

# **Extraction Oil and Gas**

**Weld County, CO (NAD83)**

**Sec 21-T05N-R65W Ardrey Pad**

**AD Fed Library 20W-25-18**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**03 September, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil and Gas	<b>Local Co-ordinate Reference:</b>	Well AD Fed Library 20W-25-18
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Site:</b>	Sec 21-T05N-R65W Ardrey Pad	<b>MD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Well:</b>	AD Fed Library 20W-25-18	<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 21-T05N-R65W Ardrey Pad						
Site Position:		Northing:	1,386,649.39	usft	Latitude:	40.391840		
From:	Lat/Long	Easting:	3,229,007.14	usft	Longitude:	-104.677830		
Position Uncertainty:	0.00	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.53	°

Well	AD Fed Library 20W-25-18					
Well Position	+N/-S	0.00 usft	Northing:	1,383,210.40 usft	Latitude:	40.382390
	+E/-W	0.00 usft	Easting:	3,229,412.35 usft	Longitude:	-104.676490
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,638.00 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	7/10/2019	7.94	66.80	52,118.23523290

<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	262.45	

<b>Survey Program</b>	<b>Date</b>	9/3/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
126.00	1,583.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,674.00	19,816.00	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	
126.00	0.13	119.50	126.00	-0.07	0.12	-0.11	0.10	0.10	0.00	
213.00	1.32	188.15	212.99	-1.11	0.07	0.08	1.47	1.37	78.91	
300.00	3.21	185.25	299.92	-4.53	-0.30	0.89	2.18	2.17	-3.33	
388.00	4.70	192.83	387.71	-10.50	-1.32	2.69	1.79	1.69	8.61	
475.00	7.12	193.24	474.24	-19.22	-3.35	5.85	2.78	2.78	0.47	
562.00	9.01	192.28	560.38	-31.13	-6.03	10.07	2.18	2.17	-1.10	
649.00	10.99	190.70	646.05	-45.94	-9.02	14.98	2.30	2.28	-1.82	
737.00	12.04	188.94	732.28	-63.25	-12.01	20.21	1.26	1.19	-2.00	
824.00	14.41	190.43	816.96	-82.86	-15.38	26.13	2.75	2.72	1.71	

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<b>Site:</b>	Sec 21-T05N-R65W Ardrey Pad	<b>MD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Well:</b>	AD Fed Library 20W-25-18	<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)
911.00	16.08	192.10	900.90	-105.29	-19.86	33.53	1.98	1.92	1.92
998.00	15.60	189.20	984.60	-128.62	-24.26	40.95	1.06	-0.55	-3.33
1,086.00	16.08	189.55	1,069.26	-152.31	-28.17	47.94	0.56	0.55	0.40
1,173.00	15.56	189.29	1,152.96	-175.71	-32.05	54.87	0.60	-0.60	-0.30
1,260.00	16.83	189.38	1,236.51	-199.66	-35.99	61.92	1.46	1.46	0.10
1,348.00	15.86	187.36	1,320.95	-224.15	-39.61	68.72	1.28	-1.10	-2.30
1,435.00	16.22	185.42	1,404.56	-248.04	-42.28	74.51	0.74	0.41	-2.23
1,522.00	14.77	186.30	1,488.40	-271.16	-44.64	79.89	1.69	-1.67	1.01
1,583.00	14.94	188.23	1,547.36	-286.67	-46.62	83.89	0.86	0.28	3.16
Tie into Surface Surveys									
1,674.00	14.63	187.29	1,635.35	-309.68	-49.76	90.02	0.43	-0.34	-1.03
First MWD Survey @ 1674' MD									
1,764.00	13.48	184.08	1,722.65	-331.42	-51.95	95.05	1.54	-1.28	-3.57
1,853.00	14.89	186.24	1,808.94	-353.13	-53.93	99.87	1.69	1.58	2.43
1,942.00	17.01	190.25	1,894.51	-377.31	-57.49	106.57	2.68	2.38	4.51
2,031.00	17.10	190.16	1,979.60	-403.00	-62.11	114.53	0.11	0.10	-0.10
2,121.00	16.53	186.10	2,065.75	-428.76	-65.81	121.58	1.45	-0.63	-4.51
2,210.00	17.94	189.23	2,150.75	-454.88	-69.35	128.53	1.90	1.58	3.52
2,299.00	17.50	187.82	2,235.53	-481.67	-73.37	136.03	0.69	-0.49	-1.58
2,389.00	16.70	186.46	2,321.55	-507.92	-76.67	142.75	0.99	-0.89	-1.51
2,478.00	17.23	191.88	2,406.68	-533.53	-80.82	150.23	1.87	0.60	6.09
2,568.00	16.88	191.97	2,492.73	-559.35	-86.27	159.03	0.39	-0.39	0.10
2,657.00	17.45	190.64	2,577.76	-585.11	-91.42	167.51	0.78	0.64	-1.49
2,747.00	17.59	190.95	2,663.59	-611.72	-96.49	176.04	0.19	0.16	0.34
2,837.00	17.72	189.98	2,749.35	-638.57	-101.45	184.48	0.36	0.14	-1.08
2,926.00	15.95	192.76	2,834.53	-663.83	-106.50	192.81	2.18	-1.99	3.12
3,016.00	15.47	192.98	2,921.17	-687.59	-111.93	201.31	0.54	-0.53	0.24
3,105.00	14.58	192.10	3,007.13	-710.11	-116.94	209.24	1.03	-1.00	-0.99
3,194.00	12.95	189.10	3,093.57	-730.91	-120.87	215.87	2.00	-1.83	-3.37
3,284.00	13.04	189.32	3,181.26	-750.89	-124.11	221.70	0.11	0.10	0.24
3,373.00	12.77	189.32	3,268.02	-770.50	-127.32	227.47	0.30	-0.30	0.00
3,463.00	14.18	193.60	3,355.54	-791.04	-131.53	234.34	1.92	1.57	4.76
3,552.00	14.76	183.55	3,441.73	-812.95	-134.79	240.45	2.89	0.65	-11.29
3,641.00	15.29	190.03	3,527.69	-835.82	-137.54	246.18	1.98	0.60	7.28
3,730.00	18.34	191.17	3,612.88	-861.12	-142.30	254.22	3.45	3.43	1.28
3,820.00	19.27	190.51	3,698.07	-889.61	-147.75	263.37	1.06	1.03	-0.73
3,909.00	17.94	185.75	3,782.42	-917.70	-151.80	271.08	2.27	-1.49	-5.35
3,998.00	18.16	185.88	3,867.04	-945.13	-154.60	277.45	0.25	0.25	0.15
4,088.00	15.47	188.13	3,953.19	-970.97	-157.73	283.96	3.07	-2.99	2.50
4,178.00	13.17	187.65	4,040.39	-993.02	-160.79	289.89	2.56	-2.56	-0.53
4,268.00	12.42	189.23	4,128.15	-1,012.73	-163.71	295.37	0.92	-0.83	1.76
4,357.00	13.61	192.89	4,214.86	-1,032.39	-167.58	301.79	1.63	1.34	4.11
4,446.00	15.33	193.82	4,301.04	-1,054.02	-172.73	309.74	1.95	1.93	1.04

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Survey									
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4,536.00	16.57	188.97	4,387.58	-1,078.25	-177.57	317.72	2.02	1.38	-5.39
4,626.00	15.82	187.56	4,474.00	-1,103.09	-181.19	324.57	0.94	-0.83	-1.57
4,715.00	16.44	188.84	4,559.50	-1,127.56	-184.72	331.29	0.80	0.70	1.44
4,805.00	14.67	189.19	4,646.20	-1,151.40	-188.50	338.16	1.97	-1.97	0.39
4,894.00	16.00	185.09	4,732.03	-1,174.74	-191.38	344.09	1.93	1.49	-4.61
4,984.00	15.91	189.10	4,818.57	-1,199.28	-194.44	350.34	1.23	-0.10	4.46
5,073.00	17.41	186.85	4,903.83	-1,224.54	-197.95	357.15	1.83	1.69	-2.53
5,163.00	16.39	186.77	4,989.94	-1,250.52	-201.06	363.64	1.13	-1.13	-0.09
5,252.00	13.30	183.15	5,075.96	-1,273.22	-203.10	368.65	3.62	-3.47	-4.07
5,342.00	14.05	187.29	5,163.41	-1,294.39	-205.05	373.37	1.37	0.83	4.60
5,454.00	14.45	187.96	5,271.97	-1,321.72	-208.72	380.59	0.39	0.36	0.60
5,544.00	14.76	185.53	5,359.06	-1,344.25	-211.37	386.19	0.76	0.34	-2.70
5,633.00	16.35	189.67	5,444.80	-1,367.88	-214.57	392.46	2.18	1.79	4.65
5,722.00	17.45	187.34	5,529.96	-1,393.47	-218.38	399.60	1.45	1.24	-2.62
5,812.00	13.52	181.04	5,616.68	-1,417.38	-220.30	404.64	4.74	-4.37	-7.00
5,902.00	14.85	180.11	5,703.93	-1,439.43	-220.51	407.75	1.50	1.48	-1.03
5,992.00	17.76	187.25	5,790.31	-1,464.59	-222.27	412.80	3.92	3.23	7.93
6,082.00	17.59	189.98	5,876.06	-1,491.60	-226.35	420.40	0.94	-0.19	3.03
6,171.00	15.73	189.98	5,961.32	-1,516.73	-230.78	428.08	2.09	-2.09	0.00
6,261.00	14.67	188.92	6,048.18	-1,540.01	-234.66	434.99	1.22	-1.18	-1.18
6,350.00	14.63	190.60	6,134.28	-1,562.19	-238.47	441.69	0.48	-0.04	1.89
6,440.00	15.11	184.47	6,221.27	-1,585.05	-241.48	447.67	1.83	0.53	-6.81
6,529.00	14.76	184.12	6,307.27	-1,607.93	-243.20	452.38	0.41	-0.39	-0.39
6,619.00	12.28	191.70	6,394.77	-1,628.74	-245.96	457.86	3.38	-2.76	8.42
6,709.00	18.91	211.05	6,481.47	-1,650.64	-255.44	470.13	9.27	7.37	21.50
6,799.00	24.48	220.92	6,565.09	-1,677.26	-275.20	493.22	7.38	6.19	10.97
6,876.73	29.94	232.08	6,634.23	-1,701.38	-301.09	522.05	9.59	7.03	14.36
30° Inclination @ 6876.73' MD									
6,888.00	30.80	233.39	6,643.96	-1,704.83	-305.62	527.00	9.59	7.60	11.58
6,977.00	37.74	244.71	6,717.54	-1,730.11	-348.64	572.96	10.56	7.80	12.72
7,002.09	40.11	246.64	6,737.05	-1,736.60	-363.00	588.06	10.61	9.45	7.69
Cross @ 7002.09' MD									
7,066.00	46.27	250.80	6,783.64	-1,752.37	-403.76	630.53	10.61	9.64	6.51
7,156.00	56.12	257.19	6,840.00	-1,771.41	-471.10	699.79	12.25	10.94	7.10
7,245.00	61.78	260.93	6,885.90	-1,785.80	-545.93	775.86	7.31	6.36	4.20
7,335.00	64.07	262.65	6,926.87	-1,797.23	-625.24	855.98	3.06	2.54	1.91
7,424.00	67.04	271.02	6,963.75	-1,801.63	-706.03	936.66	9.19	3.34	9.40
7,514.00	69.86	270.54	6,996.80	-1,800.49	-789.73	1,019.48	3.17	3.13	-0.53
7,515.74	70.00	270.49	6,997.40	-1,800.48	-791.36	1,021.09	8.40	8.03	-2.63
70° Inclination @ 7515.74' MD									
7,603.00	77.02	268.29	7,022.15	-1,801.39	-874.97	1,104.10	8.40	8.05	-2.53
7,692.00	83.43	269.48	7,037.26	-1,803.09	-962.61	1,191.20	7.32	7.20	1.34
7,781.00	89.75	268.73	7,042.55	-1,804.48	-1,051.40	1,279.40	7.15	7.10	-0.84
7,870.00	91.91	269.44	7,041.26	-1,805.90	-1,140.37	1,367.79	2.55	2.43	0.80

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7,974.00	91.78	269.22	7,037.91	-1,807.11	-1,244.31	1,470.99	0.25	-0.13	-0.21
8,063.00	90.68	270.49	7,036.00	-1,807.34	-1,333.29	1,559.22	1.89	-1.24	1.43
8,153.00	90.68	270.10	7,034.93	-1,806.88	-1,423.28	1,648.37	0.43	0.00	-0.43
8,243.00	90.54	270.23	7,033.97	-1,806.62	-1,513.27	1,737.55	0.21	-0.16	0.14
8,332.00	90.54	269.83	7,033.14	-1,806.57	-1,602.27	1,825.77	0.45	0.00	-0.45
8,422.00	90.68	270.01	7,032.18	-1,806.70	-1,692.26	1,915.00	0.25	0.16	0.20
8,511.00	90.81	270.63	7,031.02	-1,806.20	-1,781.25	2,003.16	0.71	0.15	0.70
8,601.00	90.85	272.48	7,029.72	-1,803.76	-1,871.21	2,092.01	2.06	0.04	2.06
8,691.00	90.59	271.77	7,028.58	-1,800.42	-1,961.14	2,180.72	0.84	-0.29	-0.79
8,780.00	90.50	272.08	7,027.74	-1,797.43	-2,050.08	2,268.50	0.36	-0.10	0.35
8,869.00	90.63	271.37	7,026.86	-1,794.75	-2,139.04	2,356.33	0.81	0.15	-0.80
8,959.00	91.69	272.70	7,025.04	-1,791.56	-2,228.96	2,445.05	1.89	1.18	1.48
9,049.00	90.15	271.64	7,023.59	-1,788.15	-2,318.88	2,533.75	2.08	-1.71	-1.18
9,138.00	90.59	271.68	7,023.02	-1,785.57	-2,407.84	2,621.60	0.50	0.49	0.04
9,227.00	89.93	271.37	7,022.61	-1,783.20	-2,496.81	2,709.48	0.82	-0.74	-0.35
9,316.00	90.99	272.26	7,021.90	-1,780.38	-2,585.76	2,797.29	1.56	1.19	1.00
9,406.00	91.30	271.77	7,020.10	-1,777.22	-2,675.68	2,886.02	0.64	0.34	-0.54
9,496.00	90.41	271.51	7,018.76	-1,774.65	-2,765.64	2,974.85	1.03	-0.99	-0.29
9,586.00	90.50	272.34	7,018.04	-1,771.62	-2,855.58	3,063.62	0.93	0.10	0.92
9,675.00	90.46	271.46	7,017.30	-1,768.67	-2,944.53	3,151.41	0.99	-0.04	-0.99
9,764.00	90.50	272.04	7,016.55	-1,765.95	-3,033.48	3,239.24	0.65	0.04	0.65
9,854.00	90.37	272.17	7,015.87	-1,762.65	-3,123.42	3,327.96	0.20	-0.14	0.14
9,943.00	90.63	272.52	7,015.09	-1,759.01	-3,212.34	3,415.63	0.49	0.29	0.39
10,033.00	91.34	271.90	7,013.55	-1,755.54	-3,302.26	3,504.32	1.05	0.79	-0.69
10,123.00	90.85	271.24	7,011.83	-1,753.07	-3,392.21	3,593.16	0.91	-0.54	-0.73
10,213.00	91.12	271.51	7,010.28	-1,750.91	-3,482.17	3,682.06	0.42	0.30	0.30
10,301.00	91.03	271.51	7,008.63	-1,748.59	-3,570.12	3,768.94	0.10	-0.10	0.00
10,391.00	90.99	271.73	7,007.04	-1,746.05	-3,660.07	3,857.78	0.25	-0.04	0.24
10,480.00	91.07	271.11	7,005.44	-1,743.84	-3,749.03	3,945.68	0.70	0.09	-0.70
10,569.00	91.12	269.92	7,003.74	-1,743.04	-3,838.01	4,033.78	1.34	0.06	-1.34
10,658.00	91.16	269.79	7,001.97	-1,743.27	-3,926.99	4,122.02	0.15	0.04	-0.15
10,748.00	90.85	270.27	7,000.39	-1,743.22	-4,016.98	4,211.22	0.63	-0.34	0.53
10,838.00	91.12	269.79	6,998.84	-1,743.18	-4,106.96	4,300.42	0.61	0.30	-0.53
10,927.00	90.99	270.41	6,997.21	-1,743.02	-4,195.95	4,388.61	0.71	-0.15	0.70
11,016.00	90.99	270.76	6,995.67	-1,742.11	-4,284.93	4,476.70	0.39	0.00	0.39
11,106.00	91.16	270.14	6,993.98	-1,741.40	-4,374.91	4,565.81	0.71	0.19	-0.69
11,195.00	90.90	269.83	6,992.38	-1,741.43	-4,463.90	4,654.02	0.45	-0.29	-0.35
11,285.00	90.19	269.74	6,991.52	-1,741.77	-4,553.89	4,743.28	0.80	-0.79	-0.10
11,375.00	90.10	270.23	6,991.30	-1,741.79	-4,643.89	4,832.51	0.55	-0.10	0.54
11,464.00	90.28	270.58	6,991.00	-1,741.16	-4,732.89	4,920.65	0.44	0.20	0.39
11,553.00	90.10	270.67	6,990.71	-1,740.19	-4,821.88	5,008.74	0.23	-0.20	0.10
11,643.00	89.79	270.80	6,990.79	-1,739.03	-4,911.88	5,097.80	0.37	-0.34	0.14
11,732.00	89.04	269.88	6,991.70	-1,738.51	-5,000.87	5,185.95	1.33	-0.84	-1.03

# Survey Report

<b>Company:</b>	Extraction Oil and Gas	<b>Local Co-ordinate Reference:</b>	Well AD Fed Library 20W-25-18
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Site:</b>	Sec 21-T05N-R65W Ardrey Pad	<b>MD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Well:</b>	AD Fed Library 20W-25-18	<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)
11,821.00	89.04	270.67	6,993.19	-1,738.08	-5,089.85	5,274.11	0.89	0.00	0.89
11,911.00	89.31	269.61	6,994.49	-1,737.86	-5,179.84	5,363.29	1.22	0.30	-1.18
12,001.00	89.04	270.18	6,995.78	-1,738.02	-5,269.83	5,452.52	0.70	-0.30	0.63
12,090.00	89.00	269.48	6,997.31	-1,738.29	-5,358.82	5,540.77	0.79	-0.04	-0.79
12,179.00	89.31	269.70	6,998.62	-1,738.93	-5,447.81	5,629.07	0.43	0.35	0.25
12,269.00	89.09	270.71	6,999.87	-1,738.60	-5,537.80	5,718.24	1.15	-0.24	1.12
12,358.00	88.95	270.23	7,001.40	-1,737.87	-5,626.78	5,806.36	0.56	-0.16	-0.54
12,409.23	89.10	269.95	7,002.27	-1,737.79	-5,678.00	5,857.12	0.61	0.30	-0.54
<b>Cross @ 12409.23' MD</b>									
12,449.00	89.22	269.74	7,002.85	-1,737.90	-5,717.77	5,896.56	0.61	0.30	-0.54
12,538.00	88.33	270.54	7,004.75	-1,737.68	-5,806.74	5,984.74	1.34	-1.00	0.90
12,627.00	88.25	270.14	7,007.41	-1,737.15	-5,895.70	6,072.85	0.46	-0.09	-0.45
12,717.00	88.16	269.79	7,010.23	-1,737.21	-5,985.66	6,162.04	0.40	-0.10	-0.39
12,807.00	88.03	270.41	7,013.22	-1,737.05	-6,075.61	6,251.19	0.70	-0.14	0.69
12,897.00	88.20	270.45	7,016.18	-1,736.37	-6,165.56	6,340.27	0.19	0.19	0.04
12,986.00	89.35	270.41	7,018.08	-1,735.71	-6,254.53	6,428.38	1.29	1.29	-0.04
13,076.00	89.44	269.88	7,019.03	-1,735.48	-6,344.53	6,517.57	0.60	0.10	-0.59
13,166.00	89.48	270.49	7,019.88	-1,735.19	-6,434.52	6,606.74	0.68	0.04	0.68
13,255.00	89.35	269.66	7,020.79	-1,735.07	-6,523.52	6,694.95	0.94	-0.15	-0.93
13,345.00	89.53	270.63	7,021.67	-1,734.84	-6,613.51	6,784.13	1.10	0.20	1.08
13,435.00	90.01	270.67	7,022.03	-1,733.82	-6,703.50	6,873.21	0.54	0.53	0.04
13,524.00	89.13	269.08	7,022.70	-1,734.02	-6,792.50	6,961.46	2.04	-0.99	-1.79
13,614.00	90.41	272.92	7,023.06	-1,732.45	-6,882.47	7,050.44	4.50	1.42	4.27
13,703.00	89.88	270.05	7,022.84	-1,730.14	-6,971.43	7,138.33	3.28	-0.60	-3.22
13,793.00	90.28	267.81	7,022.71	-1,731.82	-7,061.40	7,227.74	2.53	0.44	-2.49
13,882.00	90.68	270.41	7,021.96	-1,733.20	-7,150.38	7,316.13	2.96	0.45	2.92
13,971.00	90.59	270.49	7,020.98	-1,732.50	-7,239.37	7,404.26	0.14	-0.10	0.09
14,061.00	90.46	270.71	7,020.15	-1,731.56	-7,329.37	7,493.35	0.28	-0.14	0.24
14,150.00	90.54	271.02	7,019.38	-1,730.22	-7,418.35	7,581.39	0.36	0.09	0.35
14,240.00	90.46	269.66	7,018.59	-1,729.68	-7,508.34	7,670.53	1.51	-0.09	-1.51
14,330.00	90.50	270.41	7,017.84	-1,729.63	-7,598.34	7,759.74	0.83	0.04	0.83
14,419.00	90.54	270.05	7,017.03	-1,729.27	-7,687.34	7,847.91	0.41	0.04	-0.40
14,509.00	90.72	269.66	7,016.04	-1,729.50	-7,777.33	7,937.16	0.48	0.20	-0.43
14,598.00	91.21	269.61	7,014.54	-1,730.07	-7,866.32	8,025.45	0.55	0.55	-0.06
14,688.00	91.12	270.27	7,012.71	-1,730.16	-7,956.30	8,114.66	0.74	-0.10	0.73
14,777.00	91.03	271.02	7,011.04	-1,729.16	-8,045.27	8,202.73	0.85	-0.10	0.84
14,867.00	90.99	270.05	7,009.45	-1,728.32	-8,135.26	8,291.82	1.08	-0.04	-1.08
14,956.00	91.03	270.27	7,007.89	-1,728.07	-8,224.24	8,380.01	0.25	0.04	0.25
15,046.00	90.99	270.76	7,006.30	-1,727.26	-8,314.22	8,469.10	0.55	-0.04	0.54
15,135.00	91.03	270.10	7,004.73	-1,726.59	-8,403.21	8,557.22	0.74	0.04	-0.74
15,225.00	91.03	269.83	7,003.11	-1,726.65	-8,493.19	8,646.44	0.30	0.00	-0.30
15,314.00	91.03	270.49	7,001.51	-1,726.40	-8,582.18	8,734.62	0.74	0.00	0.74
15,404.00	91.07	270.89	6,999.86	-1,725.32	-8,672.15	8,823.67	0.45	0.04	0.44
15,493.00	91.07	269.74	6,998.20	-1,724.83	-8,761.14	8,911.82	1.29	0.00	-1.29

# Survey Report

<b>Company:</b>	Extraction Oil and Gas	<b>Local Co-ordinate Reference:</b>	Well AD Fed Library 20W-25-18
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Site:</b>	Sec 21-T05N-R65W Ardrey Pad	<b>MD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Well:</b>	AD Fed Library 20W-25-18	<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)
15,582.00	91.07	270.80	6,996.54	-1,724.41	-8,850.12	8,999.97	1.19	0.00	1.19
15,671.00	91.12	270.98	6,994.84	-1,723.03	-8,939.09	9,087.99	0.21	0.06	0.20
15,761.00	91.07	269.61	6,993.12	-1,722.56	-9,029.07	9,177.13	1.52	-0.06	-1.52
15,851.00	90.85	271.11	6,991.61	-1,722.00	-9,119.05	9,266.26	1.68	-0.24	1.67
15,941.00	90.81	269.74	6,990.31	-1,721.33	-9,209.04	9,355.38	1.52	-0.04	-1.52
16,030.00	90.59	270.67	6,989.22	-1,721.01	-9,298.03	9,443.56	1.07	-0.25	1.04
16,120.00	90.32	270.98	6,988.50	-1,719.72	-9,388.02	9,532.59	0.46	-0.30	0.34
16,209.00	90.32	271.15	6,988.01	-1,718.06	-9,477.00	9,620.59	0.19	0.00	0.19
16,298.00	90.19	271.11	6,987.61	-1,716.31	-9,565.98	9,708.57	0.15	-0.15	-0.04
16,388.00	90.15	271.24	6,987.34	-1,714.46	-9,655.97	9,797.53	0.15	-0.04	0.14
16,477.00	90.32	271.02	6,986.98	-1,712.71	-9,744.95	9,885.51	0.31	0.19	-0.25
16,567.00	89.84	268.07	6,986.85	-1,713.42	-9,834.93	9,974.81	3.32	-0.53	-3.28
16,657.00	89.97	269.30	6,987.00	-1,715.49	-9,924.91	10,064.27	1.37	0.14	1.37
16,746.00	90.15	269.04	6,986.91	-1,716.78	-10,013.90	10,152.66	0.36	0.20	-0.29
16,836.00	90.23	268.73	6,986.61	-1,718.53	-10,103.88	10,242.09	0.36	0.09	-0.34
16,925.00	90.06	268.91	6,986.39	-1,720.36	-10,192.86	10,330.54	0.28	-0.19	0.20
17,016.00	90.10	268.33	6,986.26	-1,722.55	-10,283.84	10,421.01	0.64	0.04	-0.64
17,105.00	90.15	269.08	6,986.06	-1,724.56	-10,372.81	10,509.48	0.84	0.06	0.84
17,195.00	90.06	267.76	6,985.90	-1,727.04	-10,462.78	10,598.99	1.47	-0.10	-1.47
17,284.00	90.19	268.38	6,985.71	-1,730.04	-10,551.72	10,687.56	0.71	0.15	0.70
17,373.00	89.93	267.45	6,985.61	-1,733.28	-10,640.66	10,776.16	1.09	-0.29	-1.04
17,463.00	90.15	267.98	6,985.55	-1,736.87	-10,730.59	10,865.78	0.64	0.24	0.59
17,553.00	90.23	268.51	6,985.25	-1,739.62	-10,820.55	10,955.32	0.60	0.09	0.59
17,643.00	90.54	269.04	6,984.65	-1,741.55	-10,910.53	11,044.77	0.68	0.34	0.59
17,667.48	90.35	269.20	6,984.46	-1,741.92	-10,935.00	11,069.08	1.01	-0.79	0.64
<b>Cross @ 17667.48' MD</b>									
17,732.00	89.84	269.61	6,984.35	-1,742.60	-10,999.52	11,133.13	1.01	-0.79	0.64
17,821.00	90.06	270.58	6,984.43	-1,742.45	-11,088.52	11,221.33	1.12	0.25	1.09
17,910.00	89.93	269.79	6,984.44	-1,742.16	-11,177.52	11,309.52	0.90	-0.15	-0.89
18,000.00	89.48	269.39	6,984.90	-1,742.81	-11,267.51	11,398.82	0.67	-0.50	-0.44
18,089.00	89.44	270.41	6,985.74	-1,742.96	-11,356.51	11,487.07	1.15	-0.04	1.15
18,179.00	88.86	270.36	6,987.07	-1,742.36	-11,446.49	11,576.19	0.65	-0.64	-0.06
18,269.00	89.00	269.92	6,988.75	-1,742.14	-11,536.48	11,665.37	0.51	0.16	-0.49
18,358.00	89.13	270.71	6,990.21	-1,741.65	-11,625.46	11,753.52	0.90	0.15	0.89
18,448.00	89.04	270.85	6,991.64	-1,740.42	-11,715.44	11,842.56	0.18	-0.10	0.16
18,538.00	89.09	271.07	6,993.11	-1,738.91	-11,805.42	11,931.56	0.25	0.06	0.24
18,627.00	89.00	269.83	6,994.60	-1,738.22	-11,894.40	12,019.67	1.40	-0.10	-1.39
18,717.00	89.13	270.67	6,996.06	-1,737.82	-11,984.39	12,108.83	0.94	0.14	0.93
18,807.00	88.95	270.36	6,997.57	-1,737.01	-12,074.37	12,197.93	0.40	-0.20	-0.34
18,897.00	89.26	269.74	6,998.98	-1,736.94	-12,164.36	12,287.12	0.77	0.34	-0.69
18,987.00	89.44	270.32	7,000.00	-1,736.89	-12,254.36	12,376.33	0.67	0.20	0.64
19,077.00	89.53	270.05	7,000.81	-1,736.60	-12,344.35	12,465.51	0.32	0.10	-0.30
19,167.00	89.44	270.49	7,001.62	-1,736.17	-12,434.35	12,554.67	0.50	-0.10	0.49

## Survey Report

<b>Company:</b>	Extraction Oil and Gas	<b>Local Co-ordinate Reference:</b>	Well AD Fed Library 20W-25-18
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Site:</b>	Sec 21-T05N-R65W Ardrey Pad	<b>MD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Well:</b>	AD Fed Library 20W-25-18	<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)
19,256.00	89.44	270.36	7,002.49	-1,735.51	-12,523.34	12,642.80	0.15	0.00	-0.15
19,345.00	89.44	269.48	7,003.36	-1,735.64	-12,612.33	12,731.04	0.99	0.00	-0.99
19,434.00	89.70	270.71	7,004.03	-1,735.49	-12,701.33	12,819.25	1.41	0.29	1.38
19,523.00	89.57	270.89	7,004.59	-1,734.25	-12,790.32	12,907.30	0.25	-0.15	0.20
19,613.00	89.75	269.92	7,005.13	-1,733.61	-12,880.31	12,996.43	1.10	0.20	-1.08
19,702.00	89.44	269.39	7,005.76	-1,734.15	-12,969.31	13,084.73	0.69	-0.35	-0.60
19,783.00	89.70	270.23	7,006.36	-1,734.42	-13,050.31	13,165.06	1.09	0.32	1.04
<b>Last MWD Survey @ 19783' MD</b>									
19,816.00	89.70	270.23	7,006.54	-1,734.28	-13,083.31	13,197.75	0.00	0.00	0.00
<b>Projection to TD @ 19816' MD 34.5' FSL/ 2148' FEL</b>									

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 @ 6876.7 - actual wellpath misses target center by 0.10usft at 6876.73usft MD (6634.24 TVD, -1701.38 N, -301.09 E) - Point	0.00	0.00	6,634.22	-1,701.48	-301.06	1,381,506.20	3,229,127.10	40.377719	-104.677571
Cross @ 7002.09' MD - actual wellpath hits target center - Point	0.00	0.00	6,737.06	-1,736.60	-363.00	1,381,470.50	3,229,065.49	40.377623	-104.677793
Cross @ 17667.48' MD - actual wellpath hits target center - Point	0.00	0.00	6,984.46	-1,741.92	-10,935.00	1,381,367.00	3,218,493.99	40.377602	-104.715740
70° Inclination @ 7515.7 - actual wellpath hits target center - Point	0.00	0.00	6,997.40	-1,800.48	-791.36	1,381,402.65	3,228,637.74	40.377448	-104.679331
Cross @ 12409.23' MD - actual wellpath hits target center - Point	0.00	0.00	7,002.27	-1,737.79	-5,678.00	1,381,419.95	3,223,750.73	40.377618	-104.696871

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,583.00	1,547.36	-286.67	-46.62	Tie into Surface Surveys	
1,674.00	1,635.35	-309.68	-49.76	First MWD Survey @ 1674' MD	
6,876.73	6,634.23	-1,701.38	-301.09	30° Inclination @ 6876.73' MD	
7,002.09	6,737.05	-1,736.60	-363.00	Cross @ 7002.09' MD	
7,515.74	6,997.40	-1,800.48	-791.36	70° Inclination @ 7515.74' MD	
12,409.23	7,002.27	-1,737.79	-5,678.00	Cross @ 12409.23' MD	
17,667.48	6,984.46	-1,741.92	-10,935.00	Cross @ 17667.48' MD	
19,783.00	7,006.36	-1,734.42	-13,050.31	Last MWD Survey @ 19783' MD	
19,816.00	7,006.54	-1,734.28	-13,083.31	Projection to TD @ 19816' MD 34.5' FSL/ 2148' FEL	



## Survey Report

<b>Company:</b>	Extraction Oil and Gas	<b>Local Co-ordinate Reference:</b>	Well AD Fed Library 20W-25-18
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Site:</b>	Sec 21-T05N-R65W Ardrey Pad	<b>MD Reference:</b>	KB @ 4666.00usft (Ensign 147)
<b>Well:</b>	AD Fed Library 20W-25-18	<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

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