



Extraction Oil & Gas

Weld County, CO (NAD83)

Sec.19-T7N-R65W

WAAG 10

Wellbore #2 / Job# 1523846

Survey: Phoenix MWD Surveys

Standard Survey Report

02 August, 2015





Phoenix Technology Services LP

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well WAAG 10
Project:	Weld County, CO (NAD83)	TVD Reference:	RKB @ 4909.00usft (H&P319)
Site:	Sec.19-T7N-R65W	MD Reference:	RKB @ 4909.00usft (H&P319)
Well:	WAAG 10	North Reference:	True
Wellbore:	Wellbore #2 / Job# 1523846	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 10					
Well Position	+N/-S	0.00 usft	Northing:	1,448,333.38 usft	Latitude:	40° 33' 40.932 N
	+E/-W	0.00 usft	Easting:	3,220,341.16 usft	Longitude:	104° 42' 25.056 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,885.00 usft

Wellbore	Wellbore #2 / Job# 1523846				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/28/2015	8.33	67.10	52,680

Design	Surveys (H&P 319)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	6,520.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	276.19	

Survey Program	Date	8/2/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
141.00	820.00	Newsco Surveys (Wellbore #1 / Job #1523	MWD		
908.00	6,520.00	Phoenix MWD Surveys (Wellbore #1 / Job	PHX+MWD+HDGM	PHX+MWD+HDGM	
6,614.00	12,050.00	Phoenix MWD Surveys (Wellbore #2 / 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)	
6,520.00	3.79	26.95	6,493.01	414.19	326.68	-280.11	0.00	0.00	0.00	
Tie In to WB1										
6,614.00	0.24	346.92	6,586.94	417.15	328.04	-281.15	3.84	-3.78	-42.59	
First Phoenix MWD Survey WB2										
6,709.00	8.07	241.58	6,681.63	414.16	322.12	-275.59	8.57	8.24	-110.88	
6,803.00	16.13	266.20	6,773.52	410.15	303.25	-257.26	10.00	8.57	26.19	
6,897.00	21.84	272.23	6,862.38	409.96	272.72	-226.93	6.42	6.07	6.41	
6,992.00	28.23	274.75	6,948.41	412.51	232.63	-186.79	6.82	6.73	2.65	

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Well:	WAAG 10	North Reference:	True
Wellbore:	Wellbore #2 / Job# 1523846	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)
7,085.00	35.88	274.03	7,027.17	416.26	183.45	-137.50	8.24	8.23	-0.77
7,179.00	38.86	262.73	7,101.96	414.46	126.64	-81.21	7.94	3.17	-12.02
7,274.00	48.24	266.66	7,170.75	408.61	61.55	-17.13	10.27	9.87	4.14
7,368.00	55.46	271.89	7,228.80	407.84	-12.27	56.18	8.84	7.68	5.56
7,462.00	61.90	271.78	7,277.64	410.41	-92.49	136.21	6.85	6.85	-0.12
7,556.00	67.56	272.56	7,317.75	413.64	-177.40	220.97	6.07	6.02	0.83
7,650.00	77.94	271.91	7,345.59	417.12	-266.98	310.40	11.06	11.04	-0.69
7,683.00	83.05	272.24	7,351.03	418.30	-299.50	342.85	15.52	15.48	1.00
7,773.00	89.27	273.51	7,357.06	422.81	-389.14	432.46	7.05	6.91	1.41
7,868.00	88.01	271.61	7,359.31	427.05	-484.01	527.23	2.40	-1.33	-2.00
7,962.00	90.56	272.89	7,360.49	430.74	-577.92	620.99	3.04	2.71	1.36
8,056.00	88.41	270.87	7,361.33	433.82	-671.85	714.71	3.14	-2.29	-2.15
8,151.00	90.45	270.96	7,362.28	435.34	-766.83	809.30	2.15	2.15	0.09
8,245.00	90.50	270.24	7,361.50	436.32	-860.82	902.85	0.77	0.05	-0.77
8,340.00	89.58	269.56	7,361.43	436.16	-955.82	997.28	1.20	-0.97	-0.72
8,434.00	90.31	269.84	7,361.52	435.66	-1,049.82	1,090.67	0.83	0.78	0.30
8,528.00	89.86	269.23	7,361.38	434.90	-1,143.81	1,184.04	0.81	-0.48	-0.65
8,623.00	91.20	270.25	7,360.50	434.47	-1,238.81	1,278.43	1.77	1.41	1.07
8,717.00	89.86	271.89	7,359.63	436.23	-1,332.78	1,372.05	2.25	-1.43	1.74
8,812.00	87.93	272.36	7,361.46	439.75	-1,427.69	1,466.78	2.09	-2.03	0.49
8,906.00	88.80	272.95	7,364.15	444.10	-1,521.55	1,560.57	1.12	0.93	0.63
9,000.00	88.35	272.85	7,366.48	448.85	-1,615.40	1,654.38	0.49	-0.48	-0.11
9,095.00	89.41	273.74	7,368.34	454.31	-1,710.22	1,749.24	1.46	1.12	0.94
9,189.00	89.53	273.99	7,369.21	460.65	-1,804.01	1,843.16	0.29	0.13	0.27
9,283.00	87.51	273.31	7,371.64	466.63	-1,897.78	1,937.03	2.27	-2.15	-0.72
9,378.00	87.96	273.15	7,375.39	471.98	-1,992.55	2,031.83	0.50	0.47	-0.17
9,472.00	88.01	272.40	7,378.70	476.53	-2,086.39	2,125.60	0.80	0.05	-0.80
9,566.00	90.14	272.41	7,380.22	480.47	-2,180.28	2,219.38	2.27	2.27	0.01
9,661.00	92.74	272.60	7,377.83	484.62	-2,275.16	2,314.15	2.74	2.74	0.20
9,755.00	94.96	271.17	7,371.52	487.71	-2,368.88	2,407.66	2.81	2.36	-1.52
9,850.00	92.10	270.86	7,365.67	489.39	-2,463.68	2,502.08	3.03	-3.01	-0.33
9,944.00	89.72	268.69	7,364.17	489.02	-2,557.65	2,595.47	3.43	-2.53	-2.31
10,038.00	90.22	265.49	7,364.22	484.25	-2,651.52	2,688.28	3.45	0.53	-3.40
10,132.00	87.93	267.60	7,365.74	478.58	-2,745.33	2,780.92	3.31	-2.44	2.24
10,226.00	88.71	268.01	7,368.50	474.98	-2,839.22	2,873.88	0.94	0.83	0.44
10,321.00	88.41	268.91	7,370.88	472.43	-2,934.15	2,967.98	1.00	-0.32	0.95
10,415.00	87.85	268.41	7,373.95	470.23	-3,028.07	3,061.12	0.80	-0.60	-0.53
10,509.00	87.43	267.53	7,377.82	466.91	-3,121.93	3,154.08	1.04	-0.45	-0.94
10,604.00	89.16	271.15	7,380.65	465.82	-3,216.87	3,248.34	4.22	1.82	3.81
10,698.00	88.91	271.24	7,382.23	467.78	-3,310.83	3,341.97	0.28	-0.27	0.10
10,793.00	89.02	271.39	7,383.95	469.96	-3,405.79	3,436.61	0.20	0.12	0.16
10,887.00	89.08	271.64	7,385.51	472.44	-3,499.75	3,530.28	0.27	0.06	0.27
10,981.00	88.74	271.55	7,387.30	475.06	-3,593.69	3,623.96	0.37	-0.36	-0.10
11,075.00	88.46	271.96	7,389.59	477.93	-3,687.62	3,717.65	0.53	-0.30	0.44



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Survey Report



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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)
11,170.00	88.99	272.03	7,391.71	481.24	-3,782.54	3,812.38	0.56	0.56	0.07
11,264.00	87.82	271.79	7,394.32	484.37	-3,876.45	3,906.08	1.27	-1.24	-0.26
11,358.00	85.39	271.06	7,399.89	486.71	-3,970.25	3,999.58	2.70	-2.59	-0.78
11,453.00	89.64	272.74	7,404.01	489.85	-4,065.08	4,094.20	4.81	4.47	1.77
11,547.00	90.45	273.33	7,403.93	494.83	-4,158.95	4,188.06	1.07	0.86	0.63
11,641.00	89.89	273.06	7,403.65	500.07	-4,252.80	4,281.93	0.66	-0.60	-0.29
11,735.00	89.89	273.06	7,403.84	505.09	-4,346.67	4,375.79	0.00	0.00	0.00
11,830.00	89.69	273.27	7,404.18	510.33	-4,441.52	4,470.65	0.31	-0.21	0.22
11,924.00	89.86	275.22	7,404.55	517.29	-4,535.26	4,564.59	2.08	0.18	2.07
11,980.00	89.30	274.69	7,404.96	522.13	-4,591.05	4,620.58	1.38	-1.00	-0.95
Final Phoenix MWD Survey WB2									
12,050.00	89.30	274.69	7,405.82	527.85	-4,660.81	4,690.55	0.00	0.00	0.00
Projection to TD WB2									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,520.00	6,493.01	414.19	326.68	Tie In to WB1
6,614.00	6,586.94	417.15	328.04	First Phoenix MWD Survey WB2
11,980.00	7,404.96	522.13	-4,591.05	Final Phoenix MWD Survey WB2
12,050.00	7,405.82	527.85	-4,660.81	Projection to TD WB2

Checked By: _____	Approved By: _____	Date: _____
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