

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N  
1N-67W-22 Marrs 6-22HZ Pad  
MARRS 28N-10HZ**

**Plan A**

**Plan: Permit Rev-1**

## **Standard Survey Report**

**15 March, 2016**

Project: WELD-NAD83-UTMFT13N  
Site: 1N-67W-22 Marrs 6-22HZ Pad  
Well: MARRS 28N-10HZ  
Wellbore: Plan A  
Design: Permit Rev-1

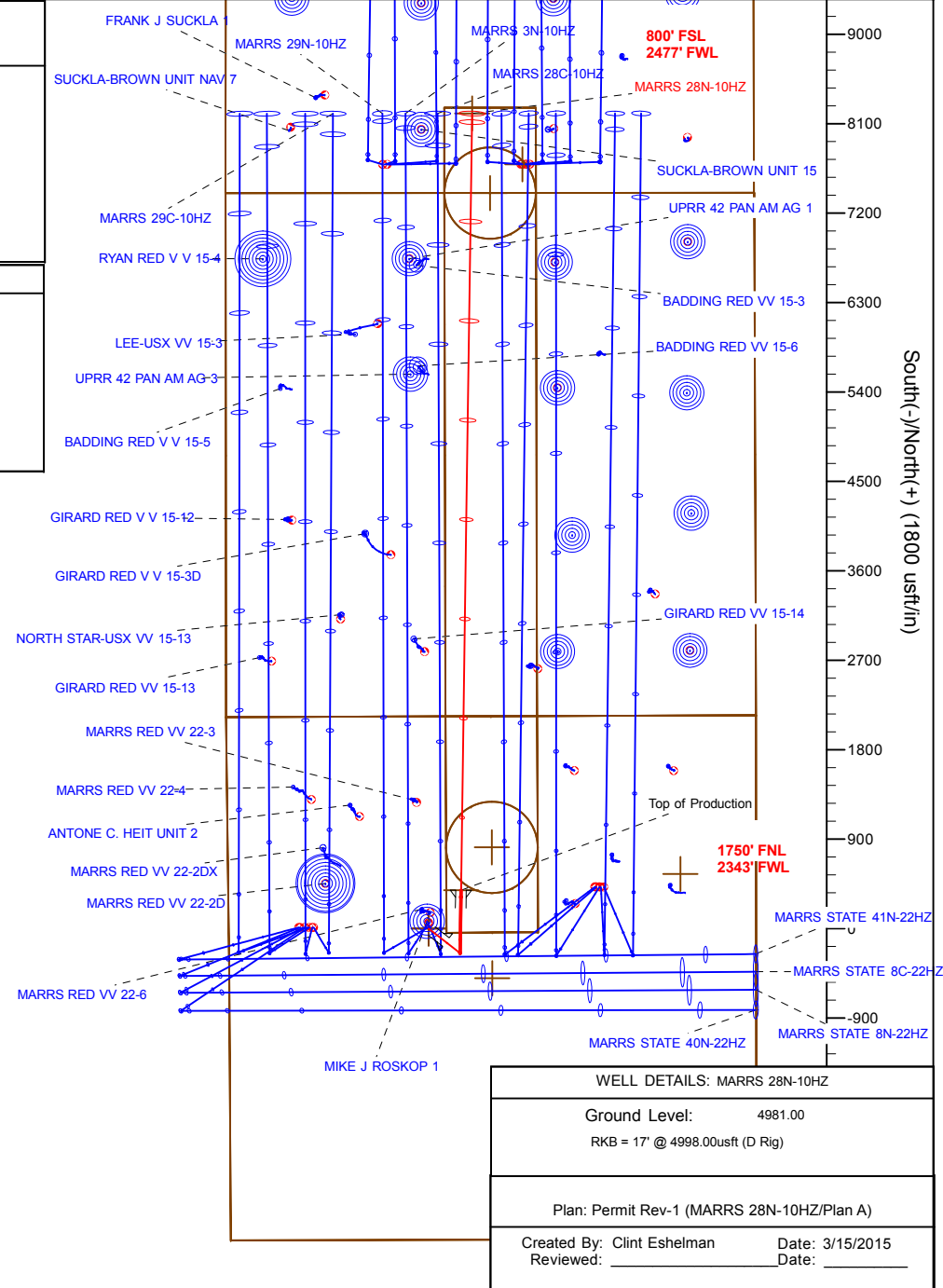
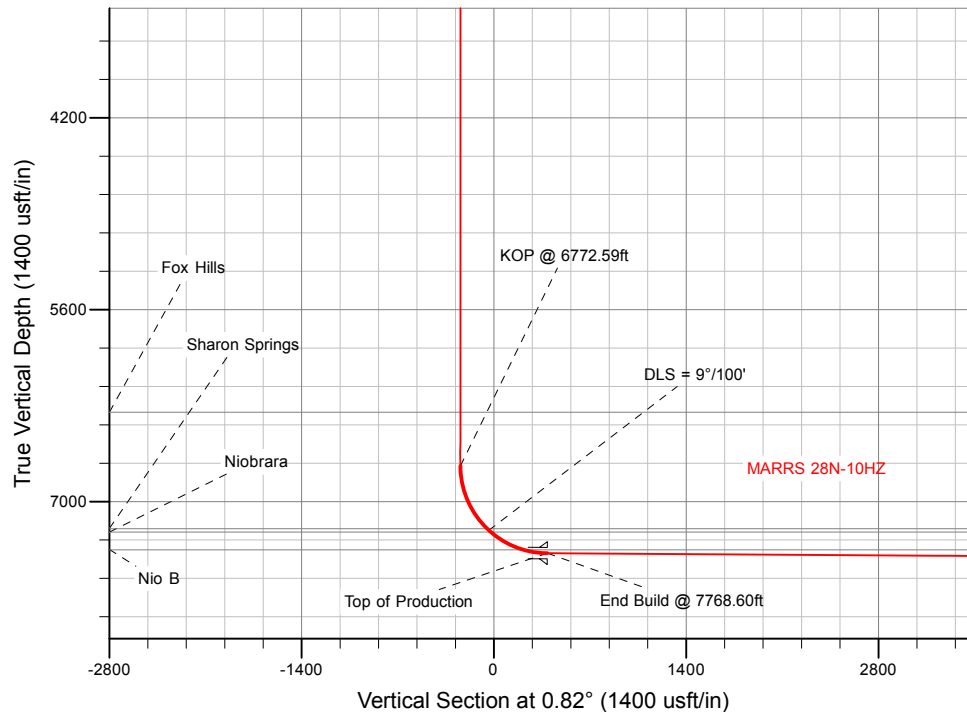
# US ROCKIES WATTENBERG PLANNING

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	866.67	10.00	128.00	863.29	-35.73	45.73	1.50	128.00	-35.07	
4	2596.67	10.00	128.00	2567.00	-220.68	282.46	0.00	0.00	-216.61	
5	3096.67	0.00	0.00	3064.47	-247.47	316.75	2.00	180.00	-242.92	
6	6772.59	0.00	0.00	6740.39	-247.47	316.75	0.00	0.00	-242.92	
7	7768.60	89.64	0.82	7377.00	385.09	325.76	9.00	0.82	389.71	
8	15587.16	89.64	0.82	7426.00	8202.71	437.15	0.00	0.00	8208.13	MARRS 28N-10HZ_TOE

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
MARRS 28N-10HZ_SHL	0.00	0.00	0.00	40.037946	-104.879030	Point
MARRS 28N-10HZ_TOE	7426.00	8202.71	437.15	40.060472	-104.877468	Point



# Anadarko

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 Marrs 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

<b>Project</b>	WELD-NAD83-UTMFT13N		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

Site		1N-67W-22 Marrs 6-22HZ Pad			
Site Position:		Northing:	14,540,634.27 usft	Latitude:	40.038111
From:	Lat/Long	Easting:	1,674,276.15 usft	Longitude:	-104.879028
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.08 °

Well	MARRS 28N-10HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,540,574.18 usft	Latitude:	40.037946
	+E/-W	0.00 usft	Easting:	1,674,275.67 usft	Longitude:	-104.879030
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,981.00 usft

<b>Wellbore</b>	Plan A				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	3/10/2016	8.26	66.58	52,429

<b>Design</b>	Permit Rev-1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	0.82	

<b>Survey Tool Program</b>	<b>Date</b>	3/15/2016			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.00	1,800.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,800.00	15,587.16	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	

<b>Planned 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	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Begin Nudge @ 200.00ft</b>										
300.00	1.50	128.00	299.99	-0.81	1.03	-0.79	1.50	1.50	0.00	
400.00	3.00	128.00	399.91	-3.22	4.13	-3.16	1.50	1.50	0.00	
500.00	4.50	128.00	499.69	-7.25	9.28	-7.12	1.50	1.50	0.00	
600.00	6.00	128.00	599.27	-12.88	16.49	-12.65	1.50	1.50	0.00	
700.00	7.50	128.00	698.57	-20.12	25.75	-19.75	1.50	1.50	0.00	
800.00	9.00	128.00	797.54	-28.95	37.06	-28.42	1.50	1.50	0.00	

# Anadarko

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 Marrs 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

### Planned 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)
866.67	10.00	128.00	863.29	-35.73	45.73	-35.07	1.50	1.50	0.00
<b>End Nudge @ 866.67ft</b>									
900.00	10.00	128.00	896.11	-39.29	50.29	-38.57	0.00	0.00	0.00
1,000.00	10.00	128.00	994.59	-49.98	63.97	-49.06	0.00	0.00	0.00
1,100.00	10.00	128.00	1,093.08	-60.67	77.66	-59.55	0.00	0.00	0.00
1,200.00	10.00	128.00	1,191.56	-71.36	91.34	-70.05	0.00	0.00	0.00
1,300.00	10.00	128.00	1,290.04	-82.05	105.02	-80.54	0.00	0.00	0.00
1,400.00	10.00	128.00	1,388.52	-92.74	118.71	-91.04	0.00	0.00	0.00
1,500.00	10.00	128.00	1,487.00	-103.44	132.39	-101.53	0.00	0.00	0.00
1,600.00	10.00	128.00	1,585.48	-114.13	146.08	-112.02	0.00	0.00	0.00
1,700.00	10.00	128.00	1,683.96	-124.82	159.76	-122.52	0.00	0.00	0.00
1,800.00	10.00	128.00	1,782.44	-135.51	173.44	-133.01	0.00	0.00	0.00
1,817.83	10.00	128.00	1,800.00	-137.41	175.88	-134.88	0.00	0.00	0.00
<b>9 5/8"</b>									
1,900.00	10.00	128.00	1,880.92	-146.20	187.13	-143.51	0.00	0.00	0.00
2,000.00	10.00	128.00	1,979.40	-156.89	200.81	-154.00	0.00	0.00	0.00
2,100.00	10.00	128.00	2,077.88	-167.58	214.49	-164.49	0.00	0.00	0.00
2,200.00	10.00	128.00	2,176.36	-178.27	228.18	-174.99	0.00	0.00	0.00
2,300.00	10.00	128.00	2,274.85	-188.96	241.86	-185.48	0.00	0.00	0.00
2,400.00	10.00	128.00	2,373.33	-199.65	255.54	-195.98	0.00	0.00	0.00
2,500.00	10.00	128.00	2,471.81	-210.34	269.23	-206.47	0.00	0.00	0.00
2,596.67	10.00	128.00	2,567.01	-220.68	282.46	-216.61	0.00	0.00	0.00
<b>Begin Drop @ 2596.67ft</b>									
2,600.00	9.93	128.00	2,570.29	-221.03	282.91	-216.96	2.00	-2.00	0.00
2,700.00	7.93	128.00	2,669.07	-230.59	295.15	-226.35	2.00	-2.00	0.00
2,800.00	5.93	128.00	2,768.33	-238.03	304.66	-233.64	2.00	-2.00	0.00
2,900.00	3.93	128.00	2,867.96	-243.32	311.43	-238.84	2.00	-2.00	0.00
3,000.00	1.93	128.00	2,967.82	-246.47	315.47	-241.93	2.00	-2.00	0.00
3,096.67	0.00	0.00	3,064.47	-247.47	316.75	-242.92	2.00	-2.00	0.00
<b>End Drop @ 3096.67ft</b>									
3,100.00	0.00	0.00	3,067.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,200.00	0.00	0.00	3,167.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,300.00	0.00	0.00	3,267.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,400.00	0.00	0.00	3,367.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,500.00	0.00	0.00	3,467.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,600.00	0.00	0.00	3,567.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,700.00	0.00	0.00	3,667.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,800.00	0.00	0.00	3,767.80	-247.47	316.75	-242.92	0.00	0.00	0.00
3,900.00	0.00	0.00	3,867.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,000.00	0.00	0.00	3,967.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,100.00	0.00	0.00	4,067.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,200.00	0.00	0.00	4,167.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,300.00	0.00	0.00	4,267.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,400.00	0.00	0.00	4,367.80	-247.47	316.75	-242.92	0.00	0.00	0.00

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## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 Marrs 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

### Planned 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)
4,500.00	0.00	0.00	4,467.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,600.00	0.00	0.00	4,567.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,700.00	0.00	0.00	4,667.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,800.00	0.00	0.00	4,767.80	-247.47	316.75	-242.92	0.00	0.00	0.00
4,900.00	0.00	0.00	4,867.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,000.00	0.00	0.00	4,967.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,100.00	0.00	0.00	5,067.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,200.00	0.00	0.00	5,167.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,300.00	0.00	0.00	5,267.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,400.00	0.00	0.00	5,367.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,500.00	0.00	0.00	5,467.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,600.00	0.00	0.00	5,567.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,700.00	0.00	0.00	5,667.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,800.00	0.00	0.00	5,767.80	-247.47	316.75	-242.92	0.00	0.00	0.00
5,900.00	0.00	0.00	5,867.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,000.00	0.00	0.00	5,967.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,100.00	0.00	0.00	6,067.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,200.00	0.00	0.00	6,167.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,300.00	0.00	0.00	6,267.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,380.20	0.00	0.00	6,348.00	-247.47	316.75	-242.92	0.00	0.00	0.00
<b>Fox Hills</b>									
6,400.00	0.00	0.00	6,367.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,500.00	0.00	0.00	6,467.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,600.00	0.00	0.00	6,567.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,700.00	0.00	0.00	6,667.80	-247.47	316.75	-242.92	0.00	0.00	0.00
6,772.59	0.00	0.00	6,740.39	-247.47	316.75	-242.92	0.00	0.00	0.00
<b>KOP @ 6772.59ft</b>									
6,800.00	2.47	0.82	6,767.79	-246.88	316.76	-242.33	9.00	9.00	0.00
6,900.00	11.47	0.82	6,866.95	-234.77	316.93	-230.21	9.00	9.00	0.00
7,000.00	20.47	0.82	6,963.00	-207.29	317.32	-202.73	9.00	9.00	0.00
7,100.00	29.47	0.82	7,053.56	-165.13	317.93	-160.56	9.00	9.00	0.00
7,200.00	38.47	0.82	7,136.41	-109.32	318.72	-104.75	9.00	9.00	0.00
7,283.21	45.96	0.82	7,198.00	-53.45	319.52	-48.88	9.00	9.00	0.00
<b>Sharon Springs</b>									
7,300.00	47.47	0.82	7,209.51	-41.24	319.69	-36.66	9.00	9.00	0.00
<b>DLS = 9°/100'</b>									
7,320.31	49.30	0.82	7,223.00	-26.05	319.91	-21.47	9.00	9.00	0.00
<b>Niobrara</b>									
7,400.00	56.47	0.82	7,271.06	37.44	320.81	42.03	9.00	9.00	0.00
7,500.00	65.47	0.82	7,319.54	124.77	322.06	129.37	9.00	9.00	0.00
7,589.98	73.57	0.82	7,351.00	208.99	323.26	213.59	9.00	9.00	0.00
<b>Nio B</b>									
7,600.00	74.47	0.82	7,353.76	218.62	323.39	223.22	9.00	9.00	0.00
7,700.00	83.47	0.82	7,372.88	316.66	324.79	321.27	9.00	9.00	0.00

# Anadarko

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 MARRS 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

### Planned 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)
7,768.60	89.64	0.82	7,377.00	385.10	325.76	389.72	9.00	9.00	0.00
<b>End Build @ 7768.60ft - Top of Production</b>									
7,800.00	89.64	0.82	7,377.19	416.49	326.21	421.12	0.00	0.00	0.00
7,900.00	89.64	0.82	7,377.82	516.48	327.64	521.12	0.00	0.00	0.00
8,000.00	89.64	0.82	7,378.45	616.47	329.06	621.11	0.00	0.00	0.00
8,100.00	89.64	0.82	7,379.07	716.46	330.49	721.11	0.00	0.00	0.00
8,200.00	89.64	0.82	7,379.70	816.44	331.91	821.11	0.00	0.00	0.00
8,300.00	89.64	0.82	7,380.33	916.43	333.34	921.11	0.00	0.00	0.00
8,400.00	89.64	0.82	7,380.95	1,016.42	334.76	1,021.11	0.00	0.00	0.00
8,500.00	89.64	0.82	7,381.58	1,116.41	336.18	1,121.10	0.00	0.00	0.00
8,600.00	89.64	0.82	7,382.21	1,216.39	337.61	1,221.10	0.00	0.00	0.00
8,700.00	89.64	0.82	7,382.83	1,316.38	339.03	1,321.10	0.00	0.00	0.00
8,800.00	89.64	0.82	7,383.46	1,416.37	340.46	1,421.10	0.00	0.00	0.00
8,900.00	89.64	0.82	7,384.09	1,516.36	341.88	1,521.10	0.00	0.00	0.00
9,000.00	89.64	0.82	7,384.72	1,616.35	343.31	1,621.09	0.00	0.00	0.00
9,100.00	89.64	0.82	7,385.34	1,716.33	344.73	1,721.09	0.00	0.00	0.00
9,200.00	89.64	0.82	7,385.97	1,816.32	346.16	1,821.09	0.00	0.00	0.00
9,300.00	89.64	0.82	7,386.60	1,916.31	347.58	1,921.09	0.00	0.00	0.00
9,400.00	89.64	0.82	7,387.22	2,016.30	349.01	2,021.09	0.00	0.00	0.00
9,500.00	89.64	0.82	7,387.85	2,116.29	350.43	2,121.08	0.00	0.00	0.00
9,600.00	89.64	0.82	7,388.48	2,216.27	351.86	2,221.08	0.00	0.00	0.00
9,700.00	89.64	0.82	7,389.10	2,316.26	353.28	2,321.08	0.00	0.00	0.00
9,800.00	89.64	0.82	7,389.73	2,416.25	354.70	2,421.08	0.00	0.00	0.00
9,900.00	89.64	0.82	7,390.36	2,516.24	356.13	2,521.08	0.00	0.00	0.00
10,000.00	89.64	0.82	7,390.98	2,616.22	357.55	2,621.07	0.00	0.00	0.00
10,100.00	89.64	0.82	7,391.61	2,716.21	358.98	2,721.07	0.00	0.00	0.00
10,200.00	89.64	0.82	7,392.24	2,816.20	360.40	2,821.07	0.00	0.00	0.00
10,300.00	89.64	0.82	7,392.86	2,916.19	361.83	2,921.07	0.00	0.00	0.00
10,400.00	89.64	0.82	7,393.49	3,016.18	363.25	3,021.07	0.00	0.00	0.00
10,500.00	89.64	0.82	7,394.12	3,116.16	364.68	3,121.06	0.00	0.00	0.00
10,600.00	89.64	0.82	7,394.74	3,216.15	366.10	3,221.06	0.00	0.00	0.00
10,700.00	89.64	0.82	7,395.37	3,316.14	367.53	3,321.06	0.00	0.00	0.00
10,800.00	89.64	0.82	7,396.00	3,416.13	368.95	3,421.06	0.00	0.00	0.00
10,900.00	89.64	0.82	7,396.62	3,516.12	370.38	3,521.06	0.00	0.00	0.00
11,000.00	89.64	0.82	7,397.25	3,616.10	371.80	3,621.05	0.00	0.00	0.00
11,100.00	89.64	0.82	7,397.88	3,716.09	373.22	3,721.05	0.00	0.00	0.00
11,200.00	89.64	0.82	7,398.50	3,816.08	374.65	3,821.05	0.00	0.00	0.00
11,300.00	89.64	0.82	7,399.13	3,916.07	376.07	3,921.05	0.00	0.00	0.00
11,400.00	89.64	0.82	7,399.76	4,016.06	377.50	4,021.05	0.00	0.00	0.00
11,500.00	89.64	0.82	7,400.38	4,116.04	378.92	4,121.04	0.00	0.00	0.00
11,600.00	89.64	0.82	7,401.01	4,216.03	380.35	4,221.04	0.00	0.00	0.00
11,700.00	89.64	0.82	7,401.64	4,316.02	381.77	4,321.04	0.00	0.00	0.00
11,800.00	89.64	0.82	7,402.26	4,416.01	383.20	4,421.04	0.00	0.00	0.00
11,900.00	89.64	0.82	7,402.89	4,515.99	384.62	4,521.04	0.00	0.00	0.00

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## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 Marrs 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

### Planned 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)
12,000.00	89.64	0.82	7,403.52	4,615.98	386.05	4,621.03	0.00	0.00	0.00
12,100.00	89.64	0.82	7,404.14	4,715.97	387.47	4,721.03	0.00	0.00	0.00
12,200.00	89.64	0.82	7,404.77	4,815.96	388.90	4,821.03	0.00	0.00	0.00
12,300.00	89.64	0.82	7,405.40	4,915.95	390.32	4,921.03	0.00	0.00	0.00
12,400.00	89.64	0.82	7,406.02	5,015.93	391.74	5,021.03	0.00	0.00	0.00
12,500.00	89.64	0.82	7,406.65	5,115.92	393.17	5,121.02	0.00	0.00	0.00
12,600.00	89.64	0.82	7,407.28	5,215.91	394.59	5,221.02	0.00	0.00	0.00
12,700.00	89.64	0.82	7,407.90	5,315.90	396.02	5,321.02	0.00	0.00	0.00
12,800.00	89.64	0.82	7,408.53	5,415.89	397.44	5,421.02	0.00	0.00	0.00
12,900.00	89.64	0.82	7,409.16	5,515.87	398.87	5,521.02	0.00	0.00	0.00
13,000.00	89.64	0.82	7,409.79	5,615.86	400.29	5,621.02	0.00	0.00	0.00
13,100.00	89.64	0.82	7,410.41	5,715.85	401.72	5,721.01	0.00	0.00	0.00
13,200.00	89.64	0.82	7,411.04	5,815.84	403.14	5,821.01	0.00	0.00	0.00
13,300.00	89.64	0.82	7,411.67	5,915.83	404.57	5,921.01	0.00	0.00	0.00
13,400.00	89.64	0.82	7,412.29	6,015.81	405.99	6,021.01	0.00	0.00	0.00
13,500.00	89.64	0.82	7,412.92	6,115.80	407.42	6,121.01	0.00	0.00	0.00
13,600.00	89.64	0.82	7,413.55	6,215.79	408.84	6,221.00	0.00	0.00	0.00
13,700.00	89.64	0.82	7,414.17	6,315.78	410.27	6,321.00	0.00	0.00	0.00
13,800.00	89.64	0.82	7,414.80	6,415.76	411.69	6,421.00	0.00	0.00	0.00
13,900.00	89.64	0.82	7,415.43	6,515.75	413.11	6,521.00	0.00	0.00	0.00
14,000.00	89.64	0.82	7,416.05	6,615.74	414.54	6,621.00	0.00	0.00	0.00
14,100.00	89.64	0.82	7,416.68	6,715.73	415.96	6,720.99	0.00	0.00	0.00
14,200.00	89.64	0.82	7,417.31	6,815.72	417.39	6,820.99	0.00	0.00	0.00
14,300.00	89.64	0.82	7,417.93	6,915.70	418.81	6,920.99	0.00	0.00	0.00
14,400.00	89.64	0.82	7,418.56	7,015.69	420.24	7,020.99	0.00	0.00	0.00
14,500.00	89.64	0.82	7,419.19	7,115.68	421.66	7,120.99	0.00	0.00	0.00
14,600.00	89.64	0.82	7,419.81	7,215.67	423.09	7,220.98	0.00	0.00	0.00
14,700.00	89.64	0.82	7,420.44	7,315.66	424.51	7,320.98	0.00	0.00	0.00
14,800.00	89.64	0.82	7,421.07	7,415.64	425.94	7,420.98	0.00	0.00	0.00
14,900.00	89.64	0.82	7,421.69	7,515.63	427.36	7,520.98	0.00	0.00	0.00
15,000.00	89.64	0.82	7,422.32	7,615.62	428.79	7,620.98	0.00	0.00	0.00
15,100.00	89.64	0.82	7,422.95	7,715.61	430.21	7,720.97	0.00	0.00	0.00
15,200.00	89.64	0.82	7,423.57	7,815.60	431.63	7,820.97	0.00	0.00	0.00
15,300.00	89.64	0.82	7,424.20	7,915.58	433.06	7,920.97	0.00	0.00	0.00
15,400.00	89.64	0.82	7,424.83	8,015.57	434.48	8,020.97	0.00	0.00	0.00
15,500.00	89.64	0.82	7,425.45	8,115.56	435.91	8,120.97	0.00	0.00	0.00
15,586.33	89.64	0.82	7,425.99	8,201.87	437.14	8,207.29	0.00	0.00	0.00
TD Well @ 15586.33ft									
15,587.16	89.64	0.82	7,426.00	8,202.71	437.15	8,208.13	0.00	0.00	0.00

# Anadarko

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 Marrs 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

### Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
MARRS 28N-10HZ_Hee - plan misses target center by 506.55usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	385.99	328.03	14,540,960.62	1,674,603.18	40.039006	-104.877858
MARRS 28N-10HZ_460 - plan misses target center by 7423.33usft at 14741.66usft MD (7420.70 TVD, 7357.31 N, 425.10 E) - Circle (radius 460.00)	0.00	0.00	0.00	7,401.08	617.88	14,547,976.10	1,674,883.50	40.058271	-104.876822
MARRS 28N-10HZ_SHL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,540,574.18	1,674,275.67	40.037946	-104.879030
MARRS 28N-10HZ_Har - plan hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	14,540,574.18	1,674,275.67	40.037946	-104.879030
Point 1		0.00	-42.43	180.07		14,540,532.00	1,674,455.80		
Point 2		0.00	815.08	175.93		14,541,389.50	1,674,450.50		
Point 3		0.00	2,132.99	169.62		14,542,707.40	1,674,442.40		
Point 4		0.00	3,449.49	166.61		14,544,023.90	1,674,437.60		
Point 5		0.00	4,766.30	163.60		14,545,340.70	1,674,432.80		
Point 6		0.00	6,083.40	160.99		14,546,657.80	1,674,428.40		
Point 7		0.00	7,400.61	157.88		14,547,975.00	1,674,423.50		
Point 8		0.00	8,261.31	157.15		14,548,835.70	1,674,421.60		
Point 9		0.00	8,261.68	617.15		14,548,836.70	1,674,881.60		
Point 10		0.00	8,261.96	1,077.15		14,548,837.60	1,675,341.60		
Point 11		0.00	7,401.36	1,077.88		14,547,977.00	1,675,343.50		
Point 12		0.00	6,086.25	1,080.99		14,546,661.90	1,675,348.40		
Point 13		0.00	4,771.35	1,083.61		14,545,347.00	1,675,352.80		
Point 14		0.00	3,452.44	1,086.62		14,544,028.10	1,675,357.60		
Point 15		0.00	2,135.14	1,089.63		14,542,710.80	1,675,362.40		
Point 16		0.00	818.53	1,095.94		14,541,394.20	1,675,370.50		
Point 17		0.00	-38.58	1,100.07		14,540,537.10	1,675,375.80		
Point 18		0.00	-40.26	640.07		14,540,534.80	1,674,915.80		
Point 19		0.00	-42.43	180.07		14,540,532.00	1,674,455.80		
MARRS 28N-10HZ_460 - plan misses target center by 1035.21usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Circle (radius 460.00)	0.00	0.00	0.00	816.85	635.94	14,541,391.90	1,674,910.50	40.040189	-104.876758
1N-R67W-Sec. 22_Secti - plan misses target center by 811.88usft at 13.00usft MD (13.00 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	13.00	-500.27	639.44	14,540,074.78	1,674,915.79	40.036572	-104.876746
Point 1		13.00	2,627.78	-2,674.22		14,542,698.93	1,672,238.00		
Point 2		13.00	2,636.63	-12.49		14,542,711.39	1,674,899.72		
Point 3		13.00	2,645.60	2,649.28		14,542,723.98	1,677,561.47		
Point 4		13.00	9.73	2,650.67		14,540,088.11	1,677,566.44		
Point 5		13.00	-2,626.39	2,652.38		14,537,452.00	1,677,571.73		
Point 6		13.00	-2,631.96	12.48		14,537,442.84	1,674,931.84		
Point 7		13.00	-2,637.68	-2,626.99		14,537,433.53	1,672,292.39		
Point 8		13.00	-9.70	-2,642.90		14,540,061.49	1,672,272.91		
1N-R67W-Sec. 15_Secti - plan misses target center by 2588.12usft at 13.00usft MD (13.00 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	13.00	549.62	2,529.09	14,541,127.24	1,676,804.01	40.039455	-104.869994
Point 1		13.00	6,851.58	-4,568.26		14,547,972.61	1,672,226.45		
Point 2		13.00	6,853.93	-1,913.35		14,547,978.57	1,674,881.35		
Point 3		13.00	6,855.16	741.27		14,547,983.40	1,677,535.97		
Point 4		13.00	4,225.46	750.46		14,545,353.72	1,677,548.73		
Point 5		13.00	1,595.89	759.53		14,542,724.16	1,677,561.37		
Point 6		13.00	1,586.93	-1,902.25		14,542,711.59	1,674,899.61		
Point 7		13.00	1,578.07	-4,563.97		14,542,699.11	1,672,237.90		

# Anadarko

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well MARRS 28N-10HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Site:</b>	1N-67W-22 Marris 6-22HZ Pad	<b>MD Reference:</b>	RKB = 17' @ 4998.00usft (D Rig)
<b>Well:</b>	MARRS 28N-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Permit Rev-1	<b>Database:</b>	PLANNING

Point 8		13.00	4,213.91	-4,566.57	14,545,334.94	1,672,231.72		
1N-R67W-Sec. 10_Secti	0.00	0.00	-82.00	7,691.83	942.68	14,548,267.29	1,675,207.90	40.059069
- plan misses target center by 7522.19usft at 15036.49usft MD (7422.55 TVD, 7652.11 N, 429.30 E)								
- Polygon								
Point 1		-82.00	4,992.86	-2,976.12	14,553,256.10	1,672,225.00		
Point 2		-82.00	4,994.59	-331.69	14,553,261.42	1,674,869.43		
Point 3		-82.00	4,996.25	2,313.07	14,553,266.68	1,677,514.18		
Point 4		-82.00	2,354.63	2,320.05	14,550,625.07	1,677,524.75		
Point 5		-82.00	-287.06	2,326.97	14,547,983.39	1,677,535.26		
Point 6		-82.00	-288.46	-327.65	14,547,978.39	1,674,880.65		
Point 7		-82.00	-290.97	-2,982.55	14,547,972.27	1,672,225.75		
MARRS 28N-10HZ_TOE	0.00	0.00	7,426.00	8,202.71	437.15	14,548,777.48	1,674,701.68	40.060472
- plan hits target center								
- Point								

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")	
1,817.83	1,800.00	9 5/8"		9-5/8	13-1/2	
7,768.60	7,377.00	Top of Production		5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,380.20	6,348.00	Fox Hills				
7,283.21	7,198.00	Sharon Springs				
7,320.31	7,223.00	Niobrara				
7,589.98	7,351.00	Nio B				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
200	200	0	0	Begin Nudge @ 200.00ft	
867	863	-36	46	End Nudge @ 866.67ft	
2597	2567	-221	282	Begin Drop @ 2596.67ft	
3097	3064	-247	317	End Drop @ 3096.67ft	
6773	6740	-247	317	KOP @ 6772.59ft	
7300	7210	-41	316	DLS = 9°/100'	
7769	7377	385	315	End Build @ 7768.60ft	
15,586	7426	8203	297	TD Well @ 15586.33ft	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_