

Extraction Oil & Gas

Weld County, CO (NAD83)

Berthoud Farms Pad KB 29

Berthoud Farms 8E-10-9N

Wellbore #1

Survey: Survey #1

Standard Survey Report

01 May, 2018

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Berthoud Farms 8E-10-9N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB=29 @ 5063.00ft
Site:	Berthoud Farms Pad KB 29	MD Reference:	KB=29 @ 5063.00ft
Well:	Berthoud Farms 8E-10-9N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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

Site		Berthoud Farms Pad KB 29				
Site Position:		Northing:	1,361,363.24	usft	Latitude:	40.324431
From:	Map	Easting:	3,128,155.77	usft	Longitude:	-105.040363
Position Uncertainty:	0.00	ft	Slot Radius:	13-3/16	Grid Convergence:	0.30 °

Well		Berthoud Farms 8E-10-9N				
Well Position	+N/-S	0.00 ft	Northing:	1,361,363.24 usft	Latitude:	40.324431
	+E/-W	0.00 ft	Easting:	3,128,155.77 usft	Longitude:	-105.040363
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	5,034.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/1/2018	8.52	66.65	52,119

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	67.63	

Survey Program	Date	5/1/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
105.00	10,595.00	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
105.00	0.40	71.84	105.00	0.11	0.35	0.37	0.38	0.38	0.00
1st MWD Survey									
200.00	0.31	4.08	200.00	0.47	0.68	0.81	0.42	-0.09	-71.33
295.00	0.62	24.47	294.99	1.20	0.91	1.30	0.36	0.33	21.46
391.00	1.14	51.45	390.98	2.27	1.87	2.60	0.68	0.54	28.10
485.00	0.79	32.91	484.97	3.39	2.96	4.03	0.49	-0.37	-19.72
581.00	2.55	24.47	580.93	5.89	4.20	6.13	1.85	1.83	-8.79
676.00	4.13	19.29	675.76	11.05	6.21	9.94	1.69	1.66	-5.45
770.00	5.14	22.27	769.45	18.14	8.92	15.15	1.10	1.07	3.17
865.00	6.11	17.53	863.99	26.90	12.06	21.39	1.13	1.02	-4.99

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Well:	Berthoud Farms 8E-10-9N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
960.00	7.47	14.54	958.33	37.70	15.13	28.34	1.48	1.43	-3.15
1,056.00	10.33	17.26	1,053.16	51.96	19.25	37.58	3.01	2.98	2.83
1,151.00	13.10	18.76	1,146.17	70.29	25.24	50.10	2.93	2.92	1.58
1,247.00	15.95	20.34	1,239.10	92.96	33.33	66.20	3.00	2.97	1.65
1,342.00	18.11	21.66	1,329.93	118.93	43.32	85.32	2.31	2.27	1.39
1,436.00	19.73	26.67	1,418.85	146.69	55.83	107.46	2.44	1.72	5.33
1,484.00	20.00	29.92	1,463.99	161.04	63.56	120.07	2.37	0.56	6.77
1,502.00	20.00	29.92	1,480.91	166.38	66.63	124.95	0.00	0.00	0.00
1,673.00	22.18	26.43	1,640.45	220.64	95.59	172.37	1.47	1.27	-2.04
1,768.00	24.70	27.66	1,727.61	254.28	112.79	201.08	2.70	2.65	1.29
1,863.00	26.12	22.24	1,813.43	291.23	129.92	230.99	2.87	1.49	-5.71
1,959.00	27.09	13.87	1,899.29	332.02	143.17	258.76	4.03	1.01	-8.72
2,054.00	25.98	11.05	1,984.28	373.45	152.34	283.01	1.77	-1.17	-2.97
2,150.00	24.61	8.45	2,071.08	413.86	159.31	304.84	1.84	-1.43	-2.71
2,246.00	25.50	9.55	2,158.05	454.01	165.67	326.01	1.05	0.93	1.15
2,341.00	24.30	8.35	2,244.22	493.52	171.91	346.81	1.37	-1.26	-1.26
2,437.00	26.51	10.96	2,330.93	534.10	178.85	368.67	2.58	2.30	2.72
2,532.00	26.60	15.37	2,415.92	575.43	188.52	393.34	2.08	0.09	4.64
2,627.00	27.80	20.26	2,500.42	616.73	201.83	421.37	2.67	1.26	5.15
2,723.00	30.89	20.26	2,584.09	660.86	218.12	453.23	3.22	3.22	0.00
2,818.00	34.20	24.45	2,664.17	708.06	237.62	489.23	4.21	3.48	4.41
2,913.00	36.01	22.46	2,741.89	758.18	259.34	528.39	2.25	1.91	-2.09
3,009.00	36.90	25.24	2,819.11	810.33	282.42	569.58	1.95	0.93	2.90
3,104.00	36.41	27.13	2,895.33	861.22	307.43	612.09	1.29	-0.52	1.99
3,199.00	33.10	24.14	2,973.37	910.00	330.91	652.36	3.92	-3.48	-3.15
3,295.00	34.11	26.96	3,053.33	957.92	353.83	691.80	1.94	1.05	2.94
3,390.00	36.59	28.15	3,130.81	1,006.63	379.27	733.86	2.71	2.61	1.25
3,486.00	37.91	28.94	3,207.23	1,057.67	407.04	778.97	1.46	1.38	0.82
3,581.00	39.11	29.95	3,281.56	1,109.18	436.13	825.47	1.43	1.26	1.06
3,677.00	36.19	28.15	3,357.57	1,160.42	464.62	871.32	3.25	-3.04	-1.88
3,772.00	37.12	30.35	3,433.78	1,209.89	492.34	915.78	1.69	0.98	2.32
3,867.00	37.12	28.77	3,509.53	1,259.75	520.62	960.91	1.00	0.00	-1.66
3,963.00	35.48	26.96	3,586.90	1,309.98	547.20	1,004.61	2.04	-1.71	-1.89
4,058.00	35.22	29.03	3,664.39	1,358.51	572.99	1,046.93	1.29	-0.27	2.18
4,153.00	35.71	26.34	3,741.77	1,407.31	598.59	1,089.17	1.72	0.52	-2.83
4,249.00	37.61	26.74	3,818.78	1,458.58	624.20	1,132.38	1.99	1.98	0.42
4,344.00	38.40	28.06	3,893.63	1,510.51	651.12	1,177.04	1.19	0.83	1.39
4,439.00	34.69	25.86	3,969.95	1,560.89	676.80	1,219.96	4.14	-3.91	-2.32
4,535.00	35.31	25.86	4,048.58	1,610.44	700.82	1,261.03	0.65	0.65	0.00
4,656.00	37.78	29.73	4,145.80	1,674.11	734.46	1,316.37	2.79	2.04	3.20
4,751.00	36.81	29.03	4,221.37	1,724.27	762.71	1,361.58	1.11	-1.02	-0.74
4,847.00	34.91	28.24	4,299.17	1,773.62	789.66	1,405.29	2.04	-1.98	-0.82
4,942.00	34.38	23.96	4,377.34	1,822.09	813.42	1,445.71	2.62	-0.56	-4.51

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,037.00	35.40	27.13	4,455.27	1,871.09	836.87	1,486.04	2.19	1.07	3.34
5,133.00	37.69	29.56	4,532.40	1,921.38	864.03	1,530.30	2.82	2.39	2.53
5,229.00	34.29	28.06	4,610.06	1,970.78	891.23	1,574.26	3.66	-3.54	-1.56
5,324.00	35.09	27.27	4,688.17	2,018.67	916.33	1,615.70	0.97	0.84	-0.83
5,420.00	37.69	33.74	4,765.48	2,067.63	945.29	1,661.11	4.83	2.71	6.74
5,515.00	38.80	46.66	4,840.21	2,112.28	983.13	1,713.09	8.49	1.17	13.60
5,610.00	41.58	61.64	4,912.94	2,147.77	1,032.65	1,772.39	10.57	2.93	15.77
5,706.00	47.81	68.34	4,981.19	2,176.07	1,093.83	1,839.74	8.13	6.49	6.98
5,801.00	57.80	69.84	5,038.55	2,202.98	1,164.45	1,915.29	10.59	10.52	1.58
5,897.00	67.39	68.73	5,082.69	2,233.13	1,244.06	2,000.38	10.04	9.99	-1.16
5,936.23	70.00	69.36	5,096.94	2,246.20	1,278.19	2,036.91	6.82	6.65	1.62
70° Inc. 5936.23 MD/5096.94 TVD 2246.2 N 1278.19 E									
5,992.00	73.71	70.23	5,114.30	2,264.49	1,327.92	2,089.86	6.82	6.66	1.55
6,085.46	76.92	83.94	5,138.10	2,284.56	1,415.80	2,178.78	14.59	3.44	14.67
Cross 460' FWL 6085.46 MD/5138.10 TV 2284.56 N 1415.80 E N: 1363655.1 E: 3129559.7									
6,087.00	76.98	84.16	5,138.45	2,284.72	1,417.30	2,180.21	14.59	3.86	14.45
6,183.00	76.80	84.33	5,160.22	2,294.09	1,510.32	2,269.81	0.25	-0.19	0.18
6,279.00	78.48	87.07	5,180.77	2,301.12	1,603.82	2,358.94	3.29	1.75	2.85
6,374.00	78.08	87.64	5,200.07	2,305.41	1,696.74	2,446.50	0.72	-0.42	0.60
6,469.00	77.69	87.46	5,220.01	2,309.38	1,789.54	2,533.83	0.45	-0.41	-0.19
6,565.00	80.29	87.46	5,238.34	2,313.56	1,883.67	2,622.46	2.71	2.71	0.00
6,660.00	80.20	86.45	5,254.44	2,318.53	1,977.17	2,710.81	1.05	-0.09	-1.06
6,756.00	80.20	90.86	5,270.79	2,320.75	2,071.71	2,799.09	4.53	0.00	4.59
6,851.00	77.11	90.46	5,289.47	2,319.68	2,164.84	2,884.80	3.28	-3.25	-0.42
6,947.00	76.58	90.94	5,311.32	2,318.53	2,258.31	2,970.80	0.74	-0.55	0.50
7,042.00	79.89	88.43	5,330.69	2,319.06	2,351.29	3,056.99	4.34	3.48	-2.64
7,138.00	81.49	90.15	5,346.22	2,320.23	2,446.02	3,145.02	2.43	1.67	1.79
7,233.00	81.40	89.75	5,360.36	2,320.31	2,539.96	3,231.93	0.43	-0.09	-0.42
7,329.00	81.31	89.93	5,374.79	2,320.57	2,634.87	3,319.79	0.21	-0.09	0.19
7,425.00	81.00	90.37	5,389.55	2,320.33	2,729.73	3,407.42	0.56	-0.32	0.46
7,520.00	79.32	89.84	5,405.78	2,320.15	2,823.32	3,493.90	1.85	-1.77	-0.56
7,616.00	79.19	90.24	5,423.68	2,320.09	2,917.64	3,581.10	0.43	-0.14	0.42
7,710.00	79.01	91.74	5,441.46	2,318.49	3,009.93	3,665.83	1.58	-0.19	1.60
7,805.00	80.91	86.36	5,458.03	2,320.06	3,103.42	3,752.88	5.92	2.00	-5.66
7,901.00	81.00	85.35	5,473.12	2,326.91	3,197.98	3,842.93	1.04	0.09	-1.05
7,997.00	79.32	86.36	5,489.53	2,333.75	3,292.31	3,932.77	2.03	-1.75	1.05
8,092.00	79.41	86.85	5,507.06	2,339.28	3,385.52	4,021.06	0.52	0.09	0.52
8,188.00	79.32	86.05	5,524.78	2,345.12	3,479.68	4,110.37	0.82	-0.09	-0.83
8,283.00	77.42	87.24	5,543.93	2,350.57	3,572.57	4,198.33	2.35	-2.00	1.25
8,379.00	76.09	89.27	5,565.92	2,353.42	3,665.96	4,285.78	2.48	-1.39	2.11
8,474.00	74.68	89.27	5,589.89	2,354.59	3,757.88	4,371.23	1.48	-1.48	0.00
8,570.00	74.42	89.27	5,615.47	2,355.77	3,850.40	4,457.24	0.27	-0.27	0.00
8,665.00	74.42	88.65	5,640.98	2,357.43	3,941.90	4,542.48	0.63	0.00	-0.65
8,761.00	77.91	88.34	5,663.94	2,359.88	4,035.07	4,629.56	3.65	3.64	-0.32

Survey Report

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Site:	Berthoud Farms Pad KB 29	MD Reference:	KB=29 @ 5063.00ft
Well:	Berthoud Farms 8E-10-9N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,856.00	80.29	87.86	5,681.90	2,362.97	4,128.29	4,716.95	2.55	2.51	-0.51
8,951.00	82.02	88.04	5,696.51	2,366.33	4,222.10	4,804.98	1.83	1.82	0.19
9,047.00	82.19	88.17	5,709.69	2,369.47	4,317.14	4,894.06	0.22	0.18	0.14
9,142.00	80.51	89.27	5,723.98	2,371.57	4,411.03	4,981.68	2.11	-1.77	1.16
9,238.00	76.01	91.25	5,743.51	2,371.16	4,504.99	5,068.41	5.10	-4.69	2.06
9,333.00	76.01	91.56	5,766.48	2,368.90	4,597.15	5,152.77	0.32	0.00	0.33
9,429.00	74.50	91.87	5,790.91	2,366.12	4,689.94	5,237.53	1.60	-1.57	0.32
9,524.00	74.02	91.16	5,816.68	2,363.71	4,781.34	5,321.13	0.88	-0.51	-0.75
9,620.00	70.00	90.77	5,846.33	2,362.16	4,872.62	5,404.95	4.21	-4.19	-0.41
9,715.00	70.31	90.24	5,878.58	2,361.38	4,961.97	5,487.28	0.62	0.33	-0.56
9,811.00	71.10	90.15	5,910.30	2,361.07	5,052.58	5,570.95	0.83	0.82	-0.09
9,906.00	68.89	89.93	5,942.79	2,361.01	5,141.84	5,653.47	2.34	-2.33	-0.23
10,002.00	68.80	89.67	5,977.44	2,361.32	5,231.37	5,736.38	0.27	-0.09	-0.27
10,098.00	68.18	90.15	6,012.64	2,361.46	5,320.68	5,819.02	0.80	-0.65	0.50
10,193.00	67.30	88.96	6,048.63	2,362.14	5,408.60	5,900.58	1.48	-0.93	-1.25
10,288.00	70.79	86.45	6,082.60	2,365.71	5,497.22	5,983.89	4.43	3.67	-2.64
10,384.00	72.60	87.64	6,112.75	2,370.41	5,588.24	6,069.84	2.22	1.89	1.24
10,479.00	72.69	87.95	6,141.09	2,373.90	5,678.84	6,154.96	0.33	0.09	0.33
Last MWD Survey 10479 MD/6141.09 TVD 2373.90 N 5678.84 E N: 1363766.5 E: 3133827.2									
10,595.00	72.69	87.95	6,175.61	2,377.86	5,789.52	6,258.81	0.00	0.00	0.00
479' FEL PTB 10595 MD/6175.61 TVD 2377.86 N 5789.52 E N: 1363771.0 E: 3133932.8									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
105.00	105.00	0.11	0.35	1st MWD Survey
5,936.23	5,096.94	2,246.20	1,278.19	70° Inc. 5936.23 MD/5096.94 TVD 2246.2 N 1278.19 E
6,085.46	5,138.10	2,284.56	1,415.80	Cross 460' FWL 6085.46 MD/5138.10 TV 2284.56 N 1415.80 E N: 1363655.1 E
10,479.00	6,141.09	2,373.90	5,678.84	Last MWD Survey 10479 MD/6141.09 TVD 2373.90 N 5678.84 E N: 1363766.5
10,595.00	6,175.61	2,377.86	5,789.52	479' FEL PTB 10595 MD/6175.61 TVD 2377.86 N 5789.52 E N: 1363771.0 E: 3

Checked By: _____	Approved By: _____	Date: _____
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