

# **Extraction Oil & Gas**

**Adams County (NAD 83)**

**Sec 12-T01S-R66W**

**Duck Club 12W-20-4N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**20 December, 2018**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-4N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5061.00usft
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5061.00usft
<b>Well:</b>	Duck Club 12W-20-4N	<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-20-4N				
Well Position	+N/-S	0.00 usft	Northing:	1,236,211.80 usft	Latitude:	39.97922
	+E/-W	0.00 usft	Easting:	3,215,517.87 usft	Longitude:	-104.73094
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,036.00 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	11/6/2018	8.20	66.32	51,945

<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	278.35	

<b>Survey Program</b>	<b>Date</b>	12/20/2018			
<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	17,770.00	Atlas 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	0.53	12.58	129.00	0.58	0.13	-0.04	0.41	0.41	0.00	
<b>First Surface Survey</b>										
225.00	0.26	228.79	225.00	0.87	0.06	0.06	0.79	-0.28	-149.78	
320.00	0.31	210.07	320.00	0.51	-0.23	0.30	0.11	0.05	-19.71	
415.00	0.48	213.32	414.99	-0.05	-0.58	0.56	0.18	0.18	3.42	
510.00	0.40	235.74	509.99	-0.57	-1.07	0.97	0.20	-0.08	23.60	
604.00	0.35	223.17	603.99	-0.96	-1.54	1.38	0.10	-0.05	-13.37	
699.00	1.41	51.60	698.98	-0.45	-0.82	0.74	1.85	1.12	-180.60	
795.00	1.80	52.31	794.94	1.21	1.30	-1.11	0.41	0.41	0.74	

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<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5061.00usft
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5061.00usft
<b>Well:</b>	Duck Club 12W-20-4N	<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)
890.00	2.64	56.00	889.87	3.35	4.30	-3.76	0.90	0.88	3.88
985.00	4.79	56.88	984.67	6.74	9.43	-8.35	2.26	2.26	0.93
1,080.00	7.34	58.81	1,079.13	12.05	17.95	-16.01	2.69	2.68	2.03
1,175.00	10.11	63.91	1,173.02	18.86	30.63	-27.57	3.02	2.92	5.37
1,270.00	11.34	64.52	1,266.36	26.54	46.55	-42.20	1.30	1.29	0.64
1,364.00	13.67	60.92	1,358.12	35.92	64.60	-58.70	2.61	2.48	-3.83
1,459.00	15.21	60.92	1,450.12	47.43	85.30	-77.52	1.62	1.62	0.00
1,555.00	18.98	60.48	1,541.86	61.25	109.90	-99.85	3.93	3.93	-0.46
1,587.00	19.20	61.01	1,572.10	66.36	119.04	-108.14	0.88	0.69	1.66
Last Surface Survey									
1,663.00	19.75	62.80	1,643.75	78.29	141.39	-128.53	1.07	0.72	2.36
First MWD Survey @ 1663.00' MD									
1,759.00	23.33	65.18	1,733.04	93.69	173.08	-157.64	3.84	3.73	2.48
1,855.00	26.65	61.96	1,820.04	111.80	209.35	-190.90	3.74	3.46	-3.35
1,950.00	26.82	61.70	1,904.89	131.97	247.02	-225.25	0.22	0.18	-0.27
2,046.00	26.96	60.24	1,990.51	153.04	284.98	-259.75	0.70	0.15	-1.52
2,142.00	26.29	59.23	2,076.33	174.72	322.14	-293.37	0.84	-0.70	-1.05
2,237.00	29.39	61.30	2,160.32	196.68	360.67	-328.30	3.42	3.26	2.18
2,333.00	28.63	60.38	2,244.28	219.36	401.33	-365.24	0.92	-0.79	-0.96
2,429.00	27.40	59.01	2,329.03	242.11	440.26	-400.46	1.45	-1.28	-1.43
2,524.00	26.34	58.83	2,413.77	264.27	477.04	-433.62	1.12	-1.12	-0.19
2,620.00	28.63	58.17	2,498.93	287.43	514.81	-467.63	2.41	2.39	-0.69
2,715.00	26.12	56.45	2,583.29	310.99	551.58	-500.59	2.77	-2.64	-1.81
2,811.00	28.99	62.49	2,668.40	333.42	589.84	-535.19	4.17	2.99	6.29
2,906.00	27.04	62.58	2,752.27	354.00	629.43	-571.37	2.05	-2.05	0.09
3,002.00	25.45	63.55	2,838.37	373.24	667.27	-606.02	1.72	-1.66	1.01
3,097.00	27.66	63.77	2,923.34	392.08	705.33	-640.94	2.33	2.33	0.23
3,193.00	24.97	63.68	3,009.39	410.92	743.48	-675.96	2.80	-2.80	-0.09
3,288.00	27.80	59.41	3,094.49	431.09	780.54	-709.69	3.58	2.98	-4.49
3,384.00	26.43	58.17	3,179.94	453.75	817.96	-743.43	1.54	-1.43	-1.29
3,479.00	29.25	60.86	3,263.94	476.21	856.21	-778.01	3.25	2.97	2.83
3,574.00	27.35	60.07	3,347.58	498.40	895.40	-813.56	2.04	-2.00	-0.83
3,670.00	23.60	58.13	3,434.23	519.56	930.84	-845.56	4.00	-3.91	-2.02
3,765.00	25.63	57.78	3,520.59	540.55	964.38	-875.70	2.14	2.14	-0.37
3,861.00	28.86	60.07	3,605.93	563.19	1,002.03	-909.67	3.54	3.36	2.39
3,956.00	27.71	60.38	3,689.59	585.55	1,041.10	-945.08	1.22	-1.21	0.33
4,051.00	28.81	62.67	3,773.27	606.97	1,080.64	-981.09	1.63	1.16	2.41
4,147.00	27.13	61.26	3,858.05	628.12	1,120.39	-1,017.34	1.88	-1.75	-1.47
4,242.00	28.81	60.86	3,941.95	649.68	1,159.38	-1,052.79	1.78	1.77	-0.42
4,337.00	26.73	59.58	4,026.01	671.65	1,197.80	-1,087.61	2.28	-2.19	-1.35
4,432.00	27.31	59.80	4,110.64	693.43	1,235.06	-1,121.32	0.62	0.61	0.23
4,528.00	29.34	59.49	4,195.14	716.45	1,274.36	-1,156.86	2.12	2.11	-0.32
4,623.00	25.23	57.95	4,279.55	739.02	1,311.59	-1,190.42	4.39	-4.33	-1.62

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<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

Survey										
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4,719.00	26.29	61.17	4,366.01	760.13	1,347.56	-1,222.94	1.83	1.10	3.35	
4,815.00	31.73	64.25	4,449.94	781.37	1,388.95	-1,260.82	5.87	5.67	3.21	
4,910.00	31.82	65.22	4,530.70	802.72	1,434.19	-1,302.48	0.55	0.09	1.02	
5,028.00	27.35	64.69	4,633.29	827.36	1,486.97	-1,351.12	3.79	-3.79	-0.45	
5,123.00	28.41	64.03	4,717.27	846.59	1,527.01	-1,387.95	1.16	1.12	-0.69	
5,219.00	26.78	62.45	4,802.34	866.59	1,566.72	-1,424.33	1.86	-1.70	-1.65	
5,315.00	29.87	62.98	4,886.84	887.46	1,607.20	-1,461.36	3.23	3.22	0.55	
5,410.00	28.15	63.20	4,969.92	908.31	1,648.28	-1,498.97	1.81	-1.81	0.23	
5,505.00	31.64	62.67	5,052.26	929.86	1,690.43	-1,537.55	3.68	3.67	-0.56	
5,601.00	29.39	60.68	5,134.96	952.96	1,733.35	-1,576.66	2.57	-2.34	-2.07	
5,697.00	25.14	57.16	5,220.28	975.57	1,771.04	-1,610.67	4.73	-4.43	-3.67	
5,792.00	26.25	58.52	5,305.89	997.48	1,805.91	-1,641.99	1.32	1.17	1.43	
5,888.00	27.44	60.16	5,391.54	1,019.58	1,843.21	-1,675.68	1.46	1.24	1.71	
5,983.00	29.08	57.78	5,475.22	1,042.78	1,881.73	-1,710.43	2.09	1.73	-2.51	
6,079.00	25.50	56.85	5,560.52	1,066.52	1,918.78	-1,743.64	3.76	-3.73	-0.97	
6,174.00	22.58	52.05	5,647.28	1,088.93	1,950.29	-1,771.56	3.70	-3.07	-5.05	
6,270.00	18.52	42.18	5,737.18	1,111.58	1,975.08	-1,792.80	5.55	-4.23	-10.28	
6,365.00	15.33	37.90	5,828.06	1,132.68	1,992.93	-1,807.40	3.60	-3.36	-4.51	
6,461.00	12.46	31.16	5,921.24	1,151.56	2,006.09	-1,817.68	3.43	-2.99	-7.02	
6,556.00	9.15	42.13	6,014.56	1,165.93	2,016.46	-1,825.86	4.09	-3.48	11.55	
6,652.00	7.11	72.05	6,109.63	1,173.43	2,027.24	-1,835.43	4.82	-2.13	31.17	
6,747.00	5.70	71.39	6,204.03	1,176.75	2,037.30	-1,844.91	1.49	-1.48	-0.69	
6,842.00	1.28	129.03	6,298.85	1,177.59	2,042.60	-1,850.03	5.40	-4.65	60.67	
6,938.00	1.02	162.04	6,394.83	1,176.10	2,043.70	-1,851.33	0.73	-0.27	34.39	
7,034.00	0.40	211.44	6,490.82	1,175.00	2,043.79	-1,851.58	0.85	-0.65	51.46	
7,129.00	0.49	253.35	6,585.82	1,174.60	2,043.23	-1,851.08	0.35	0.09	44.12	
7,225.00	1.10	274.54	6,681.81	1,174.55	2,041.91	-1,849.79	0.69	0.64	22.07	
7,320.00	5.48	249.07	6,776.64	1,173.01	2,036.77	-1,844.92	4.75	4.61	-26.81	
7,416.00	16.17	261.59	6,870.80	1,169.40	2,019.21	-1,828.07	11.34	11.14	13.04	
7,512.00	24.92	270.45	6,960.63	1,167.60	1,985.69	-1,795.17	9.65	9.11	9.23	
7,608.00	30.80	268.95	7,045.46	1,167.31	1,940.85	-1,750.84	6.17	6.13	-1.56	
7,703.00	38.75	269.78	7,123.44	1,166.75	1,886.71	-1,697.36	8.38	8.37	0.87	
7,799.00	44.85	270.89	7,194.97	1,167.16	1,822.76	-1,634.03	6.40	6.35	1.16	
7,894.00	54.35	271.90	7,256.47	1,168.96	1,750.52	-1,562.29	10.03	10.00	1.06	
7,990.00	64.69	270.53	7,305.10	1,170.66	1,667.92	-1,480.32	10.84	10.77	-1.43	
8,085.00	74.55	269.83	7,338.14	1,170.93	1,578.98	-1,392.28	10.40	10.38	-0.74	
8,180.00	83.16	270.97	7,356.49	1,171.59	1,485.86	-1,300.05	9.14	9.06	1.20	
8,185.60	83.65	270.90	7,357.13	1,171.68	1,480.30	-1,294.54	8.80	8.71	-1.25	
LP Duck Club 12W-20-4N										
8,276.00	91.52	269.78	7,360.94	1,172.21	1,390.05	-1,205.17	8.80	8.71	-1.24	
8,371.00	90.28	268.86	7,359.45	1,171.09	1,295.07	-1,111.36	1.63	-1.31	-0.97	
8,467.00	91.87	269.39	7,357.65	1,169.62	1,199.11	-1,016.62	1.75	1.66	0.55	
8,562.00	91.91	268.64	7,354.51	1,167.99	1,104.17	-922.93	0.79	0.04	-0.79	
8,657.00	91.21	269.70	7,351.93	1,166.61	1,009.22	-829.18	1.34	-0.74	1.12	

# Survey Report

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<b>Well:</b>	Duck Club 12W-20-4N	<b>North Reference:</b>	True
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<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)
8,753.00	88.95	268.86	7,351.79	1,165.41	913.23	-734.39	2.51	-2.35	-0.88
8,848.00	88.82	268.33	7,353.64	1,163.08	818.28	-640.78	0.57	-0.14	-0.56
8,944.00	90.23	270.53	7,354.44	1,162.12	722.30	-545.95	2.72	1.47	2.29
9,039.00	90.28	269.39	7,354.02	1,162.06	627.30	-451.97	1.20	0.05	-1.20
9,134.00	91.21	269.34	7,352.78	1,161.00	532.31	-358.14	0.98	0.98	-0.05
9,230.00	91.91	268.73	7,350.17	1,159.39	436.36	-263.45	0.97	0.73	-0.64
9,325.00	91.56	269.92	7,347.29	1,158.27	341.42	-169.67	1.31	-0.37	1.25
9,420.00	90.28	269.70	7,345.77	1,157.95	246.43	-75.73	1.37	-1.35	-0.23
9,516.00	91.07	269.21	7,344.63	1,157.04	150.44	19.11	0.97	0.82	-0.51
9,611.00	88.91	269.70	7,344.65	1,156.14	55.45	112.96	2.33	-2.27	0.52
9,707.00	88.51	269.12	7,346.81	1,155.15	-40.52	207.77	0.73	-0.42	-0.60
9,802.00	90.10	270.67	7,347.97	1,154.98	-135.50	301.72	2.34	1.67	1.63
9,898.00	89.35	269.92	7,348.43	1,155.47	-231.50	396.78	1.10	-0.78	-0.78
9,994.00	88.86	269.08	7,349.93	1,154.63	-327.48	491.62	1.01	-0.51	-0.88
10,089.00	91.47	271.46	7,349.65	1,155.08	-422.47	585.66	3.72	2.75	2.51
10,184.00	91.87	271.24	7,346.88	1,157.32	-517.40	679.92	0.48	0.42	-0.23
10,280.00	92.31	271.37	7,343.38	1,159.50	-613.31	775.13	0.48	0.46	0.14
10,376.00	89.84	272.08	7,341.58	1,162.39	-709.24	870.46	2.68	-2.57	0.74
10,471.00	90.01	271.33	7,341.71	1,165.22	-804.20	964.82	0.81	0.18	-0.79
10,567.00	89.70	270.84	7,341.95	1,167.04	-900.18	1,060.05	0.60	-0.32	-0.51
10,662.00	90.06	270.97	7,342.15	1,168.54	-995.17	1,154.25	0.40	0.38	0.14
10,757.00	89.44	270.36	7,342.56	1,169.64	-1,090.16	1,248.40	0.92	-0.65	-0.64
10,853.00	89.66	269.43	7,343.32	1,169.46	-1,186.16	1,343.35	1.00	0.23	-0.97
10,948.00	89.26	269.12	7,344.21	1,168.26	-1,281.14	1,437.16	0.53	-0.42	-0.33
11,044.00	89.75	268.81	7,345.04	1,166.53	-1,377.12	1,531.87	0.60	0.51	-0.32
11,139.00	89.26	268.29	7,345.86	1,164.12	-1,472.09	1,625.48	0.75	-0.52	-0.55
11,235.00	89.66	268.29	7,346.77	1,161.26	-1,568.04	1,720.00	0.42	0.42	0.00
11,330.00	89.44	270.18	7,347.51	1,159.99	-1,663.03	1,813.80	2.00	-0.23	1.99
11,426.00	87.98	269.83	7,349.67	1,160.00	-1,759.00	1,908.75	1.56	-1.52	-0.36
11,521.00	88.16	269.08	7,352.87	1,159.09	-1,853.94	2,002.56	0.81	0.19	-0.79
11,616.00	88.60	268.42	7,355.56	1,157.02	-1,948.88	2,096.19	0.83	0.46	-0.69
11,712.00	88.64	268.51	7,357.87	1,154.45	-2,044.82	2,190.74	0.10	0.04	0.09
11,808.00	89.04	272.03	7,359.81	1,154.90	-2,140.78	2,285.75	3.69	0.42	3.67
11,903.00	88.03	271.77	7,362.24	1,158.05	-2,235.70	2,380.12	1.10	-1.06	-0.27
11,999.00	88.38	271.06	7,365.25	1,160.42	-2,331.62	2,475.37	0.82	0.36	-0.74
12,094.00	89.00	270.36	7,367.42	1,161.60	-2,426.59	2,569.50	0.98	0.65	-0.74
12,190.00	90.37	270.40	7,367.95	1,162.24	-2,522.58	2,664.57	1.43	1.43	0.04
12,285.00	88.95	270.27	7,368.51	1,162.79	-2,617.58	2,758.64	1.50	-1.49	-0.14
12,381.00	89.22	269.43	7,370.05	1,162.54	-2,713.56	2,853.57	0.92	0.28	-0.88
12,476.00	88.60	271.50	7,371.85	1,163.31	-2,808.54	2,947.65	2.27	-0.65	2.18
12,572.00	88.16	271.68	7,374.57	1,165.97	-2,904.46	3,042.95	0.50	-0.46	0.19
12,667.00	88.11	271.59	7,377.66	1,168.68	-2,999.37	3,137.25	0.11	-0.05	-0.09
12,762.00	89.35	272.30	7,379.77	1,171.91	-3,094.29	3,231.63	1.50	1.31	0.75

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-4N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5061.00usft
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5061.00usft
<b>Well:</b>	Duck Club 12W-20-4N	<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)	
12,858.00	89.48	271.77	7,380.75	1,175.32	-3,190.22	3,327.04	0.57	0.14	-0.55	
12,954.00	89.40	271.24	7,381.68	1,177.84	-3,286.19	3,422.35	0.56	-0.08	-0.55	
13,050.00	89.26	270.93	7,382.81	1,179.65	-3,382.16	3,517.58	0.35	-0.15	-0.32	
13,145.00	90.10	270.58	7,383.34	1,180.91	-3,477.15	3,611.74	0.96	0.88	-0.37	
13,240.00	89.88	270.05	7,383.35	1,181.43	-3,572.15	3,705.81	0.60	-0.23	-0.56	
13,335.00	89.93	269.56	7,383.51	1,181.10	-3,667.15	3,799.76	0.52	0.05	-0.52	
13,431.00	90.28	269.52	7,383.34	1,180.33	-3,763.15	3,894.62	0.37	0.36	-0.04	
13,527.00	90.68	268.99	7,382.53	1,179.09	-3,859.13	3,989.41	0.69	0.42	-0.55	
13,622.00	91.03	268.77	7,381.11	1,177.23	-3,954.10	4,083.11	0.44	0.37	-0.23	
13,718.00	89.79	270.31	7,380.43	1,176.46	-4,050.09	4,177.97	2.06	-1.29	1.60	
13,813.00	89.13	269.74	7,381.32	1,176.50	-4,145.09	4,271.97	0.92	-0.69	-0.60	
13,909.00	89.09	269.34	7,382.81	1,175.73	-4,241.07	4,366.82	0.42	-0.04	-0.42	
14,004.00	89.57	269.43	7,383.92	1,174.71	-4,336.06	4,460.66	0.51	0.51	0.09	
14,100.00	90.10	270.14	7,384.20	1,174.35	-4,432.06	4,555.59	0.92	0.55	0.74	
14,195.00	90.28	270.09	7,383.89	1,174.54	-4,527.06	4,649.61	0.20	0.19	-0.05	
14,290.00	89.57	269.52	7,384.01	1,174.22	-4,622.06	4,743.55	0.96	-0.75	-0.60	
14,386.00	89.17	269.52	7,385.07	1,173.41	-4,718.05	4,838.41	0.42	-0.42	0.00	
14,482.00	88.69	268.95	7,386.86	1,172.13	-4,814.02	4,933.18	0.78	-0.50	-0.59	
14,577.00	90.28	270.67	7,387.71	1,171.82	-4,909.01	5,027.12	2.47	1.67	1.81	
14,673.00	89.66	270.00	7,387.76	1,172.38	-5,005.01	5,122.18	0.95	-0.65	-0.70	
14,769.00	89.44	269.61	7,388.52	1,172.05	-5,101.01	5,217.11	0.47	-0.23	-0.41	
14,864.00	90.77	271.81	7,388.34	1,173.23	-5,195.99	5,311.26	2.71	1.40	2.32	
14,959.00	91.52	271.06	7,386.44	1,175.61	-5,290.94	5,405.55	1.12	0.79	-0.79	
15,054.00	92.36	271.06	7,383.23	1,177.36	-5,385.87	5,499.73	0.88	0.88	0.00	
15,149.00	89.44	271.19	7,381.74	1,179.23	-5,480.83	5,593.95	3.08	-3.07	0.14	
15,244.00	89.31	270.80	7,382.77	1,180.88	-5,575.81	5,688.17	0.43	-0.14	-0.41	
15,340.00	89.22	270.22	7,384.00	1,181.73	-5,671.80	5,783.26	0.61	-0.09	-0.60	
15,435.00	89.31	269.56	7,385.22	1,181.55	-5,766.79	5,877.22	0.70	0.09	-0.69	
15,530.00	89.66	268.99	7,386.08	1,180.35	-5,861.77	5,971.03	0.70	0.37	-0.60	
15,626.00	89.53	268.11	7,386.75	1,177.92	-5,957.74	6,065.62	0.93	-0.14	-0.92	
15,721.00	88.82	270.89	7,388.12	1,177.09	-6,052.72	6,159.47	3.02	-0.75	2.93	
15,817.00	89.57	270.18	7,389.47	1,177.99	-6,148.70	6,254.57	1.08	0.78	-0.74	
15,912.00	90.77	270.05	7,389.19	1,178.18	-6,243.70	6,348.59	1.27	1.26	-0.14	
16,008.00	90.28	272.03	7,388.31	1,179.92	-6,339.68	6,443.80	2.12	-0.51	2.06	
16,103.00	91.03	271.59	7,387.22	1,182.92	-6,434.62	6,538.18	0.92	0.79	-0.46	
16,199.00	89.00	272.34	7,387.20	1,186.21	-6,530.56	6,633.58	2.25	-2.11	0.78	
16,294.00	88.60	271.46	7,389.19	1,189.36	-6,625.48	6,727.96	1.02	-0.42	-0.93	
16,389.00	88.42	270.45	7,391.66	1,190.94	-6,720.44	6,822.13	1.08	-0.19	-1.06	
16,485.00	89.00	270.58	7,393.82	1,191.81	-6,816.41	6,917.21	0.62	0.60	0.14	
16,580.00	89.04	270.05	7,395.44	1,192.33	-6,911.39	7,011.27	0.56	0.04	-0.56	
16,675.00	89.48	269.74	7,396.67	1,192.15	-7,006.38	7,105.23	0.57	0.46	-0.33	
16,771.00	87.72	270.67	7,399.02	1,192.50	-7,102.35	7,200.23	2.07	-1.83	0.97	
16,866.00	87.23	270.18	7,403.20	1,193.20	-7,197.26	7,294.23	0.73	-0.52	-0.52	
16,962.00	89.00	270.71	7,406.36	1,193.95	-7,293.20	7,389.26	1.92	1.84	0.55	

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-4N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5061.00usft
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5061.00usft
<b>Well:</b>	Duck Club 12W-20-4N	<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)	
17,057.00	89.31	270.18	7,407.76	1,194.68	-7,388.18	7,483.35	0.65	0.33	-0.56	
17,153.00	88.86	268.37	7,409.29	1,193.47	-7,484.16	7,578.13	1.94	-0.47	-1.89	
17,248.00	89.48	269.43	7,410.67	1,191.65	-7,579.13	7,671.83	1.29	0.65	1.12	
17,343.00	89.31	270.45	7,411.67	1,191.55	-7,674.12	7,765.80	1.09	-0.18	1.07	
17,439.00	89.26	271.55	7,412.87	1,193.22	-7,770.10	7,861.01	1.15	-0.05	1.15	
17,534.00	89.66	272.56	7,413.77	1,196.63	-7,865.03	7,955.43	1.14	0.42	1.06	
17,630.00	89.35	271.24	7,414.60	1,199.81	-7,960.97	8,050.82	1.41	-0.32	-1.38	
<b>Last MWD Survey @ 17630.00' MD</b>										
17,770.00	89.35	271.24	7,416.18	1,202.84	-8,100.93	8,189.73	0.00	0.00	0.00	
<b>Projection to TD @ 17770' MD 1590.4' FNL/ 2134.4' FEL - PBHL Duck Club 12W-20-4N</b>										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
30° Inclination @ 7594.9	0.00	0.00	7,034.20	1,167.43	1,947.46	1,237,396.07	3,217,455.13	39.98243	-104.72399	
- hit/miss target										
- Shape										
- actual wellpath misses target center by 0.01usft at 7594.95usft MD (7034.21 TVD, 1167.42 N, 1947.45 E)										
- Point										
70° Inclination @ 8041.1	0.00	0.00	7,324.80	1,170.94	1,620.72	1,237,396.75	3,217,128.38	39.98244	-104.72516	
- actual wellpath misses target center by 0.01usft at 8041.17usft MD (7324.80 TVD, 1170.94 N, 1620.72 E)										
- Point										
Cross @ 10358.75' MD	0.00	0.00	7,341.60	1,161.78	-692.00	1,237,367.54	3,214,815.82	39.98241	-104.73341	
- actual wellpath hits target center										
- Point										
Cross @ 15634.26' MD	0.00	0.00	7,386.83	1,177.66	-5,966.00	1,237,337.68	3,209,541.88	39.98245	-104.75223	
- 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	0.58	0.13	First Surface Survey	
1,587.00	1,572.10	66.36	119.04	Last Surface Survey	
1,663.00	1,643.75	78.29	141.39	First MWD Survey @ 1663.00' MD	
17,630.00	7,414.60	1,199.81	-7,960.97	Last MWD Survey @ 17630.00' MD	
17,770.00	7,416.18	1,202.84	-8,100.93	Projection to TD @ 17770' MD 1590.4' FNL/ 2134.4' FEL	

Checked By: _____	Approved By: _____	Date: _____
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