

1st Amended Final

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514390

API: 47 - 017 - 6443

Submission: Initial Amended

Notes: Add'l Injection Test- 1.02, 2.01, 21.01,
27.01

Reperfs- 8.1, 26.1

AX WS 03/23/16

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03/25/2016

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

API 47-017-6443 County DODDRIDGE District WEST UNION
Quad WEST UNION 7.5' Pad Name WEU49 Field/Pool Name _____
Farm name MARY FARR SECRIST Well Number 514390
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 4,345,075 Easting 518,427
Landing Point of Curve Northing 4,344,912 Easting 518,342
Bottom Hole Northing 4,343,468 Easting 519,045

Elevation (ft) 1130 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)

Synthetic base Mud 12.4 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 03/13/2014 Date drilling commenced 06/24/2014 Date drilling ceased 3/31/2015
Date completion activities began 5/3/2015 Date completion activities ceased 5/13/2015
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 487 Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 1542 Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 6, 83, 236, 408, 483 Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) N

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Reviewed by:
03/25/2016

API 47-017 - 6443 Farm name MARY FARR SECRIST Well number 514390

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"	1058'	NEW	J-55 54.5LB/FT	317', 721'	Y
Coal							
Intermediate 1	12.375"	9.625"	5241'	NEW	P-110 40LB/FT	2938', 4459'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	12,484'	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	960	15.6	1.19	1142.4	0	8
Coal							
Intermediate 1	CLASS A / CLASS A	377 / 335	14.2 / 15.6	1.28 / 1.19	881.21	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS A / CLASS H	295 / 715	14.2 / 15.2	1.26 / 1.97	1780.25	4,732'	8
Tubing							

Drillers TD (ft) 12,484' Loggers TD (ft) 6684'

Deepest formation penetrated Marcellus Plug back to (ft) 4952'

Plug back procedure Pumped 2 bbls fresh water, mixed and pumped 29 bbls, of 15.6, 2% CaCl followed by 2 bbls fresh water, pulled up to 5704' and pumped 2 bbls fresh water, mixed and pumped 27 bbls 15.6 ppg cement followed by 2 bbls fresh water, pulled up to 5315' and pumped 2 bbls fresh water, mixed and pumped 44 bbls 15.6 ppg cement followed by 2 bbls fresh water pulled up to 4633' and pumped 2 bbls fresh water, mixed and pumped 49 bbls 15.6 ppg cement followed by 10 bbls fresh water

Kick off depth (ft) 5,372'

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- 69', 560', 1014'
INTERMEDIATE- 278', 785', 1292', 1798', 2304', 2811', 2039', 3471', 3926', 4382', 4806', 5198'
PRODUCTION- Composite body centralizers installed every joint from TD to 5,360'

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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API 47- 017 - 6443 Farm name MARY FARR SECRIST Well number 514390

Drilling Contractor Orion Drilling
Address 601 Aviation Way City Reynoldsville State PA Zip 15851

Logging Company WEATHERFORD WIRELINE
Address P.O. BOX 784 City DALLAS State TX Zip 75320

Logging Company VAUGHN ENERGY SERVICES
Address P.O. BOX 561021 City CORPUS CHRISTI State TX Zip 78246

Cementing Company Nabors
Address 2504 Smith Creek Road City Waynesburg State PA Zip 15370

Logging Company Gyrodatta
Address 601 Maver Street City Bridgeville State PA Zip 15017

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EQT Well #514390 - API 47-1706443

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	1		497	
REDSTOEN COAL	350		353	
SAND/SHALE	353		493	
PITTSBURGH COAL	493		495	
SAND/SHALE	495		1,428	
MAXTON	1,428		1,861	
BIG LIME	1,861		2,156	
WEIR	2,156		2,358	
BEREA	2,358		2,363	
GANTZ	2,363		2,484	
50F	2,484		2,567	
30F	2,567		2,610	
GORDON	2,610		2,721	
4TH SAND	2,721		2,905	
BAYARD	2,905		3,229	
WARREN	3,229		3,293	
SPEECHLEY	3,293		3,930	
BALLTOWN A	3,930		4,227	
BRADFORD	4,227		4,426	
RILEY	4,426		4,867	
BENSON	4,867		5,121	
ALEXANDER	5,121		6,408	6,304
SONYEA	6,408	6,304	6,595	6,461
MIDDLESEX	6,595	6,461	6,670	6,517
GENESSEE	6,670	6,517	6,799	6,598
GENESEO	6,799	6,598	6,853	6,625
TULLY	6,853	6,625	6,929	6,656
HAMILTON	6,929	6,656	7,023	6,682
MARCELLUS	7,023	6,682		

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514390 - 47-017-6443-0000- 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	5/3/2015	13.2	5,505.00	8,494.00	4,792.00	0	505	0
1	5/4/2015	99.1	8,043.00	9,249.00	6,351.00	259,666	7232	0
1.02	5/4/2015	10.2	5,695.00	7,231.00	5,152.00	0	4002	0
2	5/5/2015	100.2	7,938.00	9,197.00	4,096.00	297,518	8082	0
3	5/5/2015	101	7,847.00	8,829.00	4,344.00	300,013	8125	0
4	5/5/2015	98.1	8,348.00	9,129.00	3,326.00	300,774	8111	0
5	5/5/2015	100.5	7,685.00	8,588.00	3,809.00	301,160	8041	0
6	5/6/2015	100.7	7,740.00	8,417.00	4,375.00	300,574	8054	0
7	5/6/2015	100.3	7,632.00	9,067.00	4,396.00	299,224	8218	0
8.1	5/6/2015	96.1	8,211.00	9,854.00	5,825.00	298,695	11906	0
8.02	5/7/2015	10.2	5,292.00	6,947.00	4,990.00	0	3457	0
9	5/7/2015	101	7,332.00	8,792.00	3,667.00	297,612	8069	0
10	5/7/2015	100.6	7,859.00	8,962.00	3,779.00	299,433	7938	0
11	5/7/2015	97.7	8,091.00	8,488.00	3,941.00	289,614	11003	0
12	5/8/2015	100.6	7,774.00	8,471.00	4,888.00	297,792	7895	0
13	5/8/2015	100.5	7,661.00	8,436.00	4,312.00	296,770	7907	0
14	5/8/2015	100.1	7,888.00	8,667.00	4,495.00	297,348	7794	0
15	5/9/2015	100.6	7,561.00	8,420.00	4,037.00	295,419	7745	0
16	5/9/2015	100.2	7,806.00	8,932.00	4,092.00	296,599	7822	0
17	5/9/2015	100.8	7,296.00	8,998.00	5,287.00	298,915	7855	0
18	5/9/2015	98.70	7,861.00	9,305.00	5,160	299,653	8,647	0
19	5/9/2015	97.90	7,922.00	9,269.00	4,767	300,083	8,525	0
20	5/9/2015	99.50	7,613.00	9,821.00	5,959	275,370	7,229	0
20.02	5/10/2015	9.90	6,347.00	6,966.00	5,664	0	2,399	0
21	5/10/2015	99.50	7,667.00	8,720.00	5,963	300,154	9,144	0
22	5/11/2015	98.60	7,966.00	8,893.00	5,769	300,382	7,559	0
23	5/11/2015	97.50	7,899.00	9,015.00	6,273	297,738	7,735	0
24	5/11/2015	100.3	7,610.00	8,874.00	5,578.00	299,931	8024	0
25	5/11/2015	100.2	7,899.00	8,717.00	4,447.00	300,858	7762	0
26	5/11/2015	98.3	7,317.00	9,461.00	6,105.00	203,932	6240	0
26.1	5/12/2015	83.5	7,539.00	10,282.00	5,683.00	61,173	2779	0
26.02	5/12/2015	9.9	5,512.00	6,425.00	5,432.00	0	1855	0
27	5/12/2015	100.3	6,830.00	7,319.00	4,333.00	300,480	7939	0
28	5/12/2015	98.8	6,981.00	7,887.00	4,452.00	300,020	7749	0
29	5/13/2015	95.8	7,693.00	8,664.00	3,551.00	299,630	8287	0
30	5/13/2015	100.8	7,361.00	9,098.00	3,547.00	300,186	7675	0
								0

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514390 - 47-017-6443-0000- Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	4/25/2015	12,482.00	12,484.00	10	MARCELLUS
1	5/4/2015	12,337.00	12,399.00	32	MARCELLUS
2	5/5/2015	12,157.00	12,279.00	40	MARCELLUS
3	5/5/2015	11,977.00	12,099.00	40	MARCELLUS
4	5/5/2015	11,797.00	11,919.00	40	MARCELLUS
5	5/5/2015	11,617.00	11,739.00	40	MARCELLUS
6	5/6/2015	11,437.00	11,559.00	40	MARCELLUS
7	5/6/2015	11,257.00	11,379.00	40	MARCELLUS
8	5/6/2015	11,077.00	11,199.00	40	MARCELLUS
8.1	5/6/2015	11,054.00	11,127.00	28	MARCELLUS
9	5/7/2015	10,874.00	10,996.00	40	MARCELLUS
10	5/7/2015	10,694.00	10,816.00	40	MARCELLUS
11	5/7/2015	10,514.00	10,636.00	40	MARCELLUS
12	5/8/2015	10,334.00	10,456.00	40	MARCELLUS
13	5/8/2015	10,154.00	10,276.00	40	MARCELLUS
14	5/8/2015	9,974.00	10,100.00	40	MARCELLUS
15	5/8/2015	9,794.00	9,916.00	40	MARCELLUS
16	5/9/2015	9,616.00	9,736.00	40	MARCELLUS
17	5/9/2015	9,432.00	9,556.00	40	MARCELLUS
18	5/9/2015	9,254.00	9,376.00	40	MARCELLUS
19	5/9/2015	9,074.00	9,196.00	40	MARCELLUS
20	5/9/2015	8,894.00	9,016.00	40	MARCELLUS
21	5/10/2015	8,714.00	8,836.00	40	MARCELLUS
22	5/10/2015	8,534.00	8,656.00	40	MARCELLUS
23	5/11/2015	8,354.00	8,477.00	40	MARCELLUS
24	5/11/2015	8,174.00	8,296.00	40	MARCELLUS
25	5/11/2015	7,994.00	8,116.00	40	MARCELLUS
26	5/11/2015	7,813.00	7,936.00	40	MARCELLUS
26.1	5/12/2015	7,802.00	7,865.00	28	MARCELLUS
27	5/12/2015	7,634.00	7,754.00	40	MARCELLUS
28	5/12/2015	7,454.00	7,576.00	40	MARCELLUS
29	5/12/2015	7,274.00	7,396.00	40	MARCELLUS
30	5/13/2015	7,094.00	7,216.00	40	MARCELLUS

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/3/2015
Job End Date:	5/13/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06443-00-00
Operator Name:	EQT Production
Well Name and Number:	514390
Longitude:	-80.78660300
Latitude:	39.25472500
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,682
Total Base Water Volume (gal):	10,908,618
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	90.78585	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	8.84270	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05608	None
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02288	None
			Alkyl Alcohol	Proprietary	10.00000	0.00763	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00381	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02605	None
CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10.00000	0.00251	None
HVG-1	FTS International	Gelling agent	Petroleum distillate	64742-47-8	55.00000	0.00073	None
			Guar gum	9000-30-0	50.00000	0.00067	None
			Surfactant	68439-51-0	2.00000	0.00003	None

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			Clay	14808-60-7	2.00000	0.00003	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00058	None
CI-150	FTS International	Acid Corrosion Inhibitor					
			Isopropanol	67-63-0	30.00000	0.00009	None
			Organic amine resin salt	Proprietary	30.00000	0.00009	None
			Ethylene glycol	107-21-1	30.00000	0.00009	None
			Aromatic aldehyde	Proprietary	10.00000	0.00003	None
			Dimethylformamide	68-12-2	10.00000	0.00003	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00003	None
NE-100	FTS International	Non-emulsifier					
			2-Propanol	67-63-0	10.00000	0.00003	None
			2-Butoxyethanol	111-76-2	10.00000	0.00003	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00001	None
APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00002	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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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.

TOM DAVIES, ET AL 1457.95 ACRES±

**EQT PRODUCTION COMPANY
LEWIS MAXWELL LEASE
2,654 ACRES±
WELL NO. WV 514390**

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

NAD'27 S.P.C.(FT) N. 277,495.1 E. 1,635,670.5
 NAD'27 GEO. LAT-(N) 39.254725 LONG-(W) 80.786603
 NAD'83 UTM (M) N. 4,345,075.4 E. 518,426.9

LANDING POINT

NAD'27 S.P.C.(FT) N. 276,962.3 E. 1,635,382.5
 NAD'27 GEO. LAT-(N) 39.253251 LONG-(W) 80.787593
 NAD'83 UTM (M) N. 4,344,911.6 E. 518,341.8

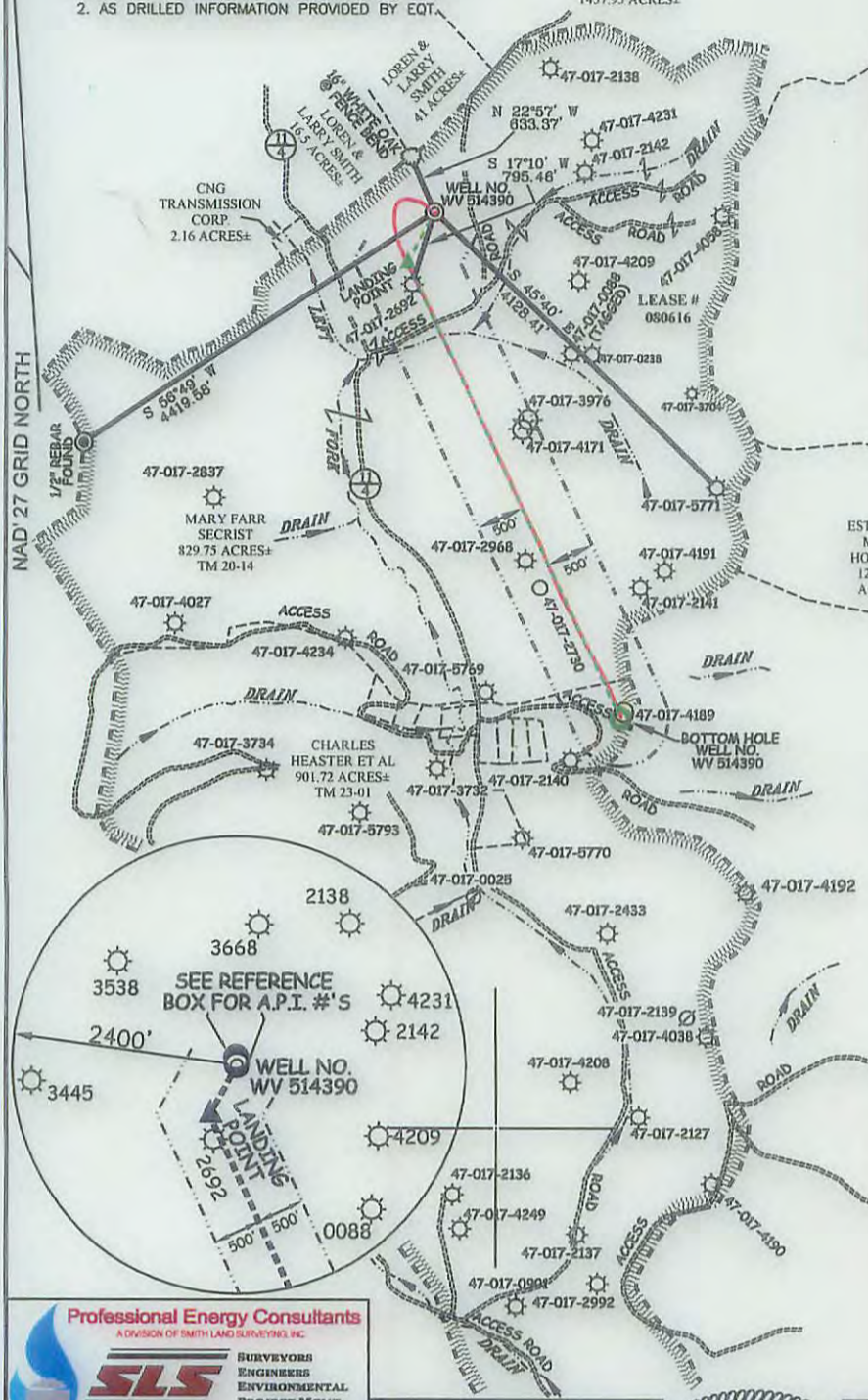
BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 272,186.1 E. 1,637,609.7
 NAD'27 GEO. LAT-(N) 39.240226 LONG-(W) 80.779489
 NAD'83 UTM (M) N. 4,343,467.8 E. 519,044.6

NAD'27 GRID NORTH

LONGITUDE 80°45'00"

13,455'



LEGEND

LEASE LINE	---
SURFACE LINE	---
PROPOSED PATH	---
AS DRILLED PATH	---
OFFSET LINE	---
TIE LINE	---
CREEK	---
ROAD	---
COUNTY ROUTE	---
PROPOSED WELL	⊙
EXISTING WELL	⊙
TAX MAP-PARCEL	00-00



AS DRILLED COORDINATES FOR WELL NO. WV 514390
 (S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT) N. 277,495.1 E. 1,635,670.5
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BOTTOM HOLE

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 NAD'27 GEO. LAT-(N) 39.240231 LONG-(W) 80.779471
 NAD'83 UTM (M) N. 4,343,468.4 E. 519,046.2

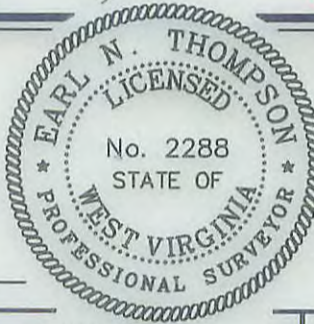
Professional Energy Consultants
 A DIVISION OF SMITH LAND SURVEYING, INC.

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 SURVEYORS
 ENGINEERS
 ENVIRONMENTAL
 PROJECT MGMT.

(304) 462-5634 WWW.SLSURVEYS.COM

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. Earl N. Thompson
 2288



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE SEPTEMBER 09, 20 13
 REVISED 12/02/13, 07/01/14, 07/31/14 & 04/14/15
 OPERATORS WELL NO. WV 514390
 API WELL NO. 47 - 017 - 06443-H
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200 FILE NO. 7871AD514390
 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 1,166'(GROUND) 1,130'(PROPOSED) WATERSHED LEFT FORK OF ARNOLD CREEK
 DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE WEST UNION 7.5'

SURFACE OWNER MARY FARR SECRIST ACREAGE 829.75±
 ROYALTY OWNER LEWIS MAXWELL HRS ACREAGE 2654±

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 6,622'

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