

Extraction Oil & Gas

Weld County, CO (NAD83)

Sec 07-T01S-R68W Livingston Pad

Livingston S19-25-11C

Wellbore #1

Design: Wellbore #1

Standard Survey Report

03 October, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-11C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5352.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5352.60usft (Patterson 901)
Well:	Livingston S19-25-11C	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 S19-25-11C				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.28 usft	Latitude:	39.978561
	+E/-W	0.00 usft	Easting:	3,129,056.31 usft	Longitude:	-105.039480
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,323.60 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/28/2019	8.10	66.42	51,868.58725656

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	180.44	

Survey Program	Date	10/3/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	1,560.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,764.00	21,226.00	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	0.44	197.51	143.00	-0.52	-0.17	0.52	0.31	0.31	0.00	
230.00	0.66	217.99	229.99	-1.24	-0.57	1.24	0.34	0.25	23.54	
318.00	0.44	240.58	317.99	-1.80	-1.18	1.81	0.35	-0.25	25.67	
405.00	0.13	248.14	404.99	-2.00	-1.56	2.02	0.36	-0.36	8.69	
492.00	0.26	289.89	491.99	-1.97	-1.84	1.99	0.21	0.15	47.99	
579.00	0.53	283.30	578.99	-1.81	-2.42	1.83	0.31	0.31	-7.57	
667.00	0.31	323.11	666.98	-1.53	-2.96	1.55	0.40	-0.25	45.24	
754.00	0.31	85.54	753.98	-1.32	-2.86	1.34	0.62	0.00	140.72	
841.00	0.57	87.39	840.98	-1.28	-2.20	1.30	0.30	0.30	2.13	

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Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5352.60usft (Patterson 901)
Well:	Livingston S19-25-11C	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	0.88	67.61	928.97	-1.01	-1.13	1.02	0.45	0.35	-22.48
1,016.00	0.92	49.86	1,015.96	-0.30	0.02	0.30	0.32	0.05	-20.40
1,103.00	0.70	0.29	1,102.96	0.68	0.55	-0.68	0.81	-0.25	-56.98
1,190.00	2.46	325.04	1,189.92	2.74	-0.51	-2.74	2.22	2.02	-40.52
1,278.00	3.34	338.67	1,277.81	6.68	-2.53	-6.66	1.26	1.00	15.49
1,365.00	4.39	350.53	1,364.61	12.32	-4.00	-12.29	1.51	1.21	13.63
1,452.00	6.59	358.62	1,451.21	20.60	-4.67	-20.56	2.67	2.53	9.30
1,539.00	7.43	351.85	1,537.56	31.16	-5.58	-31.11	1.35	0.97	-7.78
1,560.00	7.60	351.32	1,558.38	33.87	-5.99	-33.83	0.87	0.81	-2.52
Tie into Surface Surveys									
1,764.00	8.13	349.23	1,760.46	61.38	-10.72	-61.30	0.30	0.26	-1.02
First MWD Survey @ 1764' MD									
1,859.00	7.91	346.76	1,854.53	74.34	-13.47	-74.24	0.43	-0.23	-2.60
1,955.00	7.42	343.85	1,949.67	86.73	-16.71	-86.60	0.65	-0.51	-3.03
2,050.00	6.98	341.69	2,043.92	98.10	-20.23	-97.94	0.54	-0.46	-2.27
2,145.00	6.36	338.08	2,138.28	108.46	-24.00	-108.27	0.79	-0.65	-3.80
2,239.00	6.01	334.99	2,231.73	117.75	-28.03	-117.53	0.51	-0.37	-3.29
2,334.00	8.35	347.99	2,325.99	129.01	-31.57	-128.76	2.98	2.46	13.68
2,428.00	8.18	345.88	2,419.01	142.17	-34.62	-141.90	0.37	-0.18	-2.24
2,523.00	7.34	344.47	2,513.14	154.57	-37.89	-154.28	0.91	-0.88	-1.48
2,618.00	7.78	0.86	2,607.33	166.85	-39.42	-166.54	2.31	0.46	17.25
2,714.00	7.29	358.04	2,702.50	179.43	-39.53	-179.12	0.64	-0.51	-2.94
2,808.00	6.63	353.98	2,795.80	190.79	-40.30	-190.47	0.88	-0.70	-4.32
2,902.00	5.74	349.71	2,889.26	200.81	-41.71	-200.49	1.07	-0.95	-4.54
2,998.00	7.64	350.28	2,984.60	211.83	-43.65	-211.48	1.98	1.98	0.59
3,093.00	6.58	346.32	3,078.87	223.34	-46.00	-222.98	1.23	-1.12	-4.17
3,188.00	5.66	342.84	3,173.32	233.10	-48.67	-232.72	1.04	-0.97	-3.66
3,283.00	8.31	354.65	3,267.62	244.42	-50.69	-244.02	3.16	2.79	12.43
3,378.00	7.29	350.24	3,361.74	257.19	-52.36	-256.78	1.24	-1.07	-4.64
3,474.00	6.41	343.50	3,457.05	268.34	-54.91	-267.91	1.24	-0.92	-7.02
3,569.00	5.35	334.86	3,551.55	277.43	-58.30	-276.97	1.45	-1.12	-9.09
3,665.00	6.81	348.92	3,647.02	287.07	-61.29	-286.59	2.16	1.52	14.65
3,760.00	8.09	359.45	3,741.22	299.28	-62.44	-298.79	1.96	1.35	11.08
3,856.00	6.67	353.81	3,836.42	311.58	-63.11	-311.09	1.66	-1.48	-5.88
3,951.00	5.66	348.30	3,930.87	321.65	-64.65	-321.15	1.23	-1.06	-5.80
4,045.00	6.45	352.27	4,024.34	331.42	-66.30	-330.90	0.95	0.84	4.22
4,141.00	9.10	359.54	4,119.46	344.36	-67.09	-343.84	2.94	2.76	7.57
4,236.00	7.20	354.87	4,213.49	357.80	-67.68	-357.27	2.12	-2.00	-4.92
4,331.00	5.79	351.65	4,307.88	368.47	-68.91	-367.93	1.53	-1.48	-3.39
4,426.00	4.77	349.40	4,402.48	377.10	-70.33	-376.55	1.10	-1.07	-2.37
4,522.00	5.88	7.65	4,498.07	385.90	-70.41	-385.34	2.10	1.16	19.01
4,617.00	8.13	6.37	4,592.35	397.40	-69.02	-396.86	2.37	2.37	-1.35
4,713.00	7.42	4.21	4,687.47	410.32	-67.81	-409.79	0.80	-0.74	-2.25

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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)	
4,808.00	6.50	0.11	4,781.77	421.82	-67.35	-421.29	1.10	-0.97	-4.32	
4,904.00	9.41	359.41	4,876.84	435.10	-67.42	-434.57	3.03	3.03	-0.73	
4,999.00	7.64	351.16	4,970.79	449.11	-68.47	-448.57	2.26	-1.86	-8.68	
5,095.00	6.63	344.86	5,066.04	460.77	-70.90	-460.21	1.33	-1.05	-6.56	
5,190.00	9.37	351.83	5,160.11	473.72	-73.43	-473.14	3.05	2.88	7.34	
5,285.00	8.75	351.34	5,253.93	488.52	-75.62	-487.92	0.66	-0.65	-0.52	
5,380.00	7.03	347.20	5,348.02	501.33	-77.99	-500.72	1.91	-1.81	-4.36	
5,476.00	8.44	354.87	5,443.15	514.08	-79.92	-513.45	1.82	1.47	7.99	
5,571.00	6.58	353.94	5,537.33	526.44	-81.12	-525.80	1.96	-1.96	-0.98	
5,667.00	4.73	350.59	5,632.86	535.81	-82.35	-535.16	1.96	-1.93	-3.49	
5,762.00	4.51	350.28	5,727.55	543.36	-83.62	-542.70	0.23	-0.23	-0.33	
5,857.00	6.05	6.15	5,822.15	552.02	-83.72	-551.36	2.22	1.62	16.71	
5,953.00	4.42	353.76	5,917.75	560.72	-83.58	-560.07	2.06	-1.70	-12.91	
6,049.00	7.25	351.38	6,013.24	570.39	-84.89	-569.72	2.96	2.95	-2.48	
6,144.00	5.79	355.00	6,107.63	581.09	-86.20	-580.42	1.60	-1.54	3.81	
6,240.00	8.62	2.23	6,202.86	593.11	-86.34	-592.43	3.09	2.95	7.53	
6,335.00	7.29	359.10	6,296.94	606.25	-86.16	-605.57	1.47	-1.40	-3.29	
6,429.00	6.10	357.55	6,390.30	617.20	-86.47	-616.52	1.28	-1.27	-1.65	
6,525.00	8.40	0.46	6,485.53	629.31	-86.63	-628.63	2.43	2.40	3.03	
6,620.00	7.03	355.92	6,579.67	642.05	-86.99	-641.36	1.58	-1.44	-4.78	
6,716.00	5.66	355.92	6,675.08	652.63	-87.74	-651.94	1.43	-1.43	0.00	
6,811.00	7.25	354.43	6,769.47	663.27	-88.66	-662.57	1.68	1.67	-1.57	
6,906.00	6.14	355.35	6,863.82	674.30	-89.65	-673.60	1.17	-1.17	0.97	
7,001.00	4.99	353.85	6,958.37	683.48	-90.51	-682.76	1.22	-1.21	-1.58	
7,096.00	3.84	352.84	7,053.09	690.74	-91.35	-690.02	1.21	-1.21	-1.06	
7,192.00	2.08	6.72	7,148.96	695.66	-91.54	-694.94	1.97	-1.83	14.46	
7,287.00	2.47	357.64	7,243.88	699.42	-91.43	-698.70	0.56	0.41	-9.56	
7,382.00	1.59	315.12	7,338.83	702.40	-92.44	-701.67	1.77	-0.93	-44.76	
7,478.00	1.64	318.60	7,434.79	704.37	-94.29	-703.63	0.11	0.05	3.63	
7,573.00	1.50	330.36	7,529.76	706.47	-95.80	-705.72	0.37	-0.15	12.38	
7,669.00	1.24	333.63	7,625.73	708.49	-96.89	-707.73	0.28	-0.27	3.41	
7,764.00	1.37	250.16	7,720.71	709.03	-98.41	-708.25	1.83	0.14	-87.86	
7,863.00	10.43	189.79	7,839.00	697.91	-101.59	-697.11	8.26	7.61	-50.73	
7,978.00	18.47	184.99	7,930.92	674.40	-104.36	-673.58	8.55	8.46	-5.05	
8,073.00	25.14	183.58	8,019.08	639.23	-106.94	-638.39	7.04	7.02	-1.48	
8,147.29	30.00	183.58	8,084.91	604.92	-109.08	-604.07	6.54	6.54	0.00	
30° Inclination @ 8147.29' MD										
8,169.00	31.42	183.58	8,103.58	593.86	-109.77	-593.00	6.54	6.54	0.00	
8,263.00	39.51	181.55	8,180.07	539.42	-112.12	-538.54	8.70	8.61	-2.16	
8,359.00	50.86	181.33	8,247.63	471.45	-113.81	-470.56	11.82	11.82	-0.23	
8,454.00	64.91	180.18	8,298.01	391.20	-114.81	-390.31	14.82	14.79	-1.21	
8,482.56	70.00	180.01	8,308.95	364.83	-114.85	-363.94	17.83	17.82	-0.60	
70° Inclination @ 8482.56' MD										
8,549.00	81.84	179.65	8,325.09	300.50	-114.65	-299.61	17.83	17.82	-0.54	

Survey Report

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8,646.00	88.78	180.98	8,333.01	203.89	-115.19	-203.00	7.28	7.15	1.37
8,741.00	91.07	179.35	8,333.14	108.90	-115.47	-108.01	2.96	2.41	-1.72
8,837.00	91.16	178.07	8,331.27	12.94	-113.30	-12.07	1.34	0.09	-1.33
8,932.00	91.16	177.94	8,329.35	-81.98	-110.00	82.82	0.14	0.00	-0.14
9,027.00	93.02	178.46	8,325.88	-176.87	-107.02	177.68	2.03	1.96	0.55
9,122.00	93.24	178.07	8,320.70	-271.68	-104.14	272.47	0.47	0.23	-0.41
9,218.00	92.09	178.55	8,316.23	-367.53	-101.32	368.30	1.30	-1.20	0.50
9,313.00	89.84	179.74	8,314.63	-462.50	-99.90	463.25	2.68	-2.37	1.25
9,408.00	90.72	179.79	8,314.17	-557.50	-99.51	558.25	0.93	0.93	0.05
9,503.00	91.25	179.65	8,312.53	-652.48	-99.05	653.22	0.58	0.56	-0.15
9,598.00	89.00	180.18	8,312.33	-747.48	-98.90	748.21	2.43	-2.37	0.56
9,693.00	89.00	179.39	8,313.99	-842.46	-98.55	843.19	0.83	0.00	-0.83
9,787.00	89.04	179.04	8,315.59	-936.44	-97.26	937.16	0.37	0.04	-0.37
9,883.00	89.22	178.77	8,317.05	-1,032.41	-95.43	1,033.11	0.34	0.19	-0.28
9,978.00	90.10	181.51	8,317.61	-1,127.40	-95.66	1,128.10	3.03	0.93	2.88
10,073.00	90.68	181.24	8,316.97	-1,222.37	-97.94	1,223.08	0.67	0.61	-0.28
10,168.00	91.03	181.06	8,315.55	-1,317.34	-99.84	1,318.06	0.41	0.37	-0.19
10,264.00	90.94	181.20	8,313.90	-1,413.30	-101.74	1,414.04	0.17	-0.09	0.15
10,359.00	90.68	180.40	8,312.56	-1,508.28	-103.06	1,509.03	0.89	-0.27	-0.84
10,454.00	90.68	179.65	8,311.43	-1,603.28	-103.10	1,604.02	0.79	0.00	-0.79
10,549.00	91.03	180.10	8,310.01	-1,698.27	-102.90	1,699.00	0.60	0.37	0.47
10,644.00	91.25	179.48	8,308.12	-1,793.25	-102.55	1,793.98	0.69	0.23	-0.65
10,740.00	91.03	178.95	8,306.21	-1,889.22	-101.23	1,889.94	0.60	-0.23	-0.55
10,834.00	89.40	179.13	8,305.86	-1,983.20	-99.66	1,983.91	1.74	-1.73	0.19
10,930.00	89.48	177.80	8,306.80	-2,079.16	-97.09	2,079.84	1.39	0.08	-1.39
11,025.00	88.82	180.98	8,308.21	-2,174.13	-96.08	2,174.80	3.42	-0.69	3.35
11,120.00	88.91	180.67	8,310.09	-2,269.10	-97.44	2,269.78	0.34	0.09	-0.33
11,180.91	88.94	180.42	8,311.23	-2,330.00	-98.02	2,330.68	0.42	0.04	-0.42
Cross @ 11180.91' MD									
11,216.00	88.95	180.27	8,311.88	-2,365.08	-98.23	2,365.77	0.42	0.04	-0.42
11,311.00	89.93	180.14	8,312.81	-2,460.08	-98.57	2,460.76	1.04	1.03	-0.14
11,406.00	90.90	180.58	8,312.12	-2,555.07	-99.17	2,555.76	1.12	1.02	0.46
11,501.00	90.81	179.92	8,310.70	-2,650.06	-99.58	2,650.74	0.70	-0.09	-0.69
11,596.00	91.47	179.21	8,308.81	-2,745.03	-98.86	2,745.71	1.02	0.69	-0.75
11,692.00	89.44	179.83	8,308.05	-2,841.02	-98.06	2,841.69	2.21	-2.11	0.65
11,787.00	89.70	180.40	8,308.76	-2,936.02	-98.25	2,936.69	0.66	0.27	0.60
11,882.00	89.97	179.92	8,309.04	-3,031.02	-98.51	3,031.69	0.58	0.28	-0.51
11,978.00	90.54	179.96	8,308.61	-3,127.02	-98.41	3,127.68	0.60	0.59	0.04
12,073.00	91.21	179.26	8,307.16	-3,222.00	-97.77	3,222.66	1.02	0.71	-0.74
12,169.00	89.09	181.46	8,306.91	-3,317.99	-98.37	3,318.65	3.18	-2.21	2.29
12,264.00	88.91	180.67	8,308.57	-3,412.96	-100.14	3,413.63	0.85	-0.19	-0.83
12,360.00	89.84	180.71	8,309.61	-3,508.94	-101.29	3,509.62	0.97	0.97	0.04
12,455.00	90.06	180.14	8,309.70	-3,603.94	-102.00	3,604.62	0.64	0.23	-0.60

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-11C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5352.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5352.60usft (Patterson 901)
Well:	Livingston S19-25-11C	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)
12,551.00	88.82	180.54	8,310.64	-3,699.93	-102.57	3,700.61	1.36	-1.29	0.42
12,647.00	88.82	181.42	8,312.61	-3,795.90	-104.21	3,796.58	0.92	0.00	0.92
12,742.00	88.86	180.93	8,314.54	-3,890.86	-106.15	3,891.56	0.52	0.04	-0.52
12,838.00	89.53	180.62	8,315.88	-3,986.84	-107.45	3,987.55	0.77	0.70	-0.32
12,933.00	90.28	181.24	8,316.04	-4,081.82	-108.99	4,082.54	1.02	0.79	0.65
13,028.00	90.68	181.02	8,315.25	-4,176.80	-110.87	4,177.53	0.48	0.42	-0.23
13,123.00	88.82	182.12	8,315.66	-4,271.76	-113.47	4,272.50	2.27	-1.96	1.16
13,219.00	89.88	181.55	8,316.75	-4,367.70	-116.54	4,368.47	1.25	1.10	-0.59
13,315.00	88.73	181.99	8,317.91	-4,463.65	-119.51	4,464.43	1.28	-1.20	0.46
13,410.00	90.15	182.25	8,318.84	-4,558.58	-123.02	4,559.39	1.52	1.49	0.27
13,506.00	86.96	182.30	8,321.26	-4,654.46	-126.83	4,655.29	3.32	-3.32	0.05
13,601.00	86.66	181.77	8,326.55	-4,749.25	-130.20	4,750.11	0.64	-0.32	-0.56
13,697.00	87.41	181.11	8,331.52	-4,845.09	-132.61	4,845.96	1.04	0.78	-0.69
13,792.00	88.20	180.98	8,335.15	-4,940.00	-134.34	4,940.89	0.84	0.83	-0.14
13,887.00	88.25	181.02	8,338.10	-5,034.94	-136.00	5,035.84	0.07	0.05	0.04
13,982.00	90.10	181.06	8,339.46	-5,129.91	-137.72	5,130.82	1.95	1.95	0.04
14,077.00	90.54	178.99	8,338.93	-5,224.91	-137.76	5,225.81	2.23	0.46	-2.18
14,172.00	90.68	179.30	8,337.92	-5,319.89	-136.35	5,320.78	0.36	0.15	0.33
14,267.00	91.65	179.52	8,335.99	-5,414.87	-135.37	5,415.74	1.05	1.02	0.23
14,362.00	89.88	180.40	8,334.72	-5,509.85	-135.30	5,510.73	2.08	-1.86	0.93
14,457.00	89.79	180.93	8,335.00	-5,604.85	-136.40	5,605.73	0.57	-0.09	0.56
14,552.00	90.50	179.87	8,334.76	-5,699.84	-137.07	5,700.72	1.34	0.75	-1.12
14,648.00	90.59	180.40	8,333.84	-5,795.84	-137.29	5,796.72	0.56	0.09	0.55
14,743.00	88.33	180.01	8,334.74	-5,890.82	-137.63	5,891.71	2.41	-2.38	-0.41
14,838.00	88.73	178.91	8,337.17	-5,985.79	-136.74	5,986.66	1.23	0.42	-1.16
14,933.00	89.09	179.26	8,338.98	-6,080.76	-135.22	6,081.62	0.53	0.38	0.37
15,028.00	89.84	178.16	8,339.87	-6,175.73	-133.08	6,176.57	1.40	0.79	-1.16
15,123.00	90.41	177.98	8,339.66	-6,270.67	-129.88	6,271.48	0.63	0.60	-0.19
15,218.00	90.41	178.82	8,338.98	-6,365.63	-127.23	6,366.42	0.88	0.00	0.88
15,313.00	88.95	180.71	8,339.51	-6,460.62	-126.84	6,461.41	2.51	-1.54	1.99
15,407.00	89.66	181.64	8,340.65	-6,554.59	-128.77	6,555.39	1.24	0.76	0.99
15,503.00	89.53	180.89	8,341.33	-6,650.57	-130.89	6,651.38	0.79	-0.14	-0.78
15,598.00	89.75	180.76	8,341.93	-6,745.56	-132.26	6,746.37	0.27	0.23	-0.14
15,693.00	89.13	180.98	8,342.86	-6,840.54	-133.70	6,841.37	0.69	-0.65	0.23
15,789.00	87.85	181.33	8,345.39	-6,936.49	-135.63	6,937.32	1.38	-1.33	0.36
15,884.00	87.76	181.37	8,349.03	-7,031.39	-137.87	7,032.24	0.10	-0.09	0.04
15,979.00	88.51	181.24	8,352.12	-7,126.31	-140.03	7,127.18	0.80	0.79	-0.14
16,074.00	88.78	180.80	8,354.36	-7,221.27	-141.72	7,222.15	0.54	0.28	-0.46
16,169.00	89.00	179.70	8,356.20	-7,316.25	-142.14	7,317.13	1.18	0.23	-1.16
16,263.00	89.35	179.35	8,357.56	-7,410.24	-141.36	7,411.10	0.53	0.37	-0.37
16,358.00	90.06	179.52	8,358.05	-7,505.23	-140.42	7,506.09	0.77	0.75	0.18
16,451.28	88.73	179.22	8,359.03	-7,598.50	-139.39	7,599.34	1.46	-1.43	-0.32
Cross @ 16451.28' MD									
16,454.00	88.69	179.21	8,359.09	-7,601.22	-139.36	7,602.06	1.46	-1.43	-0.32

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-11C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5352.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5352.60usft (Patterson 901)
Well:	Livingston S19-25-11C	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)
16,549.00	89.22	178.60	8,360.83	-7,696.18	-137.54	7,697.01	0.85	0.56	-0.64
16,644.00	90.01	179.96	8,361.46	-7,791.17	-136.35	7,791.99	1.66	0.83	1.43
16,740.00	88.56	179.96	8,362.66	-7,887.16	-136.28	7,887.97	1.51	-1.51	0.00
16,835.00	88.25	179.13	8,365.31	-7,982.12	-135.53	7,982.93	0.93	-0.33	-0.87
16,930.00	88.91	178.42	8,367.66	-8,077.07	-133.50	8,077.86	1.02	0.69	-0.75
17,026.00	88.86	178.64	8,369.53	-8,173.02	-131.03	8,173.78	0.23	-0.05	0.23
17,121.00	88.56	178.02	8,371.67	-8,267.95	-128.27	8,268.69	0.72	-0.32	-0.65
17,216.00	88.42	177.85	8,374.17	-8,362.86	-124.84	8,363.57	0.23	-0.15	-0.18
17,310.00	89.40	178.24	8,375.96	-8,456.79	-121.64	8,457.47	1.12	1.04	0.41
17,404.00	88.82	177.32	8,377.42	-8,550.70	-118.00	8,551.36	1.16	-0.62	-0.98
17,500.00	90.81	178.20	8,377.73	-8,646.62	-114.25	8,647.25	2.27	2.07	0.92
17,595.00	89.70	180.36	8,377.31	-8,741.61	-113.05	8,742.22	2.56	-1.17	2.27
17,690.00	89.93	180.62	8,377.61	-8,836.60	-113.87	8,837.22	0.37	0.24	0.27
17,786.00	90.15	181.73	8,377.55	-8,932.58	-115.83	8,933.21	1.18	0.23	1.16
17,881.00	90.10	181.37	8,377.34	-9,027.55	-118.40	9,028.19	0.38	-0.05	-0.38
17,977.00	89.48	179.65	8,377.69	-9,123.54	-119.26	9,124.18	1.90	-0.65	-1.79
18,072.00	88.95	179.79	8,378.99	-9,218.53	-118.79	9,219.17	0.58	-0.56	0.15
18,168.00	90.68	180.10	8,379.30	-9,314.52	-118.70	9,315.16	1.83	1.80	0.32
18,263.00	90.15	179.83	8,378.61	-9,409.52	-118.64	9,410.15	0.63	-0.56	-0.28
18,358.00	89.84	179.52	8,378.62	-9,504.52	-118.10	9,505.15	0.46	-0.33	-0.33
18,454.00	90.32	180.80	8,378.49	-9,600.52	-118.37	9,601.14	1.42	0.50	1.33
18,550.00	90.15	180.40	8,378.09	-9,696.51	-119.38	9,697.14	0.45	-0.18	-0.42
18,646.00	89.75	179.96	8,378.18	-9,792.51	-119.68	9,793.14	0.62	-0.42	-0.46
18,741.00	91.07	181.11	8,377.50	-9,887.50	-120.57	9,888.13	1.84	1.39	1.21
18,836.00	91.47	181.37	8,375.39	-9,982.45	-122.62	9,983.10	0.50	0.42	0.27
18,932.00	91.38	180.80	8,373.01	-10,078.41	-124.44	10,079.06	0.60	-0.09	-0.59
19,027.00	88.42	180.36	8,373.17	-10,173.39	-125.40	10,174.05	3.15	-3.12	-0.46
19,123.00	88.11	180.14	8,376.08	-10,269.34	-125.82	10,270.01	0.40	-0.32	-0.23
19,218.00	88.03	179.04	8,379.28	-10,364.29	-125.14	10,364.94	1.16	-0.08	-1.16
19,314.00	89.22	180.36	8,381.58	-10,460.25	-124.64	10,460.90	1.85	1.24	1.38
19,410.00	89.40	179.70	8,382.74	-10,556.25	-124.69	10,556.89	0.71	0.19	-0.69
19,504.00	89.13	179.21	8,383.94	-10,650.23	-123.79	10,650.87	0.60	-0.29	-0.52
19,599.00	89.66	180.84	8,384.95	-10,745.23	-123.84	10,745.86	1.80	0.56	1.72
19,694.00	89.57	181.15	8,385.58	-10,840.21	-125.49	10,840.85	0.34	-0.09	0.33
19,788.00	89.35	179.87	8,386.47	-10,934.20	-126.32	10,934.85	1.38	-0.23	-1.36
19,883.00	89.84	179.65	8,387.14	-11,029.19	-125.92	11,029.84	0.57	0.52	-0.23
19,977.00	90.85	178.64	8,386.58	-11,123.18	-124.52	11,123.81	1.52	1.07	-1.07
20,072.00	90.46	178.64	8,385.49	-11,218.15	-122.27	11,218.76	0.41	-0.41	0.00
20,167.00	90.10	177.50	8,385.03	-11,313.09	-119.07	11,313.67	1.26	-0.38	-1.20
20,262.00	91.87	177.98	8,383.39	-11,408.00	-115.32	11,408.55	1.93	1.86	0.51
20,357.00	92.62	180.45	8,379.67	-11,502.91	-114.02	11,503.44	2.72	0.79	2.60
20,451.00	91.69	181.59	8,376.14	-11,596.82	-115.69	11,597.37	1.56	-0.99	1.21
20,546.00	91.16	180.93	8,373.77	-11,691.77	-117.78	11,692.33	0.89	-0.56	-0.69

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-11C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5352.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5352.60usft (Patterson 901)
Well:	Livingston S19-25-11C	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)
20,641.00	90.94	180.01	8,372.03	-11,786.75	-118.56	11,787.31	1.00	-0.23	-0.97
20,736.00	89.79	181.95	8,371.43	-11,881.73	-120.19	11,882.30	2.37	-1.21	2.04
20,830.00	89.53	180.80	8,371.99	-11,975.70	-122.44	11,976.29	1.25	-0.28	-1.22
20,924.00	87.89	176.31	8,374.10	-12,069.62	-120.07	12,070.18	5.08	-1.74	-4.78
21,018.00	89.53	176.70	8,376.22	-12,163.42	-114.34	12,163.94	1.79	1.74	0.41
21,113.00	89.31	174.50	8,377.18	-12,258.13	-107.06	12,258.59	2.33	-0.23	-2.32
21,166.00	89.17	173.62	8,377.88	-12,310.84	-101.57	12,311.25	1.68	-0.26	-1.66
Last MWD Survey @ 21166' MD									
21,226.00	89.17	173.62	8,378.75	-12,370.46	-94.91	12,370.82	0.00	0.00	0.00
Projection to TD @ 21226' MD 506' FSL/ 1517' 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 @ 8147.2 - actual wellpath hits target center - Point	0.00	0.00	8,084.91	604.92	-109.08	1,235,976.63	3,128,944.09	39.980222	-105.039870
70° Inclination @ 8482.5 - actual wellpath hits target center - Point	0.00	0.00	8,308.95	364.83	-114.85	1,235,736.51	3,128,939.56	39.979563	-105.039890
Cross @ 11180.91' MD - actual wellpath hits target center - Point	0.00	0.00	8,311.23	-2,330.00	-98.02	1,233,041.80	3,128,970.39	39.972165	-105.039830
Cross @ 16451.28' MD - actual wellpath hits target center - Point	0.00	0.00	8,359.03	-7,598.50	-139.39	1,227,773.16	3,128,956.38	39.957702	-105.039978

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,560.00	1,558.38	33.87	-5.99	Tie into Surface Surveys
1,764.00	1,760.46	61.38	-10.72	First MWD Survey @ 1764' MD
8,147.29	8,084.91	604.92	-109.08	30° Inclination @ 8147.29' MD
8,482.56	8,308.95	364.83	-114.85	70° Inclination @ 8482.56' MD
11,180.91	8,311.23	-2,330.00	-98.02	Cross @ 11180.91' MD
16,451.28	8,359.03	-7,598.50	-139.39	Cross @ 16451.28' MD
21,166.00	8,377.88	-12,310.84	-101.57	Last MWD Survey @ 21166' MD
21,226.00	8,378.75	-12,370.46	-94.91	Projection to TD @ 21226' MD 506' FSL/ 1517' FEL

Checked By: _____ Approved By: _____ Date: _____