

Extraction Oil and Gas

Weld County, CO (NAD83)

Sec 21-T05N-R65W Ardrey Pad

AD Fed Library 20W-25-17

Wellbore #1

Design: Wellbore #1

Standard Survey Report

03 September, 2019

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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 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-25-17					
Well Position	+N/-S	0.00 usft	Northing:	1,383,235.89 usft	Latitude:	40.382460
	+E/-W	0.00 usft	Easting:	3,229,412.11 usft	Longitude:	-104.676490
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,638.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/10/2019	7.94	66.80	52,118.27136881

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	263.58	

Survey Program	Date	9/3/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
126.00	1,567.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,674.00	19,702.00	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	
126.00	0.44	201.42	126.00	-0.45	-0.18	0.23	0.35	0.35	0.00	
213.00	0.40	285.97	213.00	-0.68	-0.59	0.66	0.65	-0.05	97.18	
300.00	1.32	222.34	299.99	-1.33	-1.56	1.70	1.38	1.06	-73.14	
388.00	2.86	202.21	387.93	-4.12	-3.07	3.51	1.91	1.75	-22.88	
475.00	4.70	192.37	474.74	-9.61	-4.65	5.70	2.23	2.11	-11.31	
562.00	6.99	191.31	561.28	-18.28	-6.46	8.46	2.63	2.63	-1.22	
649.00	8.44	190.78	647.49	-29.75	-8.69	11.96	1.67	1.67	-0.61	
737.00	10.68	191.57	734.26	-44.08	-11.53	16.39	2.55	2.55	0.90	
824.00	12.30	189.03	819.51	-61.13	-14.60	21.35	1.95	1.86	-2.92	

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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)
911.00	13.27	189.55	904.36	-80.13	-17.72	26.56	1.12	1.11	0.60
998.00	14.33	191.66	988.84	-100.52	-21.55	32.65	1.35	1.22	2.43
1,086.00	14.15	189.90	1,074.14	-121.78	-25.60	39.06	0.53	-0.20	-2.00
1,173.00	14.77	188.32	1,158.38	-143.23	-29.03	44.87	0.84	0.71	-1.82
1,260.00	14.85	186.65	1,242.49	-165.28	-31.93	50.21	0.50	0.09	-1.92
1,348.00	14.63	186.39	1,327.60	-187.52	-34.47	55.22	0.26	-0.25	-0.30
1,435.00	14.55	187.97	1,411.79	-209.27	-37.21	60.38	0.47	-0.09	1.82
1,522.00	13.89	188.06	1,496.13	-230.43	-40.19	65.70	0.76	-0.76	0.10
1,567.00	13.71	189.38	1,539.83	-241.04	-41.81	68.50	0.81	-0.40	2.93
Tie into Surface Surveys									
1,674.00	13.12	186.85	1,643.91	-265.61	-45.33	74.75	0.78	-0.55	-2.36
First MWD Survey @ 1674' MD									
1,764.00	15.16	190.56	1,731.18	-287.32	-48.70	80.53	2.48	2.27	4.12
1,853.00	17.06	194.48	1,816.68	-311.40	-54.10	88.58	2.46	2.13	4.40
1,942.00	16.75	192.41	1,901.84	-336.57	-60.12	97.38	0.76	-0.35	-2.33
2,032.00	16.22	192.14	1,988.14	-361.52	-65.55	105.57	0.60	-0.59	-0.30
2,121.00	15.33	190.33	2,073.79	-385.25	-70.28	112.92	1.14	-1.00	-2.03
2,211.00	15.95	189.10	2,160.45	-409.17	-74.37	119.65	0.78	0.69	-1.37
2,299.00	14.63	189.50	2,245.34	-432.07	-78.11	125.94	1.50	-1.50	0.45
2,389.00	16.53	192.49	2,332.03	-455.78	-82.76	133.21	2.29	2.11	3.32
2,478.00	15.78	191.08	2,417.51	-480.02	-87.82	140.95	0.95	-0.84	-1.58
2,568.00	15.02	189.45	2,504.28	-503.53	-92.09	147.82	0.97	-0.84	-1.81
2,658.00	15.16	189.28	2,591.18	-526.65	-95.90	154.19	0.16	0.16	-0.19
2,747.00	15.11	189.06	2,677.09	-549.59	-99.60	160.44	0.09	-0.06	-0.25
2,836.00	14.45	188.92	2,763.15	-572.01	-103.15	166.47	0.74	-0.74	-0.16
2,926.00	16.00	189.41	2,849.98	-595.35	-106.92	172.82	1.73	1.72	0.54
3,016.00	15.38	189.50	2,936.63	-619.35	-110.92	179.48	0.69	-0.69	0.10
3,105.00	14.01	188.57	3,022.72	-641.65	-114.47	185.51	1.56	-1.54	-1.04
3,195.00	14.45	191.00	3,109.96	-663.44	-118.24	191.69	0.82	0.49	2.70
3,284.00	15.47	187.91	3,195.94	-686.10	-121.99	197.95	1.45	1.15	-3.47
3,373.00	13.61	187.91	3,282.09	-708.23	-125.07	203.48	2.09	-2.09	0.00
3,462.00	14.10	190.60	3,368.50	-729.26	-128.50	209.24	0.91	0.55	3.02
3,552.00	14.45	189.15	3,455.72	-751.12	-132.30	215.47	0.56	0.39	-1.61
3,641.00	15.47	188.53	3,541.70	-773.82	-135.83	221.51	1.16	1.15	-0.70
3,730.00	15.29	186.99	3,627.51	-797.21	-139.02	227.29	0.50	-0.20	-1.73
3,820.00	15.60	186.63	3,714.26	-821.01	-141.86	232.78	0.36	0.34	-0.40
3,909.00	15.78	185.71	3,799.95	-844.94	-144.45	238.02	0.35	0.20	-1.03
3,999.00	15.86	185.13	3,886.54	-869.36	-146.76	243.06	0.20	0.09	-0.64
4,088.00	13.96	193.02	3,972.55	-891.94	-150.27	249.07	3.12	-2.13	8.87
4,178.00	12.37	195.18	4,060.18	-911.82	-155.24	256.23	1.85	-1.77	2.40
4,267.00	14.10	191.61	4,146.81	-931.64	-159.92	263.09	2.15	1.94	-4.01
4,357.00	15.16	187.96	4,233.90	-954.04	-163.76	269.41	1.56	1.18	-4.06
4,446.00	14.05	186.55	4,320.02	-976.30	-166.60	274.73	1.31	-1.25	-1.58

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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)
4,536.00	12.99	184.12	4,407.52	-997.24	-168.57	279.03	1.34	-1.18	-2.70
4,625.00	13.88	192.58	4,494.10	-1,017.64	-171.62	284.33	2.42	1.00	9.51
4,715.00	14.54	193.77	4,581.34	-1,039.15	-176.66	291.75	0.80	0.73	1.32
4,804.00	12.95	194.04	4,667.79	-1,059.67	-181.74	299.09	1.79	-1.79	0.30
4,894.00	14.10	192.71	4,755.29	-1,080.15	-186.59	306.21	1.32	1.28	-1.48
4,983.00	15.38	188.62	4,841.37	-1,102.40	-190.75	312.82	1.85	1.44	-4.60
5,073.00	14.54	188.00	4,928.31	-1,125.38	-194.11	318.74	0.95	-0.93	-0.69
5,163.00	15.33	186.63	5,015.27	-1,148.39	-197.06	324.24	0.96	0.88	-1.52
5,252.00	13.57	184.69	5,101.46	-1,170.48	-199.27	328.90	2.05	-1.98	-2.18
5,342.00	14.67	186.63	5,188.74	-1,192.33	-201.45	333.51	1.33	1.22	2.16
5,431.00	15.25	187.43	5,274.72	-1,215.13	-204.26	338.86	0.69	0.65	0.90
5,521.00	14.45	192.01	5,361.71	-1,237.85	-208.13	345.24	1.58	-0.89	5.09
5,610.00	15.33	198.27	5,447.73	-1,259.89	-214.13	353.67	2.06	0.99	7.03
5,699.00	15.64	192.41	5,533.51	-1,282.78	-220.40	362.46	1.79	0.35	-6.58
5,789.00	13.83	190.03	5,620.54	-1,305.22	-224.88	369.42	2.12	-2.01	-2.64
5,879.00	15.16	186.37	5,707.68	-1,327.51	-228.06	375.07	1.79	1.48	-4.07
5,969.00	15.25	186.32	5,794.53	-1,350.97	-230.66	380.29	0.10	0.10	-0.06
6,059.00	13.70	184.65	5,881.67	-1,373.36	-232.83	384.94	1.78	-1.72	-1.86
6,148.00	15.38	186.94	5,967.82	-1,395.58	-235.11	389.69	1.99	1.89	2.57
6,238.00	16.57	185.97	6,054.34	-1,420.19	-237.89	395.21	1.36	1.32	-1.08
6,327.00	14.72	180.24	6,140.04	-1,444.12	-239.26	399.24	2.71	-2.08	-6.44
6,417.00	15.73	177.73	6,226.88	-1,467.75	-238.82	401.45	1.34	1.12	-2.79
6,506.00	15.42	186.24	6,312.63	-1,491.57	-239.63	404.92	2.59	-0.35	9.56
6,596.00	19.18	206.33	6,398.62	-1,516.74	-247.50	415.55	7.79	4.18	22.32
6,686.00	22.09	227.13	6,482.95	-1,541.55	-266.49	437.19	8.71	3.23	23.11
6,776.00	28.55	243.39	6,564.36	-1,562.74	-298.19	471.07	10.49	7.18	18.07
6,797.80	29.87	247.01	6,583.38	-1,567.20	-307.85	481.16	10.12	6.07	16.59
30° Inclination @ 6797.80' MD									
6,865.00	34.47	256.44	6,640.29	-1,578.20	-341.78	516.11	10.12	6.84	14.04
6,902.14	36.82	261.22	6,670.47	-1,582.37	-363.00	537.67	9.82	6.34	12.88
Cross @ 6902.14' MD									
6,954.00	40.39	267.06	6,711.00	-1,585.60	-395.16	569.99	9.82	6.88	11.25
7,043.00	48.96	268.11	6,774.24	-1,588.19	-457.62	632.35	9.66	9.63	1.18
7,133.00	59.48	264.63	6,826.79	-1,592.96	-530.36	705.16	12.10	11.69	-3.87
7,222.00	69.91	264.94	6,864.78	-1,600.25	-610.38	785.49	11.72	11.72	0.35
7,222.63	70.00	264.96	6,865.00	-1,600.30	-610.97	786.09	14.48	14.17	3.18
70° Inclination @ 7222.63' MD									
7,312.00	82.68	267.63	6,886.06	-1,605.85	-697.45	872.64	14.48	14.19	2.99
7,401.00	90.10	270.05	6,891.67	-1,607.64	-786.18	961.02	8.77	8.34	2.72
7,491.00	90.59	269.17	6,891.12	-1,608.25	-876.18	1,050.52	1.12	0.54	-0.98
7,614.00	89.97	268.47	6,890.52	-1,610.78	-999.15	1,173.00	0.76	-0.50	-0.57
7,703.00	90.50	271.51	6,890.16	-1,610.80	-1,088.14	1,261.44	3.47	0.60	3.42
7,793.00	90.63	270.89	6,889.27	-1,608.91	-1,178.11	1,350.64	0.70	0.14	-0.69
7,882.00	90.68	269.70	6,888.25	-1,608.45	-1,267.10	1,439.02	1.34	0.06	-1.34

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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)
7,971.00	90.50	269.61	6,887.34	-1,608.99	-1,356.10	1,527.51	0.23	-0.20	-0.10
8,061.00	90.63	269.70	6,886.45	-1,609.53	-1,446.09	1,617.00	0.18	0.14	0.10
8,151.00	90.32	268.33	6,885.70	-1,611.08	-1,536.07	1,706.59	1.56	-0.34	-1.52
8,241.00	90.68	269.74	6,884.92	-1,612.59	-1,626.06	1,796.18	1.62	0.40	1.57
8,330.00	90.46	268.25	6,884.03	-1,614.16	-1,715.03	1,884.78	1.69	-0.25	-1.67
8,420.00	90.46	269.08	6,883.31	-1,616.25	-1,805.01	1,974.42	0.92	0.00	0.92
8,509.00	90.01	268.91	6,882.94	-1,617.81	-1,893.99	2,063.02	0.54	-0.51	-0.19
8,599.00	90.15	269.88	6,882.82	-1,618.76	-1,983.99	2,152.56	1.09	0.16	1.08
8,689.00	90.01	268.91	6,882.69	-1,619.71	-2,073.98	2,242.09	1.09	-0.16	-1.08
8,778.00	90.19	269.70	6,882.54	-1,620.79	-2,162.97	2,330.65	0.91	0.20	0.89
8,867.00	90.10	268.91	6,882.31	-1,621.87	-2,251.96	2,419.20	0.89	-0.10	-0.89
8,957.00	90.23	270.41	6,882.05	-1,622.41	-2,341.96	2,508.69	1.67	0.14	1.67
9,047.00	89.79	270.10	6,882.04	-1,622.01	-2,431.96	2,598.08	0.60	-0.49	-0.34
9,136.00	90.15	271.86	6,882.08	-1,620.48	-2,520.94	2,686.34	2.02	0.40	1.98
9,225.00	89.70	270.32	6,882.20	-1,618.79	-2,609.92	2,774.57	1.80	-0.51	-1.73
9,314.00	89.93	271.55	6,882.49	-1,617.34	-2,698.91	2,862.84	1.41	0.26	1.38
9,404.00	90.10	271.68	6,882.46	-1,614.80	-2,788.87	2,951.95	0.24	0.19	0.14
9,494.00	89.88	270.49	6,882.48	-1,613.10	-2,878.86	3,041.18	1.34	-0.24	-1.32
9,584.00	89.79	270.76	6,882.74	-1,612.12	-2,968.85	3,130.50	0.32	-0.10	0.30
9,673.00	89.84	270.23	6,883.03	-1,611.35	-3,057.85	3,218.85	0.60	0.06	-0.60
9,762.00	90.19	271.51	6,883.00	-1,610.00	-3,146.83	3,307.13	1.49	0.39	1.44
9,852.00	90.01	270.63	6,882.85	-1,608.32	-3,236.82	3,396.36	1.00	-0.20	-0.98
9,941.00	89.97	270.54	6,882.86	-1,607.41	-3,325.81	3,484.70	0.11	-0.04	-0.10
10,031.00	89.93	270.54	6,882.94	-1,606.56	-3,415.81	3,574.03	0.04	-0.04	0.00
10,121.00	90.19	271.42	6,882.85	-1,605.02	-3,505.79	3,663.28	1.02	0.29	0.98
10,211.00	90.10	271.55	6,882.62	-1,602.69	-3,595.76	3,752.43	0.18	-0.10	0.14
10,299.00	89.88	270.85	6,882.63	-1,600.84	-3,683.74	3,839.65	0.83	-0.25	-0.80
10,389.00	89.93	270.32	6,882.78	-1,599.93	-3,773.74	3,928.98	0.59	0.06	-0.59
10,478.00	90.06	271.90	6,882.79	-1,598.20	-3,862.72	4,017.21	1.78	0.15	1.78
10,567.00	90.19	269.83	6,882.60	-1,596.86	-3,951.70	4,105.48	2.33	0.15	-2.33
10,656.00	89.84	270.05	6,882.57	-1,596.95	-4,040.70	4,193.93	0.46	-0.39	0.25
10,746.00	89.79	270.18	6,882.86	-1,596.77	-4,130.70	4,283.35	0.15	-0.06	0.14
10,836.00	89.75	270.01	6,883.22	-1,596.62	-4,220.70	4,372.77	0.19	-0.04	-0.19
10,925.00	90.06	270.76	6,883.37	-1,596.02	-4,309.70	4,461.14	0.91	0.35	0.84
11,014.00	90.06	271.11	6,883.28	-1,594.57	-4,398.69	4,549.41	0.39	0.00	0.39
11,104.00	89.93	270.93	6,883.29	-1,592.97	-4,488.67	4,638.65	0.25	-0.14	-0.20
11,193.00	89.84	270.85	6,883.47	-1,591.59	-4,577.66	4,726.93	0.14	-0.10	-0.09
11,283.00	90.10	271.15	6,883.51	-1,590.02	-4,667.65	4,816.17	0.44	0.29	0.33
11,373.00	89.84	269.88	6,883.56	-1,589.21	-4,757.64	4,905.51	1.44	-0.29	-1.41
11,462.00	89.97	270.23	6,883.71	-1,589.12	-4,846.64	4,993.94	0.42	0.15	0.39
11,551.00	90.10	271.68	6,883.65	-1,587.64	-4,935.63	5,082.20	1.64	0.15	1.63
11,641.00	89.66	269.83	6,883.84	-1,586.45	-5,025.61	5,171.50	2.11	-0.49	-2.06
11,730.00	90.15	271.46	6,883.99	-1,585.45	-5,114.61	5,259.82	1.91	0.55	1.83

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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)
11,819.00	90.01	271.60	6,883.86	-1,583.07	-5,203.57	5,347.96	0.22	-0.16	0.16
11,909.00	90.41	271.20	6,883.53	-1,580.87	-5,293.55	5,437.12	0.63	0.44	-0.44
11,999.00	90.15	270.49	6,883.09	-1,579.55	-5,383.53	5,526.40	0.84	-0.29	-0.79
12,088.00	89.93	270.63	6,883.03	-1,578.68	-5,472.53	5,614.74	0.29	-0.25	0.16
12,177.00	89.88	269.79	6,883.18	-1,578.35	-5,561.53	5,703.14	0.95	-0.06	-0.94
12,267.00	89.84	270.10	6,883.40	-1,578.44	-5,651.53	5,792.59	0.35	-0.04	0.34
12,293.47	89.89	270.35	6,883.46	-1,578.33	-5,678.00	5,818.88	0.95	0.19	0.93
Cross @ 12293.47' MD									
12,356.00	90.01	270.93	6,883.52	-1,577.64	-5,740.52	5,880.93	0.95	0.19	0.93
12,446.00	89.84	270.18	6,883.63	-1,576.77	-5,830.52	5,970.27	0.85	-0.19	-0.83
12,535.00	90.15	271.64	6,883.64	-1,575.35	-5,919.50	6,058.54	1.68	0.35	1.64
12,625.00	89.93	270.54	6,883.58	-1,573.64	-6,009.49	6,147.76	1.25	-0.24	-1.22
12,715.00	90.10	271.24	6,883.56	-1,572.24	-6,099.48	6,237.03	0.80	0.19	0.78
12,805.00	90.01	270.45	6,883.47	-1,570.92	-6,189.46	6,326.31	0.88	-0.10	-0.88
12,895.00	90.23	271.55	6,883.28	-1,569.34	-6,279.45	6,415.55	1.25	0.24	1.22
12,984.00	90.23	271.90	6,882.92	-1,566.67	-6,368.41	6,503.66	0.39	0.00	0.39
13,074.00	90.23	271.55	6,882.56	-1,563.96	-6,458.37	6,592.75	0.39	0.00	-0.39
13,164.00	90.15	271.68	6,882.26	-1,561.42	-6,548.33	6,681.86	0.17	-0.09	0.14
13,253.00	89.22	270.36	6,882.75	-1,559.84	-6,637.31	6,770.11	1.81	-1.04	-1.48
13,343.00	89.22	271.99	6,883.98	-1,557.99	-6,727.28	6,859.31	1.81	0.00	1.81
13,433.00	89.13	269.88	6,885.27	-1,556.52	-6,817.26	6,948.55	2.35	-0.10	-2.34
13,522.00	89.00	270.36	6,886.73	-1,556.34	-6,906.24	7,036.96	0.56	-0.15	0.54
13,612.00	88.91	270.27	6,888.37	-1,555.84	-6,996.23	7,126.33	0.14	-0.10	-0.10
13,701.00	88.82	269.92	6,890.13	-1,555.69	-7,085.21	7,214.73	0.41	-0.10	-0.39
13,791.00	89.13	270.71	6,891.74	-1,555.20	-7,175.19	7,304.10	0.94	0.34	0.88
13,880.00	89.04	271.42	6,893.16	-1,553.54	-7,264.17	7,392.33	0.80	-0.10	0.80
13,969.00	88.78	270.10	6,894.86	-1,552.36	-7,353.14	7,480.61	1.51	-0.29	-1.48
14,059.00	88.73	270.32	6,896.81	-1,552.03	-7,443.12	7,569.99	0.25	-0.06	0.24
14,148.00	89.00	271.29	6,898.57	-1,550.78	-7,532.09	7,658.26	1.13	0.30	1.09
14,238.00	89.04	270.63	6,900.11	-1,549.28	-7,622.06	7,747.50	0.73	0.04	-0.73
14,328.00	88.91	270.71	6,901.72	-1,548.22	-7,712.04	7,836.80	0.17	-0.14	0.09
14,417.00	88.95	270.23	6,903.39	-1,547.49	-7,801.02	7,925.14	0.54	0.04	-0.54
14,507.00	88.78	269.48	6,905.17	-1,547.72	-7,891.01	8,014.58	0.85	-0.19	-0.83
14,596.00	89.00	271.37	6,906.89	-1,547.06	-7,979.98	8,102.93	2.14	0.25	2.12
14,686.00	89.00	270.85	6,908.46	-1,545.32	-8,069.95	8,192.14	0.58	0.00	-0.58
14,775.00	89.04	271.20	6,909.99	-1,543.73	-8,158.92	8,280.38	0.40	0.04	0.39
14,865.00	89.17	271.24	6,911.39	-1,541.81	-8,248.89	8,369.57	0.15	0.14	0.04
14,954.00	89.40	270.49	6,912.50	-1,540.47	-8,337.87	8,457.84	0.88	0.26	-0.84
15,044.00	89.75	272.08	6,913.17	-1,538.45	-8,427.85	8,547.02	1.81	0.39	1.77
15,133.00	89.44	270.54	6,913.80	-1,536.41	-8,516.82	8,635.21	1.77	-0.35	-1.73
15,223.00	89.35	270.05	6,914.75	-1,535.95	-8,606.81	8,724.59	0.55	-0.10	-0.54
15,312.00	89.53	271.11	6,915.62	-1,535.05	-8,695.80	8,812.92	1.21	0.20	1.19
15,402.00	89.75	271.86	6,916.18	-1,532.72	-8,785.77	8,902.06	0.87	0.24	0.83
15,491.00	89.57	271.46	6,916.71	-1,530.14	-8,874.73	8,990.17	0.49	-0.20	-0.45

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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)
15,580.00	89.70	271.64	6,917.28	-1,527.73	-8,963.70	9,078.31	0.25	0.15	0.20
15,669.00	89.35	270.14	6,918.02	-1,526.35	-9,052.68	9,166.58	1.73	-0.39	-1.69
15,759.00	89.66	270.80	6,918.79	-1,525.61	-9,142.67	9,255.93	0.81	0.34	0.73
15,849.00	89.70	271.82	6,919.30	-1,523.55	-9,232.65	9,345.11	1.13	0.04	1.13
15,939.00	89.62	270.80	6,919.83	-1,521.50	-9,322.62	9,434.29	1.14	-0.09	-1.13
16,028.00	89.62	272.04	6,920.42	-1,519.29	-9,411.59	9,522.45	1.39	0.00	1.39
16,118.00	89.53	270.80	6,921.09	-1,517.06	-9,501.56	9,611.61	1.38	-0.10	-1.38
16,207.00	89.62	270.89	6,921.75	-1,515.75	-9,590.54	9,699.89	0.14	0.10	0.10
16,296.00	89.44	269.92	6,922.48	-1,515.12	-9,679.54	9,788.25	1.11	-0.20	-1.09
16,386.00	89.53	270.54	6,923.29	-1,514.76	-9,769.53	9,877.64	0.70	0.10	0.69
16,475.00	89.57	270.76	6,923.99	-1,513.75	-9,858.53	9,965.97	0.25	0.04	0.25
16,565.00	89.40	271.11	6,924.80	-1,512.28	-9,948.51	10,055.22	0.43	-0.19	0.39
16,655.00	89.53	271.68	6,925.64	-1,510.09	-10,038.48	10,144.38	0.65	0.14	0.63
16,744.00	89.35	269.74	6,926.51	-1,508.99	-10,127.46	10,232.68	2.19	-0.20	-2.18
16,834.00	89.44	269.92	6,927.46	-1,509.25	-10,217.46	10,322.14	0.22	0.10	0.20
16,923.00	89.57	270.49	6,928.23	-1,508.94	-10,306.45	10,410.55	0.66	0.15	0.64
17,014.00	89.53	269.83	6,928.94	-1,508.68	-10,397.45	10,500.94	0.73	-0.04	-0.73
17,103.00	89.75	272.08	6,929.50	-1,507.20	-10,486.43	10,589.20	2.54	0.25	2.53
17,193.00	89.31	270.58	6,930.24	-1,505.11	-10,576.40	10,678.37	1.74	-0.49	-1.67
17,282.00	89.53	270.10	6,931.14	-1,504.58	-10,665.39	10,766.75	0.59	0.25	-0.54
17,371.00	89.70	271.51	6,931.74	-1,503.33	-10,754.38	10,855.04	1.60	0.19	1.58
17,461.00	89.62	271.90	6,932.27	-1,500.65	-10,844.34	10,944.13	0.44	-0.09	0.43
17,551.00	89.26	270.23	6,933.15	-1,498.98	-10,934.32	11,033.36	1.90	-0.40	-1.86
17,552.69	89.26	270.23	6,933.17	-1,498.97	-10,936.01	11,035.04	0.00	0.00	0.00
Cross @ 17552.69' MD									
17,641.00	89.44	270.05	6,934.17	-1,498.76	-11,024.31	11,122.76	0.29	0.20	-0.20
17,730.00	89.93	270.36	6,934.66	-1,498.44	-11,113.31	11,211.17	0.65	0.55	0.35
17,819.00	90.46	272.04	6,934.36	-1,496.58	-11,202.28	11,299.38	1.98	0.60	1.89
17,905.00	90.19	271.73	6,933.87	-1,493.75	-11,288.24	11,384.47	0.48	-0.31	-0.36
17,995.00	90.23	271.60	6,933.54	-1,491.13	-11,378.20	11,473.58	0.15	0.04	-0.14
18,084.00	89.75	269.83	6,933.56	-1,490.02	-11,467.19	11,561.88	2.06	-0.54	-1.99
18,174.00	90.15	271.90	6,933.63	-1,488.67	-11,557.17	11,651.15	2.34	0.44	2.30
18,264.00	90.06	271.29	6,933.47	-1,486.16	-11,647.14	11,740.27	0.69	-0.10	-0.68
18,353.00	90.06	271.24	6,933.38	-1,484.20	-11,736.11	11,828.47	0.06	0.00	-0.06
18,443.00	90.23	271.82	6,933.15	-1,481.79	-11,826.08	11,917.61	0.67	0.19	0.64
18,533.00	89.97	270.10	6,932.99	-1,480.28	-11,916.06	12,006.86	1.93	-0.29	-1.91
18,622.00	89.75	269.57	6,933.21	-1,480.54	-12,005.06	12,095.33	0.64	-0.25	-0.60
18,712.00	89.79	269.74	6,933.57	-1,481.08	-12,095.06	12,184.82	0.19	0.04	0.19
18,802.00	89.75	269.52	6,933.93	-1,481.66	-12,185.06	12,274.32	0.25	-0.04	-0.24
18,892.00	89.79	270.32	6,934.29	-1,481.79	-12,275.06	12,363.77	0.89	0.04	0.89
18,982.00	89.84	269.79	6,934.58	-1,481.70	-12,365.06	12,453.19	0.59	0.06	-0.59
19,072.00	90.19	271.29	6,934.56	-1,480.85	-12,455.05	12,542.53	1.71	0.39	1.67
19,162.00	90.01	270.98	6,934.40	-1,479.07	-12,545.03	12,631.74	0.40	-0.20	-0.34

Survey Report

Company:	Extraction Oil and Gas	Local Co-ordinate Reference:	Well AD Fed Library 20W-25-17
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 4666.00usft (Ensign 147)
Site:	Sec 21-T05N-R65W Ardrey Pad	MD Reference:	KB @ 4666.00usft (Ensign 147)
Well:	AD Fed Library 20W-25-17	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)
19,251.00	89.84	269.61	6,934.52	-1,478.61	-12,634.03	12,720.13	1.55	-0.19	-1.54
19,340.00	90.15	271.60	6,934.53	-1,477.67	-12,723.02	12,808.46	2.26	0.35	2.24
19,429.00	90.15	271.82	6,934.29	-1,475.02	-12,811.98	12,896.56	0.25	0.00	0.25
19,518.00	89.93	270.67	6,934.23	-1,473.08	-12,900.96	12,984.77	1.32	-0.25	-1.29
19,608.00	89.79	269.83	6,934.45	-1,472.69	-12,990.95	13,074.16	0.95	-0.16	-0.93
19,667.00	89.84	270.32	6,934.64	-1,472.61	-13,049.95	13,132.78	0.83	0.08	0.83
Last MWD Survey @ 19667' MD									
19,702.00	89.84	270.32	6,934.74	-1,472.42	-13,084.95	13,167.54	0.00	0.00	0.00
Projection to TD @ 19702' MD 322' FSL/ 2148.5' FEL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 6797.8	0.00	0.00	6,583.37	-1,567.24	-307.85	1,381,665.86	3,229,118.83	40.378158	-104.677595
- actual wellpath misses target center by 0.05usft at 6797.80usft MD (6583.38 TVD, -1567.20 N, -307.85 E)									
- Point									
Cross @ 6902.14' MD	0.00	0.00	6,670.47	-1,582.37	-363.00	1,381,650.22	3,229,063.82	40.378116	-104.677793
- actual wellpath hits target center									
- Point									
70° Inclination @ 7222.6	0.00	0.00	6,865.00	-1,600.30	-610.97	1,381,629.99	3,228,816.02	40.378067	-104.678683
- actual wellpath hits target center									
- Point									
Cross @ 12293.47' MD	0.00	0.00	6,883.46	-1,578.33	-5,678.00	1,381,604.90	3,223,749.01	40.378126	-104.696871
- actual wellpath hits target center									
- Point									
Cross @ 17552.69' MD	0.00	0.00	6,933.17	-1,498.97	-10,936.00	1,381,635.43	3,218,490.50	40.378339	-104.715744
- actual wellpath hits target center									
- Point									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,567.00	1,539.83	-241.04	-41.81	Tie into Surface Surveys
1,674.00	1,643.91	-265.61	-45.33	First MWD Survey @ 1674' MD
6,797.80	6,583.38	-1,567.20	-307.85	30° Inclination @ 6797.80' MD
6,902.14	6,670.47	-1,582.37	-363.00	Cross @ 6902.14' MD
7,222.63	6,865.00	-1,600.30	-610.97	70° Inclination @ 7222.63' MD
12,293.47	6,883.46	-1,578.33	-5,678.00	Cross @ 12293.47' MD
17,552.69	6,933.17	-1,498.97	-10,936.01	Cross @ 17552.69' MD
19,667.00	6,934.64	-1,472.61	-13,049.95	Last MWD Survey @ 19667' MD
19,702.00	6,934.74	-1,472.42	-13,084.95	Projection to TD @ 19702' MD 322' FSL/ 2148.5' FEL

Checked By: _____ Approved By: _____ Date: _____