

# **EQT Production - Marcellus**

Wetzel County, WV

Wetzel County 513982

Well #513982

Main Wellbore

Design: As Drilled

## **Standard Survey Report**

22 January, 2015

**Phoenix Technologies**  
Survey Report

<b>Database:</b> EDM 5000 1 Single User Dr	<b>Local Co-ordinate Reference:</b>	<b>Site:</b> Watzel County 513982
<b>Company:</b> EOI Production - Marcellus	<b>TVD Reference:</b>	KB @ 16 ft @ 1474.0usft
<b>Project:</b> Watzel County, WV	<b>MD Reference:</b>	KB @ 16 ft @ 1474.0usft
<b>Site:</b> Watzel County 513982	<b>North Reference:</b>	Grid
<b>Well:</b> Well #513982	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b> Main Wellbore		
<b>Design:</b> As Drilled		

<b>Project</b> Watzel County, WV		
<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		Using geodetic scale factor

<b>Site</b> Watzel County 513982			
<b>Site Position:</b>	<b>Northing:</b>	390,029.00 usft	<b>Latitude:</b> 39 57
<b>From:</b> Map	<b>Easting:</b>	1,682,382.00 usft	<b>Longitude:</b> -80 63
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -0.72 °

<b>Well</b> Well #513982				
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b> 390,029.00 usft	<b>Latitude:</b> 39° 33' 55.401 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b> 1,682,382.00 usft	<b>Longitude:</b> 80° 37' 35.928 W
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b> 1,458.0 usft

<b>Wellbore</b> Main Wellbore			
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	1/5/2015	-8.67	66.95	52,347

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

**Version:** 1.0      **Phase:** ACTUAL      **Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	190.71

Survey Program	Date	From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
	1/22/2015	0.00	4,173.0	513982 Gyrodata Final (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
		0.00	14,191.0	513982 PHX MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declinat on

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	-1,474.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.31	97.05	103.0	-1,371.0	0.0	0.3	0.0	0.30	0.30	0.00
203.0	0.24	113.16	203.0	-1,271.0	-0.1	0.7	0.0	0.10	-0.07	16.11
303.0	0.20	117.93	303.0	-1,171.0	-0.3	1.1	0.1	0.04	-0.04	4.77
403.0	0.14	150.53	403.0	-1,071.0	-0.5	1.3	0.3	0.11	-0.06	32.60
503.0	0.14	184.98	503.0	-971.0	-0.7	1.3	0.5	0.08	0.00	34.45
603.0	0.20	188.34	603.0	-871.0	-1.0	1.3	0.8	0.06	0.06	3.36
703.0	0.12	174.05	703.0	-771.0	-1.3	1.3	1.0	0.09	-0.08	-14.29

# Phoenix Technologies

## Survey Report

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	
<b>Company:</b>	EC1 Production - Marcellus	<b>TVD Reference:</b>	
<b>Project:</b>	Webster County WV	<b>MD Reference:</b>	
<b>Site:</b>	Webster County 513882	<b>North Reference:</b>	
<b>Well:</b>	Well #513982	<b>Survey Calculation Method:</b>	
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	A 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)
803.0	0.08	159.55	803.0	-671.0	-1.5	1.3	1.2	0.05	-0.04	-14.50
903.0	0.05	153.83	903.0	-571.0	-1.6	1.4	1.3	0.03	-0.03	-5.72
1,003.0	0.04	236.96	1,003.0	-471.0	-1.6	1.4	1.4	0.06	-0.01	83.13
1,103.0	0.25	229.91	1,103.0	-371.0	-1.8	1.2	1.5	0.21	0.21	-7.05
1,203.0	0.26	230.21	1,203.0	-271.0	-2.1	0.8	1.9	0.01	0.01	0.30
1,303.0	0.19	261.46	1,303.0	-171.0	-2.2	0.5	2.1	0.14	-0.07	31.25
1,403.0	0.39	255.92	1,403.0	-71.0	-2.4	0.0	2.3	0.20	0.20	-5.54
1,503.0	3.23	244.49	1,502.9	28.9	-3.7	-2.9	4.1	2.85	2.84	-11.43
1,603.0	7.24	250.77	1,602.5	128.5	-6.9	-11.4	8.9	4.04	4.01	6.28
1,703.0	9.94	253.33	1,701.4	227.4	-11.5	-25.6	16.1	2.73	2.70	2.56
1,803.0	8.87	244.01	1,800.0	326.0	-17.3	-40.8	24.6	1.86	-1.07	-9.32
1,903.0	7.67	234.33	1,899.0	425.0	-24.6	-53.1	34.1	1.83	-1.20	-9.68
2,003.0	5.74	238.16	1,998.3	524.3	-31.2	-62.8	42.3	1.98	-1.93	3.83
2,103.0	3.68	248.40	2,098.0	624.0	-35.0	-70.0	47.4	2.22	-2.06	10.24
2,203.0	1.84	230.56	2,197.8	723.8	-37.2	-74.3	50.3	2.01	-1.84	-17.84
2,303.0	1.59	224.46	2,297.8	823.8	-39.2	-76.5	52.7	0.31	-0.25	-6.10
2,403.0	1.62	220.03	2,397.8	923.8	-41.3	-78.4	55.1	0.13	0.03	-4.43
2,503.0	1.72	217.42	2,497.7	1,023.7	-43.5	-80.2	57.7	0.13	0.10	-2.61
2,603.0	1.76	216.53	2,597.7	1,123.7	-46.0	-82.0	60.4	0.05	0.04	-0.89
2,703.0	1.79	212.75	2,697.6	1,223.6	-48.5	-83.8	63.2	0.12	0.03	-3.77
2,803.0	1.73	207.33	2,797.6	1,323.6	-51.2	-85.3	66.1	0.18	-0.06	-5.43
2,903.0	1.73	200.23	2,897.5	1,423.5	-53.9	-86.5	69.1	0.21	0.00	-7.10
3,003.0	1.70	195.16	2,997.5	1,523.5	-56.8	-87.4	72.0	0.15	-0.03	-5.07
3,103.0	1.88	193.70	3,097.4	1,623.4	-59.8	-88.2	75.1	0.19	0.19	-1.46
3,203.0	1.82	192.52	3,197.4	1,723.4	-62.9	-88.9	78.4	0.07	-0.06	-1.18
3,303.0	1.70	191.81	3,297.3	1,823.3	-65.9	-89.6	81.4	0.12	-0.12	-0.71
3,403.0	1.52	193.36	3,397.3	1,923.3	-68.7	-90.2	84.2	0.19	-0.18	1.55
3,503.0	1.07	198.62	3,497.3	2,023.3	-70.9	-90.8	86.5	0.45	-0.45	5.26
3,603.0	0.76	199.39	3,597.3	2,123.3	-72.4	-91.3	88.1	0.31	-0.31	0.77
3,703.0	0.54	198.89	3,697.2	2,223.2	-73.4	-91.7	89.2	0.22	-0.22	-0.50
3,803.0	0.51	195.60	3,797.2	2,323.2	-74.3	-92.0	90.1	0.04	-0.03	-3.29
3,903.0	0.34	188.99	3,897.2	2,423.2	-75.0	-92.1	90.8	0.18	-0.17	-6.61
4,003.0	0.27	204.46	3,997.2	2,523.2	-75.5	-92.3	91.4	0.11	-0.07	15.47
4,103.0	0.29	214.20	4,097.2	2,623.2	-76.0	-92.5	91.8	0.05	0.02	9.74
Gyro Tie In=4173' MD										
4,173.0	0.35	217.97	4,167.2	2,693.2	-76.3	-92.7	92.2	0.09	0.09	5.39
4,204.0	0.30	230.70	4,198.2	2,724.2	-76.4	-92.9	92.3	0.28	-0.16	41.06
4,235.0	0.50	256.40	4,229.2	2,755.2	-76.5	-93.1	92.4	0.85	0.65	82.90
4,267.0	2.70	256.80	4,261.2	2,787.2	-76.7	-93.9	92.8	6.88	6.88	1.25
4,299.0	6.00	257.30	4,293.1	2,819.1	-77.2	-96.3	93.8	10.31	10.31	1.56
4,330.0	9.10	259.50	4,323.9	2,849.9	-78.0	-100.3	95.3	10.04	10.00	7.10
4,362.0	11.70	261.30	4,355.3	2,881.3	-79.0	-106.0	97.3	8.19	8.13	5.63
4,394.0	14.00	261.10	4,386.5	2,912.5	-80.1	-113.0	99.7	7.19	7.19	-0.63

# Phoenix Technologies

## Survey Report

<b>Database:</b>	EDM 5000.1 Single User Op	<b>Local Co-ordinate Reference:</b>	Site Wetzel County 513982
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@16 ft @ 1474.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB@16 ft @ 1474.0usft
<b>Site:</b>	Wetzel County 513982	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513982	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	As Drilled		

**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)
4,425.0	16.90	261.30	4,416.4	2,942.4	-81.3	-121.2	102.4	9.36	9.35	0.65
4,457.0	19.60	262.20	4,446.8	2,972.8	-82.8	-131.1	105.7	8.48	8.44	2.81
4,489.0	21.50	262.20	4,476.7	3,002.7	-84.3	-142.2	109.3	5.94	5.94	0.00
4,520.0	23.20	261.60	4,505.4	3,031.4	-86.0	-153.9	113.1	5.53	5.48	-1.94
4,552.0	25.10	261.10	4,534.6	3,060.6	-87.9	-166.8	117.4	5.97	5.94	-1.56
4,583.0	27.80	260.00	4,562.4	3,088.4	-90.2	-180.5	122.2	8.85	8.71	-3.55
4,615.0	30.40	260.30	4,590.3	3,116.3	-92.9	-195.8	127.6	8.14	8.13	0.94
4,647.0	32.80	261.10	4,617.6	3,143.6	-95.6	-212.3	133.4	7.61	7.50	2.50
4,678.0	35.30	261.50	4,643.3	3,169.3	-98.2	-229.5	139.1	8.10	8.06	1.29
4,710.0	38.10	261.80	4,668.9	3,194.9	-101.0	-248.4	145.4	8.77	8.75	0.94
4,741.0	40.90	261.30	4,692.8	3,218.8	-103.9	-267.9	151.8	9.09	9.03	-1.61
4,804.0	43.10	262.10	4,739.7	3,265.7	-109.9	-309.6	165.6	3.59	3.49	1.27
4,867.0	43.60	261.80	4,785.5	3,311.5	-116.0	-352.4	179.5	0.86	0.79	-0.48
4,930.0	42.40	261.20	4,831.5	3,357.5	-122.3	-394.9	193.6	2.01	-1.90	-0.95
4,993.0	41.80	261.20	4,878.3	3,404.3	-128.8	-436.7	207.7	0.95	-0.95	0.00
5,056.0	42.30	262.00	4,925.1	3,451.1	-135.0	-478.4	221.5	1.16	0.79	1.27
5,120.0	41.00	261.30	4,972.9	3,498.9	-141.1	-520.5	235.4	2.16	-2.03	-1.09
5,183.0	40.80	261.80	5,020.5	3,546.5	-147.2	-561.3	248.9	0.61	-0.32	0.79
5,246.0	41.20	262.00	5,068.1	3,594.1	-153.0	-602.2	262.3	0.67	0.63	0.32
5,309.0	39.70	261.30	5,116.0	3,642.0	-159.0	-642.7	275.6	2.49	-2.38	-1.11
5,372.0	39.30	260.60	5,164.6	3,690.6	-165.3	-682.2	289.2	0.95	-0.63	-1.11
5,436.0	40.10	260.80	5,213.8	3,739.8	-171.9	-722.6	303.2	1.27	1.25	0.31
5,499.0	39.90	260.10	5,262.1	3,788.1	-178.6	-762.5	317.2	0.78	-0.32	-1.11
5,562.0	40.20	259.70	5,310.3	3,836.3	-185.7	-802.4	331.6	0.63	0.48	-0.63
5,625.0	39.60	259.60	5,358.7	3,884.7	-193.0	-842.2	346.1	0.96	-0.95	-0.16
5,688.0	40.60	260.60	5,406.9	3,932.9	-199.9	-882.1	360.4	1.89	1.59	1.59
5,751.0	39.00	259.90	5,455.3	3,981.3	-206.8	-921.9	374.5	2.64	-2.54	-1.11
5,815.0	40.00	262.30	5,504.6	4,030.6	-213.0	-962.1	388.1	2.85	1.56	3.75
5,878.0	39.80	262.50	5,553.0	4,079.0	-218.4	-1,002.2	400.8	0.38	-0.32	0.32
5,941.0	41.00	263.10	5,600.9	4,126.9	-223.5	-1,042.7	413.4	2.00	1.90	0.95
6,003.0	41.50	262.50	5,647.6	4,173.6	-228.6	-1,083.2	425.9	1.03	0.81	-0.97
6,067.0	40.70	262.00	5,695.8	4,221.8	-234.3	-1,124.9	439.3	1.35	-1.25	-0.78
6,130.0	42.10	262.90	5,743.0	4,269.0	-239.8	-1,166.2	452.3	2.41	2.22	1.43
6,193.0	41.70	260.80	5,789.9	4,315.9	-245.7	-1,207.9	465.9	2.31	-0.63	-3.33
6,256.0	41.90	260.70	5,836.9	4,362.9	-252.5	-1,249.3	480.2	0.33	0.32	-0.16
6,319.0	41.40	260.40	5,884.0	4,410.0	-259.4	-1,290.6	494.7	0.85	-0.79	-0.48
6,383.0	43.80	261.40	5,931.1	4,457.1	-266.2	-1,333.4	509.3	3.90	3.75	1.56
6,446.0	43.30	261.30	5,976.7	4,502.7	-272.7	-1,376.3	523.7	0.80	-0.79	-0.16
6,509.0	41.30	260.60	6,023.3	4,549.3	-279.4	-1,418.2	538.1	3.26	-3.17	-1.11
6,572.0	40.60	260.40	6,070.9	4,596.9	-286.2	-1,458.9	552.3	1.13	-1.11	-0.32
6,635.0	41.20	261.20	6,118.5	4,644.5	-292.8	-1,499.6	566.4	1.26	0.95	1.27
6,698.0	40.80	260.10	6,166.1	4,692.1	-299.5	-1,540.4	580.5	1.31	-0.63	-1.75

**Phoenix Technologies**  
Survey Report

<b>Database:</b> EDM 5092.1 Single User Obj	<b>Local Co-ordinate Reference:</b> Site Wetzel County 513983
<b>Company:</b> EOT Production - Marcellus	<b>TVD Reference:</b> KB@15 ft @ 1474 Grid
<b>Project:</b> Wetzel County WV	<b>MD Reference:</b> KB@18 ft @ 1474 Grid
<b>Site:</b> Wetzel County 513983	<b>North Reference:</b> Grid
<b>Well:</b> Well #513982	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Wellbore:</b> Main Wellbore	
<b>Design:</b> As Drilled	

**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)
6,761.0	40.80	261.00	6,213.8	4,739.8	-306.3	-1,581.0	594.7	0.93	0.00	1.43
6,824.0	39.20	259.90	6,262.0	4,788.0	-313.0	-1,620.9	608.7	2.78	-2.54	-1.75
6,887.0	38.90	261.30	6,311.0	4,837.0	-319.5	-1,660.1	622.4	1.48	-0.48	2.22
6,950.0	37.60	261.00	6,360.4	4,886.4	-325.5	-1,698.6	635.4	2.08	-2.06	-0.48
7,013.0	40.50	261.40	6,409.4	4,935.4	-331.5	-1,737.8	648.7	4.62	4.60	0.63
7,076.0	40.00	261.80	6,457.4	4,983.4	-337.5	-1,778.1	662.0	0.89	-0.79	0.63
7,140.0	41.40	263.00	6,506.0	5,032.0	-343.0	-1,819.5	675.1	2.51	2.19	1.88
7,203.0	41.50	262.40	6,553.2	5,079.2	-348.3	-1,860.8	688.0	0.65	0.16	-0.95
7,266.0	43.00	262.00	6,599.8	5,125.8	-354.0	-1,902.8	701.5	2.42	2.38	-0.63
7,329.0	41.50	261.80	6,646.5	5,172.5	-360.0	-1,944.7	715.1	2.39	-2.38	-0.32
7,392.0	-41.30	261.50	6,693.7	5,219.7	-366.1	-1,986.0	728.7	0.45	-0.32	-0.48
7,456.0	42.60	262.00	6,741.3	5,267.3	-372.2	-2,028.3	742.6	2.10	2.03	0.78
7,519.0	40.90	261.30	6,788.3	5,314.3	-378.3	-2,069.8	756.3	2.80	-2.70	-1.11
7,582.0	40.10	260.70	6,836.2	5,362.2	-384.7	-2,110.2	770.1	1.41	-1.27	-0.95
7,645.0	41.90	261.40	6,883.8	5,409.8	-391.1	-2,151.0	784.0	2.95	2.86	1.11
7,708.0	41.20	260.40	6,930.9	5,456.9	-397.7	-2,192.3	798.2	1.53	-1.11	-1.59
7,770.0	42.50	259.00	6,954.7	5,480.7	-401.5	-2,213.3	805.8	5.00	4.06	-4.38
7,771.0	43.40	254.10	6,977.4	5,503.4	-406.4	-2,233.8	814.5	11.15	2.90	-15.81
7,803.0	43.30	248.90	7,000.7	5,526.7	-413.4	-2,254.6	825.2	11.16	-0.31	-16.25
7,834.0	43.10	243.90	7,023.3	5,549.3	-421.9	-2,274.1	837.1	11.06	-0.65	-16.13
7,866.0	43.00	238.50	7,046.7	5,572.7	-432.4	-2,293.2	851.0	11.52	-0.31	-16.88
7,897.0	42.90	232.90	7,069.4	5,595.4	-444.3	-2,310.6	866.0	12.31	-0.32	-18.06
7,929.0	43.60	229.50	7,092.7	5,618.7	-458.0	-2,327.7	882.6	7.60	2.19	-10.63
7,960.0	44.20	226.50	7,115.1	5,641.1	-472.4	-2,343.7	899.7	6.98	1.94	-9.68
7,992.0	44.00	222.90	7,138.0	5,664.0	-486.2	-2,359.3	918.2	7.85	-0.63	-11.25
8,024.0	45.10	218.90	7,160.9	5,686.9	-505.2	-2,374.0	937.6	9.42	3.44	-12.50
8,055.0	46.60	216.10	7,182.4	5,708.4	-522.9	-2,387.6	957.4	8.09	4.84	-9.03
8,087.0	47.80	213.20	7,204.2	5,730.2	-542.2	-2,400.9	978.9	7.63	3.75	-9.06
8,118.0	50.20	211.20	7,224.5	5,750.5	-562.0	-2,413.4	1,000.7	9.15	7.74	-6.45
8,150.0	51.80	208.30	7,244.7	5,770.7	-583.6	-2,425.7	1,024.2	8.64	5.00	-9.06
8,181.0	54.30	205.40	7,263.3	5,789.3	-605.7	-2,438.9	1,048.0	11.00	8.06	-9.35
8,213.0	55.80	202.30	7,281.6	5,807.6	-629.7	-2,447.5	1,073.5	9.22	4.69	-9.69
8,245.0	57.30	199.60	7,299.3	5,825.3	-654.6	-2,457.0	1,099.8	8.46	4.69	-8.44
8,276.0	59.00	197.80	7,315.6	5,841.6	-679.5	-2,465.4	1,125.8	7.38	5.48	-5.81
8,308.0	61.30	195.90	7,331.6	5,857.6	-706.1	-2,473.5	1,153.4	8.84	7.19	-5.94
8,340.0	62.90	194.40	7,346.5	5,872.5	-733.4	-2,480.9	1,181.6	6.49	5.00	-4.69
8,371.0	65.60	192.40	7,360.0	5,886.0	-760.5	-2,487.3	1,209.5	10.47	8.71	-6.45
8,402.0	66.70	189.70	7,372.5	5,898.5	-788.4	-2,492.8	1,237.9	8.72	3.55	-8.71
8,434.0	69.40	187.30	7,384.5	5,910.5	-817.7	-2,497.2	1,267.5	10.93	8.44	-7.50
8,465.0	71.20	185.80	7,395.0	5,921.0	-846.7	-2,500.5	1,296.6	7.38	5.81	-4.84
8,497.0	73.30	184.20	7,404.7	5,930.7	-877.1	-2,503.1	1,326.9	8.11	6.56	-5.00
8,528.0	74.30	181.90	7,413.4	5,939.4	-906.8	-2,504.7	1,356.5	7.82	3.23	-7.42
8,560.0	75.70	180.00	7,421.6	5,947.6	-937.7	-2,505.2	1,386.9	7.21	4.38	-5.94

**Phoenix Technologies**  
Survey Report

<b>Database:</b>	EDM 5000.1 Single User Ob	<b>Local Co-ordinate Reference:</b>	Site: Wetzell County 513982
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@16 ft @ 1474.0usft
<b>Project:</b>	Wetzell County, WV	<b>MD Reference:</b>	KB@16 ft @ 1474.0usft
<b>Site:</b>	Wetzell County 513982	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513982	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	As Drilled		

**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)
8,591.0	77.20	176.40	7,428.9	5,954.9	-967.8	-2,504.3	1,416.3	12.28	4.84	-11.61
8,623.0	79.20	174.30	7,435.5	5,961.5	-999.0	-2,501.7	1,446.5	8.96	6.25	-6.56
8,654.0	80.80	173.30	7,440.8	5,966.8	-1,029.4	-2,498.4	1,475.7	6.06	5.16	-3.23
8,686.0	82.50	171.40	7,445.5	5,971.5	-1,060.8	-2,494.2	1,505.8	7.92	5.31	-5.94
8,717.0	84.40	170.20	7,449.0	5,975.0	-1,091.2	-2,489.3	1,534.7	7.24	6.13	-3.87
8,749.0	86.40	168.90	7,451.6	5,977.6	-1,122.5	-2,483.5	1,564.5	7.45	6.25	-4.06
<b>UP= 6781 W@1453 TVD</b>										
8,781.0	87.50	167.90	7,453.3	5,979.3	-1,153.8	-2,477.1	1,594.0	4.64	3.44	-3.13
8,844.0	89.50	166.30	7,454.9	5,980.9	-1,215.2	-2,463.0	1,651.7	4.06	3.17	-2.54
8,907.0	89.20	165.70	7,455.7	5,981.7	-1,276.3	-2,447.8	1,709.0	1.06	-0.48	-0.95
8,970.0	89.50	165.80	7,456.4	5,982.4	-1,337.4	-2,432.3	1,766.1	0.50	0.48	0.16
9,033.0	90.50	166.60	7,456.4	5,982.4	-1,398.6	-2,417.3	1,823.4	2.03	1.59	1.27
9,096.0	91.30	167.20	7,455.4	5,981.4	-1,459.9	-2,403.0	1,881.0	1.59	1.27	0.95
9,159.0	89.10	166.30	7,455.2	5,981.2	-1,521.2	-2,388.5	1,938.6	3.77	-3.49	-1.43
9,222.0	88.50	165.60	7,456.5	5,982.5	-1,582.3	-2,373.2	1,995.8	1.46	-0.95	-1.11
9,285.0	88.00	164.80	7,458.4	5,984.4	-1,643.2	-2,357.2	2,052.6	1.50	-0.79	-1.27
9,348.0	89.70	166.10	7,459.7	5,985.7	-1,704.2	-2,341.3	2,109.6	3.40	2.70	2.06
9,412.0	90.00	166.30	7,459.8	5,985.8	-1,765.3	-2,326.1	2,167.8	0.56	0.47	0.31
9,475.0	90.20	165.00	7,459.7	5,985.7	-1,827.4	-2,310.5	2,224.9	2.09	0.32	-2.06
9,538.0	90.50	164.60	7,459.3	5,985.3	-1,888.2	-2,293.9	2,281.6	0.79	0.48	-0.53
9,601.0	90.70	165.50	7,458.7	5,984.7	-1,949.0	-2,277.7	2,338.3	1.46	0.32	1.43
9,664.0	90.90	166.60	7,457.8	5,983.8	-2,010.2	-2,262.5	2,395.6	1.77	0.32	1.75
9,728.0	89.80	164.90	7,457.4	5,983.4	-2,072.2	-2,246.8	2,453.6	3.16	-1.72	-2.66
9,791.0	89.80	165.50	7,457.6	5,983.6	-2,133.1	-2,230.7	2,510.5	0.95	0.00	0.95
9,854.0	89.70	165.80	7,457.9	5,983.9	-2,194.1	-2,215.0	2,567.5	0.50	-0.16	0.48
9,917.0	90.20	166.10	7,458.0	5,984.0	-2,255.2	-2,199.7	2,624.7	0.93	0.79	0.48
9,980.0	90.30	166.20	7,457.7	5,983.7	-2,316.4	-2,184.7	2,682.0	0.22	0.16	0.16
10,043.0	89.80	165.90	7,457.6	5,983.6	-2,377.6	-2,169.5	2,739.3	0.93	-0.79	-0.48
10,106.0	89.40	165.50	7,458.1	5,984.1	-2,438.6	-2,153.9	2,796.4	0.90	-0.63	-0.63
10,169.0	89.10	164.30	7,458.9	5,984.9	-2,499.4	-2,137.5	2,853.1	1.96	-0.48	-1.90
10,232.0	90.00	166.30	7,459.4	5,985.4	-2,560.3	-2,121.5	2,910.0	3.48	1.43	3.17
10,295.0	90.10	167.10	7,459.3	5,985.3	-2,621.7	-2,107.0	2,967.5	1.28	0.16	1.27
10,358.0	90.30	166.60	7,459.1	5,985.1	-2,683.0	-2,092.7	3,025.2	0.85	0.32	-0.79
10,422.0	90.40	166.60	7,458.7	5,984.7	-2,745.3	-2,077.9	3,083.6	0.16	0.16	0.00
10,484.0	90.50	166.90	7,458.2	5,984.2	-2,805.6	-2,063.7	3,140.2	0.51	0.16	0.48
10,547.0	90.50	166.60	7,457.7	5,983.7	-2,865.9	-2,049.2	3,197.8	0.48	0.00	-0.48
10,611.0	88.90	166.90	7,458.0	5,984.0	-2,929.2	-2,034.6	3,256.3	2.54	-2.50	0.47
10,673.0	88.70	166.80	7,459.3	5,985.3	-2,989.6	-2,020.4	3,313.0	0.36	-0.32	-0.16
10,737.0	88.50	167.00	7,460.9	5,986.9	-3,051.9	-2,005.9	3,371.5	0.44	-0.31	0.31
10,800.0	89.00	167.80	7,462.3	5,988.3	-3,113.4	-1,992.2	3,429.4	1.50	0.79	1.27
10,863.0	89.70	167.70	7,463.0	5,989.0	-3,174.9	-1,978.8	3,487.4	1.12	1.11	-0.16
10,926.0	89.80	167.50	7,463.2	5,989.2	-3,236.5	-1,963.3	3,545.3	0.35	0.16	-0.32

**Phoenix Technologies**  
Survey Report

<b>Database:</b>	EDM 5000 1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Wellbore Coord 513882
<b>Company:</b>	ECOT Production - Marcellus	<b>TVD Reference:</b>	KB 1611 (Q) 1474 (usft)
<b>Project:</b>	Wellzel County, WV	<b>MD Reference:</b>	KB 1611 (Q) 1474 (usft)
<b>Site:</b>	Wellzel County 5 15082	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #R13882	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	As Drilled		

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)	
10,989.0	91.20	167.80	7,462.7	5,988.7	-3,298.0	-1,951.8	3,603.3	2.27	2.22	0.48	
11,053.0	91.40	167.20	7,461.2	5,987.2	-3,360.5	-1,938.0	3,662.1	0.99	0.31	-0.94	
11,116.0	91.80	168.10	7,459.5	5,985.5	-3,422.0	-1,924.5	3,720.0	1.56	0.63	1.43	
11,179.0	89.90	166.70	7,458.6	5,984.6	-3,483.5	-1,910.8	3,777.9	3.75	-3.02	-2.22	
11,243.0	89.50	166.40	7,458.9	5,984.9	-3,545.7	-1,895.9	3,836.3	0.78	-0.63	-0.47	
11,306.0	89.10	165.60	7,459.7	5,985.7	-3,606.8	-1,880.7	3,893.5	1.42	-0.63	-1.27	
11,369.0	89.40	165.00	7,460.5	5,986.5	-3,667.8	-1,864.7	3,950.4	1.06	0.48	-0.95	
11,432.0	89.50	165.50	7,461.1	5,987.1	-3,728.7	-1,848.6	4,007.3	0.81	0.16	0.79	
11,495.0	89.50	164.90	7,461.6	5,987.6	-3,789.6	-1,832.5	4,064.1	0.95	0.00	-0.95	
11,558.0	90.30	166.40	7,461.7	5,987.7	-3,850.6	-1,816.9	4,121.2	2.70	1.27	2.38	
11,622.0	90.60	166.70	7,461.2	5,987.2	-3,912.9	-1,802.0	4,179.6	0.66	0.47	0.47	
11,685.0	91.00	167.00	7,460.4	5,986.4	-3,974.2	-1,787.7	4,237.2	0.79	0.63	0.48	
11,748.0	91.30	165.80	7,459.1	5,985.1	-4,035.4	-1,772.9	4,294.6	1.96	0.48	-1.90	
11,811.0	90.20	166.50	7,458.3	5,984.3	-4,096.6	-1,757.8	4,351.9	2.07	-1.75	1.11	
11,874.0	90.20	166.00	7,458.1	5,984.1	-4,157.8	-1,742.8	4,409.2	0.79	0.00	-0.79	
11,938.0	90.50	166.00	7,457.7	5,983.7	-4,219.9	-1,727.4	4,467.4	0.47	0.47	0.00	
12,000.0	90.20	165.80	7,457.3	5,983.3	-4,280.0	-1,712.3	4,523.6	0.58	-0.48	-0.32	
12,063.0	89.40	165.50	7,457.5	5,983.5	-4,341.0	-1,696.6	4,580.7	1.36	-1.27	-0.48	
12,127.0	89.50	166.80	7,458.1	5,984.1	-4,403.2	-1,681.3	4,638.9	2.04	0.16	2.03	
12,190.0	88.70	167.90	7,459.1	5,985.1	-4,464.6	-1,667.5	4,696.7	2.16	-1.27	1.75	
12,253.0	88.30	167.90	7,460.8	5,986.8	-4,526.2	-1,654.3	4,754.8	0.63	-0.63	0.00	
12,316.0	88.00	167.90	7,462.8	5,988.8	-4,587.8	-1,641.1	4,812.8	0.48	-0.48	0.00	
12,379.0	88.40	168.40	7,464.8	5,990.8	-4,649.4	-1,628.2	4,871.0	1.02	0.63	0.79	
12,442.0	89.50	168.90	7,465.9	5,991.9	-4,711.2	-1,615.8	4,929.4	1.92	1.75	0.79	
12,505.0	89.00	168.30	7,466.7	5,992.7	-4,772.9	-1,603.4	4,987.7	1.24	-0.79	-0.95	
12,568.0	88.90	168.40	7,467.9	5,993.9	-4,834.6	-1,590.6	5,046.0	0.22	-0.16	0.16	
12,631.0	89.40	168.40	7,468.8	5,994.8	-4,896.3	-1,578.0	5,104.3	0.79	0.79	0.00	
12,694.0	91.20	168.50	7,468.5	5,994.5	-4,958.0	-1,565.4	5,162.6	2.86	2.86	0.16	
12,757.0	90.70	168.30	7,467.5	5,993.5	-5,019.7	-1,552.7	5,220.8	0.85	-0.79	-0.32	
12,821.0	90.40	167.70	7,466.8	5,992.8	-5,082.3	-1,539.4	5,279.9	1.05	-0.47	-0.94	
12,884.0	89.20	166.80	7,467.1	5,993.1	-5,143.8	-1,525.5	5,337.7	2.38	-1.90	-1.43	
12,947.0	88.80	166.30	7,468.2	5,994.2	-5,205.0	-1,510.8	5,395.1	1.02	-0.63	-0.79	
13,010.0	88.50	165.80	7,469.7	5,995.7	-5,266.2	-1,495.6	5,452.4	0.93	-0.48	-0.79	
13,073.0	88.10	165.90	7,471.5	5,997.5	-5,327.2	-1,480.2	5,509.5	0.65	-0.63	0.16	
13,136.0	88.40	166.50	7,473.4	5,999.4	-5,388.4	-1,465.2	5,566.8	1.06	0.48	0.95	
13,199.0	89.80	166.00	7,474.4	6,000.4	-5,449.6	-1,450.3	5,624.1	2.36	2.22	-0.79	
13,263.0	89.00	166.10	7,475.1	6,001.1	-5,511.7	-1,434.8	5,682.3	1.26	-1.25	0.16	
13,325.0	89.10	167.40	7,476.1	6,002.1	-5,572.0	-1,420.6	5,739.0	2.10	0.16	2.10	
13,389.0	91.20	167.70	7,476.0	6,002.0	-5,634.5	-1,406.8	5,797.8	3.31	3.28	0.47	
13,452.0	91.20	167.60	7,474.6	6,000.6	-5,696.0	-1,393.4	5,855.7	0.16	0.00	-0.16	
13,515.0	90.90	167.70	7,473.5	5,999.5	-5,757.6	-1,379.9	5,913.7	0.50	-0.48	0.16	
13,579.0	90.70	167.00	7,472.6	5,998.6	-5,820.0	-1,365.9	5,972.5	1.14	-0.31	-1.09	
13,642.0	90.90	167.40	7,471.7	5,997.7	-5,881.4	-1,351.9	6,030.2	0.71	0.32	0.63	

# Phoenix Technologies

## Survey Report

<b>Database:</b>	EDM 5000 1 Single User Db	<b>Local Co-ordinate Reference:</b>	See Wetzel County S13982
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 18 ft @ 1474.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB @ 18 ft @ 1474.0usft
<b>Site:</b>	Wetzel County S13982	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513982	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	As Drilled		

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)	
13,705.0	90.50	167.30	7,470.9	5,996.9	-5,942.9	-1,338.1	6,088.0	0.65	-0.63	-0.16	
13,768.0	90.50	167.40	7,470.4	5,996.4	-6,004.4	-1,324.3	6,145.9	0.16	0.00	0.16	
13,831.0	90.00	167.20	7,470.1	5,996.1	-6,065.8	-1,310.5	6,203.7	0.85	-0.79	-0.32	
13,895.0	89.60	166.70	7,470.3	5,996.3	-6,128.2	-1,296.0	6,262.3	1.00	-0.63	-0.78	
13,958.0	89.20	167.20	7,471.0	5,997.0	-6,189.5	-1,281.8	6,319.9	1.02	-0.63	0.79	
14,021.0	89.10	167.30	7,471.9	5,997.9	-6,251.0	-1,267.9	6,377.7	0.22	0.16	0.16	
14,084.0	88.60	167.00	7,473.2	5,999.2	-6,312.4	-1,253.9	6,435.4	0.93	-0.79	-0.48	
Final Survey=14131' MD/7475' TVD											
14,131.0	88.10	166	7,474.6	6,000.6	-6,358.2	-1,243.3	6,478.4	1.08	-1.05	-0.21	
Projection to TD/ Deepest Point of Well= 14191' MD/7477' TVD											
14,191.0	88.10	166	7,475.5	6,002.5	-6,416.6	1,229.7	6,533.3	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
4,173.0	4,167.2	-76.3	-92.7	Gyro Tie In=4173' MD	
8,781.0	7,453.3	-1,153.8	-2,477.1	LP= 8781' MD/7453' TVD	
14,131.0	7,474.6	-6,358.2	-1,243.3	Final Survey= 14131' MD/7475' TVD	
14,191.0	7,476.5	-6,416.6	-1,229.7	Projection to TD/ Deepest Point of Well= 14191' MD/7477' TVD	

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



# EQT Production - Marcellus

Project: Wetzel County, WV  
Site: Wetzel County 513982  
Well: Well #513982  
Wellbore: Main Wellbore  
Design: As Drilled

