

Extraction Oil & Gas

Weld County, CO (NAD83)

Sec 07-T01S-R68W Livingston Pad

Livingston S19-25-12N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

03 October, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-12N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5353.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5353.30usft (Patterson 901)
Well:	Livingston S19-25-12N	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 S19-25-12N				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.36 usft	Latitude:	39.978561
	+E/-W	0.00 usft	Easting:	3,129,074.25 usft	Longitude:	-105.039416
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,324.30 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/28/2019	8.10	66.42	51,868.58849555

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	179.25	

Survey Program	Date	10/3/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	1,559.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,663.00	20,849.00	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	1.05	135.82	142.99	-0.94	0.91	0.95	0.73	0.73	0.00	
230.00	0.09	257.81	229.99	-1.53	1.40	1.54	1.26	-1.10	140.22	
318.00	0.22	342.62	317.99	-1.38	1.28	1.40	0.26	0.15	96.38	
405.00	0.18	298.41	404.99	-1.15	1.11	1.17	0.18	-0.05	-50.82	
492.00	0.26	232.23	491.99	-1.21	0.84	1.22	0.29	0.09	-76.07	
579.00	0.57	234.52	578.98	-1.58	0.33	1.59	0.36	0.36	2.63	
667.00	0.75	248.67	666.98	-2.05	-0.56	2.04	0.27	0.20	16.08	
754.00	1.05	269.76	753.97	-2.26	-1.89	2.23	0.51	0.34	24.24	
841.00	0.40	225.11	840.96	-2.47	-2.90	2.44	0.94	-0.75	-51.32	

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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)
929.00	0.31	155.50	928.96	-2.91	-3.02	2.87	0.47	-0.10	-79.10
1,016.00	0.97	81.06	1,015.95	-3.01	-2.20	2.98	1.08	0.76	-85.56
1,103.00	1.19	78.07	1,102.94	-2.71	-0.59	2.70	0.26	0.25	-3.44
1,190.00	1.27	54.96	1,189.92	-1.97	1.09	1.98	0.57	0.09	-26.56
1,278.00	1.76	24.99	1,277.89	-0.18	2.46	0.21	1.04	0.56	-34.06
1,365.00	2.55	17.43	1,364.83	2.88	3.60	-2.83	0.96	0.91	-8.69
1,452.00	4.75	14.35	1,451.65	8.21	5.07	-8.15	2.54	2.53	-3.54
1,539.00	7.51	15.67	1,538.14	17.18	7.50	-17.08	3.18	3.17	1.52
1,559.00	7.87	17.34	1,557.96	19.74	8.26	-19.63	2.12	1.80	8.35
Tie into Surface Surveys									
1,663.00	9.63	19.29	1,660.75	34.75	13.26	-34.58	1.72	1.69	1.88
First MWD Survey @ 1663' MD									
1,758.00	9.90	16.38	1,754.37	50.09	18.19	-49.84	0.59	0.28	-3.06
1,853.00	9.90	13.34	1,847.96	65.87	22.37	-65.57	0.55	0.00	-3.20
1,948.00	9.85	9.11	1,941.55	81.84	25.55	-81.50	0.77	-0.05	-4.45
2,044.00	8.00	13.92	2,036.38	96.43	28.45	-96.05	2.08	-1.93	5.01
2,138.00	6.98	8.36	2,129.58	108.43	30.86	-108.02	1.33	-1.09	-5.91
2,233.00	6.63	2.58	2,223.91	119.62	31.94	-119.19	0.81	-0.37	-6.08
2,327.00	5.97	19.47	2,317.35	129.65	33.82	-129.20	2.08	-0.70	17.97
2,421.00	5.35	17.27	2,410.90	138.45	36.75	-137.95	0.70	-0.66	-2.34
2,516.00	7.03	33.53	2,505.35	147.52	41.27	-146.97	2.54	1.77	17.12
2,612.00	6.14	31.46	2,600.71	156.80	47.20	-156.17	0.96	-0.93	-2.16
2,707.00	5.21	29.43	2,695.24	164.89	51.97	-164.19	1.00	-0.98	-2.14
2,801.00	7.03	19.12	2,788.71	174.04	55.95	-173.29	2.25	1.94	-10.97
2,896.00	8.57	13.48	2,882.83	186.42	59.51	-185.62	1.81	1.62	-5.94
2,992.00	7.07	10.26	2,977.93	199.19	62.23	-198.36	1.63	-1.56	-3.35
3,103.00	6.81	8.94	3,088.12	212.41	64.47	-211.55	0.27	-0.23	-1.19
3,199.00	5.92	10.44	3,183.53	222.91	66.25	-222.02	0.94	-0.93	1.56
3,294.00	7.34	22.29	3,277.89	233.34	69.44	-232.41	2.07	1.49	12.47
3,389.00	6.01	16.43	3,372.25	243.73	73.15	-242.74	1.57	-1.40	-6.17
3,485.00	6.89	21.72	3,467.64	253.90	76.70	-252.87	1.11	0.92	5.51
3,580.00	8.97	23.35	3,561.73	265.99	81.74	-264.89	2.20	2.19	1.72
3,675.00	8.53	17.31	3,655.62	279.52	86.77	-278.35	1.07	-0.46	-6.36
3,771.00	6.76	12.11	3,750.77	291.84	90.08	-290.63	1.98	-1.84	-5.42
3,866.00	8.31	23.92	3,844.95	303.58	94.04	-302.32	2.30	1.63	12.43
3,961.00	6.27	21.41	3,939.18	314.69	98.71	-313.37	2.17	-2.15	-2.64
4,056.00	8.75	18.68	4,033.35	326.37	102.92	-324.99	2.64	2.61	-2.87
4,152.00	7.07	18.94	4,128.44	338.87	107.18	-337.44	1.75	-1.75	0.27
4,247.00	4.95	19.91	4,222.91	348.26	110.47	-346.78	2.23	-2.23	1.02
4,342.00	7.95	25.59	4,317.30	358.04	114.71	-356.50	3.22	3.16	5.98
4,437.00	8.88	27.18	4,411.28	370.49	120.89	-368.87	1.01	0.98	1.67
4,533.00	6.58	24.32	4,506.40	382.09	126.54	-380.40	2.43	-2.40	-2.98
4,628.00	9.50	21.76	4,600.45	394.34	131.69	-392.57	3.10	3.07	-2.69

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Survey									
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4,723.00	8.18	16.25	4,694.32	408.11	136.49	-406.28	1.65	-1.39	-5.80
4,819.00	11.09	21.67	4,788.96	423.25	141.81	-421.35	3.17	3.03	5.65
4,914.00	8.97	18.85	4,882.51	438.75	147.58	-436.77	2.29	-2.23	-2.97
5,010.00	6.10	18.10	4,977.67	450.68	151.58	-448.65	2.99	-2.99	-0.78
5,105.00	9.54	12.51	5,071.77	463.17	154.86	-461.10	3.70	3.62	-5.88
5,201.00	9.10	11.36	5,166.50	478.38	158.08	-476.26	0.50	-0.46	-1.20
5,295.00	7.78	8.09	5,259.48	491.97	160.44	-489.82	1.49	-1.40	-3.48
5,391.00	7.07	8.32	5,354.68	504.24	162.21	-502.07	0.74	-0.74	0.24
5,486.00	7.47	13.70	5,448.92	516.03	164.51	-513.83	0.83	0.42	5.66
5,582.00	9.32	14.36	5,543.88	529.62	167.92	-527.37	1.93	1.93	0.69
5,677.00	8.62	13.61	5,637.72	544.00	171.50	-541.70	0.75	-0.74	-0.79
5,773.00	6.72	9.47	5,732.86	556.53	174.12	-554.20	2.06	-1.98	-4.31
5,868.00	7.73	10.70	5,827.10	568.29	176.22	-565.93	1.08	1.06	1.29
5,964.00	7.60	10.48	5,922.24	580.88	178.58	-578.48	0.14	-0.14	-0.23
6,059.00	5.70	7.51	6,016.60	591.73	180.33	-589.31	2.03	-2.00	-3.13
6,155.00	7.78	19.29	6,111.94	602.59	183.10	-600.14	2.59	2.17	12.27
6,250.00	9.46	12.95	6,205.86	616.27	186.98	-613.77	2.03	1.77	-6.67
6,346.00	8.40	6.02	6,300.70	630.94	189.48	-628.39	1.57	-1.10	-7.22
6,440.00	6.81	4.34	6,393.87	643.32	190.62	-640.76	1.71	-1.69	-1.79
6,535.00	6.63	10.96	6,488.22	654.32	192.09	-651.74	0.84	-0.19	6.97
6,631.00	9.50	29.08	6,583.28	666.69	197.00	-664.05	3.96	2.99	18.88
6,726.00	7.95	28.06	6,677.17	679.34	203.90	-676.61	1.64	-1.63	-1.07
6,821.00	6.36	19.69	6,771.43	690.09	208.76	-687.29	2.00	-1.67	-8.81
6,916.00	5.44	16.03	6,865.93	699.38	211.78	-696.54	1.05	-0.97	-3.85
7,011.00	3.84	14.14	6,960.61	706.79	213.80	-703.92	1.69	-1.68	-1.99
7,107.00	2.83	16.25	7,056.45	712.18	215.25	-709.30	1.06	-1.05	2.20
7,202.00	1.68	25.99	7,151.38	715.68	216.52	-712.78	1.27	-1.21	10.25
7,297.00	1.41	41.11	7,246.34	717.82	217.90	-714.90	0.51	-0.28	15.92
7,393.00	1.68	146.34	7,342.32	717.54	219.45	-714.59	2.56	0.28	109.61
7,488.00	12.81	183.09	7,436.44	705.82	219.66	-702.88	12.11	11.72	38.68
7,584.00	18.91	180.84	7,528.74	679.61	218.85	-676.68	6.39	6.35	-2.34
7,679.00	23.51	180.54	7,617.28	645.26	218.45	-642.33	4.84	4.84	-0.32
7,749.16	30.00	182.23	7,679.90	613.70	217.64	-610.80	9.31	9.25	2.40
30° Inclination @ 7749.16' MD									
7,775.00	32.39	182.69	7,702.00	600.33	217.06	-597.43	9.31	9.26	1.79
7,870.00	39.73	183.71	7,778.74	544.54	213.90	-541.69	7.75	7.73	1.07
7,965.00	49.98	180.71	7,846.01	477.69	211.47	-474.87	11.01	10.79	-3.16
8,061.00	58.11	175.38	7,902.35	400.14	214.31	-397.29	9.58	8.47	-5.55
8,145.93	70.00	177.02	7,939.45	324.08	219.31	-321.17	14.10	14.00	1.93
70° Inclination @ 8145.93' MD									
8,156.00	71.41	177.19	7,942.77	314.58	219.79	-311.67	14.10	14.01	1.74
8,251.00	81.00	182.65	7,965.42	222.47	219.83	-219.57	11.53	10.09	5.75
8,347.00	88.25	181.86	7,974.40	127.03	216.07	-124.18	7.60	7.55	-0.82
8,442.00	91.43	181.55	7,974.67	32.09	213.25	-29.28	3.36	3.35	-0.33

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8,537.00	90.72	178.73	7,972.89	-62.89	213.01	65.68	3.06	-0.75	-2.97
8,654.00	89.97	178.82	7,972.18	-179.86	215.52	182.67	0.65	-0.64	0.08
8,749.00	90.63	178.91	7,971.68	-274.84	217.40	277.67	0.70	0.69	0.09
8,845.00	90.72	179.21	7,970.55	-370.82	218.97	373.66	0.33	0.09	0.31
8,940.00	90.90	179.43	7,969.21	-465.80	220.10	468.65	0.30	0.19	0.23
9,035.00	90.85	179.43	7,967.76	-560.78	221.04	563.64	0.05	-0.05	0.00
9,119.00	88.42	180.27	7,968.29	-644.78	221.26	647.62	3.06	-2.89	1.00
9,215.00	87.94	180.05	7,971.34	-740.73	221.00	743.56	0.55	-0.50	-0.23
9,310.00	87.89	182.52	7,974.80	-835.63	218.87	838.43	2.60	-0.05	2.60
9,405.00	90.63	183.80	7,976.03	-930.47	213.63	933.19	3.18	2.88	1.35
9,500.00	89.79	183.71	7,975.68	-1,025.26	207.41	1,027.90	0.89	-0.88	-0.09
9,595.00	89.88	183.18	7,975.95	-1,120.09	201.70	1,122.64	0.57	0.09	-0.56
9,690.00	90.46	182.61	7,975.67	-1,214.97	196.90	1,217.45	0.86	0.61	-0.60
9,784.00	90.15	182.30	7,975.17	-1,308.88	192.88	1,311.30	0.47	-0.33	-0.33
9,880.00	90.90	182.21	7,974.29	-1,404.80	189.10	1,407.16	0.79	0.78	-0.09
9,975.00	91.30	181.81	7,972.47	-1,499.73	185.77	1,502.03	0.60	0.42	-0.42
10,070.00	88.73	182.12	7,972.44	-1,594.66	182.51	1,596.92	2.72	-2.71	0.33
10,166.00	88.33	182.34	7,974.90	-1,690.56	178.78	1,692.76	0.48	-0.42	0.23
10,261.00	92.71	181.86	7,974.04	-1,785.47	175.30	1,787.61	4.64	4.61	-0.51
10,356.00	92.53	181.99	7,969.70	-1,880.31	172.11	1,882.41	0.23	-0.19	0.14
10,451.00	90.81	181.95	7,966.93	-1,975.21	168.84	1,977.26	1.81	-1.81	-0.04
10,546.00	91.25	179.96	7,965.22	-2,070.18	167.26	2,072.20	2.14	0.46	-2.09
10,642.00	90.72	179.39	7,963.57	-2,166.16	167.81	2,168.18	0.81	-0.55	-0.59
10,737.00	89.75	178.46	7,963.18	-2,261.14	169.59	2,263.17	1.41	-1.02	-0.98
10,804.87	89.56	179.07	7,963.60	-2,329.00	171.05	2,331.04	0.94	-0.29	0.89
Cross @ 10804.87' MD									
10,831.00	89.48	179.30	7,963.82	-2,355.12	171.43	2,357.17	0.94	-0.29	0.89
10,927.00	87.50	179.52	7,966.34	-2,451.08	172.41	2,453.13	2.08	-2.06	0.23
11,022.00	88.73	179.13	7,969.47	-2,546.02	173.53	2,548.08	1.36	1.29	-0.41
11,117.00	89.88	179.08	7,970.62	-2,641.00	175.02	2,643.07	1.21	1.21	-0.05
11,213.00	89.22	179.21	7,971.38	-2,736.98	176.45	2,739.06	0.70	-0.69	0.14
11,308.00	88.60	178.99	7,973.18	-2,831.96	177.94	2,834.05	0.69	-0.65	-0.23
11,403.00	90.94	180.01	7,973.56	-2,926.94	178.77	2,929.04	2.69	2.46	1.07
11,498.00	90.15	179.70	7,972.66	-3,021.94	179.01	3,024.03	0.89	-0.83	-0.33
11,593.00	90.10	178.99	7,972.45	-3,116.93	180.10	3,119.03	0.75	-0.05	-0.75
11,689.00	89.00	178.66	7,973.21	-3,212.91	182.06	3,215.02	1.20	-1.15	-0.34
11,784.00	88.47	178.29	7,975.30	-3,307.85	184.59	3,309.99	0.68	-0.56	-0.39
11,879.00	89.22	178.46	7,977.22	-3,402.79	187.29	3,404.96	0.81	0.79	0.18
11,975.00	90.72	181.24	7,977.27	-3,498.78	187.54	3,500.94	3.29	1.56	2.90
12,070.00	89.97	181.33	7,976.70	-3,593.75	185.41	3,595.88	0.80	-0.79	0.09
12,166.00	91.87	181.02	7,975.16	-3,689.71	183.44	3,691.80	2.01	1.98	-0.32
12,261.00	90.77	180.76	7,972.97	-3,784.68	181.96	3,786.74	1.19	-1.16	-0.27
12,357.00	90.81	180.62	7,971.64	-3,880.66	180.81	3,882.70	0.15	0.04	-0.15

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-12N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5353.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5353.30usft (Patterson 901)
Well:	Livingston S19-25-12N	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)
12,452.00	90.37	180.23	7,970.67	-3,975.65	180.10	3,977.67	0.62	-0.46	-0.41
12,548.00	89.57	179.57	7,970.72	-4,071.65	180.27	4,073.67	1.08	-0.83	-0.69
12,644.00	91.25	179.70	7,970.03	-4,167.64	180.88	4,169.66	1.76	1.75	0.14
12,739.00	90.63	179.65	7,968.47	-4,262.63	181.42	4,264.64	0.65	-0.65	-0.05
12,835.00	90.10	179.21	7,967.86	-4,358.62	182.38	4,360.64	0.72	-0.55	-0.46
12,930.00	89.40	178.77	7,968.27	-4,453.60	184.05	4,455.64	0.87	-0.74	-0.46
13,025.00	89.70	181.06	7,969.02	-4,548.59	184.19	4,550.62	2.43	0.32	2.41
13,121.00	91.52	181.06	7,968.00	-4,644.57	182.42	4,646.56	1.90	1.90	0.00
13,216.00	90.90	180.14	7,965.99	-4,739.54	181.42	4,741.51	1.17	-0.65	-0.97
13,312.00	90.10	180.14	7,965.15	-4,835.54	181.19	4,837.50	0.83	-0.83	0.00
13,407.00	89.75	179.35	7,965.28	-4,930.53	181.61	4,932.49	0.91	-0.37	-0.83
13,503.00	88.64	178.82	7,966.63	-5,026.51	183.14	5,028.48	1.28	-1.16	-0.55
13,598.00	91.12	181.86	7,966.83	-5,121.49	182.58	5,123.45	4.13	2.61	3.20
13,694.00	91.34	181.37	7,964.77	-5,217.43	179.87	5,219.34	0.56	0.23	-0.51
13,789.00	91.07	181.46	7,962.77	-5,312.38	177.53	5,314.25	0.30	-0.28	0.09
13,884.00	90.94	181.11	7,961.10	-5,407.34	175.40	5,409.18	0.39	-0.14	-0.37
13,979.00	88.78	179.74	7,961.33	-5,502.33	174.69	5,504.15	2.69	-2.27	-1.44
14,074.00	88.42	179.52	7,963.65	-5,597.30	175.31	5,599.12	0.44	-0.38	-0.23
14,169.00	87.80	179.30	7,966.79	-5,692.24	176.28	5,694.07	0.69	-0.65	-0.23
14,264.00	90.81	180.01	7,967.94	-5,787.22	176.86	5,789.04	3.26	3.17	0.75
14,359.00	90.77	179.70	7,966.63	-5,882.21	177.10	5,884.03	0.33	-0.04	-0.33
14,454.00	90.85	179.17	7,965.29	-5,977.20	178.03	5,979.02	0.56	0.08	-0.56
14,549.00	90.59	178.68	7,964.09	-6,072.17	179.81	6,074.01	0.58	-0.27	-0.52
14,645.00	90.68	178.33	7,963.03	-6,168.13	182.32	6,170.00	0.38	0.09	-0.36
14,740.00	87.94	178.77	7,964.17	-6,263.09	184.72	6,264.97	2.92	-2.88	0.46
14,835.00	87.85	179.17	7,967.66	-6,358.01	186.43	6,359.91	0.43	-0.09	0.42
14,930.00	86.04	179.08	7,972.73	-6,452.86	187.88	6,454.77	1.91	-1.91	-0.09
15,025.00	86.57	179.13	7,978.85	-6,547.65	189.36	6,549.57	0.56	0.56	0.05
15,120.00	86.92	184.06	7,984.25	-6,642.43	186.72	6,644.31	5.19	0.37	5.19
15,215.00	86.17	183.84	7,989.97	-6,737.03	180.19	6,738.82	0.82	-0.79	-0.23
15,310.00	88.64	185.34	7,994.27	-6,831.62	172.59	6,833.30	3.04	2.60	1.58
15,404.00	87.85	184.77	7,997.15	-6,925.21	164.31	6,926.77	1.04	-0.84	-0.61
15,500.00	88.91	186.48	7,999.86	-7,020.70	154.91	7,022.13	2.10	1.10	1.78
15,595.00	88.07	186.22	8,002.37	-7,115.09	144.40	7,116.37	0.93	-0.88	-0.27
15,691.00	90.19	183.71	8,003.83	-7,210.70	136.10	7,211.87	3.42	2.21	-2.61
15,786.00	89.88	183.40	8,003.77	-7,305.52	130.21	7,306.60	0.46	-0.33	-0.33
15,881.00	89.44	183.71	8,004.33	-7,400.33	124.32	7,401.33	0.57	-0.46	0.33
15,976.00	89.17	183.40	8,005.48	-7,495.14	118.43	7,496.05	0.43	-0.28	-0.33
16,071.00	89.66	178.99	8,006.45	-7,590.09	116.45	7,590.97	4.67	0.52	-4.64
16,078.91	89.58	178.98	8,006.51	-7,598.00	116.59	7,598.88	1.08	-1.07	-0.14
Cross @ 16078.91' MD									
16,166.00	88.64	178.86	8,007.86	-7,685.07	118.23	7,685.96	1.08	-1.07	-0.14
16,260.00	87.45	178.77	8,011.07	-7,778.99	120.17	7,779.90	1.27	-1.27	-0.10
16,355.00	86.57	178.64	8,016.03	-7,873.84	122.31	7,874.76	0.94	-0.93	-0.14

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-12N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5353.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5353.30usft (Patterson 901)
Well:	Livingston S19-25-12N	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)
16,451.00	89.04	178.60	8,019.70	-7,969.73	124.62	7,970.68	2.57	2.57	-0.04
16,546.00	88.29	178.07	8,021.92	-8,064.66	127.38	8,065.64	0.97	-0.79	-0.56
16,641.00	87.85	177.67	8,025.12	-8,159.54	130.91	8,160.56	0.63	-0.46	-0.42
16,737.00	88.82	178.60	8,027.90	-8,255.45	134.04	8,256.50	1.40	1.01	0.97
16,832.00	89.17	178.46	8,029.57	-8,350.40	136.47	8,351.48	0.40	0.37	-0.15
16,928.00	89.40	177.63	8,030.77	-8,446.34	139.75	8,447.45	0.90	0.24	-0.86
17,023.00	89.48	177.45	8,031.70	-8,541.25	143.82	8,542.40	0.21	0.08	-0.19
17,118.00	89.00	177.14	8,032.96	-8,636.13	148.31	8,637.34	0.60	-0.51	-0.33
17,213.00	88.60	176.70	8,034.95	-8,730.97	153.41	8,732.24	0.63	-0.42	-0.46
17,308.00	90.28	179.35	8,035.88	-8,825.90	156.68	8,827.20	3.30	1.77	2.79
17,402.00	90.06	178.95	8,035.60	-8,919.89	158.08	8,921.20	0.49	-0.23	-0.43
17,498.00	89.48	178.51	8,035.98	-9,015.87	160.21	9,017.19	0.76	-0.60	-0.46
17,593.00	88.38	181.20	8,037.76	-9,110.84	160.45	9,112.16	3.06	-1.16	2.83
17,688.00	87.80	180.71	8,040.92	-9,205.77	158.86	9,207.06	0.80	-0.61	-0.52
17,783.00	86.88	180.49	8,045.33	-9,300.66	157.87	9,301.93	1.00	-0.97	-0.23
17,879.00	86.21	180.14	8,051.12	-9,396.49	157.34	9,397.74	0.79	-0.70	-0.36
17,974.00	87.80	181.02	8,056.08	-9,491.35	156.38	9,492.58	1.91	1.67	0.93
18,070.00	86.70	180.98	8,060.69	-9,587.22	154.71	9,588.43	1.15	-1.15	-0.04
18,165.00	85.55	180.36	8,067.11	-9,682.00	153.60	9,683.18	1.37	-1.21	-0.65
18,261.00	86.74	179.48	8,073.56	-9,777.78	153.73	9,778.95	1.54	1.24	-0.92
18,356.00	87.27	179.26	8,078.52	-9,872.64	154.78	9,873.82	0.60	0.56	-0.23
18,452.00	86.61	178.64	8,083.65	-9,968.49	156.53	9,969.68	0.94	-0.69	-0.65
18,548.00	85.68	178.42	8,090.10	-10,064.24	158.99	10,065.46	1.00	-0.97	-0.23
18,643.00	88.42	178.38	8,094.99	-10,159.06	161.64	10,160.31	2.88	2.88	-0.04
18,738.00	88.38	177.94	8,097.64	-10,253.98	164.69	10,255.26	0.46	-0.04	-0.46
18,834.00	87.94	177.50	8,100.73	-10,349.85	168.51	10,351.17	0.65	-0.46	-0.46
18,929.00	88.07	181.02	8,104.03	-10,444.77	169.73	10,446.10	3.71	0.14	3.71
19,025.00	91.43	180.84	8,104.45	-10,540.74	168.17	10,542.04	3.51	3.50	-0.19
19,120.00	90.85	180.18	8,102.56	-10,635.72	167.33	10,637.00	0.92	-0.61	-0.69
19,216.00	89.70	179.43	8,102.10	-10,731.72	167.66	10,732.99	1.43	-1.20	-0.78
19,311.00	91.34	181.68	8,101.24	-10,826.70	166.74	10,827.95	2.93	1.73	2.37
19,407.00	91.25	181.11	8,099.07	-10,922.65	164.40	10,923.86	0.60	-0.09	-0.59
19,502.00	90.99	180.84	8,097.21	-11,017.61	162.78	11,018.80	0.39	-0.27	-0.28
19,597.00	91.16	180.80	8,095.43	-11,112.59	161.42	11,113.75	0.18	0.18	-0.04
19,691.00	91.07	180.62	8,093.60	-11,206.56	160.26	11,207.70	0.21	-0.10	-0.19
19,785.00	90.85	180.98	8,092.03	-11,300.54	158.95	11,301.65	0.45	-0.23	0.38
19,880.00	90.99	180.36	8,090.50	-11,395.52	157.84	11,396.61	0.67	0.15	-0.65
20,070.00	89.00	180.23	8,090.52	-11,585.51	156.86	11,586.57	1.05	-1.05	-0.07
20,164.00	91.65	181.42	8,089.99	-11,679.49	155.51	11,680.52	3.09	2.82	1.27
20,259.00	91.91	180.62	8,087.03	-11,774.42	153.81	11,775.43	0.89	0.27	-0.84
20,355.00	92.00	180.01	8,083.76	-11,870.37	153.29	11,871.36	0.64	0.09	-0.64
20,449.00	91.74	179.65	8,080.69	-11,964.32	153.57	11,965.30	0.47	-0.28	-0.38
20,543.00	91.83	179.17	8,077.76	-12,058.27	154.53	12,059.25	0.52	0.10	-0.51

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-12N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5353.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5353.30usft (Patterson 901)
Well:	Livingston S19-25-12N	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)
20,638.00	91.43	178.86	8,075.06	-12,153.21	156.17	12,154.22	0.53	-0.42	-0.33
20,734.00	91.21	178.16	8,072.85	-12,249.15	158.66	12,250.18	0.76	-0.23	-0.73
20,783.00	91.16	178.20	8,071.84	-12,298.12	160.22	12,299.16	0.13	-0.10	0.08
Last MWD Survey @ 20783' MD									
20,849.00	91.16	178.20	8,070.50	-12,364.07	162.29	12,365.14	0.00	0.00	0.00
Projection to TD @ 20849' MD 511.5' FSL/ 1242' FEL									

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 @ 7749.1 - actual wellpath misses target center by 0.04usft at 7749.16usft MD (7679.90 TVD, 613.70 N, 217.64 E) - Point	0.00	0.00	7,679.90	613.70	217.67	1,235,987.19	3,129,288.73	39.980246	-105.038640
70° Inclination @ 8145.9 - actual wellpath misses target center by 0.01usft at 8145.93usft MD (7939.45 TVD, 324.08 N, 219.31 E) - Point	0.00	0.00	7,939.45	324.08	219.32	1,235,697.58	3,129,291.88	39.979451	-105.038634
Cross @ 10804.87' MD - actual wellpath hits target center - Point	0.00	0.00	7,963.60	-2,329.00	171.05	1,233,044.28	3,129,257.39	39.972167	-105.038806
Cross @ 16078.91' MD - actual wellpath hits target center - Point	0.00	0.00	8,006.51	-7,598.00	116.59	1,227,775.07	3,129,230.29	39.957703	-105.039000

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,559.00	1,557.96	19.74	8.26	Tie into Surface Surveys	
1,663.00	1,660.75	34.75	13.26	First MWD Survey @ 1663' MD	
7,749.16	7,679.90	613.70	217.64	30° Inclination @ 7749.16' MD	
8,145.93	7,939.45	324.08	219.31	70° Inclination @ 8145.93' MD	
10,804.87	7,963.60	-2,329.00	171.05	Cross @ 10804.87' MD	
16,078.91	8,006.51	-7,598.00	116.59	Cross @ 16078.91' MD	
20,783.00	8,071.84	-12,298.12	160.22	Last MWD Survey @ 20783' MD	
20,849.00	8,070.50	-12,364.07	162.29	Projection to TD @ 20849' MD 511.5' FSL/ 1242' FEL	

Checked By: _____ Approved By: _____ Date: _____