



Extraction Oil & Gas

Weld County, CO (NAD83)

MLD Pad

MLD 5

Wellbore #1

Design: Wellbore #1

Standard Survey Report

29 September, 2017





Integrity Directional Services, LLC

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well MLD 5
Project:	Weld County, CO (NAD83)	TVD Reference:	KB=25' @ 4901.00ft (P 346)
Site:	MLD Pad	MD Reference:	KB=25' @ 4901.00ft (P 346)
Well:	MLD 5	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

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	MLD Pad		
Site Position:		Northing:	1,350,393.7900 usft
From:	Map	Easting:	3,140,798.8300 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	40.294131
		Longitude:	-104.995243
		Grid Convergence:	0.33 °

Well	MLD 5		
Well Position	+N/-S	0.00 ft	Northing: 1,353,976.2000 usft
	+E/-W	0.00 ft	Easting: 3,140,465.2200 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	40.303970
		Longitude:	-104.996366
		Ground Level:	4,876.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/15/2017	8.60	66.68	52,219

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	103.65	

Survey Program	Date 9/29/2017				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
983.00	1,550.00	Surface Surveys (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,652.00	11,540.00	MWD Surveys (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	
983.00	1.01	201.60	982.95	-8.06	-3.19	-1.20	0.10	0.10	0.00	
1,079.00	1.10	312.43	1,078.94	-8.22	-4.18	-2.12	1.81	0.09	115.45	
1,175.00	2.20	324.21	1,174.90	-6.10	-5.94	-4.33	1.19	1.15	12.27	
1,270.00	1.09	291.42	1,269.86	-4.29	-7.85	-6.61	1.49	-1.17	-34.52	
1,366.00	1.05	264.36	1,365.84	-4.05	-9.57	-8.35	0.52	-0.04	-28.19	
1,460.00	0.66	230.96	1,459.83	-4.47	-10.85	-9.49	0.66	-0.41	-35.53	
1,550.00	0.48	40.23	1,549.83	-4.51	-11.01	-9.63	1.26	-0.20	188.08	
1,652.00	1.28	33.50	1,651.82	-3.24	-10.10	-9.05	0.79	0.78	-6.60	
First MWD Survey										

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Well:	MLD 5	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

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)
1,746.00	1.50	262.69	1,745.81	-2.52	-10.74	-9.85	2.69	0.23	-139.16
1,840.00	4.60	234.40	1,839.67	-4.87	-15.03	-13.46	3.57	3.30	-30.10
1,934.00	8.09	229.51	1,933.08	-11.36	-23.13	-19.79	3.75	3.71	-5.20
2,028.00	9.99	230.21	2,025.91	-20.87	-34.43	-28.53	2.02	2.02	0.74
2,123.00	12.11	223.52	2,119.14	-33.37	-47.62	-38.40	2.60	2.23	-7.04
2,217.00	13.21	210.12	2,210.88	-49.82	-59.80	-46.36	3.33	1.17	-14.26
2,311.00	13.92	211.09	2,302.25	-68.79	-71.03	-52.79	0.79	0.76	1.03
2,405.00	14.32	214.88	2,393.41	-88.01	-83.52	-60.39	1.07	0.43	4.03
2,500.00	16.39	209.90	2,485.02	-109.27	-96.92	-68.40	2.58	2.18	-5.24
2,594.00	18.38	211.09	2,574.72	-133.46	-111.19	-76.55	2.15	2.12	1.27
2,689.00	20.11	209.19	2,664.41	-160.55	-126.89	-85.41	1.94	1.82	-2.00
2,783.00	21.92	213.12	2,752.16	-189.35	-144.36	-95.59	2.44	1.93	4.18
2,877.00	23.29	214.70	2,838.94	-219.33	-164.52	-108.12	1.59	1.46	1.68
2,972.00	24.79	219.29	2,925.70	-250.19	-187.83	-123.48	2.52	1.58	4.83
3,066.00	26.60	216.29	3,010.41	-282.41	-212.77	-140.11	2.37	1.93	-3.19
3,161.00	29.21	215.72	3,094.36	-318.38	-238.89	-157.01	2.76	2.75	-0.60
3,256.00	29.21	214.00	3,177.28	-356.41	-265.39	-173.78	0.88	0.00	-1.81
3,350.00	31.02	215.10	3,258.59	-395.25	-292.15	-190.62	2.01	1.93	1.17
3,444.00	29.12	215.01	3,339.93	-433.80	-319.20	-207.81	2.02	-2.02	-0.10
3,539.00	27.31	218.80	3,423.65	-469.73	-346.12	-225.49	2.68	-1.91	3.99
3,633.00	28.90	221.62	3,506.56	-503.52	-374.72	-245.31	2.20	1.69	3.00
3,728.00	30.58	222.90	3,589.05	-538.38	-406.42	-267.89	1.89	1.77	1.35
3,822.00	33.19	220.70	3,668.86	-575.41	-439.48	-291.28	3.04	2.78	-2.34
3,916.00	31.90	220.39	3,748.10	-613.83	-472.36	-314.15	1.38	-1.37	-0.33
4,010.00	31.60	215.72	3,828.04	-652.75	-502.83	-334.59	2.63	-0.32	-4.97
4,105.00	29.92	215.01	3,909.68	-692.37	-530.96	-352.57	1.81	-1.77	-0.75
4,199.00	28.19	214.79	3,991.84	-729.81	-557.08	-369.12	1.84	-1.84	-0.23
4,293.00	27.49	214.70	4,074.96	-765.88	-582.10	-384.92	0.75	-0.74	-0.10
4,387.00	25.50	213.65	4,159.09	-800.56	-605.66	-399.63	2.17	-2.12	-1.12
4,482.00	22.09	215.10	4,246.00	-832.21	-627.27	-413.16	3.64	-3.59	1.53
4,576.00	22.80	214.31	4,332.88	-861.71	-647.70	-426.05	0.82	0.76	-0.84
4,671.00	23.20	212.90	4,420.33	-892.63	-668.24	-438.71	0.72	0.42	-1.48
4,765.00	20.42	214.09	4,507.59	-921.76	-687.49	-450.55	2.99	-2.96	1.27
4,859.00	19.40	215.50	4,595.97	-948.05	-705.75	-462.09	1.20	-1.09	1.50
4,954.00	17.19	217.61	4,686.16	-972.02	-723.48	-473.66	2.43	-2.33	2.22
5,048.00	14.32	220.61	4,776.62	-991.85	-739.53	-484.57	3.17	-3.05	3.19
5,142.00	13.79	216.99	4,867.81	-1,009.63	-753.84	-494.28	1.09	-0.56	-3.85
5,236.00	13.08	218.01	4,959.24	-1,026.96	-767.13	-503.11	0.80	-0.76	1.09
5,329.00	11.18	224.62	5,050.16	-1,041.67	-779.94	-512.09	2.53	-2.04	7.11
5,423.00	9.99	215.72	5,142.57	-1,054.77	-791.10	-519.84	2.15	-1.27	-9.47
5,518.00	7.91	219.29	5,236.41	-1,066.52	-800.06	-525.77	2.27	-2.19	3.76
5,612.00	6.01	206.90	5,329.71	-1,075.92	-806.38	-529.70	2.57	-2.02	-13.18
5,706.00	3.71	211.40	5,423.37	-1,082.91	-810.19	-531.75	2.48	-2.45	4.79

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Well:	MLD 5	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

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)
5,801.00	1.50	233.92	5,518.27	-1,086.26	-812.80	-533.49	2.52	-2.33	23.71
5,894.00	0.88	294.29	5,611.25	-1,086.69	-814.43	-534.98	1.41	-0.67	64.91
5,988.00	1.28	284.90	5,705.23	-1,086.12	-816.10	-536.74	0.46	0.43	-9.99
6,082.00	3.00	300.50	5,799.17	-1,084.60	-819.24	-540.14	1.92	1.83	16.60
6,199.00	1.02	153.01	5,916.12	-1,083.97	-821.41	-542.40	3.33	-1.69	-126.06
6,293.00	11.00	103.39	6,009.51	-1,086.80	-812.28	-532.86	11.03	10.62	-52.79
6,386.00	18.52	92.11	6,099.39	-1,089.41	-788.85	-509.48	8.62	8.09	-12.13
6,480.00	25.32	88.80	6,186.55	-1,089.54	-753.79	-475.38	7.35	7.23	-3.52
6,574.00	34.20	89.60	6,268.07	-1,088.93	-707.18	-430.23	9.46	9.45	0.85
6,668.00	41.71	91.58	6,342.14	-1,089.61	-649.42	-373.94	8.09	7.99	2.11
6,762.00	50.29	89.60	6,407.38	-1,090.22	-581.87	-308.16	9.25	9.13	-2.11
6,855.00	59.08	88.19	6,461.09	-1,088.71	-506.08	-234.86	9.53	9.45	-1.52
6,949.00	65.18	88.41	6,505.01	-1,086.25	-423.06	-154.77	6.49	6.49	0.23
7,044.00	71.41	89.20	6,540.12	-1,084.42	-334.86	-69.49	6.60	6.56	0.83
7,138.00	76.98	88.89	6,565.72	-1,082.91	-244.46	18.00	5.93	5.93	-0.33
7,169.63	80.01	89.16	6,572.02	-1,082.38	-213.47	47.99	9.61	9.58	0.85
Hardline Crossing @ 7169.63 'MD / 47.99'VS (1882' FNL & 460' FWL)									
7,233.00	86.08	89.68	6,579.69	-1,081.75	-150.60	108.93	9.61	9.58	0.82
7,327.00	87.98	89.60	6,584.56	-1,081.16	-56.74	200.01	2.02	2.02	-0.09
7,419.00	87.98	88.19	6,587.81	-1,079.38	35.19	288.92	1.53	0.00	-1.53
7,513.00	87.50	89.11	6,591.51	-1,077.17	129.09	379.64	1.10	-0.51	0.98
7,608.00	85.29	90.21	6,597.49	-1,076.61	223.89	471.64	2.60	-2.33	1.16
7,702.00	85.51	89.99	6,605.03	-1,076.77	317.59	562.72	0.33	0.23	-0.23
7,796.00	85.82	89.60	6,612.13	-1,076.43	411.32	653.73	0.53	0.33	-0.41
7,891.00	85.51	88.19	6,619.31	-1,074.61	506.03	745.33	1.52	-0.33	-1.48
7,985.00	87.19	88.10	6,625.30	-1,071.57	599.78	835.72	1.79	1.79	-0.10
8,079.00	88.29	89.90	6,629.00	-1,069.93	693.69	926.59	2.24	1.17	1.91
8,173.00	86.08	91.18	6,633.62	-1,070.82	787.56	1,018.02	2.72	-2.35	1.36
8,267.00	86.48	90.39	6,639.72	-1,072.10	881.36	1,109.47	0.94	0.43	-0.84
8,361.00	85.02	88.32	6,646.69	-1,071.05	975.08	1,200.30	2.69	-1.55	-2.20
8,455.00	84.89	87.70	6,654.95	-1,067.80	1,068.66	1,290.47	0.67	-0.14	-0.66
8,550.00	86.08	87.61	6,662.43	-1,063.92	1,163.29	1,381.51	1.26	1.25	-0.09
8,644.00	86.70	87.61	6,668.35	-1,060.01	1,257.02	1,471.67	0.66	0.66	0.00
8,738.00	88.38	88.01	6,672.38	-1,056.42	1,350.86	1,562.01	1.84	1.79	0.43
8,833.00	86.92	87.22	6,676.28	-1,052.47	1,445.70	1,653.23	1.75	-1.54	-0.83
8,927.00	87.50	87.22	6,680.85	-1,047.92	1,539.47	1,743.29	0.62	0.62	0.00
9,021.00	86.92	88.89	6,685.43	-1,044.73	1,633.30	1,833.72	1.88	-0.62	1.78
9,115.00	88.51	90.30	6,689.18	-1,044.07	1,727.22	1,924.83	2.26	1.69	1.50
9,209.00	85.02	89.11	6,694.48	-1,043.59	1,821.05	2,015.89	3.92	-3.71	-1.27
9,304.00	84.71	89.11	6,702.98	-1,042.12	1,915.66	2,107.48	0.33	-0.33	0.00
9,398.00	87.58	88.98	6,709.30	-1,040.55	2,009.43	2,198.23	3.06	3.05	-0.14
9,493.00	87.72	88.58	6,713.20	-1,038.53	2,104.32	2,289.97	0.45	0.15	-0.42
9,586.00	86.79	88.19	6,717.65	-1,035.91	2,197.18	2,379.59	1.08	-1.00	-0.42
9,681.00	87.32	88.01	6,722.53	-1,032.77	2,292.00	2,470.99	0.59	0.56	-0.19

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Well:	MLD 5	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

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)
9,775.00	85.51	88.32	6,728.41	-1,029.76	2,385.76	2,561.39	1.95	-1.93	0.33
9,869.00	86.79	89.20	6,734.72	-1,027.74	2,479.53	2,652.03	1.65	1.36	0.94
9,963.00	88.38	90.52	6,738.68	-1,027.51	2,573.44	2,743.23	2.20	1.69	1.40
10,057.00	87.50	90.39	6,742.06	-1,028.25	2,667.37	2,834.69	0.95	-0.94	-0.14
10,151.00	88.82	90.92	6,745.08	-1,029.33	2,761.32	2,926.24	1.51	1.40	0.56
10,245.00	88.69	90.21	6,747.12	-1,030.25	2,855.29	3,017.77	0.77	-0.14	-0.76
10,340.00	86.39	88.41	6,751.20	-1,029.11	2,950.19	3,109.72	3.07	-2.42	-1.89
10,434.00	86.08	88.32	6,757.37	-1,026.44	3,043.94	3,200.20	0.34	-0.33	-0.10
10,528.00	86.79	88.41	6,763.22	-1,023.76	3,137.72	3,290.70	0.76	0.76	0.10
10,623.00	85.59	89.42	6,769.53	-1,021.96	3,232.49	3,382.37	1.65	-1.26	1.06
10,717.00	85.68	90.08	6,776.69	-1,021.55	3,326.22	3,473.35	0.71	0.10	0.70
10,811.00	84.89	90.92	6,784.41	-1,022.37	3,419.90	3,564.57	1.22	-0.84	0.89
10,906.00	86.21	91.40	6,791.78	-1,024.29	3,514.59	3,657.04	1.48	1.39	0.51
11,000.00	84.09	90.30	6,799.73	-1,025.68	3,608.23	3,748.37	2.54	-2.26	-1.17
11,094.00	84.40	90.39	6,809.16	-1,026.24	3,701.76	3,839.39	0.34	0.33	0.10
11,188.00	85.51	90.79	6,817.42	-1,027.21	3,795.39	3,930.60	1.25	1.18	0.43
11,283.00	84.09	89.51	6,826.03	-1,027.46	3,889.99	4,022.59	2.01	-1.49	-1.35
11,471.00	85.29	90.21	6,843.43	-1,027.00	4,077.18	4,204.38	0.74	0.64	0.37
Final MWD Survey									
11,540.00	85.29	90.21	6,849.10	-1,027.25	4,145.95	4,271.27	0.00	0.00	0.00
PTD @ 11540'MD / 4271.27' VS (1906' FNL & 498' FEL)									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,652.00	1,651.82	-3.24	-10.10	First MWD Survey
7,169.63	6,572.02	-1,082.38	-213.47	Hardline Crossing @ 7169.63 'MD / 47.99'VS (1882' FNL & 460' FWL)
11,471.00	6,843.43	-1,027.00	4,077.18	Final MWD Survey
11,540.00	6,849.10	-1,027.25	4,145.95	PTD @ 11540'MD / 4271.27' VS (1906' FNL & 498' FEL)

Checked By: _____	Approved By: _____	Date: _____
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