

Extraction Oil & Gas

Adams County (NAD 83)

Sec 12-T01S-R66W

Duck Club 12W-20-11N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

20 November, 2018



Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-11N
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft
Well:	Duck Club 12W-20-11N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Project	Adams County (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 12-T01S-R66W						
Site Position:		Northing:	1,239,018.46	usft	Latitude:	39.98694		
From:	Map	Easting:	3,214,796.41	usft	Longitude:	-104.73343		
Position Uncertainty:	0.00	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.50	°

Well		Duck Club 12W-20-11N				
Well Position	+N/-S	0.00 usft	Northing:	1,236,015.02 usft	Latitude:	39.97868
	+E/-W	0.00 usft	Easting:	3,215,511.17 usft	Longitude:	-104.73097
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,037.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/6/2018	8.20	66.32	51,945

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	260.02	

Survey Program	Date	11/20/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,656.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,656.00	17,655.00	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	
129.00	0.22	139.56	129.00	-0.19	0.16	-0.13	0.17	0.17	0.00	
First Gyro Survey										
225.00	0.22	219.45	225.00	-0.47	0.16	-0.08	0.29	0.00	83.22	
320.00	0.75	136.92	320.00	-1.07	0.47	-0.28	0.79	0.56	-86.87	
415.00	2.86	119.16	414.94	-2.68	2.97	-2.46	2.27	2.22	-18.69	
510.00	5.14	119.34	509.71	-5.92	8.75	-7.59	2.40	2.40	0.19	
604.00	6.68	121.27	603.20	-10.82	17.09	-14.96	1.65	1.64	2.05	
699.00	8.31	123.82	697.39	-17.51	27.52	-24.07	1.75	1.72	2.68	
795.00	10.11	126.64	792.15	-26.39	40.04	-34.86	1.93	1.88	2.94	

Survey Report



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Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft
Well:	Duck Club 12W-20-11N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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)
890.00	11.43	128.04	885.47	-37.17	54.15	-46.89	1.42	1.39	1.47
985.00	13.71	126.99	978.19	-49.75	70.56	-60.87	2.41	2.40	-1.11
1,080.00	16.26	127.07	1,069.95	-64.54	90.17	-77.61	2.68	2.68	0.08
1,175.00	17.80	126.28	1,160.78	-81.15	112.49	-96.71	1.64	1.62	-0.83
1,270.00	20.26	126.37	1,250.58	-99.49	137.44	-118.11	2.59	2.59	0.09
1,364.00	21.14	125.41	1,338.52	-118.97	164.36	-141.25	1.00	0.94	-1.02
1,459.00	23.20	123.56	1,426.49	-139.24	193.92	-166.85	2.29	2.17	-1.95
1,555.00	25.27	124.88	1,514.02	-161.41	226.49	-195.08	2.23	2.16	1.38
1,606.00	26.24	124.70	1,559.96	-174.05	244.69	-210.81	1.91	1.90	-0.35
1,656.00	26.94	124.70	1,604.67	-186.79	263.09	-226.73	1.40	1.40	0.00
Last Gyro Survey - Tie into Surface Surveys @ 1656' MD									
1,758.00	25.67	124.76	1,696.10	-212.54	300.24	-258.85	1.25	-1.25	0.06
First MWD Survey									
1,854.00	27.84	127.53	1,781.83	-238.06	335.11	-288.76	2.61	2.26	2.89
1,950.00	27.71	126.92	1,866.76	-265.12	370.73	-319.15	0.33	-0.14	-0.64
2,046.00	27.93	127.09	1,951.67	-292.08	406.51	-349.71	0.24	0.23	0.18
2,141.00	27.40	126.83	2,035.81	-318.61	441.75	-379.82	0.57	-0.56	-0.27
2,237.00	28.50	127.58	2,120.61	-345.82	477.59	-410.40	1.20	1.15	0.78
2,333.00	28.19	127.01	2,205.10	-373.43	513.84	-441.32	0.43	-0.32	-0.59
2,429.00	26.65	126.12	2,290.31	-399.78	549.34	-471.71	1.66	-1.60	-0.93
2,524.00	27.53	123.88	2,374.89	-424.58	584.78	-502.32	1.42	0.93	-2.36
2,619.00	26.20	124.45	2,459.64	-448.68	620.31	-533.12	1.43	-1.40	0.60
2,715.00	27.80	125.29	2,545.17	-473.60	656.06	-564.01	1.71	1.67	0.88
2,810.00	28.55	123.30	2,628.91	-498.86	693.11	-596.13	1.27	0.79	-2.09
2,906.00	29.78	123.88	2,712.74	-524.75	732.08	-630.02	1.31	1.28	0.60
3,001.00	28.37	121.94	2,795.77	-549.84	770.82	-663.82	1.79	-1.48	-2.04
3,097.00	29.03	125.29	2,879.98	-575.37	809.19	-697.19	1.81	0.69	3.49
3,192.00	26.87	123.74	2,963.90	-600.61	845.87	-728.93	2.40	-2.27	-1.63
3,288.00	28.81	126.30	3,048.78	-626.36	882.55	-760.59	2.37	2.02	2.67
3,383.00	26.87	125.20	3,132.79	-652.29	918.55	-791.55	2.11	-2.04	-1.16
3,479.00	29.52	127.84	3,217.39	-679.31	954.96	-822.73	3.05	2.76	2.75
3,574.00	27.93	127.71	3,300.70	-707.28	991.05	-853.42	1.67	-1.67	-0.14
3,669.00	29.30	124.32	3,384.10	-734.00	1,027.85	-885.03	2.24	1.44	-3.57
3,765.00	26.82	122.82	3,468.81	-758.98	1,065.46	-917.74	2.69	-2.58	-1.56
3,860.00	28.59	124.54	3,552.91	-783.49	1,102.20	-949.67	2.04	1.86	1.81
3,956.00	25.94	123.92	3,638.24	-808.23	1,138.55	-981.18	2.78	-2.76	-0.65
4,051.00	25.36	125.55	3,723.88	-831.66	1,172.34	-1,010.40	0.96	-0.61	1.72
4,146.00	26.60	124.45	3,809.28	-855.52	1,206.44	-1,039.84	1.40	1.31	-1.16
4,242.00	29.61	125.42	3,893.95	-881.43	1,243.49	-1,071.85	3.17	3.14	1.01
4,337.00	27.18	123.35	3,977.52	-906.96	1,280.75	-1,104.11	2.76	-2.56	-2.18
4,432.00	28.94	128.77	4,061.36	-933.29	1,316.81	-1,135.06	3.26	1.85	5.71
4,528.00	26.34	129.65	4,146.40	-961.43	1,351.32	-1,164.17	2.74	-2.71	0.92
4,623.00	26.25	127.98	4,231.57	-987.81	1,384.11	-1,191.89	0.78	-0.09	-1.76

Survey Report



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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)	
4,719.00	28.94	126.70	4,316.64	-1,014.76	1,419.47	-1,222.04	2.87	2.80	-1.33	
4,814.00	31.82	127.67	4,398.59	-1,043.80	1,457.73	-1,254.69	3.08	3.03	1.02	
4,910.00	27.80	126.12	4,481.87	-1,072.48	1,495.86	-1,287.27	4.26	-4.19	-1.61	
5,005.00	31.33	128.11	4,564.49	-1,100.79	1,533.20	-1,319.14	3.86	3.72	2.09	
5,100.00	27.71	128.24	4,647.14	-1,129.71	1,570.00	-1,350.36	3.81	-3.81	0.14	
5,196.00	26.03	127.09	4,732.77	-1,156.24	1,604.33	-1,379.58	1.83	-1.75	-1.20	
5,292.00	31.20	125.38	4,817.02	-1,183.35	1,641.44	-1,411.42	5.45	5.39	-1.78	
5,387.00	28.99	124.05	4,899.21	-1,210.49	1,680.58	-1,445.26	2.43	-2.33	-1.40	
5,482.00	25.01	120.00	4,983.85	-1,233.44	1,717.06	-1,477.21	4.61	-4.19	-4.26	
5,578.00	29.61	120.48	5,069.12	-1,255.63	1,755.09	-1,510.82	4.80	4.79	0.50	
5,674.00	28.94	120.53	5,152.86	-1,279.45	1,795.54	-1,546.53	0.70	-0.70	0.05	
5,769.00	27.57	117.71	5,236.55	-1,301.36	1,834.81	-1,581.40	2.01	-1.44	-2.97	
5,865.00	25.50	121.19	5,322.43	-1,322.39	1,872.16	-1,614.54	2.70	-2.16	3.63	
5,984.00	21.56	118.41	5,431.52	-1,346.07	1,913.32	-1,650.97	3.44	-3.31	-2.34	
6,080.00	23.02	126.17	5,520.36	-1,365.54	1,944.00	-1,677.81	3.42	1.52	8.08	
6,175.00	21.08	124.45	5,608.41	-1,386.17	1,973.08	-1,702.88	2.15	-2.04	-1.81	
6,271.00	18.34	124.19	5,698.78	-1,404.43	1,999.82	-1,726.04	2.86	-2.85	-0.27	
6,366.00	14.67	122.20	5,789.85	-1,419.25	2,022.37	-1,745.68	3.91	-3.86	-2.09	
6,461.00	11.53	120.97	5,882.37	-1,430.54	2,040.69	-1,761.77	3.32	-3.31	-1.29	
6,557.00	8.66	119.87	5,976.87	-1,439.08	2,055.19	-1,774.57	3.00	-2.99	-1.15	
6,652.00	6.36	121.14	6,071.05	-1,445.37	2,065.90	-1,784.02	2.43	-2.42	1.34	
6,748.00	4.55	122.78	6,166.61	-1,450.18	2,073.65	-1,790.82	1.89	-1.89	1.71	
6,843.00	1.24	124.67	6,261.48	-1,452.80	2,077.66	-1,794.32	3.49	-3.48	1.99	
6,939.00	0.71	124.19	6,357.46	-1,453.73	2,079.01	-1,795.49	0.55	-0.55	-0.50	
7,034.00	0.49	161.42	6,452.46	-1,454.44	2,079.63	-1,795.97	0.46	-0.23	39.19	
7,130.00	0.44	212.41	6,548.45	-1,455.14	2,079.56	-1,795.78	0.42	-0.05	53.11	
7,225.00	5.97	274.68	6,643.28	-1,455.05	2,074.44	-1,790.75	6.08	5.82	65.55	
7,321.00	20.72	271.81	6,736.43	-1,454.10	2,052.36	-1,769.18	15.38	15.36	-2.99	
7,417.00	26.91	271.81	6,824.21	-1,452.88	2,013.64	-1,731.25	6.45	6.45	0.00	
7,513.00	34.03	269.43	6,906.90	-1,452.46	1,965.00	-1,683.42	7.52	7.42	-2.48	
7,608.00	41.10	268.59	6,982.16	-1,453.49	1,907.13	-1,626.25	7.46	7.44	-0.88	
7,704.00	47.86	267.54	7,050.61	-1,455.80	1,839.95	-1,559.69	7.08	7.04	-1.09	
7,799.00	55.24	269.56	7,109.65	-1,457.61	1,765.63	-1,486.18	7.94	7.77	2.13	
7,895.00	63.46	270.31	7,158.55	-1,457.68	1,683.11	-1,404.90	8.59	8.56	0.78	
7,990.00	73.93	270.89	7,193.02	-1,456.74	1,594.73	-1,318.02	11.04	11.02	0.61	
8,086.00	83.03	271.86	7,212.17	-1,454.47	1,500.79	-1,225.90	9.53	9.48	1.01	
8,101.72	84.06	271.76	7,213.94	-1,453.98	1,485.18	-1,210.61	6.59	6.56	-0.66	
LP Duck Club 12W-20-11N										
8,181.00	89.26	271.24	7,218.55	-1,451.91	1,406.09	-1,133.07	6.59	6.56	-0.65	
8,276.00	89.31	270.36	7,219.74	-1,450.59	1,311.11	-1,039.76	0.93	0.05	-0.93	
8,372.00	90.15	270.58	7,220.19	-1,449.80	1,215.11	-945.35	0.90	0.88	0.23	
8,467.00	91.16	270.22	7,219.11	-1,449.14	1,120.12	-851.92	1.13	1.06	-0.38	
8,563.00	90.85	270.27	7,217.42	-1,448.73	1,024.14	-757.46	0.33	-0.32	0.05	
8,658.00	90.59	270.45	7,216.23	-1,448.13	929.15	-664.01	0.33	-0.27	0.19	

Survey Report



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Well:	Duck Club 12W-20-11N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
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8,753.00	90.54	270.14	7,215.29	-1,447.64	834.15	-570.54	0.33	-0.05	-0.33
8,849.00	90.59	270.62	7,214.34	-1,447.00	738.16	-476.11	0.50	0.05	0.50
8,944.00	90.46	271.28	7,213.47	-1,445.43	643.18	-382.84	0.71	-0.14	0.69
9,040.00	89.88	271.33	7,213.19	-1,443.24	547.20	-288.70	0.61	-0.60	0.05
9,135.00	90.06	270.62	7,213.24	-1,441.63	452.22	-195.43	0.77	0.19	-0.75
9,230.00	88.20	270.18	7,214.68	-1,440.96	357.24	-102.00	2.01	-1.96	-0.46
9,326.00	87.67	270.09	7,218.14	-1,440.74	261.30	-7.56	0.56	-0.55	-0.09
9,421.00	89.04	269.87	7,220.87	-1,440.77	166.34	85.97	1.46	1.44	-0.23
9,517.00	88.03	269.78	7,223.32	-1,441.06	70.37	180.53	1.06	-1.05	-0.09
9,612.00	87.58	269.34	7,226.96	-1,441.79	-24.55	274.15	0.66	-0.47	-0.46
9,708.00	89.17	270.71	7,229.68	-1,441.75	-120.51	368.65	2.19	1.66	1.43
9,803.00	88.60	270.80	7,231.53	-1,440.50	-215.48	461.96	0.61	-0.60	0.09
9,899.00	88.60	270.93	7,233.88	-1,439.05	-311.44	556.22	0.14	0.00	0.14
9,994.00	87.72	271.28	7,236.93	-1,437.22	-406.38	649.40	1.00	-0.93	0.37
10,090.00	87.36	271.63	7,241.05	-1,434.78	-502.26	743.40	0.52	-0.38	0.36
10,185.00	86.79	271.90	7,245.90	-1,431.86	-597.09	836.29	0.66	-0.60	0.28
10,281.00	89.48	271.11	7,249.02	-1,429.34	-692.99	930.31	2.92	2.80	-0.82
10,377.00	88.11	270.62	7,251.04	-1,427.89	-788.96	1,024.57	1.52	-1.43	-0.51
10,472.00	89.88	268.68	7,252.71	-1,428.47	-883.93	1,118.21	2.76	1.86	-2.04
10,567.00	90.32	268.20	7,252.54	-1,431.06	-978.90	1,212.18	0.69	0.46	-0.51
10,663.00	88.42	267.18	7,253.59	-1,434.93	-1,074.81	1,307.31	2.25	-1.98	-1.06
10,758.00	90.54	268.29	7,254.46	-1,438.68	-1,169.72	1,401.44	2.52	2.23	1.17
10,854.00	90.15	267.76	7,253.88	-1,441.99	-1,265.66	1,496.50	0.69	-0.41	-0.55
10,949.00	90.37	267.32	7,253.45	-1,446.07	-1,360.58	1,590.68	0.52	0.23	-0.46
11,044.00	90.68	271.86	7,252.58	-1,446.75	-1,455.54	1,684.33	4.79	0.33	4.78
11,140.00	89.44	271.11	7,252.48	-1,444.26	-1,551.51	1,778.41	1.51	-1.29	-0.78
11,236.00	89.62	269.78	7,253.26	-1,443.51	-1,647.50	1,872.82	1.40	0.19	-1.39
11,331.00	89.75	269.48	7,253.79	-1,444.13	-1,742.50	1,966.48	0.34	0.14	-0.32
11,427.00	90.06	269.12	7,253.95	-1,445.30	-1,838.49	2,061.22	0.49	0.32	-0.38
11,521.00	90.15	268.73	7,253.77	-1,447.06	-1,932.47	2,154.09	0.43	0.10	-0.41
11,617.00	90.37	268.33	7,253.34	-1,449.53	-2,028.44	2,249.03	0.48	0.23	-0.42
11,713.00	90.19	267.76	7,252.87	-1,452.80	-2,124.38	2,344.09	0.62	-0.19	-0.59
11,808.00	90.10	267.23	7,252.63	-1,456.95	-2,219.29	2,438.28	0.57	-0.09	-0.56
11,904.00	89.04	269.17	7,253.35	-1,459.97	-2,315.24	2,533.29	2.30	-1.10	2.02
11,999.00	88.95	271.72	7,255.02	-1,459.23	-2,410.21	2,626.70	2.69	-0.09	2.68
12,095.00	88.82	272.56	7,256.88	-1,455.65	-2,506.12	2,720.54	0.89	-0.14	0.88
12,191.00	89.09	274.85	7,258.63	-1,449.44	-2,601.90	2,813.79	2.40	0.28	2.39
12,286.00	89.22	275.87	7,260.04	-1,440.57	-2,696.47	2,905.40	1.08	0.14	1.07
12,381.00	89.84	272.34	7,260.81	-1,433.77	-2,791.21	2,997.52	3.77	0.65	-3.72
12,477.00	89.04	268.81	7,261.75	-1,432.81	-2,887.19	3,091.87	3.77	-0.83	-3.68
12,572.00	91.43	271.24	7,261.36	-1,432.77	-2,982.17	3,185.41	3.59	2.52	2.56
12,668.00	91.60	270.93	7,258.83	-1,430.95	-3,078.12	3,279.59	0.37	0.18	-0.32
12,763.00	91.30	270.09	7,256.42	-1,430.11	-3,173.09	3,372.97	0.94	-0.32	-0.88

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-11N
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft
Well:	Duck Club 12W-20-11N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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)	
12,858.00	91.30	269.92	7,254.27	-1,430.10	-3,268.06	3,466.51	0.18	0.00	-0.18	
12,955.00	89.31	270.62	7,253.75	-1,429.64	-3,365.05	3,561.95	2.17	-2.05	0.72	
13,050.00	89.53	270.53	7,254.71	-1,428.69	-3,460.04	3,655.34	0.25	0.23	-0.09	
13,146.00	88.82	270.05	7,256.09	-1,428.20	-3,556.03	3,749.79	0.89	-0.74	-0.50	
13,241.00	87.85	269.12	7,258.85	-1,428.89	-3,650.99	3,843.43	1.41	-1.02	-0.98	
13,336.00	88.86	269.92	7,261.58	-1,429.68	-3,745.94	3,937.08	1.36	1.06	0.84	
13,432.00	90.46	270.49	7,262.15	-1,429.34	-3,841.94	4,031.56	1.77	1.67	0.59	
13,527.00	90.59	270.14	7,261.28	-1,428.82	-3,936.93	4,125.03	0.39	0.14	-0.37	
13,623.00	90.94	269.56	7,260.00	-1,429.07	-4,032.92	4,219.61	0.71	0.36	-0.60	
13,718.00	90.90	268.86	7,258.47	-1,430.38	-4,127.90	4,313.38	0.74	-0.04	-0.74	
13,814.00	90.85	269.12	7,257.01	-1,432.07	-4,223.87	4,408.19	0.28	-0.05	0.27	
13,909.00	90.54	268.15	7,255.86	-1,434.33	-4,318.84	4,502.11	1.07	-0.33	-1.02	
14,005.00	90.46	267.93	7,255.02	-1,437.62	-4,414.78	4,597.17	0.24	-0.08	-0.23	
14,101.00	90.28	267.36	7,254.40	-1,441.56	-4,510.69	4,692.31	0.62	-0.19	-0.59	
14,196.00	90.46	271.50	7,253.78	-1,442.51	-4,605.67	4,786.01	4.36	0.19	4.36	
14,291.00	90.77	271.59	7,252.76	-1,439.95	-4,700.63	4,879.09	0.34	0.33	0.09	
14,387.00	90.37	270.67	7,251.81	-1,438.05	-4,796.60	4,973.28	1.04	-0.42	-0.96	
14,482.00	89.97	269.96	7,251.53	-1,437.53	-4,891.60	5,066.75	0.86	-0.42	-0.75	
14,578.00	89.35	268.77	7,252.10	-1,438.59	-4,987.59	5,161.47	1.40	-0.65	-1.24	
14,674.00	89.84	268.99	7,252.78	-1,440.47	-5,083.57	5,256.32	0.56	0.51	0.23	
14,769.00	89.75	268.37	7,253.12	-1,442.66	-5,178.54	5,350.24	0.66	-0.09	-0.65	
14,865.00	89.66	267.89	7,253.61	-1,445.79	-5,274.49	5,445.28	0.51	-0.09	-0.50	
14,960.00	90.15	271.72	7,253.77	-1,446.11	-5,369.47	5,538.87	4.06	0.52	4.03	
15,056.00	90.28	270.93	7,253.41	-1,443.89	-5,465.44	5,633.01	0.83	0.14	-0.82	
15,152.00	90.19	270.93	7,253.01	-1,442.34	-5,561.43	5,727.27	0.09	-0.09	0.00	
15,247.00	90.15	270.67	7,252.73	-1,441.01	-5,656.42	5,820.59	0.28	-0.04	-0.27	
15,343.00	89.70	269.83	7,252.86	-1,440.59	-5,752.42	5,915.07	0.99	-0.47	-0.88	
15,438.00	89.70	269.61	7,253.35	-1,441.06	-5,847.42	6,008.70	0.23	0.00	-0.23	
15,534.00	89.97	270.18	7,253.63	-1,441.23	-5,943.42	6,103.28	0.66	0.28	0.59	
15,629.00	89.62	269.65	7,253.97	-1,441.37	-6,038.41	6,196.86	0.67	-0.37	-0.56	
15,725.00	89.88	270.53	7,254.39	-1,441.22	-6,134.41	6,291.38	0.96	0.27	0.92	
15,821.00	90.85	270.71	7,253.78	-1,440.18	-6,230.40	6,385.74	1.03	1.01	0.19	
15,916.00	90.77	270.45	7,252.43	-1,439.22	-6,325.39	6,479.12	0.29	-0.08	-0.27	
16,012.00	90.85	269.74	7,251.08	-1,439.06	-6,421.38	6,573.63	0.74	0.08	-0.74	
16,107.00	91.30	270.00	7,249.30	-1,439.28	-6,516.36	6,667.21	0.55	0.47	0.27	
16,203.00	90.15	270.27	7,248.08	-1,439.05	-6,612.35	6,761.71	1.23	-1.20	0.28	
16,298.00	90.10	270.09	7,247.87	-1,438.75	-6,707.35	6,855.22	0.20	-0.05	-0.19	
16,394.00	89.26	269.43	7,248.41	-1,439.15	-6,803.35	6,949.83	1.11	-0.88	-0.69	
16,489.00	88.91	268.99	7,249.93	-1,440.46	-6,898.33	7,043.60	0.59	-0.37	-0.46	
16,585.00	90.50	271.63	7,250.42	-1,439.95	-6,994.31	7,138.04	3.21	1.66	2.75	
16,681.00	90.46	271.19	7,249.62	-1,437.58	-7,090.28	7,232.14	0.46	-0.04	-0.46	
16,777.00	89.79	270.49	7,249.41	-1,436.18	-7,186.27	7,326.43	1.01	-0.70	-0.73	
16,872.00	90.32	270.27	7,249.32	-1,435.55	-7,281.26	7,419.88	0.60	0.56	-0.23	
16,967.00	90.01	270.00	7,249.04	-1,435.32	-7,376.26	7,513.41	0.43	-0.33	-0.28	

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-11N
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft
Well:	Duck Club 12W-20-11N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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)
17,063.00	90.15	270.58	7,248.91	-1,434.84	-7,472.26	7,607.87	0.62	0.15	0.60
17,159.00	89.88	270.14	7,248.88	-1,434.23	-7,568.26	7,702.30	0.54	-0.28	-0.46
17,254.00	89.44	268.73	7,249.45	-1,435.17	-7,663.25	7,796.02	1.55	-0.46	-1.48
17,350.00	89.13	268.02	7,250.65	-1,437.89	-7,759.20	7,890.99	0.81	-0.32	-0.74
17,445.00	88.73	267.36	7,252.42	-1,441.72	-7,854.11	7,985.12	0.81	-0.42	-0.69
17,541.00	88.56	268.51	7,254.69	-1,445.18	-7,950.02	8,080.18	1.21	-0.18	1.20
17,595.00	88.11	267.71	7,256.26	-1,446.96	-8,003.97	8,133.62	1.70	-0.83	-1.48
Last MWD Survey									
17,655.00	88.11	267.71	7,258.24	-1,449.35	-8,063.89	8,193.05	0.00	0.00	0.00
Projection to TD @ 17655' MD 837.6' FSL/2116' FEL - PBHL Duck Club 12W-20-11N									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 7458.6	0.00	0.00	6,860.83	-1,452.44	1,993.80	1,234,579.93	3,217,517.49	39.97469	-104.72386
- hit/miss target									
- Shape									
- actual wellpath misses target center by 0.02usft at 7458.66usft MD (6860.83 TVD, -1452.46 N, 1993.80 E)									
- Point									
70° Inclination @ 7954.3	0.00	0.00	7,181.98	-1,457.21	1,628.63	1,234,571.98	3,217,152.38	39.97468	-104.72516
- actual wellpath misses target center by 0.02usft at 7954.36usft MD (7181.99 TVD, -1457.21 N, 1628.61 E)									
- Point									
Cross @ 10263' MD	0.00	0.00	7,248.78	-1,429.71	-675.00	1,234,579.50	3,214,848.60	39.97476	-104.73338
- actual wellpath hits target center									
- Point									
Cross @ 15537.59' MD	0.00	0.00	7,253.63	-1,441.22	-5,947.00	1,234,522.28	3,209,576.89	39.97472	-104.75219
- actual wellpath hits target center									
- Point									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
129.00	129.00	-0.19	0.16	First Gyro Survey	
1,656.00	1,604.67	-186.79	263.09	Last Gyro Survey	
1,656.00	1,604.67	-186.79	263.09	Tie into Surface Surveys @ 1656' MD	
1,758.00	1,696.10	-212.54	300.24	First MWD Survey	
17,595.00	7,256.26	-1,446.96	-8,003.97	Last MWD Survey	
17,655.00	7,258.24	-1,449.35	-8,063.89	Projection to TD @ 17655' MD 837.6' FSL/2116' FEL	

Checked By: _____ Approved By: _____ Date: _____