

Extraction Oil & Gas

Adams County (NAD 83)

Sec 12-T01S-R66W

Duck Club 12W-20-1C

Wellbore #1

Design: Wellbore #1

Standard Survey Report

03 January, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-1C
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-1C	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-20-1C					
Well Position	+N/-S	0.00 usft	Northing:	1,236,295.61 usft	Latitude:	39.97945
	+E/-W	0.00 usft	Easting:	3,215,519.94 usft	Longitude:	-104.73093
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	285.42	

Survey Program	Date	1/3/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,611.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,758.00	18,247.00	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	
129.00	0.83	86.03	129.00	0.06	0.93	-0.88	0.64	0.64	0.00	
First Surface Survey										
225.00	2.33	38.83	224.96	1.63	2.85	-2.31	1.95	1.56	-49.17	
320.00	4.04	39.10	319.81	5.74	6.17	-4.42	1.80	1.80	0.28	
415.00	6.72	40.06	414.38	12.59	11.86	-8.09	2.82	2.82	1.01	
510.00	8.83	41.64	508.50	22.29	20.28	-13.62	2.23	2.22	1.66	
604.00	9.84	42.44	601.26	33.61	30.50	-20.46	1.08	1.07	0.85	
699.00	11.34	44.28	694.64	46.29	42.49	-28.66	1.62	1.58	1.94	
795.00	13.58	44.19	788.37	61.13	56.94	-38.64	2.33	2.33	-0.09	

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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)	
890.00	15.69	41.47	880.28	78.76	73.22	-49.65	2.34	2.22	-2.86	
985.00	17.67	43.40	971.28	98.86	91.64	-62.05	2.16	2.08	2.03	
1,080.00	20.61	42.79	1,061.02	121.61	112.90	-76.51	3.10	3.09	-0.64	
1,175.00	22.02	43.75	1,149.52	146.75	136.58	-92.65	1.53	1.48	1.01	
1,270.00	23.64	44.81	1,237.08	173.13	162.32	-110.44	1.76	1.71	1.12	
1,364.00	23.42	42.88	1,323.26	200.19	188.31	-128.31	0.85	-0.23	-2.05	
1,459.00	25.40	42.52	1,409.76	229.05	214.93	-146.29	2.09	2.08	-0.38	
1,555.00	27.55	41.29	1,495.69	260.91	243.50	-165.36	2.31	2.24	-1.28	
1,611.00	29.27	40.68	1,544.95	281.03	260.96	-176.86	3.11	3.07	-1.09	
Last Surface Survey										
1,758.00	27.80	38.39	1,674.09	335.15	305.68	-205.57	1.25	-1.00	-1.56	
First Atlas MWD Survey @ 1758' MD										
1,854.00	30.05	37.73	1,758.11	371.72	334.29	-223.43	2.37	2.34	-0.69	
1,949.00	32.13	43.32	1,839.48	408.92	366.19	-244.29	3.74	2.19	5.88	
2,045.00	32.30	42.09	1,920.70	446.53	400.90	-267.75	0.71	0.18	-1.28	
2,141.00	32.26	41.38	2,001.86	484.78	435.03	-290.48	0.40	-0.04	-0.74	
2,237.00	31.60	40.33	2,083.34	523.18	468.24	-312.29	0.90	-0.69	-1.09	
2,332.00	31.77	41.82	2,164.18	560.80	501.03	-333.89	0.84	0.18	1.57	
2,428.00	31.20	41.56	2,246.04	598.24	534.37	-356.09	0.61	-0.59	-0.27	
2,524.00	30.98	44.73	2,328.26	634.40	568.26	-379.14	1.72	-0.23	3.30	
2,619.00	29.56	44.11	2,410.31	668.59	601.78	-402.36	1.53	-1.49	-0.65	
2,714.00	30.84	41.82	2,492.41	703.57	634.33	-424.44	1.81	1.35	-2.41	
2,810.00	29.43	44.56	2,575.44	738.72	667.29	-446.87	2.05	-1.47	2.85	
2,905.00	30.27	42.48	2,657.84	773.01	699.84	-469.13	1.40	0.88	-2.19	
3,001.00	31.51	42.97	2,740.22	809.21	733.28	-491.74	1.32	1.29	0.51	
3,097.00	34.47	43.32	2,820.73	847.34	769.03	-516.06	3.09	3.08	0.36	
3,192.00	31.42	40.06	2,900.45	885.86	803.42	-538.98	3.71	-3.21	-3.43	
3,288.00	32.79	40.59	2,981.77	924.75	836.44	-560.47	1.46	1.43	0.55	
3,383.00	29.78	39.93	3,062.95	962.39	868.32	-581.20	3.19	-3.17	-0.69	
3,478.00	30.40	42.84	3,145.15	998.11	899.81	-602.06	1.67	0.65	3.06	
3,574.00	32.39	44.60	3,227.09	1,034.23	934.39	-625.78	2.28	2.07	1.83	
3,669.00	29.92	44.42	3,308.38	1,069.28	968.84	-649.68	2.60	-2.60	-0.19	
3,765.00	32.08	42.57	3,390.67	1,105.15	1,002.85	-672.92	2.46	2.25	-1.93	
3,860.00	28.94	43.81	3,472.51	1,140.33	1,035.83	-695.37	3.37	-3.31	1.31	
3,955.00	29.65	42.48	3,555.36	1,174.25	1,067.62	-716.99	1.01	0.75	-1.40	
4,051.00	28.72	43.32	3,639.17	1,208.54	1,099.48	-738.59	1.06	-0.97	0.88	
4,146.00	31.07	44.47	3,721.52	1,242.65	1,132.32	-761.18	2.55	2.47	1.21	
4,242.00	32.88	42.35	3,802.96	1,279.59	1,167.23	-785.01	2.22	1.89	-2.21	
4,337.00	29.08	39.66	3,884.39	1,316.43	1,199.35	-806.18	4.26	-4.00	-2.83	
4,432.00	30.84	44.56	3,966.71	1,351.56	1,231.17	-827.52	3.17	1.85	5.16	
4,527.00	33.10	42.35	4,047.30	1,388.09	1,265.74	-851.13	2.68	2.38	-2.33	
4,623.00	29.03	41.60	4,129.51	1,424.90	1,298.88	-873.29	4.26	-4.24	-0.78	
4,718.00	28.37	41.03	4,212.84	1,459.16	1,329.00	-893.22	0.75	-0.69	-0.60	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Survey										
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4,814.00	30.58	42.75	4,296.41	1,494.30	1,360.55	-914.29	2.46	2.30	1.79	
4,909.00	33.85	42.26	4,376.78	1,531.64	1,394.76	-937.34	3.45	3.44	-0.52	
5,005.00	33.32	41.16	4,456.75	1,571.28	1,430.09	-960.86	0.84	-0.55	-1.15	
5,100.00	33.45	40.72	4,536.08	1,610.77	1,464.35	-983.38	0.29	0.14	-0.46	
5,196.00	33.23	41.47	4,616.28	1,650.53	1,499.02	-1,006.24	0.49	-0.23	0.78	
5,291.00	30.98	39.31	4,696.75	1,688.96	1,531.76	-1,027.58	2.66	-2.37	-2.27	
5,387.00	30.80	36.80	4,779.13	1,727.76	1,562.13	-1,046.55	1.36	-0.19	-2.61	
5,482.00	33.36	39.44	4,859.62	1,767.41	1,593.30	-1,066.05	3.07	2.69	2.78	
5,601.00	33.67	42.79	4,958.85	1,816.90	1,636.50	-1,094.54	1.58	0.26	2.82	
5,697.00	36.06	45.04	5,037.61	1,856.40	1,674.58	-1,120.75	2.83	2.49	2.34	
5,792.00	34.82	44.25	5,115.01	1,895.58	1,713.29	-1,147.65	1.39	-1.31	-0.83	
5,888.00	31.11	41.96	5,195.54	1,933.67	1,749.01	-1,171.95	4.08	-3.86	-2.39	
5,983.00	32.21	40.24	5,276.41	1,971.25	1,781.78	-1,193.55	1.50	1.16	-1.81	
6,079.00	31.82	40.90	5,357.81	2,009.91	1,814.88	-1,215.18	0.55	-0.41	0.69	
6,175.00	30.62	44.38	5,439.91	2,046.52	1,848.55	-1,237.91	2.26	-1.25	3.63	
6,270.00	27.75	44.95	5,522.84	2,079.47	1,881.10	-1,260.53	3.04	-3.02	0.60	
6,366.00	25.41	44.11	5,608.69	2,110.08	1,911.23	-1,281.44	2.47	-2.44	-0.88	
6,461.00	21.65	42.04	5,695.78	2,137.74	1,937.17	-1,299.08	4.05	-3.96	-2.18	
6,556.00	17.85	42.57	5,785.17	2,161.49	1,958.76	-1,313.58	4.00	-4.00	0.56	
6,652.00	17.68	41.74	5,876.59	2,183.20	1,978.42	-1,326.76	0.32	-0.18	-0.86	
6,747.00	13.35	40.06	5,968.11	2,202.37	1,995.09	-1,337.73	4.58	-4.56	-1.77	
6,843.00	11.14	47.16	6,061.93	2,217.16	2,009.02	-1,347.24	2.78	-2.30	7.40	
6,938.00	11.71	48.70	6,155.04	2,229.76	2,023.00	-1,357.35	0.68	0.60	1.62	
7,034.00	9.41	48.26	6,249.41	2,241.42	2,036.17	-1,366.96	2.40	-2.40	-0.46	
7,129.00	7.25	47.20	6,343.40	2,250.66	2,046.37	-1,374.33	2.28	-2.27	-1.12	
7,225.00	5.21	44.47	6,438.83	2,257.89	2,053.87	-1,379.64	2.15	-2.13	-2.84	
7,320.00	3.84	39.71	6,533.53	2,263.41	2,058.92	-1,383.04	1.49	-1.44	-5.01	
7,416.00	1.68	336.24	6,629.43	2,267.18	2,060.41	-1,383.47	3.58	-2.25	-66.11	
7,512.00	1.19	321.78	6,725.40	2,269.25	2,059.22	-1,381.78	0.63	-0.51	-15.06	
7,608.00	0.97	301.56	6,821.39	2,270.45	2,057.91	-1,380.20	0.45	-0.23	-21.06	
7,703.00	0.66	266.30	6,916.38	2,270.84	2,056.68	-1,378.91	0.61	-0.33	-37.12	
7,799.00	9.90	264.36	7,011.87	2,269.99	2,047.90	-1,370.67	9.63	9.63	-2.02	
7,894.00	17.72	278.20	7,104.07	2,271.25	2,025.42	-1,348.66	8.88	8.23	14.57	
7,990.00	26.16	271.19	7,193.05	2,273.78	1,989.73	-1,313.59	9.19	8.79	-7.30	
8,085.00	34.56	271.86	7,274.95	2,275.09	1,941.78	-1,267.01	8.85	8.84	0.71	
8,180.00	44.06	270.31	7,348.38	2,276.15	1,881.68	-1,208.79	10.05	10.00	-1.63	
8,276.00	47.64	268.46	7,415.23	2,275.38	1,812.82	-1,142.61	3.98	3.73	-1.93	
8,371.00	54.44	270.14	7,474.94	2,274.53	1,739.00	-1,071.68	7.29	7.16	1.77	
8,467.00	65.58	269.43	7,522.85	2,274.19	1,655.99	-991.74	11.62	11.60	-0.74	
8,562.00	77.55	269.34	7,552.83	2,273.22	1,566.03	-905.28	12.60	12.60	-0.09	
8,647.49	89.01	270.74	7,562.82	2,273.29	1,481.27	-823.56	13.50	13.40	1.63	
LP Duck Club 12W-20-1C										
8,657.00	90.28	270.89	7,562.88	2,273.42	1,471.76	-814.35	13.50	13.40	1.61	
8,753.00	91.21	271.63	7,561.64	2,275.53	1,375.79	-721.28	1.24	0.97	0.77	

Survey Report

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8,848.00	91.47	271.59	7,559.41	2,278.20	1,280.86	-629.05	0.28	0.27	-0.04
8,944.00	91.74	271.15	7,556.73	2,280.50	1,184.92	-535.96	0.54	0.28	-0.46
9,039.00	89.75	270.05	7,555.49	2,281.49	1,089.94	-444.13	2.39	-2.09	-1.16
9,134.00	89.13	269.61	7,556.42	2,281.21	994.95	-352.63	0.80	-0.65	-0.46
9,230.00	90.54	269.78	7,556.70	2,280.70	898.95	-260.23	1.48	1.47	0.18
9,325.00	90.68	269.78	7,555.68	2,280.33	803.96	-168.75	0.15	0.15	0.00
9,420.00	89.79	269.78	7,555.29	2,279.97	708.96	-77.27	0.94	-0.94	0.00
9,516.00	89.97	271.02	7,555.50	2,280.64	612.97	15.45	1.31	0.19	1.29
9,612.00	90.19	271.55	7,555.36	2,282.79	516.99	108.55	0.60	0.23	0.55
9,707.00	88.69	269.43	7,556.29	2,283.60	422.01	200.33	2.73	-1.58	-2.23
9,802.00	88.69	268.99	7,558.46	2,282.29	327.04	291.53	0.46	0.00	-0.46
9,898.00	89.04	268.51	7,560.36	2,280.20	231.08	383.47	0.62	0.36	-0.50
9,994.00	87.63	269.56	7,563.15	2,278.58	135.14	475.53	1.83	-1.47	1.09
10,089.00	87.14	268.55	7,567.49	2,277.02	40.25	566.59	1.18	-0.52	-1.06
10,185.00	88.42	269.39	7,571.21	2,275.29	-55.66	658.59	1.59	1.33	0.88
10,280.00	89.31	269.17	7,573.09	2,274.10	-150.63	749.83	0.97	0.94	-0.23
10,376.00	90.54	269.78	7,573.21	2,273.22	-246.62	842.13	1.43	1.28	0.64
10,472.00	90.19	269.03	7,572.60	2,272.22	-342.61	934.40	0.86	-0.36	-0.78
10,567.00	90.46	269.17	7,572.06	2,270.73	-437.60	1,025.57	0.32	0.28	0.15
10,662.00	90.50	268.90	7,571.27	2,269.13	-532.58	1,116.71	0.29	0.04	-0.28
10,757.00	90.72	268.07	7,570.26	2,266.62	-627.54	1,207.59	0.90	0.23	-0.87
10,853.00	89.26	267.93	7,570.27	2,263.27	-723.48	1,299.18	1.53	-1.52	-0.15
10,948.00	88.78	267.58	7,571.90	2,259.55	-818.40	1,389.69	0.63	-0.51	-0.37
11,044.00	88.03	269.26	7,574.57	2,256.90	-914.32	1,481.46	1.92	-0.78	1.75
11,139.00	90.68	270.31	7,575.64	2,256.55	-1,009.30	1,572.93	3.00	2.79	1.11
11,235.00	91.16	270.14	7,574.10	2,256.92	-1,105.29	1,665.56	0.53	0.50	-0.18
11,331.00	91.56	269.17	7,571.82	2,256.35	-1,201.26	1,757.92	1.09	0.42	-1.01
11,426.00	89.66	269.43	7,570.81	2,255.19	-1,296.24	1,849.18	2.02	-2.00	0.27
11,521.00	90.15	269.26	7,570.96	2,254.10	-1,391.23	1,940.46	0.55	0.52	-0.18
11,616.00	89.97	268.46	7,570.87	2,252.21	-1,486.21	2,031.52	0.86	-0.19	-0.84
11,712.00	91.60	268.95	7,569.55	2,250.04	-1,582.18	2,123.45	1.77	1.70	0.51
11,808.00	90.01	269.70	7,568.20	2,248.91	-1,678.16	2,215.68	1.83	-1.66	0.78
11,903.00	89.57	269.74	7,568.55	2,248.45	-1,773.16	2,307.14	0.47	-0.46	0.04
11,999.00	89.44	268.59	7,569.38	2,247.05	-1,869.14	2,399.29	1.21	-0.14	-1.20
12,094.00	89.17	267.27	7,570.53	2,243.62	-1,964.07	2,489.89	1.42	-0.28	-1.39
12,190.00	89.22	269.08	7,571.88	2,240.56	-2,060.01	2,581.57	1.89	0.05	1.89
12,285.00	89.35	273.04	7,573.07	2,242.32	-2,154.96	2,673.57	4.17	0.14	4.17
12,381.00	88.73	271.68	7,574.67	2,246.27	-2,250.87	2,767.07	1.56	-0.65	-1.42
12,476.00	89.13	271.33	7,576.45	2,248.76	-2,345.82	2,859.27	0.56	0.42	-0.37
12,572.00	89.35	270.53	7,577.72	2,250.32	-2,441.79	2,952.21	0.86	0.23	-0.83
12,667.00	89.66	270.67	7,578.54	2,251.32	-2,536.79	3,044.04	0.36	0.33	0.15
12,762.00	89.35	269.74	7,579.36	2,251.66	-2,631.78	3,135.71	1.03	-0.33	-0.98
12,858.00	89.31	269.78	7,580.49	2,251.25	-2,727.77	3,228.14	0.06	-0.04	0.04

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-1C
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-1C	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)
12,954.00	89.26	269.26	7,581.68	2,250.45	-2,823.76	3,320.46	0.54	-0.05	-0.54
13,050.00	89.17	268.55	7,583.00	2,248.62	-2,919.74	3,412.49	0.75	-0.09	-0.74
13,145.00	89.70	267.40	7,583.94	2,245.26	-3,014.67	3,503.12	1.33	0.56	-1.21
13,241.00	89.04	270.05	7,584.99	2,243.12	-3,110.63	3,595.06	2.84	-0.69	2.76
13,336.00	90.01	271.02	7,585.78	2,244.01	-3,205.62	3,686.86	1.44	1.02	1.02
13,431.00	90.01	269.96	7,585.76	2,244.82	-3,300.62	3,778.66	1.12	0.00	-1.12
13,527.00	89.44	269.08	7,586.22	2,244.02	-3,396.61	3,870.98	1.09	-0.59	-0.92
13,622.00	90.10	270.89	7,586.61	2,243.99	-3,491.60	3,962.55	2.03	0.69	1.91
13,718.00	90.10	271.41	7,586.44	2,245.92	-3,587.59	4,055.59	0.54	0.00	0.54
13,813.00	89.09	270.75	7,587.11	2,247.71	-3,682.56	4,147.63	1.27	-1.06	-0.69
13,909.00	89.13	269.92	7,588.60	2,248.27	-3,778.55	4,240.31	0.87	0.04	-0.86
14,004.00	88.86	269.21	7,590.27	2,247.55	-3,873.53	4,331.68	0.80	-0.28	-0.75
14,100.00	89.88	268.15	7,591.32	2,245.34	-3,969.50	4,423.60	1.53	1.06	-1.10
14,195.00	90.50	267.93	7,591.01	2,242.09	-4,064.44	4,514.26	0.69	0.65	-0.23
14,290.00	90.23	266.88	7,590.40	2,237.79	-4,159.34	4,604.60	1.14	-0.28	-1.11
14,386.00	89.17	270.31	7,590.90	2,235.44	-4,255.29	4,696.48	3.74	-1.10	3.57
14,482.00	89.22	272.12	7,592.25	2,237.47	-4,351.26	4,789.53	1.89	0.05	1.89
14,578.00	90.59	271.55	7,592.41	2,240.54	-4,447.21	4,882.84	1.55	1.43	-0.59
14,673.00	90.19	270.67	7,591.77	2,242.39	-4,542.19	4,974.89	1.02	-0.42	-0.93
14,769.00	89.84	269.34	7,591.74	2,242.39	-4,638.18	5,067.44	1.43	-0.36	-1.39
14,864.00	88.95	268.64	7,592.74	2,240.72	-4,733.16	5,158.55	1.19	-0.94	-0.74
14,959.00	88.29	271.11	7,595.03	2,240.51	-4,828.13	5,250.04	2.69	-0.69	2.60
15,054.00	88.16	272.12	7,597.97	2,243.19	-4,923.04	5,342.25	1.07	-0.14	1.06
15,149.00	90.01	272.74	7,599.49	2,247.22	-5,017.94	5,434.81	2.05	1.95	0.65
15,245.00	90.37	272.03	7,599.17	2,251.21	-5,113.86	5,528.33	0.83	0.38	-0.74
15,340.00	91.07	271.99	7,597.98	2,254.54	-5,208.79	5,620.74	0.74	0.74	-0.04
15,435.00	88.82	271.41	7,598.07	2,257.36	-5,303.74	5,713.02	2.45	-2.37	-0.61
15,530.00	89.00	271.41	7,599.88	2,259.70	-5,398.70	5,805.18	0.19	0.19	0.00
15,626.00	90.10	271.11	7,600.63	2,261.81	-5,494.67	5,898.26	1.19	1.15	-0.31
15,722.00	90.06	270.05	7,600.50	2,262.78	-5,590.66	5,991.05	1.10	-0.04	-1.10
15,817.00	90.06	269.34	7,600.40	2,262.27	-5,685.66	6,082.50	0.75	0.00	-0.75
15,912.00	89.84	269.39	7,600.48	2,261.22	-5,780.65	6,173.79	0.24	-0.23	0.05
16,008.00	89.88	268.95	7,600.72	2,259.83	-5,876.64	6,265.96	0.46	0.04	-0.46
16,103.00	89.53	268.07	7,601.21	2,257.36	-5,971.61	6,356.85	1.00	-0.37	-0.93
16,199.00	88.64	266.61	7,602.74	2,252.91	-6,067.49	6,448.09	1.78	-0.93	-1.52
16,294.00	89.26	269.74	7,604.48	2,249.88	-6,162.41	6,538.80	3.36	0.65	3.29
16,390.00	90.06	270.58	7,605.05	2,250.15	-6,258.41	6,631.41	1.21	0.83	0.88
16,485.00	90.01	270.18	7,604.99	2,250.78	-6,353.41	6,723.16	0.42	-0.05	-0.42
16,580.00	89.04	270.40	7,605.78	2,251.26	-6,448.40	6,814.86	1.05	-1.02	0.23
16,676.00	88.51	269.08	7,607.83	2,250.83	-6,544.38	6,907.26	1.48	-0.55	-1.38
16,771.00	88.56	268.77	7,610.26	2,249.04	-6,639.33	6,998.32	0.33	0.05	-0.33
16,867.00	88.78	268.29	7,612.49	2,246.58	-6,735.27	7,090.16	0.55	0.23	-0.50
16,962.00	86.92	269.08	7,616.05	2,244.40	-6,830.17	7,181.07	2.13	-1.96	0.83
17,057.00	87.10	270.27	7,621.01	2,243.86	-6,925.04	7,272.38	1.27	0.19	1.25

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-1C
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-1C	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)
17,153.00	89.48	270.93	7,623.87	2,244.87	-7,020.98	7,365.14	2.57	2.48	0.69
17,248.00	90.10	270.53	7,624.22	2,246.08	-7,115.98	7,457.03	0.78	0.65	-0.42
17,344.00	90.15	269.83	7,624.01	2,246.38	-7,211.97	7,549.65	0.73	0.05	-0.73
17,439.00	90.32	269.74	7,623.62	2,246.03	-7,306.97	7,641.14	0.20	0.18	-0.09
17,534.00	90.90	269.17	7,622.61	2,245.12	-7,401.96	7,732.47	0.86	0.61	-0.60
17,630.00	89.48	269.34	7,622.29	2,243.87	-7,497.95	7,824.67	1.49	-1.48	0.18
17,726.00	89.31	268.55	7,623.31	2,242.11	-7,593.93	7,916.72	0.84	-0.18	-0.82
17,821.00	87.98	268.24	7,625.55	2,239.45	-7,688.86	8,007.53	1.44	-1.40	-0.33
17,916.00	87.27	267.45	7,629.49	2,235.88	-7,783.71	8,098.02	1.12	-0.75	-0.83
18,012.00	88.82	270.27	7,632.76	2,233.97	-7,879.63	8,189.97	3.35	1.61	2.94
18,107.00	90.06	270.53	7,633.69	2,234.63	-7,974.62	8,281.72	1.33	1.31	0.27
18,188.00	90.32	271.15	7,633.42	2,235.82	-8,055.61	8,360.11	0.83	0.32	0.77
Last MWD Survey @ 18188' MD									
18,247.00	90.32	271.15	7,633.09	2,237.00	-8,114.59	8,417.29	0.00	0.00	0.00
Projection to TD @ 18247' MD 472.5' FSL/ 2141.6' FEL - PBHL Duck Club 12W-20-1C									

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 @ 8033.4 - actual wellpath misses target center by 0.01usft at 8033.42usft MD (7231.36 TVD, 2274.27 N, 1969.30 E) - Point	0.00	0.00	7,231.36	2,274.26	1,969.30	1,238,586.87	3,217,469.44	39.98569	-104.72390
70° Inclination @ 8502.0 - actual wellpath misses target center by 0.02usft at 8502.06usft MD (7536.10 TVD, 2273.85 N, 1623.54 E) - Point	0.00	0.00	7,536.10	2,273.85	1,623.52	1,238,583.46	3,217,123.68	39.98569	-104.72514
Cross @ 10827.50' MD - actual wellpath hits target center - Point	0.00	0.00	7,570.03	2,264.18	-698.00	1,238,553.65	3,214,802.33	39.98567	-104.73342
Cross @ 16105.39' MD - actual wellpath hits target center - Point	0.00	0.00	7,601.23	2,257.28	-5,974.00	1,238,500.99	3,209,526.59	39.98565	-104.75225

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
129.00	129.00	0.06	0.93	First Surface Survey	
1,611.00	1,544.95	281.03	260.96	Last Surface Survey	
1,758.00	1,674.09	335.15	305.68	First Atlas MWD Survey @ 1758' MD	
18,188.00	7,633.42	2,235.82	-8,055.61	Last MWD Survey @ 18188' MD	
18,247.00	7,633.09	2,237.00	-8,114.59	Projection to TD @ 18247' MD 472.5' FSL/ 2141.6' FEL	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-1C
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-1C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Checked By: _____ Approved By: _____ Date: _____