



Extraction Oil & Gas

Weld County, CO (NAD83)

RBF

3

OH / Job #61103

Survey: Phoenix MWD Surveys

Standard Survey Report

01 June, 2017



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 3
Project:	Weld County, CO (NAD83)	TVD Reference:	RKB @ 4803.00usft (Patterson 346)
Site:	RBF	MD Reference:	RKB @ 4803.00usft (Patterson 346)
Well:	3	North Reference:	True
Wellbore:	OH / Job #61103	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

Project	Weld County, CO (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	RBF				
Site Position:		Northing:	1,416,272.86 usft	Latitude:	40° 28' 27.728 N
From:	Lat/Long	Easting:	3,174,878.37 usft	Longitude:	104° 52' 17.036 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.41 °

Well	3					
Well Position	+N/-S	0.00 usft	Northing:	1,416,240.79 usft	Latitude:	40° 28' 27.411 N
	+E/-W	0.00 usft	Easting:	3,174,878.60 usft	Longitude:	104° 52' 17.036 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,778.00 usft

Wellbore	OH / Job #61103				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/15/2017	8.42	66.93	52,461

Design	Surveys (Patterson 346)				
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	279.29	

Survey Program	Date	6/1/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
128.00	1,594.00	Total MWD Surveys (OH / Surface)	MWD	OWSG Rev.2 MWD - Standard	
1,544.00	16,950.00	Phoenix MWD Surveys (OH / Job #61103)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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)	
1,544.00	17.49	15.28	1,516.27	218.78	57.81	-21.73	0.00	0.00	0.00	
1,607.00	17.17	12.31	1,576.42	236.99	62.29	-23.21	1.49	-0.51	-4.71	
First Phoenix MWD Survey										
1,702.00	16.29	8.86	1,667.40	263.86	67.33	-23.85	1.40	-0.93	-3.63	
1,796.00	15.44	7.50	1,757.81	289.29	70.99	-23.36	0.99	-0.90	-1.45	
1,890.00	14.80	9.66	1,848.56	313.53	74.64	-23.05	0.91	-0.68	2.30	
1,985.00	16.00	16.00	1,940.15	338.08	80.29	-24.66	2.17	1.26	6.67	
2,080.00	17.74	20.49	2,031.07	364.23	88.96	-29.00	2.29	1.83	4.73	
2,175.00	17.74	17.33	2,121.55	391.60	98.34	-33.83	1.01	0.00	-3.33	
2,269.00	17.76	16.92	2,211.08	418.99	106.78	-37.74	0.13	0.02	-0.44	

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Wellbore:	OH / Job #61103	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

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)	
2,363.00	18.31	18.41	2,300.46	446.72	115.62	-41.98	0.76	0.59	1.59	
2,457.00	17.80	15.08	2,389.83	474.60	124.02	-45.77	1.22	-0.54	-3.54	
2,552.00	17.42	22.18	2,480.39	501.79	133.16	-50.41	2.29	-0.40	7.47	
2,647.00	17.21	21.89	2,571.08	528.00	143.77	-56.65	0.24	-0.22	-0.31	
2,741.00	15.99	19.99	2,661.17	553.07	153.38	-62.09	1.42	-1.30	-2.02	
2,836.00	14.96	17.26	2,752.72	577.08	161.49	-66.22	1.33	-1.08	-2.87	
2,931.00	17.06	18.66	2,844.03	601.99	169.59	-70.19	2.25	2.21	1.47	
3,026.00	15.79	16.90	2,935.15	627.57	177.81	-74.17	1.44	-1.34	-1.85	
3,121.00	14.22	15.53	3,026.91	651.18	184.69	-77.15	1.69	-1.65	-1.44	
3,215.00	16.01	16.22	3,117.66	674.75	191.40	-79.97	1.91	1.90	0.73	
3,309.00	17.23	16.73	3,207.73	700.53	199.03	-83.33	1.31	1.30	0.54	
3,402.00	14.87	16.54	3,297.10	725.16	206.40	-86.62	2.54	-2.54	-0.20	
3,497.00	16.01	15.20	3,388.67	749.49	213.30	-89.51	1.26	1.20	-1.41	
3,591.00	17.71	15.20	3,478.62	775.80	220.45	-92.32	1.81	1.81	0.00	
3,686.00	19.85	16.90	3,568.56	805.18	228.93	-95.94	2.32	2.25	1.79	
3,780.00	19.97	15.47	3,656.94	835.92	237.85	-99.78	0.53	0.13	-1.52	
3,875.00	18.99	14.73	3,746.50	866.51	246.11	-102.99	1.06	-1.03	-0.78	
3,967.00	17.44	15.30	3,833.89	894.28	253.55	-105.86	1.70	-1.68	0.62	
4,061.00	14.39	13.90	3,924.28	919.21	260.07	-108.27	3.27	-3.24	-1.49	
4,155.00	14.78	15.98	4,015.25	942.08	266.18	-110.61	0.69	0.41	2.21	
4,250.00	16.20	19.12	4,106.80	966.25	273.86	-114.28	1.74	1.49	3.31	
4,344.00	16.59	21.07	4,196.98	991.16	282.98	-119.26	0.72	0.41	2.07	
4,438.00	17.64	18.31	4,286.81	1,017.21	292.28	-124.23	1.41	1.12	-2.94	
4,533.00	17.81	15.18	4,377.31	1,044.89	300.60	-127.98	1.02	0.18	-3.29	
4,627.00	15.33	12.01	4,467.40	1,070.93	306.95	-130.04	2.81	-2.64	-3.37	
4,722.00	15.55	14.76	4,558.97	1,095.52	312.81	-131.85	0.80	0.23	2.89	
4,816.00	16.48	15.92	4,649.32	1,120.53	319.68	-134.60	1.05	0.99	1.23	
4,911.00	19.10	15.53	4,739.77	1,148.47	327.54	-137.84	2.76	2.76	-0.41	
5,005.00	19.29	14.03	4,828.55	1,178.35	335.42	-140.80	0.56	0.20	-1.60	
5,099.00	16.65	14.76	4,917.95	1,206.44	342.62	-143.36	2.82	-2.81	0.78	
5,193.00	15.96	20.64	5,008.18	1,231.56	350.60	-147.19	1.90	-0.73	6.26	
5,287.00	16.33	21.06	5,098.47	1,255.98	359.91	-152.43	0.41	0.39	0.45	
5,381.00	16.12	20.45	5,188.73	1,280.54	369.22	-157.65	0.29	-0.22	-0.65	
5,476.00	15.47	19.03	5,280.14	1,304.88	377.95	-162.35	0.80	-0.68	-1.49	
5,570.00	15.90	20.98	5,370.64	1,328.75	386.65	-167.08	0.72	0.46	2.07	
5,664.00	15.01	23.30	5,461.24	1,351.96	396.08	-172.63	1.15	-0.95	2.47	
5,758.00	14.08	24.76	5,552.23	1,373.52	405.68	-178.63	1.06	-0.99	1.55	
5,853.00	11.82	21.55	5,644.81	1,393.07	414.10	-183.78	2.50	-2.38	-3.38	
5,946.00	9.30	16.13	5,736.23	1,409.15	419.68	-186.70	2.91	-2.71	-5.83	
6,041.00	9.01	11.50	5,830.02	1,423.81	423.30	-187.90	0.83	-0.31	-4.87	
6,136.00	8.53	10.31	5,923.91	1,438.03	426.04	-188.31	0.54	-0.51	-1.25	
6,230.00	7.19	11.67	6,017.02	1,450.65	428.48	-188.68	1.44	-1.43	1.45	
6,324.00	5.12	11.42	6,110.47	1,460.52	430.50	-189.08	2.20	-2.20	-0.27	

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Survey										
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6,418.00	3.54	10.71	6,204.20	1,467.49	431.87	-189.31	1.68	-1.68	-0.76	
6,512.00	2.61	5.80	6,298.07	1,472.47	432.63	-189.25	1.03	-0.99	-5.22	
6,631.00	0.42	7.17	6,417.02	1,475.60	432.96	-189.07	1.84	-1.84	1.15	
6,725.00	11.83	276.25	6,510.35	1,476.99	423.39	-179.40	12.60	12.14	-96.72	
6,819.00	23.47	279.19	6,599.77	1,481.05	395.23	-150.96	12.42	12.38	3.13	
6,914.00	32.84	275.62	6,683.44	1,486.60	350.82	-106.23	10.02	9.86	-3.76	
7,008.00	41.14	271.46	6,758.47	1,489.89	294.44	-50.06	9.22	8.83	-4.43	
7,102.00	50.07	271.99	6,824.17	1,491.94	227.37	16.46	9.51	9.50	0.56	
7,196.00	57.89	272.41	6,879.40	1,494.87	151.46	91.85	8.33	8.32	0.45	
7,290.00	65.77	269.99	6,923.75	1,496.54	68.68	173.81	8.68	8.38	-2.57	
7,384.00	74.47	269.31	6,955.69	1,495.98	-19.63	260.87	9.28	9.26	-0.72	
7,479.00	82.39	269.99	6,974.72	1,495.42	-112.62	352.56	8.37	8.34	0.72	
7,573.00	83.57	268.06	6,986.21	1,493.83	-205.90	444.35	2.39	1.26	-2.05	
7,667.00	90.88	268.31	6,990.76	1,490.86	-299.68	536.42	7.78	7.78	0.27	
7,762.00	91.95	270.07	6,988.41	1,489.52	-394.63	629.91	2.17	1.13	1.85	
7,855.00	90.65	269.86	6,986.30	1,489.46	-487.61	721.66	1.42	-1.40	-0.23	
7,950.00	89.83	269.53	6,985.91	1,488.96	-582.60	815.33	0.93	-0.86	-0.35	
8,044.00	90.20	271.06	6,985.88	1,489.44	-676.60	908.17	1.67	0.39	1.63	
8,139.00	89.06	270.75	6,986.50	1,490.94	-771.58	1,002.15	1.24	-1.20	-0.33	
8,327.00	87.94	272.34	6,991.42	1,496.01	-959.44	1,188.36	1.03	-0.60	0.85	
8,422.00	88.93	273.14	6,994.01	1,500.55	-1,054.30	1,282.71	1.34	1.04	0.84	
8,516.00	90.88	273.31	6,994.17	1,505.83	-1,148.14	1,376.18	2.08	2.07	0.18	
8,610.00	90.65	272.18	6,992.91	1,510.34	-1,242.03	1,469.55	1.23	-0.24	-1.20	
8,799.00	88.21	268.86	6,994.79	1,512.05	-1,430.97	1,656.29	2.18	-1.29	-1.76	
8,894.00	89.63	267.96	6,996.58	1,509.42	-1,525.91	1,749.57	1.77	1.49	-0.95	
8,988.00	88.35	266.43	6,998.24	1,504.82	-1,619.78	1,841.46	2.12	-1.36	-1.63	
9,177.00	91.56	270.37	6,998.39	1,499.54	-1,808.64	2,027.00	2.69	1.70	2.08	
9,271.00	90.73	270.10	6,996.51	1,499.93	-1,902.62	2,119.81	0.93	-0.88	-0.29	
9,460.00	89.21	269.28	6,996.61	1,498.90	-2,091.61	2,306.15	0.91	-0.80	-0.43	
9,554.00	89.24	271.45	6,997.88	1,499.50	-2,185.60	2,399.00	2.31	0.03	2.31	
9,649.00	87.60	271.18	7,000.50	1,501.68	-2,280.53	2,493.04	1.75	-1.73	-0.28	
9,743.00	87.93	271.71	7,004.17	1,504.05	-2,374.43	2,586.09	0.66	0.35	0.56	
9,838.00	90.55	271.66	7,005.43	1,506.84	-2,469.37	2,680.24	2.76	2.76	-0.05	
9,932.00	90.85	271.73	7,004.28	1,509.62	-2,563.32	2,773.41	0.33	0.32	0.07	
10,027.00	90.03	271.00	7,003.55	1,511.89	-2,658.29	2,867.49	1.16	-0.86	-0.77	
10,121.00	92.18	271.73	7,001.74	1,514.13	-2,752.24	2,960.57	2.42	2.29	0.78	
10,216.00	89.93	269.95	6,999.99	1,515.52	-2,847.21	3,054.52	3.02	-2.37	-1.87	
10,310.00	90.27	270.32	6,999.82	1,515.74	-2,941.21	3,147.32	0.53	0.36	0.39	
10,405.00	88.86	269.58	7,000.54	1,515.66	-3,036.20	3,241.05	1.68	-1.48	-0.78	
10,499.00	89.35	269.20	7,002.01	1,514.66	-3,130.18	3,333.64	0.66	0.52	-0.40	
10,594.00	90.73	269.55	7,001.95	1,513.62	-3,225.17	3,427.22	1.50	1.45	0.37	
10,688.00	90.31	270.07	7,001.09	1,513.31	-3,319.17	3,519.93	0.71	-0.45	0.55	
10,782.00	88.63	270.81	7,001.96	1,514.03	-3,413.16	3,612.81	1.95	-1.79	0.79	

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Survey										
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10,876.00	89.18	271.06	7,003.76	1,515.56	-3,507.13	3,705.79	0.64	0.59	0.27	
10,970.00	90.65	270.41	7,003.90	1,516.77	-3,601.12	3,798.74	1.71	1.56	-0.69	
11,064.00	90.50	271.09	7,002.95	1,518.00	-3,695.10	3,891.69	0.74	-0.16	0.72	
11,158.00	91.47	271.31	7,001.34	1,519.97	-3,789.07	3,984.74	1.06	1.03	0.23	
11,253.00	90.14	270.17	7,000.00	1,521.19	-3,884.05	4,078.67	1.84	-1.40	-1.20	
11,347.00	91.73	270.25	6,998.47	1,521.54	-3,978.03	4,171.48	1.69	1.69	0.09	
11,441.00	90.57	270.08	6,996.58	1,521.81	-4,072.01	4,264.27	1.25	-1.23	-0.18	
11,535.00	88.96	270.30	6,996.97	1,522.12	-4,166.01	4,357.08	1.73	-1.71	0.23	
11,630.00	89.86	270.72	6,997.95	1,522.97	-4,261.00	4,450.96	1.05	0.95	0.44	
11,724.00	91.62	270.75	6,996.73	1,524.17	-4,354.98	4,543.91	1.87	1.87	0.03	
11,819.00	91.04	270.75	6,994.53	1,525.42	-4,449.94	4,637.83	0.61	-0.61	0.00	
11,912.00	89.05	270.06	6,994.46	1,526.07	-4,542.93	4,729.71	2.26	-2.14	-0.74	
12,007.00	89.99	270.43	6,995.25	1,526.48	-4,637.93	4,823.52	1.06	0.99	0.39	
12,102.00	89.20	269.76	6,995.92	1,526.64	-4,732.93	4,917.30	1.09	-0.83	-0.71	
12,197.00	90.16	269.19	6,996.45	1,525.77	-4,827.92	5,010.90	1.18	1.01	-0.60	
12,292.00	92.00	268.76	6,994.66	1,524.07	-4,922.88	5,104.35	1.99	1.94	-0.45	
12,388.00	91.61	269.07	6,991.64	1,522.25	-5,018.82	5,198.73	0.52	-0.41	0.32	
12,483.00	89.25	270.03	6,990.93	1,521.50	-5,113.80	5,292.35	2.68	-2.48	1.01	
12,577.00	90.34	271.19	6,991.26	1,522.50	-5,207.79	5,385.27	1.69	1.16	1.23	
12,673.00	89.77	271.39	6,991.17	1,524.67	-5,303.77	5,480.34	0.63	-0.59	0.21	
12,768.00	91.48	271.02	6,990.13	1,526.66	-5,398.74	5,574.38	1.84	1.80	-0.39	
12,863.00	90.66	270.72	6,988.36	1,528.11	-5,493.71	5,668.34	0.92	-0.86	-0.32	
12,959.00	88.75	270.65	6,988.85	1,529.25	-5,589.70	5,763.25	1.99	-1.99	-0.07	
13,054.00	89.15	271.04	6,990.60	1,530.65	-5,684.67	5,857.21	0.59	0.42	0.41	
13,149.00	90.98	271.19	6,990.49	1,532.50	-5,779.65	5,951.24	1.93	1.93	0.16	
13,244.00	89.89	271.45	6,989.77	1,534.69	-5,874.62	6,045.32	1.18	-1.15	0.27	
13,339.00	87.78	270.85	6,991.70	1,536.60	-5,969.58	6,139.33	2.31	-2.22	-0.63	
13,434.00	88.40	270.73	6,994.86	1,537.91	-6,064.51	6,233.24	0.66	0.65	-0.13	
13,529.00	91.03	271.66	6,995.34	1,539.89	-6,159.48	6,327.28	2.94	2.77	0.98	
13,624.00	89.97	271.11	6,994.51	1,542.18	-6,254.45	6,421.37	1.26	-1.12	-0.58	
13,719.00	90.88	270.98	6,993.80	1,543.92	-6,349.43	6,515.39	0.97	0.96	-0.14	
13,813.00	89.23	270.97	6,993.71	1,545.52	-6,443.41	6,608.40	1.76	-1.76	-0.01	
13,909.00	90.26	271.08	6,994.14	1,547.23	-6,539.40	6,703.40	1.08	1.07	0.11	
14,004.00	88.25	271.74	6,995.38	1,549.57	-6,634.35	6,797.49	2.23	-2.12	0.69	
14,097.00	89.10	271.90	6,997.53	1,552.52	-6,727.28	6,889.67	0.93	0.91	0.17	
14,193.00	87.53	271.10	7,000.35	1,555.03	-6,823.20	6,984.74	1.84	-1.64	-0.83	
14,287.00	88.00	270.70	7,004.01	1,556.51	-6,917.12	7,077.66	0.66	0.50	-0.43	
14,381.00	89.65	270.95	7,005.94	1,557.86	-7,011.09	7,170.62	1.78	1.76	0.27	
14,477.00	89.07	270.05	7,007.01	1,558.70	-7,107.07	7,265.48	1.12	-0.60	-0.94	
14,571.00	90.29	269.58	7,007.54	1,558.40	-7,201.07	7,358.20	1.39	1.30	-0.50	
14,665.00	89.08	270.52	7,008.06	1,558.48	-7,295.07	7,450.97	1.63	-1.29	1.00	
14,760.00	90.04	270.74	7,008.79	1,559.52	-7,390.06	7,544.89	1.04	1.01	0.23	
14,854.00	88.26	269.41	7,010.18	1,559.65	-7,484.04	7,637.66	2.36	-1.89	-1.41	
14,948.00	88.83	269.41	7,012.57	1,558.68	-7,578.00	7,730.23	0.61	0.61	0.00	

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well 3
Project:	Weld County, CO (NAD83)	TVD Reference:	RKB @ 4803.00usft (Patterson 346)
Site:	RBF	MD Reference:	RKB @ 4803.00usft (Patterson 346)
Well:	3	North Reference:	True
Wellbore:	OH / Job #61103	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 346)	Database:	Compass 5000 RMR

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)	
15,042.00	89.22	269.34	7,014.17	1,557.65	-7,671.99	7,822.81	0.42	0.41	-0.07	
15,137.00	91.84	270.47	7,013.29	1,557.50	-7,766.97	7,916.53	3.00	2.76	1.19	
15,232.00	90.50	271.05	7,011.35	1,558.76	-7,861.94	8,010.46	1.54	-1.41	0.61	
15,327.00	89.02	270.25	7,011.75	1,559.83	-7,956.93	8,104.37	1.77	-1.56	-0.84	
15,420.00	87.32	269.83	7,014.72	1,559.90	-8,049.88	8,196.11	1.88	-1.83	-0.45	
15,514.00	87.74	270.23	7,018.77	1,559.95	-8,143.79	8,288.80	0.62	0.45	0.43	
15,608.00	88.43	269.68	7,021.91	1,559.87	-8,237.74	8,381.50	0.94	0.73	-0.59	
15,795.00	91.94	270.35	7,021.30	1,559.92	-8,424.71	8,566.03	1.91	1.88	0.36	
15,889.00	90.74	270.87	7,019.11	1,560.92	-8,518.67	8,658.92	1.39	-1.28	0.55	
15,983.00	88.41	270.65	7,019.80	1,562.17	-8,612.66	8,751.88	2.49	-2.48	-0.23	
16,076.00	89.23	271.28	7,021.72	1,563.74	-8,705.62	8,843.88	1.11	0.88	0.68	
16,170.00	91.03	270.89	7,021.50	1,565.52	-8,799.60	8,936.91	1.96	1.91	-0.41	
16,263.00	90.43	271.53	7,020.32	1,567.48	-8,892.57	9,028.98	0.94	-0.65	0.69	
16,357.00	88.97	270.63	7,020.81	1,569.25	-8,986.55	9,122.01	1.82	-1.55	-0.96	
16,451.00	90.80	270.73	7,021.00	1,570.37	-9,080.54	9,214.95	1.95	1.95	0.11	
16,544.00	89.97	270.52	7,020.38	1,571.38	-9,173.53	9,306.88	0.92	-0.89	-0.23	
16,638.00	88.17	269.92	7,021.90	1,571.74	-9,267.51	9,399.69	2.02	-1.91	-0.64	
16,731.00	90.13	270.43	7,023.28	1,572.03	-9,360.50	9,491.50	2.18	2.11	0.55	
16,825.00	92.22	270.09	7,021.35	1,572.45	-9,454.47	9,584.31	2.25	2.22	-0.36	
Final Phoenix MWD Survey										
16,950.00	92.22	270.09	7,016.51	1,572.65	-9,579.38	9,707.61	0.00	0.00	0.00	
Projection to TD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,607.00	1,576.42	236.99	62.29	First Phoenix MWD Survey	
16,825.00	7,021.35	1,572.45	-9,454.47	Final Phoenix MWD Survey	
16,950.00	7,016.51	1,572.65	-9,579.38	Projection to TD	