

API 47-085-10132

**PHOENIX**  
TECHNOLOGY SERVICES



## **EQT Production - Marcellus**

**Ritchie County, WV  
Ritchie County 513756  
Well #513756**

**Main Wellbore**

**Design: 513756 As Drilled Surveys**

## **Standard Survey Report**

**13 July, 2015**



WV Department of  
Environmental Protection  
02/05/2016



Phoenix Technology Services  
Survey Report



<b>Database:</b>	EDM 5000 1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Ritchie County 513756
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@16 @ 1175 Oust
<b>Project:</b>	Ritchie County, WV	<b>MD Reference:</b>	KB@16 @ 1175 Oust
<b>Site:</b>	Ritchie County 513756	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513756	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	513756 As Drilled Surveys		

<b>Project</b>	Ritchie 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>	Ritchie County 513756				
<b>Site Position:</b>		<b>Northing:</b>	234,498.60 usft	<b>Latitude:</b>	39.14
<b>From:</b>	Map	<b>Easting:</b>	1,619,128.20 usft	<b>Longitude:</b>	-80.84
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.86 °

<b>Well</b>	Well #513756					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	234,498.60 usft	<b>Latitude:</b>	39° 8' 9.677 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,619,128.20 usft	<b>Longitude:</b>	80° 50' 33.875 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,159.0 usft

<b>Wellbore</b>	Main Wellbore				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	6/8/2015	-7.72	66.57	52,064

<b>Design</b>	513756 As Drilled Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	161.18	

<b>Survey Program</b>	Date 7/13/2015				
<b>From (°)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.00	4,603.0	513756 Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
0.00	4,863.0	513756 PHX MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3:standard declination	
0.00	14,550.0	513756 PHX MWD Curve and Lateral (Ma	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

<b>Survey</b>											
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>Subsea Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	-1,175.0	0.0	0.0	0.0	0.00	0.00	0.00	
103.0	0.23	125.49	103.0	-1,072.0	-0.1	0.2	0.2	0.22	0.22	0.00	
203.0	0.13	126.84	203.0	-972.0	-0.3	0.4	0.4	0.10	0.00	0.00	
303.0	0.13	127.74	303.0	-872.0	-0.4	0.6	0.6	0.00	0.00	0.00	
403.0	0.11	121.53	403.0	-772.0	-0.6	0.8	0.8	0.02	0.02	-0.21	
503.0	0.06	144.59	503.0	-672.0	-0.7	0.9	0.9	0.06	0.00	0.00	
603.0	0.06	144.58	603.0	-572.0	-0.7	0.9	1.0	0.00	0.00	-0.01	

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Phoenix Technology Services  
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513756
Company:	EQT Production - Marcellus	TVD Reference:	KB@16 @ 1175 Just
Project:	Ritchie County WV	MD Reference:	KB@16 @ 1175 Just
Site:	Ritchie County 513756	North Reference:	Grid
Well:	Well #513756	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513756 As Drilled Surveys		

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)
703.0	0.07	15.37	703.0	-472.0	-0.7	1.0	1.0	0.12	0.01	-129.21
803.0	0.24	32.99	803.0	-372.0	-0.5	1.1	0.8	0.17	0.17	17.62
903.0	0.29	50.81	903.0	-272.0	-0.2	1.4	0.6	0.10	0.05	17.82
1,003.0	0.45	59.16	1,003.0	-172.0	0.2	2.0	0.4	0.17	0.16	8.35
1,103.0	0.45	57.14	1,103.0	-72.0	0.6	2.6	0.3	0.02	0.00	-2.02
1,203.0	0.52	75.96	1,203.0	28.0	0.9	3.4	0.2	0.17	0.07	18.82
1,303.0	0.60	86.06	1,303.0	128.0	1.1	4.4	0.4	0.13	0.08	10.10
1,403.0	0.81	93.05	1,403.0	228.0	1.1	5.6	0.8	0.23	0.21	6.99
1,503.0	0.83	95.04	1,503.0	328.0	1.0	7.0	1.3	0.03	0.02	1.99
1,603.0	0.97	99.29	1,603.0	428.0	0.8	8.6	2.0	0.16	0.14	4.25
1,703.0	1.19	105.01	1,702.9	527.9	0.4	10.4	3.0	0.24	0.22	5.72
1,803.0	1.46	107.13	1,802.9	627.9	-0.3	12.6	4.3	0.27	0.27	2.12
1,903.0	1.65	109.16	1,902.9	727.9	-1.1	15.2	6.0	0.20	0.19	2.03
2,003.0	1.80	113.92	2,002.8	827.8	-2.2	18.0	7.9	0.21	0.15	4.76
2,103.0	1.84	114.29	2,102.8	927.8	-3.5	20.9	10.1	0.04	0.04	0.37
2,203.0	1.87	113.11	2,202.7	1,027.7	-4.8	23.9	12.3	0.05	0.03	-1.18
2,303.0	1.92	114.08	2,302.7	1,127.7	-6.1	26.9	14.5	0.06	0.05	0.97
2,403.0	1.98	112.23	2,402.6	1,227.6	-7.5	30.0	16.8	0.09	0.06	-1.85
2,503.0	2.08	109.22	2,502.5	1,327.5	-8.7	33.3	19.0	0.15	0.10	-3.01
2,603.0	2.03	106.81	2,602.5	1,427.5	-9.8	36.8	21.2	0.10	-0.05	-2.41
2,703.0	1.96	102.32	2,702.4	1,527.4	-10.7	40.1	23.1	0.17	-0.07	-4.49
2,803.0	1.97	97.86	2,802.4	1,627.4	-11.3	43.5	24.7	0.15	0.01	-4.46
2,903.0	2.01	95.56	2,902.3	1,727.3	-11.7	46.9	26.2	0.09	0.04	-2.30
3,003.0	1.98	91.88	3,002.2	1,827.2	-11.9	50.4	27.6	0.13	-0.03	-3.68
3,103.0	1.64	87.38	3,102.2	1,927.2	-11.9	53.6	28.6	0.37	-0.34	-4.50
3,203.0	1.32	89.85	3,202.2	2,027.2	-11.9	56.2	29.4	0.33	-0.32	2.47
3,303.0	1.04	95.58	3,302.1	2,127.1	-12.0	58.2	30.1	0.30	-0.28	5.73
3,403.0	0.65	98.22	3,402.1	2,227.1	-12.1	59.7	30.7	0.39	-0.39	2.64
3,503.0	0.48	104.41	3,502.1	2,327.1	-12.3	60.6	31.2	0.18	-0.17	6.19
3,603.0	0.39	106.25	3,602.1	2,427.1	-12.5	61.4	31.6	0.09	-0.09	1.84
3,703.0	0.34	111.49	3,702.1	2,527.1	-12.7	62.0	32.0	0.06	-0.05	5.24
3,803.0	0.21	129.92	3,802.1	2,627.1	-12.9	62.4	32.4	0.16	-0.13	18.43
3,903.0	0.05	254.70	3,902.1	2,727.1	-13.1	62.5	32.5	0.24	-0.16	124.78
4,003.0	0.14	316.27	4,002.1	2,827.1	-13.0	62.4	32.4	0.12	0.09	61.57
4,103.0	0.24	318.77	4,102.1	2,927.1	-12.7	62.1	32.1	0.10	0.10	2.50
4,203.0	0.46	333.74	4,202.1	3,027.1	-12.2	61.8	31.5	0.24	0.22	14.97
4,303.0	0.60	326.25	4,302.1	3,127.1	-11.4	61.4	30.6	0.16	0.14	-7.49
4,403.0	0.66	327.82	4,402.1	3,227.1	-10.5	60.8	29.6	0.06	0.06	1.57
4,503.0	0.87	323.34	4,502.1	3,327.1	-9.4	60.0	28.3	0.22	0.21	-4.48
Gyro Tie On=4603' MD										
4,603.0	1.03	321.25	4,602.1	3,427.1	-8.1	59.0	26.7	0.16	0.16	-2.09
4,611.0	1.00	323.40	4,610.1	3,435.1	-8.0	58.9	26.6	0.61	-0.38	26.88
4,642.0	2.70	358.30	4,641.1	3,466.1	-7.0	58.7	25.6	6.34	5.48	112.58

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site: Ritchie County 513756
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@15 @ 1175.Dust
<b>Project:</b>	Ritchie County WV	<b>MD Reference:</b>	KB@16 @ 1175.Dust
<b>Site:</b>	Ritchie County 513756	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513756	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	513756 As Drilled Surveys		

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)
4,674.0	6.50	7.70	4,673.0	3,498.0	-4.5	58.9	23.3	12.07	11.88	29.38
4,705.0	10.90	12.50	4,703.6	3,528.6	0.1	59.8	19.2	14.37	14.19	15.48
4,737.0	13.80	13.30	4,734.8	3,559.8	6.8	61.3	13.4	9.08	9.06	2.50
4,769.0	13.30	12.10	4,766.0	3,591.0	14.1	63.0	7.0	1.79	-1.56	-3.75
4,800.0	9.40	6.80	4,796.3	3,621.3	20.1	64.0	1.6	13.01	-12.58	-17.10
4,832.0	5.80	358.70	4,828.1	3,653.1	24.3	64.3	-2.3	11.71	-11.25	-25.31
4,863.0	3.30	344.50	4,859.0	3,684.0	26.7	64.0	-4.6	8.79	-8.06	-45.81
4,875.0	1.90	326.70	4,870.9	3,695.9	27.2	63.8	-5.2	13.33	-11.67	-148.33
4,938.0	1.50	288.80	4,933.9	3,758.9	28.4	62.5	-6.7	1.85	-0.63	-60.16
4,969.0	1.50	292.60	4,964.9	3,789.9	28.7	61.7	-7.2	0.32	0.00	12.26
5,001.0	1.90	303.20	4,996.9	3,821.9	29.1	60.9	-7.9	1.58	1.25	33.13
5,032.0	4.90	333.20	5,027.8	3,852.8	30.6	59.9	-9.6	10.94	9.68	96.77
5,064.0	9.10	339.00	5,059.6	3,884.6	34.2	58.3	-13.5	13.29	13.13	18.13
5,095.0	12.80	342.30	5,090.0	3,915.0	39.7	56.4	-19.4	12.10	11.94	10.65
5,127.0	16.00	342.50	5,121.0	3,946.0	47.3	54.0	-27.3	10.00	10.00	0.63
5,158.0	18.90	339.00	5,150.6	3,975.6	56.1	50.9	-36.6	9.94	9.35	-11.29
5,190.0	21.40	337.40	5,180.6	4,005.6	66.3	46.8	-47.6	8.00	7.81	-5.00
5,221.0	24.00	337.70	5,209.2	4,034.2	77.4	42.3	-59.6	8.40	8.39	0.97
5,253.0	26.50	337.80	5,238.2	4,063.2	90.0	37.1	-73.2	7.81	7.81	0.31
5,284.0	29.50	337.40	5,265.5	4,090.5	103.4	31.5	-87.7	9.70	9.68	-1.29
5,316.0	32.50	339.10	5,293.0	4,118.0	118.7	25.4	-104.2	9.77	9.38	5.31
5,347.0	34.50	340.90	5,318.8	4,143.8	134.8	19.6	-121.3	7.20	6.45	5.81
5,379.0	36.70	341.50	5,344.8	4,169.8	152.5	13.6	-139.9	6.96	6.88	1.88
5,410.0	39.10	341.20	5,369.3	4,194.3	170.5	7.5	-159.0	7.76	7.74	-0.97
5,442.0	40.70	341.40	5,393.8	4,218.8	189.9	0.9	-179.5	5.02	5.00	0.63
5,505.0	42.20	341.50	5,441.1	4,266.1	229.5	-12.3	-221.2	2.38	2.38	0.16
5,568.0	41.80	339.40	5,487.9	4,312.9	269.2	-26.4	-263.3	2.32	-0.63	-3.33
5,631.0	40.40	340.90	5,535.3	4,360.3	308.1	-40.5	-304.7	2.72	-2.22	2.38
5,663.0	37.50	340.70	5,560.2	4,385.2	327.1	-47.1	-324.9	9.07	-9.06	-0.63
5,694.0	35.30	339.60	5,585.2	4,410.2	344.4	-53.4	-343.2	7.40	-7.10	-3.55
5,726.0	31.50	339.70	5,611.9	4,436.9	361.0	-59.5	-360.8	11.88	-11.88	0.31
5,757.0	29.30	341.50	5,638.6	4,463.6	375.8	-64.7	-376.5	7.68	-7.10	5.81
5,789.0	26.20	344.20	5,666.9	4,491.9	390.0	-69.1	-391.4	10.45	-9.69	8.44
5,820.0	22.90	348.50	5,695.1	4,520.1	402.5	-72.2	-404.2	12.10	-10.65	13.87
5,852.0	19.30	353.80	5,725.0	4,550.0	413.8	-74.0	-415.6	12.72	-11.25	16.56
5,883.0	15.70	358.90	5,754.6	4,579.6	423.1	-74.6	-424.6	12.61	-11.61	16.45
5,915.0	12.50	1.00	5,785.6	4,610.6	430.9	-74.7	-432.0	10.13	-10.00	6.56
5,946.0	10.40	1.80	5,816.0	4,641.0	437.1	-74.5	-437.7	6.79	-6.77	2.58
5,977.0	8.10	3.20	5,846.6	4,671.6	442.1	-74.3	-442.4	7.45	-7.42	4.52
6,009.0	5.40	13.10	5,878.3	4,703.3	445.8	-73.8	-445.8	9.16	-8.44	30.94
6,040.0	5.70	38.80	5,909.2	4,734.2	448.4	-72.5	-447.8	8.01	0.97	82.90
6,072.0	8.00	56.30	5,941.0	4,766.0	450.9	-69.7	-449.2	9.63	7.19	54.69



Phoenix Technology Services  
Survey Report



Database:	EDM 5002-1 Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513756
Company:	EQT Production - Marcellus	TVD Reference:	KB@16 @ 1175.0usft
Project:	Ritchie County, WV	MD Reference:	KB@16 @ 1175.0usft
Site:	Ritchie County 513756	North Reference:	Gnd
Well:	Well #513756	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513756 As Drilled Surveys		

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)
6,103.0	9.50	70.50	5,971.6	4,796.6	452.9	-65.5	-449.8	8.45	4.84	45.81
6,135.0	10.70	91.10	6,003.1	4,828.1	453.7	-60.0	-448.8	11.82	3.75	64.38
6,167.0	11.80	111.50	6,034.5	4,859.5	452.5	-54.0	-445.7	12.83	3.44	63.75
6,198.0	13.40	125.40	6,064.8	4,889.8	449.2	-48.1	-440.7	11.02	5.16	44.84
6,230.0	15.50	134.10	6,095.8	4,920.8	444.1	-42.0	-433.9	9.42	6.56	27.19
6,261.0	16.80	142.60	6,125.6	4,950.6	437.7	-36.3	-426.0	8.69	4.19	27.42
6,293.0	18.70	150.50	6,156.0	4,981.0	429.5	-31.0	-416.6	9.57	5.94	24.69
6,324.0	21.20	154.40	6,185.2	5,010.2	420.2	-26.1	-406.1	9.13	8.06	12.58
6,356.0	24.10	155.90	6,214.7	5,039.7	409.0	-21.0	-393.9	9.24	9.06	4.69
6,387.0	27.30	157.60	6,242.6	5,067.6	396.6	-15.7	-380.5	10.59	10.32	5.48
6,419.0	30.40	159.20	6,270.7	5,095.7	382.3	-10.0	-365.0	9.98	9.69	5.00
6,451.0	34.20	160.90	6,297.7	5,122.7	366.2	-4.2	-347.9	12.21	11.88	5.31
6,482.0	37.50	160.70	6,322.8	5,147.8	349.0	1.8	-329.8	10.65	10.65	-0.65
6,514.0	40.90	160.80	6,347.6	5,172.6	329.9	8.5	-309.6	10.63	10.63	0.31
6,545.0	44.40	161.80	6,370.4	5,195.4	310.1	15.2	-288.6	11.50	11.29	3.23
6,577.0	46.90	162.80	6,392.8	5,217.8	288.3	22.2	-265.7	8.13	7.81	3.13
6,608.0	50.30	162.80	6,413.3	5,238.3	266.0	29.0	-242.5	10.97	10.97	0.00
6,640.0	53.60	161.60	6,433.0	5,258.0	242.1	36.7	-217.3	10.73	10.31	-3.75
6,671.0	56.70	161.60	6,450.7	5,275.7	217.9	44.8	-191.8	10.00	10.00	0.00
6,703.0	57.90	161.50	6,468.0	5,293.0	192.4	53.3	-164.9	3.76	3.75	-0.31
6,734.0	60.70	161.00	6,483.8	5,308.8	167.1	61.9	-138.2	9.14	9.03	-1.61
6,766.0	63.40	160.90	6,498.8	5,323.8	140.4	71.1	-110.0	8.44	8.44	-0.31
6,797.0	67.20	160.20	6,511.8	5,336.8	113.9	80.5	-81.8	12.43	12.26	-2.26
6,829.0	69.60	160.40	6,523.6	5,348.6	85.9	90.5	-52.1	7.52	7.50	0.63
6,860.0	72.80	160.50	6,533.5	5,358.5	58.2	100.3	-22.7	10.33	10.32	0.32
6,892.0	75.90	162.20	6,542.2	5,367.2	29.0	110.2	8.1	10.95	9.69	5.31
6,923.0	79.10	164.00	6,548.9	5,373.9	0.1	118.9	38.3	11.78	10.32	5.81
6,955.0	81.70	164.90	6,554.2	5,379.2	-30.3	127.4	69.8	8.59	8.13	2.81
6,986.0	84.80	164.10	6,557.9	5,382.9	-60.0	135.6	100.5	10.32	10.00	-2.58
<b>513756 LP 125' VS</b>										
7,010.7	87.11	162.98	6,559.6	5,384.6	-83.6	142.6	125.2	10.38	9.35	-4.52
7,017.0	87.70	162.70	6,559.9	5,384.9	-89.6	144.5	131.4	10.38	9.36	-4.51
<b>LP=7081' MD/6581' TVD</b>										
7,081.0	89.80	162.30	6,561.3	5,386.3	-150.6	163.7	195.4	3.34	3.28	-0.63
<b>513756 Plat LP</b>										
7,114.9	90.18	162.14	6,561.3	5,386.3	-182.9	174.1	229.3	1.23	1.13	-0.48
7,143.0	90.50	162.00	6,561.1	5,386.1	-209.7	182.7	257.4	1.23	1.13	-0.48
7,207.0	90.80	161.50	6,560.4	5,385.4	-270.4	202.8	321.4	0.91	0.47	-0.78
7,269.0	89.90	161.60	6,560.0	5,385.0	-329.2	222.4	383.4	1.46	-1.45	0.46
7,332.0	90.20	161.40	6,560.0	5,385.0	-389.0	242.4	446.4	0.57	0.32	-0.32
7,395.0	88.20	162.10	6,560.8	5,385.8	-448.8	262.1	509.4	0.46	0.17	0.32
7,458.0	88.90	162.30	6,562.4	5,387.4	-508.8	281.3	572.3	1.16	1.11	0.32
7,520.0	89.30	162.50	6,563.4	5,388.4	-567.9	300.1	634.3	0.72	0.32	0.32

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# Phoenix Technology Services

## Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Ritchie County 513756
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@15 @ -1175 Offset
<b>Project:</b>	Ritchie County, WV	<b>MD Reference:</b>	KB@16 @ -1175 Offset
<b>Site:</b>	Ritchie County 513756	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513756	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	513756 As Drilled Surveys		

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)
7,583.0	89.80	162.50	6,563.9	5,388.9	-628.0	319.0	697.3	0.79	0.79	0.00
7,646.0	90.60	162.30	6,563.7	5,388.7	-688.0	338.1	760.3	1.31	1.27	-0.32
7,709.0	90.80	161.20	6,562.9	5,387.9	-747.8	357.8	823.3	1.77	0.32	-1.75
7,772.0	88.90	160.70	6,563.1	5,388.1	-807.4	378.4	886.3	3.12	-3.02	-0.79
7,835.0	89.60	160.90	6,563.9	5,388.9	-866.9	399.1	949.3	1.16	1.11	0.32
7,897.0	91.30	162.00	6,563.4	5,388.4	-925.6	418.8	1,011.3	3.27	2.74	1.77
7,960.0	91.50	161.70	6,561.9	5,386.9	-985.5	438.4	1,074.2	0.57	0.32	-0.48
8,023.0	88.80	162.10	6,561.7	5,386.7	-1,045.4	458.0	1,137.2	4.33	-4.29	0.63
8,086.0	88.70	161.50	6,563.1	5,388.1	-1,105.2	477.7	1,200.2	0.97	-0.16	-0.95
8,149.0	89.40	162.30	6,564.1	5,389.1	-1,165.1	497.2	1,263.2	1.69	1.11	1.27
Deepest Point=8212' MD/8564' TVD										
8,212.0	90.60	162.70	6,564.1	5,389.1	-1,225.2	516.2	1,326.2	2.01	1.90	0.63
8,275.0	92.00	163.60	6,562.7	5,387.7	-1,285.4	534.4	1,389.1	2.64	2.22	1.43
8,338.0	92.50	163.40	6,560.2	5,385.2	-1,345.8	552.3	1,452.0	0.85	0.79	-0.32
8,400.0	93.00	162.60	6,557.3	5,382.3	-1,405.0	570.4	1,513.9	1.52	0.81	-1.29
8,463.0	91.70	162.40	6,554.7	5,379.7	-1,465.0	589.4	1,576.8	2.09	-2.06	-0.32
8,526.0	91.10	163.20	6,553.1	5,378.1	-1,525.2	608.0	1,639.8	1.59	-0.95	1.27
8,589.0	90.10	162.10	6,552.5	5,377.5	-1,585.3	626.8	1,702.8	2.36	-1.59	-1.75
8,652.0	87.60	162.00	6,553.7	5,378.7	-1,645.3	646.2	1,765.7	3.97	-3.97	-0.16
8,715.0	87.60	161.90	6,556.4	5,381.4	-1,705.1	665.7	1,828.7	0.16	0.00	-0.16
8,778.0	87.90	161.60	6,558.9	5,383.9	-1,764.9	685.4	1,891.6	0.67	0.48	-0.48
8,841.0	91.80	163.20	6,559.0	5,384.0	-1,824.9	704.4	1,954.6	6.69	6.19	2.54
8,904.0	93.50	163.70	6,556.1	5,381.1	-1,885.2	722.4	2,017.5	2.81	2.70	0.79
8,967.0	93.50	162.90	6,552.3	5,377.3	-1,945.5	740.4	2,080.3	1.27	0.00	-1.27
9,030.0	91.60	162.60	6,549.5	5,374.5	-2,005.6	759.1	2,143.2	3.05	-3.02	-0.48
9,093.0	89.50	162.90	6,548.9	5,373.9	-2,065.7	777.8	2,206.2	3.37	-3.33	0.48
9,156.0	89.30	162.40	6,549.5	5,374.5	-2,125.9	796.6	2,269.2	0.85	-0.32	-0.79
9,219.0	87.50	161.20	6,551.3	5,376.3	-2,185.7	816.2	2,332.2	3.43	-2.86	-1.90
9,282.0	88.00	161.60	6,553.7	5,378.7	-2,245.4	836.3	2,395.1	1.02	0.79	0.63
9,345.0	88.30	160.40	6,555.8	5,380.8	-2,304.9	856.8	2,458.1	1.96	0.48	-1.90
9,408.0	90.20	161.00	6,556.6	5,381.6	-2,364.3	877.6	2,521.1	3.16	3.02	0.95
9,471.0	92.60	161.50	6,555.1	5,380.1	-2,424.0	897.9	2,584.0	3.89	3.81	0.79
9,534.0	90.20	158.60	6,553.5	5,378.5	-2,483.2	919.4	2,647.0	5.97	-3.81	-4.60
9,597.0	89.80	156.70	6,553.5	5,378.5	-2,541.4	943.3	2,709.9	3.08	-0.63	-3.02
9,659.0	91.60	157.10	6,552.8	5,377.8	-2,598.5	967.6	2,771.7	2.97	2.90	0.65
9,722.0	94.00	157.30	6,549.7	5,374.7	-2,656.5	992.0	2,834.5	3.82	3.81	0.32
9,785.0	94.90	158.80	6,544.8	5,369.8	-2,714.7	1,015.5	2,897.2	2.77	1.43	2.38
9,848.0	93.40	159.80	6,540.2	5,365.2	-2,773.5	1,037.7	2,960.0	2.86	-2.38	1.59
9,911.0	90.90	160.70	6,537.9	5,362.9	-2,832.7	1,059.0	3,022.9	4.22	-3.97	1.43
9,974.0	91.00	160.70	6,536.8	5,361.8	-2,892.2	1,079.8	3,085.9	0.16	0.16	0.00
10,037.0	91.30	161.00	6,535.6	5,360.6	-2,951.7	1,100.5	3,148.9	0.67	0.48	0.48
10,100.0	89.90	162.60	6,534.9	5,359.9	-3,011.5	1,120.1	3,211.9	3.37	-2.22	2.54
10,163.0	90.80	162.40	6,534.5	5,359.5	-3,071.6	1,139.1	3,274.9	1.46	1.43	-0.32



Phoenix Technology Services  
Survey Report



<b>Database:</b>	EDM 5000.1-Single User Db	<b>Local Co-ordinate Reference:</b>	Site Ritchie County 513756
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@18 @ 1175 Dual
<b>Project:</b>	Ritchie County, WV	<b>MD Reference:</b>	KB@18 @ 1175 Dual
<b>Site:</b>	Ritchie County 513756	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #513756	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	513756 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)
10,226.0	89.80	163.20	6,534.2	5,359.2	-3,131.8	1,157.7	3,337.8	2.03	-1.59	1.27
10,289.0	90.70	163.30	6,533.9	5,358.9	-3,192.1	1,175.9	3,400.8	1.44	1.43	0.16
10,352.0	91.00	163.30	6,533.0	5,358.0	-3,252.5	1,194.0	3,463.7	0.48	0.48	0.00
10,415.0	89.30	164.30	6,532.8	5,357.8	-3,312.9	1,211.5	3,526.7	3.13	-2.70	1.59
10,478.0	89.50	164.40	6,533.5	5,358.5	-3,373.6	1,228.5	3,589.6	0.35	0.32	0.16
10,541.0	90.20	164.50	6,533.6	5,358.6	-3,434.3	1,245.4	3,652.5	1.12	1.11	0.16
10,604.0	90.40	164.00	6,533.3	5,358.3	-3,494.9	1,262.5	3,715.4	0.85	0.32	-0.79
10,667.0	91.00	163.20	6,532.5	5,357.5	-3,555.4	1,280.3	3,778.3	1.59	0.95	-1.27
10,730.0	88.80	163.80	6,532.7	5,357.7	-3,615.8	1,298.2	3,841.3	3.62	-3.49	0.95
10,793.0	89.50	163.60	6,533.6	5,358.6	-3,676.2	1,315.9	3,904.2	1.16	1.11	-0.32
10,856.0	90.70	163.60	6,533.5	5,358.5	-3,736.7	1,333.7	3,967.1	1.90	1.90	0.00
10,919.0	91.30	163.90	6,532.4	5,357.4	-3,797.1	1,351.3	4,030.1	1.06	0.95	0.48
10,982.0	89.20	163.10	6,532.1	5,357.1	-3,857.5	1,369.2	4,093.0	3.57	-3.33	-1.27
11,045.0	89.10	163.40	6,533.0	5,358.0	-3,917.9	1,387.3	4,156.0	0.50	-0.16	0.48
11,108.0	89.70	163.50	6,533.7	5,358.7	-3,978.2	1,405.3	4,218.9	0.97	0.95	0.16
11,171.0	89.30	161.50	6,534.3	5,359.3	-4,038.3	1,424.2	4,281.9	3.24	-0.63	-3.17
11,234.0	87.80	161.10	6,535.8	5,360.8	-4,098.0	1,444.4	4,344.9	2.46	-2.38	-0.63
11,297.0	88.10	160.70	6,538.1	5,363.1	-4,157.5	1,465.0	4,407.8	0.79	0.48	-0.63
11,360.0	88.70	161.50	6,539.9	5,364.9	-4,217.1	1,485.4	4,470.8	1.59	0.95	1.27
11,424.0	89.30	161.70	6,541.0	5,366.0	-4,277.8	1,505.6	4,534.8	0.99	0.94	0.31
11,487.0	89.90	161.80	6,541.4	5,366.4	-4,337.6	1,525.3	4,597.8	0.97	0.95	0.16
11,550.0	90.50	161.90	6,541.2	5,366.2	-4,397.5	1,545.0	4,660.8	0.97	0.95	0.16
11,613.0	90.90	161.40	6,540.4	5,365.4	-4,457.3	1,564.8	4,723.8	1.02	0.63	-0.79
11,676.0	91.00	161.50	6,539.4	5,364.4	-4,517.0	1,584.8	4,786.7	0.22	0.16	0.16
11,739.0	89.20	161.90	6,539.3	5,364.3	-4,576.8	1,604.6	4,849.7	2.93	-2.86	0.63
11,801.0	89.50	162.30	6,540.0	5,365.0	-4,635.8	1,623.7	4,911.7	0.81	0.48	0.65
11,864.0	90.00	162.80	6,540.3	5,365.3	-4,695.9	1,642.6	4,974.7	1.12	0.79	0.79
11,927.0	90.10	162.40	6,540.2	5,365.2	-4,756.0	1,661.4	5,037.7	0.65	0.16	-0.63
11,990.0	89.90	162.60	6,540.2	5,365.2	-4,816.1	1,680.4	5,100.7	0.45	-0.32	0.32
12,053.0	90.00	162.90	6,540.3	5,365.3	-4,876.2	1,699.0	5,163.7	0.50	0.16	0.48
12,116.0	90.70	162.70	6,539.9	5,364.9	-4,936.4	1,717.7	5,226.6	1.16	1.11	-0.32
12,179.0	91.40	162.00	6,538.7	5,363.7	-4,996.5	1,736.8	5,289.6	1.57	1.11	-1.11
12,242.0	91.60	161.50	6,537.1	5,362.1	-5,056.3	1,756.5	5,352.6	0.85	0.32	-0.79
12,305.0	89.00	161.40	6,536.7	5,361.7	-5,116.0	1,776.5	5,415.6	4.13	-4.13	-0.16
12,368.0	89.80	161.60	6,537.4	5,362.4	-5,175.7	1,796.5	5,478.6	1.31	1.27	0.32
12,431.0	90.40	161.30	6,537.3	5,362.3	-5,235.4	1,816.6	5,541.6	1.06	0.95	-0.48
12,493.0	89.40	163.00	6,537.4	5,362.4	-5,294.5	1,835.6	5,603.5	3.18	-1.61	2.74
12,556.0	90.20	162.90	6,537.6	5,362.6	-5,354.7	1,854.0	5,666.5	1.28	1.27	1.11
12,619.0	90.10	161.80	6,537.4	5,362.4	-5,414.7	1,873.1	5,729.5	1.75	-0.16	-1.75
12,682.0	87.70	162.50	6,538.7	5,363.7	-5,474.7	1,892.4	5,792.5	3.07	1.11	1.11
12,745.0	88.30	162.60	6,540.9	5,365.9	-5,534.7	1,911.3	5,855.4	0.97	0.95	0.16
12,808.0	88.70	162.60	6,542.5	5,367.5	-5,594.8	1,930.2	5,918.4	0.63	0.63	0.00

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Phoenix Technology Services  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Ritchie County 513756
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@10 @ 1175.0usft
<b>Project:</b>	Ritchie County, WV	<b>MD Reference:</b>	KB@16 @ 1175.0usft
<b>Site:</b>	Ritchie County 513756	<b>North Reference:</b>	Gnd
<b>Well:</b>	Well #513756	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	513756 As Drilled Surveys		

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)
12,871.0	89.50	162.70	6,543.5	5,368.5	-5,655.0	1,948.9	5,981.4	1.28	1.27	0.16
12,934.0	89.80	162.20	6,543.9	5,368.9	-5,715.0	1,967.9	6,044.3	0.93	0.48	-0.79
12,996.0	88.20	161.80	6,545.0	5,370.0	-5,774.0	1,987.1	6,106.3	2.66	-2.58	-0.65
13,059.0	88.40	160.90	6,546.8	5,371.8	-5,833.6	2,007.2	6,169.3	1.46	0.32	-1.43
13,122.0	89.80	161.60	6,547.8	5,372.8	-5,893.3	2,027.5	6,232.3	2.48	2.22	1.11
13,185.0	91.60	161.70	6,547.0	5,372.0	-5,953.1	2,047.3	6,295.3	2.86	2.86	0.16
13,248.0	91.50	161.50	6,545.3	5,370.3	-6,012.8	2,067.2	6,358.2	0.35	-0.16	-0.32
13,311.0	89.50	161.50	6,544.8	5,369.8	-6,072.6	2,087.2	6,421.2	3.17	-3.17	0.00
13,373.0	89.70	161.00	6,545.2	5,370.2	-6,131.3	2,107.1	6,483.2	0.87	0.32	-0.81
13,437.0	89.80	160.50	6,545.5	5,370.5	-6,191.7	2,128.2	6,547.2	0.80	0.16	-0.78
13,500.0	90.10	159.70	6,545.6	5,370.6	-6,250.9	2,149.6	6,610.2	1.36	0.48	-1.27
13,625.0	89.40	160.50	6,546.1	5,371.1	-6,368.5	2,192.2	6,735.2	0.85	-0.56	0.64
13,688.0	87.90	162.60	6,547.6	5,372.6	-6,428.2	2,212.1	6,798.2	4.10	-2.38	3.33
13,751.0	91.60	165.10	6,547.9	5,372.9	-6,488.7	2,229.6	6,861.1	7.09	5.87	3.97
13,814.0	93.10	165.40	6,545.3	5,370.3	-6,549.6	2,245.7	6,923.9	2.43	2.38	0.48
13,877.0	91.60	164.40	6,542.7	5,367.7	-6,610.4	2,262.1	6,986.7	2.86	-2.38	-1.59
13,939.0	90.20	163.20	6,541.7	5,366.7	-6,669.9	2,279.4	7,048.6	2.97	-2.26	-1.94
14,002.0	89.70	161.80	6,541.8	5,366.8	-6,730.0	2,298.3	7,111.6	2.36	-0.79	-2.22
14,065.0	88.70	160.60	6,542.7	5,367.7	-6,789.6	2,318.6	7,174.6	2.48	-1.59	-1.90
14,128.0	88.80	160.80	6,544.0	5,369.0	-6,849.0	2,339.4	7,237.6	0.35	0.16	0.32
14,191.0	88.60	160.70	6,545.5	5,370.5	-6,908.5	2,360.2	7,300.5	0.35	-0.32	-0.16
14,254.0	88.70	160.70	6,546.9	5,371.9	-6,968.0	2,381.0	7,363.5	0.16	0.16	0.00
14,317.0	88.60	160.60	6,548.4	5,373.4	-7,027.4	2,401.9	7,426.5	0.22	-0.16	-0.16
14,380.0	88.30	160.30	6,550.1	5,375.1	-7,086.7	2,422.9	7,489.5	0.67	-0.48	-0.48
14,443.0	88.00	160.20	6,552.2	5,377.2	-7,146.0	2,444.2	7,552.4	0.50	-0.48	-0.16
Final Survey=14493' MD/6554' TVD										
14,493.0	87.80	160.20	6,554.0	5,379.0	-7,193.0	2,461.1	7,602.4	0.40	-0.40	0.00
513756 Plat TD										
14,549.5	87.80	160.20	6,556.2	5,381.2	-7,246.1	2,480.3	7,658.8	0.00	0.00	0.00
PROJ to BH=14550' MD/6556' TVD										
14,550.0	87.80	160.20	6,556.2	5,381.2	-7,246.6	2,480.4	7,659.3	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,603.0	4,602.1	-8.1	59.0	Gyro Tie On=4603' MD
7,081.0	6,561.3	-150.6	163.7	LP=7081' MD/6561' TVD
8,212.0	6,564.1	-1,225.2	516.2	Deepest Point=8212' MD/6564' TVD
14,493.0	6,554.0	-7,193.0	2,461.1	Final Survey=14493' MD/6554' TVD
14,550.0	6,556.2	-7,246.6	2,480.4	PROJ to Bit=14550' MD/6556' TVD

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Phoenix Technology Services  
Survey Report



<b>Database:</b>	EDM 5000 1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Ritchie County 513756
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@16 @ 1175.0usft
<b>Project:</b>	Ritchie County, WV	<b>MD Reference:</b>	KB@16 @ 1175.0usft
<b>Site:</b>	Ritchie County 513756	<b>North Reference:</b>	Gnd
<b>Well:</b>	Well #513756	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	513756 As Drilled Surveys		

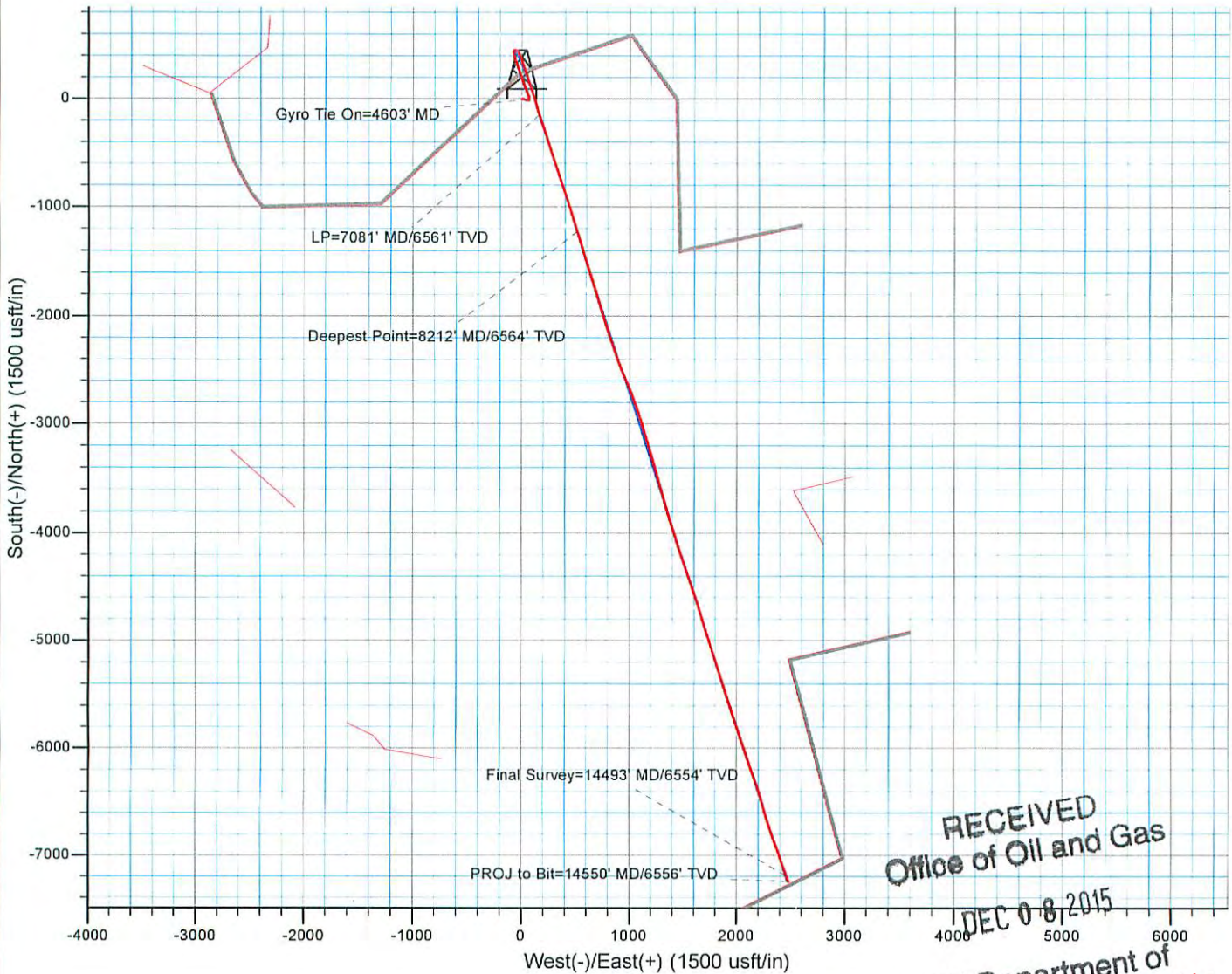
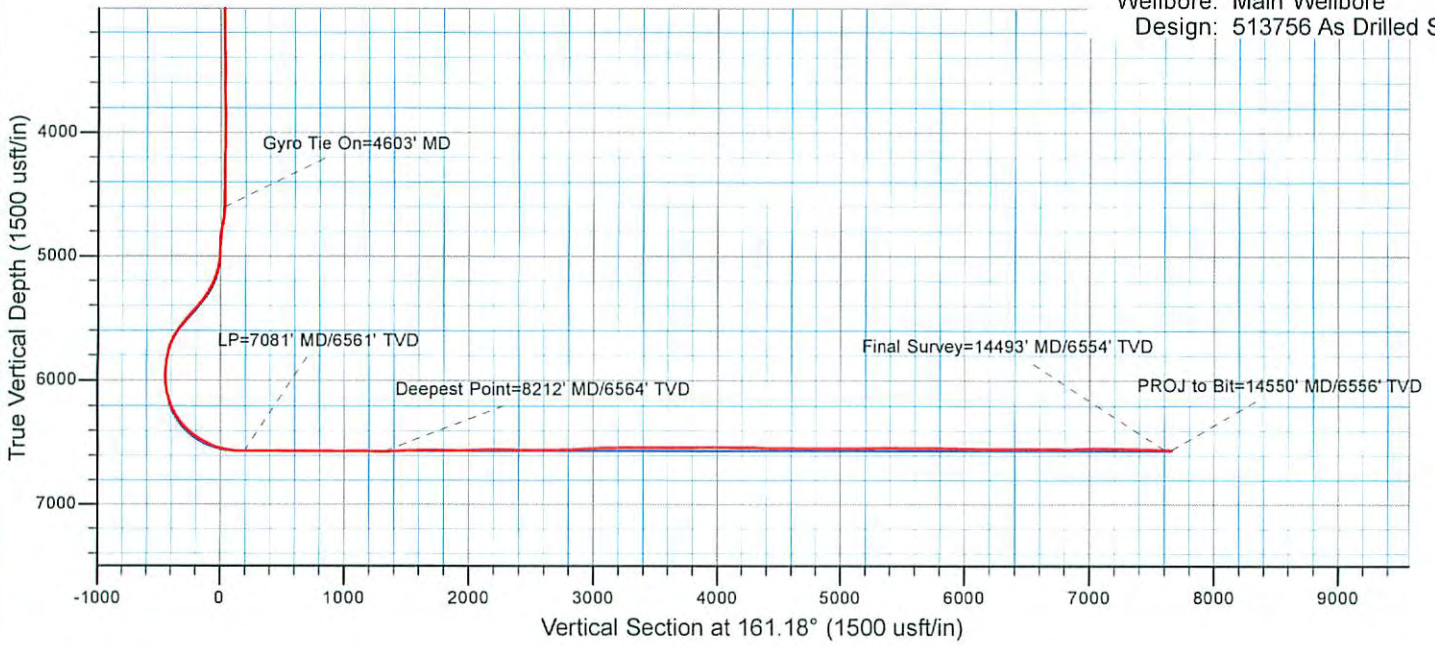
Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

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# EQT Production - Marcellus

Project: Ritchie County, WV  
 Site: Ritchie County 513756  
 Well: Well #513756  
 Wellbore: Main Wellbore  
 Design: 513756 As Drilled Surveys



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Environmental Protection 02/05/2016