

# **Extraction Oil & Gas**

**Adams County (NAD 83)**

**Sec 12-T01S-R66W**

**Duck Club 12W-20-8C**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**02 December, 2018**



# Survey Report



<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-8C
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-8C	<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 5000.1

<b>Project</b>	Adams County (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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-20-8C					
Well Position	+N/-S	0.00 usft	Northing:	1,236,098.83 usft	Latitude:	39.97891
	+E/-W	0.00 usft	Easting:	3,215,513.25 usft	Longitude:	-104.73096
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,037.00 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>
	HDGM	11/5/2018	8.20	66.32	51,946

<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	266.80	

<b>Survey Program</b>	<b>Date</b>	12/2/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
129.00	1,587.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,663.00	17,815.00	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	
129.00	0.44	89.05	129.00	0.01	0.50	-0.49	0.34	0.34	0.00	
225.00	0.75	106.45	224.99	-0.16	1.47	-1.45	0.37	0.32	18.13	
320.00	0.57	119.02	319.99	-0.57	2.48	-2.44	0.24	-0.19	13.23	
415.00	0.35	164.54	414.98	-1.08	2.97	-2.90	0.43	-0.23	47.92	
510.00	0.31	152.77	509.98	-1.59	3.16	-3.07	0.08	-0.04	-12.39	
604.00	0.79	190.56	603.98	-2.45	3.16	-3.02	0.61	0.51	40.20	
699.00	0.53	170.17	698.97	-3.53	3.11	-2.91	0.36	-0.27	-21.46	
795.00	0.40	3.79	794.97	-3.63	3.21	-3.00	0.96	-0.14	-173.31	
890.00	1.89	67.07	889.95	-2.69	4.68	-4.52	1.84	1.57	66.61	

# Survey Report



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<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-8C	<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 5000.1

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)
985.00	3.78	79.11	984.83	-1.49	9.20	-9.10	2.08	1.99	12.67
1,080.00	5.93	90.89	1,079.49	-0.97	17.18	-17.10	2.48	2.26	12.40
1,175.00	7.47	99.50	1,173.84	-2.07	28.18	-28.02	1.93	1.62	9.06
1,270.00	8.53	103.20	1,267.91	-4.69	41.13	-40.80	1.24	1.12	3.89
1,364.00	11.07	101.00	1,360.53	-8.01	56.78	-56.24	2.73	2.70	-2.34
1,459.00	13.84	100.12	1,453.29	-11.75	76.92	-76.14	2.92	2.92	-0.93
1,555.00	16.00	101.79	1,546.05	-16.47	101.18	-100.10	2.29	2.25	1.74
1,587.00	16.26	101.61	1,576.79	-18.27	109.88	-108.69	0.83	0.81	-0.56
Tie in to Surface Survey									
1,663.00	16.92	104.40	1,649.63	-23.16	131.02	-129.52	1.36	0.87	3.67
First MWD Survey @ 1663' MD									
1,758.00	19.93	105.81	1,739.75	-31.01	159.99	-158.01	3.20	3.17	1.48
1,854.00	22.45	102.90	1,829.25	-39.56	193.61	-191.10	2.84	2.63	-3.03
1,950.00	22.54	101.40	1,917.95	-47.29	229.51	-226.52	0.61	0.09	-1.56
2,046.00	22.40	100.08	2,006.66	-54.13	265.56	-262.13	0.55	-0.15	-1.38
2,142.00	22.05	99.68	2,095.53	-60.36	301.33	-297.50	0.40	-0.36	-0.42
2,237.00	21.87	99.99	2,183.63	-66.43	336.34	-332.11	0.23	-0.19	0.33
2,333.00	21.12	97.35	2,272.96	-71.75	371.10	-366.52	1.27	-0.78	-2.75
2,429.00	23.38	96.29	2,361.80	-76.05	407.19	-402.32	2.39	2.35	-1.10
2,524.00	22.80	96.07	2,449.19	-80.06	444.23	-439.08	0.62	-0.61	-0.23
2,619.00	21.65	95.32	2,537.13	-83.63	479.98	-474.57	1.25	-1.21	-0.79
2,715.00	22.27	96.38	2,626.17	-87.29	515.70	-510.03	0.77	0.65	1.10
2,810.00	20.64	96.60	2,714.58	-91.22	550.22	-544.28	1.72	-1.72	0.23
2,906.00	21.70	99.42	2,804.11	-96.07	584.54	-578.27	1.53	1.10	2.94
3,001.00	22.40	98.54	2,892.16	-101.63	619.76	-613.13	0.81	0.74	-0.93
3,097.00	23.77	98.63	2,980.47	-107.25	656.98	-649.98	1.43	1.43	0.09
3,192.00	21.83	97.70	3,068.04	-112.49	693.42	-686.07	2.08	-2.04	-0.98
3,288.00	22.89	98.23	3,156.82	-117.55	729.59	-721.90	1.12	1.10	0.55
3,384.00	23.73	99.64	3,244.99	-123.46	767.11	-759.03	1.05	0.88	1.47
3,479.00	21.65	98.32	3,332.63	-129.20	803.30	-794.85	2.25	-2.19	-1.39
3,574.00	22.76	101.27	3,420.58	-135.33	838.66	-829.81	1.66	1.17	3.11
3,669.00	24.39	99.29	3,507.65	-142.08	876.05	-866.76	1.91	1.72	-2.08
3,765.00	22.49	98.45	3,595.73	-147.98	913.77	-904.10	2.01	-1.98	-0.88
3,860.00	23.69	98.98	3,683.12	-153.63	950.60	-940.55	1.28	1.26	0.56
3,956.00	21.26	97.17	3,771.82	-158.82	986.92	-976.53	2.63	-2.53	-1.89
4,051.00	22.18	101.80	3,860.08	-164.63	1,021.57	-1,010.80	2.05	0.97	4.87
4,146.00	23.02	100.21	3,947.78	-171.59	1,057.40	-1,046.19	1.09	0.88	-1.67
4,242.00	20.72	100.52	4,036.87	-178.02	1,092.58	-1,080.95	2.40	-2.40	0.32
4,337.00	22.85	98.49	4,125.08	-183.81	1,127.35	-1,115.34	2.38	2.24	-2.14
4,432.00	24.26	98.01	4,212.16	-189.26	1,164.92	-1,152.55	1.50	1.48	-0.51
4,528.00	21.87	97.13	4,300.48	-194.22	1,202.20	-1,189.50	2.52	-2.49	-0.92
4,623.00	23.46	96.91	4,388.14	-198.70	1,238.53	-1,225.52	1.68	1.67	-0.23
4,719.00	21.56	96.42	4,476.83	-202.97	1,275.03	-1,261.73	1.99	-1.98	-0.51

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

Survey										
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4,814.00	24.88	99.77	4,564.12	-208.31	1,312.08	-1,298.43	3.76	3.49	3.53	
4,910.00	22.32	99.60	4,652.09	-214.78	1,349.96	-1,335.89	2.67	-2.67	-0.18	
5,005.00	22.32	95.54	4,739.97	-219.53	1,385.71	-1,371.31	1.62	0.00	-4.27	
5,100.00	25.23	101.53	4,826.92	-225.32	1,423.52	-1,408.74	3.98	3.06	6.31	
5,196.00	23.20	100.61	4,914.46	-232.89	1,462.15	-1,446.89	2.15	-2.11	-0.96	
5,292.00	24.22	98.93	5,002.36	-239.43	1,500.19	-1,484.51	1.27	1.06	-1.75	
5,387.00	22.32	97.97	5,089.63	-244.96	1,537.31	-1,521.26	2.04	-2.00	-1.01	
5,506.00	22.63	97.70	5,199.59	-251.16	1,582.38	-1,565.91	0.27	0.26	-0.23	
5,602.00	22.93	99.11	5,288.10	-256.60	1,619.15	-1,602.32	0.65	0.31	1.47	
5,697.00	23.99	99.20	5,375.25	-262.61	1,656.49	-1,639.27	1.12	1.12	0.09	
5,793.00	20.77	98.58	5,464.01	-268.27	1,692.59	-1,675.00	3.36	-3.35	-0.65	
5,889.00	24.48	96.69	5,552.60	-273.13	1,729.19	-1,711.27	3.94	3.86	-1.97	
5,984.00	23.38	97.70	5,639.44	-277.95	1,767.42	-1,749.17	1.24	-1.16	1.06	
6,080.00	23.02	95.54	5,727.68	-282.32	1,804.98	-1,786.43	0.96	-0.38	-2.25	
6,175.00	22.67	99.20	5,815.23	-287.04	1,841.54	-1,822.67	1.54	-0.37	3.85	
6,271.00	22.14	97.74	5,903.98	-292.43	1,877.73	-1,858.50	0.80	-0.55	-1.52	
6,366.00	18.38	97.97	5,993.09	-296.92	1,910.31	-1,890.78	3.96	-3.96	0.24	
6,461.00	18.56	94.31	6,083.20	-300.13	1,940.22	-1,920.47	1.23	0.19	-3.85	
6,557.00	15.20	93.16	6,175.05	-301.98	1,968.03	-1,948.13	3.52	-3.50	-1.20	
6,653.00	12.15	89.86	6,268.32	-302.64	1,990.71	-1,970.73	3.28	-3.18	-3.44	
6,748.00	10.12	86.24	6,361.53	-302.07	2,009.03	-1,989.07	2.26	-2.14	-3.81	
6,843.00	8.22	78.66	6,455.31	-300.19	2,024.02	-2,004.14	2.37	-2.00	-7.98	
6,939.00	6.81	103.43	6,550.51	-300.16	2,036.29	-2,016.39	3.64	-1.47	25.80	
7,034.00	5.17	98.27	6,644.99	-302.09	2,046.01	-2,025.98	1.82	-1.73	-5.43	
7,130.00	3.98	94.44	6,740.68	-302.97	2,053.61	-2,033.52	1.28	-1.24	-3.99	
7,225.00	0.57	169.97	6,835.60	-303.69	2,056.98	-2,036.85	4.08	-3.59	79.51	
7,321.00	1.06	208.93	6,931.59	-304.93	2,056.63	-2,036.43	0.74	0.51	40.58	
7,417.00	10.16	260.18	7,027.05	-307.16	2,047.84	-2,027.53	9.93	9.48	53.39	
7,513.00	21.34	268.77	7,119.31	-308.99	2,021.95	-2,001.57	11.87	11.65	8.95	
7,608.00	31.55	274.68	7,204.27	-307.32	1,979.78	-1,959.56	11.09	10.75	6.22	
7,704.00	33.76	272.87	7,285.09	-303.94	1,928.10	-1,908.15	2.52	2.30	-1.89	
7,799.00	40.70	270.75	7,360.69	-302.21	1,870.69	-1,850.93	7.43	7.31	-2.23	
7,895.00	50.20	270.75	7,427.96	-301.32	1,802.36	-1,782.75	9.90	9.90	0.00	
7,990.00	60.98	268.95	7,481.57	-301.60	1,724.10	-1,704.61	11.45	11.35	-1.89	
8,086.00	72.56	267.98	7,519.37	-303.99	1,636.07	-1,616.58	12.10	12.06	-1.01	
8,181.00	78.52	268.90	7,543.08	-306.48	1,544.16	-1,524.67	6.34	6.27	0.97	
8,242.36	84.00	268.59	7,552.40	-307.81	1,483.55	-1,464.08	8.95	8.94	-0.51	
LP Duck Club 12W-20-8C										
8,276.00	87.01	268.42	7,555.04	-308.69	1,450.03	-1,430.56	8.95	8.94	-0.50	
8,372.00	88.33	268.29	7,558.94	-311.44	1,354.15	-1,334.67	1.38	1.38	-0.14	
8,467.00	87.80	267.98	7,562.15	-314.53	1,259.25	-1,239.75	0.65	-0.56	-0.33	
8,563.00	89.53	268.90	7,564.38	-317.15	1,163.32	-1,143.82	2.04	1.80	0.96	
8,658.00	89.00	267.67	7,565.60	-319.99	1,068.37	-1,048.87	1.41	-0.56	-1.29	
8,753.00	88.42	266.48	7,567.74	-324.84	973.52	-953.89	1.39	-0.61	-1.25	

## Survey Report



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<b>Well:</b>	Duck Club 12W-20-8C	<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 5000.1

Survey										
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8,849.00	89.35	268.51	7,569.61	-329.03	877.64	-857.92	2.33	0.97	2.11	
8,944.00	89.09	267.58	7,570.90	-332.27	782.70	-762.96	1.02	-0.27	-0.98	
9,040.00	88.95	266.92	7,572.54	-336.88	686.83	-666.97	0.70	-0.15	-0.69	
9,135.00	89.40	269.43	7,573.91	-339.90	591.89	-572.02	2.68	0.47	2.64	
9,231.00	88.73	268.51	7,575.48	-341.63	495.92	-476.10	1.19	-0.70	-0.96	
9,326.00	89.62	268.46	7,576.85	-344.14	400.97	-381.15	0.94	0.94	-0.05	
9,421.00	89.66	268.33	7,577.44	-346.80	306.01	-286.19	0.14	0.04	-0.14	
9,517.00	89.62	268.02	7,578.05	-349.85	210.06	-190.22	0.33	-0.04	-0.32	
9,612.00	89.13	267.01	7,579.08	-353.97	115.15	-95.24	1.18	-0.52	-1.06	
9,708.00	90.19	269.96	7,579.65	-356.51	19.20	0.71	3.27	1.10	3.07	
9,803.00	90.81	269.74	7,578.82	-356.76	-75.80	95.57	0.69	0.65	-0.23	
9,899.00	88.82	269.39	7,579.13	-357.49	-171.79	191.45	2.10	-2.07	-0.36	
9,994.00	89.31	269.26	7,580.68	-358.61	-266.77	286.35	0.53	0.52	-0.14	
10,090.00	88.20	269.34	7,582.77	-359.78	-362.74	382.23	1.16	-1.16	0.08	
10,185.00	88.25	268.55	7,585.71	-361.53	-457.67	477.12	0.83	0.05	-0.83	
10,281.00	88.91	267.98	7,588.09	-364.43	-553.60	573.06	0.91	0.69	-0.59	
10,377.00	88.69	267.05	7,590.10	-368.60	-649.49	669.03	1.00	-0.23	-0.97	
10,472.00	89.17	266.43	7,591.88	-374.00	-744.32	764.01	0.83	0.51	-0.65	
10,567.00	89.70	270.40	7,592.81	-376.62	-839.26	858.95	4.22	0.56	4.18	
10,663.00	90.46	270.49	7,592.68	-375.88	-935.25	954.76	0.80	0.79	0.09	
10,758.00	90.72	269.70	7,591.70	-375.72	-1,030.25	1,049.59	0.88	0.27	-0.83	
10,854.00	90.46	269.12	7,590.71	-376.71	-1,126.24	1,145.49	0.66	-0.27	-0.60	
10,949.00	89.48	269.34	7,590.76	-377.99	-1,221.23	1,240.40	1.06	-1.03	0.23	
11,045.00	89.44	268.55	7,591.67	-379.75	-1,317.20	1,336.33	0.82	-0.04	-0.82	
11,140.00	89.53	267.85	7,592.52	-382.74	-1,412.15	1,431.30	0.74	0.09	-0.74	
11,236.00	89.40	266.83	7,593.42	-387.19	-1,508.04	1,527.29	1.07	-0.14	-1.06	
11,331.00	88.73	266.08	7,594.97	-393.07	-1,602.85	1,622.27	1.06	-0.71	-0.79	
11,427.00	89.75	268.73	7,596.24	-397.41	-1,698.73	1,718.25	2.96	1.06	2.76	
11,521.00	89.48	272.12	7,596.87	-396.71	-1,792.71	1,812.04	3.62	-0.29	3.61	
11,617.00	89.93	271.86	7,597.37	-393.38	-1,888.65	1,907.65	0.54	0.47	-0.27	
11,713.00	89.75	271.11	7,597.64	-390.89	-1,984.62	2,003.33	0.80	-0.19	-0.78	
11,808.00	91.34	271.90	7,596.73	-388.40	-2,079.58	2,098.00	1.87	1.67	0.83	
11,904.00	90.37	271.72	7,595.30	-385.37	-2,175.52	2,193.62	1.03	-1.01	-0.19	
12,000.00	90.94	271.77	7,594.20	-382.44	-2,271.47	2,289.26	0.60	0.59	0.05	
12,095.00	88.64	270.75	7,594.55	-380.35	-2,366.44	2,383.96	2.65	-2.42	-1.07	
12,191.00	88.64	270.36	7,596.83	-379.42	-2,462.41	2,479.73	0.41	0.00	-0.41	
12,286.00	88.51	270.09	7,599.19	-379.05	-2,557.38	2,574.53	0.32	-0.14	-0.28	
12,381.00	88.29	269.74	7,601.84	-379.19	-2,652.34	2,669.36	0.44	-0.23	-0.37	
12,477.00	88.82	269.26	7,604.26	-380.03	-2,748.30	2,765.22	0.74	0.55	-0.50	
12,572.00	88.16	271.19	7,606.77	-379.66	-2,843.27	2,860.01	2.15	-0.69	2.03	
12,668.00	87.63	270.18	7,610.29	-378.51	-2,939.19	2,955.72	1.19	-0.55	-1.05	
12,763.00	88.03	270.00	7,613.89	-378.36	-3,034.12	3,050.50	0.46	0.42	-0.19	
12,859.00	89.04	269.83	7,616.35	-378.50	-3,130.09	3,146.33	1.07	1.05	-0.18	

# Survey Report



<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-8C
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-8C	<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 5000.1

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)
12,955.00	89.84	270.05	7,617.28	-378.60	-3,226.09	3,242.18	0.86	0.83	0.23
13,050.00	89.40	269.17	7,617.91	-379.25	-3,321.08	3,337.06	1.04	-0.46	-0.93
13,146.00	89.26	268.29	7,619.04	-381.38	-3,417.05	3,433.00	0.93	-0.15	-0.92
13,241.00	88.78	267.23	7,620.66	-385.09	-3,511.96	3,527.97	1.22	-0.51	-1.12
13,336.00	89.75	268.51	7,621.88	-388.62	-3,606.88	3,622.94	1.69	1.02	1.35
13,432.00	89.70	268.11	7,622.34	-391.45	-3,702.84	3,718.91	0.42	-0.05	-0.42
13,527.00	90.37	268.33	7,622.28	-394.40	-3,797.79	3,813.88	0.74	0.71	0.23
13,623.00	90.77	267.67	7,621.33	-397.75	-3,893.73	3,909.85	0.80	0.42	-0.69
13,718.00	89.79	267.01	7,620.86	-402.16	-3,988.63	4,004.84	1.24	-1.03	-0.69
13,814.00	90.32	268.90	7,620.77	-405.59	-4,084.56	4,100.82	2.04	0.55	1.97
13,910.00	90.68	268.90	7,619.93	-407.43	-4,180.54	4,196.75	0.38	0.38	0.00
14,005.00	91.30	267.85	7,618.29	-410.12	-4,275.48	4,291.70	1.28	0.65	-1.11
14,101.00	91.34	269.92	7,616.08	-411.99	-4,371.43	4,387.61	2.16	0.04	2.16
14,196.00	88.42	270.97	7,616.28	-411.25	-4,466.42	4,482.40	3.27	-3.07	1.11
14,291.00	88.64	271.11	7,618.72	-409.53	-4,561.37	4,577.11	0.27	0.23	0.15
14,387.00	87.80	269.92	7,621.70	-408.67	-4,657.32	4,672.86	1.52	-0.88	-1.24
14,483.00	89.93	270.45	7,623.60	-408.36	-4,753.30	4,768.67	2.29	2.22	0.55
14,578.00	90.23	270.49	7,623.47	-407.58	-4,848.29	4,863.48	0.32	0.32	0.04
14,674.00	90.19	270.18	7,623.12	-407.02	-4,944.29	4,959.29	0.33	-0.04	-0.32
14,769.00	88.78	268.64	7,623.97	-407.99	-5,039.28	5,054.18	2.20	-1.48	-1.62
14,865.00	88.82	268.02	7,625.98	-410.79	-5,135.21	5,150.13	0.65	0.04	-0.65
14,960.00	88.11	266.57	7,628.52	-415.27	-5,230.07	5,245.09	1.70	-0.75	-1.53
15,055.00	89.84	266.52	7,630.22	-421.00	-5,324.88	5,340.07	1.82	1.82	-0.05
15,150.00	89.62	265.77	7,630.67	-427.38	-5,419.66	5,435.06	0.82	-0.23	-0.79
15,245.00	89.04	266.61	7,631.78	-433.70	-5,514.44	5,530.05	1.07	-0.61	0.88
15,340.00	89.17	266.61	7,633.27	-439.31	-5,609.27	5,625.04	0.14	0.14	0.00
15,436.00	89.88	267.23	7,634.06	-444.47	-5,705.12	5,721.03	0.98	0.74	0.65
15,531.00	89.88	268.90	7,634.26	-447.68	-5,800.07	5,816.00	1.76	0.00	1.76
15,627.00	90.77	269.17	7,633.72	-449.29	-5,896.05	5,911.93	0.97	0.93	0.28
15,722.00	89.88	271.11	7,633.18	-449.06	-5,991.04	6,006.76	2.25	-0.94	2.04
15,817.00	89.31	269.87	7,633.85	-448.25	-6,086.03	6,101.56	1.44	-0.60	-1.31
15,913.00	89.17	268.37	7,635.12	-449.72	-6,182.01	6,197.47	1.57	-0.15	-1.56
16,008.00	91.03	270.00	7,634.96	-451.08	-6,276.99	6,292.38	2.60	1.96	1.72
16,104.00	91.03	270.62	7,633.23	-450.56	-6,372.98	6,388.18	0.65	0.00	0.65
16,200.00	91.12	269.96	7,631.43	-450.07	-6,468.96	6,483.99	0.69	0.09	-0.69
16,295.00	89.31	271.33	7,631.07	-449.00	-6,563.95	6,578.77	2.39	-1.91	1.44
16,390.00	91.30	271.63	7,630.57	-446.55	-6,658.91	6,673.45	2.12	2.09	0.32
16,486.00	87.54	271.41	7,631.54	-444.00	-6,754.85	6,769.10	3.92	-3.92	-0.23
16,581.00	88.51	271.33	7,634.81	-441.73	-6,849.77	6,863.74	1.02	1.02	-0.08
16,676.00	89.26	270.93	7,636.66	-439.86	-6,944.73	6,958.45	0.89	0.79	-0.42
16,772.00	89.62	269.92	7,637.60	-439.15	-7,040.72	7,054.25	1.12	0.38	-1.05
16,867.00	90.90	270.18	7,637.17	-439.06	-7,135.72	7,149.10	1.37	1.35	0.27
16,963.00	88.78	269.74	7,637.44	-439.13	-7,231.71	7,244.95	2.26	-2.21	-0.46

## Survey Report



<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-8C
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	Kb=29 @ 5066.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-8C	<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 5000.1

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)
17,058.00	89.79	269.43	7,638.62	-439.82	-7,326.70	7,339.83	1.11	1.06	-0.33
17,154.00	90.15	268.59	7,638.67	-441.48	-7,422.68	7,435.75	0.95	0.38	-0.88
17,249.00	87.98	268.55	7,640.22	-443.85	-7,517.64	7,530.69	2.28	-2.28	-0.04
17,344.00	90.23	268.68	7,641.71	-446.14	-7,612.59	7,625.62	2.37	2.37	0.14
17,439.00	88.73	268.81	7,642.57	-448.22	-7,707.56	7,720.56	1.58	-1.58	0.14
17,535.00	89.57	269.08	7,643.99	-449.99	-7,803.53	7,816.49	0.92	0.88	0.28
17,631.00	87.98	269.92	7,646.05	-450.83	-7,899.50	7,912.35	1.87	-1.66	0.88
17,726.00	89.09	269.78	7,648.47	-451.08	-7,994.47	8,007.19	1.18	1.17	-0.15
<b>Last MWD Survey @ 17815' MD</b>									
17,815.00	89.09	269.78	7,649.89	-451.42	-8,083.46	8,096.05	0.00	0.00	0.00
<b>Projection to TD @ 17815' MD 1918' FSL/ 2130' FEL - PBHL Duck Club 12W-20-8C</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 @ 7593.1' - actual wellpath misses target center by 0.09usft at 7593.60usft MD (7191.90 TVD, -307.88 N, 1987.12 E) - Point	0.00	0.00	7,191.87	-307.97	1,987.12	1,235,808.10	3,217,502.97	39.97807	-104.72387
70° Inclination @ 8064.1' - actual wellpath misses target center by 0.03usft at 8064.81usft MD (7512.57 TVD, -303.32 N, 1656.13 E) - Point	0.00	0.00	7,512.56	-303.31	1,656.16	1,235,809.89	3,217,171.98	39.97808	-104.72505
Cross @ 10409.17' MD - actual wellpath hits target center - Point	0.00	0.00	7,590.79	-370.31	-681.60	1,235,722.62	3,214,834.89	39.97789	-104.73339
Cross @ 15685.25' MD - actual wellpath hits target center - Point	0.00	0.00	7,633.21	-449.53	-5,954.30	1,235,597.67	3,209,563.07	39.97767	-104.75221

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,587.00	1,576.79	-18.27	109.88	Tie in to Surface Survey	
1,663.00	1,649.63	-23.16	131.02	First MWD Survey @ 1663' MD	
17,726.00	7,648.47	-451.08	-7,994.47	Last MWD Survey @ 17815' MD	
17,815.00	7,649.89	-451.42	-8,083.46	Projection to TD @ 17815' MD 1918' FSL/ 2130' FEL	

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