

API 47-085-10137

PHOENIX
TECHNOLOGY SERVICES



EQT Production - Marcellus

Ritchie County, WV
Ritchie County 513761
Well #513761

Main Wellbore

Design: 513761 As Drilled Surveys

Standard Survey Report

16 July, 2015

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Where Energy Meets Innovation.

02/05/2016



Phoenix Technology Services
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513761
Company:	EQT Production - Marcellus	TVD Reference:	KB@16 @ 1175.0usft
Project:	Ritchie County, WV	MD Reference:	KB@16 @ 1175.0usft
Site:	Ritchie County 513761	North Reference:	Grid
Well:	Well #513761	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513761 As Drilled Surveys		

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		Using geodetic scale factor

Site Ritchie County 513761

Site Position:		Northing:	234,445.30 usft	Latitude:	39.14
From:	Map	Easting:	1,619,075.40 usft	Longitude:	-80.84
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.86 °

Well Well #513761

Well Position	+N/-S	0.0 usft	Northing:	234,445.30 usft	Latitude:	39° 8' 9.142 N
	+E/-W	0.0 usft	Easting:	1,619,075.40 usft	Longitude:	80° 50' 34.534 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,159.0 usft

Wellbore Main Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/13/2015	-7.70	66.58	52,085

Design 513761 As Drilled Surveys

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 (°)
	6,560.0	0.0	0.0	154.41

Survey Program Date 7/16/2015

From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	4,580.0	513761 Gyrodata Gyros (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
0.00	15,371.0	513761 MWD (drilled as 513760) (Main W	GYD_DP_MS	Gyrodata gyro-compassing and drop

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)
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	0.20	42.77	103.0	-1,072.0	0.1	0.1	-0.1	0.19	0.19	0.00
203.0	0.15	74.70	203.0	-972.0	0.3	0.4	-0.1	0.11	-0.05	31.93
303.0	0.18	47.29	303.0	-872.0	0.4	0.6	-0.1	0.08	0.03	-27.41
403.0	0.09	127.33	403.0	-772.0	0.5	0.8	-0.1	0.19	-0.09	80.04
503.0	0.11	141.20	503.0	-672.0	0.4	0.9	0.1	0.03	0.02	13.87
603.0	0.07	141.27	603.0	-572.0	0.2	1.0	0.2	0.04	-0.04	0.07
703.0	0.06	97.73	703.0	-472.0	0.2	1.1	0.3	0.05	-0.01	-43.54



Phoenix Technology Services
Survey Report



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Company:	EQT Production - Marcellus	TVD Reference:	KB@16 @ 1175'usft
Project:	Ritchie County 'WV'	MD Reference:	KB@16 @ 1175'usft
Site:	Ritchie County 513761	North Reference:	Grid
Well:	Well #513761	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513761 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	0.09	95.96	803.0	-372.0	0.2	1.2	0.4	0.03	0.03	-1.77	
903.0	0.16	76.10	903.0	-272.0	0.2	1.4	0.4	0.08	0.07	-19.86	
1,003.0	0.26	42.95	1,003.0	-172.0	0.4	1.7	0.4	0.15	0.10	-33.15	
1,103.0	0.29	64.87	1,103.0	-72.0	0.7	2.1	0.3	0.11	0.03	21.92	
1,203.0	0.31	74.30	1,203.0	28.0	0.9	2.6	0.4	0.05	0.02	9.43	
1,303.0	0.37	87.49	1,303.0	128.0	0.9	3.2	0.5	0.10	0.06	13.19	
1,403.0	0.42	93.55	1,403.0	228.0	0.9	3.9	0.8	0.07	0.05	6.06	
1,503.0	0.49	87.55	1,503.0	328.0	0.9	4.7	1.2	0.08	0.07	-6.00	
1,603.0	0.63	86.65	1,603.0	428.0	1.0	5.6	1.6	0.14	0.14	-0.90	
1,703.0	0.95	101.51	1,703.0	528.0	0.9	7.0	2.3	0.38	0.32	14.86	
1,803.0	0.97	100.53	1,803.0	628.0	0.5	8.7	3.3	0.03	0.02	-0.98	
1,903.0	0.98	103.76	1,902.9	727.9	0.2	10.3	4.3	0.06	0.01	3.23	
2,003.0	0.95	104.78	2,002.9	827.9	-0.2	11.9	5.4	0.03	-0.03	1.02	
2,103.0	0.83	110.85	2,102.9	927.9	-0.7	13.4	6.4	0.15	-0.12	6.07	
2,203.0	0.75	109.39	2,202.9	1,027.9	-1.2	14.7	7.4	0.08	-0.08	-1.46	
2,303.0	0.60	125.62	2,302.9	1,127.9	-1.7	15.8	8.3	0.24	-0.15	16.23	
2,403.0	0.56	135.44	2,402.9	1,227.9	-2.4	16.5	9.3	0.11	-0.04	9.82	
2,503.0	0.59	137.30	2,502.9	1,327.9	-3.1	17.2	10.2	0.04	0.03	1.86	
2,603.0	0.57	143.32	2,602.9	1,427.9	-3.9	17.9	11.2	0.06	-0.02	6.02	
2,703.0	0.66	142.31	2,702.9	1,527.9	-4.7	18.5	12.3	0.09	0.09	-1.01	
2,803.0	0.56	145.51	2,802.9	1,627.9	-5.6	19.1	13.3	0.11	-0.10	3.20	
2,903.0	0.52	141.82	2,902.9	1,727.9	-6.3	19.7	14.2	0.05	-0.04	-3.69	
3,003.0	0.50	140.27	3,002.9	1,827.9	-7.0	20.3	15.1	0.02	-0.02	-1.55	
3,103.0	0.47	126.81	3,102.9	1,927.9	-7.6	20.9	15.9	0.12	-0.03	-13.46	
3,203.0	0.48	129.21	3,202.9	2,027.9	-8.1	21.5	16.6	0.02	0.01	2.40	
3,303.0	0.35	128.31	3,302.9	2,127.9	-8.6	22.1	17.3	0.13	-0.13	-0.90	
3,403.0	0.28	132.93	3,402.9	2,227.9	-8.9	22.5	17.8	0.07	-0.07	4.62	
3,503.0	0.31	145.27	3,502.9	2,327.9	-9.3	22.8	18.3	0.07	0.03	12.34	
3,603.0	0.33	154.14	3,602.9	2,427.9	-9.8	23.1	18.8	0.05	0.02	8.87	
3,703.0	0.31	166.01	3,702.9	2,527.9	-10.3	23.3	19.4	0.07	-0.02	11.87	
3,803.0	0.21	182.52	3,802.9	2,627.9	-10.8	23.4	19.8	0.12	-0.10	16.51	
3,903.0	0.17	282.06	3,902.9	2,727.9	-10.9	23.2	19.9	0.29	-0.04	99.54	
4,003.0	0.07	316.75	4,002.8	2,827.8	-10.8	23.0	19.7	0.12	-0.10	34.69	
4,103.0	0.28	328.90	4,102.8	2,927.8	-10.6	22.9	19.4	0.21	0.21	12.15	
4,203.0	0.46	341.41	4,202.8	3,027.8	-10.0	22.6	18.8	0.20	0.18	12.51	
4,303.0	0.52	331.97	4,302.8	3,127.8	-9.2	22.3	17.9	0.10	0.06	-9.44	
4,403.0	0.59	335.26	4,402.8	3,227.8	-8.4	21.8	17.0	0.08	0.07	0.00	
4,503.0	0.95	314.57	4,502.8	3,327.8	-7.3	21.0	15.7	0.00	0.00	0.00	
513761 Gyro Tie In=4580' MD											
4,580.0	1.31	316.49	4,579.8	3,404.8	-6.2	20.0	14.2	0.47	0.47	2.49	
First MWD Survey (Drilled As 513760)=4623' MD											
4,623.0	1.10	318.80	4,622.8	3,447.8	-5.6	19.4	13.4	0.50	-0.49	5.37	
4,686.0	1.10	316.00	4,685.8	3,510.8	-4.7	18.5	12.2	0.00	0.00	0.00	

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Phoenix Technology Services
Survey Report



Database:	EDM 5000.1 Single User DE	Local Co-ordinate Reference:	Site Ritchie County 613761
Company:	EQT Production - Marcolius	TVD Reference:	K8 @ 16 @ 1175.0usft
Project:	Ritchie County, WV	MD Reference:	K8 @ 16 @ 1175.0usft
Site:	Ritchie County 613761	North Reference:	Gnd.
Well:	Well #513761	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	613761 Aa 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)
KOP=4749' MD										
4,749.0	1.80	359.00	4,748.8	3,573.8	-3.2	18.1	10.7	1.98	1.11	68.25
4,780.0	3.50	10.90	4,779.7	3,604.7	-1.8	18.3	9.5	5.73	5.48	38.39
4,812.0	5.90	12.40	4,811.6	3,636.6	0.7	18.8	7.5	7.51	7.50	4.69
4,843.0	9.00	10.80	4,842.4	3,667.4	4.7	19.6	4.2	10.02	10.00	-5.16
4,875.0	11.60	8.70	4,873.8	3,698.8	10.3	20.6	-0.4	8.21	8.13	-6.56
4,906.0	14.00	11.40	4,904.1	3,729.1	17.1	21.8	-6.0	7.98	7.74	8.71
4,938.0	16.70	17.60	4,934.9	3,759.9	25.3	23.9	-12.4	9.86	8.44	19.38
4,969.0	19.40	21.20	4,964.4	3,789.4	34.3	27.1	-19.2	9.42	8.71	11.61
5,001.0	21.50	22.70	4,994.4	3,819.4	44.7	31.3	-26.8	6.76	6.56	4.69
5,033.0	23.80	23.60	5,023.9	3,848.9	56.0	36.2	-34.9	7.27	7.19	2.81
5,064.0	26.50	26.00	5,052.0	3,877.0	68.0	41.7	-43.3	9.31	8.71	7.74
5,127.0	33.30	26.40	5,106.6	3,931.6	96.1	55.6	-62.7	10.80	10.79	0.63
5,190.0	39.70	24.70	5,157.2	3,982.2	129.9	71.7	-86.2	10.28	10.16	-2.70
613761 LP 2										
5,203.4	40.08	24.11	5,167.5	3,992.5	137.7	75.2	-91.7	3.99	2.82	-4.41
5,253.0	41.50	22.00	5,205.0	4,030.0	167.6	87.9	-113.1	3.99	2.87	-4.25
5,316.0	40.00	18.90	5,252.7	4,077.7	206.1	102.3	-141.7	4.00	-2.38	-4.92
5,379.0	40.40	17.90	5,300.9	4,125.9	244.7	115.1	-170.9	1.21	0.63	-1.59
5,442.0	41.20	19.30	5,348.6	4,173.6	283.7	128.3	-200.4	1.93	1.27	2.22
5,505.0	42.10	22.00	5,395.6	4,220.6	322.8	143.0	-229.4	3.19	1.43	4.29
5,568.0	41.60	22.20	5,442.6	4,267.6	361.8	158.9	-257.7	0.82	-0.79	0.32
5,631.0	42.20	21.90	5,489.5	4,314.5	400.8	174.6	-286.0	1.00	0.95	-0.48
5,693.0	42.10	25.30	5,535.4	4,360.4	438.9	191.3	-313.2	3.68	-0.16	5.48
5,756.0	41.40	26.00	5,582.4	4,407.4	476.7	209.5	-339.5	1.33	-1.11	1.11
5,820.0	40.80	26.10	5,630.7	4,455.7	514.5	227.9	-365.6	0.94	-0.94	0.16
5,883.0	40.10	26.80	5,678.6	4,503.6	551.1	246.1	-390.7	1.32	-1.11	1.11
5,946.0	40.70	26.30	5,726.6	4,551.6	587.6	264.4	-415.8	1.08	0.95	-0.79
6,009.0	41.20	24.40	5,774.2	4,599.2	624.9	282.1	-441.8	2.13	0.79	-3.02
6,040.0	40.20	25.70	5,797.7	4,622.7	643.2	290.6	-454.6	4.23	-3.23	4.19
6,072.0	36.80	30.00	5,822.7	4,647.7	660.9	299.9	-466.5	13.52	-10.63	13.44
6,103.0	33.20	34.40	5,848.1	4,673.1	675.9	309.3	-476.0	14.18	-11.61	14.19
6,135.0	32.00	40.40	5,875.1	4,700.1	689.6	319.8	-483.8	10.77	-3.75	18.75
6,167.0	33.50	44.50	5,902.0	4,727.0	702.4	331.5	-490.3	8.37	4.69	12.81
6,198.0	32.80	50.20	5,927.9	4,752.9	713.8	343.9	-495.3	10.30	-2.26	18.39
6,230.0	32.20	53.50	5,954.9	4,779.9	724.5	357.4	-499.0	5.85	-1.88	10.31
6,261.0	31.90	55.70	5,981.2	4,806.2	734.0	370.8	-501.8	3.89	-0.97	7.10
6,293.0	31.20	60.70	6,008.5	4,833.5	742.8	385.1	-503.6	8.46	15.88	15.88
6,324.0	30.10	67.30	6,035.2	4,860.2	749.7	399.2	-503.8	8.58	21.29	21.29
6,356.0	30.20	73.10	6,062.8	4,887.8	755.2	414.3	-502.1	9.11	0.31	18.13
6,387.0	30.30	79.90	6,089.6	4,914.6	758.8	429.5	-498.9	11.05	22.04	22.04
6,419.0	30.20	85.40	6,117.3	4,942.3	760.9	445.5	-493.8	8.66	-0.31	17.19
6,450.0	31.30	91.40	6,143.9	4,968.9	761.3	461.3	-487.4	10.51	3.55	19.35

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Well:	Well #513761	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513761 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)
6,482.0	32.20	95.70	6,171.1	4,996.1	760.3	478.1	-479.2	7.61	2.81	13.44
6,514.0	34.30	100.30	6,197.9	5,022.9	757.8	495.5	-469.5	10.25	6.56	14.38
6,545.0	35.40	101.80	6,223.3	5,048.3	754.4	512.8	-458.9	4.50	3.55	4.84
6,577.0	37.40	105.90	6,249.1	5,074.1	749.8	531.3	-446.8	9.84	6.25	12.81
6,608.0	37.90	110.20	6,273.6	5,098.6	744.0	549.3	-433.7	8.62	1.61	13.87
6,639.0	39.30	114.10	6,297.9	5,122.9	736.7	567.2	-419.4	9.05	4.52	12.58
6,671.0	41.10	118.10	6,322.3	5,147.3	727.6	585.7	-403.2	9.83	5.63	12.50
6,702.0	42.30	121.90	6,345.5	5,170.5	717.3	603.5	-386.2	9.03	3.87	12.26
6,734.0	44.90	126.30	6,368.6	5,193.6	704.9	621.8	-367.2	12.48	8.13	13.75
6,765.0	47.30	129.70	6,390.1	5,215.1	691.1	639.4	-347.2	11.06	7.74	10.97
6,797.0	50.70	132.90	6,411.1	5,236.1	675.2	657.5	-324.9	13.03	10.63	10.00
6,828.0	53.50	134.80	6,430.2	5,255.2	658.2	675.1	-302.0	10.24	9.03	6.13
6,860.0	55.80	137.10	6,448.7	5,273.7	639.5	693.3	-277.3	9.27	7.19	7.19
6,891.0	58.80	140.00	6,465.4	5,290.4	619.9	710.5	-252.2	12.47	9.68	9.35
6,923.0	61.40	142.70	6,481.4	5,306.4	598.3	727.8	-225.2	10.93	8.13	8.44
6,954.0	63.60	145.60	6,495.7	5,320.7	576.0	743.9	-198.1	10.92	7.10	9.35
6,986.0	67.20	147.10	6,509.0	5,334.0	551.8	760.1	-169.3	12.03	11.25	4.69
7,017.0	68.00	148.40	6,520.8	5,345.8	527.5	775.3	-140.9	4.66	2.58	4.19
7,080.0	73.10	150.00	6,541.8	5,366.8	476.5	805.7	-81.7	8.44	8.10	2.54
7,111.0	77.50	150.30	6,549.7	5,374.7	450.5	820.7	-51.8	14.22	14.19	0.97
7,143.0	81.80	150.70	6,555.4	5,380.4	423.1	836.2	-20.4	13.49	13.44	1.25
7,174.0	84.70	153.80	6,559.1	5,384.1	395.9	850.5	10.3	13.64	9.35	10.00
7,206.0	85.00	155.80	6,561.9	5,386.9	367.0	864.1	42.2	6.29	0.94	6.25
7,237.0	87.00	159.40	6,564.1	5,389.1	338.4	875.8	73.1	13.26	6.45	11.61
7,269.0	88.80	161.90	6,565.3	5,390.3	308.3	886.4	104.9	9.62	5.63	7.81
LP=7333' MD/ 6566' TVD										
7,333.0	89.60	161.90	6,566.2	5,391.2	247.4	906.3	168.3	1.25	1.25	0.00
7,396.0	89.10	161.70	6,566.9	5,391.9	187.6	926.0	230.8	0.85	-0.79	-0.32
7,459.0	87.80	162.30	6,568.6	5,393.6	127.7	945.4	293.2	2.27	-2.06	0.95
7,522.0	87.70	164.50	6,571.1	5,396.1	67.4	963.4	355.4	3.49	-0.16	3.49
7,585.0	87.60	165.20	6,573.6	5,398.6	6.6	979.9	417.3	1.12	-0.16	1.11
Deepest Point of Well#548' MD/ 6575' TVD										
7,648.0	90.20	166.00	6,574.9	5,399.9	-54.4	995.5	479.1	4.32	4.13	1.27
7,710.0	90.70	167.30	6,574.4	5,399.4	-114.7	1,009.9	539.6	2.25	0.81	2.10
7,773.0	94.80	169.20	6,571.3	5,396.3	-176.3	1,022.7	600.7	7.17	6.51	3.02
7,836.0	97.90	169.30	6,564.4	5,389.4	-237.8	1,034.4	661.3	4.92	4.92	0.16
7,899.0	99.50	168.00	6,554.8	5,379.8	-298.9	1,046.6	721.6	3.26	2.54	0.44
7,962.0	95.30	165.20	6,546.7	5,371.7	-359.6	1,061.1	782.7	7.99	-6.67	-1.75
8,025.0	93.30	164.10	6,542.0	5,367.0	-420.2	1,077.7	844.5	3.62	-3.11	-2.96
8,088.0	90.70	162.30	6,539.8	5,364.8	-480.4	1,095.9	906.7	5.02	-4.13	-2.54
8,151.0	88.60	160.70	6,540.2	5,365.2	-540.2	1,115.9	969.2	4.19	-3.33	-2.54
8,214.0	88.10	160.50	6,542.0	5,367.0	-599.6	1,136.8	1,031.8	0.85	-0.79	-0.32

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Database:	EDM 5000.1 Single User Dr	Local Co-ordinate Reference:	Site Arche County 513781
Company:	EQT Production - Memphis	TVD Reference:	KB@18 @ 1175 Duff
Project:	Richie County WV	MD Reference:	KB@18 @ 1175 Duff
Site:	Richie County 513761	North Reference:	Gnd
Well:	Well #513761	Survey Calculation Method:	Millman Curvating
Wellbore:	Main Wellbore		
Design:	513781 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)
8,277.0	87.20	159.80	6,544.6	5,369.6	-658.8	1,158.2	1,094.4	1.81	-1.43	-1.11
8,340.0	87.20	159.80	6,547.7	5,372.7	-717.8	1,179.9	1,157.1	0.00	0.00	0.00
8,403.0	88.30	159.40	6,550.1	5,375.1	-776.8	1,201.9	1,219.8	1.86	1.75	-0.63
8,466.0	90.20	159.40	6,551.0	5,376.0	-835.8	1,224.0	1,282.5	3.02	3.02	0.00
8,529.0	91.60	158.00	6,550.0	5,375.0	-894.5	1,246.9	1,345.3	3.14	2.22	-2.22
8,592.0	91.00	155.10	6,548.6	5,373.6	-952.3	1,272.0	1,408.3	4.70	-0.95	-4.60
8,655.0	90.50	155.00	6,547.7	5,372.7	-1,009.4	1,298.5	1,471.3	0.81	-0.79	-0.16
8,718.0	89.90	155.00	6,547.5	5,372.5	-1,066.5	1,325.2	1,534.3	0.95	-0.95	0.00
8,781.0	90.30	154.30	6,547.4	5,372.4	-1,123.4	1,352.1	1,597.3	1.28	0.63	-1.11
8,845.0	91.10	157.10	6,546.6	5,371.6	-1,181.7	1,378.5	1,661.2	4.55	1.25	4.38
8,908.0	91.70	161.70	6,545.1	5,370.1	-1,240.7	1,400.6	1,724.0	7.36	0.95	7.30
8,971.0	91.80	161.40	6,543.2	5,368.2	-1,300.4	1,420.6	1,786.4	0.50	0.16	-0.48
9,034.0	91.50	160.90	6,541.3	5,366.3	-1,360.0	1,440.9	1,849.0	0.93	-0.48	-0.79
9,097.0	90.50	160.60	6,540.2	5,365.2	-1,419.5	1,461.7	1,911.6	1.66	-1.59	-0.48
9,160.0	90.40	159.90	6,539.7	5,364.7	-1,478.8	1,483.0	1,974.3	1.12	-0.16	-1.11
9,223.0	89.10	160.90	6,540.0	5,365.0	-1,538.1	1,504.1	2,036.9	2.60	-2.06	1.59
9,286.0	88.70	160.90	6,541.2	5,366.2	-1,597.6	1,524.7	2,099.5	0.63	-0.63	0.00
9,349.0	88.50	161.10	6,542.8	5,367.8	-1,657.2	1,545.2	2,162.1	0.45	-0.32	0.32
9,412.0	88.30	160.20	6,544.5	5,369.5	-1,716.6	1,566.1	2,224.7	1.46	-0.32	-1.43
9,475.0	89.40	160.20	6,545.8	5,370.8	-1,775.9	1,587.4	2,287.3	1.75	1.75	0.00
9,538.0	89.30	159.90	6,546.5	5,371.5	-1,835.1	1,608.9	2,350.0	0.50	-0.16	-0.48
9,601.0	91.10	160.90	6,546.3	5,371.3	-1,894.4	1,630.0	2,412.7	3.27	2.86	1.59
9,664.0	90.90	160.80	6,545.2	5,370.2	-1,953.9	1,650.7	2,475.3	0.35	-0.32	1.11
9,727.0	91.50	160.10	6,543.9	5,368.9	-2,013.3	1,671.8	2,537.9	1.46	0.95	1.94
9,789.0	90.80	158.90	6,542.6	5,367.6	-2,071.3	1,693.5	2,599.6	2.43	1.94	1.94
9,852.0	89.10	154.60	6,542.7	5,367.7	-2,129.2	1,718.3	2,662.6	7.34	-2.70	6.48
9,915.0	89.00	155.40	6,543.7	5,368.7	-2,186.3	1,745.0	2,725.6	1.28	-0.16	1.27
9,978.0	90.20	158.80	6,544.2	5,369.2	-2,244.3	1,769.5	2,788.5	5.72	1.90	5.40
10,041.0	90.90	161.80	6,543.6	5,368.6	-2,303.6	1,790.7	2,851.1	4.89	1.43	3.81
10,104.0	90.00	164.20	6,543.1	5,368.1	-2,363.9	1,809.1	2,913.4	4.07	-1.43	3.81
10,166.0	89.10	162.60	6,543.5	5,368.5	-2,423.3	1,826.8	2,974.6	2.96	-1.45	-2.58
10,229.0	89.50	163.90	6,544.3	5,369.3	-2,483.6	1,845.0	3,036.9	2.16	0.63	2.06
10,291.0	89.70	164.50	6,544.8	5,369.8	-2,543.3	1,861.9	3,098.0	1.02	0.32	0.97
10,354.0	89.40	163.90	6,545.2	5,370.2	-2,603.9	1,879.0	3,160.1	1.06	-0.48	-0.95
10,417.0	89.40	163.60	6,545.9	5,370.9	-2,664.4	1,896.7	3,222.2	0.48	0.00	-0.48
10,479.0	89.00	163.10	6,546.8	5,371.8	-2,723.7	1,914.4	3,283.5	1.03	-0.63	0.81
10,510.0	89.80	162.60	6,547.1	5,372.1	-2,753.4	1,923.6	3,314.1	3.04	2.58	1.81
10,605.0	89.40	161.90	6,547.8	5,372.8	-2,843.8	1,952.5	3,408.2	0.83	-0.42	-0.74
10,668.0	90.20	162.00	6,548.0	5,373.0	-2,903.7	1,972.0	3,470.7	1.28	1.27	0.95
10,731.0	90.40	162.60	6,547.6	5,372.6	-2,963.8	1,991.2	3,533.1	1.00	0.32	0.95
10,794.0	91.00	163.00	6,546.9	5,371.9	-3,023.9	2,009.8	3,595.4	1.14	0.95	0.95
10,857.0	90.70	162.20	6,545.9	5,370.9	-3,084.0	2,028.7	3,657.8	1.36	-0.48	-1.27
10,921.0	90.50	162.00	6,545.3	5,370.3	-3,144.9	2,048.3	3,721.2	0.44	-0.32	0.31

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Phoenix Technology Services
Survey Report



Database:	EDM 8608-1 Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513761
Company:	EQT Production - Marcellus	TVD Reference:	KB@16 @ 1175.0usf
Project:	Ritchie County, WV	MD Reference:	KB@16 @ 1175.0usf
Site:	Ritchie County 513761	North Reference:	Grid
Well:	Well #513761	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513761 As Dotted 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)
10,984.0	90.20	160.90	6,544.9	5,369.9	-3,204.7	2,068.4	3,783.7	1.81	-0.48	-1.75
11,109.0	89.50	160.20	6,545.2	5,370.2	-3,322.5	2,110.0	3,908.0	0.79	-0.56	-0.56
11,172.0	90.20	163.10	6,545.4	5,370.4	-3,382.3	2,129.8	3,970.5	4.74	1.11	4.60
11,235.0	90.00	162.90	6,545.3	5,370.3	-3,442.6	2,148.2	4,032.8	0.45	-0.32	-0.32
11,298.0	91.30	162.70	6,544.6	5,369.6	-3,502.7	2,166.9	4,095.1	2.09	2.06	-0.32
11,361.0	91.50	162.00	6,543.0	5,368.0	-3,562.8	2,186.0	4,157.5	1.16	0.32	-1.11
11,424.0	91.10	161.70	6,541.6	5,366.6	-3,622.6	2,205.6	4,219.9	0.79	-0.63	-0.48
11,487.0	90.80	161.90	6,540.5	5,365.5	-3,682.5	2,225.3	4,282.4	0.57	-0.48	0.32
11,551.0	90.50	160.90	6,539.8	5,364.8	-3,743.1	2,245.7	4,345.9	1.63	-0.47	-1.56
11,613.0	90.20	160.20	6,539.4	5,364.4	-3,801.6	2,266.3	4,407.6	1.23	-0.48	-1.13
11,676.0	89.90	160.30	6,539.4	5,364.4	-3,860.9	2,287.6	4,470.2	0.50	-0.48	0.16
11,739.0	90.30	160.90	6,539.3	5,364.3	-3,920.3	2,308.5	4,532.9	1.14	0.63	0.95
11,802.0	89.80	160.10	6,539.2	5,364.2	-3,979.7	2,329.6	4,595.5	1.50	-0.79	-1.27
11,865.0	89.70	161.10	6,539.5	5,364.5	-4,039.1	2,350.5	4,658.1	1.60	-0.16	1.59
11,926.0	89.80	163.40	6,539.8	5,364.8	-4,097.2	2,369.1	4,718.6	3.77	0.16	3.77
11,989.0	89.70	163.10	6,540.0	5,365.0	-4,157.5	2,387.2	4,780.8	0.50	-0.16	-0.48
12,052.0	89.60	162.70	6,540.4	5,365.4	-4,217.7	2,405.8	4,843.1	0.65	-0.16	-0.63
12,115.0	89.90	162.60	6,540.7	5,365.7	-4,277.9	2,424.5	4,905.5	0.50	0.48	-0.16
12,178.0	89.60	162.50	6,541.0	5,366.0	-4,338.0	2,443.4	4,967.8	0.50	-0.48	-0.16
12,241.0	89.50	161.90	6,541.5	5,366.5	-4,397.9	2,462.7	5,030.2	0.97	-0.16	-0.95
12,304.0	89.50	161.50	6,542.0	5,367.0	-4,457.7	2,482.5	5,092.7	0.63	0.00	-0.63
12,367.0	89.40	161.00	6,542.6	5,367.6	-4,517.4	2,502.7	5,155.3	0.81	-0.16	-0.79
12,430.0	90.90	160.90	6,542.5	5,367.5	-4,576.9	2,523.3	5,217.9	2.39	2.38	-0.16
12,493.0	91.00	160.50	6,541.4	5,366.4	-4,636.4	2,544.1	5,280.5	0.65	0.16	-0.63
12,556.0	90.80	160.30	6,540.4	5,365.4	-4,695.7	2,565.2	5,343.1	0.45	-0.32	-0.32
12,619.0	90.60	160.20	6,539.7	5,364.7	-4,755.0	2,586.5	5,405.8	0.35	-0.32	-0.16
12,682.0	90.60	161.80	6,539.0	5,364.0	-4,814.6	2,607.0	5,468.4	2.54	0.00	2.54
12,745.0	90.90	162.90	6,538.2	5,363.2	-4,874.6	2,626.1	5,530.8	1.81	0.48	1.75
12,808.0	90.50	161.60	6,537.4	5,362.4	-4,934.6	2,645.3	5,593.2	2.16	-0.63	-2.06
12,871.0	89.40	160.20	6,537.5	5,362.5	-4,994.1	2,666.0	5,655.8	2.83	-1.75	-2.22
12,934.0	89.10	160.20	6,538.3	5,363.3	-5,053.4	2,687.3	5,718.4	0.48	-0.48	0.00
12,997.0	88.90	159.70	6,539.4	5,364.4	-5,112.6	2,708.9	5,781.1	0.85	-0.32	-0.79
13,060.0	89.10	159.20	6,540.5	5,365.5	-5,171.6	2,731.0	5,843.9	0.85	0.32	-0.79
13,123.0	89.30	159.40	6,541.4	5,366.4	-5,230.5	2,753.3	5,906.6	0.45	0.32	0.32
13,185.0	89.20	159.20	6,542.2	5,367.2	-5,288.5	2,775.2	5,968.4	0.36	-0.16	-0.16
13,248.0	90.20	159.10	6,542.5	5,367.5	-5,347.4	2,797.6	6,031.2	1.60	1.59	1.59
13,311.0	90.50	159.20	6,542.1	5,367.1	-5,406.2	2,820.0	6,094.0	0.50	0.48	0.48
13,374.0	90.30	159.20	6,541.7	5,366.7	-5,465.1	2,842.4	6,156.8	0.32	-0.32	-0.32
13,437.0	90.50	158.80	6,541.2	5,366.2	-5,523.9	2,865.0	6,219.6	0.71	0.32	0.32
13,501.0	90.60	158.40	6,540.6	5,365.6	-5,583.5	2,888.3	6,283.4	0.64	0.16	-0.63
13,564.0	90.50	158.10	6,540.0	5,365.0	-5,642.0	2,911.7	6,346.2	0.50	-0.16	-0.16
13,627.0	91.00	159.60	6,539.2	5,364.2	-5,700.8	2,934.4	6,409.0	2.51	0.79	2.38

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Phoenix Technology Services
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513761
Company:	EQT Production - Marcellus	TVD Reference:	KB@18 @ 1175.0usft
Project:	Ritchie County, WV	MD Reference:	KB@18 @ 1175.0usft
Site:	Ritchie County 513761	North Reference:	Grid
Well:	Well #513761	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513761 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)
13,690.0	91.40	162.90	6,537.9	5,362.9	-5,760.4	2,954.6	6,471.6	5.28	0.63	5.24
13,753.0	90.70	163.10	6,536.7	5,361.7	-5,820.7	2,973.1	6,533.9	1.16	-1.11	0.32
13,816.0	89.20	163.20	6,536.8	5,361.8	-5,881.0	2,991.3	6,596.1	2.39	-2.38	0.16
13,879.0	89.10	162.80	6,537.7	5,362.7	-5,941.2	3,009.7	6,658.4	0.65	-0.16	-0.63
13,942.0	89.00	162.30	6,538.7	5,363.7	-6,001.3	3,028.6	6,720.8	0.81	-0.16	-0.79
14,005.0	89.00	162.40	6,539.8	5,364.8	-6,061.3	3,047.7	6,783.1	0.16	0.00	0.16
14,068.0	89.00	161.40	6,540.9	5,365.9	-6,121.2	3,067.3	6,845.6	1.59	0.00	-1.59
14,131.0	88.50	160.30	6,542.3	5,367.3	-6,180.7	3,088.0	6,908.2	1.92	-0.79	-1.75
14,194.0	88.70	160.40	6,543.9	5,368.9	-6,240.0	3,109.1	6,970.8	0.35	0.32	0.16
14,257.0	89.10	161.10	6,545.1	5,370.1	-6,299.5	3,129.9	7,033.4	1.28	0.63	1.11
14,320.0	89.50	161.00	6,545.8	5,370.8	-6,359.0	3,150.4	7,096.0	0.65	0.63	-0.16
14,383.0	90.60	161.10	6,545.8	5,370.8	-6,418.6	3,170.8	7,158.6	1.75	1.75	0.16
14,446.0	90.50	160.90	6,545.2	5,370.2	-6,478.2	3,191.3	7,221.2	0.35	-0.16	-0.32
14,510.0	90.60	160.70	6,544.6	5,369.6	-6,538.6	3,212.4	7,284.8	0.35	0.16	-0.31
14,573.0	90.10	158.60	6,544.2	5,369.2	-6,597.7	3,234.3	7,347.5	3.43	-0.79	-3.33
14,636.0	88.80	155.80	6,544.8	5,369.8	-6,655.8	3,258.7	7,410.4	4.90	-2.06	-4.44
14,699.0	88.90	157.70	6,546.0	5,371.0	-6,713.6	3,283.5	7,473.3	3.02	0.16	3.02
14,762.0	90.20	158.80	6,546.5	5,371.5	-6,772.1	3,306.9	7,536.2	2.70	2.06	1.75
14,824.0	90.90	158.70	6,545.9	5,370.9	-6,829.9	3,329.4	7,598.0	1.14	1.13	-0.16
14,887.0	90.90	157.70	6,545.0	5,370.0	-6,888.4	3,352.8	7,660.9	1.59	0.00	-1.59
14,950.0	90.60	156.80	6,544.1	5,369.1	-6,946.5	3,377.1	7,723.8	1.51	-0.48	-1.43
15,013.0	90.50	154.40	6,543.5	5,368.5	-7,003.9	3,403.1	7,786.8	3.81	-0.16	-3.81
Final Survey=15073' MD/ 6543' TVD - 513760 Plat TD 4"										
15,073.0	90.50	154.40	6,543.0	5,368.0	-7,058.0	3,429.1	7,846.8	0.00	0.00	0.00
Projection to TD=15371' MD/ 6540' TVD										
15,371.0	90.50	149.00	6,540.4	5,365.4	-7,320.3	3,570.3	8,144.3	1.81	0.00	-1.81

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,580.0	4,579.8	-6.2	20.0	513761 Gyro Tie In=4580' MD
4,623.0	4,622.8	-5.6	19.4	First MWD Survey (Drilled As 513760)=4623' MD
4,749.0	4,748.8	-3.2	18.1	KOP=4749' MD
7,333.0	6,566.2	247.4	906.3	LP=7333' MD/ 6566' TVD
7,648.0	6,574.9	-54.4	995.5	Deepest Point of Well=7648' MD/ 6575' TVD
15,073.0	6,543.0	-7,058.0	3,429.1	Final Survey=15073' MD/ 6543' TVD
15,371.0	6,540.4	-7,320.3	3,570.3	Projection to TD=15371' MD/ 6540' TVD

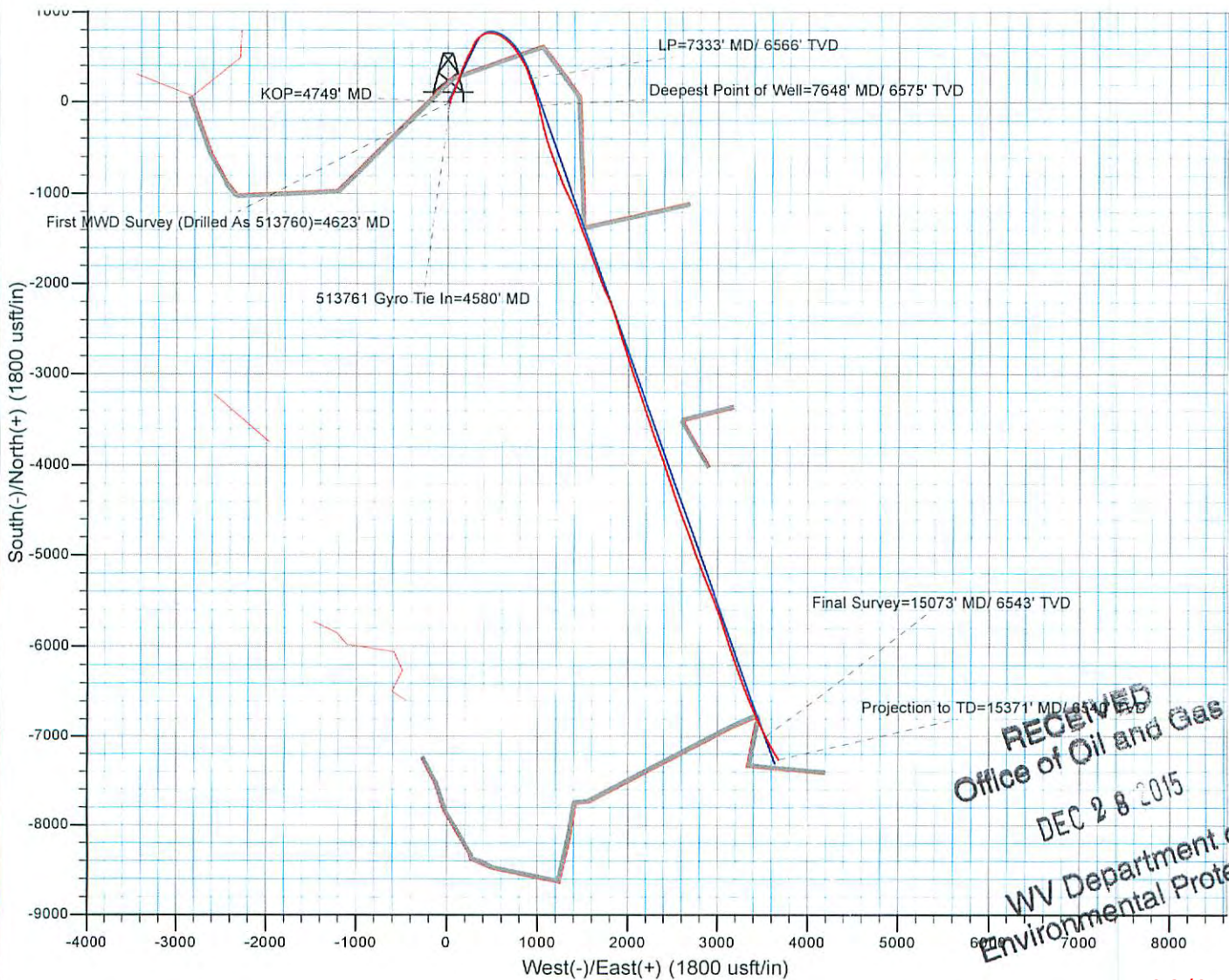
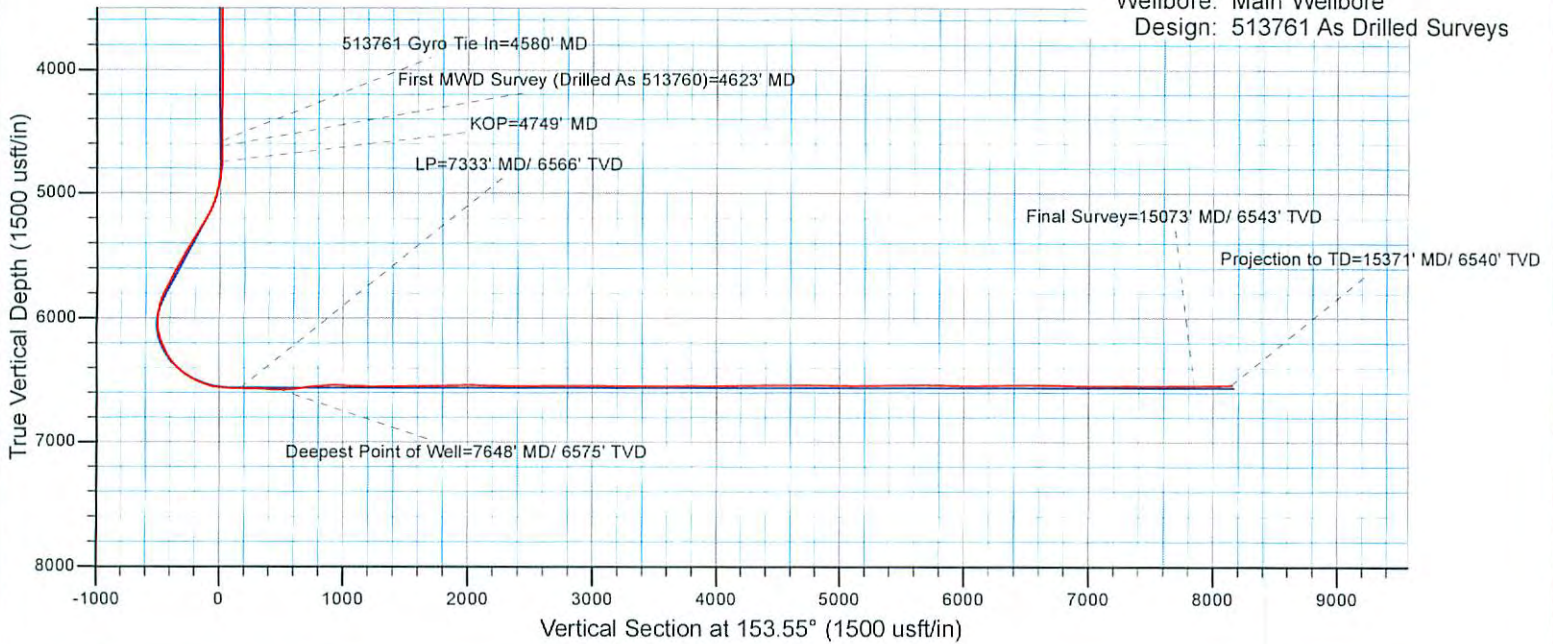
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Checked By: _____ Approved By: _____ Date: DEC 28 2015

WV Department of
Environmental Protection



Project: Ritchie County, WV
 Site: Ritchie County 513761
 Well: Well #513761
 Wellbore: Main Wellbore
 Design: 513761 As Drilled Surveys



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