

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 512893

API: 47 - 095 - 02281

Submission: Initial Amended

Notes:

Received
Office of Oil & Gas
JUL 20 2016

10/28/2016

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

API 47 - 095 - 02281 County TYLER District CENTERVILLE
Quad WEST UNION 7.5' Pad Name WEU4 Field/Pool Name N/A
Farm name DONNA J. PETER Well Number 512893
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 4,357,467.22 Easting 515,453.34
Landing Point of Curve Northing 4,357,400.74 Easting 514,981.94
Bottom Hole Northing 4,358,121.03 Easting 514,632.26

Elevation (ft) 1079' 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 08/28/2015 Date drilling commenced 12/16/2015 Date drilling ceased 03/20/2016
Date completion activities began 4/11/2016 Date completion activities ceased 4/20/2016
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 132', 175', 186', 204' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1128', 1219', 1222' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 230', 290', 698' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
APPROVED
NAME: [Signature] 10/28/2016
DATE: 9/8/16

API 47-095 - 02281 Farm name DONNA J. PETER Well number 512893

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"	752'	NEW	J-55	206'	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	2868'	NEW	A-500	1771'	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	10261	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	637	15.6	1.21	770.77	0	8
Coal							
Intermediate 1	CLASS A / CLASS H	575 / 439	15.6 / 16.0	1.19 / 1.25	1233.00	0	8
Intermediate 2							
Intermediate 3							
Production	Class H/Class H	655/401	15.2/15.6	1.25/2.06	1645	3355	72
Tubing							

Drillers TD (ft) 10274 Loggers TD (ft) N/A
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 4570

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: 3 CENTRALIZERS (LESS THAN EVERY 500')
 INTERMEDIATE: 7 CENTRALIZERS (LESS THAN EVERY 500')
 PRODUCTION: Composite body spiral centralizers run every joint from bottom to 4484'

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- 095 - 02281 Farm name DONNA J. PETER Well number 512893

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

Logging Company HOSSCO
Address 614 Trotters Lane City Charleston State WV Zip 25312

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

Logging Company Phoenix Technology Services
Address 1805 Brittmoore Road City Houston State TX Zip 77043

Logging Company ProDirectional
Address 421 North Metro Drive City Morgantown State WV Zip 26501

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WEU4 512893 AP# 47-095-02281

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	240	240
COAL	240	240	242	242
SAND/SHALE	242	242	291	291
COAL	291	291	295	295
SAND/SHALE	295	295	706	706
COAL	706	706	710	710
SAND/SHALE	710	710	1545	1545
MAXTON	1545	1545	1839	1839
BIG LIME	1839	1839	2261	2261
WEIR	2261	2261	2379	2379
GANTZ	2379	2379	2472	2472
BOF	2472	2472	2697	2697
GORDON	2697	2697	3017	3017
BAYARD	3017	3017	3349	3349
WARREN	3349	3349	3444	3444
SPEECHLEY	3444	3444	3865	3865
BALLTOWN A	3865	3865	4003	4003
BALLTOWN B	4003	4003	4300	4300
BRADFORD	4300	4300	4564	4564
RILEY	4564	4564	4981	4981
BENSON	4981	4981	5232	5166
ALEXANDER	5232	5166	5826	5607
RHINESTREET	5826	5607	6124	5838
RHINESTREET UPPER	6124	5838	6740	6292
SONYEA	6740	6292	6908	6405
MIDDLESEX	6908	6405	6992	6455
GENESSEE	6992	6455	7166	6537
GENESSED	7166	6537	7253	6569
TULLY	7253	6569	7402	6607
MARCELLUS	7402	6607	10274	6632

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512893 47-095-02281-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	4/1/2016	10,273	10,274	10	MARCELLUS
1	4/11/2016	10,127	10,219	32	MARCELLUS
2	4/12/2016	9,977	10,099	40	MARCELLUS
3	4/12/2016	9,827	9,949	40	MARCELLUS
4	4/12/2016	9,677	9,799	40	MARCELLUS
5	4/12/2016	9,527	9,649	40	MARCELLUS
6	4/13/2016	9,377	9,499	40	MARCELLUS
7	4/14/2016	9,227	9,349	40	MARCELLUS
8	4/15/2016	9,077	9,199	40	MARCELLUS
9	4/15/2016	8,927	9,047	40	MARCELLUS
10	4/15/2016	8,777	8,899	40	MARCELLUS
11	4/16/2016	8,627	8,749	40	MARCELLUS
12	4/17/2016	8,477	8,597	40	MARCELLUS
13	4/17/2016	8,327	8,449	40	MARCELLUS
14	4/18/2016	8,177	8,299	40	MARCELLUS
15	4/18/2016	8,027	8,149	40	MARCELLUS
16	4/19/2016	7,877	7,999	40	MARCELLUS
17	4/19/2016	7,727	7,849	40	MARCELLUS
18	4/20/2016	7,577	7,699	40	MARCELLUS
19	4/20/2016	7,427	7,549	40	MARCELLUS

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512893 47-095-02281-0000 - 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	4/11/2016	17.80	7,394	8,883	4,411	0	433	0
1	4/12/2016	101.60	8,235	8,432	4,210	251,380.00	6,306	0
2	4/12/2016	100.84	8,176	8,560	3,808	249,580.00	5,949	0
3	4/13/2016	101.80	8,555	8,851	3,575	248,320.00	5,904	0
4	4/13/2016	100.30	7,621	8,388	4,097	250,360.00	5,972	0
5	4/14/2016	101.70	7,863	8,009	4,593	253,560.00	5,760	0
6	4/14/2016	98.00	8,113	9,341	3,925	249,720.00	5,946	0
7	4/15/2016	99.70	8,016	8,515	4,293	250,400.00	5,790	0
8	4/15/2016	100.20	8,595	8,921	4,210	249,140.00	5,871	0
9	4/15/2016	101.70	8,394	8,742	4,960	250,260.00	5,601	0
10	4/16/2016	101.20	8,141	8,491	4,529	251,080.00	5,710	0
11.01	4/16/2016	8.30	4,575	6,329	4,539	0.00	2,870	0
11	4/16/2016	101.60	7,954	8,213	4,237	251,240.00	5,860	0
12	4/17/2016	100.70	8,080	9,249	4,029	249,840.00	5,861	0
12.01	4/17/2016	9.00	4,923	6,170	4,477	0.00	1,661	0
13	4/18/2016	101.20	7,971	8,189	4,086	251,620.00	5,905	0
14	4/18/2016	100.64	7,906	9,126	4,581	249,220.00	5,720	0
15	4/18/2016	101.60	7,899	8,178	4,840	250,320.00	5,661	0
16	4/19/2016	101.60	7,634	8,685	4,312	250,920.00	5,721	0
17	4/19/2016	100.80	7,804	8,481	4,984	249,700.00	5,588	0
17.01	4/19/2016	96.10	7,520	7,776	4,889	0.00	5,831	0
18	4/20/2016	101.20	7,671	7,933	4,350	247,900.00	5,855	0
19	4/20/2016	85.80	8,041	8,474	3,776	253,620.00	6,729	0

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/11/2016
Job End Date:	4/20/2016
State:	West Virginia
County:	Tyler
API Number:	47-095-02281-00-00
Operator Name:	EQT Production
Well Name and Number:	512893
Latitude:	39.36645000
Longitude:	-80.82078000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,607
Total Base Water Volume (gal):	5,145,168
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	89.61611	None
Sand (Proppant)	Keane Group	Proppant					
MC MX 5-3886	Multi-Chem	Specialty Brine	Silica Substrate	14808-60-7	100.00000	9.93178	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Calcium nitrate.4H2O	13477-34-4	100.00000	0.11185	None
FFR760	Keane Group	Friction Reducer	Hydrochloric Acid	7647-01-0	15.00000	0.03637	None
			Hydrotreated Light Distillate	64742-47-8	30.00000	0.01278	None
			Alkyl Alcohol	68002-98-0	10.00000	0.00426	None
			Oxyalkylated alcohol A	69227-21-0	5.00000	0.00213	None
ECM FR NI 200	ECM	Friction Reducing Agent					
			Water	7732-18-5	50.00000	0.00811	None
			Copolymer of Two Propenamide	69418-26-4	30.00000	0.00487	None
			Petroleum Distillate	64742-47-8	20.00000	0.00324	None
			Alcohols, C-12-16, Ethoxylated	68551-12-2	2.00000	0.00532	None

			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00032	None
			Ammonium Chloride (NH4)Cl	12125-02-9	1.00000	0.00016	None
MC MX 8-2544	Multi-Chem	Live Culture - Nitrate Reducing Bacteria					
			Sodium chloride	7647-14-5	100.00000	0.00964	None
			Sodium nitrate	7631-99-4	5.00000	0.00048	None
EC6330A	Keane Group	Scale Inhibitor					
			Ethylene Glycol	107-21-1	5.00000	0.00147	None
			Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00147	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
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00009	None
			Pyridine, alkyl derivatives, quaternized with benzyl chloride	68909-18-2	15.00000	0.00009	None
			Cinnamaldehyde	104-55-2	15.00000	0.00009	None
			1-Decanol	112-30-1	5.00000	0.00003	None
			2-Butoxyethanol	111-78-2	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
LEB-10X	Keane	Gel Breaker					
			Ethylene Glycol	107-21-1	30.00000	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)

ROYALTY OWNERS		
ROBA B. ONESS ET AL	47 AC±	LEASE NO. 126144

A	BRADLEY D. DAVIS	2.73 AC±	
B	WILLIAM DOLL ET AL	0.50 AC±	
C	WILLIAM DOLL ET AL	0.49 AC±	
D	WILLIAM DOLL	1 AC±	
E	FRIEDERIKE DOHRMANN	7.067 AC±	
F	WILBUR COMMUNITY CLUB	0.95 AC±	
G	JOHN STARKEY	7.888 AC±	
H	CHRIS A. BAUM ET AL	0.84 AC±	
I	TERRY G. WEEKLEY	1.182 AC±	
J	RUTH O. & OLIN L. DOLL	1 AC±	
K	GARY PROSSER	0.50 AC±	
L	GARY & BARBARA PROSSER	2.50 AC±	
M	HOWARD SHRIVER ET AL	24.84 AC±	
N	CONRAD COSTILOW	46.17 AC±	TM C-16-14
O	RICHARD & YVONNE METCALF	0.61 AC±	TM C-16-14.1
P	JOHN & SANDRA ANDERS	0.09 AC±	TM C-16-14.2
Q	DONNA J. PETER	113.4 AC±	TM C-16-22
R	ELIZABETH ABRUZZINO	109.94 AC±	
S	L.B. & SANDRA STONEKING	42.86 AC±	

**EQT PRODUCTION COMPANY
W.H. ASH ET AL LEASE
152 ACRES±
WELL NO. WV 512893
(WEU4 H4)**

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

NAD'27 S.P.C.(FT) N. 318,322.32 E. 1,626,591.04
 NAD'27 GEO. LAT-(N) 39.366447 LONG-(W) 80.820781
 NAD'83 UTM (M) N. 4,357,467.22 E. 515,453.34

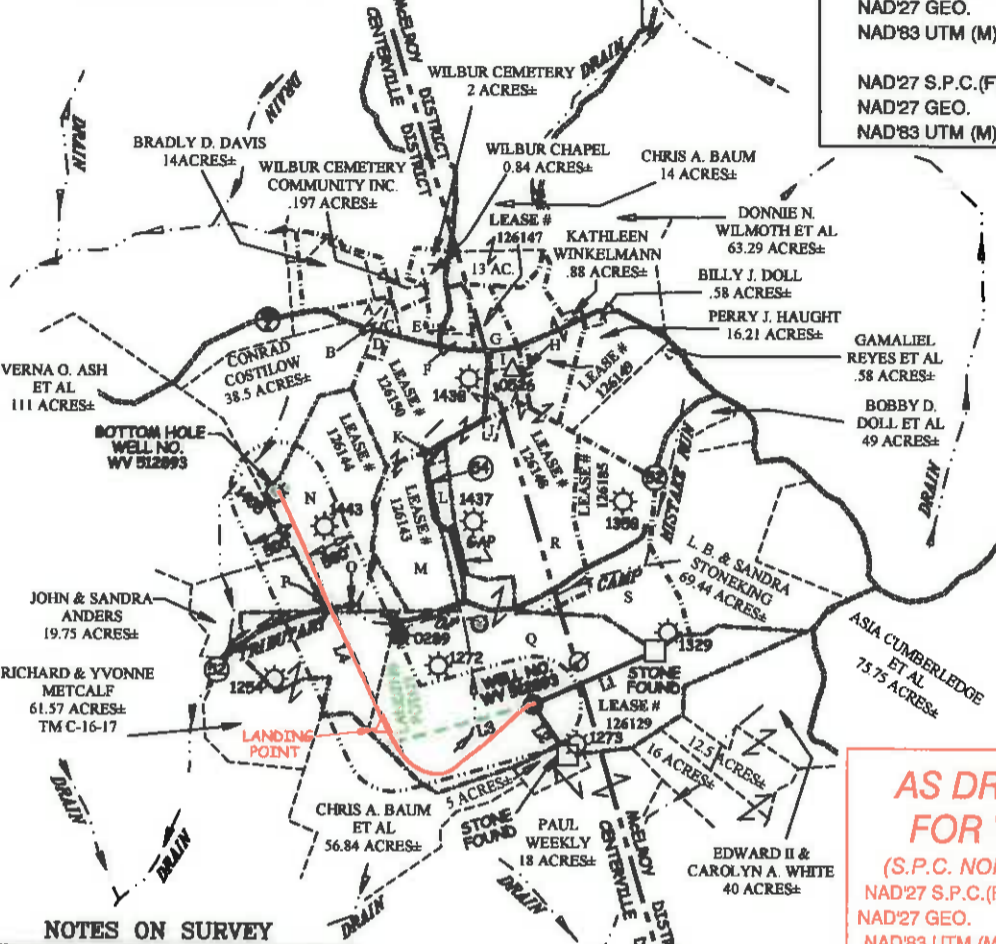
LANDING POINT

NAD'27 S.P.C.(FT) N. 317,914.15 E. 1,625,148.09
 NAD'27 GEO. LAT-(N) 39.365268 LONG-(W) 80.825663
 NAD'83 UTM (M) N. 4,357,335.52 E. 515,015.82

BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 320,515.26 E. 1,623,935.18
 NAD'27 GEO. LAT-(N) 39.372359 LONG-(W) 80.830289
 NAD'83 UTM (M) N. 4,358,121.78 E. 514,633.08

NAD'27 GRID NORTH



LEGEND

LEASE LINE	---
SURFACE LINE	---
PROPOSED PATH	---
AS DRILLED PATH	---
OFFSET LINE	---
TIE LINE	---
CREEK	---
ROAD	---
FENCE LINE	---
COUNTY ROUTE	---
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
ABANDONED WELL	⊙
PLUGGED WELL	⊙
STORAGE WELL	⊙
CENTERVILLE DISTRICT TAX MAP-PARCEL	C-00-00

**AS DRILLED COORDINATES
FOR WELL NO. WV 512893**

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

NAD'27 S.P.C.(FT) N. 318,322.32 E. 1,626,591.04
 NAD'27 GEO. LAT-(N) 39.366447 LONG-(W) 80.820781
 NAD'83 UTM (M) N. 4,357,467.22 E. 515,453.34

LANDING POINT

NAD'27 S.P.C.(FT) N. 318,130.02 E. 1,625,040.48
 NAD'27 GEO. LAT-(N) 39.365856 LONG-(W) 80.826255
 NAD'83 UTM (M) N. 4,357,400.74 E. 514,981.94

BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 320,512.86 E. 1,623,932.46
 NAD'27 GEO. LAT-(N) 39.372353 LONG-(W) 80.830289
 NAD'83 UTM (M) N. 4,358,121.03 E. 514,632.26

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.

**CORNER TIES
BEARING & DISTANCE**

L1	N 86°53' E 1378.97'
L2	S 34°38' E 831.81'

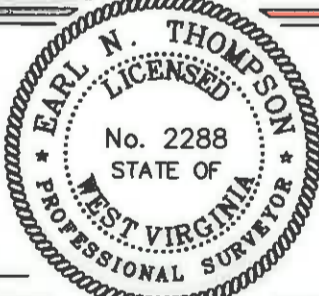
**LATERAL PATH
BEARING & DISTANCE**

L3	S 74°12' W 1498.57'
L4	N 25°00' W 2870.00'

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

SLS
SURVEYING
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT.

(304) 482-4834 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. 2288 *Earl N. Thompson*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE JUNE 04, 20 15

REVISED 06/18/15, 04/06/16 & 06/13/16

OPERATORS WELL NO. WV 512893

API WELL NO. 47 - 095 - 02281H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/2500 FILE NO. 7701AD512893R
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 1,098(GROUND)1,079(PROPOSED) WATERSHED TRIBUTARY OF CAMP MISTAKE RUN
DISTRICT CENTERVILLE COUNTY TYLER QUADRANGLE WEST UNION 7.5'

SURFACE OWNER DONNA J. PETER ACREAGE 113.40±
ROYALTY OWNER WACO OIL & GAS CO. INC. ET AL ACREAGE 152±

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 6,696'

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

10/28/2016