



Where energy meets innovation.

EQT PRODUCTION

Ritchie County, WV

OXF122

Well #513762 -Marcellus

Main Wellbore

API: 47-851-0085

Design: 513762 As Drilled Surveys

Standard Survey Report

16 June, 2016

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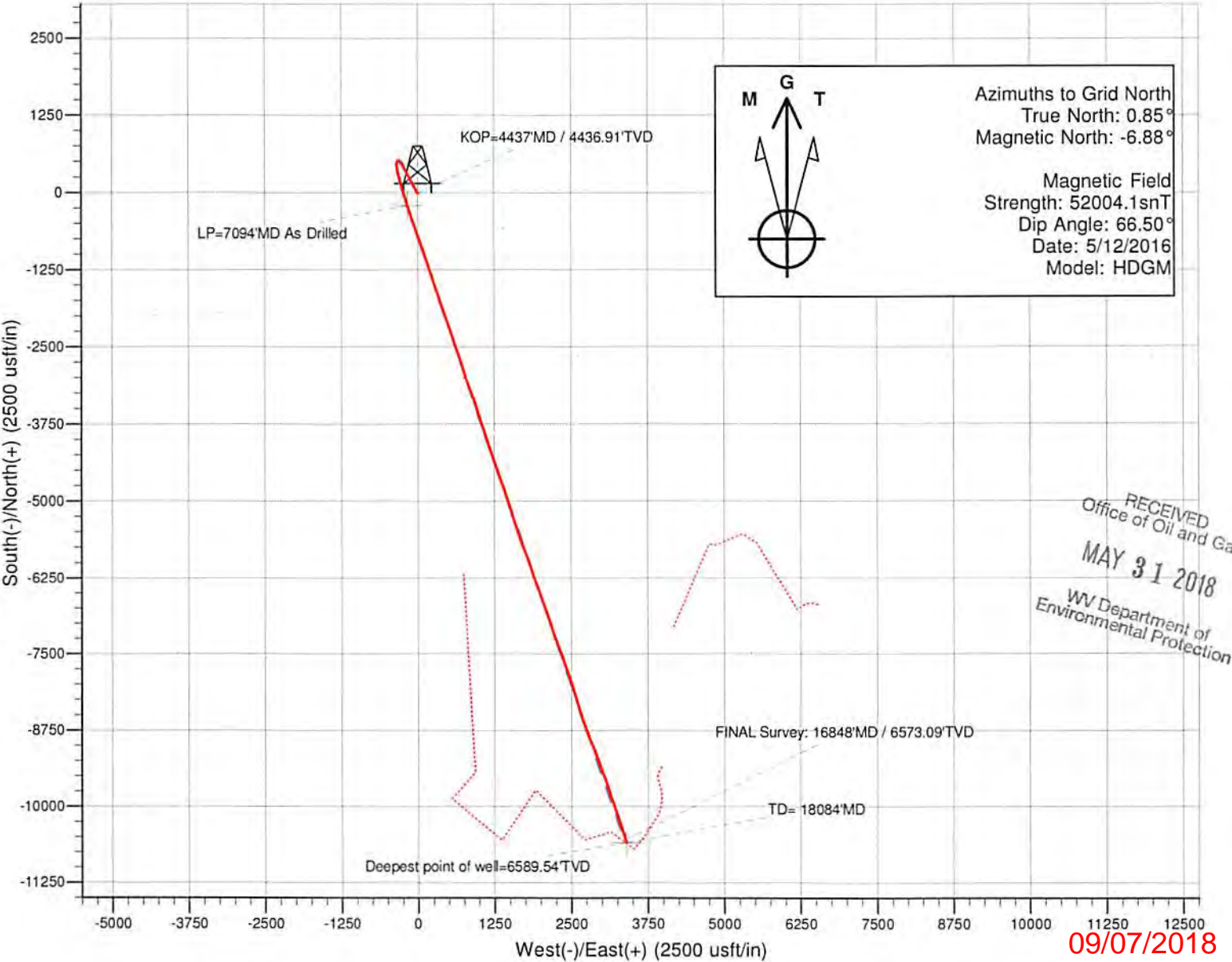
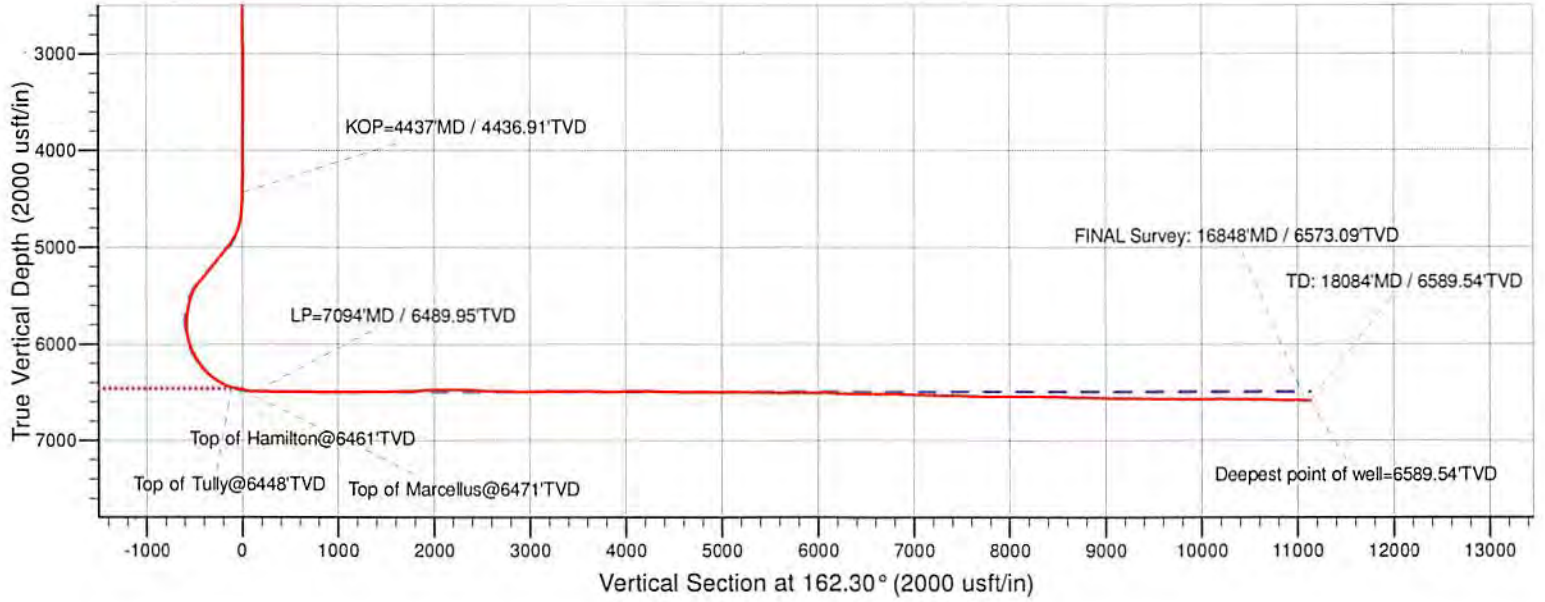


09/07/2018



Where energy meets innovation.

Project: Ritchie County, WV
Site: OXF122
Well: Well #513762 -Marcellus
Wellbore: Main Wellbore
Design: 513762 As Drilled Surveys
Elevation: GL 1111 + 23' KB @ 1134.00usft



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Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #513762 -Marcellus
Project:	Ritchie County, WV	TVD Reference:	GL 1111 + 23' KB @ 1134.00usft
Site:	OXF122	MD Reference:	GL 1111 + 23' KB @ 1134.00usft
Well:	Well #513762 -Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	513762 As Drilled Surveys	Database:	Well_Planner1

Project	Ritchie 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		

Site	OXF122				
Site Position:		Northing:	233,060.52 usft	Latitude:	39° 7' 55.941 N
From:	Map	Easting:	1,622,368.52 usft	Longitude:	80° 49' 52.485 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.85 °

Well	Well #513762 -Marcellus					
Well Position	+N/-S	0.00 usft	Northing:	233,079.15 usft	Latitude:	39° 7' 56.133 N
	+E/-W	0.00 usft	Easting:	1,622,425.56 usft	Longitude:	80° 49' 51.765 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,111.00 usft

Wellbore	Main Wellbore				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/12/2016	-7.73	66.50	52,004

Design	513762 As Drilled Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	162.30	

Survey Program	Date 6/16/2016				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
110.00	4,410.00	513762 Gyrodata (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
4,437.00	18,084.00	513762 Pro D MWD (Main Wellbore)	MWD - OWSG	MWD - OWSG	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110.00	0.14	133.28	110.00	-0.09	0.10	0.12	0.13	0.13	0.00	
210.00	0.16	97.14	210.00	-0.19	0.33	0.28	0.09	0.02	-36.14	
310.00	0.14	77.75	310.00	-0.18	0.58	0.35	0.05	-0.02	-19.39	
410.00	0.09	109.37	410.00	-0.18	0.78	0.41	0.08	-0.05	31.62	
510.00	0.10	87.84	510.00	-0.21	0.94	0.48	0.04	0.01	-21.53	
610.00	0.13	75.78	610.00	-0.18	1.14	0.51	0.04	0.03	-12.06	
710.00	0.11	76.04	710.00	-0.13	1.34	0.53	0.02	-0.02	0.26	
810.00	0.06	272.90	810.00	-0.10	1.38	0.51	0.17	-0.05	-163.14	
910.00	0.05	271.31	910.00	-0.10	1.28	0.48	0.01	-0.01	-1.59	

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Professional Directional Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #513762 -Marcellus
Project:	Ritchie County, WV	TVD Reference:	GL 1111 + 23' KB @ 1134.00usft
Site:	OXF122	MD Reference:	GL 1111 + 23' KB @ 1134.00usft
Well:	Well #513762 -Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	513762 As Drilled Surveys	Database:	Well_Planner1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,010.00	0.24	284.53	1,010.00	-0.04	1.04	0.36	0.19	0.19	13.22
1,110.00	0.07	335.66	1,110.00	0.07	0.81	0.18	0.20	-0.17	51.13
1,210.00	0.11	0.02	1,210.00	0.22	0.78	0.03	0.05	0.04	24.36
1,310.00	0.16	44.27	1,310.00	0.41	0.88	-0.13	0.11	0.05	44.25
1,410.00	0.17	50.51	1,410.00	0.61	1.09	-0.25	0.02	0.01	6.24
1,510.00	0.17	49.39	1,510.00	0.80	1.32	-0.36	0.00	0.00	-1.12
1,610.00	0.27	84.79	1,610.00	0.92	1.67	-0.37	0.16	0.10	35.40
1,710.00	0.28	84.64	1,709.99	0.96	2.15	-0.26	0.01	0.01	-0.15
1,810.00	0.46	142.21	1,809.99	0.67	2.63	0.17	0.39	0.18	57.57
1,910.00	0.47	149.67	1,909.99	0.00	3.09	0.94	0.06	0.01	7.46
2,010.00	0.56	156.71	2,009.99	-0.81	3.49	1.83	0.11	0.09	7.04
2,110.00	0.55	155.94	2,109.98	-1.69	3.88	2.79	0.01	-0.01	-0.77
2,210.00	0.49	157.59	2,209.98	-2.53	4.24	3.70	0.06	-0.06	1.65
2,310.00	0.51	156.48	2,309.97	-3.33	4.58	4.57	0.02	0.02	-1.11
2,410.00	0.45	162.78	2,409.97	-4.11	4.87	5.40	0.08	-0.06	6.30
2,509.99	0.38	167.74	2,509.96	-4.81	5.06	6.12	0.08	-0.07	4.96
2,609.99	0.34	172.56	2,609.95	-5.43	5.17	6.75	0.05	-0.04	4.82
2,709.99	0.31	182.94	2,709.95	-6.00	5.19	7.29	0.07	-0.03	10.38
2,809.99	0.28	212.71	2,809.95	-6.47	5.04	7.70	0.15	-0.03	29.77
2,909.99	0.20	209.95	2,909.95	-6.83	4.83	7.97	0.08	-0.08	-2.76
3,009.99	0.13	220.86	3,009.95	-7.07	4.66	8.15	0.08	-0.07	10.91
3,109.99	0.09	102.12	3,109.95	-7.17	4.67	8.25	0.19	-0.04	-118.74
3,209.99	0.17	72.35	3,209.95	-7.14	4.88	8.29	0.10	0.08	-29.77
3,309.99	0.15	94.47	3,309.95	-7.11	5.16	8.34	0.06	-0.02	22.12
3,409.99	0.18	63.30	3,409.95	-7.04	5.43	8.36	0.09	0.03	-31.17
3,509.99	0.15	38.38	3,509.95	-6.87	5.65	8.26	0.08	-0.03	-24.90
3,609.99	0.15	33.02	3,609.95	-6.66	5.80	8.11	0.01	0.00	-5.36
3,709.99	0.25	358.49	3,709.95	-6.33	5.87	7.82	0.15	0.10	-34.53
3,809.99	0.39	335.61	3,809.95	-5.80	5.72	7.27	0.19	0.14	-22.88
3,909.99	0.43	331.35	3,909.94	-5.16	5.40	6.56	0.05	0.04	-4.26
4,009.99	0.49	310.04	4,009.94	-4.56	4.89	5.83	0.18	0.06	-21.31
4,109.99	0.63	306.78	4,109.94	-3.96	4.13	5.02	0.14	0.14	-3.26
4,209.99	0.70	306.30	4,209.93	-3.26	3.19	4.08	0.07	0.07	-0.48
4,309.99	0.82	299.60	4,309.92	-2.55	2.08	3.06	0.15	0.12	-6.70
4,410.00	1.03	302.10	4,409.92	-1.72	0.69	1.85	0.21	0.21	2.50
4,437.00	1.20	298.00	4,436.91	-1.46	0.24	1.46	0.70	0.63	-15.19
KOP=4437'MD / 4436.91'TVD									
4,468.00	1.20	294.70	4,467.91	-1.17	-0.34	1.01	0.22	0.00	-10.65
4,500.00	1.60	303.10	4,499.90	-0.78	-1.02	0.44	1.40	1.25	26.25
4,531.00	2.20	311.30	4,530.88	-0.16	-1.83	-0.41	2.12	1.94	26.45
4,562.00	3.30	318.20	4,561.84	0.90	-2.87	-1.73	3.70	3.55	22.26
4,594.00	4.70	323.00	4,593.76	2.64	-4.27	-3.81	4.49	4.38	15.00
4,626.00	6.30	324.80	4,625.62	5.12	-6.08	-6.72	5.03	5.00	5.63

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Well:	Well #513762 -Marcellus	North Reference:	Grid
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Design:	513762 As Drilled Surveys	Database:	Well_Planner1

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,657.00	7.70	325.60	4,656.38	8.22	-8.23	-10.33	4.53	4.52	2.58
4,689.00	9.30	325.80	4,688.03	12.13	-10.89	-14.87	5.00	5.00	0.63
4,720.00	10.60	326.80	4,718.56	16.59	-13.86	-20.02	4.23	4.19	3.23
4,752.00	13.10	326.80	4,749.88	22.08	-17.46	-26.35	7.81	7.81	0.00
4,784.00	16.40	328.80	4,780.82	28.99	-21.79	-34.24	10.43	10.31	6.25
4,815.00	19.90	329.90	4,810.27	37.30	-26.70	-43.65	11.34	11.29	3.55
4,847.00	23.50	329.80	4,840.00	47.52	-32.65	-55.20	11.25	11.25	-0.31
4,878.00	27.50	329.00	4,867.98	59.01	-39.44	-68.21	12.95	12.90	-2.58
4,910.00	30.50	329.70	4,895.96	72.35	-47.35	-83.32	9.43	9.38	2.19
4,941.00	31.60	331.10	4,922.52	86.26	-55.24	-98.97	4.24	3.55	4.52
4,973.00	33.90	333.20	4,949.43	101.56	-63.32	-116.01	8.02	7.19	6.56
5,004.00	37.50	334.40	4,974.60	117.80	-71.30	-133.90	11.83	11.61	3.87
5,051.00	40.00	333.00	5,011.25	144.16	-84.34	-162.98	5.64	5.32	-2.98
5,099.00	39.90	332.20	5,048.05	171.52	-98.52	-193.36	1.09	-0.21	-1.67
5,146.00	39.70	331.70	5,084.16	198.08	-112.67	-222.95	0.80	-0.43	-1.06
5,194.00	39.50	331.10	5,121.15	224.94	-127.31	-253.00	0.90	-0.42	-1.25
5,288.00	38.50	328.80	5,194.20	276.14	-156.92	-310.78	1.87	-1.06	-2.45
5,383.00	41.40	333.30	5,267.04	329.52	-186.37	-370.58	4.31	3.05	4.74
5,415.00	41.10	333.00	5,291.09	348.34	-195.90	-391.41	1.12	-0.94	-0.94
5,446.00	40.70	331.50	5,314.53	366.31	-205.34	-411.40	3.42	-1.29	-4.84
5,478.00	40.20	331.20	5,338.88	384.53	-215.30	-431.78	1.68	-1.56	-0.94
5,509.00	40.00	330.30	5,362.59	401.95	-225.05	-451.34	1.98	-0.65	-2.90
5,541.00	36.70	328.40	5,387.68	419.03	-235.16	-470.69	10.95	-10.31	-5.94
5,573.00	33.00	326.40	5,413.94	434.44	-245.00	-488.36	12.10	-11.56	-6.25
5,604.00	28.80	323.80	5,440.54	447.50	-254.09	-503.57	14.21	-13.55	-8.39
5,636.00	25.30	322.10	5,469.03	459.12	-262.84	-517.30	11.20	-10.94	-5.31
5,667.00	21.60	323.70	5,497.47	468.95	-270.29	-528.93	12.11	-11.94	5.16
5,699.00	18.40	326.20	5,527.53	477.90	-276.59	-539.37	10.35	-10.00	7.81
5,730.00	15.20	326.80	5,557.21	485.36	-281.54	-547.99	10.34	-10.32	1.94
5,761.00	12.10	332.50	5,587.33	491.65	-285.26	-555.11	10.89	-10.00	18.39
5,793.00	10.60	321.70	5,618.71	496.93	-288.64	-561.17	8.11	-4.69	-33.75
5,825.00	10.70	313.30	5,650.16	501.28	-292.62	-566.52	4.86	0.31	-26.25
5,856.00	10.80	304.60	5,680.61	504.91	-297.11	-571.34	5.24	0.32	-28.06
5,888.00	11.10	294.20	5,712.03	507.87	-302.39	-575.76	6.24	0.94	-32.50
5,919.00	10.70	281.70	5,742.48	509.68	-307.93	-579.17	7.72	-1.29	-40.32
5,951.00	10.30	265.30	5,773.95	510.05	-313.69	-581.27	9.39	-1.25	-51.25
5,982.00	9.50	252.00	5,804.49	509.03	-318.89	-581.88	7.79	-2.58	-42.90
6,014.00	9.80	233.80	5,836.05	506.60	-323.60	-581.01	9.54	0.94	-56.88
6,045.00	11.70	221.10	5,866.51	502.68	-327.79	-578.54	9.76	6.13	-40.97
6,077.00	13.90	211.20	5,897.71	496.94	-331.92	-574.33	9.68	6.88	-30.94
6,109.00	15.90	203.00	5,928.64	489.62	-335.62	-568.48	9.07	6.25	-25.63
6,140.00	17.40	194.10	5,958.34	481.21	-338.41	-561.32	9.53	4.84	-28.71
6,172.00	19.10	185.90	5,988.74	471.36	-340.12	-552.45	9.61	5.31	-25.63

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6,203.00	21.00	181.40	6,017.86	460.76	-340.77	-542.56	7.89	6.13	-14.52
6,234.00	22.70	175.50	6,046.63	449.24	-340.44	-531.48	8.95	5.48	-19.03
6,266.00	25.20	173.60	6,075.88	436.31	-339.19	-518.79	8.17	7.81	-5.94
6,297.00	27.70	174.40	6,103.63	422.58	-337.76	-505.27	8.15	8.06	2.58
6,329.00	29.70	173.90	6,131.70	407.30	-336.19	-490.23	6.29	6.25	-1.56
6,361.00	31.90	173.00	6,159.18	391.02	-334.31	-474.15	7.02	6.88	-2.81
6,392.00	33.50	171.10	6,185.27	374.44	-331.99	-457.65	6.13	5.16	-6.13
6,424.00	35.60	169.80	6,211.62	356.54	-328.98	-439.69	6.95	6.56	-4.06
6,455.00	38.20	168.80	6,236.41	338.26	-325.52	-421.21	8.61	8.39	-3.23
6,487.00	40.70	168.10	6,261.12	318.34	-321.44	-401.00	7.94	7.81	-2.19
6,518.00	43.10	166.40	6,284.19	298.15	-316.87	-380.37	8.56	7.74	-5.48
6,550.00	46.50	164.60	6,306.90	276.33	-311.21	-357.87	11.34	10.63	-5.63
6,581.00	49.80	163.90	6,327.58	254.11	-304.94	-334.79	10.78	10.65	-2.26
6,613.00	52.90	163.50	6,347.56	230.13	-297.93	-309.81	9.74	9.69	-1.25
6,644.00	55.70	163.70	6,365.65	205.98	-290.82	-284.65	9.05	9.03	0.65
6,676.00	58.50	164.80	6,383.03	180.12	-283.53	-257.80	9.21	8.75	3.44
6,707.00	61.10	164.70	6,398.62	154.27	-276.48	-231.03	8.39	8.39	-0.32
6,739.00	64.20	164.50	6,413.32	126.87	-268.94	-202.63	9.70	9.69	-0.63
6,770.00	67.40	164.30	6,426.03	99.64	-261.33	-174.38	10.34	10.32	-0.65
6,802.00	69.80	164.70	6,437.70	70.94	-253.37	-144.61	7.59	7.50	1.25
6,834.00	72.70	164.40	6,447.99	41.73	-245.30	-114.34	9.11	9.06	-0.94
6,834.04	72.70	164.40	6,448.00	41.69	-245.29	-114.30	0.00	0.00	0.00
Top of Tully@6448'TVD									
6,865.00	74.50	163.70	6,456.74	13.14	-237.13	-84.61	6.21	5.81	-2.26
6,881.48	75.53	163.39	6,461.00	-2.12	-232.62	-68.70	6.51	6.25	-1.88
Top of Hamilton@6461'TVD									
6,897.00	76.50	163.10	6,464.75	-16.55	-228.28	-53.64	6.51	6.25	-1.87
6,925.93	78.55	162.17	6,471.00	-43.51	-219.85	-25.39	7.76	7.10	-3.23
Top of Marcellus@6471'TVD									
6,928.00	78.70	162.10	6,471.41	-45.44	-219.22	-23.37	7.76	7.10	-3.20
6,960.00	81.10	161.80	6,477.02	-75.39	-209.46	8.14	7.56	7.50	-0.94
6,991.00	81.80	162.00	6,481.63	-104.53	-199.94	38.79	2.35	2.26	0.65
7,023.00	84.00	163.00	6,485.58	-134.81	-190.39	70.54	7.54	6.88	3.13
7,054.00	86.90	163.40	6,488.04	-164.39	-181.46	101.44	9.44	9.35	1.29
7,086.00	87.50	163.40	6,489.61	-195.02	-172.33	133.39	1.88	1.88	0.00
7,094.20	87.69	163.24	6,489.95	-202.87	-169.98	141.58	3.02	2.34	-1.92
LP=7094'MD / 6489.95'TVD									
7,180.00	89.70	161.60	6,491.90	-284.63	-144.07	227.36	3.02	2.34	-1.91
7,275.00	89.90	161.40	6,492.23	-374.72	-113.93	322.35	0.30	0.21	-0.21
7,369.00	89.60	160.90	6,492.64	-463.68	-83.56	416.32	0.62	-0.32	-0.53
7,464.00	89.70	160.90	6,493.22	-553.45	-52.47	511.29	0.11	0.11	0.00
7,559.00	89.40	160.60	6,493.97	-643.13	-21.15	606.26	0.45	-0.32	-0.32
7,654.00	89.40	160.60	6,494.97	-732.73	10.40	701.21	0.00	0.00	0.00
7,748.00	88.90	159.00	6,496.36	-820.94	42.85	795.11	1.78	-0.53	-1.70

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #513762 -Marcellus
Project:	Ritchie County, WV	TVD Reference:	GL 1111 + 23' KB @ 1134.00usft
Site:	OXF122	MD Reference:	GL 1111 + 23' KB @ 1134.00usft
Well:	Well #513762 -Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	513762 As Drilled Surveys	Database:	Well_Planner1

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,843.00	89.40	161.30	6,497.77	-910.28	75.10	890.02	2.48	0.53	2.42
7,938.00	90.00	161.70	6,498.27	-1,000.37	105.25	985.01	0.76	0.63	0.42
8,032.00	90.90	161.30	6,497.53	-1,089.51	135.07	1,079.00	1.05	0.96	-0.43
8,127.00	90.90	161.00	6,496.04	-1,179.40	165.76	1,173.97	0.32	0.00	-0.32
8,222.00	90.60	161.40	6,494.79	-1,269.32	196.38	1,268.94	0.53	-0.32	0.42
8,317.00	90.20	162.10	6,494.13	-1,359.54	226.12	1,363.93	0.85	-0.42	0.74
8,411.00	90.00	162.50	6,493.97	-1,449.09	254.70	1,457.93	0.48	-0.21	0.43
8,506.00	91.80	161.00	6,492.47	-1,539.30	284.45	1,552.91	2.47	1.89	-1.58
8,601.00	92.00	161.30	6,489.32	-1,629.15	315.13	1,647.84	0.38	0.21	0.32
8,695.00	91.80	161.30	6,486.21	-1,718.14	345.25	1,741.77	0.21	-0.21	0.00
8,790.00	92.30	160.90	6,482.81	-1,807.96	376.00	1,836.69	0.67	0.53	-0.42
8,884.00	92.50	160.60	6,478.87	-1,896.63	406.96	1,930.57	0.38	0.21	-0.32
8,979.00	91.10	160.60	6,475.89	-1,986.19	438.50	2,025.48	1.47	-1.47	0.00
9,074.00	91.00	159.50	6,474.15	-2,075.47	470.91	2,120.39	1.16	-0.11	-1.16
9,168.00	89.10	161.50	6,474.07	-2,164.07	502.28	2,214.34	2.93	-2.02	2.13
9,263.00	88.90	161.00	6,475.72	-2,254.01	532.82	2,309.31	0.57	-0.21	-0.53
9,276.00	89.00	161.70	6,475.96	-2,266.33	536.97	2,322.30	5.44	0.77	5.38
9,371.00	86.20	162.00	6,479.94	-2,356.51	566.54	2,417.21	2.96	-2.95	0.32
9,466.00	87.20	161.50	6,485.41	-2,446.58	596.24	2,512.04	1.18	1.05	-0.53
9,560.00	89.40	161.50	6,488.20	-2,535.68	626.05	2,605.99	2.34	2.34	0.00
9,655.00	89.40	161.70	6,489.19	-2,625.82	656.03	2,700.97	0.21	0.00	0.21
9,750.00	88.80	162.00	6,490.68	-2,716.08	685.62	2,795.96	0.71	-0.63	0.32
9,844.00	89.10	161.90	6,492.41	-2,805.44	714.74	2,889.94	0.34	0.32	-0.11
9,939.00	90.60	160.60	6,492.65	-2,895.39	745.28	2,984.92	2.09	1.58	-1.37
10,033.00	90.60	159.90	6,491.67	-2,983.86	777.04	3,078.85	0.74	0.00	-0.74
10,128.00	90.40	160.00	6,490.84	-3,073.10	809.61	3,173.77	0.24	-0.21	0.11
10,222.00	90.60	159.10	6,490.02	-3,161.17	842.45	3,267.66	0.98	0.21	-0.96
10,317.00	91.10	159.30	6,488.61	-3,249.97	876.18	3,362.51	0.57	0.53	0.21
10,412.00	90.80	159.40	6,487.04	-3,338.85	909.68	3,457.37	0.33	-0.32	0.11
10,506.00	89.00	162.90	6,487.20	-3,427.79	940.05	3,551.33	4.19	-1.91	3.72
10,601.00	88.80	162.50	6,489.02	-3,518.48	968.29	3,646.31	0.47	-0.21	-0.42
10,696.00	88.30	162.50	6,491.43	-3,609.05	996.85	3,741.28	0.53	-0.53	0.00
10,791.00	89.60	161.50	6,493.17	-3,699.38	1,026.20	3,836.26	1.73	1.37	-1.05
10,886.00	91.60	161.60	6,492.17	-3,789.49	1,056.26	3,931.24	2.11	2.11	0.11
10,980.00	91.50	161.50	6,489.63	-3,878.63	1,086.00	4,025.20	0.15	-0.11	-0.11
11,075.00	90.00	161.50	6,488.39	-3,968.71	1,116.14	4,120.18	1.58	-1.58	0.00
11,170.00	88.90	161.90	6,489.30	-4,058.90	1,145.97	4,215.17	1.23	-1.16	0.42
11,264.00	88.80	161.20	6,491.19	-4,148.05	1,175.71	4,309.14	0.75	-0.11	-0.74
11,359.00	88.60	161.60	6,493.34	-4,238.06	1,206.00	4,404.10	0.47	-0.21	0.42
11,454.00	88.70	161.90	6,495.58	-4,328.26	1,235.75	4,499.07	0.33	0.11	0.32
11,548.00	88.90	160.30	6,497.55	-4,417.17	1,266.19	4,593.03	1.72	0.21	-1.70
11,643.00	90.50	160.70	6,498.05	-4,506.72	1,297.90	4,687.98	1.74	1.68	0.42
11,738.00	90.60	160.30	6,497.13	-4,596.26	1,329.61	4,782.93	0.43	0.11	-0.42
11,832.00	90.20	160.60	6,496.48	-4,684.84	1,361.06	4,876.87	0.53	-0.43	0.32



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Professional Directional Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #513762 -Marcellus
Project:	Ritchie County, WV	TVD Reference:	GL 1111 + 23' KB @ 1134.00usft
Site:	OXF122	MD Reference:	GL 1111 + 23' KB @ 1134.00usft
Well:	Well #513762 -Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	513762 As Drilled Surveys	Database:	Well_Planner1

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,927.00	90.00	160.40	6,496.31	-4,774.39	1,392.77	4,971.83	0.30	-0.21	-0.21	
12,022.00	90.10	160.60	6,496.23	-4,863.94	1,424.48	5,066.78	0.24	0.11	0.21	
12,116.00	88.90	162.00	6,497.05	-4,952.97	1,454.62	5,160.76	1.96	-1.28	1.49	
12,211.00	88.60	162.90	6,499.12	-5,043.53	1,483.26	5,255.73	1.00	-0.32	0.95	
12,306.00	88.60	162.90	6,501.44	-5,134.30	1,511.18	5,350.70	0.00	0.00	0.00	
12,400.00	88.20	163.40	6,504.07	-5,224.23	1,538.42	5,444.65	0.68	-0.43	0.53	
12,495.00	89.10	160.60	6,506.31	-5,314.55	1,567.77	5,539.62	3.10	0.95	-2.95	
12,590.00	89.40	163.80	6,507.55	-5,404.98	1,596.80	5,634.59	3.38	0.32	3.37	
12,684.00	88.80	160.00	6,509.03	-5,494.30	1,625.99	5,728.56	4.09	-0.64	-4.04	
12,779.00	90.70	162.70	6,509.44	-5,584.30	1,656.37	5,823.54	3.48	2.00	2.84	
12,874.00	90.10	159.40	6,508.78	-5,674.13	1,687.22	5,918.50	3.53	-0.63	-3.47	
12,969.00	89.80	158.80	6,508.86	-5,762.88	1,721.11	6,013.35	0.71	-0.32	-0.63	
13,063.00	88.90	158.40	6,509.93	-5,850.39	1,755.40	6,107.15	1.05	-0.96	-0.43	
13,158.00	87.40	158.50	6,512.99	-5,938.71	1,790.28	6,201.88	1.58	-1.58	0.11	
13,253.00	89.30	161.30	6,515.73	-6,027.87	1,822.90	6,296.74	3.56	2.00	2.95	
13,347.00	89.50	163.50	6,516.72	-6,117.46	1,851.32	6,390.73	2.35	0.21	2.34	
13,442.00	90.00	162.30	6,517.13	-6,208.26	1,879.26	6,485.72	1.37	0.53	-1.26	
13,536.00	90.40	160.60	6,516.80	-6,297.37	1,909.16	6,579.71	1.86	0.43	-1.81	
13,631.00	89.60	160.20	6,516.80	-6,386.86	1,941.03	6,674.66	0.94	-0.84	-0.42	
13,725.00	89.30	159.90	6,517.70	-6,475.22	1,973.10	6,768.58	0.45	-0.32	-0.32	
13,820.00	87.70	161.00	6,520.19	-6,564.71	2,004.88	6,863.49	2.04	-1.68	1.16	
13,914.00	87.50	160.30	6,524.13	-6,653.32	2,036.00	6,957.37	0.77	-0.21	-0.74	
14,009.00	88.40	160.60	6,527.53	-6,742.78	2,067.76	7,052.26	1.00	0.95	0.32	
14,103.00	88.30	159.90	6,530.23	-6,831.22	2,099.51	7,146.16	0.75	-0.11	-0.74	
14,198.00	89.30	162.40	6,532.22	-6,921.09	2,130.20	7,241.11	2.83	1.05	2.63	
14,293.00	89.00	162.70	6,533.63	-7,011.71	2,158.68	7,336.10	0.45	-0.32	0.32	
14,387.00	88.50	161.50	6,535.68	-7,101.14	2,187.57	7,430.07	1.38	-0.53	-1.28	
14,482.00	88.00	160.50	6,538.58	-7,190.92	2,218.48	7,525.00	1.18	-0.53	-1.05	
14,577.00	89.00	158.80	6,541.07	-7,279.95	2,251.51	7,619.86	2.08	1.05	-1.79	
14,671.00	89.60	160.40	6,542.22	-7,368.05	2,284.27	7,713.75	1.82	0.64	1.70	
14,766.00	89.10	159.40	6,543.30	-7,457.26	2,316.91	7,808.66	1.18	-0.53	-1.05	
14,860.00	89.90	161.20	6,544.12	-7,545.75	2,348.60	7,902.59	2.10	0.85	1.91	
14,955.00	90.20	161.70	6,544.03	-7,635.81	2,378.82	7,997.58	0.61	0.32	0.53	
15,049.00	89.30	160.90	6,544.44	-7,724.85	2,408.96	8,091.57	1.28	-0.96	-0.85	
15,144.00	90.60	160.60	6,544.53	-7,814.53	2,440.28	8,186.53	1.40	1.37	-0.32	
15,239.00	89.10	161.30	6,544.78	-7,904.33	2,471.28	8,281.50	1.74	-1.58	0.74	
15,334.00	88.60	162.10	6,546.68	-7,994.50	2,501.10	8,376.47	0.99	-0.53	0.84	
15,428.00	89.10	163.00	6,548.57	-8,084.16	2,529.29	8,470.45	1.10	0.53	0.96	
15,523.00	88.70	162.20	6,550.39	-8,174.79	2,557.69	8,565.43	0.94	-0.42	-0.84	
15,617.00	88.40	162.00	6,552.77	-8,264.21	2,586.57	8,659.40	0.38	-0.32	-0.21	
15,712.00	88.30	162.00	6,555.51	-8,354.53	2,615.92	8,754.36	0.11	-0.11	0.00	
15,807.00	87.80	162.80	6,558.74	-8,445.03	2,644.62	8,849.30	0.99	-0.53	0.84	
15,901.00	88.90	161.50	6,561.45	-8,534.46	2,673.43	8,943.26	1.81	1.17	-1.38	

WV Department of Environmental Protection

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #513762 -Marcellus
Project:	Ritchie County, WV	TVD Reference:	GL 1111 + 23' KB @ 1134.00usft
Site:	OXF122	MD Reference:	GL 1111 + 23' KB @ 1134.00usft
Well:	Well #513762 -Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	513762 As Drilled Surveys	Database:	Well_Planner1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,996.00	89.10	160.20	6,563.10	-8,624.19	2,704.58	9,038.21	1.38	0.21	-1.37
16,090.00	89.70	160.70	6,564.09	-8,712.76	2,736.04	9,132.16	0.83	0.64	0.53
16,185.00	89.60	160.50	6,564.67	-8,802.37	2,767.59	9,227.12	0.24	-0.11	-0.21
16,280.00	88.30	156.80	6,566.41	-8,890.82	2,802.17	9,321.89	4.13	-1.37	-3.89
16,374.00	88.70	157.90	6,568.87	-8,977.54	2,838.35	9,415.50	1.24	0.43	1.17
16,469.00	89.70	157.00	6,570.20	-9,065.26	2,874.78	9,510.15	1.42	1.05	-0.95
16,564.00	89.80	160.00	6,570.61	-9,153.64	2,909.59	9,604.93	3.16	0.11	3.16
16,658.00	89.40	160.90	6,571.27	-9,242.22	2,941.05	9,698.88	1.05	-0.43	0.96
16,753.00	89.60	160.70	6,572.10	-9,331.93	2,972.29	9,793.84	0.30	0.21	-0.21
16,848.00	89.20	159.70	6,573.09	-9,421.31	3,004.46	9,888.77	1.13	-0.42	-1.05
16,943.00	90.10	159.10	6,573.67	-9,510.23	3,037.89	9,983.65	1.14	0.95	-0.63
17,037.00	91.40	161.20	6,572.44	-9,598.63	3,069.80	10,077.57	2.63	1.38	2.23
17,132.00	89.50	162.30	6,571.70	-9,688.84	3,099.55	10,172.55	2.31	-2.00	1.16
17,226.00	89.10	162.60	6,572.84	-9,778.46	3,127.89	10,266.55	0.53	-0.43	0.32
17,321.00	89.00	161.50	6,574.42	-9,868.82	3,157.17	10,361.53	1.16	-0.11	-1.16
17,415.00	89.10	160.40	6,575.98	-9,957.66	3,187.84	10,455.49	1.17	0.11	-1.17
17,510.00	88.80	161.40	6,577.72	-10,047.42	3,218.92	10,550.44	1.10	-0.32	1.05
17,605.00	88.80	161.40	6,579.71	-10,137.43	3,249.22	10,645.41	0.00	0.00	0.00
17,699.00	89.00	160.60	6,581.51	-10,226.30	3,279.81	10,739.37	0.88	0.21	-0.85
17,794.00	89.40	161.80	6,582.84	-10,316.22	3,310.43	10,834.34	1.33	0.42	1.26
17,888.00	89.80	163.10	6,583.50	-10,405.84	3,338.77	10,928.34	1.45	0.43	1.38
17,980.00	88.20	163.10	6,585.10	-10,493.85	3,365.51	11,020.31	1.74	-1.74	0.00
18,038.00	87.30	163.10	6,587.38	-10,549.30	3,382.36	11,078.26	1.55	-1.55	0.00
FINAL Survey: 16848'MD / 6573.09'TVD									
18,084.00	87.30	163.10	6,589.54	-10,593.26	3,395.71	11,124.20	0.00	0.00	0.00
TD: 18084'MD / 6589.54'TVD - Deepest point of well=6589.54'TVD									

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LP=7094'MD As Drilled - hit/miss target - Shape - Point	0.00	0.00	6,489.95	-202.87	-169.98	232,876.28	1,622,255.58	39° 7' 54.103 N	80° 49' 53.884 W
TD: 18084'MD - actual wellpath misses target center by 197.48usft at 6970.21usft MD (6478.58 TVD, -84.97 N, -206.32 E) - Point	0.00	0.00	6,589.54	-18.63	-57.04	233,060.52	1,622,368.52	39° 7' 55.941 N	80° 49' 52.485 W

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #513762 -Marcellus
Project:	Ritchie County, WV	TVD Reference:	GL 1111 + 23' KB @ 1134.00usft
Site:	OXF122	MD Reference:	GL 1111 + 23' KB @ 1134.00usft
Well:	Well #513762 -Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	513762 As Drilled Surveys	Database:	Well_Planner1

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,834.04	6,448.00	Top of Tully@6448'TVD		0.00	
6,881.48	6,461.00	Top of Hamilton@6461'TVD		0.00	
6,925.93	6,471.00	Top of Marcellus@6471'TVD		0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
4,437.00	4,436.91	-1.46	0.24	KOP=4437'MD / 4436.91'TVD	
7,094.20	6,489.95	-202.87	-169.98	LP=7094'MD / 6489.95'TVD	
18,038.00	6,587.38	-10,549.30	3,382.36	FINAL Survey: 16848'MD / 6573.09'TVD	
18,084.00	6,589.54	-10,593.26	3,395.71	TD: 18084'MD / 6589.54'TVD	
18,084.00	6,589.54	-10,593.26	3,395.71	Deepest point of well=6589.54'TVD	

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