

Extraction Oil & Gas

Adams County (NAD 83)

Sec 12-T01S-R66W

Duck Club 12W-20-9N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

14 November, 2018



Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-9N
Project:	Adams County (NAD 83)	TVD Reference:	KB=29 @ 5066.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=29 @ 5066.00usft (Patt 901)
Well:	Duck Club 12W-20-9N	North Reference:	Grid
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-20-9N				
Well Position	+N/-S	0.00 usft	Northing:	1,236,073.33 usft	Latitude:	39.97884
	+E/-W	0.00 usft	Easting:	3,215,513.46 usft	Longitude:	-104.73096
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	11/5/2018	8.20	66.32	51,946

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	264.16	

Survey Program	Date	11/14/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,630.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,758.00	17,598.00	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	0.53	245.32	129.00	-0.25	-0.54	0.56	0.41	0.41	0.00	
First Surface Survey										
225.00	0.53	260.70	224.99	-0.51	-1.38	1.43	0.15	0.00	16.02	
320.00	0.57	252.61	319.99	-0.72	-2.27	2.33	0.09	0.04	-8.52	
415.00	0.18	266.32	414.99	-0.87	-2.87	2.94	0.42	-0.41	14.43	
510.00	1.01	67.34	509.98	-0.56	-2.24	2.29	1.24	0.87	169.49	
604.00	1.54	85.44	603.96	-0.14	-0.22	0.23	0.70	0.56	19.26	
699.00	2.29	109.08	698.91	-0.66	2.85	-2.76	1.13	0.79	24.88	
795.00	3.34	109.08	794.79	-2.20	7.30	-7.04	1.09	1.09	0.00	

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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	5.98	102.41	889.47	-4.17	14.75	-14.25	2.83	2.78	-7.02
985.00	8.53	105.04	983.70	-7.06	26.39	-25.54	2.71	2.68	2.77
1,080.00	10.02	110.32	1,077.46	-11.76	40.95	-39.54	1.80	1.57	5.56
1,175.00	11.29	109.35	1,170.82	-17.71	57.47	-55.37	1.35	1.34	-1.02
1,270.00	12.66	110.23	1,263.75	-24.39	76.01	-73.14	1.45	1.44	0.93
1,364.00	14.11	109.44	1,355.19	-31.76	96.48	-92.75	1.55	1.54	-0.84
1,459.00	16.74	107.33	1,446.76	-39.70	120.47	-115.81	2.83	2.77	-2.22
1,555.00	18.15	106.27	1,538.35	-48.00	148.02	-142.37	1.51	1.47	-1.10
1,630.00	20.65	107.59	1,609.08	-55.27	171.85	-165.33	3.38	3.33	1.76
Last Surface Survey									
1,758.00	20.68	107.44	1,728.85	-68.87	214.92	-206.80	0.05	0.02	-0.12
First MWD Survey									
1,854.00	24.83	110.97	1,817.36	-81.17	249.93	-240.38	4.55	4.32	3.68
1,950.00	25.01	109.69	1,904.42	-95.22	287.86	-276.68	0.59	0.19	-1.33
2,046.00	24.83	108.94	1,991.48	-108.60	326.03	-313.30	0.38	-0.19	-0.78
2,141.00	24.44	107.44	2,077.84	-120.96	363.65	-349.46	0.78	-0.41	-1.58
2,237.00	24.22	107.26	2,165.31	-132.76	401.40	-385.82	0.24	-0.23	-0.19
2,333.00	23.55	106.16	2,253.09	-143.94	438.63	-421.71	0.84	-0.70	-1.15
2,429.00	22.09	105.19	2,341.57	-154.01	474.47	-456.35	1.57	-1.52	-1.01
2,524.00	23.69	106.07	2,429.09	-163.97	510.05	-490.73	1.72	1.68	0.93
2,619.00	22.01	105.50	2,516.63	-174.01	545.55	-525.02	1.78	-1.77	-0.60
2,715.00	21.56	108.10	2,605.78	-184.30	579.65	-557.90	1.11	-0.47	2.71
2,810.00	22.23	113.48	2,693.94	-196.88	612.73	-589.52	2.23	0.71	5.66
2,906.00	26.03	112.20	2,781.53	-212.08	648.90	-623.96	4.00	3.96	-1.33
3,001.00	25.41	111.58	2,867.12	-227.46	687.15	-660.46	0.71	-0.65	-0.65
3,097.00	23.69	111.67	2,954.44	-242.15	724.23	-695.85	1.79	-1.79	0.09
3,192.00	24.26	111.49	3,041.24	-256.35	760.13	-730.11	0.60	0.60	-0.19
3,288.00	22.36	112.02	3,129.40	-270.42	795.41	-763.78	1.99	-1.98	0.55
3,383.00	24.61	106.07	3,216.54	-282.68	831.18	-798.12	3.44	2.37	-6.26
3,479.00	22.58	105.19	3,304.51	-293.04	868.18	-833.87	2.15	-2.11	-0.92
3,574.00	22.67	108.10	3,392.20	-303.51	903.18	-867.63	1.18	0.09	3.06
3,669.00	24.13	106.69	3,479.38	-314.77	939.19	-902.30	1.65	1.54	-1.48
3,765.00	24.39	107.35	3,566.91	-326.32	976.90	-938.65	0.39	0.27	0.69
3,860.00	22.23	104.97	3,654.15	-336.81	1,012.99	-973.48	2.48	-2.27	-2.51
3,956.00	23.82	108.59	3,742.50	-347.69	1,048.91	-1,008.11	2.22	1.66	3.77
4,051.00	24.83	114.89	3,829.08	-362.20	1,085.20	-1,042.73	2.93	1.06	6.63
4,146.00	22.09	111.36	3,916.23	-377.10	1,119.93	-1,075.77	3.24	-2.88	-3.72
4,242.00	22.63	108.98	4,005.01	-389.69	1,154.21	-1,108.59	1.10	0.56	-2.48
4,337.00	23.46	107.09	4,092.43	-401.19	1,189.57	-1,142.60	1.17	0.87	-1.99
4,432.00	24.70	103.69	4,179.16	-411.44	1,226.93	-1,178.73	1.96	1.31	-3.58
4,528.00	24.39	104.62	4,266.49	-421.19	1,265.60	-1,216.20	0.52	-0.32	0.97
4,623.00	26.47	107.40	4,352.28	-432.48	1,304.79	-1,254.04	2.52	2.19	2.93
4,719.00	22.85	105.54	4,439.52	-443.87	1,343.18	-1,291.07	3.86	-3.77	-1.94

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Survey										
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4,814.00	25.72	104.40	4,526.10	-453.94	1,380.92	-1,327.59	3.06	3.02	-1.20	
4,910.00	23.86	105.94	4,613.25	-464.46	1,419.77	-1,365.17	2.05	-1.94	1.60	
5,005.00	23.82	108.85	4,700.15	-475.93	1,456.40	-1,400.45	1.24	-0.04	3.06	
5,100.00	25.67	114.80	4,786.44	-490.76	1,493.25	-1,435.59	3.26	1.95	6.26	
5,196.00	24.92	116.21	4,873.23	-508.42	1,530.27	-1,470.62	1.00	-0.78	1.47	
5,292.00	25.14	111.49	4,960.22	-524.82	1,567.39	-1,505.89	2.09	0.23	-4.92	
5,387.00	22.80	109.91	5,047.03	-538.49	1,603.48	-1,540.40	2.55	-2.46	-1.66	
5,482.00	23.46	112.68	5,134.39	-552.05	1,638.24	-1,573.59	1.34	0.69	2.92	
5,578.00	22.89	113.52	5,222.65	-566.87	1,672.99	-1,606.66	0.69	-0.59	0.88	
5,674.00	23.91	108.41	5,310.76	-580.46	1,708.57	-1,640.67	2.37	1.06	-5.32	
5,769.00	26.51	104.09	5,396.71	-591.71	1,747.41	-1,678.17	3.35	2.74	-4.55	
5,865.00	23.20	99.20	5,483.81	-599.95	1,786.87	-1,716.59	4.06	-3.45	-5.09	
5,984.00	25.50	101.05	5,592.22	-608.61	1,835.16	-1,763.74	2.04	1.93	1.55	
6,079.00	23.20	96.42	5,678.77	-614.62	1,873.83	-1,801.60	3.14	-2.42	-4.87	
6,175.00	19.53	88.36	5,768.18	-616.28	1,908.68	-1,836.10	4.89	-3.82	-8.40	
6,271.00	19.97	102.24	5,858.58	-619.29	1,940.76	-1,867.71	4.90	0.46	14.46	
6,366.00	19.31	113.39	5,948.09	-628.97	1,971.04	-1,896.85	4.00	-0.69	11.74	
6,461.00	16.57	113.04	6,038.46	-640.51	1,997.93	-1,922.42	2.89	-2.88	-0.37	
6,557.00	13.74	112.11	6,131.11	-650.16	2,021.09	-1,944.49	2.96	-2.95	-0.97	
6,652.00	11.14	110.70	6,223.87	-657.66	2,040.13	-1,962.67	2.76	-2.74	-1.48	
6,748.00	9.06	110.66	6,318.38	-663.60	2,055.88	-1,977.73	2.17	-2.17	-0.04	
6,843.00	5.44	107.92	6,412.61	-667.63	2,067.17	-1,988.55	3.83	-3.81	-2.88	
6,938.00	2.74	138.64	6,507.37	-670.72	2,072.96	-1,993.99	3.56	-2.84	32.34	
7,034.00	1.64	211.92	6,603.31	-673.61	2,073.75	-1,994.48	2.87	-1.15	76.33	
7,129.00	7.16	260.09	6,698.01	-675.78	2,067.19	-1,987.74	6.51	5.81	50.71	
7,225.00	19.31	273.09	6,791.30	-675.96	2,045.36	-1,966.01	12.95	12.66	13.54	
7,321.00	25.32	270.09	6,880.08	-675.07	2,008.95	-1,929.87	6.37	6.26	-3.13	
7,377.17	30.00	269.78	6,929.81	-675.10	1,982.88	-1,903.94	8.34	8.33	-0.55	
30° @ 7377.16' MD										
7,417.00	33.32	269.61	6,963.71	-675.21	1,961.98	-1,883.13	8.34	8.33	-0.43	
7,512.00	39.06	268.68	7,040.35	-676.08	1,905.91	-1,827.27	6.07	6.04	-0.98	
7,608.00	43.00	267.54	7,112.76	-678.19	1,842.95	-1,764.41	4.18	4.10	-1.19	
7,704.00	49.58	265.77	7,179.06	-682.29	1,773.72	-1,695.13	6.98	6.85	-1.84	
7,799.00	55.33	266.88	7,236.93	-687.09	1,698.58	-1,619.89	6.12	6.05	1.17	
7,895.00	62.35	267.32	7,286.57	-691.23	1,616.59	-1,537.90	7.32	7.31	0.46	
7,951.93	70.00	268.84	7,309.55	-692.95	1,564.58	-1,485.99	13.66	13.43	2.68	
70° @ 7951.91' MD										
7,990.00	75.12	269.78	7,320.96	-693.38	1,528.27	-1,449.83	13.66	13.45	2.46	
8,034.79	76.75	270.41	7,331.85	-693.31	1,484.82	-1,406.61	3.88	3.63	1.40	
LP Duck Club 12W-20-9N										
8,086.00	78.61	271.11	7,342.77	-692.65	1,434.80	-1,356.92	3.88	3.64	1.38	
8,180.00	90.06	270.53	7,352.04	-691.32	1,341.43	-1,264.16	12.20	12.18	-0.62	
8,276.00	90.23	270.40	7,351.79	-690.54	1,245.43	-1,168.74	0.22	0.18	-0.14	
8,371.00	90.59	270.36	7,351.11	-689.91	1,150.44	-1,074.30	0.38	0.38	-0.04	

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8,467.00	91.07	270.89	7,349.72	-688.86	1,054.45	-978.92	0.74	0.50	0.55
8,562.00	90.23	270.14	7,348.64	-688.01	959.47	-884.52	1.19	-0.88	-0.79
8,658.00	90.81	270.36	7,347.77	-687.59	863.47	-789.06	0.65	0.60	0.23
8,753.00	89.88	270.84	7,347.20	-686.59	768.48	-694.66	1.10	-0.98	0.51
8,848.00	90.63	271.50	7,346.78	-684.65	673.50	-600.37	1.05	0.79	0.69
8,944.00	89.70	269.30	7,346.50	-683.98	577.51	-504.95	2.49	-0.97	-2.29
9,039.00	89.66	269.78	7,347.03	-684.75	482.52	-410.37	0.51	-0.04	0.51
9,135.00	89.22	269.70	7,347.97	-685.18	386.52	-314.83	0.47	-0.46	-0.08
9,230.00	88.86	270.00	7,349.56	-685.43	291.53	-220.31	0.49	-0.38	0.32
9,325.00	90.54	269.39	7,350.06	-685.94	196.54	-125.76	1.88	1.77	-0.64
9,421.00	90.46	269.52	7,349.22	-686.85	100.55	-30.17	0.16	-0.08	0.14
9,516.00	89.66	269.61	7,349.12	-687.57	5.55	64.41	0.85	-0.84	0.09
9,612.00	91.21	269.17	7,348.39	-688.59	-90.44	160.00	1.68	1.61	-0.46
9,707.00	91.03	269.26	7,346.54	-689.89	-185.41	254.61	0.21	-0.19	0.09
9,803.00	90.54	269.87	7,345.22	-690.62	-281.40	350.18	0.81	-0.51	0.64
9,898.00	90.28	269.92	7,344.54	-690.80	-376.39	444.70	0.28	-0.27	0.05
9,994.00	88.95	269.39	7,345.19	-691.37	-472.39	540.25	1.49	-1.39	-0.55
10,089.00	91.30	269.17	7,344.98	-692.57	-567.37	634.87	2.48	2.47	-0.23
10,185.00	91.21	268.46	7,342.88	-694.55	-663.33	730.53	0.75	-0.09	-0.74
10,196.18	91.12	268.48	7,342.65	-694.85	-674.50	741.68	0.80	-0.78	0.19
Cross @ 10196.18' MD									
10,281.00	90.46	268.64	7,341.48	-696.98	-759.29	826.24	0.80	-0.78	0.19
10,376.00	90.41	268.51	7,340.76	-699.34	-854.25	920.95	0.15	-0.05	-0.14
10,472.00	90.06	268.55	7,340.36	-701.81	-950.22	1,016.67	0.37	-0.36	0.04
10,567.00	89.40	267.36	7,340.81	-705.20	-1,045.16	1,111.46	1.43	-0.69	-1.25
10,662.00	89.53	265.86	7,341.70	-710.81	-1,139.99	1,206.37	1.58	0.14	-1.58
10,758.00	90.81	269.56	7,341.41	-714.65	-1,235.89	1,302.16	4.08	1.33	3.85
10,853.00	90.99	269.30	7,339.92	-715.59	-1,330.87	1,396.75	0.33	0.19	-0.27
10,949.00	90.06	270.22	7,339.04	-716.00	-1,426.87	1,492.29	1.36	-0.97	0.96
11,044.00	89.66	269.03	7,339.27	-716.62	-1,521.86	1,586.85	1.32	-0.42	-1.25
11,140.00	89.53	267.76	7,339.95	-719.31	-1,617.82	1,682.59	1.33	-0.14	-1.32
11,235.00	89.66	271.63	7,340.62	-719.81	-1,712.80	1,777.13	4.08	0.14	4.07
11,331.00	90.41	271.59	7,340.56	-717.12	-1,808.76	1,872.31	0.78	0.78	-0.04
11,426.00	90.19	270.14	7,340.07	-715.68	-1,903.74	1,966.66	1.54	-0.23	-1.53
11,521.00	90.46	269.48	7,339.53	-716.00	-1,998.74	2,061.20	0.75	0.28	-0.69
11,616.00	90.15	268.64	7,339.02	-717.56	-2,093.73	2,155.85	0.94	-0.33	-0.88
11,712.00	90.59	268.20	7,338.40	-720.20	-2,189.69	2,251.58	0.65	0.46	-0.46
11,808.00	89.66	267.27	7,338.19	-724.00	-2,285.61	2,347.39	1.37	-0.97	-0.97
11,904.00	89.79	266.96	7,338.65	-728.83	-2,381.49	2,443.26	0.35	0.14	-0.32
11,999.00	88.86	268.20	7,339.77	-732.84	-2,476.39	2,538.09	1.63	-0.98	1.31
12,094.00	88.95	267.71	7,341.59	-736.23	-2,571.32	2,632.86	0.52	0.09	-0.52
12,190.00	88.60	270.49	7,343.64	-737.74	-2,667.27	2,728.47	2.92	-0.36	2.90
12,285.00	88.95	270.14	7,345.67	-737.21	-2,762.25	2,822.90	0.52	0.37	-0.37
12,381.00	89.00	269.83	7,347.39	-737.24	-2,858.23	2,918.39	0.33	0.05	-0.32

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-9N
Project:	Adams County (NAD 83)	TVD Reference:	KB=29 @ 5066.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=29 @ 5066.00usft (Patt 901)
Well:	Duck Club 12W-20-9N	North Reference:	Grid
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)
12,477.00	89.93	269.34	7,348.29	-737.93	-2,954.22	3,013.96	1.09	0.97	-0.51
12,572.00	89.88	270.05	7,348.44	-738.44	-3,049.22	3,108.51	0.75	-0.05	0.75
12,668.00	88.56	269.30	7,349.75	-738.98	-3,145.21	3,204.06	1.58	-1.38	-0.78
12,763.00	88.51	268.95	7,352.18	-740.43	-3,240.17	3,298.67	0.37	-0.05	-0.37
12,858.00	88.47	268.33	7,354.68	-742.69	-3,335.11	3,393.35	0.65	-0.04	-0.65
12,954.00	88.07	268.11	7,357.58	-745.67	-3,431.02	3,489.06	0.48	-0.42	-0.23
13,050.00	90.28	269.74	7,358.96	-747.47	-3,526.98	3,584.71	2.86	2.30	1.70
13,146.00	90.10	268.55	7,358.65	-748.90	-3,622.97	3,680.35	1.25	-0.19	-1.24
13,241.00	90.37	268.24	7,358.26	-751.56	-3,717.93	3,775.09	0.43	0.28	-0.33
13,336.00	90.28	268.86	7,357.72	-753.97	-3,812.90	3,869.81	0.66	-0.09	0.65
13,431.00	90.46	268.51	7,357.10	-756.15	-3,907.87	3,964.51	0.41	0.19	-0.37
13,527.00	89.13	269.48	7,357.45	-757.83	-4,003.85	4,060.17	1.71	-1.39	1.01
13,622.00	88.86	268.81	7,359.11	-759.25	-4,098.83	4,154.79	0.76	-0.28	-0.71
13,718.00	88.29	268.68	7,361.50	-761.35	-4,194.77	4,250.45	0.61	-0.59	-0.14
13,814.00	88.86	269.39	7,363.89	-762.97	-4,290.73	4,346.08	0.95	0.59	0.74
13,909.00	87.45	269.08	7,366.95	-764.23	-4,385.67	4,440.65	1.52	-1.48	-0.33
14,005.00	89.57	269.87	7,369.44	-765.11	-4,481.63	4,536.20	2.36	2.21	0.82
14,100.00	89.57	269.43	7,370.16	-765.69	-4,576.62	4,630.76	0.46	0.00	-0.46
14,196.00	89.79	269.21	7,370.69	-766.83	-4,672.61	4,726.37	0.32	0.23	-0.23
14,291.00	89.17	268.11	7,371.55	-769.05	-4,767.58	4,821.08	1.33	-0.65	-1.16
14,386.00	90.81	269.48	7,371.57	-771.05	-4,862.55	4,915.76	2.25	1.73	1.44
14,482.00	91.43	269.74	7,369.69	-771.70	-4,958.53	5,011.31	0.70	0.65	0.27
14,578.00	91.56	269.30	7,367.19	-772.51	-5,054.50	5,106.85	0.48	0.14	-0.46
14,673.00	91.87	268.77	7,364.35	-774.11	-5,149.44	5,201.47	0.65	0.33	-0.56
14,769.00	89.79	269.61	7,362.96	-775.46	-5,245.41	5,297.08	2.34	-2.17	0.88
14,865.00	89.75	269.12	7,363.34	-776.53	-5,341.41	5,392.69	0.51	-0.04	-0.51
14,960.00	89.13	267.80	7,364.27	-779.08	-5,436.37	5,487.41	1.54	-0.65	-1.39
15,056.00	89.57	270.31	7,365.36	-780.66	-5,532.34	5,583.05	2.65	0.46	2.61
15,151.00	89.44	270.49	7,366.18	-780.00	-5,627.33	5,677.48	0.23	-0.14	0.19
15,247.00	89.17	270.22	7,367.34	-779.41	-5,723.32	5,772.92	0.40	-0.28	-0.28
15,342.00	89.48	269.96	7,368.46	-779.26	-5,818.32	5,867.40	0.43	0.33	-0.27
15,438.00	89.17	270.00	7,369.59	-779.29	-5,914.31	5,962.90	0.33	-0.32	0.04
15,470.16	89.16	269.99	7,370.06	-779.29	-5,946.47	5,994.89	0.06	-0.04	-0.04
Cross @ 15470.16' MD									
15,533.00	89.13	269.96	7,371.00	-779.32	-6,009.30	6,057.40	0.06	-0.04	-0.04
15,629.00	88.86	269.34	7,372.69	-779.91	-6,105.28	6,152.94	0.70	-0.28	-0.65
15,725.00	88.29	268.33	7,375.07	-781.86	-6,201.23	6,248.59	1.21	-0.59	-1.05
15,820.00	91.21	268.86	7,375.49	-784.19	-6,296.19	6,343.30	3.12	3.07	0.56
15,916.00	91.38	268.42	7,373.32	-786.47	-6,392.14	6,438.98	0.49	0.18	-0.46
16,012.00	91.12	267.54	7,371.22	-789.85	-6,488.06	6,534.74	0.96	-0.27	-0.92
16,107.00	91.34	266.96	7,369.19	-794.41	-6,582.92	6,629.58	0.65	0.23	-0.61
16,203.00	90.23	266.57	7,367.87	-799.82	-6,678.76	6,725.47	1.23	-1.16	-0.41
16,298.00	90.06	265.82	7,367.63	-806.13	-6,773.55	6,820.41	0.81	-0.18	-0.79

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-9N
Project:	Adams County (NAD 83)	TVD Reference:	KB=29 @ 5066.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=29 @ 5066.00usft (Patt 901)
Well:	Duck Club 12W-20-9N	North Reference:	Grid
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)	
16,394.00	90.72	265.60	7,366.98	-813.31	-6,869.28	6,916.38	0.72	0.69	-0.23	
16,489.00	89.09	268.77	7,367.13	-817.97	-6,964.15	7,011.23	3.75	-1.72	3.34	
16,585.00	88.73	268.02	7,368.96	-820.66	-7,060.09	7,106.95	0.87	-0.38	-0.78	
16,681.00	88.82	267.49	7,371.01	-824.42	-7,156.00	7,202.74	0.56	0.09	-0.55	
16,776.00	88.20	266.96	7,373.48	-829.02	-7,250.85	7,297.57	0.86	-0.65	-0.56	
16,872.00	87.63	266.83	7,376.98	-834.22	-7,346.65	7,393.40	0.61	-0.59	-0.14	
16,968.00	89.40	269.43	7,379.46	-837.35	-7,442.55	7,489.12	3.28	1.84	2.71	
17,063.00	89.13	268.81	7,380.68	-838.81	-7,537.53	7,583.76	0.71	-0.28	-0.65	
17,159.00	89.48	267.93	7,381.85	-841.54	-7,633.49	7,679.49	0.99	0.36	-0.92	
17,254.00	89.57	267.27	7,382.63	-845.51	-7,728.40	7,774.32	0.70	0.09	-0.69	
17,350.00	89.62	269.39	7,383.31	-848.31	-7,824.35	7,870.05	2.21	0.05	2.21	
17,445.00	90.06	268.64	7,383.58	-849.95	-7,919.33	7,964.71	0.92	0.46	-0.79	
17,538.00	90.15	268.95	7,383.41	-851.90	-8,012.31	8,057.41	0.35	0.10	0.33	
Last MWD Survey @ 17,538' MD										
17,598.00	90.15	268.95	7,383.25	-853.00	-8,072.30	8,117.20	0.00	0.00	0.00	
Projection to TD @ 17,598' MD 1,562' FSL & 2,127' FEL - PBHL Duck Club 12W-20-9N										

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° @ 7377.16' MD - actual wellpath misses target center by 0.01usft at 7377.16usft MD (6929.81 TVD, -675.10 N, 1982.89 E) - Point	0.00	359.50	6,929.81	-675.09	1,982.89	1,235,398.23	3,217,496.35	39.97694	-104.72391
70° @ 7951.91' MD - actual wellpath misses target center by 0.02usft at 7951.91usft MD (7309.55 TVD, -692.95 N, 1564.60 E) - Point	0.00	359.50	7,309.54	-692.97	1,564.60	1,235,380.35	3,217,078.06	39.97690	-104.72540
Cross @ 10196.18' MD - actual wellpath hits target center - Point	0.00	359.50	7,342.65	-694.85	-674.50	1,235,378.48	3,214,838.96	39.97695	-104.73339
Cross @ 15470.16' MD - actual wellpath hits target center - Point	0.00	359.52	7,370.06	-779.29	-5,946.47	1,235,294.03	3,209,567.00	39.97684	-104.75220

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
129.00	129.00	-0.25	-0.54	First Surface Survey	
1,630.00	1,609.08	-55.27	171.85	Last Surface Survey	
1,758.00	1,728.85	-68.87	214.92	First MWD Survey	
17,538.00	7,383.41	-851.90	-8,012.31	Last MWD Survey @ 17,538' MD	
17,598.00	7,383.25	-853.00	-8,072.30	Projection to TD @ 17,598' MD 1,562' FSL & 2,127' FEL	

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-9N
Project:	Adams County (NAD 83)	TVD Reference:	KB=29 @ 5066.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=29 @ 5066.00usft (Patt 901)
Well:	Duck Club 12W-20-9N	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Checked By: _____ Approved By: _____ Date: _____