



Extraction Oil & Gas

Weld County, CO (NAD83)

Sec.19-T7N-R65W

WAAG 12

Wellbore #1 / Job #1523848

Survey: Phoenix MWD Surveys

Standard Survey Report

15 July, 2015

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well WAAG 12
Project:	Weld County, CO (NAD83)	TVD Reference:	RKB @ 4909.00usft (H&P 319)
Site:	Sec.19-T7N-R65W	MD Reference:	RKB @ 4909.00usft (H&P 319)
Well:	WAAG 12	North Reference:	True
Wellbore:	Wellbore #1 / Job #1523848	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (H&P 319)	Database:	Compass 5000 RMR

Project	Weld County, CO (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Sec.19-T7N-R65W				
Site Position:		Northing:	1,450,756.06 usft	Latitude:	40° 34' 4.935 N
From:	Map	Easting:	3,219,612.83 usft	Longitude:	104° 42' 34.213 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.51 °

Well	WAAG 12					
Well Position	+N/-S	0.00 usft	Northing:	1,448,275.07 usft	Latitude:	40° 33' 40.356 N
	+E/-W	0.00 usft	Easting:	3,220,338.91 usft	Longitude:	104° 42' 25.092 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level:	4,885.00 usft

Wellbore	Wellbore #1 / Job #1523848				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/25/2015	8.32	67.08	52,651

Design	Surveys (H&P 319)				
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	270.89	

Survey Program	Date	7/15/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
141.00	847.00	Newsco Surveys (Wellbore #1 / Job #1523	MWD		
939.00	11,868.00	Phoenix MWD Surveys (Wellbore #1 / Job	PHX+MWD+HDGM	PHX+MWD+HDGM	

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)	
847.00	1.00	131.10	846.71	0.98	-3.56	3.58	0.00	0.00	0.00	
Tie In to Newsco Surveys										
939.00	0.90	142.79	938.70	-0.13	-2.52	2.52	0.24	-0.11	12.71	
First Phoenix MWD Survey										
1,030.00	3.76	104.44	1,029.62	-1.44	0.80	-0.82	3.41	3.14	-42.14	
1,122.00	4.82	101.36	1,121.36	-2.95	7.51	-7.56	1.18	1.15	-3.35	
1,212.00	4.81	99.54	1,211.04	-4.33	14.94	-15.01	0.17	-0.01	-2.02	
1,303.00	4.64	100.80	1,301.73	-5.65	22.32	-22.40	0.22	-0.19	1.38	
1,485.00	4.16	105.85	1,483.20	-8.83	35.90	-36.03	0.34	-0.26	2.77	

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Wellbore:	Wellbore #1 / Job #1523848	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (H&P 319)	Database:	Compass 5000 RMR

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)	
1,577.00	3.88	95.28	1,574.97	-10.03	42.21	-42.36	0.86	-0.30	-11.49	
1,668.00	4.44	65.86	1,665.74	-8.87	48.49	-48.62	2.39	0.62	-32.33	
1,760.00	3.94	54.66	1,757.50	-5.59	54.32	-54.40	1.04	-0.54	-12.17	
1,943.00	2.16	43.44	1,940.23	0.56	61.82	-61.80	1.02	-0.97	-6.13	
2,035.00	1.62	60.85	2,032.18	2.45	64.15	-64.10	0.85	-0.59	18.92	
2,126.00	2.91	83.28	2,123.11	3.35	67.57	-67.51	1.69	1.42	24.65	
2,218.00	2.58	78.09	2,215.01	4.05	71.91	-71.84	0.45	-0.36	-5.64	
2,310.00	3.28	80.61	2,306.89	4.90	76.53	-76.45	0.77	0.76	2.74	
2,590.00	3.99	70.33	2,586.32	9.49	93.61	-93.45	0.34	0.25	-3.67	
2,684.00	3.45	61.39	2,680.13	11.94	99.17	-98.98	0.84	-0.57	-9.51	
2,779.00	3.74	72.33	2,774.94	14.25	104.63	-104.40	0.78	0.31	11.52	
2,873.00	5.24	88.67	2,868.65	15.28	111.85	-111.60	2.08	1.60	17.38	
2,967.00	4.97	85.76	2,962.28	15.68	120.20	-119.94	0.40	-0.29	-3.10	
3,061.00	4.61	81.91	3,055.95	16.52	128.00	-127.73	0.51	-0.38	-4.10	
3,250.00	3.34	75.27	3,244.49	18.99	140.84	-140.53	0.71	-0.67	-3.51	
3,344.00	4.12	96.53	3,338.30	19.30	146.85	-146.53	1.67	0.83	22.62	
3,439.00	4.94	106.11	3,433.00	17.77	154.17	-153.87	1.17	0.86	10.08	
3,533.00	4.00	104.26	3,526.72	15.84	161.23	-160.97	1.01	-1.00	-1.97	
3,627.00	3.72	107.01	3,620.50	14.14	167.33	-167.09	0.36	-0.30	2.93	
3,721.00	3.13	112.55	3,714.33	12.27	172.61	-172.40	0.72	-0.63	5.89	
3,816.00	2.89	115.29	3,809.20	10.25	177.18	-176.99	0.29	-0.25	2.88	
3,910.00	2.24	108.87	3,903.11	8.64	181.06	-180.90	0.75	-0.69	-6.83	
4,005.00	4.35	109.21	3,997.95	6.86	186.22	-186.09	2.22	2.22	0.36	
4,098.00	5.66	110.67	4,090.59	4.08	193.84	-193.75	1.42	1.41	1.57	
4,193.00	6.25	108.72	4,185.08	0.77	203.12	-203.08	0.66	0.62	-2.05	
4,287.00	6.07	108.30	4,278.53	-2.44	212.68	-212.70	0.20	-0.19	-0.45	
4,382.00	5.10	108.55	4,373.08	-5.36	221.46	-221.51	1.02	-1.02	0.26	
4,476.00	4.82	111.85	4,466.73	-8.16	229.08	-229.18	0.43	-0.30	3.51	
4,571.00	4.40	107.27	4,561.42	-10.72	236.27	-236.40	0.59	-0.44	-4.82	
4,665.00	3.62	102.44	4,655.19	-12.43	242.61	-242.77	0.90	-0.83	-5.14	
4,759.00	3.24	102.55	4,749.02	-13.65	248.10	-248.28	0.40	-0.40	0.12	
4,853.00	2.64	105.15	4,842.90	-14.79	252.78	-252.98	0.65	-0.64	2.77	
4,948.00	1.82	102.75	4,937.83	-15.70	256.36	-256.58	0.87	-0.86	-2.53	
5,042.00	1.35	90.08	5,031.79	-16.03	258.93	-259.14	0.62	-0.50	-13.48	
5,137.00	2.08	77.15	5,126.75	-15.65	261.73	-261.94	0.86	0.77	-13.61	
5,231.00	3.77	81.44	5,220.62	-14.81	266.45	-266.64	1.81	1.80	4.56	
5,325.00	3.14	85.73	5,314.45	-14.16	272.07	-272.26	0.72	-0.67	4.56	
5,419.00	4.83	81.39	5,408.22	-13.37	278.55	-278.72	1.83	1.80	-4.62	
5,514.00	3.91	90.83	5,502.94	-12.82	285.74	-285.91	1.23	-0.97	9.94	
5,608.00	3.08	87.06	5,596.77	-12.74	291.47	-291.63	0.92	-0.88	-4.01	
5,702.00	3.05	88.07	5,690.63	-12.52	296.49	-296.65	0.07	-0.03	1.07	
5,796.00	2.37	85.31	5,784.53	-12.28	300.93	-301.08	0.74	-0.72	-2.94	
5,890.00	1.74	84.75	5,878.47	-11.99	304.29	-304.44	0.67	-0.67	-0.60	

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5,985.00	3.12	90.59	5,973.38	-11.89	308.31	-308.46	1.47	1.45	6.15	
6,173.00	1.85	97.86	6,161.20	-12.35	316.43	-316.58	0.69	-0.68	3.87	
6,267.00	1.19	89.70	6,255.17	-12.56	318.91	-319.07	0.74	-0.70	-8.68	
6,361.00	0.59	82.03	6,349.15	-12.48	320.36	-320.52	0.65	-0.64	-8.16	
6,456.00	0.20	315.95	6,444.15	-12.30	320.73	-320.89	0.76	-0.41	-132.72	
6,550.00	1.33	286.74	6,538.14	-11.86	319.58	-319.72	1.23	1.20	-31.07	
6,645.00	12.27	277.32	6,632.33	-10.26	308.47	-308.60	11.54	11.52	-9.92	
6,739.00	23.50	281.94	6,721.65	-5.09	280.14	-280.18	12.03	11.95	4.91	
6,833.00	31.02	285.19	6,805.16	5.15	238.37	-238.26	8.15	8.00	3.46	
6,927.00	35.02	276.95	6,884.00	14.77	188.17	-187.92	6.39	4.26	-8.77	
7,022.00	44.14	263.58	6,957.27	14.37	128.00	-127.77	13.09	9.60	-14.07	
7,116.00	53.20	265.40	7,019.29	7.67	57.82	-57.69	9.75	9.64	1.94	
7,209.00	60.74	266.44	7,069.95	2.16	-19.90	19.93	8.16	8.11	1.12	
7,303.00	62.72	270.22	7,114.48	-0.23	-102.63	102.61	4.12	2.11	4.02	
7,398.00	71.67	273.26	7,151.27	2.51	-190.06	190.07	9.87	9.42	3.20	
7,460.00	83.33	274.01	7,164.66	6.35	-250.36	250.43	18.84	18.81	1.21	
7,484.00	86.06	276.06	7,166.88	8.44	-274.16	274.26	14.20	11.38	8.54	
7,578.00	88.83	275.92	7,171.07	18.24	-367.55	367.79	2.95	2.95	-0.15	
7,673.00	90.50	274.39	7,171.63	26.78	-462.15	462.52	2.38	1.76	-1.61	
7,767.00	90.92	272.34	7,170.46	32.30	-555.98	556.41	2.23	0.45	-2.18	
7,862.00	90.11	270.20	7,169.61	34.40	-650.95	651.40	2.41	-0.85	-2.25	
7,956.00	89.19	270.33	7,170.18	34.84	-744.94	745.39	0.99	-0.98	0.14	
8,050.00	88.99	270.21	7,171.68	35.28	-838.93	839.38	0.25	-0.21	-0.13	
8,144.00	90.42	270.28	7,172.16	35.68	-932.93	933.37	1.52	1.52	0.07	
8,239.00	88.57	269.48	7,173.00	35.48	-1,027.92	1,028.34	2.12	-1.95	-0.84	
8,334.00	87.90	268.58	7,175.92	33.87	-1,122.86	1,123.25	1.18	-0.71	-0.95	
8,428.00	87.65	268.35	7,179.57	31.36	-1,216.75	1,217.09	0.36	-0.27	-0.24	
8,522.00	88.99	268.67	7,182.33	28.91	-1,310.68	1,310.97	1.47	1.43	0.34	
8,617.00	90.78	269.52	7,182.52	27.41	-1,405.66	1,405.92	2.09	1.88	0.89	
8,711.00	91.17	270.07	7,180.92	27.08	-1,499.65	1,499.89	0.72	0.41	0.59	
8,806.00	90.22	269.98	7,179.77	27.12	-1,594.64	1,594.87	1.00	-1.00	-0.09	
8,900.00	88.74	269.94	7,180.62	27.05	-1,688.63	1,688.85	1.58	-1.57	-0.04	
8,994.00	90.22	270.08	7,181.47	27.07	-1,782.62	1,782.83	1.58	1.57	0.15	
9,089.00	88.85	270.27	7,182.25	27.36	-1,877.62	1,877.82	1.46	-1.44	0.20	
9,183.00	89.50	270.16	7,183.60	27.71	-1,971.61	1,971.80	0.70	0.69	-0.12	
9,278.00	88.69	269.29	7,185.10	27.26	-2,066.59	2,066.77	1.25	-0.85	-0.92	
9,372.00	88.85	270.08	7,187.12	26.74	-2,160.57	2,160.72	0.86	0.17	0.84	
9,466.00	88.88	270.48	7,188.98	27.20	-2,254.55	2,254.70	0.43	0.03	0.43	
9,561.00	89.69	271.30	7,190.17	28.68	-2,349.53	2,349.69	1.21	0.85	0.86	
9,654.00	90.39	272.00	7,190.10	31.35	-2,442.49	2,442.68	1.06	0.75	0.75	
9,749.00	89.83	272.23	7,189.92	34.86	-2,537.42	2,537.66	0.64	-0.59	0.24	
9,844.00	89.61	272.25	7,190.38	38.57	-2,632.35	2,632.63	0.23	-0.23	0.02	
9,938.00	89.33	272.52	7,191.25	42.48	-2,726.26	2,726.60	0.41	-0.30	0.29	
10,032.00	87.60	272.22	7,193.77	46.37	-2,820.15	2,820.53	1.87	-1.84	-0.32	

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10,126.00	87.71	271.92	7,197.62	49.76	-2,914.01	2,914.43	0.34	0.12	-0.32	
10,221.00	88.18	273.26	7,201.02	54.05	-3,008.85	3,009.32	1.49	0.49	1.41	
10,315.00	87.26	272.82	7,204.76	59.03	-3,102.64	3,103.18	1.08	-0.98	-0.47	
10,409.00	85.38	272.89	7,210.80	63.71	-3,196.32	3,196.93	2.00	-2.00	0.07	
10,504.00	84.45	271.73	7,219.22	67.52	-3,290.87	3,291.52	1.56	-0.98	-1.22	
10,598.00	89.33	271.44	7,224.31	70.12	-3,384.67	3,385.35	5.20	5.19	-0.31	
10,692.00	90.84	271.57	7,224.17	72.58	-3,478.63	3,479.34	1.61	1.61	0.14	
10,787.00	91.82	270.59	7,221.97	74.37	-3,573.59	3,574.31	1.46	1.03	-1.03	
10,881.00	94.20	270.91	7,217.03	75.60	-3,667.44	3,668.18	2.55	2.53	0.34	
10,975.00	93.83	270.56	7,210.45	76.81	-3,761.20	3,761.94	0.54	-0.39	-0.37	
11,069.00	91.06	269.47	7,206.44	76.83	-3,855.11	3,855.84	3.17	-2.95	-1.16	
11,164.00	89.83	268.27	7,205.70	74.96	-3,950.08	3,950.77	1.81	-1.29	-1.26	
11,258.00	91.43	268.97	7,204.67	72.69	-4,044.05	4,044.69	1.86	1.70	0.74	
11,352.00	87.65	267.72	7,205.43	69.98	-4,137.99	4,138.57	4.24	-4.02	-1.33	
11,447.00	86.89	267.24	7,209.95	65.81	-4,232.79	4,233.30	0.95	-0.80	-0.51	
11,541.00	87.71	267.93	7,214.38	61.85	-4,326.60	4,327.03	1.14	0.87	0.73	
11,635.00	87.73	267.95	7,218.12	58.47	-4,420.46	4,420.84	0.03	0.02	0.02	
11,729.00	89.02	268.12	7,220.78	55.25	-4,514.37	4,514.68	1.38	1.37	0.18	
11,798.00	89.27	268.75	7,221.81	53.37	-4,583.33	4,583.61	0.98	0.36	0.91	
Final Phoenix MWD Survey										
11,868.00	89.27	268.75	7,222.70	51.84	-4,653.31	4,653.55	0.00	0.00	0.00	
Projection to TD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
847.00	846.71	0.98	-3.56	Tie In to Newsco Surveys	
939.00	938.70	-0.13	-2.52	First Phoenix MWD Survey	
11,798.00	7,221.81	53.37	-4,583.33	Final Phoenix MWD Survey	
11,868.00	7,222.70	51.84	-4,653.31	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____