



# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**MLD Pad**

**MLD 4**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**06 September, 2017**





# Integrity Directional Services, LLC

## Survey Report



<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well MLD 4
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25' @ 4901.00ft (P 346)
<b>Site:</b>	MLD Pad	<b>MD Reference:</b>	KB=25' @ 4901.00ft (P 346)
<b>Well:</b>	MLD 4	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Multi User Db

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

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

<b>Well</b>	MLD 4		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b> 1,353,975.9800 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b> 3,140,493.1100 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft
		<b>Latitude:</b>	40.303969
		<b>Longitude:</b>	-104.996266
		<b>Ground Level:</b>	4,876.00 ft

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

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	107.82	

<b>Survey Program</b>	<b>Date</b>	9/6/2017			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
696.50	1,531.50	Surface Surveys (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,652.00	11,570.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
696.50	0.83	253.02	696.48	-1.47	-4.82	-4.14	0.12	0.12	0.00	
792.50	0.79	256.53	792.47	-1.83	-6.13	-5.28	0.07	-0.04	3.66	
887.50	1.32	257.41	887.45	-2.22	-7.84	-6.78	0.56	0.56	0.93	
983.50	0.83	191.58	983.44	-3.14	-9.06	-7.66	1.29	-0.51	-68.57	
1,079.50	0.88	222.52	1,079.43	-4.37	-9.69	-7.89	0.48	0.05	32.23	
1,175.50	0.26	162.84	1,175.42	-5.12	-10.13	-8.08	0.81	-0.65	-62.17	
1,270.50	0.88	183.76	1,270.42	-6.05	-10.11	-7.78	0.68	0.65	22.02	
1,366.50	0.66	114.77	1,366.41	-7.02	-9.66	-7.05	0.93	-0.23	-71.86	
1,460.50	0.31	13.34	1,460.41	-7.00	-9.11	-6.53	0.83	-0.37	-107.90	

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well MLD 4
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<b>Site:</b>	MLD Pad	<b>MD Reference:</b>	KB=25' @ 4901.00ft (P 346)
<b>Well:</b>	MLD 4	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
1,531.50	0.44	12.72	1,531.40	-6.55	-9.00	-6.57	0.18	0.18	-0.87
1,652.00	0.62	296.71	1,651.90	-5.80	-9.49	-7.25	0.55	0.15	-63.08
<b>First MWD Survey @ 1652'MD</b>									
1,746.00	3.31	245.99	1,745.84	-6.68	-12.42	-9.78	3.15	2.86	-53.96
1,841.00	6.41	239.20	1,840.49	-10.51	-19.48	-15.33	3.31	3.26	-7.15
1,935.00	9.50	227.70	1,933.58	-18.42	-29.73	-22.67	3.68	3.29	-12.23
2,029.00	11.62	210.21	2,026.00	-31.83	-40.23	-28.56	4.06	2.26	-18.61
2,123.00	13.79	198.79	2,117.71	-50.62	-48.61	-30.79	3.52	2.31	-12.15
2,217.00	16.08	199.19	2,208.53	-73.52	-56.50	-31.29	2.44	2.44	0.43
2,311.00	17.01	200.12	2,298.64	-98.73	-65.51	-32.15	1.03	0.99	0.99
2,406.00	18.29	202.50	2,389.17	-125.55	-75.99	-33.93	1.55	1.35	2.51
2,500.00	19.71	202.89	2,478.04	-153.78	-87.80	-36.53	1.52	1.51	0.41
2,594.00	21.70	209.68	2,565.98	-183.49	-102.58	-41.50	3.31	2.12	7.22
2,689.00	22.80	215.19	2,653.91	-213.80	-121.88	-50.61	2.48	1.16	5.80
2,783.00	23.82	215.58	2,740.24	-244.12	-143.42	-61.84	1.10	1.09	0.41
2,878.00	26.60	211.79	2,826.19	-277.81	-165.80	-72.83	3.38	2.93	-3.99
2,972.00	28.59	208.31	2,909.50	-315.50	-187.55	-82.01	2.72	2.12	-3.70
3,067.00	30.71	209.81	2,992.05	-356.57	-210.39	-91.19	2.36	2.23	1.58
3,162.00	33.19	207.39	3,072.66	-400.71	-234.42	-100.55	2.94	2.61	-2.55
3,256.00	33.19	205.58	3,151.33	-446.77	-257.37	-108.30	1.05	0.00	-1.93
3,350.00	34.91	205.80	3,229.21	-494.19	-280.18	-115.51	1.83	1.83	0.23
3,444.00	33.58	205.10	3,306.91	-541.95	-302.92	-122.54	1.48	-1.41	-0.74
3,539.00	32.30	207.78	3,386.64	-588.20	-325.89	-130.26	2.04	-1.35	2.82
3,633.00	31.82	209.02	3,466.31	-632.09	-349.62	-139.42	0.87	-0.51	1.32
3,728.00	32.21	209.90	3,546.86	-675.94	-374.39	-149.59	0.64	0.41	0.93
3,822.00	32.92	212.50	3,626.08	-719.21	-400.61	-161.30	1.67	0.76	2.77
3,916.00	35.40	211.88	3,703.86	-763.88	-428.71	-174.39	2.66	2.64	-0.66
4,011.00	33.19	211.71	3,782.34	-809.37	-456.92	-187.32	2.33	-2.33	-0.18
4,105.00	34.20	210.69	3,860.55	-853.97	-483.93	-199.38	1.23	1.07	-1.09
4,199.00	34.29	209.42	3,938.25	-899.76	-510.42	-210.59	0.77	0.10	-1.35
4,387.00	34.20	206.20	4,093.67	-993.30	-559.76	-228.95	0.96	-0.05	-1.71
4,482.00	32.21	205.18	4,173.16	-1,040.17	-582.32	-236.08	2.18	-2.09	-1.07
4,576.00	31.99	206.11	4,252.79	-1,085.21	-603.94	-242.88	0.58	-0.23	0.99
4,671.00	28.81	205.40	4,334.72	-1,128.49	-624.84	-249.53	3.37	-3.35	-0.75
4,765.00	27.09	208.62	4,417.75	-1,167.74	-644.81	-256.53	2.43	-1.83	3.43
4,859.00	24.39	208.00	4,502.42	-1,203.68	-664.18	-263.98	2.89	-2.87	-0.66
4,954.00	21.39	211.22	4,589.93	-1,235.82	-682.37	-271.46	3.42	-3.16	3.39
5,048.00	21.21	212.72	4,677.51	-1,264.78	-700.45	-279.81	0.61	-0.19	1.60
5,142.00	17.81	214.09	4,766.10	-1,291.00	-717.70	-288.21	3.65	-3.62	1.46
5,236.00	16.79	213.29	4,855.85	-1,314.26	-733.21	-295.86	1.11	-1.09	-0.85
5,329.00	14.18	217.48	4,945.47	-1,334.53	-747.52	-303.28	3.05	-2.81	4.51
5,423.00	12.68	211.79	5,036.90	-1,352.44	-759.96	-309.64	2.12	-1.60	-6.05
5,518.00	9.90	211.79	5,130.05	-1,368.24	-769.76	-314.13	2.93	-2.93	0.00

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Survey									
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5,612.00	7.51	205.71	5,222.96	-1,380.65	-776.68	-316.92	2.72	-2.54	-6.47
5,706.00	5.48	225.72	5,316.36	-1,389.32	-782.56	-319.87	3.20	-2.16	21.29
5,801.00	3.40	219.42	5,411.08	-1,394.66	-787.59	-323.03	2.25	-2.19	-6.63
5,894.00	1.02	257.32	5,504.00	-1,396.98	-790.15	-324.76	2.87	-2.56	40.75
5,988.00	2.70	299.31	5,597.95	-1,396.07	-792.90	-327.65	2.19	1.79	44.67
6,082.00	1.28	307.91	5,691.89	-1,394.35	-795.66	-330.80	1.54	-1.51	9.15
6,176.00	1.81	312.09	5,785.86	-1,392.71	-797.59	-333.14	0.58	0.56	4.45
6,270.00	0.88	14.02	5,879.84	-1,391.01	-798.52	-334.55	1.70	-0.99	65.88
6,363.00	12.02	100.30	5,972.15	-1,392.05	-788.78	-324.96	12.90	11.98	92.77
6,457.00	20.02	85.72	6,062.46	-1,392.60	-763.05	-300.30	9.46	8.51	-15.51
6,551.00	26.29	84.09	6,148.85	-1,389.26	-726.26	-266.30	6.70	6.67	-1.73
6,645.00	36.90	89.51	6,228.81	-1,386.86	-677.19	-220.31	11.67	11.29	5.77
6,739.00	43.08	89.90	6,300.80	-1,386.57	-616.81	-162.92	6.58	6.57	0.41
6,832.00	54.62	90.52	6,361.89	-1,386.86	-546.90	-96.27	12.42	12.41	0.67
6,926.00	57.40	89.60	6,414.44	-1,386.93	-468.97	-22.06	3.07	2.96	-0.98
7,020.00	63.81	91.80	6,460.56	-1,387.98	-387.13	56.18	7.12	6.82	2.34
7,114.00	70.61	93.30	6,496.95	-1,391.86	-300.61	139.74	7.38	7.23	1.60
7,177.66	76.09	93.18	6,515.18	-1,395.30	-239.74	198.74	8.62	8.61	-0.19
Hardline Crossing @ 7177.66'MD / 198.74'VS (2195.8' FNL & 460' FWL)									
7,210.00	78.88	93.12	6,522.19	-1,397.04	-208.22	229.28	8.62	8.61	-0.18
7,304.00	86.39	90.30	6,534.23	-1,399.80	-115.11	318.76	8.52	7.99	-3.00
7,396.00	90.99	89.99	6,536.33	-1,400.03	-23.16	406.38	5.01	5.00	-0.34
7,490.00	90.19	89.29	6,535.36	-1,399.44	70.83	495.68	1.13	-0.85	-0.74
7,585.00	90.10	89.11	6,535.12	-1,398.11	165.82	585.71	0.21	-0.09	-0.19
7,679.00	90.50	88.89	6,534.63	-1,396.47	259.81	674.68	0.49	0.43	-0.23
7,773.00	91.21	88.71	6,533.23	-1,394.50	353.77	763.54	0.78	0.76	-0.19
7,868.00	89.70	88.32	6,532.47	-1,392.04	448.74	853.19	1.64	-1.59	-0.41
7,962.00	88.82	88.41	6,533.69	-1,389.36	542.69	941.82	0.94	-0.94	0.10
8,056.00	89.00	88.19	6,535.48	-1,386.57	636.63	1,030.40	0.30	0.19	-0.23
8,150.00	87.58	87.70	6,538.28	-1,383.20	730.53	1,118.76	1.60	-1.51	-0.52
8,244.00	87.32	88.10	6,542.46	-1,379.76	824.37	1,207.05	0.51	-0.28	0.43
8,338.00	87.50	86.38	6,546.71	-1,375.24	918.16	1,294.95	1.84	0.19	-1.83
8,432.00	86.92	88.41	6,551.29	-1,370.97	1,011.95	1,382.94	2.24	-0.62	2.16
8,526.00	87.32	88.49	6,556.01	-1,368.43	1,105.79	1,471.50	0.43	0.43	0.09
8,621.00	87.41	91.18	6,560.38	-1,368.16	1,200.68	1,561.76	2.83	0.09	2.83
8,715.00	86.30	91.09	6,565.54	-1,370.02	1,294.52	1,651.66	1.18	-1.18	-0.10
8,809.00	86.79	91.31	6,571.20	-1,371.98	1,388.33	1,741.57	0.57	0.52	0.23
8,904.00	86.48	90.70	6,576.78	-1,373.65	1,483.15	1,832.35	0.72	-0.33	-0.64
8,998.00	86.70	91.71	6,582.37	-1,375.62	1,576.96	1,922.27	1.10	0.23	1.07
9,092.00	87.50	90.08	6,587.12	-1,377.09	1,670.83	2,012.08	1.93	0.85	-1.73
9,186.00	86.79	89.51	6,591.81	-1,376.75	1,764.71	2,101.35	0.97	-0.76	-0.61
9,281.00	86.61	88.41	6,597.27	-1,375.03	1,859.54	2,191.10	1.17	-0.19	-1.16
9,375.00	86.21	87.39	6,603.16	-1,371.59	1,953.29	2,279.31	1.16	-0.43	-1.09
9,469.00	85.82	86.69	6,609.69	-1,366.75	2,046.93	2,366.98	0.85	-0.41	-0.74

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9,563.00	85.20	87.79	6,617.05	-1,362.24	2,140.53	2,454.71	1.34	-0.66	1.17
9,681.00	85.99	89.29	6,626.12	-1,359.24	2,258.14	2,565.76	1.43	0.67	1.27
9,775.00	85.90	88.89	6,632.76	-1,357.75	2,351.90	2,654.56	0.44	-0.10	-0.43
9,869.00	85.42	88.10	6,639.88	-1,355.29	2,445.59	2,743.01	0.98	-0.51	-0.84
9,963.00	83.78	89.29	6,648.72	-1,353.16	2,539.15	2,831.42	2.15	-1.74	1.27
10,057.00	82.99	88.58	6,659.55	-1,351.42	2,632.50	2,919.77	1.13	-0.84	-0.76
10,151.00	82.50	87.48	6,671.42	-1,348.22	2,725.69	3,007.51	1.27	-0.52	-1.17
10,246.00	81.00	89.60	6,685.06	-1,345.82	2,819.67	3,096.24	2.71	-1.58	2.23
10,340.00	80.12	89.68	6,700.47	-1,345.24	2,912.40	3,184.34	0.94	-0.94	0.09
10,434.00	79.40	89.60	6,717.18	-1,344.65	3,004.90	3,272.22	0.77	-0.77	-0.09
10,528.00	81.00	90.21	6,733.18	-1,344.50	3,097.52	3,360.36	1.82	1.70	0.65
10,624.00	80.60	89.82	6,748.53	-1,344.53	3,192.29	3,450.59	0.58	-0.42	-0.41
10,718.00	79.59	89.90	6,764.70	-1,344.30	3,284.88	3,538.67	1.08	-1.07	0.09
10,811.00	81.09	89.90	6,780.31	-1,344.14	3,376.56	3,625.90	1.61	1.61	0.00
10,906.00	81.40	89.60	6,794.77	-1,343.73	3,470.45	3,715.17	0.45	0.33	-0.32
11,000.00	81.40	87.70	6,808.82	-1,341.54	3,563.37	3,802.95	2.00	0.00	-2.02
11,094.00	80.60	88.49	6,823.53	-1,338.45	3,656.16	3,890.35	1.19	-0.85	0.84
11,189.00	78.88	89.90	6,840.45	-1,337.14	3,749.62	3,978.92	2.33	-1.81	1.48
11,283.00	77.51	89.11	6,859.68	-1,336.35	3,841.63	4,066.27	1.67	-1.46	-0.84
11,471.00	78.88	88.71	6,898.14	-1,332.84	4,025.61	4,240.36	0.76	0.73	-0.21
Final MWD Survey @ 11471'MD									
11,570.00	78.88	88.71	6,917.23	-1,330.66	4,122.73	4,332.15	0.00	0.00	0.00
PTD @ 11570'MD / 4332.15'VS (2211' FNL & 493.6' FEL)									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,652.00	1,651.90	-5.80	-9.49	First MWD Survey @ 1652'MD
7,177.66	6,515.18	-1,395.30	-239.74	Hardline Crossing @ 7177.66'MD / 198.74'VS (2195.8' FNL & 460' FW)
11,471.00	6,898.14	-1,332.84	4,025.61	Final MWD Survey @ 11471'MD
11,570.00	6,917.23	-1,330.66	4,122.73	PTD @ 11570'MD / 4332.15'VS (2211' FNL & 493.6' FEL)

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_