



# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**Sec 32-T6N-R65W**

**WS-SUNRISE C1-5-5**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**12 March, 2018**

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well WS-SUNRISE C1-5-5
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25 @ 4666.00ft (P346)
<b>Site:</b>	Sec 32-T6N-R65W	<b>MD Reference:</b>	KB=25 @ 4666.00ft (P346)
<b>Well:</b>	WS-SUNRISE C1-5-5	<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>	Weld County, CO (NAD83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Ground Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site						Sec 32-T6N-R65W											
Site Position:						Northing:			1,403,150.90 usft			Latitude:			40.437180		
From:			Map			Easting:			3,227,225.68 usft			Longitude:			-104.683680		
Position Uncertainty:			0.00 ft			Slot Radius:			13-3/16 "			Grid Convergence:			0.53 °		

Well	WS-SUNRISE C1-5-5					
Well Position	+N/-S	0.00 ft	Northing:	1,403,154.39 usfl	Latitude:	40.437190
	+E/-W	0.00 ft	Easting:	3,227,208.94 usfl	Longitude:	-104.683740
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,641.00 ft

<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	2/15/2018	8.13	66.92	52,306

<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	176.81	

<b>Survey Program</b>	<b>Date</b>	3/12/2018			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
101.00	1,519.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,667.00	11,942.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</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	
101.00	0.26	47.52	101.00	0.15	0.17	-0.15	0.26	0.26	0.00	
196.00	0.26	28.89	196.00	0.49	0.43	-0.46	0.09	0.00	-19.61	
291.00	0.17	307.33	291.00	0.76	0.42	-0.74	0.30	-0.09	-85.85	
386.00	0.52	330.88	386.00	1.23	0.10	-1.22	0.39	0.37	24.79	
485.00	0.43	342.39	484.99	1.97	-0.23	-1.98	0.13	-0.09	11.63	
581.00	1.01	330.97	580.99	3.05	-0.75	-3.09	0.62	0.60	-11.90	
676.00	0.48	24.93	675.98	4.15	-0.99	-4.20	0.87	-0.56	56.80	
771.00	1.09	85.23	770.97	4.58	0.08	-4.57	1.00	0.64	63.47	
866.00	1.18	77.67	865.95	4.87	1.94	-4.75	0.18	0.09	-7.96	

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<b>Well:</b>	WS-SUNRISE C1-5-5	<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 (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
961.00	1.84	95.95	960.92	4.92	4.41	-4.67	0.85	0.69	19.24
1,055.00	4.21	114.67	1,054.78	3.32	9.05	-2.81	2.70	2.52	19.91
1,150.00	3.42	120.56	1,149.57	0.43	14.66	0.39	0.93	-0.83	6.20
1,244.00	3.55	127.76	1,243.40	-2.78	19.37	3.86	0.49	0.14	7.66
1,339.00	3.77	107.29	1,338.21	-5.51	24.68	6.88	1.39	0.23	-21.55
1,434.00	4.83	106.85	1,432.94	-7.60	31.49	9.34	1.12	1.12	-0.46
1,519.00	3.99	123.28	1,517.69	-10.26	37.39	12.32	1.78	-0.99	19.33
1,667.00	4.24	124.64	1,665.31	-16.19	46.19	18.74	0.18	0.17	0.92
<b>First MWD Survey @ 1667'MD</b>									
1,761.00	6.23	123.01	1,758.91	-20.95	53.33	23.88	2.12	2.12	-1.73
1,855.00	5.83	117.02	1,852.39	-25.90	61.86	29.30	0.79	-0.43	-6.37
1,950.00	5.61	114.60	1,946.92	-30.02	70.38	33.89	0.34	-0.23	-2.55
2,044.00	5.30	112.70	2,040.49	-33.61	78.56	37.93	0.38	-0.33	-2.02
2,138.00	4.82	110.37	2,134.13	-36.66	86.27	41.40	0.56	-0.51	-2.48
2,233.00	4.37	108.21	2,228.82	-39.18	93.45	44.32	0.51	-0.47	-2.27
2,327.00	4.24	108.43	2,322.56	-41.40	100.15	46.91	0.14	-0.14	0.23
2,421.00	4.86	115.87	2,416.26	-44.23	107.03	50.12	0.91	0.66	7.91
2,515.00	4.68	114.42	2,509.94	-47.56	114.10	53.83	0.23	-0.19	-1.54
2,609.00	4.37	113.58	2,603.64	-50.57	120.88	57.22	0.34	-0.33	-0.89
2,703.00	4.33	113.14	2,697.37	-53.40	127.42	60.41	0.06	-0.04	-0.47
2,798.00	4.33	110.45	2,792.10	-56.06	134.08	63.44	0.21	0.00	-2.83
2,892.00	5.35	115.74	2,885.76	-59.21	141.35	66.98	1.18	1.09	5.63
2,986.00	4.95	114.46	2,979.38	-62.79	148.99	70.98	0.44	-0.43	-1.36
3,081.00	3.93	116.76	3,074.10	-65.95	155.63	74.51	1.09	-1.07	2.42
3,175.00	4.95	123.19	3,167.82	-69.62	161.90	78.52	1.21	1.09	6.84
3,269.00	4.46	126.72	3,261.50	-74.03	168.22	83.27	0.61	-0.52	3.76
3,363.00	4.86	120.46	3,355.19	-78.23	174.58	87.83	0.69	0.43	-6.66
3,458.00	3.84	123.41	3,449.91	-82.02	180.71	91.95	1.10	-1.07	3.11
3,552.00	4.77	115.08	3,543.65	-85.41	186.88	95.68	1.19	0.99	-8.86
3,646.00	4.73	115.30	3,637.33	-88.73	193.92	99.38	0.05	-0.04	0.23
3,741.00	4.60	113.89	3,732.01	-91.94	200.94	102.98	0.18	-0.14	-1.48
3,835.00	6.50	115.65	3,825.57	-95.77	209.19	107.27	2.03	2.02	1.87
3,929.00	6.50	115.52	3,918.96	-100.37	218.79	112.39	0.02	0.00	-0.14
4,023.00	6.10	119.14	4,012.39	-105.09	227.95	117.61	0.60	-0.43	3.85
4,118.00	5.39	119.00	4,106.92	-109.71	236.26	122.69	0.75	-0.75	-0.15
4,212.00	4.51	118.56	4,200.57	-113.62	243.37	126.99	0.94	-0.94	-0.47
4,306.00	4.46	114.33	4,294.28	-116.89	249.94	130.62	0.36	-0.05	-4.50
4,400.00	5.04	114.64	4,387.95	-120.12	257.03	134.24	0.62	0.62	0.33
4,495.00	4.29	114.82	4,482.64	-123.35	264.05	137.85	0.79	-0.79	0.19
4,589.00	3.98	122.35	4,576.39	-126.57	269.99	141.40	0.66	-0.33	8.01
4,683.00	5.61	121.21	4,670.06	-130.70	276.68	145.89	1.74	1.73	-1.21
4,778.00	4.60	116.89	4,764.69	-134.83	284.05	150.43	1.14	-1.06	-4.55
4,872.00	5.88	116.93	4,858.29	-138.72	291.70	154.73	1.36	1.36	0.04

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## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,966.00	5.21	116.67	4,951.85	-142.81	299.81	159.27	0.71	-0.71	-0.28
5,061.00	4.24	116.23	5,046.53	-146.30	306.81	163.15	1.02	-1.02	-0.46
5,155.00	5.13	115.92	5,140.21	-149.67	313.71	166.90	0.95	0.95	-0.33
5,249.00	3.93	112.13	5,233.92	-152.72	320.48	170.32	1.32	-1.28	-4.03
5,344.00	5.04	107.55	5,328.62	-155.21	327.47	173.19	1.23	1.17	-4.82
5,437.00	4.29	105.08	5,421.31	-157.35	334.72	175.73	0.83	-0.81	-2.66
5,531.00	6.45	120.94	5,514.90	-160.98	342.65	179.79	2.77	2.30	16.87
5,626.00	5.39	123.50	5,609.39	-166.18	350.95	185.45	1.15	-1.12	2.69
5,720.00	4.20	123.23	5,703.06	-170.50	357.51	190.13	1.27	-1.27	-0.29
5,814.00	3.31	126.23	5,796.86	-173.99	362.58	193.90	0.97	-0.95	3.19
5,909.00	1.94	101.64	5,891.76	-175.94	366.36	196.05	1.84	-1.44	-25.88
6,003.00	0.18	42.68	5,985.74	-176.15	368.02	196.36	1.97	-1.87	-62.72
6,097.00	0.27	65.20	6,079.74	-175.95	368.32	196.17	0.13	0.10	23.96
6,191.00	0.40	75.91	6,173.74	-175.78	368.84	196.03	0.15	0.14	11.39
6,286.00	0.40	44.93	6,268.74	-175.46	369.40	195.75	0.22	0.00	-32.61
6,380.00	0.44	8.17	6,362.74	-174.87	369.68	195.17	0.28	0.04	-39.11
6,474.00	5.57	179.64	6,456.60	-179.08	369.76	199.38	6.39	5.46	182.42
6,568.00	15.55	179.86	6,548.89	-196.29	369.82	216.56	10.62	10.62	0.23
6,662.00	25.45	184.31	6,636.83	-229.11	368.33	249.25	10.65	10.53	4.73
6,780.00	33.98	179.51	6,739.24	-287.48	366.70	307.44	7.50	7.23	-4.07
6,782.71	34.19	179.45	6,741.48	-289.00	366.72	308.96	7.84	7.76	-2.09
<b>Enter Lease @ 6782.71'MD</b>									
6,875.00	41.36	177.83	6,814.38	-345.48	368.12	365.43	7.84	7.77	-1.76
6,969.00	51.61	177.88	6,879.02	-413.51	370.67	433.49	10.90	10.90	0.05
7,063.00	58.64	179.07	6,932.73	-490.55	372.68	510.52	7.55	7.48	1.27
7,158.00	64.43	178.98	6,977.99	-574.01	374.11	593.94	6.10	6.09	-0.09
7,214.97	70.00	179.06	7,000.05	-626.51	375.00	646.41	9.78	9.78	0.14
<b>70°INC @ 7214.97'MD / 7000.05'TVD</b>									
7,252.00	73.62	179.11	7,011.61	-661.68	375.56	681.55	9.78	9.78	0.13
7,344.24	79.86	180.28	7,032.75	-751.41	376.03	771.17	6.88	6.77	1.27
<b>Hardline Crossing @ 7214.97'MD (460'FNL &amp; 1326'FEL)</b>									
7,346.00	79.98	180.30	7,033.06	-753.15	376.02	772.90	6.88	6.77	1.24
7,440.00	83.39	181.84	7,046.65	-846.12	374.28	865.64	3.97	3.63	1.64
7,534.00	89.00	183.65	7,052.89	-939.77	369.79	958.89	6.27	5.97	1.93
7,629.00	92.89	185.06	7,051.32	-1,034.46	362.58	1,053.03	4.36	4.09	1.48
7,723.00	92.00	184.00	7,047.31	-1,128.08	355.16	1,146.09	1.47	-0.95	-1.13
7,817.00	90.77	181.84	7,045.04	-1,221.92	350.37	1,239.53	2.64	-1.31	-2.30
7,911.00	91.38	182.72	7,043.28	-1,315.83	346.63	1,333.08	1.14	0.65	0.94
8,005.00	90.81	180.13	7,041.48	-1,409.78	344.30	1,426.75	2.82	-0.61	-2.76
8,099.00	91.87	180.83	7,039.28	-1,503.74	343.51	1,520.53	1.35	1.13	0.74
8,194.00	86.96	179.60	7,040.25	-1,598.71	343.15	1,615.33	5.33	-5.17	-1.29
8,288.00	89.53	179.82	7,043.13	-1,692.65	343.63	1,709.15	2.74	2.73	0.23
8,382.00	89.22	179.29	7,044.16	-1,786.65	344.36	1,803.04	0.65	-0.33	-0.56
8,475.00	90.85	179.29	7,044.10	-1,879.64	345.51	1,895.95	1.75	1.75	0.00

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8,569.00	90.81	178.89	7,042.74	-1,973.61	347.00	1,989.87	0.43	-0.04	-0.43
8,663.00	90.10	179.82	7,041.99	-2,067.60	348.06	2,083.77	1.24	-0.76	0.99
8,758.00	91.07	180.26	7,041.02	-2,162.60	347.99	2,178.61	1.12	1.02	0.46
8,852.00	91.21	179.42	7,039.15	-2,256.58	348.26	2,272.46	0.91	0.15	-0.89
8,946.00	91.21	180.57	7,037.17	-2,350.55	348.27	2,366.29	1.22	0.00	1.22
9,040.00	90.06	180.57	7,036.12	-2,444.54	347.33	2,460.08	1.22	-1.22	0.00
9,134.00	90.06	180.17	7,036.03	-2,538.54	346.72	2,553.90	0.43	0.00	-0.43
9,229.00	90.85	179.77	7,035.27	-2,633.54	346.77	2,648.75	0.93	0.83	-0.42
9,323.00	90.19	181.09	7,034.42	-2,727.53	346.07	2,742.56	1.57	-0.70	1.40
9,417.00	88.25	181.40	7,035.70	-2,821.49	344.03	2,836.26	2.09	-2.06	0.33
9,510.00	88.82	180.83	7,038.08	-2,914.44	342.22	2,928.97	0.87	0.61	-0.61
9,604.00	89.57	180.61	7,039.40	-3,008.43	341.04	3,022.74	0.83	0.80	-0.23
9,698.00	87.98	180.87	7,041.41	-3,102.39	339.82	3,116.50	1.71	-1.69	0.28
9,792.00	92.27	181.27	7,041.20	-3,196.35	338.07	3,210.21	4.58	4.56	0.43
9,886.00	89.70	181.45	7,039.58	-3,290.31	335.84	3,303.90	2.74	-2.73	0.19
9,980.00	87.54	181.36	7,041.85	-3,384.25	333.53	3,397.56	2.30	-2.30	-0.10
10,074.00	87.63	180.92	7,045.81	-3,478.14	331.66	3,491.21	0.48	0.10	-0.47
10,168.00	90.63	181.14	7,047.24	-3,572.11	329.97	3,584.93	3.20	3.19	0.23
10,262.00	89.93	180.04	7,046.78	-3,666.10	329.01	3,678.73	1.39	-0.74	-1.17
10,356.00	87.72	179.33	7,048.70	-3,760.07	329.52	3,772.58	2.47	-2.35	-0.76
10,450.00	87.63	178.71	7,052.52	-3,853.98	331.13	3,866.43	0.67	-0.10	-0.66
10,545.00	88.42	180.30	7,055.79	-3,948.91	331.95	3,961.27	1.87	0.83	1.67
10,639.00	89.09	180.57	7,057.83	-4,042.89	331.24	4,055.06	0.77	0.71	0.29
10,733.00	89.26	179.99	7,059.19	-4,136.88	330.78	4,148.87	0.64	0.18	-0.62
10,827.00	87.94	177.08	7,061.49	-4,230.81	333.18	4,242.79	3.40	-1.40	-3.10
10,921.00	87.63	177.57	7,065.12	-4,324.63	337.56	4,336.72	0.62	-0.33	0.52
11,016.00	87.80	179.29	7,068.91	-4,419.52	340.16	4,431.60	1.82	0.18	1.81
11,110.00	89.04	179.86	7,071.50	-4,513.48	340.86	4,525.45	1.45	1.32	0.61
11,205.00	89.13	182.15	7,073.02	-4,608.45	339.19	4,620.18	2.41	0.09	2.41
11,299.00	90.81	182.37	7,073.06	-4,702.37	335.49	4,713.75	1.80	1.79	0.23
11,394.00	90.46	184.22	7,072.01	-4,797.20	330.03	4,808.13	1.98	-0.37	1.95
11,488.00	89.84	184.14	7,071.77	-4,890.95	323.17	4,901.36	0.67	-0.66	-0.09
11,583.00	90.32	183.34	7,071.63	-4,985.75	316.98	4,995.66	0.98	0.51	-0.84
11,677.00	91.43	182.90	7,070.20	-5,079.60	311.86	5,089.08	1.27	1.18	-0.47
11,771.00	89.70	183.43	7,069.27	-5,173.44	306.67	5,182.49	1.92	-1.84	0.56
11,866.00	90.41	183.03	7,069.18	-5,268.29	301.32	5,276.90	0.86	0.75	-0.42
<b>Final MWD Survey @ 11866'MD</b>									
11,942.00	90.41	183.03	7,068.64	-5,344.18	297.30	5,352.45	0.00	0.00	0.00
<b>PTD @ 11942'MD (501'FSL &amp; 1339'FEL)</b>									



Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well WS-SUNRISE C1-5-5
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25 @ 4666.00ft (P346)
<b>Site:</b>	Sec 32-T6N-R65W	<b>MD Reference:</b>	KB=25 @ 4666.00ft (P346)
<b>Well:</b>	WS-SUNRISE C1-5-5	<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

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,667.00	1,665.31	-16.19	46.19	First MWD Survey @ 1667'MD
6,782.71	6,741.48	-289.00	366.72	Enter Lease @ 6782.71'MD
7,214.97	7,000.05	-626.51	375.00	70°INC @ 7214.97'MD / 7000.05'TVD
7,344.24	7,032.75	-751.41	376.03	Hardline Crossing @ 7214.97'MD (460'FNL & 1326'FEL)
11,866.00	7,069.18	-5,268.29	301.32	Final MWD Survey @ 11866'MD
11,942.00	7,068.64	-5,344.18	297.30	PTD @ 11942'MD (501'FSL & 1339'FEL)

Checked By: _____	Approved By: _____	Date: _____
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