

Extraction Oil & Gas

Weld County, CO (NAD83)

Sec 07-T01S-R68W Livingston Pad

Livingston S19-25-08C

Wellbore #1

Design: Wellbore #1

Standard Survey Report

02 October, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-08C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5350.40usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5350.40usft (Patterson 901)
Well:	Livingston S19-25-08C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.15 Single 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		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 S19-25-08C				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.35 usft	Latitude:	39.978562
	+E/-W	0.00 usft	Easting:	3,129,002.50 usft	Longitude:	-105.039672
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,321.40 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/28/2019	8.10	66.42	51,868.58481087

Design	Wellbore #1				
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	184.93	

Survey Program	Date	10/2/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	1,584.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,669.00	21,183.00	Atlas MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
143.00	1.01	95.21	142.99	-0.11	1.26	0.01	0.71	0.71	0.00	
230.00	0.22	29.56	229.99	-0.04	2.10	-0.14	1.08	-0.91	-75.46	
318.00	0.26	333.83	317.99	0.29	2.10	-0.47	0.26	0.05	-63.33	
405.00	0.48	318.36	404.98	0.74	1.77	-0.89	0.28	0.25	-17.78	
492.00	0.62	320.83	491.98	1.37	1.23	-1.47	0.16	0.16	2.84	
579.00	1.01	317.49	578.97	2.30	0.41	-2.33	0.45	0.45	-3.84	
667.00	0.66	329.61	666.96	3.31	-0.37	-3.27	0.44	-0.40	13.77	
754.00	0.79	309.84	753.96	4.13	-1.08	-4.02	0.32	0.15	-22.72	
841.00	1.27	290.42	840.94	4.85	-2.45	-4.62	0.67	0.55	-22.32	

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Well:	Livingston S19-25-08C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
929.00	2.50	287.69	928.89	5.77	-5.19	-5.31	1.40	1.40	-3.10
1,016.00	3.47	294.63	1,015.77	7.45	-9.39	-6.61	1.19	1.11	7.98
1,103.00	4.79	307.03	1,102.55	10.73	-14.68	-9.43	1.82	1.52	14.25
1,190.00	6.20	305.62	1,189.15	15.66	-21.40	-13.76	1.63	1.62	-1.62
1,278.00	8.66	302.46	1,276.40	21.98	-30.86	-19.25	2.83	2.80	-3.59
1,365.00	10.11	302.98	1,362.23	29.65	-42.79	-25.87	1.67	1.67	0.60
1,452.00	11.34	300.52	1,447.71	38.15	-56.56	-33.16	1.51	1.41	-2.83
1,539.00	11.51	298.06	1,532.99	46.58	-71.59	-40.26	0.59	0.20	-2.83
1,584.00	11.34	299.91	1,577.10	50.90	-79.39	-43.89	0.90	-0.38	4.11
Tie into Surface Surveys									
1,669.00	12.02	300.62	1,660.34	59.57	-94.25	-51.26	0.82	0.80	0.84
First MWD Survey @ 1669' MD									
1,764.00	11.36	300.84	1,753.37	69.41	-110.80	-59.64	0.70	-0.69	0.23
1,860.00	10.16	301.63	1,847.68	78.70	-126.12	-67.57	1.26	-1.25	0.82
1,955.00	9.24	302.12	1,941.32	87.15	-139.72	-74.83	0.97	-0.97	0.52
2,050.00	10.83	298.94	2,034.86	95.52	-153.99	-81.94	1.77	1.67	-3.35
2,145.00	11.31	298.68	2,128.09	104.31	-169.97	-89.33	0.51	0.51	-0.27
2,240.00	9.85	297.75	2,221.48	112.57	-185.34	-96.23	1.55	-1.54	-0.98
2,334.00	11.75	302.16	2,313.81	121.40	-200.56	-103.73	2.20	2.02	4.69
2,428.00	10.34	303.53	2,406.07	131.16	-215.69	-112.15	1.53	-1.50	1.46
2,523.00	11.62	303.57	2,499.32	141.16	-230.77	-120.82	1.35	1.35	0.04
2,618.00	9.77	306.08	2,592.67	151.20	-245.26	-129.58	2.01	-1.95	2.64
2,714.00	8.40	302.73	2,687.46	159.79	-257.74	-137.06	1.53	-1.43	-3.49
2,808.00	9.59	296.92	2,780.31	167.04	-270.50	-143.20	1.59	1.27	-6.18
2,903.00	11.00	299.43	2,873.78	175.08	-285.45	-149.92	1.56	1.48	2.64
2,998.00	11.18	297.05	2,967.00	183.72	-301.55	-157.15	0.52	0.19	-2.51
3,093.00	11.53	304.32	3,060.15	193.26	-317.59	-165.27	1.55	0.37	7.65
3,189.00	12.11	302.82	3,154.11	204.13	-333.98	-174.69	0.68	0.60	-1.56
3,284.00	9.59	301.19	3,247.41	213.63	-349.12	-182.86	2.67	-2.65	-1.72
3,379.00	11.40	300.35	3,340.81	222.48	-364.00	-190.39	1.91	1.91	-0.88
3,474.00	12.51	305.69	3,433.76	233.22	-380.46	-199.69	1.65	1.17	5.62
3,569.00	9.54	304.45	3,526.99	243.68	-395.31	-208.83	3.14	-3.13	-1.31
3,665.00	11.45	302.73	3,621.38	253.33	-409.89	-217.20	2.02	1.99	-1.79
3,760.00	12.46	309.43	3,714.32	264.94	-425.73	-227.40	1.81	1.06	7.05
3,856.00	11.53	306.48	3,808.23	277.22	-441.45	-238.29	1.16	-0.97	-3.07
3,951.00	12.11	304.89	3,901.21	288.57	-457.26	-248.23	0.70	0.61	-1.67
4,046.00	13.30	306.17	3,993.89	300.72	-474.25	-258.88	1.29	1.25	1.35
4,141.00	10.61	309.61	4,086.82	312.75	-489.82	-269.52	2.93	-2.83	3.62
4,237.00	11.62	299.39	4,181.03	323.13	-505.05	-278.56	2.30	1.05	-10.65
4,332.00	11.98	304.14	4,274.02	333.36	-521.55	-287.33	1.09	0.38	5.00
4,427.00	12.06	295.64	4,366.94	343.18	-538.66	-295.66	1.86	0.08	-8.95
4,522.00	13.04	298.42	4,459.67	352.58	-557.03	-303.44	1.21	1.03	2.93
4,618.00	10.74	294.58	4,553.61	361.46	-574.69	-310.77	2.53	-2.40	-4.00

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)	
4,713.00	12.68	302.43	4,646.63	370.73	-591.54	-318.56	2.64	2.04	8.26	
4,809.00	11.14	303.40	4,740.57	381.49	-608.18	-327.85	1.62	-1.60	1.01	
4,904.00	9.32	304.85	4,834.05	390.94	-622.16	-336.06	1.93	-1.92	1.53	
5,000.00	11.62	304.19	4,928.45	400.81	-636.53	-344.66	2.40	2.40	-0.69	
5,095.00	9.77	304.89	5,021.79	410.80	-651.06	-353.37	1.95	-1.95	0.74	
5,191.00	9.28	303.70	5,116.47	419.75	-664.18	-361.16	0.55	-0.51	-1.24	
5,285.00	12.95	302.16	5,208.69	429.57	-679.41	-369.63	3.92	3.90	-1.64	
5,380.00	10.87	301.85	5,301.64	439.96	-696.03	-378.56	2.19	-2.19	-0.33	
5,476.00	11.31	302.21	5,395.85	449.76	-711.69	-386.97	0.46	0.46	0.38	
5,571.00	11.05	305.60	5,489.04	460.02	-726.97	-395.89	0.74	-0.27	3.57	
5,667.00	11.53	304.41	5,583.19	470.80	-742.37	-405.30	0.56	0.50	-1.24	
5,763.00	10.78	306.39	5,677.37	481.55	-757.51	-414.71	0.88	-0.78	2.06	
5,858.00	8.62	304.06	5,771.01	490.81	-770.56	-422.82	2.31	-2.27	-2.45	
5,953.00	10.03	304.72	5,864.75	499.51	-783.26	-430.39	1.49	1.48	0.69	
6,049.00	12.86	306.35	5,958.83	510.60	-798.74	-440.12	2.97	2.95	1.70	
6,167.00	11.67	302.87	6,074.14	524.86	-819.34	-452.56	1.19	-1.01	-2.95	
6,263.00	10.16	301.24	6,168.40	534.53	-834.73	-460.86	1.61	-1.57	-1.70	
6,358.00	12.55	304.37	6,261.54	544.70	-850.42	-469.65	2.60	2.52	3.29	
6,453.00	11.05	300.84	6,354.53	555.19	-866.76	-478.70	1.75	-1.58	-3.72	
6,548.00	12.06	316.26	6,447.62	567.04	-881.44	-489.24	3.41	1.06	16.23	
6,643.00	10.12	316.53	6,540.84	580.26	-894.05	-501.34	2.04	-2.04	0.28	
6,739.00	11.27	317.10	6,635.17	593.26	-906.23	-513.24	1.20	1.20	0.59	
6,834.00	10.25	313.62	6,728.50	605.89	-918.67	-524.75	1.27	-1.07	-3.66	
6,929.00	13.08	311.86	6,821.53	618.90	-932.80	-536.50	3.00	2.98	-1.85	
7,024.00	11.31	310.36	6,914.39	632.10	-947.91	-548.36	1.89	-1.86	-1.58	
7,120.00	8.93	306.70	7,008.89	642.65	-961.06	-557.74	2.57	-2.48	-3.81	
7,215.00	12.81	307.36	7,102.16	653.46	-975.34	-567.28	4.09	4.08	0.69	
7,310.00	10.69	304.19	7,195.17	664.80	-991.00	-577.23	2.33	-2.23	-3.34	
7,405.00	8.22	301.19	7,288.87	673.27	-1,004.10	-584.55	2.65	-2.60	-3.16	
7,501.00	6.54	299.61	7,384.07	679.52	-1,014.73	-589.87	1.76	-1.75	-1.65	
7,596.00	5.35	294.71	7,478.56	684.05	-1,023.46	-593.62	1.36	-1.25	-5.16	
7,692.00	3.27	268.58	7,574.29	685.85	-1,030.26	-594.84	2.93	-2.17	-27.22	
7,787.00	0.66	288.77	7,669.23	685.96	-1,033.49	-594.67	2.80	-2.75	21.25	
7,883.00	9.24	188.64	7,764.82	678.50	-1,035.17	-587.09	9.77	8.94	-104.30	
7,978.00	19.27	191.02	7,856.78	655.52	-1,039.33	-563.83	10.57	10.56	2.51	
8,073.00	27.97	190.49	7,943.73	618.15	-1,046.39	-526.00	9.16	9.16	-0.56	
8,089.34	29.99	189.55	7,958.03	610.36	-1,047.77	-518.12	12.67	12.36	-5.74	
30° Inclination @ 8089.34' MD										
8,169.00	39.90	186.22	8,023.25	565.21	-1,053.85	-472.61	12.67	12.44	-4.18	
8,264.00	51.35	181.73	8,089.59	497.60	-1,058.29	-404.87	12.51	12.05	-4.73	
8,360.00	58.82	179.13	8,144.51	418.95	-1,058.80	-326.46	8.09	7.78	-2.71	
8,455.00	64.56	178.20	8,189.54	335.37	-1,056.83	-243.36	6.10	6.04	-0.98	
8,550.00	64.60	177.80	8,230.32	249.62	-1,053.84	-158.19	0.38	0.04	-0.42	
8,647.00	69.91	177.72	8,267.81	160.26	-1,050.34	-69.46	5.47	5.47	-0.08	

Survey Report

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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8,647.72	70.00	177.77	8,268.06	159.58	-1,050.32	-68.79	13.83	12.42	6.49
70° Inclination @ 8647.72' MD									
8,742.00	81.79	183.53	8,291.01	68.36	-1,051.47	22.20	13.83	12.51	6.11
8,838.00	89.09	183.80	8,298.64	-27.08	-1,057.58	117.80	7.61	7.60	0.28
8,933.00	90.81	182.87	8,298.72	-121.91	-1,063.11	212.76	2.06	1.81	-0.98
9,028.00	91.34	181.15	8,296.94	-216.83	-1,066.44	307.62	1.89	0.56	-1.81
9,123.00	89.13	179.43	8,296.55	-311.82	-1,066.92	402.30	2.95	-2.33	-1.81
9,219.00	89.53	179.26	8,297.67	-407.81	-1,065.82	497.84	0.45	0.42	-0.18
9,314.00	89.79	178.42	8,298.24	-502.79	-1,063.90	592.30	0.93	0.27	-0.88
9,409.00	89.13	177.27	8,299.13	-597.71	-1,060.33	686.57	1.40	-0.69	-1.21
9,504.00	87.67	178.20	8,301.78	-692.60	-1,056.58	780.78	1.82	-1.54	0.98
9,599.00	88.73	178.38	8,304.77	-787.51	-1,053.74	875.10	1.13	1.12	0.19
9,694.00	89.00	180.05	8,306.65	-882.48	-1,052.44	969.60	1.78	0.28	1.76
9,788.00	90.41	180.05	8,307.13	-976.47	-1,052.52	1,063.26	1.50	1.50	0.00
9,884.00	87.14	177.80	8,309.19	-1,072.41	-1,050.72	1,158.69	4.13	-3.41	-2.34
9,979.00	87.50	177.45	8,313.63	-1,167.23	-1,046.79	1,252.82	0.53	0.38	-0.37
10,074.00	88.47	177.05	8,316.97	-1,262.06	-1,042.24	1,346.91	1.10	1.02	-0.42
10,170.00	90.99	179.57	8,317.42	-1,358.00	-1,039.41	1,442.25	3.71	2.63	2.63
10,265.00	91.65	180.05	8,315.23	-1,452.97	-1,039.09	1,536.85	0.86	0.69	0.51
10,360.00	89.17	181.68	8,314.55	-1,547.95	-1,040.52	1,631.59	3.12	-2.61	1.72
10,455.00	89.35	181.28	8,315.78	-1,642.91	-1,042.98	1,726.41	0.46	0.19	-0.42
10,550.00	90.15	181.37	8,316.19	-1,737.88	-1,045.17	1,821.22	0.85	0.84	0.09
10,646.00	90.63	181.28	8,315.54	-1,833.86	-1,047.39	1,917.03	0.51	0.50	-0.09
10,741.00	91.25	181.02	8,313.98	-1,928.82	-1,049.30	2,011.81	0.71	0.65	-0.27
10,835.00	90.10	181.15	8,312.88	-2,022.80	-1,051.08	2,105.59	1.23	-1.22	0.14
10,931.00	90.81	181.02	8,312.11	-2,118.78	-1,052.90	2,201.37	0.75	0.74	-0.14
11,026.00	89.44	181.11	8,311.91	-2,213.76	-1,054.66	2,296.16	1.45	-1.44	0.09
11,121.00	89.93	181.06	8,312.43	-2,308.74	-1,056.46	2,390.94	0.52	0.52	-0.05
11,145.26	90.13	181.04	8,312.42	-2,333.00	-1,056.91	2,415.15	0.83	0.82	-0.08
Cross @ 11145.26' MD									
11,217.00	90.72	180.98	8,311.88	-2,404.72	-1,058.17	2,486.72	0.83	0.82	-0.08
11,312.00	88.95	180.67	8,312.16	-2,499.71	-1,059.54	2,581.47	1.89	-1.86	-0.33
11,407.00	89.35	180.18	8,313.57	-2,594.69	-1,060.24	2,676.16	0.67	0.42	-0.52
11,502.00	90.28	180.76	8,313.87	-2,689.69	-1,061.02	2,770.87	1.15	0.98	0.61
11,597.00	90.99	181.37	8,312.82	-2,784.67	-1,062.79	2,865.65	0.99	0.75	0.64
11,693.00	89.13	180.49	8,312.72	-2,880.65	-1,064.35	2,961.41	2.14	-1.94	-0.92
11,788.00	90.06	181.02	8,313.39	-2,975.64	-1,065.60	3,056.16	1.13	0.98	0.56
11,883.00	91.03	181.33	8,312.49	-3,070.61	-1,067.55	3,150.95	1.07	1.02	0.33
11,979.00	90.72	179.65	8,311.02	-3,166.59	-1,068.37	3,246.65	1.78	-0.32	-1.75
12,074.00	89.22	177.67	8,311.07	-3,261.56	-1,066.15	3,341.07	2.61	-1.58	-2.08
12,170.00	90.23	178.02	8,311.53	-3,357.49	-1,062.54	3,436.34	1.11	1.05	0.36
12,265.00	89.44	178.55	8,311.81	-3,452.44	-1,059.69	3,530.70	1.00	-0.83	0.56
12,361.00	90.28	178.16	8,312.04	-3,548.40	-1,056.94	3,626.07	0.96	0.88	-0.41

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-08C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5350.40usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5350.40usft (Patterson 901)
Well:	Livingston S19-25-08C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
12,456.00	87.80	177.67	8,313.63	-3,643.32	-1,053.48	3,720.33	2.66	-2.61	-0.52
12,552.00	87.85	177.76	8,317.27	-3,739.17	-1,049.66	3,815.51	0.11	0.05	0.09
12,648.00	89.13	177.76	8,319.80	-3,835.07	-1,045.91	3,910.72	1.33	1.33	0.00
12,743.00	89.66	178.33	8,320.81	-3,930.00	-1,042.67	4,005.03	0.82	0.56	0.60
12,839.00	90.77	178.46	8,320.45	-4,025.96	-1,039.98	4,100.41	1.16	1.16	0.14
12,934.00	88.78	177.89	8,320.82	-4,120.91	-1,036.95	4,194.74	2.18	-2.09	-0.60
13,029.00	89.13	177.67	8,322.55	-4,215.82	-1,033.27	4,288.99	0.44	0.37	-0.23
13,124.00	90.32	178.99	8,323.01	-4,310.78	-1,030.50	4,383.35	1.87	1.25	1.39
13,220.00	91.12	179.21	8,321.80	-4,406.76	-1,029.00	4,478.85	0.86	0.83	0.23
13,316.00	91.03	180.80	8,320.00	-4,502.74	-1,029.00	4,574.47	1.66	-0.09	1.66
13,411.00	89.40	182.34	8,319.65	-4,597.69	-1,031.61	4,669.30	2.36	-1.72	1.62
13,507.00	90.19	182.87	8,319.99	-4,693.59	-1,035.97	4,765.22	0.99	0.82	0.55
13,602.00	89.13	184.06	8,320.55	-4,788.42	-1,041.71	4,860.19	1.68	-1.12	1.25
13,698.00	88.86	183.49	8,322.24	-4,884.19	-1,048.03	4,956.15	0.66	-0.28	-0.59
13,793.00	87.19	182.25	8,325.51	-4,979.01	-1,052.79	5,051.03	2.19	-1.76	-1.31
13,888.00	87.41	180.67	8,329.99	-5,073.87	-1,055.20	5,145.75	1.68	0.23	-1.66
13,983.00	87.45	180.23	8,334.25	-5,168.77	-1,055.95	5,240.36	0.46	0.04	-0.46
14,078.00	87.85	179.30	8,338.14	-5,263.69	-1,055.56	5,334.90	1.06	0.42	-0.98
14,173.00	89.75	178.55	8,340.13	-5,358.65	-1,053.78	5,429.35	2.15	2.00	-0.79
14,268.00	90.59	179.26	8,339.85	-5,453.63	-1,051.96	5,523.82	1.16	0.88	0.75
14,363.00	88.33	178.99	8,340.74	-5,548.61	-1,050.51	5,618.33	2.40	-2.38	-0.28
14,458.00	89.17	178.99	8,342.82	-5,643.57	-1,048.84	5,712.80	0.88	0.88	0.00
14,553.00	89.53	178.46	8,343.89	-5,738.54	-1,046.72	5,807.23	0.67	0.38	-0.56
14,649.00	89.93	177.89	8,344.35	-5,834.49	-1,043.67	5,902.57	0.73	0.42	-0.59
14,744.00	90.99	177.54	8,343.58	-5,929.41	-1,039.88	5,996.81	1.18	1.12	-0.37
14,839.00	89.53	178.73	8,343.15	-6,024.35	-1,036.79	6,091.14	1.98	-1.54	1.25
14,934.00	89.26	178.02	8,344.16	-6,119.31	-1,034.09	6,185.51	0.80	-0.28	-0.75
15,029.00	90.32	180.93	8,344.50	-6,214.29	-1,033.22	6,280.07	3.26	1.12	3.06
15,124.00	91.16	180.49	8,343.28	-6,309.28	-1,034.40	6,374.80	1.00	0.88	-0.46
15,219.00	90.28	181.64	8,342.08	-6,404.25	-1,036.17	6,469.58	1.52	-0.93	1.21
15,314.00	90.77	182.21	8,341.21	-6,499.19	-1,039.36	6,564.44	0.79	0.52	0.60
15,408.00	88.56	182.61	8,341.76	-6,593.10	-1,043.31	6,658.34	2.39	-2.35	0.43
15,504.00	89.17	182.43	8,343.66	-6,688.99	-1,047.53	6,754.24	0.66	0.64	-0.19
15,599.00	89.88	182.47	8,344.45	-6,783.90	-1,051.59	6,849.15	0.75	0.75	0.04
15,694.00	88.25	182.78	8,346.00	-6,878.78	-1,055.94	6,944.05	1.75	-1.72	0.33
15,790.00	89.09	182.87	8,348.23	-6,974.64	-1,060.67	7,039.96	0.88	0.88	0.09
15,885.00	90.06	182.69	8,348.93	-7,069.52	-1,065.28	7,134.89	1.04	1.02	-0.19
15,980.00	88.78	182.08	8,349.90	-7,164.43	-1,069.23	7,229.79	1.49	-1.35	-0.64
16,075.00	89.66	181.59	8,351.19	-7,259.38	-1,072.27	7,324.64	1.06	0.93	-0.52
16,170.00	88.20	181.95	8,352.96	-7,354.31	-1,075.21	7,419.48	1.58	-1.54	0.38
16,264.00	88.47	181.81	8,355.69	-7,448.22	-1,078.29	7,513.31	0.32	0.29	-0.15
16,359.00	89.93	182.03	8,357.02	-7,543.16	-1,081.47	7,608.17	1.55	1.54	0.23
16,416.87	89.02	181.45	8,357.55	-7,601.00	-1,083.23	7,665.94	1.87	-1.57	-1.01
Cross @ 16416.87' MD									

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-08C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5350.40usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5350.40usft (Patterson 901)
Well:	Livingston S19-25-08C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
16,455.00	88.42	181.06	8,358.40	-7,639.11	-1,084.06	7,703.98	1.87	-1.57	-1.01
16,550.00	88.56	180.49	8,360.91	-7,734.06	-1,085.34	7,798.70	0.62	0.15	-0.60
16,645.00	89.57	180.45	8,362.46	-7,829.05	-1,086.12	7,893.40	1.06	1.06	-0.04
16,741.00	90.54	180.49	8,362.36	-7,925.04	-1,086.91	7,989.11	1.01	1.01	0.04
16,836.00	88.78	180.62	8,362.93	-8,020.03	-1,087.83	8,083.83	1.86	-1.85	0.14
16,932.00	89.75	180.36	8,364.16	-8,116.02	-1,088.65	8,179.53	1.05	1.01	-0.27
17,027.00	89.22	179.87	8,365.01	-8,211.02	-1,088.84	8,274.19	0.76	-0.56	-0.52
17,122.00	90.10	179.79	8,365.58	-8,306.01	-1,088.56	8,368.81	0.93	0.93	-0.08
17,217.00	88.29	179.70	8,366.91	-8,401.00	-1,088.14	8,463.41	1.91	-1.91	-0.09
17,312.00	89.26	179.08	8,368.94	-8,495.97	-1,087.13	8,557.94	1.21	1.02	-0.65
17,406.00	90.15	179.30	8,369.43	-8,589.96	-1,085.80	8,651.47	0.98	0.95	0.23
17,501.00	88.51	180.49	8,370.54	-8,684.95	-1,085.62	8,746.09	2.13	-1.73	1.25
17,597.00	89.09	180.89	8,372.55	-8,780.92	-1,086.78	8,841.81	0.73	0.60	0.42
17,692.00	89.88	180.67	8,373.40	-8,875.90	-1,088.07	8,936.56	0.86	0.83	-0.23
17,787.00	90.54	180.18	8,373.05	-8,970.90	-1,088.78	9,031.26	0.87	0.69	-0.52
17,883.00	89.40	180.05	8,373.10	-9,066.90	-1,088.97	9,126.92	1.20	-1.19	-0.14
17,978.00	90.19	179.57	8,373.44	-9,161.90	-1,088.65	9,221.54	0.97	0.83	-0.51
18,074.00	90.90	179.48	8,372.53	-9,257.89	-1,087.86	9,317.11	0.75	0.74	-0.09
18,169.00	89.04	180.14	8,372.58	-9,352.88	-1,087.54	9,411.73	2.08	-1.96	0.69
18,264.00	89.09	179.43	8,374.13	-9,447.87	-1,087.19	9,506.33	0.75	0.05	-0.75
18,360.00	90.01	179.26	8,374.88	-9,543.86	-1,086.09	9,601.87	0.97	0.96	-0.18
18,456.00	90.59	178.68	8,374.38	-9,639.84	-1,084.36	9,697.35	0.85	0.60	-0.60
18,551.00	87.63	178.99	8,375.86	-9,734.80	-1,082.43	9,791.79	3.13	-3.12	0.33
18,647.00	87.27	177.63	8,380.13	-9,830.66	-1,079.60	9,887.06	1.46	-0.38	-1.42
18,742.00	88.29	177.58	8,383.81	-9,925.50	-1,075.64	9,981.21	1.07	1.07	-0.05
18,838.00	88.86	177.01	8,386.20	-10,021.37	-1,071.11	10,076.33	0.84	0.59	-0.59
18,933.00	90.15	177.45	8,387.02	-10,116.25	-1,066.52	10,170.47	1.43	1.36	0.46
19,029.00	91.38	177.14	8,385.74	-10,212.13	-1,061.99	10,265.61	1.32	1.28	-0.32
19,124.00	89.84	180.14	8,384.72	-10,307.09	-1,059.73	10,360.02	3.55	-1.62	3.16
19,220.00	90.23	180.76	8,384.67	-10,403.08	-1,060.49	10,455.72	0.76	0.41	0.65
19,315.00	88.42	181.90	8,385.78	-10,498.05	-1,062.69	10,550.53	2.25	-1.91	1.20
19,411.00	88.56	181.64	8,388.31	-10,593.97	-1,065.66	10,646.35	0.31	0.15	-0.27
19,506.00	89.75	181.37	8,389.72	-10,688.92	-1,068.15	10,741.16	1.28	1.25	-0.28
19,601.00	87.58	180.98	8,391.93	-10,783.87	-1,070.10	10,835.93	2.32	-2.28	-0.41
19,695.00	88.60	180.93	8,395.06	-10,877.80	-1,071.66	10,929.65	1.09	1.09	-0.05
19,789.00	89.70	180.93	8,396.46	-10,971.78	-1,073.19	11,023.41	1.17	1.17	0.00
19,884.00	90.77	180.93	8,396.07	-11,066.76	-1,074.73	11,118.18	1.13	1.13	0.00
19,978.00	91.74	180.93	8,394.01	-11,160.73	-1,076.26	11,211.92	1.03	1.03	0.00
20,074.00	89.93	180.45	8,392.61	-11,256.71	-1,077.41	11,307.65	1.95	-1.89	-0.50
20,168.00	90.85	179.79	8,391.97	-11,350.70	-1,077.61	11,401.31	1.20	0.98	-0.70
20,263.00	90.23	179.39	8,391.07	-11,445.70	-1,076.93	11,495.90	0.78	-0.65	-0.42
20,359.00	88.07	178.77	8,392.50	-11,541.67	-1,075.39	11,591.38	2.34	-2.25	-0.65
20,453.00	88.73	178.60	8,395.12	-11,635.61	-1,073.23	11,684.79	0.73	0.70	-0.18

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-08C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5350.40usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5350.40usft (Patterson 901)
Well:	Livingston S19-25-08C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
20,547.00	89.62	178.42	8,396.48	-11,729.56	-1,070.79	11,778.19	0.97	0.95	-0.19
20,642.00	88.56	179.39	8,397.98	-11,824.53	-1,068.97	11,872.65	1.51	-1.12	1.02
20,737.00	89.75	180.05	8,399.39	-11,919.52	-1,068.51	11,967.24	1.43	1.25	0.69
20,832.00	89.04	181.06	8,400.39	-12,014.51	-1,069.43	12,061.96	1.30	-0.75	1.06
20,926.00	88.38	180.54	8,402.50	-12,108.47	-1,070.74	12,155.69	0.89	-0.70	-0.55
21,020.00	87.85	178.68	8,405.60	-12,202.41	-1,070.10	12,249.23	2.06	-0.56	-1.98
21,115.00	89.40	178.46	8,407.88	-12,297.35	-1,067.73	12,343.62	1.65	1.63	-0.23
Last MWD Survey @ 21115' MD									
21,183.00	89.40	178.46	8,408.59	-12,365.33	-1,065.91	12,411.18	0.00	0.00	0.00
Projection to TD @ 21183' MD 509' FSL/ 2642' 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 @ 8089.3 - actual wellpath misses target center by 0.02usft at 8089.34usft MD (7958.02 TVD, 610.36 N, -1047.77 E) - Point	0.00	0.00	7,958.02	610.36	-1,047.78	1,235,977.26	3,127,951.57	39.980238	-105.043411
70° Inclination @ 8647.7 - actual wellpath hits target center - Point	0.00	0.00	8,268.06	159.58	-1,050.32	1,235,526.48	3,127,951.37	39.979000	-105.043420
Cross @ 11145.26' MD - actual wellpath hits target center - Point	0.00	0.00	8,312.42	-2,333.00	-1,056.91	1,233,033.90	3,127,957.72	39.972157	-105.043443
Cross @ 16416.87' MD - actual wellpath hits target center - Point	0.00	0.00	8,357.55	-7,601.00	-1,083.23	1,227,765.83	3,127,958.75	39.957696	-105.043536

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,584.00	1,577.10	50.90	-79.39	Tie into Surface Surveys
1,669.00	1,660.34	59.57	-94.25	First MWD Survey @ 1669' MD
8,089.34	7,958.03	610.36	-1,047.77	30° Inclination @ 8089.34' MD
8,647.72	8,268.06	159.58	-1,050.32	70° Inclination @ 8647.72' MD
11,145.26	8,312.42	-2,333.00	-1,056.91	Cross @ 11145.26' MD
16,416.87	8,357.55	-7,601.00	-1,083.23	Cross @ 16416.87' MD
21,115.00	8,407.88	-12,297.35	-1,067.73	Last MWD Survey @ 21115' MD
21,183.00	8,408.59	-12,365.33	-1,065.91	Projection to TD @ 21183' MD 509' FSL/ 2642' FWL

Checked By: _____	Approved By: _____	Date: _____
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