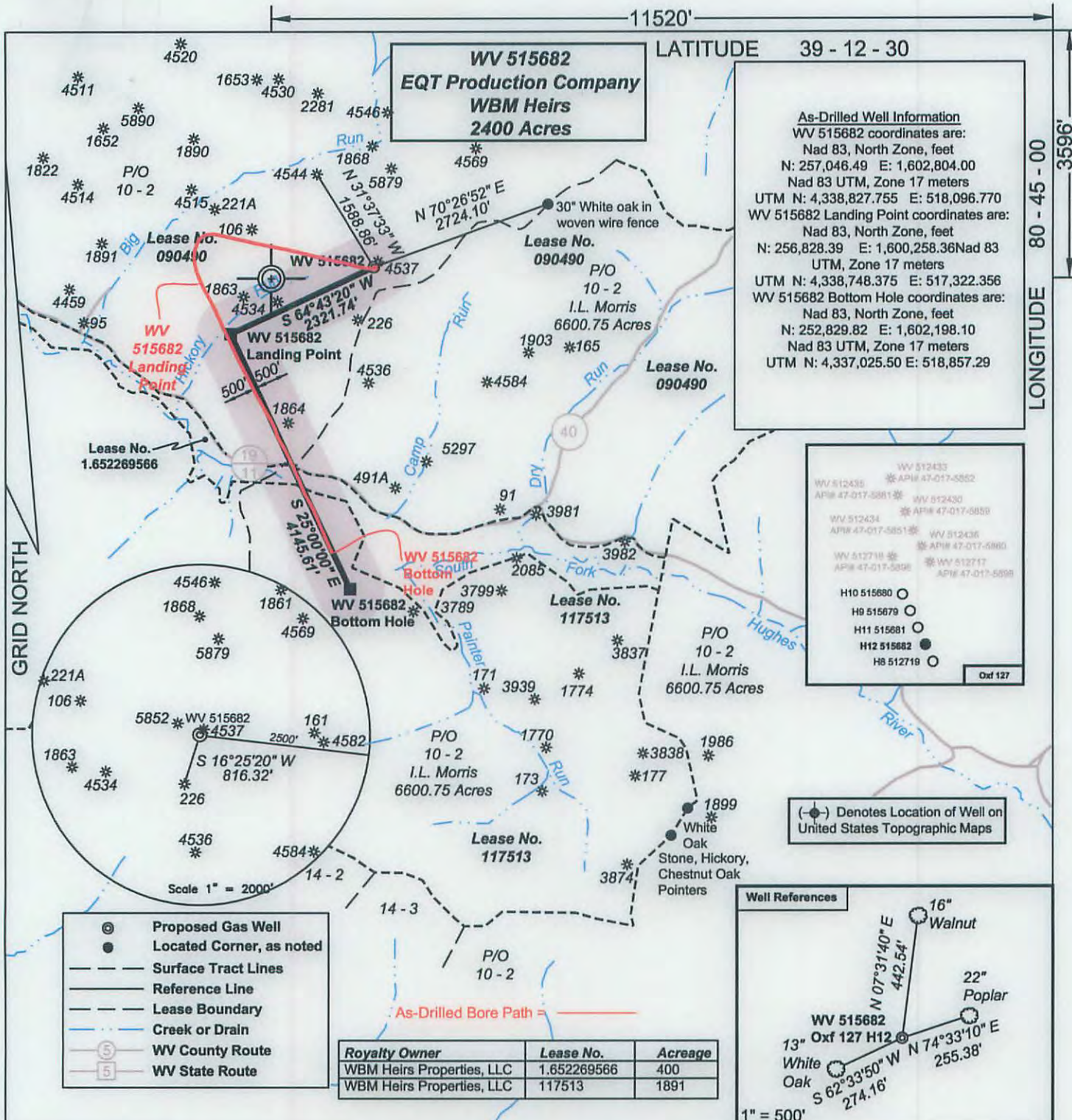
		Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00009	None
		Pyridine, alkyl derives, quaternized with benzyl chloride	68909-18-2	15.00000	0.00009	None
		Cinnamialdehyde	104-55-2	15.00000	0.00009	None
		2-Butoxyethanol	111-76-2	5.00000	0.00003	None
		1-Decanol	112-30-1	5.00000	0.00003	None
		1-Octanol	111-87-5	5.00000	0.00003	None
		Methanol	67-56-1	2.50000	0.00001	None
		Triethyl Phosphate	78-40-0	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)

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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 Department of Environmental Protection.

Ben R. Singleton
P.S. 2092



FILE NO: 150-30-SW-14
DRAWING NO: H12
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1:2500
PROVEN SOURCE OF ELEVATION: NGS CORS Station

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

DATE: January 21, 2016
OPERATOR'S WELL NO. 515682
API WELL NO. 47-017-06611
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: Existing 1240 Proposed 1242.1 WATERSHED Hickory Run of South Fork of Hughes River QUADRANGLE: Oxford
DISTRICT: Southwest COUNTY: Doddridge
SURFACE OWNER: I. L. Morris ACREAGE: 6600.75
ROYALTY OWNER: WBM Heirs Properties, LLC LEASE NO: 090490 ACREAGE: 2400
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY)
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus ESTIMATED DEPTH: 14100

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Ray
ADDRESS: 115 Professional Place PO Box 280 Bridgeport, WV 26330
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