

Extraction Oil & Gas

Adams County (NAD 83)

Sec 12-T01S-R66W

Duck Club 12W-20-10N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

17 November, 2018



Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-10N
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-20-10N	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-20-10N				
Well Position	+N/-S	0.00 usft	Northing:	1,236,044.17 usft	Latitude:	39.97876
	+E/-W	0.00 usft	Easting:	3,215,510.92 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	262.55	

Survey Program	Date	11/16/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,607.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,758.00	17,700.00	MWD Survey (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	0.92	92.56	128.99	-0.05	1.03	-1.02	0.71	0.71	0.00	
First Surface Survey										
225.00	0.84	94.41	224.98	-0.13	2.51	-2.47	0.09	-0.08	1.93	
320.00	0.97	130.71	319.97	-0.71	3.81	-3.69	0.61	0.14	38.21	
415.00	0.22	148.99	414.97	-1.39	4.51	-4.29	0.80	-0.79	19.24	
510.00	2.15	108.29	509.94	-2.11	6.30	-5.97	2.09	2.03	-42.84	
604.00	4.17	114.53	603.79	-4.08	11.08	-10.46	2.18	2.15	6.64	
699.00	5.36	120.33	698.47	-7.76	18.06	-16.90	1.35	1.25	6.11	
795.00	6.59	119.19	793.94	-12.71	26.74	-24.86	1.29	1.28	-1.19	

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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	8.44	118.23	888.12	-18.66	37.64	-34.90	1.95	1.95	-1.01
985.00	10.77	117.87	981.78	-26.11	51.63	-47.81	2.45	2.45	-0.38
1,080.00	13.62	118.75	1,074.63	-35.64	69.29	-64.08	3.01	3.00	0.93
1,175.00	15.16	118.31	1,166.65	-46.92	90.03	-83.19	1.63	1.62	-0.46
1,270.00	16.66	118.84	1,258.01	-59.38	112.90	-104.24	1.59	1.58	0.56
1,364.00	18.33	116.73	1,347.65	-72.53	137.90	-127.34	1.90	1.78	-2.24
1,459.00	20.08	116.73	1,437.36	-86.58	165.81	-153.19	1.84	1.84	0.00
1,555.00	22.19	115.41	1,526.90	-101.77	196.91	-182.05	2.25	2.20	-1.38
1,607.00	23.69	117.26	1,574.79	-110.77	215.07	-198.89	3.20	2.88	3.56
Last Surface Survey - Tie into Surface Surveys @ 1607' MD									
1,758.00	22.76	117.40	1,713.55	-138.11	267.97	-247.80	0.62	-0.62	0.09
First MWD Survey @ 1758' MD									
1,854.00	25.41	119.29	1,801.19	-156.74	302.42	-279.55	2.87	2.76	1.97
1,950.00	25.67	118.10	1,887.81	-176.61	338.73	-312.97	0.60	0.27	-1.24
2,046.00	25.72	118.15	1,974.31	-196.23	375.44	-346.83	0.06	0.05	0.05
2,141.00	24.92	116.30	2,060.19	-214.82	411.56	-380.23	1.18	-0.84	-1.95
2,237.00	24.39	116.39	2,147.44	-232.59	447.44	-413.51	0.55	-0.55	0.09
2,333.00	26.69	117.97	2,234.05	-251.52	484.25	-447.55	2.50	2.40	1.65
2,429.00	25.63	116.47	2,320.22	-270.88	521.88	-482.35	1.30	-1.10	-1.56
2,524.00	24.70	116.25	2,406.20	-288.82	558.07	-515.91	0.98	-0.98	-0.23
2,619.00	23.24	114.67	2,493.00	-305.42	592.91	-548.30	1.68	-1.54	-1.66
2,715.00	24.39	118.41	2,580.83	-322.76	627.56	-580.41	1.98	1.20	3.90
2,810.00	25.81	119.16	2,666.86	-342.17	662.87	-612.91	1.53	1.49	0.79
2,906.00	22.93	118.94	2,754.30	-361.41	697.49	-644.75	3.00	-3.00	-0.23
3,001.00	24.97	120.57	2,841.12	-380.56	730.96	-675.45	2.26	2.15	1.72
3,097.00	26.07	121.98	2,927.75	-402.04	766.30	-707.70	1.31	1.15	1.47
3,192.00	22.89	120.22	3,014.20	-422.40	799.98	-738.46	3.43	-3.35	-1.85
3,288.00	25.23	118.63	3,101.85	-441.61	834.08	-769.78	2.53	2.44	-1.66
3,383.00	26.73	118.02	3,187.25	-461.35	870.71	-803.55	1.60	1.58	-0.64
3,479.00	24.08	117.84	3,273.96	-480.64	907.09	-837.12	2.76	-2.76	-0.19
3,574.00	24.48	119.29	3,360.56	-499.32	941.40	-868.71	0.76	0.42	1.53
3,669.00	26.07	116.39	3,446.46	-518.23	977.27	-901.83	2.12	1.67	-3.05
3,765.00	22.98	114.49	3,533.79	-535.38	1,013.23	-935.26	3.32	-3.22	-1.98
3,860.00	26.07	117.49	3,620.21	-552.70	1,048.63	-968.12	3.51	3.25	3.16
3,956.00	29.43	117.66	3,705.16	-573.40	1,088.24	-1,004.72	3.50	3.50	0.18
4,051.00	25.63	116.65	3,789.39	-593.45	1,127.29	-1,040.84	4.03	-4.00	-1.06
4,146.00	26.34	120.66	3,874.79	-613.42	1,163.79	-1,074.44	1.99	0.75	4.22
4,242.00	22.36	121.10	3,962.23	-633.72	1,197.76	-1,105.49	4.15	-4.15	0.46
4,337.00	23.82	117.62	4,049.63	-651.95	1,230.23	-1,135.32	2.10	1.54	-3.66
4,432.00	27.53	117.97	4,135.23	-671.15	1,266.63	-1,168.93	3.91	3.91	0.37
4,528.00	23.46	116.87	4,221.87	-690.20	1,303.29	-1,202.80	4.27	-4.24	-1.15
4,623.00	23.16	121.67	4,309.12	-708.55	1,336.06	-1,232.92	2.02	-0.32	5.05
4,719.00	25.41	121.85	4,396.62	-729.34	1,369.63	-1,263.51	2.35	2.34	0.19

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Survey									
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4,814.00	28.46	119.91	4,481.30	-751.39	1,406.57	-1,297.28	3.34	3.21	-2.04
4,910.00	26.29	118.19	4,566.55	-772.84	1,445.14	-1,332.74	2.41	-2.26	-1.79
5,005.00	27.31	115.90	4,651.35	-792.30	1,483.29	-1,368.05	1.53	1.07	-2.41
5,100.00	22.40	112.07	4,737.53	-808.63	1,519.70	-1,402.03	5.44	-5.17	-4.03
5,196.00	23.24	111.32	4,826.01	-822.39	1,554.29	-1,434.55	0.93	0.88	-0.78
5,315.00	21.87	115.28	4,935.91	-840.39	1,596.21	-1,473.78	1.72	-1.15	3.33
5,411.00	26.91	118.99	5,023.32	-858.57	1,631.40	-1,506.32	5.48	5.25	3.86
5,506.00	28.19	120.62	5,107.55	-880.42	1,669.52	-1,541.28	1.56	1.35	1.72
5,601.00	26.12	118.77	5,192.08	-901.91	1,707.17	-1,575.82	2.35	-2.18	-1.95
5,697.00	27.00	118.77	5,277.94	-922.57	1,744.79	-1,610.45	0.92	0.92	0.00
5,793.00	25.45	117.93	5,364.06	-942.72	1,782.12	-1,644.85	1.66	-1.61	-0.88
5,888.00	26.73	119.34	5,449.38	-962.75	1,818.78	-1,678.60	1.50	1.35	1.48
5,984.00	25.28	119.03	5,535.66	-983.28	1,855.53	-1,712.38	1.52	-1.51	-0.32
6,079.00	23.29	117.88	5,622.25	-1,001.91	1,889.87	-1,744.01	2.15	-2.09	-1.21
6,175.00	20.46	117.13	5,711.33	-1,018.44	1,921.58	-1,773.32	2.96	-2.95	-0.78
6,271.00	17.45	115.94	5,802.11	-1,032.39	1,949.46	-1,799.16	3.16	-3.14	-1.24
6,366.00	14.49	115.59	5,893.43	-1,043.76	1,973.00	-1,821.02	3.12	-3.12	-0.37
6,461.00	11.62	115.11	5,985.97	-1,052.95	1,992.38	-1,839.05	3.02	-3.02	-0.51
6,557.00	9.28	115.24	6,080.37	-1,060.35	2,008.14	-1,853.71	2.44	-2.44	0.14
6,652.00	7.34	111.54	6,174.37	-1,065.85	2,020.72	-1,865.47	2.12	-2.04	-3.89
6,748.00	6.36	116.56	6,269.68	-1,070.48	2,031.18	-1,875.24	1.20	-1.02	5.23
6,843.00	5.26	125.11	6,364.20	-1,075.34	2,039.45	-1,882.81	1.47	-1.16	9.00
6,938.00	1.90	122.64	6,459.00	-1,078.69	2,044.34	-1,887.22	3.54	-3.54	-2.60
7,034.00	2.21	138.24	6,554.94	-1,080.93	2,046.91	-1,889.48	0.66	0.32	16.25
7,129.00	0.97	271.59	6,649.91	-1,082.27	2,047.32	-1,889.72	3.12	-1.31	140.37
7,225.00	1.50	282.56	6,745.89	-1,081.98	2,045.29	-1,887.74	0.60	0.55	11.43
7,321.00	11.49	275.91	6,841.16	-1,080.72	2,034.52	-1,877.23	10.42	10.41	-6.93
7,417.00	21.39	276.31	6,933.12	-1,077.80	2,007.54	-1,850.86	10.31	10.31	0.42
7,512.00	27.71	276.66	7,019.48	-1,073.33	1,968.35	-1,812.57	6.65	6.65	0.37
7,538.60	29.97	274.80	7,042.78	-1,072.06	1,955.58	-1,800.08	9.15	8.50	-6.98
30° Inclination @ 7,538.62' MD									
7,608.00	35.97	270.97	7,100.99	-1,070.26	1,917.89	-1,762.94	9.15	8.64	-5.52
7,704.00	42.47	268.51	7,175.33	-1,070.63	1,857.23	-1,702.75	6.96	6.77	-2.56
7,799.00	46.27	266.83	7,243.22	-1,073.36	1,790.87	-1,636.59	4.19	4.00	-1.77
7,895.00	56.12	270.09	7,303.32	-1,075.22	1,716.20	-1,562.30	10.59	10.26	3.40
7,990.00	66.06	270.14	7,349.19	-1,075.05	1,633.14	-1,479.97	10.46	10.46	0.05
8,030.75	70.00	270.28	7,364.43	-1,074.91	1,595.35	-1,442.52	9.67	9.67	0.33
70° Inclination @ 8,030.76' MD									
8,086.00	75.34	270.45	7,380.88	-1,074.58	1,542.63	-1,390.29	9.67	9.67	0.31
8,145.76	76.82	270.39	7,395.26	-1,074.15	1,484.63	-1,332.83	2.48	2.47	-0.10
LP Duck Club 12W-20-10N									
8,181.00	77.69	270.36	7,403.04	-1,073.93	1,450.26	-1,298.78	2.48	2.47	-0.09
8,276.00	86.35	270.40	7,416.21	-1,073.30	1,356.27	-1,205.67	9.12	9.12	0.04
8,371.00	88.64	271.50	7,420.36	-1,071.73	1,261.38	-1,111.78	2.67	2.41	1.16

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Survey									
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8,467.00	90.41	269.96	7,421.16	-1,070.50	1,165.40	-1,016.77	2.44	1.84	-1.60
8,562.00	90.85	269.43	7,420.12	-1,071.01	1,070.41	-922.52	0.73	0.46	-0.56
8,658.00	91.38	269.03	7,418.25	-1,072.30	974.44	-827.19	0.69	0.55	-0.42
8,753.00	91.07	270.00	7,416.22	-1,073.10	879.46	-732.91	1.07	-0.33	1.02
8,849.00	89.44	269.96	7,415.79	-1,073.14	783.47	-637.72	1.70	-1.70	-0.04
8,944.00	89.31	267.54	7,416.83	-1,075.21	688.50	-543.29	2.55	-0.14	-2.55
9,039.00	90.15	268.11	7,417.27	-1,078.81	593.57	-448.69	1.07	0.88	0.60
9,135.00	89.88	267.01	7,417.25	-1,082.90	497.66	-353.06	1.18	-0.28	-1.15
9,230.00	91.03	270.14	7,416.49	-1,085.26	402.71	-258.60	3.51	1.21	3.29
9,325.00	89.35	270.71	7,416.18	-1,084.56	307.72	-164.50	1.87	-1.77	0.60
9,421.00	90.68	271.72	7,416.15	-1,082.52	211.74	-69.60	1.74	1.39	1.05
9,516.00	87.67	271.11	7,417.52	-1,080.18	116.79	24.24	3.23	-3.17	-0.64
9,612.00	87.80	270.89	7,421.32	-1,078.50	20.88	119.13	0.27	0.14	-0.23
9,708.00	88.69	271.06	7,424.26	-1,076.87	-75.06	214.05	0.94	0.93	0.18
9,803.00	89.04	270.89	7,426.14	-1,075.26	-170.03	308.00	0.41	0.37	-0.18
9,898.00	89.75	270.62	7,427.14	-1,074.00	-265.01	402.02	0.80	0.75	-0.28
9,994.00	89.48	268.90	7,427.79	-1,074.41	-361.01	497.26	1.81	-0.28	-1.79
10,089.00	89.44	267.27	7,428.68	-1,077.58	-455.95	591.81	1.72	-0.04	-1.72
10,185.00	92.36	270.18	7,427.17	-1,079.72	-551.89	687.22	4.29	3.04	3.03
10,281.00	90.50	271.50	7,424.78	-1,078.31	-647.84	782.18	2.38	-1.94	1.38
10,309.97	90.82	271.50	7,424.44	-1,077.55	-676.80	810.80	1.12	1.12	0.00
Cross @ 10310.96' MD									
10,376.00	91.56	271.50	7,423.07	-1,075.82	-742.79	876.01	1.12	1.12	0.00
10,472.00	90.01	272.16	7,421.75	-1,072.76	-838.73	970.74	1.75	-1.61	0.69
10,567.00	90.77	271.90	7,421.11	-1,069.39	-933.67	1,064.44	0.85	0.80	-0.27
10,662.00	89.22	271.77	7,421.12	-1,066.35	-1,028.62	1,158.19	1.64	-1.63	-0.14
10,758.00	90.37	271.33	7,421.46	-1,063.75	-1,124.58	1,253.01	1.28	1.20	-0.46
10,853.00	89.97	270.58	7,421.18	-1,062.17	-1,219.57	1,346.99	0.89	-0.42	-0.79
10,949.00	90.90	270.62	7,420.45	-1,061.17	-1,315.56	1,442.04	0.97	0.97	0.04
11,044.00	87.58	268.86	7,421.71	-1,061.60	-1,410.53	1,536.26	3.96	-3.49	-1.85
11,140.00	87.98	268.73	7,425.43	-1,063.61	-1,506.44	1,631.62	0.44	0.42	-0.14
11,235.00	88.78	268.20	7,428.11	-1,066.16	-1,601.36	1,726.08	1.01	0.84	-0.56
11,331.00	89.40	267.98	7,429.64	-1,069.36	-1,697.30	1,821.62	0.69	0.65	-0.23
11,426.00	89.26	267.32	7,430.75	-1,073.25	-1,792.21	1,916.23	0.71	-0.15	-0.69
11,521.00	89.70	267.80	7,431.61	-1,077.30	-1,887.12	2,010.87	0.69	0.46	0.51
11,616.00	90.72	267.93	7,431.26	-1,080.83	-1,982.05	2,105.46	1.08	1.07	0.14
11,712.00	90.15	269.70	7,430.53	-1,082.82	-2,078.02	2,200.88	1.94	-0.59	1.84
11,808.00	88.51	271.19	7,431.66	-1,082.07	-2,174.01	2,295.95	2.31	-1.71	1.55
11,904.00	88.69	271.59	7,434.00	-1,079.75	-2,269.95	2,390.79	0.46	0.19	0.42
11,999.00	89.13	273.44	7,435.81	-1,075.58	-2,364.84	2,484.33	2.00	0.46	1.95
12,095.00	88.82	270.45	7,437.53	-1,072.32	-2,460.76	2,579.02	3.13	-0.32	-3.11
12,190.00	89.40	272.38	7,439.00	-1,069.98	-2,555.71	2,672.87	2.12	0.61	2.03
12,285.00	89.57	272.52	7,439.86	-1,065.91	-2,650.62	2,766.45	0.23	0.18	0.15
12,381.00	90.01	274.90	7,440.21	-1,059.70	-2,746.41	2,860.63	2.52	0.46	2.48

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-10N
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-20-10N	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)
12,477.00	89.44	270.80	7,440.67	-1,054.93	-2,842.27	2,955.06	4.31	-0.59	-4.27
12,572.00	90.06	270.45	7,441.08	-1,053.89	-2,937.26	3,049.11	0.75	0.65	-0.37
12,668.00	90.63	268.68	7,440.51	-1,054.62	-3,033.26	3,144.39	1.94	0.59	-1.84
12,763.00	91.78	268.68	7,438.51	-1,056.81	-3,128.21	3,238.82	1.21	1.21	0.00
12,858.00	89.97	270.31	7,437.06	-1,057.65	-3,223.19	3,333.11	2.56	-1.91	1.72
12,954.00	90.50	269.96	7,436.66	-1,057.42	-3,319.18	3,428.27	0.66	0.55	-0.36
13,050.00	91.34	269.52	7,435.12	-1,057.86	-3,415.17	3,523.50	0.99	0.88	-0.46
13,146.00	87.45	269.39	7,436.14	-1,058.77	-3,511.14	3,618.78	4.05	-4.05	-0.14
13,241.00	87.54	269.61	7,440.29	-1,059.60	-3,606.05	3,712.99	0.25	0.09	0.23
13,336.00	87.50	269.56	7,444.40	-1,060.29	-3,700.96	3,807.19	0.07	-0.04	-0.05
13,431.00	89.93	268.99	7,446.53	-1,061.49	-3,795.92	3,901.50	2.63	2.56	-0.60
13,527.00	90.19	268.02	7,446.43	-1,063.99	-3,891.88	3,996.98	1.05	0.27	-1.01
13,623.00	90.85	267.98	7,445.56	-1,067.34	-3,987.82	4,092.55	0.69	0.69	-0.04
13,718.00	89.31	269.65	7,445.42	-1,069.31	-4,082.79	4,186.97	2.39	-1.62	1.76
13,814.00	90.41	269.48	7,445.66	-1,070.04	-4,178.79	4,282.25	1.16	1.15	-0.18
13,909.00	89.22	271.19	7,445.97	-1,069.48	-4,273.78	4,376.37	2.19	-1.25	1.80
14,005.00	89.75	270.75	7,446.83	-1,067.86	-4,369.76	4,471.33	0.72	0.55	-0.46
14,100.00	89.70	268.64	7,447.28	-1,068.36	-4,464.76	4,565.59	2.22	-0.05	-2.22
14,196.00	89.53	270.18	7,447.93	-1,069.35	-4,560.75	4,660.89	1.61	-0.18	1.60
14,291.00	90.19	268.99	7,448.16	-1,070.04	-4,655.74	4,755.18	1.43	0.69	-1.25
14,386.00	88.95	270.84	7,448.87	-1,070.18	-4,750.73	4,849.39	2.34	-1.31	1.95
14,482.00	90.06	270.80	7,449.70	-1,068.80	-4,846.72	4,944.38	1.16	1.16	-0.04
14,578.00	90.50	270.09	7,449.23	-1,068.06	-4,942.71	5,039.47	0.87	0.46	-0.74
14,673.00	88.11	271.94	7,450.39	-1,066.38	-5,037.68	5,133.42	3.18	-2.52	1.95
14,769.00	88.64	272.47	7,453.11	-1,062.69	-5,133.57	5,228.02	0.78	0.55	0.55
14,865.00	90.01	273.53	7,454.24	-1,057.66	-5,229.43	5,322.42	1.80	1.43	1.10
14,960.00	88.91	271.37	7,455.14	-1,053.60	-5,324.33	5,415.99	2.55	-1.16	-2.27
15,056.00	89.35	270.71	7,456.59	-1,051.86	-5,420.30	5,510.93	0.83	0.46	-0.69
15,151.00	90.10	270.27	7,457.05	-1,051.05	-5,515.30	5,605.01	0.92	0.79	-0.46
15,247.00	88.56	270.84	7,458.17	-1,050.12	-5,611.28	5,700.07	1.71	-1.60	0.59
15,342.00	89.35	270.75	7,459.90	-1,048.80	-5,706.26	5,794.07	0.84	0.83	-0.09
15,438.00	89.48	269.96	7,460.88	-1,048.20	-5,802.25	5,889.18	0.83	0.14	-0.82
15,534.00	89.84	269.39	7,461.45	-1,048.75	-5,898.24	5,984.43	0.70	0.38	-0.59
15,584.61	90.14	269.08	7,461.46	-1,049.42	-5,948.85	6,034.70	0.86	0.60	-0.61
Cross @ 15584.61' MD									
15,629.00	90.41	268.81	7,461.25	-1,050.24	-5,993.23	6,078.81	0.86	0.60	-0.61
15,725.00	88.38	270.14	7,462.26	-1,051.12	-6,089.21	6,174.10	2.53	-2.11	1.39
15,820.00	88.51	269.39	7,464.84	-1,051.51	-6,184.18	6,268.31	0.80	0.14	-0.79
15,916.00	88.95	269.43	7,466.97	-1,052.50	-6,280.15	6,363.60	0.46	0.46	0.04
16,012.00	89.53	269.78	7,468.24	-1,053.16	-6,376.14	6,458.87	0.71	0.60	0.36
16,107.00	89.75	269.65	7,468.84	-1,053.63	-6,471.14	6,553.12	0.27	0.23	-0.14
16,203.00	90.06	269.12	7,469.00	-1,054.66	-6,567.13	6,648.44	0.64	0.32	-0.55
16,298.00	90.77	269.30	7,468.31	-1,055.97	-6,662.12	6,742.79	0.77	0.75	0.19

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-10N
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-20-10N	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)
16,394.00	87.72	268.20	7,469.57	-1,058.07	-6,758.07	6,838.21	3.38	-3.18	-1.15
16,489.00	88.25	268.07	7,472.91	-1,061.16	-6,852.96	6,932.70	0.57	0.56	-0.14
16,585.00	88.56	267.32	7,475.58	-1,065.02	-6,948.85	7,028.28	0.85	0.32	-0.78
16,681.00	89.53	271.11	7,477.19	-1,066.33	-7,044.81	7,123.60	4.07	1.01	3.95
16,776.00	90.01	272.65	7,477.57	-1,063.21	-7,139.75	7,217.34	1.70	0.51	1.62
16,872.00	89.66	269.21	7,477.84	-1,061.66	-7,235.72	7,312.30	3.60	-0.36	-3.58
16,967.00	91.47	270.49	7,476.91	-1,061.90	-7,330.71	7,406.52	2.33	1.91	1.35
17,063.00	88.78	270.40	7,476.70	-1,061.16	-7,426.70	7,501.60	2.80	-2.80	-0.09
17,159.00	88.73	270.22	7,478.78	-1,060.64	-7,522.68	7,596.70	0.19	-0.05	-0.19
17,254.00	89.04	269.52	7,480.63	-1,060.85	-7,617.66	7,690.90	0.81	0.33	-0.74
17,350.00	90.59	270.93	7,480.94	-1,060.48	-7,713.65	7,786.04	2.18	1.61	1.47
17,445.00	88.78	270.45	7,481.46	-1,059.33	-7,808.64	7,880.08	1.97	-1.91	-0.51
17,541.00	90.01	270.40	7,482.48	-1,058.62	-7,904.63	7,975.16	1.28	1.28	-0.05
17,637.00	91.65	270.05	7,481.09	-1,058.24	-8,000.62	8,070.29	1.75	1.71	-0.36
Last MWD Survey @ 17637' MD									
17,700.00	91.65	270.05	7,479.27	-1,058.19	-8,063.59	8,132.73	0.00	0.00	0.00
Project to TD @ 17700' MD 1,330' FSL/ 2,122' FEL - PBHL Duck Club 12W-20-10N									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 7,538.1' MD - hit/miss target - Shape - Point	0.00	0.00	7,042.79	-1,072.02	1,955.57	1,234,989.14	3,217,475.72	39.97582	-104.72399
- actual wellpath misses target center by 0.03usft at 7538.61usft MD (7042.80 TVD, -1072.06 N, 1955.57 E)									
70° Inclination @ 8,030.1' MD - actual wellpath hits target center - Point	0.00	0.00	7,364.44	-1,074.91	1,595.35	1,234,983.13	3,217,115.53	39.97581	-104.72528
Cross @ 10310.96' MD - actual wellpath hits target center - Point	0.00	0.50	7,424.44	-1,077.55	-676.80	1,234,960.79	3,214,843.49	39.97580	-104.73339
Cross @ 15584.61' MD - actual wellpath hits target center - Point	0.00	0.48	7,461.46	-1,049.42	-5,948.85	1,234,943.20	3,209,571.40	39.97588	-104.75220

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-10N
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-20-10N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
129.00	128.99	-0.05	1.03	First Surface Survey
1,607.00	1,574.79	-110.77	215.07	Last Surface Survey
1,607.00	1,574.79	-110.77	215.07	Tie into Surface Surveys @ 1607' MD
1,758.00	1,713.55	-138.11	267.97	First MWD Survey @ 1758' MD
17,637.00	7,481.09	-1,058.24	-8,000.62	Last MWD Survey @ 17637' MD
17,700.00	7,479.27	-1,058.19	-8,063.59	Project to TD @ 17700' MD 1,330' FSL/ 2,122' FEL

Checked By: _____ Approved By: _____ Date: _____