

# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**Sec 07-T01S-R68W Livingston Pad**

**Livingston S19-25-04N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**07 August, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-04N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-04N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single 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		

Site		Sec 07-T01S-R68W Livingston Pad						
Site Position:		Northing:	1,238,290.24	usft	Latitude:	39.986624		
From:	Lat/Long	Easting:	3,125,301.58	usft	Longitude:	-105.052826		
Position Uncertainty:	0.00	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.29	°

Well		Livingston S19-25-04N				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.35 usft	Latitude:	39.978563
	+E/-W	0.00 usft	Easting:	3,128,930.48 usft	Longitude:	-105.039929
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,318.40 usft

<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>
	IGRF2015	6/28/2019	8.10	66.42	51,868.58182866

<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	190.68	

<b>Survey Program</b>	<b>Date</b>	8/7/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.00	1,590.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,667.00	21,250.00	Atlas MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</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	
143.00	0.92	173.78	142.99	-1.14	0.12	1.10	0.64	0.64	0.00	
230.00	0.92	193.74	229.98	-2.51	0.03	2.46	0.37	0.00	22.94	
317.00	0.44	28.32	316.98	-2.90	0.03	2.84	1.55	-0.55	-190.14	
405.00	0.48	32.90	404.98	-2.29	0.39	2.18	0.06	0.05	5.20	
492.00	0.92	273.36	491.97	-1.94	-0.11	1.93	1.41	0.51	-137.40	
579.00	2.98	283.21	578.92	-1.39	-3.01	1.92	2.39	2.37	11.32	
666.00	4.88	288.57	665.71	0.31	-8.72	1.31	2.22	2.18	6.16	
754.00	7.47	291.82	753.19	3.63	-17.58	-0.31	2.97	2.94	3.69	
841.00	8.83	292.17	839.31	8.25	-29.02	-2.73	1.56	1.56	0.40	

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<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-04N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

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)
928.00	11.51	289.01	924.94	13.60	-43.41	-5.32	3.15	3.08	-3.63
1,016.00	12.88	289.62	1,010.95	19.75	-60.95	-8.12	1.56	1.56	0.69
1,103.00	13.58	288.22	1,095.64	26.20	-79.78	-10.97	0.88	0.80	-1.61
1,190.00	14.19	284.44	1,180.10	32.05	-99.81	-13.01	1.26	0.70	-4.34
1,277.00	16.44	286.55	1,264.01	38.22	-121.94	-14.97	2.66	2.59	2.43
1,365.00	18.10	286.55	1,348.04	45.66	-146.99	-17.64	1.89	1.89	0.00
1,452.00	20.26	285.05	1,430.20	53.42	-174.49	-20.17	2.55	2.48	-1.72
1,539.00	22.68	286.55	1,511.16	62.11	-205.12	-23.04	2.85	2.78	1.72
1,590.00	22.63	287.69	1,558.22	67.90	-223.89	-25.24	0.87	-0.10	2.24
Tie into Surface Surveys									
1,667.00	22.93	288.72	1,629.22	77.21	-252.21	-29.15	0.65	0.39	1.34
First MWD Survey @ 1667' MD									
1,762.00	21.56	287.05	1,717.15	88.27	-286.43	-33.67	1.59	-1.44	-1.76
1,858.00	25.10	284.89	1,805.29	98.68	-322.98	-37.13	3.79	3.69	-2.25
1,953.00	24.35	282.55	1,891.58	108.11	-361.58	-39.25	1.30	-0.79	-2.46
2,048.00	23.16	280.26	1,978.53	115.69	-399.08	-39.75	1.58	-1.25	-2.41
2,143.00	24.04	285.77	2,065.59	124.28	-436.09	-41.34	2.50	0.93	5.80
2,238.00	21.92	282.99	2,153.05	133.53	-471.99	-43.77	2.51	-2.23	-2.93
2,332.00	22.76	294.89	2,240.04	145.13	-505.60	-48.95	4.89	0.89	12.66
2,426.00	21.39	294.49	2,327.15	159.89	-537.70	-57.50	1.47	-1.46	-0.43
2,521.00	19.75	291.89	2,416.09	173.06	-568.36	-64.76	1.98	-1.73	-2.74
2,616.00	22.23	292.29	2,504.78	185.86	-599.89	-71.50	2.61	2.61	0.42
2,712.00	20.15	291.63	2,594.28	198.84	-632.06	-78.30	2.18	-2.17	-0.69
2,806.00	22.98	287.66	2,681.70	210.38	-664.61	-83.61	3.39	3.01	-4.22
2,900.00	21.26	286.21	2,768.78	220.71	-698.46	-87.48	1.92	-1.83	-1.54
2,996.00	24.53	290.26	2,857.21	232.47	-733.88	-92.48	3.78	3.41	4.22
3,091.00	22.36	289.73	2,944.36	245.40	-769.39	-98.61	2.29	-2.28	-0.56
3,187.00	22.76	286.83	3,033.02	256.94	-804.36	-103.47	1.23	0.42	-3.02
3,282.00	20.24	287.27	3,121.40	267.14	-837.64	-107.33	2.66	-2.65	0.46
3,377.00	22.40	285.37	3,209.89	276.82	-870.79	-110.69	2.39	2.27	-2.00
3,472.00	24.39	286.78	3,297.08	287.28	-907.03	-114.26	2.18	2.09	1.48
3,567.00	20.99	285.50	3,384.72	297.49	-942.22	-117.78	3.62	-3.58	-1.35
3,663.00	23.29	287.00	3,473.63	307.64	-976.94	-121.31	2.47	2.40	1.56
3,758.00	24.57	285.99	3,560.46	318.57	-1,013.89	-125.21	1.41	1.35	-1.06
3,854.00	21.39	285.86	3,648.84	328.86	-1,049.92	-128.64	3.31	-3.31	-0.14
3,949.00	23.02	286.52	3,736.79	338.87	-1,084.40	-132.10	1.74	1.72	0.69
4,044.00	24.61	285.94	3,823.70	349.59	-1,121.23	-135.80	1.69	1.67	-0.61
4,139.00	20.68	285.55	3,911.35	359.52	-1,156.42	-139.05	4.14	-4.14	-0.41
4,235.00	23.55	286.87	4,000.28	369.63	-1,191.11	-142.56	3.03	2.99	1.38
4,330.00	20.42	286.65	4,088.36	379.89	-1,225.16	-146.33	3.30	-3.29	-0.23
4,425.00	22.49	286.17	4,176.78	389.70	-1,258.49	-149.79	2.19	2.18	-0.51
4,520.00	19.58	288.59	4,265.44	399.84	-1,291.04	-153.72	3.20	-3.06	2.55
4,616.00	22.40	289.12	4,355.06	410.96	-1,323.58	-158.63	2.94	2.94	0.55

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<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5347.40usft (Patterson 901)
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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

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)
4,711.00	23.46	287.18	4,442.55	422.48	-1,358.75	-163.42	1.37	1.12	-2.04
4,806.00	24.66	284.93	4,529.30	433.17	-1,395.96	-167.04	1.59	1.26	-2.37
4,902.00	21.48	285.94	4,617.61	443.16	-1,432.23	-170.13	3.34	-3.31	1.05
4,997.00	23.69	285.94	4,705.32	453.18	-1,467.31	-173.48	2.33	2.33	0.00
5,093.00	26.43	286.96	4,792.27	464.71	-1,506.29	-177.59	2.89	2.85	1.06
5,189.00	23.02	286.87	4,879.46	476.39	-1,544.70	-181.95	3.55	-3.55	-0.09
5,283.00	23.38	286.12	4,965.86	486.90	-1,580.21	-185.71	0.50	0.38	-0.80
5,378.00	21.17	285.33	5,053.76	496.67	-1,614.87	-188.89	2.35	-2.33	-0.83
5,496.00	23.69	285.94	5,162.83	508.82	-1,658.22	-192.79	2.14	2.14	0.52
5,592.00	22.05	285.02	5,251.28	518.79	-1,694.17	-195.92	1.75	-1.71	-0.96
5,688.00	22.54	287.53	5,340.10	529.00	-1,729.12	-199.48	1.12	0.51	2.61
5,783.00	20.11	285.37	5,428.59	538.81	-1,762.23	-202.99	2.69	-2.56	-2.27
5,878.00	23.24	287.36	5,516.87	548.74	-1,795.88	-206.51	3.38	3.29	2.09
5,974.00	21.34	284.89	5,605.69	558.88	-1,830.84	-210.00	2.21	-1.98	-2.57
6,070.00	24.17	289.82	5,694.22	570.03	-1,866.22	-214.41	3.55	2.95	5.14
6,165.00	22.58	288.59	5,781.42	582.44	-1,901.81	-220.01	1.75	-1.67	-1.29
6,261.00	23.51	287.97	5,869.76	594.23	-1,937.49	-224.98	1.00	0.97	-0.65
6,356.00	21.61	285.81	5,957.49	604.84	-1,972.35	-228.95	2.18	-2.00	-2.27
6,450.00	21.70	288.68	6,044.85	615.12	-2,005.47	-232.92	1.13	0.10	3.05
6,546.00	25.14	292.16	6,132.94	628.50	-2,041.18	-239.45	3.86	3.58	3.63
6,641.00	23.33	291.89	6,219.56	643.13	-2,077.33	-247.12	1.91	-1.91	-0.28
6,736.00	23.64	289.51	6,306.69	656.50	-2,112.74	-253.71	1.05	0.33	-2.51
6,831.00	21.48	288.54	6,394.42	668.40	-2,147.18	-259.01	2.31	-2.27	-1.02
6,927.00	19.09	287.80	6,484.46	678.78	-2,178.80	-263.36	2.50	-2.49	-0.77
7,022.00	17.19	286.65	6,574.73	687.56	-2,207.04	-266.75	2.04	-2.00	-1.21
7,117.00	13.70	285.68	6,666.29	694.62	-2,231.33	-269.19	3.68	-3.67	-1.02
7,213.00	11.93	283.12	6,759.89	699.95	-2,251.94	-270.61	1.94	-1.84	-2.67
7,308.00	8.18	277.44	6,853.42	703.05	-2,268.21	-270.65	4.08	-3.95	-5.98
7,403.00	5.74	276.51	6,947.71	704.47	-2,279.64	-269.92	2.57	-2.57	-0.98
7,499.00	1.64	252.41	7,043.50	704.60	-2,285.72	-268.92	4.47	-4.27	-25.10
7,594.00	0.71	121.97	7,138.49	703.87	-2,286.51	-268.06	2.28	-0.98	-137.31
7,689.00	0.40	134.40	7,233.48	703.33	-2,285.78	-267.66	0.35	-0.33	13.08
7,785.00	0.31	127.48	7,329.48	702.94	-2,285.33	-267.36	0.10	-0.09	-7.21
7,880.00	2.52	179.08	7,424.45	700.69	-2,285.10	-265.20	2.46	2.33	54.32
7,976.00	16.84	173.97	7,518.83	684.67	-2,283.59	-249.73	14.93	14.92	-5.32
8,071.00	29.25	176.17	7,606.08	647.68	-2,280.59	-213.94	13.09	13.06	2.32
8,079.30	29.99	176.62	7,613.30	643.59	-2,280.33	-209.97	9.34	8.96	5.38
30° Inclination @ 8079.30' MD									
8,166.00	37.83	180.32	7,685.20	595.29	-2,279.19	-162.71	9.34	9.04	4.27
8,262.00	45.38	181.86	7,756.94	531.61	-2,280.47	-99.90	7.94	7.86	1.60
8,357.00	46.05	181.15	7,823.27	463.62	-2,282.25	-32.76	0.89	0.71	-0.75
8,452.00	50.24	179.08	7,886.65	392.89	-2,282.35	36.77	4.70	4.41	-2.18
8,548.00	65.49	177.58	7,937.56	311.87	-2,279.90	115.93	15.94	15.89	-1.56
8,643.00	68.27	177.01	7,974.86	224.61	-2,275.78	200.91	2.98	2.93	-0.60

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<b>Well:</b>	Livingston S19-25-04N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

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)
8,663.76	70.00	177.05	7,982.25	205.24	-2,274.77	219.76	8.34	8.33	0.19
70° Inclination @ 8663.76' MD									
8,739.00	76.27	177.19	8,004.07	133.36	-2,271.16	289.73	8.34	8.33	0.19
8,834.00	77.42	177.50	8,025.69	40.96	-2,266.87	379.74	1.25	1.21	0.33
8,930.00	88.33	183.18	8,037.59	-54.12	-2,267.49	473.28	12.79	11.36	5.92
9,025.00	88.60	182.78	8,040.14	-148.95	-2,272.43	567.39	0.51	0.28	-0.42
9,120.00	88.16	182.92	8,042.82	-243.80	-2,277.15	661.47	0.49	-0.46	0.15
9,215.00	88.33	183.00	8,045.73	-338.63	-2,282.05	755.56	0.20	0.18	0.08
9,311.00	88.20	182.61	8,048.64	-434.47	-2,286.75	850.62	0.43	-0.14	-0.41
9,406.00	90.54	179.26	8,049.68	-529.43	-2,288.30	944.22	4.30	2.46	-3.53
9,508.00	89.70	179.21	8,049.47	-631.42	-2,286.94	1,044.19	0.82	-0.82	-0.05
9,603.00	89.93	177.58	8,049.78	-726.38	-2,284.28	1,137.01	1.73	0.24	-1.72
9,698.00	89.48	177.63	8,050.26	-821.29	-2,280.31	1,229.55	0.48	-0.47	0.05
9,792.00	89.62	177.98	8,051.00	-915.22	-2,276.71	1,321.19	0.40	0.15	0.37
9,887.00	89.57	181.28	8,051.67	-1,010.20	-2,276.09	1,414.41	3.47	-0.05	3.47
9,983.00	89.75	182.69	8,052.24	-1,106.14	-2,279.42	1,509.30	1.48	0.19	1.47
10,078.00	89.44	183.97	8,052.92	-1,200.98	-2,284.94	1,603.52	1.39	-0.33	1.35
10,173.00	89.57	182.69	8,053.74	-1,295.81	-2,290.45	1,697.73	1.35	0.14	-1.35
10,268.00	89.57	182.39	8,054.45	-1,390.72	-2,294.66	1,791.77	0.32	0.00	-0.32
10,364.00	89.48	182.03	8,055.25	-1,486.64	-2,298.37	1,886.72	0.39	-0.09	-0.38
10,458.00	89.57	181.59	8,056.02	-1,580.59	-2,301.33	1,979.60	0.48	0.10	-0.47
10,554.00	89.66	181.06	8,056.67	-1,676.56	-2,303.55	2,074.32	0.56	0.09	-0.55
10,649.00	89.62	181.37	8,057.27	-1,771.54	-2,305.57	2,168.02	0.33	-0.04	0.33
10,744.00	89.70	180.98	8,057.83	-1,866.52	-2,307.52	2,261.72	0.42	0.08	-0.41
10,839.00	89.62	180.98	8,058.39	-1,961.50	-2,309.14	2,355.36	0.08	-0.08	0.00
10,934.00	89.84	179.30	8,058.84	-2,056.50	-2,309.37	2,448.75	1.78	0.23	-1.77
11,029.00	89.62	179.35	8,059.29	-2,151.49	-2,308.25	2,541.89	0.24	-0.23	0.05
11,125.00	89.88	178.73	8,059.71	-2,247.47	-2,306.65	2,635.92	0.70	0.27	-0.65
11,213.53	89.80	180.86	8,059.96	-2,336.00	-2,306.33	2,722.85	2.41	-0.09	2.41
Cross @ 11213.53' MD									
11,220.00	89.79	181.02	8,059.98	-2,342.47	-2,306.44	2,729.23	2.41	-0.09	2.41
11,315.00	89.75	181.33	8,060.36	-2,437.45	-2,308.39	2,822.93	0.33	-0.04	0.33
11,411.00	89.88	181.15	8,060.67	-2,533.42	-2,310.46	2,917.63	0.23	0.14	-0.19
11,505.00	89.79	180.62	8,060.94	-2,627.41	-2,311.92	3,010.26	0.57	-0.10	-0.56
11,601.00	89.70	181.02	8,061.37	-2,723.40	-2,313.29	3,104.84	0.43	-0.09	0.42
11,696.00	89.75	181.02	8,061.83	-2,818.38	-2,314.98	3,198.49	0.05	0.05	0.00
11,791.00	89.70	180.49	8,062.28	-2,913.37	-2,316.23	3,292.07	0.56	-0.05	-0.56
11,887.00	90.10	181.06	8,062.45	-3,009.36	-2,317.53	3,386.64	0.73	0.42	0.59
11,982.00	90.41	180.14	8,062.03	-3,104.36	-2,318.53	3,480.17	1.02	0.33	-0.97
12,078.00	90.41	181.06	8,061.34	-3,200.35	-2,319.53	3,574.69	0.96	0.00	0.96
12,173.00	90.46	180.49	8,060.62	-3,295.34	-2,320.82	3,668.27	0.60	0.05	-0.60
12,269.00	90.46	177.76	8,059.85	-3,391.31	-2,319.35	3,762.31	2.84	0.00	-2.84
12,364.00	90.41	177.58	8,059.13	-3,486.23	-2,315.49	3,854.87	0.20	-0.05	-0.19

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-04N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-04N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

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)
12,460.00	90.37	177.10	8,058.47	-3,582.13	-2,311.03	3,948.28	0.50	-0.04	-0.50
12,555.00	90.32	176.97	8,057.90	-3,677.00	-2,306.12	4,040.60	0.15	-0.05	-0.14
12,651.00	90.23	175.47	8,057.44	-3,772.78	-2,299.79	4,133.55	1.57	-0.09	-1.56
12,747.00	90.19	176.04	8,057.09	-3,868.52	-2,292.69	4,226.32	0.60	-0.04	0.59
12,842.00	90.06	178.07	8,056.88	-3,963.39	-2,287.80	4,318.64	2.14	-0.14	2.14
12,937.00	89.70	179.48	8,057.08	-4,058.37	-2,285.77	4,411.59	1.53	-0.38	1.48
13,032.00	89.79	179.65	8,057.50	-4,153.36	-2,285.05	4,504.81	0.20	0.09	0.18
13,128.00	89.75	178.91	8,057.89	-4,249.35	-2,283.85	4,598.92	0.77	-0.04	-0.77
13,223.00	89.70	178.60	8,058.35	-4,344.33	-2,281.78	4,691.87	0.33	-0.05	-0.33
13,319.00	89.88	179.17	8,058.70	-4,440.31	-2,279.91	4,785.84	0.62	0.19	0.59
13,415.00	89.88	176.97	8,058.90	-4,536.25	-2,276.68	4,879.52	2.29	0.00	-2.29
13,510.00	89.97	177.85	8,059.02	-4,631.15	-2,272.39	4,971.98	0.93	0.09	0.93
13,605.00	89.93	180.67	8,059.11	-4,726.13	-2,271.16	5,065.09	2.97	-0.04	2.97
13,701.00	89.93	181.33	8,059.22	-4,822.12	-2,272.84	5,159.73	0.69	0.00	0.69
13,796.00	89.75	182.47	8,059.49	-4,917.06	-2,275.99	5,253.61	1.21	-0.19	1.20
13,892.00	89.79	182.74	8,059.87	-5,012.96	-2,280.35	5,348.66	0.28	0.04	0.28
13,987.00	89.79	181.37	8,060.22	-5,107.90	-2,283.76	5,442.58	1.44	0.00	-1.44
14,081.00	89.79	180.54	8,060.57	-5,201.89	-2,285.32	5,535.23	0.88	0.00	-0.88
14,176.00	89.75	181.15	8,060.95	-5,296.87	-2,286.72	5,628.84	0.64	-0.04	0.64
14,272.00	89.70	181.51	8,061.41	-5,392.85	-2,288.95	5,723.56	0.38	-0.05	0.38
14,367.00	89.31	181.06	8,062.23	-5,487.82	-2,291.08	5,817.28	0.63	-0.41	-0.47
14,461.00	89.22	182.96	8,063.44	-5,581.75	-2,294.38	5,910.20	2.02	-0.10	2.02
14,557.00	89.09	181.95	8,064.85	-5,677.65	-2,298.49	6,005.20	1.06	-0.14	-1.05
14,652.00	89.35	182.43	8,066.14	-5,772.57	-2,302.12	6,099.15	0.57	0.27	0.51
14,747.00	89.17	184.68	8,067.37	-5,867.37	-2,308.01	6,193.40	2.38	-0.19	2.37
14,842.00	89.22	182.47	8,068.71	-5,962.17	-2,313.93	6,287.66	2.33	0.05	-2.33
14,937.00	89.31	182.21	8,069.92	-6,057.09	-2,317.81	6,381.65	0.29	0.09	-0.27
15,032.00	89.26	179.57	8,071.11	-6,152.06	-2,319.29	6,475.25	2.78	-0.05	-2.78
15,127.00	89.17	178.60	8,072.41	-6,247.04	-2,317.77	6,568.30	1.03	-0.09	-1.02
15,222.00	89.13	179.43	8,073.82	-6,342.01	-2,316.14	6,661.33	0.87	-0.04	0.87
15,317.00	89.13	177.80	8,075.26	-6,436.97	-2,313.84	6,754.22	1.72	0.00	-1.72
15,412.00	89.22	177.41	8,076.63	-6,531.88	-2,309.87	6,846.75	0.42	0.09	-0.41
15,507.00	89.26	177.80	8,077.89	-6,626.79	-2,305.90	6,939.28	0.41	0.04	0.41
15,602.00	89.22	177.94	8,079.15	-6,721.71	-2,302.37	7,031.90	0.15	-0.04	0.15
15,698.00	89.22	176.97	8,080.46	-6,817.61	-2,298.11	7,125.35	1.01	0.00	-1.01
15,793.00	89.35	179.39	8,081.64	-6,912.54	-2,295.09	7,218.09	2.55	0.14	2.55
15,888.00	89.26	178.33	8,082.80	-7,007.52	-2,293.20	7,311.06	1.12	-0.09	-1.12
15,983.00	89.17	177.50	8,084.10	-7,102.44	-2,289.75	7,403.71	0.88	-0.09	-0.87
16,078.00	89.13	179.48	8,085.51	-7,197.40	-2,287.24	7,496.55	2.08	-0.04	2.08
16,173.00	89.17	180.14	8,086.92	-7,292.38	-2,286.93	7,589.84	0.70	0.04	0.69
16,267.00	89.17	181.77	8,088.28	-7,386.36	-2,288.50	7,682.47	1.73	0.00	1.73
16,363.00	89.22	180.93	8,089.63	-7,482.32	-2,290.76	7,777.19	0.88	0.05	-0.88
16,459.00	89.66	179.52	8,090.57	-7,578.31	-2,291.13	7,871.59	1.54	0.46	-1.47
16,482.69	89.68	179.53	8,090.70	-7,602.00	-2,290.94	7,894.84	0.11	0.10	0.05

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-04N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-04N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

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)
<b>Cross @ 16482.69' MD</b>									
16,553.00	89.75	179.57	8,091.05	-7,672.31	-2,290.39	7,963.82	0.11	0.10	0.05
16,649.00	89.66	181.20	8,091.54	-7,768.30	-2,291.03	8,058.28	1.70	-0.09	1.70
16,744.00	89.70	180.98	8,092.07	-7,863.28	-2,292.84	8,151.95	0.24	0.04	-0.23
16,840.00	89.66	181.15	8,092.61	-7,959.27	-2,294.62	8,246.60	0.18	-0.04	0.18
16,935.00	89.70	181.02	8,093.14	-8,054.25	-2,296.42	8,340.27	0.14	0.04	-0.14
17,030.00	89.70	180.89	8,093.64	-8,149.23	-2,298.01	8,433.90	0.14	0.00	-0.14
17,126.00	89.66	179.87	8,094.18	-8,245.23	-2,298.64	8,528.35	1.06	-0.04	-1.06
17,221.00	89.97	180.58	8,094.48	-8,340.23	-2,299.02	8,621.78	0.82	0.33	0.75
17,315.00	89.97	180.93	8,094.53	-8,434.22	-2,300.25	8,714.37	0.37	0.00	0.37
17,409.00	89.75	180.01	8,094.76	-8,528.21	-2,301.03	8,806.88	1.01	-0.23	-0.98
17,505.00	89.84	181.51	8,095.10	-8,624.20	-2,302.30	8,901.44	1.57	0.09	1.56
17,600.00	89.88	180.84	8,095.34	-8,719.18	-2,304.25	8,995.14	0.71	0.04	-0.71
17,695.00	89.93	180.76	8,095.49	-8,814.17	-2,305.57	9,088.73	0.10	0.05	-0.08
17,790.00	89.75	180.40	8,095.76	-8,909.17	-2,306.53	9,182.26	0.42	-0.19	-0.38
17,886.00	89.79	180.18	8,096.14	-9,005.16	-2,307.02	9,276.69	0.23	0.04	-0.23
17,982.00	89.84	180.23	8,096.45	-9,101.16	-2,307.36	9,371.09	0.07	0.05	0.05
18,077.00	89.75	180.32	8,096.79	-9,196.16	-2,307.82	9,464.52	0.13	-0.09	0.09
18,173.00	89.75	180.76	8,097.21	-9,292.16	-2,308.72	9,559.02	0.46	0.00	0.46
18,268.00	89.79	179.26	8,097.59	-9,387.15	-2,308.74	9,652.38	1.58	0.04	-1.58
18,363.00	89.84	179.74	8,097.90	-9,482.15	-2,307.91	9,745.58	0.51	0.05	0.51
18,459.00	89.84	181.46	8,098.17	-9,578.14	-2,308.92	9,840.09	1.79	0.00	1.79
18,555.00	89.79	179.79	8,098.48	-9,674.13	-2,309.96	9,934.61	1.74	-0.05	-1.74
18,650.00	89.66	180.54	8,098.94	-9,769.13	-2,310.24	10,028.02	0.80	-0.14	0.79
18,746.00	89.79	179.39	8,099.40	-9,865.12	-2,310.18	10,122.34	1.21	0.14	-1.20
18,841.00	89.79	180.23	8,099.74	-9,960.12	-2,309.86	10,215.64	0.88	0.00	0.88
18,936.00	89.88	179.61	8,100.02	-10,055.12	-2,309.73	10,308.97	0.66	0.09	-0.65
19,032.00	89.79	181.06	8,100.29	-10,151.12	-2,310.29	10,403.41	1.51	-0.09	1.51
19,128.00	89.75	180.40	8,100.68	-10,247.11	-2,311.52	10,497.96	0.69	-0.04	-0.69
19,223.00	89.70	180.45	8,101.14	-10,342.10	-2,312.22	10,591.44	0.07	-0.05	0.05
19,319.00	89.75	180.10	8,101.60	-10,438.10	-2,312.68	10,685.86	0.37	0.05	-0.36
19,414.00	89.66	181.55	8,102.09	-10,533.09	-2,314.05	10,779.46	1.53	-0.09	1.53
19,509.00	89.70	181.42	8,102.62	-10,628.05	-2,316.51	10,873.24	0.14	0.04	-0.14
19,604.00	90.06	181.42	8,102.82	-10,723.02	-2,318.87	10,967.00	0.38	0.38	0.00
19,698.00	90.37	180.01	8,102.46	-10,817.01	-2,320.04	11,059.58	1.54	0.33	-1.50
19,793.00	90.23	180.23	8,101.97	-10,912.01	-2,320.24	11,152.97	0.27	-0.15	0.23
19,888.00	90.23	179.48	8,101.58	-11,007.01	-2,320.00	11,246.28	0.79	0.00	-0.79
19,982.00	90.15	180.45	8,101.27	-11,101.01	-2,319.94	11,338.64	1.04	-0.09	1.03
20,077.00	89.70	179.26	8,101.40	-11,196.01	-2,319.70	11,431.95	1.34	-0.47	-1.25
20,171.00	89.75	180.71	8,101.85	-11,290.00	-2,319.67	11,524.31	1.54	0.05	1.54
20,267.00	89.70	180.18	8,102.31	-11,386.00	-2,320.42	11,618.78	0.55	-0.05	-0.55
20,362.00	89.75	180.01	8,102.76	-11,481.00	-2,320.58	11,712.17	0.19	0.05	-0.18
20,456.00	89.66	181.86	8,103.25	-11,574.98	-2,322.11	11,804.81	1.97	-0.10	1.97

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-04N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5347.40usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-04N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

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)	
20,551.00	89.17	180.49	8,104.22	-11,669.95	-2,324.06	11,898.50	1.53	-0.52	-1.44	
20,645.00	89.09	178.46	8,105.65	-11,763.93	-2,323.20	11,990.69	2.16	-0.09	-2.16	
20,741.00	89.00	180.36	8,107.25	-11,859.91	-2,322.21	12,084.82	1.98	-0.09	1.98	
20,835.00	89.31	180.71	8,108.63	-11,953.89	-2,323.09	12,177.34	0.50	0.33	0.37	
20,929.00	89.79	181.24	8,109.37	-12,047.88	-2,324.69	12,270.00	0.76	0.51	0.56	
21,023.00	89.79	181.90	8,109.72	-12,141.84	-2,327.26	12,362.81	0.70	0.00	0.70	
21,118.00	89.93	181.33	8,109.95	-12,236.80	-2,329.94	12,456.62	0.62	0.15	-0.60	
21,213.00	89.84	180.62	8,110.14	-12,331.79	-2,331.56	12,550.26	0.75	-0.09	-0.75	
Last MWD Survey @ 21213' MD										
21,250.00	89.84	180.62	8,110.24	-12,368.79	-2,331.96	12,586.69	0.00	0.00	0.00	
Projection to TD @ 21250' MD 511' FSL/ 1305' FWL										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
30° Inclination @ 8079.3 - actual wellpath hits target center - Point	0.00	0.00	7,613.30	643.58	-2,280.32	1,236,004.10	3,126,646.85	39.980330	-105.048066	
70° Inclination @ 8663.7 - actual wellpath hits target center - Point	0.00	0.00	7,982.25	205.24	-2,274.77	1,235,565.78	3,126,654.68	39.979126	-105.048047	
Cross @ 11213.53' MD - actual wellpath hits target center - Point	0.00	0.00	8,059.96	-2,336.00	-2,306.33	1,233,024.42	3,126,636.30	39.972150	-105.048158	
Cross @ 16482.69' MD - actual wellpath hits target center - Point	0.00	0.00	8,090.70	-7,602.00	-2,290.94	1,227,758.57	3,126,679.01	39.957694	-105.048102	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,590.00	1,558.22	67.90	-223.89	Tie into Surface Surveys	
1,667.00	1,629.22	77.21	-252.21	First MWD Survey @ 1667' MD	
8,079.30	7,613.30	643.59	-2,280.33	30° Inclination @ 8079.30' MD	
8,663.76	7,982.25	205.24	-2,274.77	70° Inclination @ 8663.76' MD	
11,213.53	8,059.96	-2,336.00	-2,306.33	Cross @ 11213.53' MD	
16,482.69	8,090.70	-7,602.00	-2,290.94	Cross @ 16482.69' MD	
21,213.00	8,110.14	-12,331.79	-2,331.56	Last MWD Survey @ 21213' MD	
21,250.00	8,110.24	-12,368.79	-2,331.96	Projection to TD @ 21250' MD 511' FSL/ 1305' FWL	

Checked By: _____	Approved By: _____	Date: _____
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