

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513835

API: 47 - 103 - 02992

Submission:  Initial  Amended

Notes: Correction to Production Cement Top  
(MD)

RECEIVED  
Office of Oil and Gas  
DEC 21 2015  
WV Department of  
Environmental Protection

04/01/2016  
AX 04/01/2016

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

API 47 - 103 - 02992 County WETZEL District GRANT  
Quad BIG RUN Pad Name BIG176 Field/Pool Name \_\_\_\_\_  
Farm name JOHN W. AND FLORENCE E. KILCOYNE Well Number 513835  
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 4379102 Easting 537741  
Landing Point of Curve Northing 4378851 Easting 536970  
Bottom Hole Northing 4377868 Easting 537408

Elevation (ft) 860 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) (Intermediate Hole Only)  
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 05/30/2014 Date drilling commenced 06/30/2014 Date drilling ceased 1/2/2015  
Date completion activities began 2/7/2015 Date completion activities ceased 2/12/2015  
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 135 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1457,1459,1390,1521 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 109,174,239,495,602 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
DMH  
04/01/2016

API 47- 103 - 02992 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513835

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	28"	26"	80'	NEW	A-500 40LB/FT	NONE	Y
Surface	24"	20"	319'	NEW	J-55 94LB/FT	197	Y
Coal							
Intermediate 1	17.5"	13.375"	832'	NEW	J-55 54.5LB/FT	382'	Y
Intermediate 2	12.375"	9.625"	2405'	NEW	A-500 40LB/FT	NONE	Y
Intermediate 3							
Production	8.5"	5.5"	11,881'	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	98	15.6	1.18	115.64	0	8
Surface	CLASS A	607	15.6	1.19	722.33	0	8
Coal							
Intermediate 1	CLASS A	595	15.6	1.19	708.05	0	8
Intermediate 2	CLASS A / CLASS A	475 / 390	15.6 / 15.6	1.18 / 1.19	1024.6	0	8
Intermediate 3							
Production	CLASS A / CLASS H	935/480	14.2/15.2	1.26/1.97	2123.7	2,694'	72
Tubing							

Drillers TD (ft) 11,883' 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) 3,590' 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, 7  
 INTERMEDIATE- JOINTS: 1, 12  
 INTERMEDIATE 2- RAN AT LEAST EVERY 500' FEET JOINTS: 1,11,22,33,44,54  
 PRODUCTION- 195 Composite bodied centralizers on every joint from TD up to 3,500'

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 \_\_\_\_\_

API 47- 103 - 02992 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513835

**PERFORATION RECORD**

Stage No	Perforation date	Perforated from MD ft	Perforated to MD ft	Number of Perforations	Formation(s)
					<b>Please See Attached</b>

Please insert additional pages as applicable.

**STIMULATION INFORMATION PER STAGE**

Complete a separate record for each stimulation stage.

Stage No	Stimulations 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)
						<b>Please</b>	<b>See</b>	<b>Attached</b>

Please insert additional pages as applicable.

API 47- 103 - 02992 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513835

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6,991'	8,166'
	TVD	MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3,028 psi Bottom Hole N/A psi DURATION OF TEST 72.50 hrs

OPEN FLOW Gas 5,630 mcfpd Oil 0 bpd NGL 0 bpd Water 1263.7 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 <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		

Please insert additional pages as applicable.

Drilling Contractor ALPHA HUNTER DRILLING (RIG 5)  
Address P.O. BOX 430 City RENO State OH Zip 45773

Logging Company HOSSCO SERVICES, LLC  
Address 614 TROTTERS LANE City CHARLESTON State WV Zip 25312

Cementing Company NABORS CEMENTING SERVICES  
Address 2504 SMITH CREEK ROAD City WAYNESBURG State PA Zip 15370

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

Please insert additional pages as applicable.

Completed by Brad Magdox Telephone 412-395-7053  
Signature [Signature] Title Director of Drilling Date 12/9/2015

API 47- 103 - 02992 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513835

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 ALLIED OIL AND GAS SERVICES  
Address 1036 EAST MAIN ST City BRIDGEPORT State WV Zip 26330

Mud Type(s) and Additive(s) (Production Hole Only)

SBM 12.5 ppg powdered hydrocarbon resin, calcium carbonate, ground almond hulls, barium sulfate, calcium chloride, lecithin liquid, organophilic clay, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

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	138	138
SAND/SHALE	0	0	112	112
WAHINGTON COAL	112	112	114	114
SAND/SHALE	114	114	177	177
WAYNESBURG A COAL	177	177	178	178
SAND/SHALE	178	178	242	242
WAYNESBURG COAL	242	242	244	244
SAND/SHALE	244	244	498	498
SEWICKLY COAL	498	498	500	500
SAND/SHALE	500	500	605	605
PIITSBURGH COAL	605	605	611	611
SAND/SHALE	611	611	1,710	1,710
MAXTON	1,710	1,710	1,842	1,842
SAND/SHALE	1,842	1,842	1,866	1,866
BIG LIME	1,866	1,866	1,958	1,958
SAND/SHALE	1,958	1,958	1,967	1,967
BIG INJUN	1,967	1,967	2,125	2,125
SAND/SHALE	2,125	2,125	2,262	2,262
WEIR	2,262	2,262	2,361	2,361
SAND/SHALE	2,361	2,361	2,412	2,412
GANTZ	2,412	2,412	2,421	2,420
SAND/SHALE	2,421	2,420	2,462	2,461
50F	2,462	2,461	2,508	2,507
SAND/SHALE	2,508	2,507	2,555	2,554
30F	2,555	2,554	2,579	2,578
SAND/SHALE	2,579	2,578	2,680	2,679
GORDON	2,680	2,679	2,730	2,729
SAND/SHALE	2,730	2,729	3,463	3,462
FORTH SAND	2,772	2,771	2,784	2,783
SAND/SHALE	2,784	2,783	2,928	2,927
BAYARD	2,928	2,927	3,111	3,110
SAND/SHALE	3,111	3,110	3,309	3,308
WARREN	3,309	3,308	3,358	3,357
B-5	3,358	3,357	3,462	3,461
SPEECHLEY	3,462	3,461	3,883	3,870
BALLTOWN A	3,883	3,870	4,509	4,342
RILEY	4,509	4,342	5,353	4,984
BENSON	5,353	4,984	5,803	5,322
ALEXANDER	5,803	5,322	5,885	5,383
ELKS	5,885	5,383	7,410	6,537
SONYEA	7,410	6,537	7,626	6,705
MIDDLESEX	7,626	6,705	7,695	6,757
GENSEE	7,695	6,757	7,815	6,838
GENESE0	7,815	6,838	7,870	6,871
TULLY	7,870	6,871	7,912	6,894
HAMILTON	7,912	6,894	8,166	6,991
MARCELLUS	8,166	6,991	11,883	7,052

# **EQT Production - Marcellus**

**Wetzel County, WV**

**Wetzel County 513835**

**Well #513835**

**Main Wellbore**

**Design: As Drilled Surveys**

## **Standard Survey Report**

**02 January, 2015**



**Phoenix Technologies**  
Survey Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Walzel County 513835
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 876.0usft
Project:	Walzel County, WV	MD Reference:	KB @ 876.0usft
Site:	Walzel County 513835	North Reference:	Ghd
Well:	Well #513835	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	As Drilled Surveys		

<b>Project</b> Walzel County, WV			
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		Using geodetic scale factor

<b>Site</b> Walzel County 513835			
Site Position:		Northing:	388,092.38 usft
From:	Map	Easting:	1,700,911.84 usft
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16 "
		Latitude:	39.56
		Longitude:	-80.56
		Grid Convergence:	-0.68 °

<b>Well</b> Well #513835						
Well Position	+N/-S	0 0 usft	Northing:	388,092.38 usft	Latitude:	39° 33' 38.491 N
	+E/-W	0.0 usft	Easting:	1,700,911.84 usft	Longitude:	80° 33' 39.036 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	860 0 usft

<b>Wellbore</b> Main Wellbore					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	12/15/2014	-8.71	66.95	52,348

<b>Design</b> As Drilled Surveys					
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**Audit Notes:**

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
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Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 0	0 0	0 0	196.09

Survey Program		Date			
From (')	To (usft)	1/2/2015	Survey (Wellbore)	Tool Name	Description
0.00	3,303.0		513835 Gyrodota (Main Wellbore)	GYD_DP_MS	Gyrodota gyro-compassing and drop
0.00	11,883.0		513835 PHX 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	-876.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.43	199.52	103.0	-773.0	-0.4	-0.1	0.4	0.42	0.42	0.00
203.0	0.60	164.28	203.0	-673.0	-1.2	-0.1	1.2	0.35	0.17	-35.24
303.0	0.86	158.88	303.0	-573.0	-2.4	0.3	2.2	0.27	0.26	-5.40
403.0	0.80	158.07	403.0	-473.0	-3.8	0.8	3.4	0.06	-0.06	-0.81
503.0	0.62	175.64	503.0	-373.0	-5.0	1.1	4.5	0.28	-0.18	17.57
603.0	0.59	184.74	603.0	-273.0	-6.0	1.1	5.5	0.10	-0.03	9.10
703.0	0.15	184.28	703.0	-173.0	-6.7	1.1	6.1	0.44	-0.44	-0.46

# Phoenix Technologies

## Survey Report

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Wetzel County 513835
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 875.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB @ 878.0usft
<b>Site:</b>	Wetzel County 513835	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	As Drilled Surveys		

**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)
803.0	0.16	190.12	803.0	-73.0	-6.9	1.0	6.4	0.02	0.01	5.84
903.0	0.32	218.43	903.0	27.0	-7.3	0.8	6.8	0.19	0.16	28.31
1,003.0	0.49	224.30	1,003.0	127.0	-7.8	0.4	7.4	0.17	0.17	5.87
1,103.0	0.49	232.14	1,103.0	227.0	-8.4	-0.3	8.1	0.07	0.00	7.84
1,203.0	0.44	237.07	1,203.0	327.0	-8.8	-0.9	8.8	0.06	-0.05	4.93
1,303.0	0.47	228.66	1,302.9	426.9	-9.3	-1.6	9.4	0.07	0.03	-8.41
1,403.0	0.50	212.82	1,402.9	526.9	-10.0	-2.1	10.2	0.14	0.03	-15.84
1,503.0	0.50	225.40	1,502.9	626.9	-10.6	-2.6	11.0	0.11	0.00	12.58
1,603.0	0.52	223.29	1,602.9	726.9	-11.3	-3.3	11.7	0.03	0.02	-2.11
1,703.0	0.80	212.51	1,702.9	826.9	-12.2	-4.0	12.8	0.31	0.28	-10.78
1,803.0	1.15	204.84	1,802.9	926.9	-13.7	-4.7	14.5	0.37	0.35	-7.67
1,903.0	1.73	213.74	1,902.9	1,026.9	-15.9	-6.0	16.9	0.62	0.58	8.90
2,003.0	2.14	219.15	2,002.8	1,126.8	-18.6	-8.0	20.1	0.45	0.41	5.41
2,103.0	2.22	219.01	2,102.8	1,226.8	-21.5	-10.4	23.6	0.08	0.08	-0.14
2,203.0	2.29	219.49	2,202.7	1,326.7	-24.6	-12.9	27.2	0.07	0.07	0.48
2,303.0	2.58	219.27	2,302.6	1,426.6	-27.8	-15.6	31.1	0.29	0.29	-0.22
2,403.0	3.01	217.74	2,402.5	1,526.5	-31.7	-18.6	35.6	0.44	0.43	-1.53
2,503.0	2.68	216.90	2,502.3	1,626.3	-35.6	-21.7	40.2	0.33	-0.33	-0.84
2,603.0	1.70	220.23	2,602.3	1,726.3	-38.6	-24.0	43.8	0.99	-0.98	3.33
2,703.0	0.97	228.86	2,702.2	1,826.2	-40.3	-25.6	45.8	0.76	-0.73	8.63
2,803.0	0.56	238.26	2,802.2	1,926.2	-41.1	-26.7	46.9	0.43	-0.41	9.40
2,903.0	0.35	266.98	2,902.2	2,026.2	-41.4	-27.4	47.4	0.30	-0.21	28.72
3,003.0	0.54	284.87	3,002.2	2,126.2	-41.3	-28.1	47.5	0.23	0.19	17.89
3,103.0	0.64	294.28	3,102.2	2,226.2	-40.9	-29.1	47.4	0.14	0.10	9.41
3,203.0	0.67	301.94	3,202.2	2,326.2	-40.4	-30.1	47.2	0.09	0.03	7.66
<b>Gyro Tie In=330° MD</b>										
3,303.0	0.67	304.07	3,302.2	2,426.2	-39.8	-31.1	46.8	0.02	0.00	2.13
3,351.0	0.70	304.50	3,350.2	2,474.2	-39.4	-31.6	46.6	0.06	0.06	0.90
3,383.0	0.60	314.10	3,382.2	2,506.2	-39.2	-31.8	46.5	0.46	-0.31	30.00
3,414.0	0.80	315.90	3,413.2	2,537.2	-38.9	-32.1	46.3	0.65	0.65	5.81
3,446.0	0.70	336.00	3,445.2	2,569.2	-38.6	-32.4	46.1	0.87	-0.31	62.81
3,477.0	0.60	322.20	3,476.2	2,600.2	-38.3	-32.5	45.8	0.60	-0.32	-44.52
3,509.0	0.50	331.30	3,508.2	2,632.2	-38.0	-32.7	45.6	0.41	-0.31	28.44
3,540.0	0.60	326.70	3,539.2	2,663.2	-37.8	-32.9	45.4	0.35	0.32	-14.84
3,572.0	0.70	319.30	3,571.2	2,695.2	-37.5	-33.1	45.2	0.41	0.31	-23.13
3,603.0	3.10	271.80	3,602.2	2,726.2	-37.3	-34.0	45.3	8.64	7.74	-153.23
3,635.0	6.20	266.50	3,634.1	2,758.1	-37.4	-36.6	46.1	9.77	9.69	-16.56
3,666.0	9.10	267.90	3,664.8	2,788.8	-37.6	-40.7	47.4	9.37	9.35	4.52
3,698.0	11.80	270.70	3,696.2	2,820.2	-37.7	-46.5	49.1	8.58	8.44	8.75
3,729.0	14.50	270.20	3,726.4	2,850.4	-37.6	-53.6	51.0	8.72	8.71	-1.61
3,761.0	17.20	269.70	3,757.2	2,881.2	-37.6	-62.3	53.4	8.45	8.44	-1.56
3,792.0	19.80	269.10	3,786.6	2,910.6	-37.7	-72.2	56.2	8.41	8.39	-1.94
3,824.0	22.30	268.80	3,816.5	2,940.5	-37.9	-83.7	59.6	7.82	7.81	-0.94

# Phoenix Technologies

## Survey Report

<b>Database:</b> EDM 8000.1 Single User Db <b>Company:</b> EQT Production - Marcellus <b>Project:</b> Wetzel County, WV <b>Site:</b> Wetzel County 518835 <b>Well:</b> Well #518835 <b>Wellbore:</b> Main Wellbore <b>Design:</b> As Drilled Surveys	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	Site Wetzel County 518835 KB @ 876.0usft KB @ 876.0usft Grid Minimum Curvature
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**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)
3,855.0	25.70	269.30	3,844.8	2,968.8	-38.1	-96.3	63.3	10.99	10.97	1.61
3,887.0	29.00	269.70	3,873.2	2,997.2	-38.3	-111.0	67.5	10.33	10.31	1.25
3,919.0	32.00	270.30	3,900.8	3,024.8	-38.3	-127.2	72.0	9.42	9.38	1.88
3,950.0	35.10	270.80	3,926.6	3,050.6	-38.1	-144.3	76.6	10.04	10.00	1.61
3,982.0	38.20	270.10	3,952.3	3,076.3	-37.9	-163.4	81.8	9.77	9.69	-2.19
4,045.0	42.40	268.90	4,000.3	3,124.3	-38.3	-204.2	93.4	6.78	6.67	-1.90
4,109.0	43.60	268.90	4,047.1	3,171.1	-39.2	-247.8	106.3	1.88	1.88	0.00
4,172.0	44.00	268.60	4,092.6	3,216.6	-40.1	-291.4	119.3	0.72	0.63	-0.48
4,235.0	43.40	268.30	4,138.1	3,262.1	-41.3	-334.9	132.5	1.01	-0.95	-0.48
4,298.0	42.70	268.10	4,184.2	3,308.2	-42.6	-377.9	145.7	1.13	-1.11	-0.32
4,361.0	42.20	267.70	4,230.7	3,354.7	-44.2	-420.4	159.0	0.90	-0.79	-0.63
4,424.0	41.70	267.50	4,277.5	3,401.5	-46.0	-462.5	172.3	0.82	-0.79	-0.32
4,487.0	41.00	267.00	4,324.8	3,448.8	-48.0	-504.0	185.8	1.23	-1.11	-0.79
4,550.0	40.10	266.30	4,372.7	3,496.7	-50.3	-544.9	199.4	1.60	-1.43	-1.11
4,613.0	39.30	266.40	4,421.2	3,545.2	-52.9	-585.1	213.0	1.27	-1.27	0.16
4,676.0	39.50	267.90	4,469.8	3,593.8	-54.9	-625.0	226.0	1.54	0.32	2.38
4,739.0	40.00	269.60	4,518.3	3,642.3	-55.8	-665.3	238.0	1.90	0.79	2.70
4,802.0	39.20	269.60	4,566.8	3,690.8	-56.0	-705.4	249.4	1.27	-1.27	0.00
4,865.0	40.00	269.00	4,616.1	3,740.1	-56.5	-746.2	261.2	1.39	1.25	-0.94
December 26th 1929 MD										
4,929.0	40.80	269.40	4,664.1	3,788.1	-57.1	-787.1	273.0	1.33	1.27	0.63
4,992.0	41.20	268.70	4,711.7	3,835.7	-57.8	-828.4	285.2	0.97	0.63	-1.11
5,055.0	41.50	268.10	4,758.9	3,882.9	-59.0	-870.0	297.8	0.79	0.48	-0.95
5,118.0	40.30	267.20	4,806.6	3,930.6	-60.7	-911.2	310.9	2.12	-1.90	-1.43
5,181.0	40.50	267.50	4,854.5	3,978.5	-62.5	-952.0	324.0	0.44	0.32	0.48
5,244.0	41.00	268.30	4,902.3	4,026.3	-64.0	-993.1	336.8	1.15	0.79	1.27
5,307.0	41.50	267.80	4,949.6	4,073.6	-65.5	-1,034.6	349.7	0.95	0.79	-0.79
5,370.0	41.90	268.20	4,996.7	4,120.7	-66.9	-1,076.5	362.7	0.76	0.63	0.63
5,433.0	41.60	269.00	5,043.7	4,167.7	-67.9	-1,118.4	375.3	0.97	-0.48	1.27
5,496.0	41.10	269.90	5,091.0	4,215.0	-68.3	-1,160.0	387.2	1.23	-0.79	1.43
5,559.0	41.60	268.60	5,138.3	4,262.3	-68.9	-1,201.7	399.3	1.58	0.79	-2.06
5,622.0	41.60	268.60	5,185.4	4,309.4	-69.9	-1,243.5	411.9	0.00	0.00	0.00
5,686.0	40.80	268.60	5,233.5	4,357.5	-70.9	-1,285.6	424.5	1.25	-1.25	0.00
5,749.0	41.20	268.10	5,281.1	4,405.1	-72.1	-1,326.9	437.1	0.82	0.63	-0.79
5,812.0	41.50	267.90	5,328.4	4,452.4	-73.6	-1,368.5	450.1	0.52	0.48	-0.32
5,875.0	41.00	268.80	5,375.7	4,499.7	-74.8	-1,410.1	462.7	1.23	-0.79	1.43
5,939.0	40.20	267.90	5,424.3	4,548.3	-76.0	-1,451.7	475.4	1.55	-1.25	-1.41
6,002.0	41.00	267.80	5,472.2	4,596.2	-77.5	-1,492.7	488.2	1.27	1.27	-0.16
6,065.0	41.70	266.70	5,519.5	4,643.5	-79.5	-1,534.2	501.7	1.60	1.11	-1.75
6,128.0	40.60	266.70	5,566.9	4,690.9	-81.9	-1,575.6	515.5	1.75	-1.75	0.00
6,191.0	41.10	268.50	5,614.5	4,738.5	-83.6	-1,616.8	528.5	2.03	0.79	2.86
6,254.0	40.70	269.50	5,662.2	4,786.2	-84.4	-1,658.0	540.6	1.22	-0.63	1.59

# Phoenix Technologies

## Survey Report

<b>Database:</b>		<b>Local Co-ordinate Reference:</b>	
<b>Company:</b>		<b>TVD Reference:</b>	
<b>Project:</b>		<b>MD Reference:</b>	
<b>Site:</b>		<b>North Reference:</b>	
<b>Well:</b>		<b>Survey Calculation Method:</b>	
<b>Wellbore:</b>			
<b>Design:</b>			

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)	
6,317.0	39.50	269.00	5,710.4	4,834.4	-84.9	-1,698.6	552.4	1.97	-1.90	-0.79	
6,380.0	39.90	268.80	5,758.8	4,882.8	-85.7	-1,738.8	564.3	0.67	0.63	-0.32	
6,443.0	39.90	269.00	5,807.2	4,931.2	-86.4	-1,779.2	576.2	0.20	0.00	0.32	
6,505.0	40.30	268.60	5,854.6	4,978.6	-87.3	-1,819.2	588.1	0.77	0.65	-0.65	
6,568.0	41.30	267.90	5,902.3	5,026.3	-88.5	-1,860.3	600.7	1.75	1.59	-1.11	
6,632.0	41.50	268.00	5,950.3	5,074.3	-90.0	-1,902.6	613.9	0.33	0.31	0.16	
6,695.0	41.60	268.00	5,997.4	5,121.4	-91.5	-1,944.4	626.9	0.16	0.16	0.00	
6,758.0	41.90	268.30	6,044.4	5,168.4	-92.9	-1,986.3	639.8	0.57	0.48	0.48	
6,821.0	42.20	268.60	6,091.2	5,215.2	-94.0	-2,028.5	652.6	0.57	0.48	0.48	
6,884.0	41.20	267.80	6,138.3	5,262.3	-95.3	-2,070.4	665.5	1.80	-1.59	-1.27	
6,947.0	41.00	269.80	6,185.7	5,309.7	-96.2	-2,111.8	677.8	2.11	-0.32	3.17	
7,011.0	41.00	270.80	6,234.0	5,358.0	-96.0	-2,153.7	689.2	1.03	0.00	1.56	
7,074.0	41.10	270.20	6,281.5	5,405.5	-95.6	-2,195.1	700.3	0.65	0.16	-0.95	
7,137.0	41.40	269.90	6,328.9	5,452.9	-95.6	-2,236.7	711.8	0.57	0.48	-0.48	
7,200.0	40.10	269.20	6,376.6	5,500.6	-95.9	-2,277.8	723.5	2.19	-2.06	-1.11	
7,263.0	40.00	267.90	6,424.9	5,548.9	-96.9	-2,318.3	735.7	1.34	-0.16	-2.06	
7,327.0	40.40	264.70	6,473.7	5,597.7	-99.6	-2,359.5	749.7	3.29	0.63	-5.00	
7,358.0	40.30	260.40	6,497.4	5,621.4	-102.2	-2,379.4	757.7	8.99	-0.32	-13.87	
7,390.0	40.20	255.90	6,521.8	5,645.8	-106.4	-2,399.6	767.4	9.09	-0.31	-14.06	
7,421.0	40.40	251.20	6,545.5	5,669.5	-112.1	-2,418.8	778.2	9.83	0.65	-15.16	
7,453.0	39.40	246.50	6,570.0	5,694.0	-119.5	-2,438.0	790.6	9.92	-3.13	-14.69	
7,484.0	38.70	242.20	6,594.1	5,718.1	-127.9	-2,455.6	803.6	9.02	-2.26	-13.87	
7,516.0	38.20	237.60	6,619.2	5,743.2	-137.9	-2,472.8	817.9	9.07	-1.56	-14.38	
7,547.0	37.70	232.50	6,643.8	5,767.6	-148.8	-2,488.4	832.8	10.24	-1.61	-16.45	
7,579.0	38.30	227.80	6,668.8	5,792.8	-161.4	-2,503.5	849.1	9.23	1.88	-14.69	
7,611.0	39.50	223.20	6,693.7	5,817.7	-175.5	-2,517.8	866.6	9.77	3.75	-14.38	
7,642.0	40.90	220.00	6,717.4	5,841.4	-190.5	-2,531.1	884.6	8.05	4.52	-10.32	
7,674.0	42.70	217.10	6,741.3	5,865.3	-207.2	-2,544.4	904.3	8.25	5.63	-9.06	
7,705.0	44.50	212.90	6,763.7	5,887.7	-224.7	-2,556.6	924.6	11.00	5.81	-13.55	
7,737.0	46.30	207.90	6,786.2	5,910.2	-244.3	-2,568.1	946.6	12.46	5.63	-15.63	
7,768.0	48.00	203.30	6,807.3	5,931.3	-264.8	-2,577.9	969.0	12.18	5.48	-14.84	
7,800.0	50.20	199.10	6,828.2	5,952.2	-287.4	-2,586.7	993.1	12.07	6.88	-13.13	
7,832.0	52.40	196.10	6,848.3	5,972.3	-311.2	-2,594.2	1,018.1	10.04	6.88	-9.38	
7,863.0	54.80	193.60	6,866.6	5,990.6	-335.3	-2,600.6	1,043.0	10.10	7.74	-8.06	
7,895.0	55.80	190.50	6,884.9	6,008.9	-361.0	-2,606.1	1,069.2	8.56	3.13	-9.69	
7,926.0	57.80	186.80	6,901.8	6,025.8	-386.6	-2,610.0	1,095.0	11.89	6.45	-11.94	
7,958.0	60.40	183.30	6,918.3	6,042.3	-414.0	-2,612.4	1,121.9	12.41	8.13	-10.94	
7,990.0	63.30	180.30	6,933.4	6,057.4	-442.2	-2,613.3	1,149.2	12.26	9.06	-9.38	
8,021.0	65.80	177.90	6,946.7	6,070.7	-470.2	-2,612.8	1,176.0	10.67	8.06	-7.74	
8,053.0	68.70	175.70	6,959.1	6,083.1	-499.6	-2,611.2	1,203.8	11.06	9.06	-6.88	
8,084.0	71.10	174.00	6,969.7	6,093.7	-528.6	-2,608.5	1,231.0	9.30	7.74	-5.48	
8,116.0	74.80	172.00	6,979.1	6,103.1	-559.0	-2,604.8	1,259.1	13.01	11.56	-6.25	
8,147.0	77.50	169.70	6,986.5	6,110.5	-588.7	-2,600.0	1,286.3	11.30	8.71	-7.42	

**Phoenix Technologies**  
Survey Report

<b>Database:</b> EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b> Site Wetzel County 513835
<b>Company:</b> EOT Production - Marcellus	<b>TVD Reference:</b> KB @ 876.0usft
<b>Project:</b> Wetzel County, WV	<b>MD Reference:</b> KB @ 876.0usft
<b>Site:</b> Wetzel County 513835	<b>North Reference:</b> Grid
<b>Well:</b> Well #513835	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Wellbore:</b> Main Wellbore	
<b>Design:</b> As Drilled Surveys	

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)	
8,179.0	79.20	167.10	6,993.0	6,117.0	-619.4	-2,593.7	1,314.1	9.57	5.31	-8.13	
8,211.0	81.20	166.00	6,998.4	6,122.4	-650.0	-2,586.4	1,341.5	7.11	6.25	-3.44	
8,242.0	83.10	164.10	7,002.7	6,126.7	-679.7	-2,578.5	1,367.8	8.63	6.13	-6.13	
8,274.0	85.40	162.30	7,005.9	6,129.9	-710.2	-2,569.3	1,394.5	9.11	7.19	-5.63	
8,305.0	87.20	160.30	7,007.9	6,131.9	-739.5	-2,559.3	1,419.9	8.67	5.81	-6.45	
LP= 8337 MD7008 TVD											
8,337.0	89.70	158.30	7,008.7	6,132.7	-769.4	-2,548.0	1,445.5	10.00	7.81	-6.25	
8,400.0	90.30	157.90	7,008.7	6,132.7	-827.8	-2,524.5	1,495.2	1.14	0.95	-0.63	
8,464.0	90.20	156.70	7,008.5	6,132.5	-886.9	-2,499.8	1,545.1	1.88	-0.16	-1.88	
8,527.0	89.10	155.80	7,008.9	6,132.9	-944.5	-2,474.5	1,593.4	2.26	-1.75	-1.43	
8,590.0	88.80	156.00	7,010.0	6,134.0	-1,002.0	-2,448.7	1,641.6	0.57	-0.48	0.32	
8,653.0	88.90	156.10	7,011.3	6,135.3	-1,059.6	-2,423.2	1,689.8	0.22	0.16	0.16	
8,716.0	89.20	156.20	7,012.3	6,136.3	-1,117.2	-2,397.7	1,738.1	0.50	0.48	0.16	
8,780.0	88.00	156.70	7,013.9	6,137.9	-1,175.9	-2,372.1	1,787.3	2.03	-1.88	0.78	
8,843.0	87.60	156.80	7,016.3	6,140.3	-1,233.7	-2,347.3	1,836.0	0.65	-0.63	0.16	
8,906.0	89.40	157.00	7,017.9	6,141.9	-1,291.6	-2,322.6	1,884.8	2.87	2.66	0.32	
8,969.0	89.30	156.30	7,018.7	6,142.7	-1,349.5	-2,297.6	1,933.5	1.12	-0.16	-1.11	
9,032.0	88.90	155.70	7,019.7	6,143.7	-1,407.0	-2,272.0	1,981.7	1.14	-0.63	-0.95	
9,096.0	89.70	157.30	7,020.4	6,144.4	-1,465.7	-2,246.5	2,031.0	2.79	1.25	2.50	
9,159.0	90.20	158.10	7,020.5	6,144.5	-1,524.0	-2,222.6	2,080.4	1.50	0.79	1.27	
9,222.0	89.70	157.60	7,020.5	6,144.5	-1,582.3	-2,198.8	2,129.8	1.12	-0.79	-0.79	
9,285.0	89.90	157.40	7,020.8	6,144.8	-1,640.6	-2,174.7	2,179.1	0.45	0.32	-0.32	
9,348.0	89.20	156.90	7,021.3	6,145.3	-1,698.6	-2,150.2	2,228.1	1.37	-1.11	-0.79	
9,412.0	89.20	156.70	7,022.2	6,146.2	-1,757.4	-2,125.0	2,277.6	0.31	0.00	-0.31	
9,474.0	89.00	156.10	7,023.1	6,147.1	-1,814.2	-2,100.2	2,325.3	1.02	-0.32	-0.97	
9,538.0	88.90	155.70	7,024.3	6,148.3	-1,872.6	-2,074.1	2,374.2	0.64	-0.16	-0.63	
9,601.0	89.00	155.20	7,025.5	6,149.5	-1,929.9	-2,047.9	2,422.0	0.81	0.16	-0.79	
9,664.0	89.30	154.70	7,026.4	6,150.4	-1,987.0	-2,021.2	2,469.4	0.93	0.48	-0.79	
9,727.0	90.20	155.70	7,026.7	6,150.7	-2,044.2	-1,994.8	2,517.0	2.14	1.43	1.59	
9,790.0	90.50	156.60	7,026.3	6,150.3	-2,101.8	-1,969.4	2,565.3	1.51	0.48	1.43	
9,853.0	91.20	157.60	7,025.3	6,149.3	-2,159.8	-1,944.8	2,614.3	1.94	1.11	1.59	
9,917.0	89.80	158.10	7,024.8	6,148.8	-2,219.1	-1,920.7	2,664.6	2.32	-2.19	0.78	
9,980.0	88.80	158.20	7,025.6	6,149.6	-2,277.6	-1,897.3	2,714.2	1.60	-1.59	0.16	
10,043.0	87.60	158.30	7,027.5	6,151.5	-2,336.1	-1,873.9	2,764.0	1.91	-1.90	0.16	
10,106.0	87.60	158.70	7,030.2	6,154.2	-2,394.6	-1,850.9	2,813.8	0.63	0.00	0.63	
10,170.0	87.60	157.40	7,032.9	6,156.9	-2,453.9	-1,827.0	2,864.2	2.03	0.00	-2.03	
10,233.0	88.60	157.50	7,034.9	6,158.9	-2,512.1	-1,802.8	2,913.4	1.60	1.59	0.16	
10,296.0	89.30	157.40	7,036.1	6,160.1	-2,570.3	-1,778.7	2,962.6	1.12	1.11	-0.16	
10,359.0	89.00	157.40	7,037.0	6,161.0	-2,628.4	-1,754.5	3,011.7	0.48	-0.48	0.00	
10,422.0	88.70	157.00	7,038.3	6,162.3	-2,686.5	-1,730.0	3,060.8	0.79	-0.48	-0.63	
10,485.0	90.10	157.50	7,039.0	6,163.0	-2,744.6	-1,705.7	3,109.8	2.36	2.22	0.79	
10,548.0	90.50	157.10	7,038.6	6,162.6	-2,802.7	-1,681.4	3,158.9	0.90	0.63	-0.63	

# Phoenix Technologies

## Survey Report

<b>Database:</b>	EDM 5000.1 Single User Do	<b>Local Co-ordinate Reference:</b>	Site Weizel County 513835
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 876 Dugft
<b>Project:</b>	Weizel County, WV	<b>MD Reference:</b>	KB @ 876 Dugft
<b>Site:</b>	Weizel County 513835	<b>North Reference:</b>	Gnd
<b>Well:</b>	Well #513835	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	As Drilled Surveys		

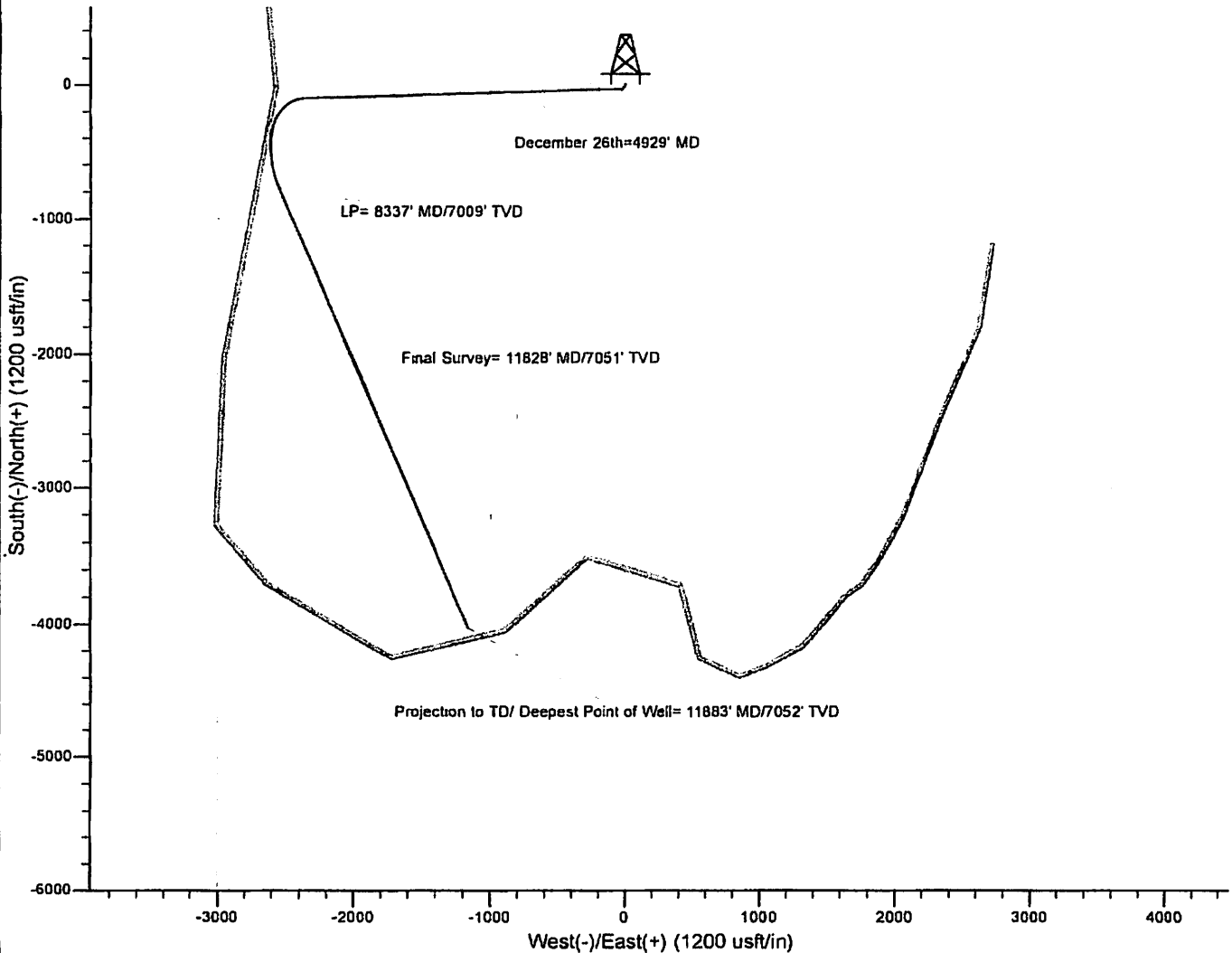
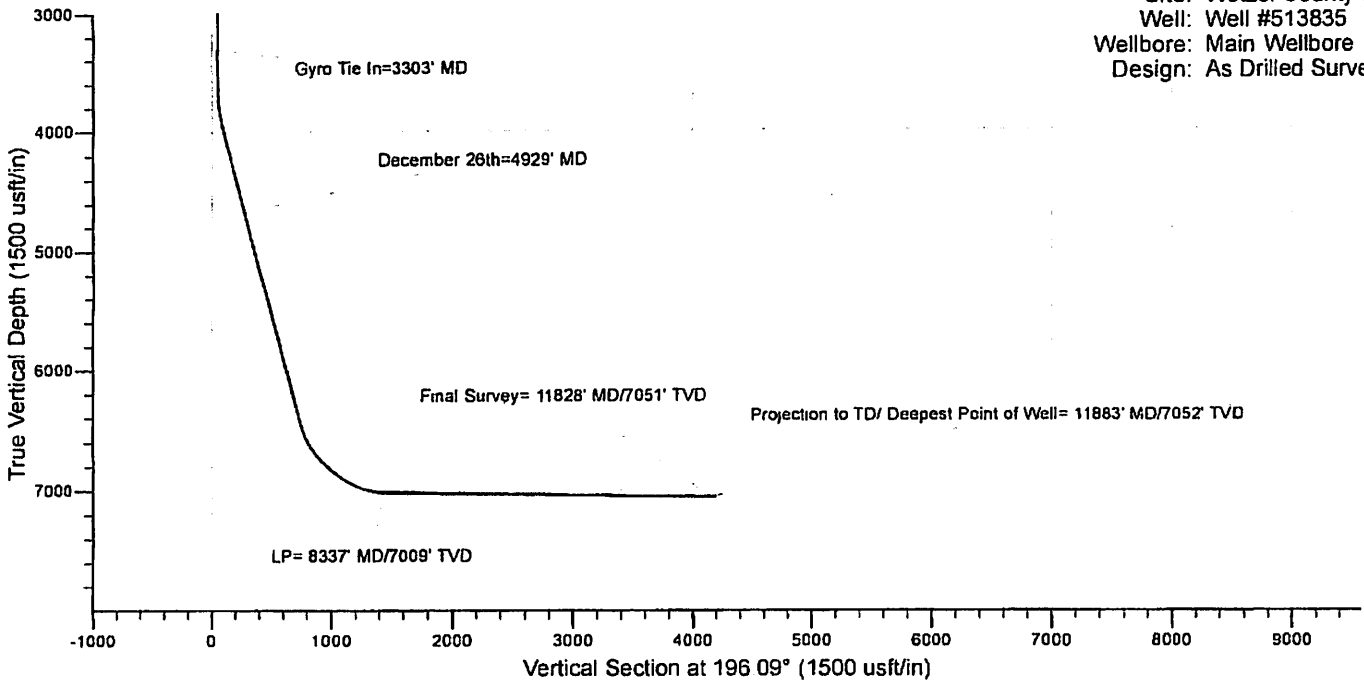
Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
10,612.0	90.60	156.60	7,038.0	6,162.0	-2,861.5	-1,656.2	3,208.5	0.80	0.16	-0.78	
10,675.0	90.50	156.40	7,037.4	6,161.4	-2,919.3	-1,631.1	3,257.0	0.35	-0.16	-0.32	
10,738.0	88.90	156.70	7,037.7	6,161.7	-2,977.1	-1,606.0	3,305.6	2.58	-2.54	0.48	
10,800.0	87.80	156.70	7,039.5	6,163.5	-3,034.0	-1,581.5	3,353.5	1.77	-1.77	0.00	
10,864.0	87.60	157.00	7,042.1	6,166.1	-3,092.8	-1,556.4	3,403.0	0.56	-0.31	0.47	
10,927.0	86.80	157.10	7,045.2	6,169.2	-3,150.8	-1,531.8	3,451.9	1.28	-1.27	0.16	
10,990.0	88.00	156.90	7,048.0	6,172.0	-3,208.7	-1,507.2	3,500.8	1.93	1.90	-0.32	
11,054.0	88.60	157.40	7,049.9	6,173.9	-3,267.7	-1,482.4	3,550.5	1.22	0.94	0.78	
11,117.0	90.90	157.30	7,050.2	6,174.2	-3,325.8	-1,458.1	3,599.7	3.65	3.65	-0.16	
11,180.0	90.50	157.60	7,049.4	6,173.4	-3,384.0	-1,434.0	3,648.9	0.79	-0.63	0.48	
11,243.0	90.50	157.40	7,048.9	6,172.9	-3,442.2	-1,409.9	3,698.1	0.32	0.00	-0.32	
11,307.0	90.60	157.60	7,048.3	6,172.3	-3,501.3	-1,385.4	3,748.1	0.35	0.16	0.31	
11,370.0	90.30	157.60	7,047.8	6,171.8	-3,559.5	-1,361.4	3,797.4	0.48	-0.48	0.00	
11,433.0	90.60	157.90	7,047.3	6,171.3	-3,617.8	-1,337.5	3,846.8	0.67	0.48	0.48	
11,496.0	90.40	157.50	7,046.7	6,170.7	-3,676.1	-1,313.6	3,896.2	0.71	-0.32	-0.63	
11,559.0	90.20	157.50	7,046.4	6,170.4	-3,734.3	-1,289.5	3,945.4	0.32	-0.32	0.00	
11,622.0	89.00	156.10	7,046.8	6,170.8	-3,792.2	-1,264.7	3,994.2	2.93	-1.90	-2.22	
11,685.0	88.70	156.10	7,048.1	6,171.1	-3,849.8	-1,239.2	4,042.5	0.48	-0.48	0.00	
11,748.0	88.60	156.10	7,049.6	6,173.6	-3,907.4	-1,213.7	4,090.7	0.16	-0.16	0.00	
11,811.0	89.10	156.90	7,050.8	6,174.8	-3,965.2	-1,188.5	4,139.2	1.50	0.79	0.00	
Final Survey= 11828' MD/7051' TVD											
11,828.0	89.40	157.30	7,051.1	6,175.1	-3,980.8	-1,181.9	4,152.5	2.94	1.76	2.35	
Projection to TD/ Deepest Point of Well= 11883' MD/7052' TVD											
11,883.0	89.40	157.30	7,051.6	6,175.6	-4,031.6	-1,160.7	4,195.3	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,303.0	3,302.2	-39.8	-31.1	Gyro Tie In=3303' MD	
4,929.0	4,664.1	-57.1	-787.1	December 26th=4929' MD	
8,337.0	7,008.7	-769.4	-2,548.0	LP= 8337' MD/7009' TVD	
11,828.0	7,051.1	-3,980.8	-1,181.9	Final Survey= 11828' MD/7051' TVD	
11,883.0	7,051.6	-4,031.6	-1,160.7	Projection to TD/ Deepest Point of Well= 11883' MD/7052' TVD	

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

# EQT Production - Marcellus

Project: Wetzel County, WV  
Site: Wetzel County 513835  
Well: Well #513835  
Wellbore: Main Wellbore  
Design: As Drilled Surveys



04/01/2016





**513835 - 47-103-02992-0000 - Perforations**

<b>Stage Number</b>	<b>Perforation Date</b>	<b>Top Perf Depth (ftKB)</b>	<b>Bottom Perf Depth (ftKB)</b>	<b>Number of Shots</b>	<b>Formation</b>
<b>Initiation Sleeve</b>	1/26/2015	11,881.00	11,886.00	10	MARCELLUS
<b>1</b>	2/8/2015	11,674.00	11,809.00	32	MARCELLUS
<b>2</b>	2/8/2015	11,450.00	11,632.00	40	MARCELLUS
<b>3</b>	2/8/2015	11,225.00	11,407.00	40	MARCELLUS
<b>4</b>	2/9/2015	11,000.00	11,182.00	40	MARCELLUS
<b>5</b>	2/9/2015	10,775.00	10,957.00	40	MARCELLUS
<b>6</b>	2/9/2015	10,550.00	10,730.00	40	MARCELLUS
<b>7</b>	2/9/2015	10,325.00	10,505.00	40	MARCELLUS
<b>8</b>	2/10/2015	10,100.00	10,282.00	40	MARCELLUS
<b>9</b>	2/10/2015	9,875.00	10,057.00	40	MARCELLUS
<b>10</b>	2/10/2015	9,650.00	9,830.00	40	MARCELLUS
<b>11</b>	2/11/2015	9,425.00	9,607.00	40	MARCELLUS
<b>12</b>	2/11/2015	9,200.00	9,376.00	40	MARCELLUS
<b>13</b>	2/11/2015	8,975.00	9,155.00	40	MARCELLUS
<b>14</b>	2/12/2015	8,750.00	8,930.00	40	MARCELLUS
<b>15</b>	2/12/2015	8,525.00	8,705.00	40	MARCELLUS
<b>16</b>	2/12/2015	8,300.00	8,480.00	40	MARCELLUS

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	2/7/2015
Job End Date	2/12/2015
State	West Virginia
County	Wayne
API Number	47-103-02992-00-00
Operator Name	EQT Production
Well Name and Number	513835
Longitude	-80.54166700
Latitude	39.58333300
Datum	NAD83
Federal/ Tribal Well	NO
True Vertical Depth	7,052
Total Base Water Volume (gal)	5,822,796
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	90.68107	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	8.96723	None
MCIMX-5-2402	Multi-Chem	Sodium Nitrate Brine	Sodium Nitrate	7631-99-4	60.00000	0.05581	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02392	None
SL-1072	Keane Group	Friction Reducer	Petroleum distillates, hydro-treated light	54742-47-8	25.00000	0.01865	None
EG6330A	Keane Group	Scale Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00116	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00017	None
			N, N-Dimethylformamide	58-12-2	20.00000	0.00008	None
			Cinnamialdehyde	104-55-2	15.00000	0.00005	None
			Tar bases, quinoline derivs, benzyl chloride-quatamized	72480-70-7	15.00000	0.00006	None
			2-Butoxyethanol	111-76-2	15.00000	0.00005	None



			Poly (oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega- hydroxy-branched	127087-87-0	5.00000	0.00002	None
			1-Decanol	112-30-1	5.00000	0.00002	None
			Isopropyl alcohol	67-63-0	2.50000	0.00001	None
			1-Octanol	111-87-5	2.50000	0.00001	None
			Triethyl Phosphate	78-40-0	2.50000	0.00001	None
IEB-10X	Keane Group	Gel Breaker	Ethylene Glycol	107-21-1	30.00000	0.00030	None

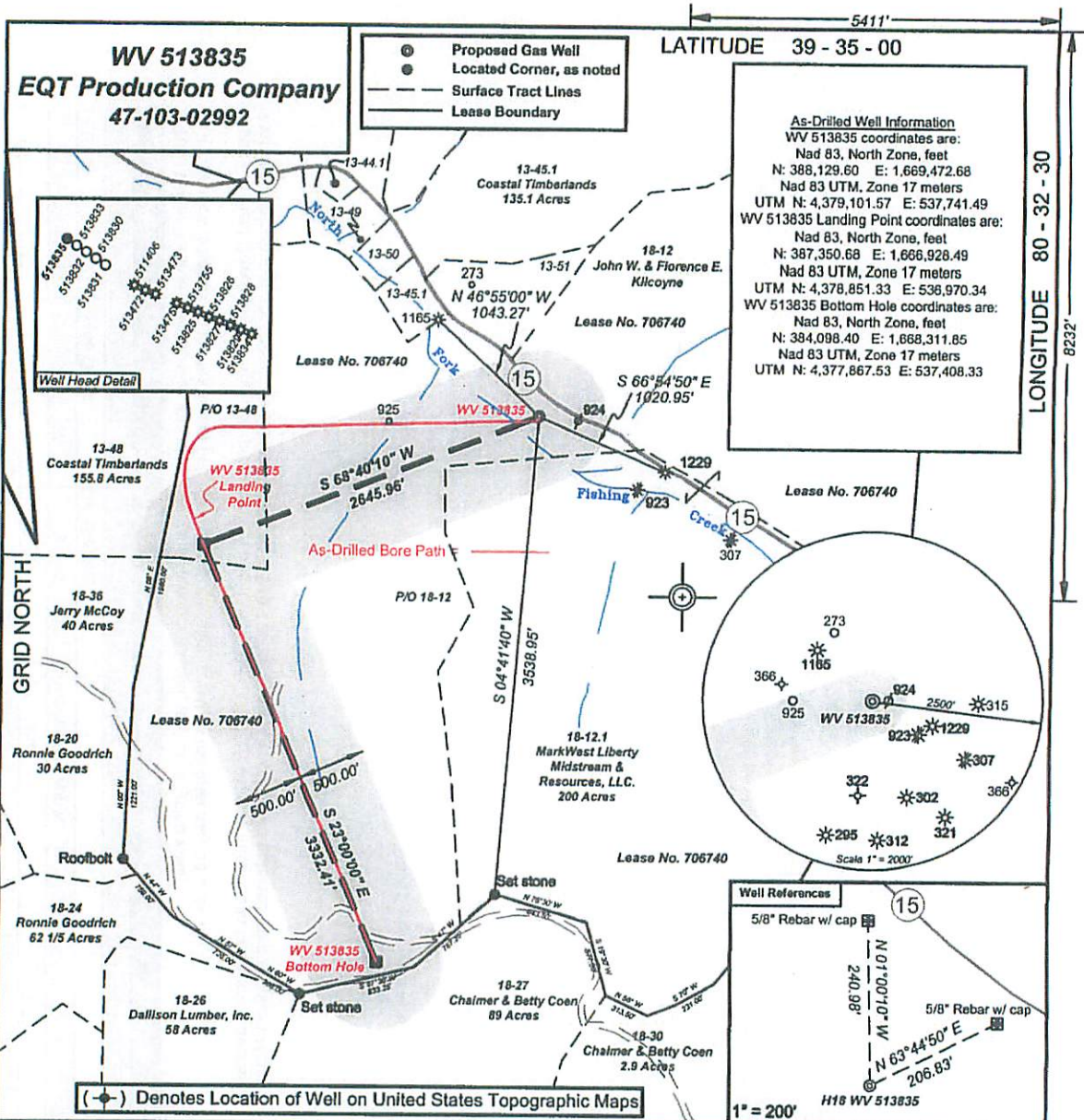
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

\* 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%

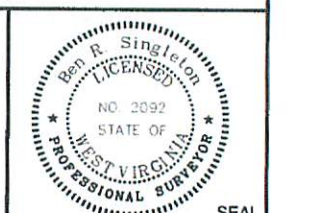
Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient Information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)



*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: 145-34-G-10  
 DRAWING NO: 145-10 Big 176 H18  
 SCALE: 1" = 1000'  
 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 19 20 15  
 OPERATOR'S WELL NO. 513835  
 API WELL NO  
 47 - 103 - 02992  
 STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
 LOCATION: ELEVATION: As-built 860' WATERSHED North Fork of Fishing Creek QUADRANGLE: Big Run  
 DISTRICT: Grant COUNTY: Wetzel  
 SURFACE OWNER: John W. and Florence E. Kilcoyne ACREAGE: 377.06  
 ROYALTY OWNER: EQT Production Company, Inc. LEASE NO: 706740 ACREAGE: 1003.75  
 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: TVD=7100' MD=12,000'

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

04/01/2016