

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 515276

API: 47 - 085 - 10094

Submission:  Initial  Amended

Notes: -Revised Plat  
-Revised "As Drilled" Coordinates

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WV Department of  
Environmental Protection

**APPROVED**

NAME: Michael Doff

DATE: 12-21-2016

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

API 47 - 085 - 10094 County Ritchie District Clay  
Quad Pennsboro Pad Name PEN15 Field/Pool Name \_\_\_\_\_  
Farm name DEWAYNE BRITTON ET UX Well Number 515276  
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 4,345,846.3 Easting 504,204.4  
Landing Point of Curve Northing 4,346,115.0 Easting 505,076.5  
Bottom Hole Northing 4,347,632.2 Easting 504,332.8

Elevation (ft) 1,119' 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)

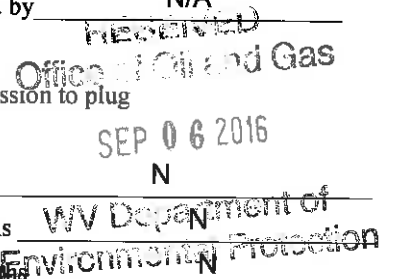
Water base Mud 12.5 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 05/22/2014 Date drilling commenced 06/18/2014 Date drilling ceased 03/24/2015  
Date completion activities began 6/3/2015 Date completion activities ceased 6/10/2015  
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 86',166',245',397',773',876' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1655',1946',2524' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 17',276',382',747' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by: \_\_\_\_\_



API 47- 085 - 10094

Farm name DEWAYNE BRITTON ET UX

Well number 515276

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	26"	20"	40'	NEW	A-500 40LB/FT	NONE	Y
Surface	17.5"	13.375"	1,081'	NEW	J-55 54.5LB/FT	249', 582'	Y
Coal							
Intermediate 1	12.25"	9.625"	5,414'	NEW	P-110 40LB/FT	NONE	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	14,143'	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 <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	38	15.6	1.19	45.22	0	8
Surface	CLASS A	892	15.6	1.19	1061.5	0	8
Coal							
Intermediate 1	CLASS A	240/307/1207	14.2/15.6/15.6	1.5/1.18/1.18	2146.5	0	8
Intermediate 2							
Intermediate 3							
Production	Class H / Class H	597/682	14.2/15.2	1.23/2.18	2221.1	4,910'	72
Tubing							

Drillers TD (ft) 14,164' 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) 3,900' 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: 1,11,24

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET JOINTS: 1,12,24,36,48,60,72,84,96,108,120,132

Production- 214 Composite bodied centralizers on every joint from TD up to 5,000'

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 \_\_\_\_\_

Office of Oil and Gas

SEP 06 2016

WV Department of Environmental Protection





API 47- 085 - 10094 Farm name DEWAYNE BRITTON ET UX Well number 515276

Drilling Contractor Savanna Drilling  
Address 2204 Timberloch Place Suite 230 City Woodlands State TX Zip 77380

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

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

Cementing Company Baker Hughes  
Address 837 Philippi Pike City Clarksburgh State WV Zip 26301

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API 47 - 085 - 10094

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	0	0	876	876
SAND/SHALE	0	0	17	17
WASHINGTON COAL	17	17	19	19
SAND/SHALE	19	19	276	276
COAL	276	276	284	284
SAND/SHALE	284	284	382	382
COAL	382	382	387	387
SAND/SHALE	387	387	747	747
COAL	747	747	751	751
SAND/SHALE	751	751	1,750	1,750
MAXTON	1,750	1,750	1,969	1,969
BIG LIME	1,969	1,969	2,037	2,037
KEENER	2,037	2,037	2,376	2,376
WEIR	2,376	2,376	2,581	2,581
GANTZ	2,581	2,581	2,721	2,721
50F	2,721	2,721	2,802	2,802
30F	2,802	2,802	2,846	2,846
GORDON	2,846	2,846	2,927	2,927
4TH	2,927	2,927	3,073	3,073
5TH	3,073	3,073	3,116	3,116
BAYARD	3,116	3,116	3,465	3,465
WARREN	3,465	3,465	3,508	3,508
B-5	3,508	3,508	3,546	3,546
SPEECHLEY	3,546	3,546	3,927	3,927
BALLTOWN A	3,927	3,927	4,589	4,577
RILEY	4,589	4,577	4,985	4,936
BENSON	4,985	4,936	5,312	5,205
ALEXANDER	5,312	5,205	5,348	5,233
ELKS	5,348	5,233	7,477	6,105
SONYEA	7,477	6,105	7,806	6,218
MIDDLESEX	7,806	6,218	7,969	6,276
GENESEE	7,969	6,276	8,135	6,328
GENESEO	8,135	6,328	8,256	6,356
TULLY	8,256	6,356	8,330	6,372
HAMILTON	8,330	6,372	8,362	6,378
MARCELLUS	8,362	6,378	14,164	6,436

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**PHOENIX**  
TECHNOLOGY SERVICES USA INC.

## **EQT Production - Marcellus**

**Ritchie County, WV**  
**Ritchie County 515276**  
**Well #515276**

**Main Wellbore**

**Design: 515276 As Drilled Surveys**

## **Standard Survey Report**

**24 March, 2015**



**Where energy meets innovation.**





# Phoenix Technologies Survey Report



<b>Database:</b> 114278 MWD <b>Company:</b> EQT Production - Marketing <b>Project:</b> Belle County, WV <b>Site:</b> Belle County 114278 <b>Well:</b> Well 4114278 <b>Wellbore:</b> Main Wellbore <b>Design:</b> 114278 MWD	<b>Local Co-ordinate Reference:</b> US State Plane 1927 <b>TVD Reference:</b> Height @ 114278 <b>MD Reference:</b> Height @ 114278 <b>North Reference:</b> US <b>Survey Calculation Method:</b> Minimum Error
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<b>Project:</b> 114278 MWD
<b>Map System:</b> US State Plane 1927 (Exact solution) <b>System Datum:</b> Mean Sea Level <b>Geo Datum:</b> NAD 1927 (NADCON CONUS) <b>Map Zone:</b> West Virginia North 4701 <b>Using geodetic scale factor</b>

<b>Site:</b> 114278 MWD
<b>Site Position:</b> <b>Northing:</b> 280,805.10 usft <b>Latitude:</b> 39.26 <b>From:</b> Map <b>Easting:</b> 1,589,040.80 usft <b>Longitude:</b> -80.95 <b>Position Uncertainty:</b> 0.0 usft <b>Slot Radius:</b> 13-3/16 " <b>Grid Convergence:</b> -0.93 °

<b>Well:</b> 114278 MWD
<b>Well Position:</b> <b>+N/-S:</b> 0.0 usft <b>Northing:</b> 280,805.10 usft <b>Latitude:</b> 39° 15' 42.700 N <b>+E/-W:</b> 0.0 usft <b>Easting:</b> 1,589,040.80 usft <b>Longitude:</b> 80° 57' 5.162 W <b>Position Uncertainty:</b> 0.0 usft <b>Wellhead Elevation:</b> usft <b>Ground Level:</b> 1,119.0 usft

<b>Wellbore:</b> 114278 MWD												
<table border="1"> <thead> <tr> <th>Magnetics</th> <th>Model Name</th> <th>Sample Date</th> <th>Declination (°)</th> <th>Dip Angle (°)</th> <th>Field Strength (nT)</th> </tr> </thead> <tbody> <tr> <td></td> <td>IGRF2015</td> <td>2/23/2015</td> <td>-8.33</td> <td>66.77</td> <td>52,203</td> </tr> </tbody> </table>	Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)		IGRF2015	2/23/2015	-8.33	66.77	52,203
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)							
	IGRF2015	2/23/2015	-8.33	66.77	52,203							

<b>Design:</b> 114278 MWD										
<b>Audit Notes:</b>										
<b>Version:</b> 1.0 <b>Phase:</b> ACTUAL <b>Tie On Depth:</b> 0.0										
<table border="1"> <thead> <tr> <th>Vertical Section:</th> <th>Depth From (TVD) (usft)</th> <th>+N/-S (usft)</th> <th>+E/-W (usft)</th> <th>Direction (°)</th> </tr> </thead> <tbody> <tr> <td></td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>5.24</td> </tr> </tbody> </table>	Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)		0.0	0.0	0.0	5.24
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)						
	0.0	0.0	0.0	5.24						

<b>Survey Program:</b> 114278 MWD	<b>Date:</b> 3/24/2015														
<table border="1"> <thead> <tr> <th>From (')</th> <th>To (usft)</th> <th>Survey (Wellbore)</th> <th>Tool Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>3,878.0</td> <td>GyroData Gyro (Main Wellbore)</td> <td>GYD_DP_MS</td> <td>Gyrodata gyro-compassing and drop</td> </tr> <tr> <td>0.00</td> <td>14,164.0</td> <td>Phoenix MWD (Main Wellbore)</td> <td>MWD+IGRF</td> <td>MWD+IGRF v3 standard declination</td> </tr> </tbody> </table>	From (')	To (usft)	Survey (Wellbore)	Tool Name	Description	0.00	3,878.0	GyroData Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop	0.00	14,164.0	Phoenix MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declination
From (')	To (usft)	Survey (Wellbore)	Tool Name	Description											
0.00	3,878.0	GyroData Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop											
0.00	14,164.0	Phoenix MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declination											

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	-1,135.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.29	245.30	103.0	-1,032.0	-0.1	-0.2	-0.1	0.28	0.28	0.00
203.0	0.42	271.96	203.0	-932.0	-0.2	-0.8	-0.3	0.21	0.13	26.66
303.0	0.41	273.56	303.0	-832.0	-0.2	-1.6	-0.3	0.02	-0.01	1.60
403.0	0.37	275.52	403.0	-732.0	-0.1	-2.2	-0.3	0.04	-0.04	1.96
503.0	0.38	264.74	503.0	-632.0	-0.1	-2.9	-0.4	0.07	0.01	-10.78
603.0	0.40	258.14	603.0	-532.0	-0.2	-3.6	-0.5	0.05	0.02	-1.60
703.0	0.19	208.26	703.0	-432.0	-0.4	-4.0	-0.8	0.32	-0.21	-51.88

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Database:	20150223_Survey_111111	Local Co-ordinate Reference:	North America (North) (NAD83)
Company:	EQT Production - Marcellus	TVD Reference:	Mean Sea Level
Project:	Marcellus County, WV	MD Reference:	VDOT 111111
Site:	Marcellus County (111111)	North Reference:	North
Well:	Well # 111111	Survey Calculation Method:	Minimum Curvature
Wellbore:	Well Trajectory		
Design:	20150223_Survey_111111		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
803.0	0.18	168.34	803.0	-332.0	-0.7	-4.0	-1.1	0.12	-0.01	-37.92
903.0	0.23	187.22	903.0	-232.0	-1.1	-4.0	-1.5	0.08	0.05	18.88
1,003.0	0.18	183.68	1,003.0	-132.0	-1.4	-4.0	-1.8	0.10	-0.05	-23.54
1,103.0	0.22	161.68	1,103.0	-32.0	-1.8	-3.9	-2.1	0.04	0.04	-2.00
1,203.0	0.58	181.80	1,203.0	68.0	-2.4	-3.7	-2.8	0.36	0.36	0.12
1,303.0	0.57	172.05	1,303.0	168.0	-3.4	-3.4	-3.7	0.10	-0.01	10.25
1,403.0	0.56	165.01	1,403.0	268.0	-4.4	-3.2	-4.7	0.07	-0.01	-7.04
1,503.0	0.65	172.78	1,503.0	368.0	-5.4	-3.0	-5.7	0.12	0.09	7.77
1,603.0	0.59	176.59	1,603.0	468.0	-6.5	-2.9	-6.7	0.07	-0.06	3.81
1,703.0	0.50	180.25	1,703.0	568.0	-7.4	-2.9	-7.7	0.10	-0.09	3.66
1,803.0	0.57	178.40	1,803.0	668.0	-8.4	-2.9	-8.6	0.07	0.07	-1.85
1,903.0	0.55	178.43	1,902.9	767.9	-9.3	-2.9	-9.6	0.02	-0.02	0.03
2,003.0	0.50	175.53	2,002.9	867.9	-10.3	-2.8	-10.5	0.06	-0.05	-2.90
2,103.0	0.47	188.09	2,102.9	967.9	-11.1	-2.9	-11.3	0.11	-0.03	12.56
2,203.0	0.52	184.81	2,202.9	1,067.9	-12.0	-2.9	-12.2	0.06	0.05	-3.28
2,303.0	0.48	179.51	2,302.9	1,167.9	-12.8	-3.0	-13.1	0.06	-0.04	-5.30
2,403.0	0.50	185.16	2,402.9	1,267.9	-13.7	-3.0	-13.9	0.05	0.02	5.65
2,503.0	0.50	184.33	2,502.9	1,367.9	-14.6	-3.1	-14.8	0.01	0.00	-0.83
2,603.0	0.40	183.55	2,602.9	1,467.9	-15.3	-3.1	-15.6	0.10	-0.10	-0.78
2,703.0	0.34	191.54	2,702.9	1,567.9	-16.0	-3.2	-16.2	0.08	-0.06	7.99
2,803.0	0.47	199.46	2,802.9	1,667.9	-16.7	-3.4	-16.9	0.14	0.13	7.92
2,903.0	0.26	216.99	2,902.9	1,767.9	-17.2	-3.7	-17.5	0.24	-0.21	17.53
3,003.0	0.20	235.01	3,002.9	1,867.9	-17.5	-4.0	-17.8	0.09	-0.06	18.02
3,103.0	0.41	229.89	3,102.9	1,967.9	-17.8	-4.4	-18.2	0.21	0.21	-5.02
3,203.0	0.27	220.86	3,202.9	2,067.9	-18.2	-4.8	-18.6	0.15	-0.14	-9.13
3,303.0	0.23	231.81	3,302.9	2,167.9	-18.5	-5.1	-18.9	0.06	-0.04	10.75
3,403.0	0.35	191.46	3,402.9	2,267.9	-19.0	-5.4	-19.4	0.23	0.12	-40.15
3,503.0	0.26	204.98	3,502.9	2,367.9	-19.5	-5.5	-19.9	0.11	-0.09	13.52
3,603.0	0.14	183.35	3,602.9	2,467.9	-19.8	-5.6	-20.2	0.18	-0.12	-41.63
3,703.0	0.19	178.03	3,702.9	2,567.9	-20.1	-5.5	-20.5	0.07	0.05	14.68
3,803.0	0.19	145.24	3,802.9	2,667.9	-20.4	-5.4	-20.8	0.11	0.00	-32.79
3,878.0	0.34	168.24	3,877.9	2,742.9	-20.7	-5.3	-21.1	0.24	0.20	30.67
3,908.0	0.20	187.80	3,907.9	2,772.9	-20.8	-5.3	-21.2	0.55	-0.47	65.20
3,940.0	0.30	105.50	3,939.9	2,804.9	-20.9	-5.2	-21.3	1.05	0.31	-257.19
3,971.0	1.00	90.30	3,970.9	2,835.9	-20.9	-4.9	-21.3	2.31	2.26	-49.03
4,003.0	1.80	88.50	4,002.9	2,867.9	-20.9	-4.1	-21.2	2.50	2.50	-5.63
4,034.0	2.80	87.70	4,033.9	2,898.9	-20.9	-2.9	-21.1	3.23	3.23	-2.58
4,066.0	4.10	84.20	4,065.8	2,930.8	-20.7	-0.9	-20.7	4.11	4.06	-10.94
4,098.0	5.10	84.90	4,097.7	2,962.7	-20.5	1.6	-20.3	3.13	3.13	2.19
4,129.0	6.30	84.90	4,128.6	2,993.6	-20.2	4.7	-19.7	3.87	3.87	0.00
4,181.0	7.40	84.40	4,180.3	3,025.3	-19.9	8.5	-19.0	3.44	3.44	-1.56
4,192.0	8.40	84.20	4,191.0	3,056.0	-19.4	12.7	-18.2	3.23	3.23	-0.65

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Database:	OP 50001 - Eagle Creek Co	Local Co-ordinate Reference:	North Carolina County 1 (NAD83)
Company:	EQT Production - Wetzel	TVD Reference:	North Carolina 1 (NAD83)
Project:	Thomas County, TX	MD Reference:	PROFIT & LOSS (NAD83)
Site:	Thomas County, TX	North Reference:	QNT
Well:	Well 0112205	Survey Calculation Method:	Minimum Curvature
Wellbore:	Start Wellbore		
Design:	100% 2-D/3-D Survey		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,224.0	9.40	86.00	4,222.6	3,087.6	-19.0	17.7	-17.3	3.24	3.13	5.63
4,255.0	10.10	87.30	4,253.2	3,118.2	-18.7	22.9	-16.6	2.37	2.26	4.19
4,287.0	10.80	87.70	4,284.7	3,149.7	-18.5	28.7	-15.8	2.20	2.19	1.25
4,318.0	11.60	88.40	4,315.1	3,180.1	-18.3	34.7	-15.0	2.62	2.58	2.26
4,350.0	12.70	89.60	4,346.4	3,211.4	-18.2	41.4	-14.3	3.53	3.44	3.75
4,382.0	13.50	90.60	4,377.5	3,242.5	-18.2	48.7	-13.6	2.60	2.50	3.13
4,413.0	14.30	90.00	4,407.6	3,272.6	-18.2	56.1	-13.0	2.62	2.58	-1.94
4,445.0	14.80	89.90	4,438.6	3,303.6	-18.2	64.2	-12.3	1.56	1.56	-0.31
4,476.0	15.70	90.70	4,468.5	3,333.5	-18.2	72.3	-11.6	2.98	2.90	2.58
4,508.0	16.30	89.50	4,499.3	3,364.3	-18.3	81.2	-10.8	2.14	1.88	-3.75
4,539.0	17.20	89.20	4,528.9	3,393.9	-18.2	90.1	-9.8	2.92	2.90	-0.97
4,571.0	17.70	89.20	4,559.5	3,424.5	-18.0	99.7	-8.8	1.56	1.56	0.00
4,602.0	19.10	90.10	4,588.9	3,453.9	-18.0	109.5	-7.9	4.61	4.52	2.90
4,634.0	20.20	90.90	4,619.0	3,484.0	-18.1	120.2	-7.0	3.54	3.44	2.50
4,665.0	21.40	91.50	4,648.0	3,513.0	-18.3	131.2	-6.2	3.93	3.87	1.94
4,697.0	22.30	90.50	4,677.7	3,542.7	-18.5	143.1	-5.3	3.04	2.81	-3.13
4,728.0	23.20	89.40	4,706.3	3,571.3	-18.5	155.1	-4.2	3.21	2.90	-3.55
4,760.0	24.30	88.10	4,735.6	3,600.6	-18.2	168.0	-2.8	3.81	3.44	-4.06
4,792.0	25.00	87.70	4,764.7	3,629.7	-17.7	181.4	-1.1	2.25	2.19	-1.25
4,823.0	25.60	87.40	4,792.7	3,657.7	-17.1	194.6	0.7	1.98	1.94	-0.97
4,855.0	26.20	86.70	4,821.5	3,686.5	-16.4	208.6	2.7	2.10	1.88	-2.19
4,886.0	27.00	87.20	4,849.2	3,714.2	-15.7	222.4	4.7	2.68	2.58	1.61
4,918.0	28.00	87.10	4,877.6	3,742.6	-14.9	237.2	6.8	3.13	3.13	-0.31
4,949.0	28.90	87.30	4,904.8	3,769.8	-14.2	251.9	8.8	2.92	2.90	0.65
4,981.0	29.80	87.50	4,932.7	3,797.7	-13.5	267.6	11.0	2.83	2.81	0.63
5,012.0	31.00	88.00	4,959.5	3,824.5	-12.9	283.3	13.0	3.96	3.87	1.61
5,044.0	31.70	88.40	4,986.8	3,851.8	-12.4	299.9	15.1	2.28	2.19	1.25
5,075.0	32.50	88.20	5,013.0	3,878.0	-11.9	316.4	17.1	2.60	2.58	-0.65
5,107.0	33.30	88.40	5,039.9	3,904.9	-11.4	333.7	19.2	2.52	2.50	0.63
5,138.0	34.20	88.40	5,065.7	3,930.7	-10.9	351.0	21.2	2.90	2.90	0.00
5,170.0	35.10	87.90	5,092.0	3,957.0	-10.3	369.1	23.5	2.95	2.81	-1.56
5,202.0	35.90	88.00	5,118.1	3,983.1	-9.6	387.7	25.8	2.51	2.50	0.31
5,233.0	36.90	88.30	5,143.0	4,008.0	-9.0	406.1	28.1	3.28	3.23	0.97
5,265.0	37.90	88.50	5,168.4	4,033.4	-8.5	425.5	30.4	3.15	3.13	0.63
5,296.0	39.20	88.90	5,192.7	4,057.7	-8.1	444.8	32.6	4.27	4.19	1.29
5,328.0	40.30	89.60	5,217.3	4,082.3	-7.8	465.3	34.7	3.71	3.44	2.19
5,359.0	41.00	89.80	5,240.8	4,105.8	-7.7	485.5	36.7	2.30	2.26	0.65
5,375.0	41.10	89.80	5,252.9	4,117.9	-7.7	496.0	37.7	0.63	0.63	0.00
5,429.0	41.40	90.90	5,293.5	4,158.5	-7.9	531.6	40.7	1.45	0.56	2.04
5,460.0	41.80	90.40	5,316.7	4,181.7	-8.1	552.2	42.4	1.68	1.29	-1.61
5,492.0	42.20	88.30	5,340.4	4,205.4	-7.9	573.6	44.6	4.57	1.25	-6.56
5,523.0	42.60	87.00	5,363.3	4,228.3	-7.0	594.5	47.3	3.11	1.29	-4.19



Database:	014400011 Single Line Co	Local Co-ordinate Reference:	014400011 Single Line Co
Company:	EQE Production Services	TVD Reference:	014400011 Single Line Co
Project:	Wanna County, TX	MD Reference:	014400011 Single Line Co
Site:	Wanna County, TX	North Reference:	014400011 Single Line Co
Well:	Wanna 014400011	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wanna Wellbore		
Design:	014400011 Single Line Co		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,731.0	68.70	65.00	6,189.9	5,054.9	102.8	2,622.5	341.9	10.87	-0.97	-11.61
7,763.0	67.90	61.90	6,201.7	5,066.7	116.1	2,649.1	357.5	9.34	-2.50	-9.69
7,795.0	68.00	58.50	6,213.7	5,078.7	130.8	2,674.9	374.6	9.85	0.31	-10.63
7,828.0	68.70	55.00	6,225.2	5,090.2	146.6	2,699.0	392.5	10.73	2.26	-11.29
7,858.0	69.50	51.30	6,236.6	5,101.6	164.5	2,722.9	412.5	11.09	2.50	-11.56
7,889.0	69.50	48.10	6,247.5	5,112.5	183.3	2,745.0	433.2	9.67	0.00	-10.32
7,921.0	69.10	44.80	6,258.8	5,123.8	203.9	2,766.7	455.8	9.78	-1.25	-10.31
7,952.0	69.10	41.40	6,269.8	5,134.8	225.1	2,788.5	478.6	10.25	0.00	-10.97
7,984.0	70.00	37.30	6,281.0	5,146.0	248.2	2,805.5	503.4	12.33	2.81	-12.81
8,015.0	70.90	34.00	6,291.4	5,156.4	272.0	2,822.5	528.6	10.44	2.90	-10.65
8,047.0	71.10	31.30	6,301.8	5,166.8	297.5	2,838.8	555.5	8.00	0.63	-8.44
8,079.0	71.90	28.20	6,312.0	5,177.0	323.8	2,853.9	583.1	9.52	2.50	-9.69
8,110.0	73.20	25.40	6,321.3	5,186.3	350.2	2,867.2	610.6	9.58	4.19	-9.03
8,142.0	74.60	22.90	6,330.1	5,195.1	378.2	2,879.8	639.7	8.69	4.38	-7.81
8,174.0	75.90	19.00	6,338.3	5,203.3	407.1	2,890.9	669.5	12.47	4.06	-12.19
8,205.0	77.10	15.90	6,345.5	5,210.5	435.9	2,899.9	698.9	10.47	3.87	-10.00
8,237.0	78.20	12.90	6,352.4	5,217.4	466.2	2,907.7	729.8	9.78	3.44	-9.38
8,269.0	78.20	9.70	6,358.9	5,223.9	496.9	2,913.8	760.9	9.79	0.00	-10.00
8,300.0	77.50	6.80	6,365.4	5,230.4	526.9	2,918.2	791.2	9.42	-2.26	-9.35
8,332.0	78.20	3.40	6,372.2	5,237.2	558.0	2,920.9	822.5	10.61	2.19	-10.63
8,363.0	79.30	0.70	6,378.2	5,243.2	588.4	2,922.0	852.8	9.25	3.55	-8.71
8,395.0	80.40	357.90	6,383.9	5,248.9	619.9	2,921.6	884.1	9.27	3.44	-8.75
8,426.0	82.00	355.40	6,388.6	5,253.6	650.5	2,919.8	914.4	9.49	5.16	-8.06
8,458.0	83.60	352.20	6,392.6	5,257.6	682.0	2,916.4	945.5	11.11	5.00	-10.00
8,489.0	83.80	349.40	6,396.0	5,261.0	712.4	2,911.5	975.4	9.00	0.65	-9.03
8,521.0	84.80	346.90	6,399.2	5,264.2	743.6	2,904.9	1,005.8	8.38	3.13	-7.81
8,553.0	86.10	344.30	6,401.7	5,266.7	774.5	2,897.0	1,035.8	9.06	4.06	-8.13
8,584.0	87.20	341.00	6,403.6	5,268.6	804.0	2,887.8	1,064.4	11.20	3.55	-10.65
8,616.0	88.20	338.20	6,404.8	5,269.8	834.0	2,876.6	1,093.2	9.28	3.13	-8.75
8,647.0	89.50	335.20	6,405.5	5,270.5	862.5	2,864.4	1,120.5	10.54	4.19	-9.68
8,679.0	90.00	334.30	6,405.6	5,270.6	891.4	2,850.7	1,148.0	3.22	1.56	-2.81
8,742.0	90.90	334.30	6,405.1	5,270.1	948.2	2,823.4	1,202.1	1.43	1.43	0.00
8,805.0	89.10	334.50	6,405.1	5,270.1	1,005.0	2,796.2	1,256.2	2.87	-2.86	0.32
8,868.0	89.70	336.80	6,405.8	5,270.8	1,062.4	2,770.2	1,310.9	3.77	0.95	3.65
8,931.0	89.10	337.60	6,406.4	5,271.4	1,120.4	2,745.8	1,366.5	1.59	-0.95	1.27
8,994.0	88.50	337.60	6,407.7	5,272.7	1,178.7	2,721.8	1,422.3	0.95	-0.95	0.00
9,057.0	88.90	337.10	6,409.2	5,274.2	1,236.8	2,697.6	1,478.0	1.02	0.63	-0.79
9,120.0	86.10	335.70	6,411.9	5,276.9	1,294.5	2,672.4	1,533.1	4.97	-4.44	-2.22
9,183.0	86.90	334.90	6,415.8	5,280.8	1,351.6	2,646.1	1,587.6	1.79	1.27	-1.27
9,246.0	89.40	333.40	6,417.8	5,282.8	1,408.3	2,618.6	1,641.5	4.63	3.97	-2.38
9,309.0	90.60	333.40	6,417.8	5,282.8	1,464.6	2,590.4	1,695.1	1.90	1.90	0.00

Database:	PHOENIX - Large Horizontal	Local Co-ordinate Reference:	PHOENIX Survey 2015
Company:	(C) Phoenix Technology	TVD Reference:	PHOENIX - 1125 Feet
Project:	Wells - Coon, TX	MD Reference:	PHOENIX - 1125 Feet
Site:	Wells - Coon, 112778	North Reference:	PHOENIX - 1125 Feet
Well:	Wells - 112778	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wells - 112778		
Design:	Wells - 112778		

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,372.0	90.40	332.90	6,417.3	5,282.3	1,520.8	2,562.0	1,748.4	0.85	-0.32	-0.79	
9,436.0	90.60	332.60	6,416.7	5,281.7	1,577.7	2,532.7	1,802.4	0.58	0.31	-0.47	
9,499.0	91.40	332.60	6,415.6	5,280.6	1,633.6	2,503.7	1,855.4	1.27	1.27	0.00	
9,562.0	89.40	333.40	6,415.2	5,280.2	1,689.7	2,475.1	1,908.7	3.42	-3.17	1.27	
9,625.0	89.50	333.80	6,415.8	5,280.8	1,746.2	2,447.1	1,962.4	0.65	0.16	0.63	
9,687.0	85.90	334.00	6,418.2	5,283.2	1,801.8	2,419.8	2,015.3	5.82	-5.81	0.32	
9,750.0	86.30	334.10	6,422.5	5,287.5	1,858.3	2,392.3	2,069.0	0.65	0.63	0.16	
9,813.0	88.30	334.60	6,425.5	5,290.5	1,915.0	2,365.1	2,123.0	3.27	3.17	0.79	
9,876.0	90.90	337.10	6,425.9	5,290.9	1,972.5	2,339.3	2,177.9	5.72	4.13	3.97	
9,939.0	92.40	337.00	6,424.1	5,289.1	2,030.5	2,314.8	2,233.4	2.39	2.38	-0.16	
10,002.0	91.30	336.00	6,422.1	5,287.1	2,088.2	2,289.6	2,288.6	2.36	-1.75	-1.59	
10,066.0	91.40	335.10	6,420.6	5,285.6	2,146.5	2,263.2	2,344.2	1.41	0.16	-1.41	
10,129.0	90.30	335.70	6,419.7	5,284.7	2,203.8	2,236.9	2,398.8	1.99	-1.75	0.95	
10,192.0	90.60	336.50	6,419.2	5,284.2	2,261.4	2,211.4	2,453.9	1.36	0.48	1.27	
10,255.0	89.00	336.10	6,419.4	5,284.4	2,319.0	2,186.1	2,509.0	2.62	-2.54	-0.63	
10,318.0	88.30	335.00	6,420.9	5,285.9	2,376.4	2,160.0	2,563.7	2.07	-1.11	-1.75	
10,381.0	89.30	334.50	6,422.2	5,287.2	2,433.3	2,133.2	2,618.0	1.77	1.59	-0.79	
10,444.0	88.20	335.10	6,423.6	5,288.6	2,490.3	2,106.3	2,672.3	1.99	-1.75	0.95	
10,508.0	88.60	334.60	6,425.3	5,290.3	2,548.2	2,079.2	2,727.5	1.00	0.63	-0.78	
10,571.0	90.00	334.90	6,426.1	5,291.1	2,605.2	2,052.3	2,781.8	2.27	2.22	0.48	
10,634.0	89.40	334.80	6,426.4	5,291.4	2,662.2	2,025.5	2,836.1	0.97	-0.95	-0.16	
10,697.0	89.90	334.90	6,426.8	5,291.8	2,719.3	1,998.7	2,890.4	0.81	0.79	0.16	
10,760.0	91.10	334.60	6,426.3	5,291.3	2,776.2	1,971.9	2,944.7	1.96	1.90	-0.48	
10,823.0	90.20	334.70	6,425.6	5,290.6	2,833.2	1,944.9	2,999.0	1.44	-1.43	0.16	
10,886.0	90.50	334.40	6,425.2	5,290.2	2,890.1	1,917.8	3,053.1	0.67	0.48	-0.48	
10,949.0	89.50	334.60	6,425.2	5,290.2	2,946.9	1,890.7	3,107.3	1.62	-1.59	0.32	
11,013.0	89.50	334.80	6,425.7	5,290.7	3,004.8	1,863.4	3,162.4	0.31	0.00	0.31	
11,076.0	90.50	333.80	6,425.7	5,290.7	3,061.5	1,836.0	3,216.4	2.24	1.59	-1.59	
11,139.0	89.70	334.10	6,425.6	5,290.6	3,118.1	1,808.4	3,270.3	1.36	-1.27	0.48	
11,202.0	89.70	334.20	6,426.0	5,291.0	3,174.8	1,780.9	3,324.2	0.16	0.00	0.16	
11,265.0	89.30	335.50	6,426.5	5,291.5	3,231.9	1,754.1	3,378.6	2.16	-0.63	2.06	
11,328.0	90.00	335.00	6,426.9	5,291.9	3,289.1	1,727.7	3,433.1	1.37	1.11	-0.79	
11,391.0	89.80	335.30	6,427.0	5,292.0	3,346.2	1,701.3	3,487.6	0.57	-0.32	0.48	
11,454.0	90.80	335.50	6,426.7	5,291.7	3,403.5	1,675.0	3,542.3	1.62	1.59	0.32	
11,517.0	90.20	336.00	6,426.1	5,291.1	3,461.0	1,649.2	3,597.1	1.24	-0.95	0.79	
11,580.0	90.10	336.40	6,426.0	5,291.0	3,518.6	1,623.8	3,652.2	0.65	-0.16	0.63	
11,643.0	89.10	337.20	6,426.4	5,291.4	3,576.5	1,598.9	3,707.6	2.03	-1.59	1.27	
11,706.0	89.10	337.00	6,427.4	5,292.4	3,634.5	1,574.4	3,763.1	0.32	0.00	-0.32	
11,770.0	90.30	337.00	6,427.7	5,292.7	3,693.4	1,549.4	3,819.5	1.88	1.88	0.00	
11,833.0	89.50	336.80	6,427.8	5,292.8	3,751.4	1,524.7	3,875.0	1.31	-1.27	-0.32	
11,896.0	89.40	336.40	6,428.4	5,293.4	3,809.2	1,499.7	3,930.3	0.65	-0.16	-0.63	
11,959.0	88.70	335.50	6,429.5	5,294.5	3,866.7	1,474.0	3,985.2	1.81	-1.11	-1.43	
12,021.0	89.00	334.80	6,430.7	5,295.7	3,923.0	1,448.0	4,038.8	1.23	0.48	-1.13	



# Phoenix Technologies Survey Report



08/15/2015 10:00:00 AM

Database:	15276-44-00001-0000	Local Co-ordinate Reference:	15276-44-00001-0000
Company:	EQT Production - Marcellus	TVD Reference:	15276-44-00001-0000
Project:	15276-44-00001-0000	MD Reference:	15276-44-00001-0000
Site:	15276-44-00001-0000	North Reference:	15276-44-00001-0000
Well:	15276-44-00001-0000	Survey Calculation Method:	15276-44-00001-0000
Wellbore:	15276-44-00001-0000		
Design:	15276-44-00001-0000		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,085.0	91.00	334.70	6,430.7	5,295.7	3,980.9	1,420.7	4,094.0	3.13	3.13	-0.16
12,148.0	92.80	333.60	6,428.6	5,293.6	4,037.5	1,393.2	4,147.9	3.35	2.86	-1.75
12,211.0	90.50	333.70	6,426.6	5,291.8	4,093.9	1,365.3	4,201.5	3.65	-3.65	0.16
12,274.0	89.90	333.20	6,426.6	5,291.6	4,150.3	1,337.1	4,255.1	1.24	-0.95	-0.79
12,337.0	90.60	332.60	6,426.3	5,291.3	4,206.4	1,308.4	4,308.3	1.46	1.11	-0.95
12,400.0	90.30	333.70	6,425.8	5,290.8	4,262.6	1,279.9	4,361.7	1.81	-0.48	1.75
12,464.0	90.90	333.90	6,425.2	5,290.2	4,320.0	1,251.7	4,416.3	0.99	0.94	0.31
12,527.0	90.00	333.60	6,424.7	5,289.7	4,376.5	1,223.8	4,470.0	1.51	-1.43	-0.48
12,590.0	89.70	333.70	6,424.8	5,289.8	4,433.0	1,195.9	4,523.7	0.50	-0.48	0.16
12,654.0	89.70	334.30	6,425.2	5,290.2	4,490.5	1,167.8	4,578.4	0.94	0.00	0.94
12,717.0	89.90	334.30	6,425.4	5,290.4	4,547.3	1,140.5	4,632.4	0.32	0.32	0.00
12,780.0	89.30	335.10	6,425.8	5,290.8	4,604.2	1,113.6	4,686.7	1.59	-0.95	1.27
12,843.0	89.40	334.40	6,426.5	5,291.5	4,661.2	1,086.7	4,741.0	1.12	0.16	-1.11
12,906.0	88.40	335.50	6,427.7	5,292.7	4,718.2	1,060.0	4,795.3	2.36	-1.59	1.75
12,969.0	88.00	336.00	6,429.7	5,294.7	4,775.7	1,034.2	4,850.2	1.02	-0.63	0.79
13,032.0	89.80	336.40	6,431.0	5,296.0	4,833.3	1,008.7	4,905.2	2.62	2.54	0.63
13,095.0	89.40	336.60	6,431.6	5,296.6	4,891.1	983.6	4,960.5	0.45	-0.32	0.32
13,158.0	89.50	335.70	6,432.2	5,297.2	4,948.7	958.2	5,015.5	1.44	0.18	-1.43
13,222.0	90.60	334.80	6,432.1	5,297.1	5,006.8	931.4	5,070.9	2.22	1.72	-1.41
13,285.0	89.40	335.30	6,432.1	5,297.1	5,063.9	904.8	5,125.4	2.08	-1.90	0.79
13,348.0	88.80	335.20	6,433.1	5,298.1	5,121.1	878.4	5,179.9	0.97	-0.95	-0.16
13,411.0	89.90	335.70	6,433.9	5,298.9	5,178.4	852.2	5,234.6	1.92	1.75	0.79
13,474.0	91.00	335.40	6,433.4	5,298.4	5,235.8	826.2	5,289.3	1.81	1.75	-0.48
13,538.0	91.60	334.70	6,431.9	5,296.9	5,293.8	799.2	5,344.6	1.44	0.94	-1.09
13,601.0	90.40	334.30	6,430.8	5,295.8	5,350.6	772.1	5,398.8	2.01	-1.90	-0.63
13,664.0	89.20	333.80	6,431.0	5,296.0	5,407.3	744.5	5,452.7	2.06	-1.90	-0.79
13,727.0	89.20	333.30	6,431.9	5,296.9	5,463.7	716.4	5,508.3	0.79	0.00	-0.79
13,789.0	89.30	333.30	6,432.7	5,297.7	5,519.1	688.6	5,558.9	0.16	0.16	0.00
13,852.0	89.50	333.50	6,433.4	5,298.4	5,575.4	660.4	5,612.4	0.45	0.32	0.32
13,916.0	89.60	334.20	6,433.9	5,298.9	5,632.8	632.2	5,667.0	1.10	0.16	1.09
13,979.0	89.50	333.90	6,434.4	5,299.4	5,689.5	604.6	5,720.9	0.50	-0.16	-0.48
14,042.0	89.60	332.60	6,434.9	5,299.9	5,745.7	576.2	5,774.4	2.07	0.16	-2.06
14,105.0	89.50	331.90	6,435.4	5,300.4	5,801.5	548.9	5,827.2	1.12	-0.16	-1.11
14,164.0	89.50	331.90	6,435.9	5,300.9	5,853.5	519.1	5,876.5	0.00	0.00	0.00

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WV Department of  
Environmental Protection  
COMPASS 5000.1 Build 73

Database:	3878 Gyro Tie In-8616.DG	Local Co-ordinate Reference:	14105' MD/6435' TVD
Company:	EQT Production Services	TVD Reference:	8616' MD/6405' TVD
Project:	Wilcox County, WI	MD Reference:	14105' MD/6435' TVD
Site:	Wilcox County A11274	North Reference:	14105' MD/6435' TVD
Well:	Well 861620	Survey Calculation Method:	Minimum Curvature
Wellbore:	Well 861620		
Design:	14105' MD/6435' TVD		

Design Annotations

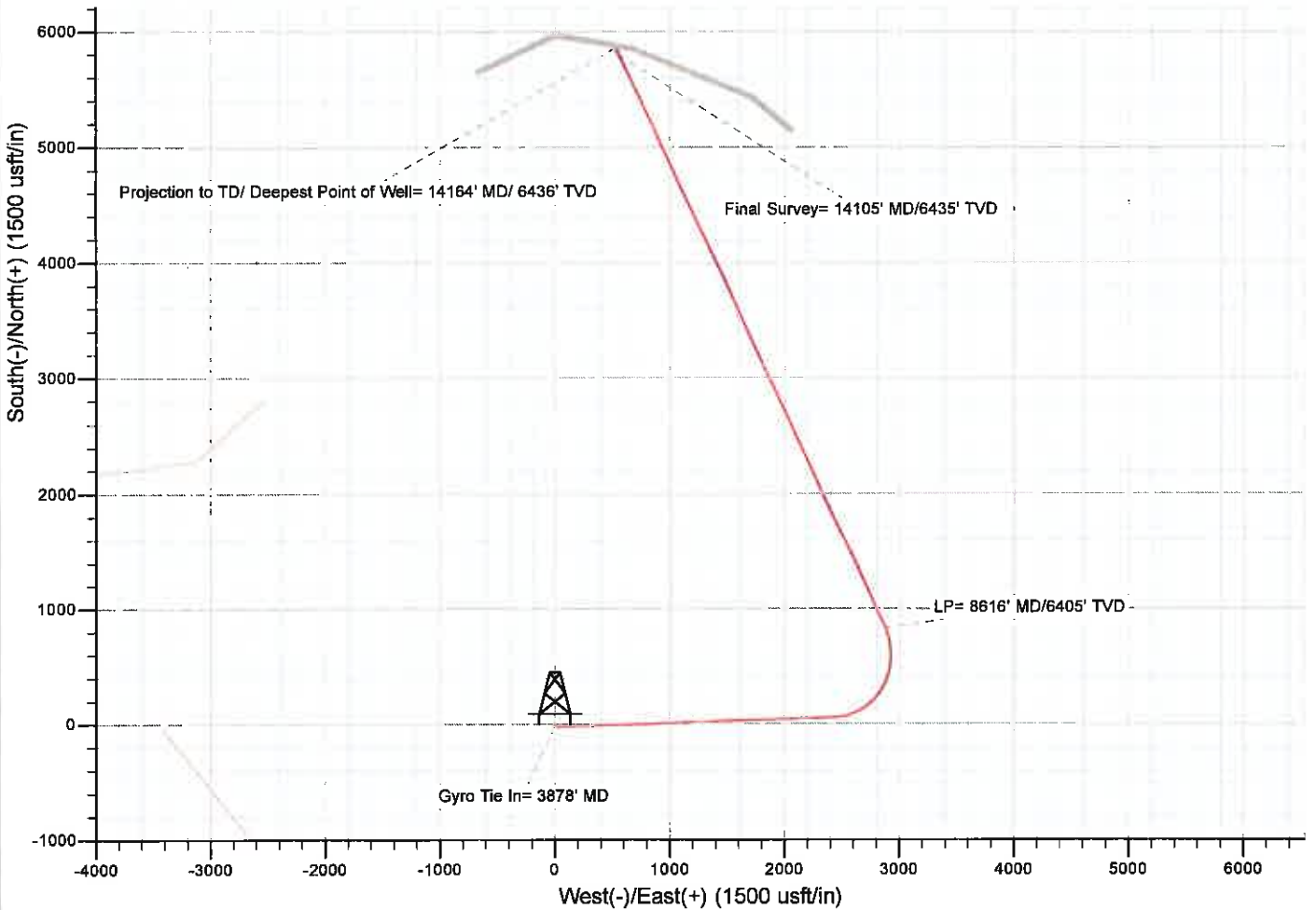
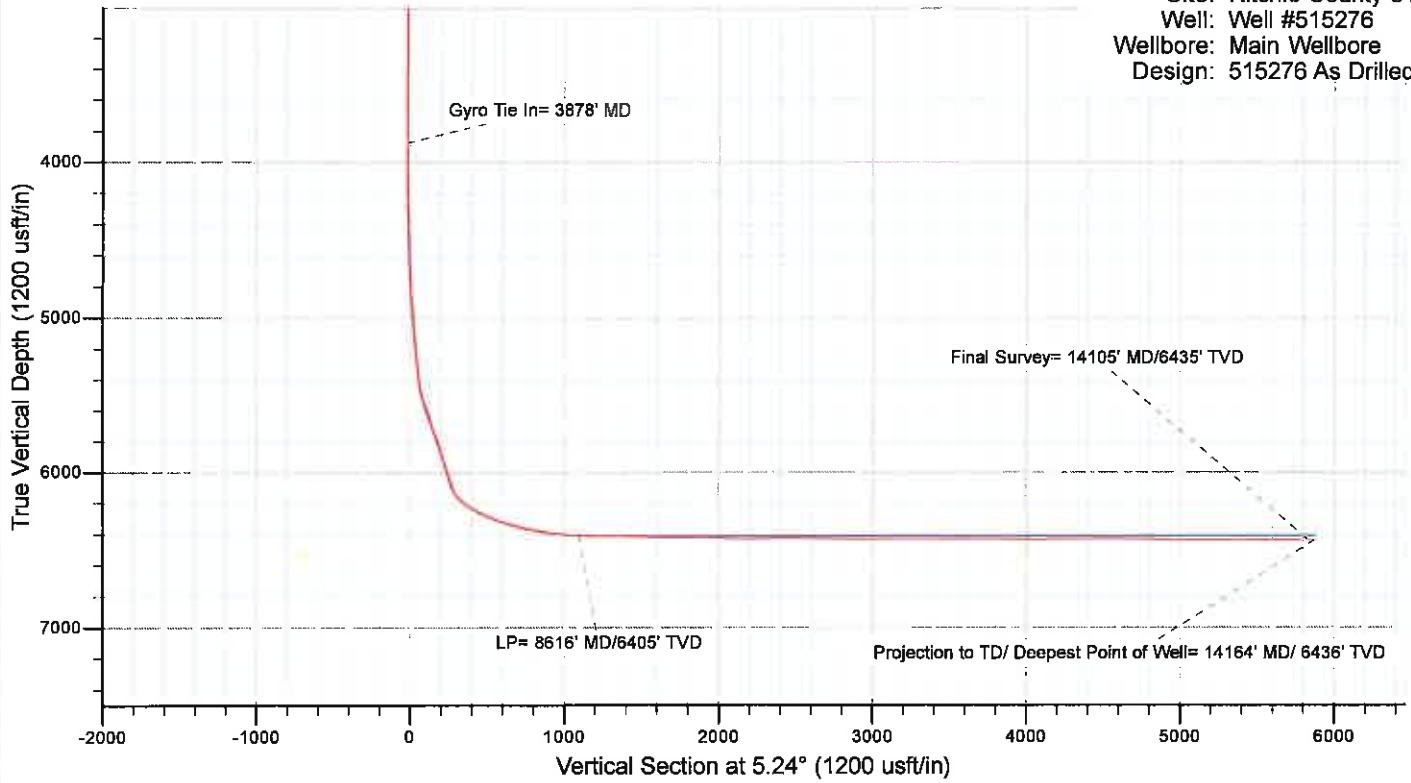
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,878.0	3,877.9	-20.7	-5.3	Gyro Tie In= 3878' MD
8,616.0	6,404.8	834.0	2,876.8	LP= 8616' MD/6405' TVD
14,105.0	6,435.4	5,801.5	546.9	Final Survey= 14105' MD/6435' TVD
14,164.0	6,435.9	5,853.5	519.1	Projection to TD/ Deepest Point of Well= 14164' MD/ 6436' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_





Project: Ritchie County, WV  
Site: Ritchie County 515276  
Well: Well #515276  
Wellbore: Main Wellbore  
Design: 515276 As Drilled Surveys





**515276-47-085-10094-0000- 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	6/3/2015	24.9	6,171.00	6,751.00	4,466.00	0	398	0
1	6/3/2015	89.1	8,280.00	8,538.00	3,915.00	202,520	5399	0
2	6/3/2015	87.6	8,187.00	8,461.00	3,435.00	202,560	5568	0
3	6/3/2015	83.3	8,001.00	8,458.00	3,246.00	203,300	5551	0
4	6/4/2015	89.3	8,039.00	8,365.00	3,917.00	201,100	5374	0
5	6/4/2015	91.1	8,219.00	8,457.00	4,133.00	200,660	5429	0
6	6/4/2015	87.4	8,193.00	8,504.00	5,207.00	202,400	5553	0
7	6/4/2015	88.4	8,172.00	8,468.00	4,051.00	200,980	5379	0
8	6/4/2015	90.3	7,928.00	8,414.00	3,959.00	202,380	5582	0
9	6/5/2015	90.6	8,020.00	8,253.00	3,533.00	202,420	5497	0
10	6/5/2015	98.8	8,536.00	8,829.00	3,827.00	200,790	5597	0
11	6/5/2015	98.5	8,508.00	8,884.00	4,156.00	202,140	5439	0
12	6/5/2015	99.2	8,465.00	8,842.00	3,512.00	201,500	5511	0
13	6/5/2015	99.1	8,484.00	8,790.00	3,558.00	203,020	5218	0
14	6/6/2015	97.3	8,433.00	8,927.00	4,210.00	201,860	5126	0
15	6/6/2015	95.7	8,625.00	8,829.00	4,626.00	199,680	5529	0
16	6/6/2015	95	8,608.00	8,861.00	4,055.00	201,420	5249	0
17	6/6/2015	98.5	8,569.00	8,868.00	3,687.00	201,000	5298	0
18	6/6/2015	98.8	8,254.00	8,662.00	3,648.00	201,820	5125	0
19	6/6/2015	96.7	8,391.00	8,649.00	3,604.00	201,800	4780	0
20	6/7/2015	99	8,369.00	8,636.00	3,919.00	202,340	5203	0
21	6/7/2015	100.6	8,438.00	8,819.00	3,662.00	202,100	5380	0
22	6/7/2015	99.4	8,484.00	8,874.00	4,127.00	200,500	5335	0
23	6/7/2015	100.5	8,468.00	8,975.00	4,304.00	198,480	5277	0
24	6/7/2015	99.2	8,330.00	8,532.00	3,790.00	202,720	5189	0
25	6/7/2015	94.6	8,265.00	8,478.00	3,445.00	202,800	5150	0
26	6/8/2015	99.4	8,224.00	8,543.00	4,401.00	201,480	5101	0
27	6/8/2015	99.6	8,093.00	8,401.00	3,680.00	202,300	4943	0
28	6/8/2015	100.8	8,342.00	8,934.00	3,502.00	198,980	5135	0
29	6/8/2015	100.8	8,349.00	8,936.00	4,099.00	199,720	5143	0
30	6/8/2015	100.90	8,450.00	8,847.00	4,058	198,740	5,100	0
31	6/9/2015	99.50	7,720.00	8,144.00	3,430	201,940	5,042	0
32	6/9/2015	100.10	7,819.00	8,294.00	3,720	202,180	4,967	0
33	6/9/2015	100.90	8,500.00	8,934.00	3,692	201,220	5,173	0
34	6/9/2015	100.80	8,529.00	8,773.00	3,777	202,680	5,227	0
35	6/9/2015	99.10	7,553.00	8,122.00	3,414	202,340	5,072	0
36	6/9/2015	100.00	7,666.00	8,175.00	3,372	201,940	4,860	0
37	6/10/2015	100.60	7,702.00	8,219.00	3,863	202,840	5,283	0
38	6/10/2015	100.4	8,175.00	8,522.00	3,542.00	202,920.00	5154	0

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	6/3/2015
Job End Date	6/10/2015
State	West Virginia
County	Ritchie
API Number	47-085-10094-00-00
Operator Name	EQT Production
Well Name and Number	515276
Longitude	-80.95143400
Latitude	39.28186100
Datum	NAD83
Federal Tract Well	NO
True Vertical Depth	6,436
Total Base Water Volume (gal)	8,414,112
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	Stingray Pressure Pumping, LLC	Carrier/Base Fluid	Water	7732-18-5	100.00000	89.83481	None
Sand (Proppant)	Stingray Pressure Pumping, LLC	Proppant	Silica Substrate	14808-60-7	100.00000	9.80230	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.06619	None
Hydrochloric Acid (1.5%)	Stingray Pressure Pumping, LLC	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03535	None
FRA-405	Stingray Pressure Pumping, LLC	Friction reducer	Petroleum distillates	64742-47-8	40.00000	0.00286	None
			Sodium chloride	7647-14-5	10.00000	0.00072	None
			Ammonium chloride	12125-02-9	7.00000	0.00050	None
			Alcohols, C12-18, Ethoxylated	88551-12-2	7.00000	0.00050	None
ScaleClear 125	Stingray Pressure Pumping, LLC	Scale inhibitor	Phosphonated polyamine, Proprietary amrod. w/ substituted amine	12125-02-9	15.00000	0.00370	None
			Ammonium chloride	12125-02-9	2.50000	0.00062	None

AI 600	Stingray Pressure Pumping, LLC	Acid corrosion inhibitor						
		Ethylene glycol	107-21-1	40.00000	0.00063	None		
		N,N-Dimethylformamide	68-12-2	20.00000	0.00031	None		
		Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00024	None		
		2-Butoxyethanol	111-78-2	15.00000	0.00024	None		
		Cinnamaldehyde	104-55-2	15.00000	0.00024	None		
		Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenoxy)- omega hydroxy-branched	127087-87-0	5.00000	0.00008	None		
		1-Decanol	112-30-1	5.00000	0.00008	None		
		Isopropanol	67-63-0	2.50000	0.00004	None		
		1-Octanol	111-87-5	2.50000	0.00004	None		
		Tris(hydroxy) phosphate	78-10-0	2.50000	0.00004	None		

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)



June 8, 2016

Mr. Gene Smith  
West Virginia Department of Environmental Protection  
Office of Oil and Gas  
601 57th Street SE  
Charleston, WV 25304

Re: Modification of 47-085-10094

Dear Mr. Smith,

Please accept the attached updates for the above referenced permit. Upon inspection of our as-drilled plat, we noted the curve geometry crossed into an additional tract, for which EQT had acquired a subsurface agreement. Enclosed is an updated WW-6A1, WW-6B, mylar plat and rec plan reflecting corrections to update the permit file to be consistent with the as-drilled well bore.

If you have any questions, please do not hesitate to contact me at (304) 848-0076.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Vicki Roark', is written over a light blue horizontal line.

Vicki Roark  
Permitting Supervisor-WV

Enc.

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SEP 06 2016  
WV Department of  
Environmental Protection

**EQT PRODUCTION COMPANY  
TAYLOR LEASE  
1,600 ACRES±  
WELL NO. WV 515276  
(PEN15 H7)**

**AS DRILLED COORDINATES**

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

NAD'27 S.P.C.(FT) N. 280,805.1 E. 1,589,040.8  
NAD'27 GEO. LAT.(N) 39.261861 LONG.(W) 80.951434  
NAD'83 UTM (M) N. 4,345,846.3 E. 504,204.4

**LANDING POINT**

NAD'27 S.P.C.(FT) N. 281,639.1 E. 1,591,917.3  
NAD'27 GEO. LAT.(N) 39.264278 LONG.(W) 80.941324  
NAD'83 UTM (M) N. 4,346,115.0 E. 505,078.5

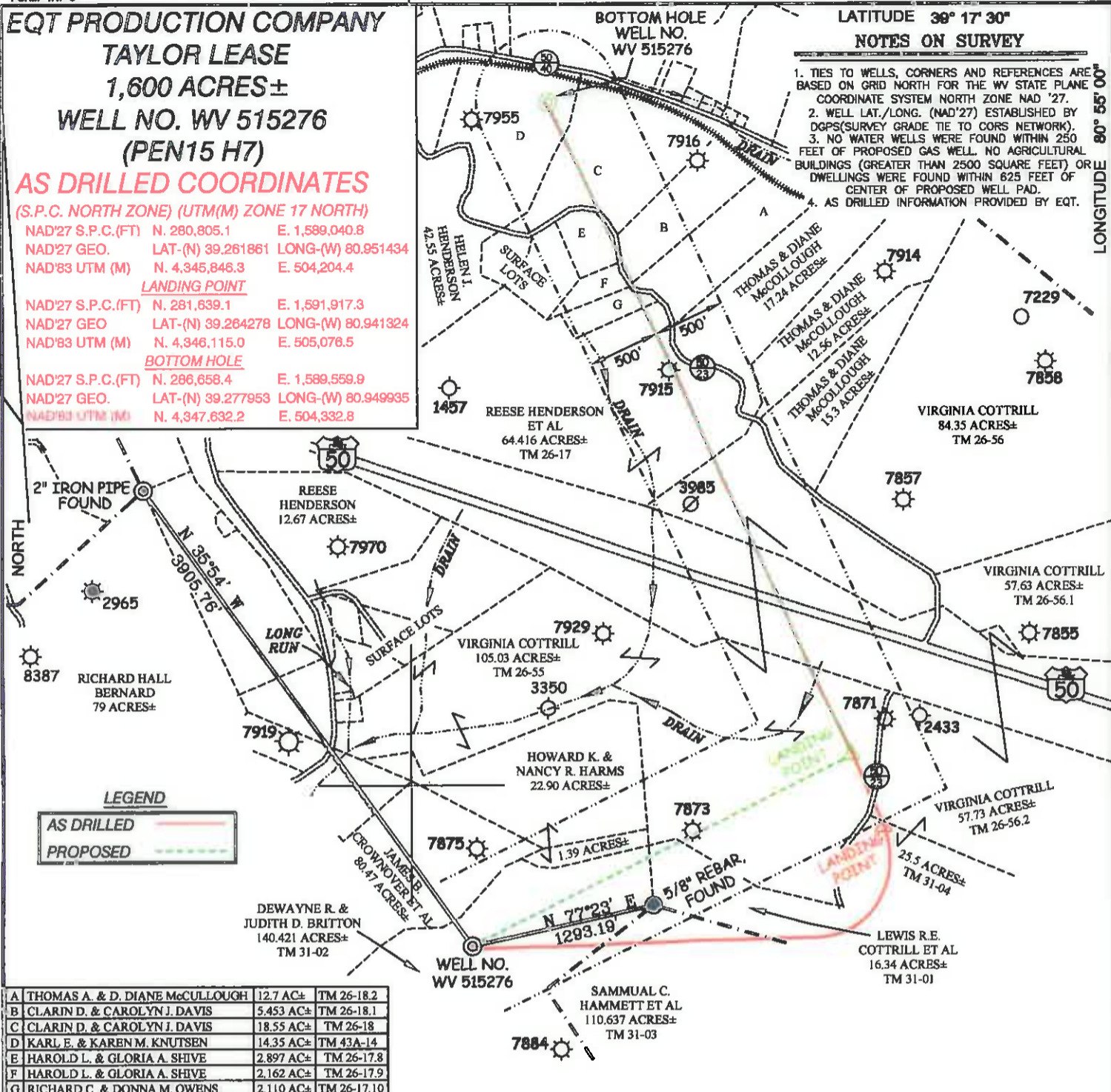
**BOTTOM HOLE**

NAD'27 S.P.C.(FT) N. 286,658.4 E. 1,589,559.9  
NAD'27 GEO. LAT.(N) 39.277953 LONG.(W) 80.949935  
NAD'83 UTM (M) N. 4,347,632.2 E. 504,332.8

LATITUDE 39° 17' 30"

NOTES ON SURVEY

1. TIES TO WELLS, CORNERS AND REFERENCES ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
  2. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE TIE TO CORS NETWORK).
  3. NO WATER WELLS WERE FOUND WITHIN 250 FEET OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS (GREATER THAN 2500 SQUARE FEET) OR DWELLINGS WERE FOUND WITHIN 625 FEET OF CENTER OF PROPOSED WELL PAD.
- AS DRILLED INFORMATION PROVIDED BY EQT.



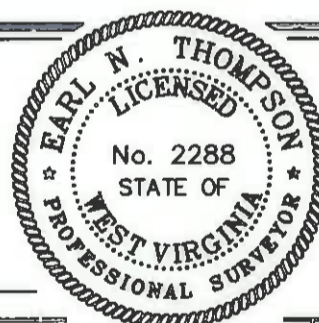
**LEGEND**  
AS DRILLED (solid line)  
PROPOSED (dashed line)

A	THOMAS A. & D. DIANE McCULLOUGH	12.7 AC±	TM 26-18.2
B	CLARIN D. & CAROLYN J. DAVIS	5.453 AC±	TM 26-18.1
C	CLARIN D. & CAROLYN J. DAVIS	18.55 AC±	TM 26-18
D	KARL E. & KAREN M. KNUITSEN	14.35 AC±	TM 43A-14
E	HAROLD L. & GLORIA A. SHIVE	2.897 AC±	TM 26-17.8
F	HAROLD L. & GLORIA A. SHIVE	2.162 AC±	TM 26-17.9
G	RICHARD C. & DONNA M. OWENS	2.110 AC±	TM 26-17.10

**Professional Energy Consultants**  
A DIVISION OF SLM LAND SURVEYING, INC.  
**SLS**  
SURVEYORS  
ENGINEERS  
ENVIRONMENTAL  
PROJECT MGMT.  
(304) 462-0634  
WWW.SLSURVEYS.COM

**SUBSURFACE AGREEMENT**  
SAMUEL C. HAMMETT ET AL | 110.637 AC± | TM 31-3

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 JANUARY 10, 20 14  
REVISED APRIL 08, 2015, MAY 16, 2016 & JUNE 06, 2016  
OPERATORS WELL NO. WV 515276  
API WELL NO. 47-085-10094-H  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7496AD515276R2  
PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1000'

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:  
PAD ELEVATION 1,118.7' WATERSHED LONG RUN OF NORTH FORK HUGHES RIVER  
DISTRICT CLAY COUNTY RITCHIE QUADRANGLE PENNSBORO 7.5'

SURFACE OWNER DEWAYNE BRITTON ET UX ACREAGE 140.421  
ROYALTY OWNER E. R. TAYLOR HEIRS ACREAGE 1,600±  
PROPOSED WORK: LEASE NO. 105804  
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 6,374'

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 BRIDGEPORT, WV 26330

LONGITUDE 80° 55' 00" 958.01