

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

**3N-67W-30 RADEMACHER 14-30HZ PAD**

**RADEMACHER SOUTH 30-13HZ**

**Plan A**

**Plan: Permit Rev-1**

## **Standard Planning Report**

**27 April, 2023**

Project: WELD-NAD83-UTMFT13N

Site: 3N-67W-30 RADEMACHER 14-30HZ PAD

Well: RADEMACHER SOUTH 30-13HZ

Wellbore: Plan A

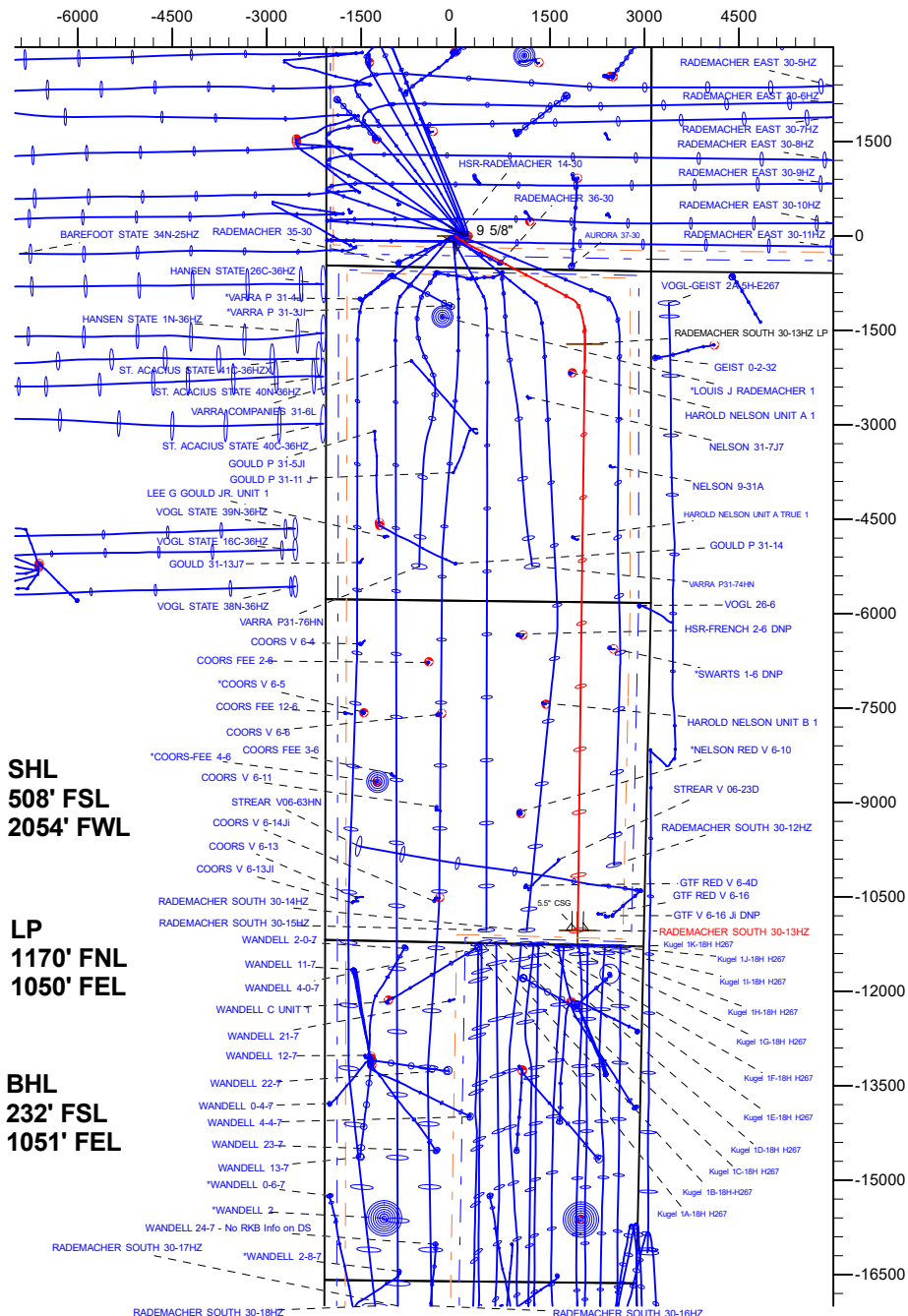
Design: Permit Rev-1

# US ROCKIES WATTENBERG PLANNING

## CASING DETAILS

TVD	MD	Name	Size
1500.00	1512.90	9 5/8"	9-5/8
7317.25	17379.00	5.5" CSG	5-1/2

West(-)/East(+) (3000 usft/in)



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	450.90	0.00	0.00	450.90	0.00	0.00	0.00	0.00	0.00	
3	784.23	5.00	140.00	783.81	-11.13	9.34	1.50	140.00	11.02	
4	1893.76	21.17	117.81	1861.37	-142.57	219.10	1.50	-28.44	139.84	
5	7060.95	21.17	117.81	6679.85	-1013.16	1869.63	0.00	0.00	989.92	
6	8062.39	89.56	180.71	7246.00	-1716.75	2054.57	8.00	64.63	1691.16	
7	17379.00	89.56	180.71	7317.25	-11032.38	1939.74	0.00	0.00	11007.50	RADEMACHER SOUTH 30-13HZ BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RADEMACHER SOUTH 30-13HZ SHL	0.00	14596405.25	1658732.31	40.191310	-104.934415
RADEMACHER SOUTH 30-13HZ LP	7246.00	14594690.02	1660788.15	40.186596	-104.927059
RADEMACHER SOUTH 30-13HZ BHL	7317.25	14585374.31	1660680.20	40.161014	-104.927473

## WELL DETAILS: RADEMACHER SOUTH 30-13HZ

GL = 4819'

RKB = 17' @ 4836.00usft (RIG)

Plan: Permit Rev-1 (RADEMACHER SOUTH 30-13HZ/Plan A)

Date: 4/27/2023

## FORMATION TOP DETAILS

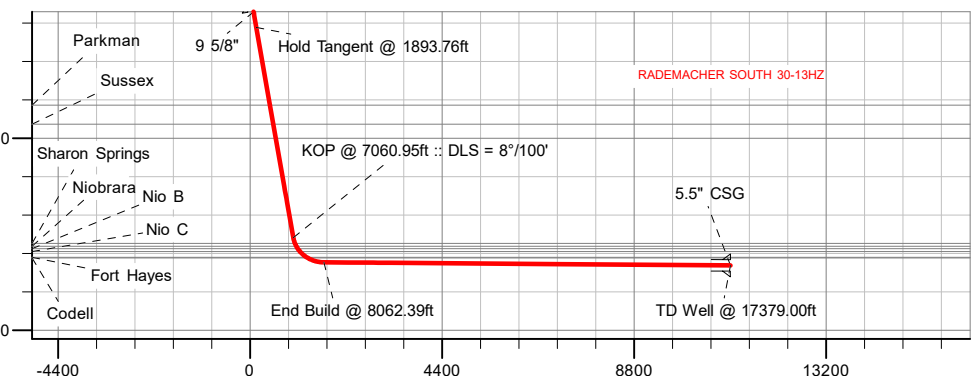
TVDPath	MDPath	Formation
36.00	36.00	Fox Hills
3644.00	3805.40	Parkman
4079.00	4271.88	Sussex
6812.00	7206.09	Sharon Springs
6879.00	7283.80	Niobrara
6932.00	7348.46	Nio B
6996.00	7431.94	Nio C
7129.00	7640.76	Fort Hayes
7149.00	7680.01	Codell



Azimuths to True North  
Magnetic North: 7.73°

Magnetic Field  
Strength: 51632.3nT  
Dip Angle: 66.39°  
Date: 4/20/2023  
Model: IGRF2020

True Vertical Depth (4400 usft/in)



Vertical Section at 180.71° (4400 usft/in)

## Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Site:</b>	3N-67W-30 RADEMACHER 14-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RADEMACHER SOUTH 30-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

<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		3N-67W-30 RADEMACHER 14-30HZ PAD				
Site Position:		Northing:	14,596,404.12	usft	Latitude:	40.191307
From:	Map	Easting:	1,658,931.24	usft	Longitude:	-104.933703
Position Uncertainty:		0.00	usft	Slot Radius:	13-3/16	"

Well		RADEMACHER SOUTH 30-13HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,596,405.25 usft	Latitude:	40.191311
	+E/-W	0.00 usft	Easting:	1,658,732.31 usft	Longitude:	-104.934416
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	4,819.00 usft
Grid Convergence:		0.04 °				

<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>
	IGRF202013	4/20/2023	7.73	66.39	51,632.28182109

<b>Design</b>	Permit Rev-1				
<b>Audit Notes:</b>					
<b>Version:</b>		<b>Phase:</b>	PLAN	<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	180.71	

<b>Plan Survey Tool Program</b>	<b>Date</b>	4/25/2023			
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	1,500.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I	
				Fixed:v2:crustal field declinatio	
2	1,500.00	17,379.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I	
				Fixed:v2:Rockies, crustal dec +	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-13HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4836.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-13HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
450.90	0.00	0.00	450.90	0.00	0.00	0.00	0.00	0.00	0.00	
784.23	5.00	140.00	783.81	-11.13	9.34	1.50	1.50	0.00	140.00	
1,893.76	21.17	117.81	1,861.37	-142.57	219.10	1.50	1.46	-2.00	-28.44	
7,060.95	21.17	117.81	6,679.85	-1,013.16	1,869.63	0.00	0.00	0.00	0.00	
8,062.39	89.56	180.71	7,246.00	-1,716.75	2,054.57	8.00	6.83	6.28	64.63	
17,379.00	89.56	180.71	7,317.25	-11,032.38	1,939.74	0.00	0.00	0.00	0.00	RADEMACHER SOU

# Planning Report

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<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Site:</b>	3N-67W-30 RADEMACHER 14-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RADEMACHER SOUTH 30-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36.00	0.00	0.00	36.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills									
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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
450.90	0.00	0.00	450.90	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 450.90ft									
500.00	0.74	140.00	500.00	-0.24	0.20	0.24	1.50	1.50	0.00
600.00	2.24	140.00	599.96	-2.23	1.87	2.21	1.50	1.50	0.00
700.00	3.74	140.00	699.82	-6.22	5.22	6.15	1.50	1.50	0.00
784.23	5.00	140.00	783.81	-11.13	9.34	11.02	1.50	1.50	0.00
Change Tangent @ 784.23ft									
800.00	5.21	138.76	799.51	-12.20	10.26	12.07	1.50	1.33	-7.87
900.00	6.58	132.76	898.98	-19.50	17.46	19.28	1.50	1.37	-6.00
1,000.00	8.00	128.85	998.17	-27.76	27.08	27.42	1.50	1.42	-3.91
1,100.00	9.44	126.12	1,097.02	-36.95	39.12	36.47	1.50	1.44	-2.73
1,200.00	10.90	124.12	1,195.45	-47.09	53.56	46.42	1.50	1.46	-2.01
1,300.00	12.36	122.58	1,293.39	-58.15	70.41	57.28	1.50	1.47	-1.54
1,400.00	13.84	121.36	1,390.78	-70.14	89.64	69.03	1.50	1.47	-1.22
1,500.00	15.32	120.38	1,487.56	-83.05	111.25	81.66	1.50	1.48	-0.99
1,512.90	15.51	120.26	1,500.00	-84.78	114.21	83.35	1.50	1.48	-0.88
9 5/8"									
1,600.00	16.80	119.56	1,583.66	-96.85	135.22	95.17	1.50	1.48	-0.81
1,700.00	18.29	118.87	1,679.01	-111.56	161.53	109.55	1.50	1.49	-0.69
1,800.00	19.77	118.29	1,773.54	-127.15	190.16	124.79	1.50	1.49	-0.59
1,893.76	21.17	117.81	1,861.37	-142.57	219.10	139.84	1.50	1.49	-0.51
Hold Tangent @ 1893.76ft									
1,900.00	21.17	117.81	1,867.19	-143.62	221.10	140.87	0.00	0.00	0.00
2,000.00	21.17	117.81	1,960.44	-160.47	253.04	157.32	0.00	0.00	0.00
2,100.00	21.17	117.81	2,053.70	-177.32	284.98	173.77	0.00	0.00	0.00
2,200.00	21.17	117.81	2,146.95	-194.17	316.93	190.22	0.00	0.00	0.00
2,300.00	21.17	117.81	2,240.20	-211.01	348.87	206.67	0.00	0.00	0.00
2,400.00	21.17	117.81	2,333.45	-227.86	380.81	223.13	0.00	0.00	0.00
2,500.00	21.17	117.81	2,426.70	-244.71	412.75	239.58	0.00	0.00	0.00
2,600.00	21.17	117.81	2,519.95	-261.56	444.70	256.03	0.00	0.00	0.00
2,700.00	21.17	117.81	2,613.20	-278.41	476.64	272.48	0.00	0.00	0.00
2,800.00	21.17	117.81	2,706.45	-295.26	508.58	288.93	0.00	0.00	0.00
2,900.00	21.17	117.81	2,799.71	-312.10	540.52	305.38	0.00	0.00	0.00
3,000.00	21.17	117.81	2,892.96	-328.95	572.47	321.83	0.00	0.00	0.00
3,100.00	21.17	117.81	2,986.21	-345.80	604.41	338.29	0.00	0.00	0.00
3,200.00	21.17	117.81	3,079.46	-362.65	636.35	354.74	0.00	0.00	0.00
3,300.00	21.17	117.81	3,172.71	-379.50	668.29	371.19	0.00	0.00	0.00
3,400.00	21.17	117.81	3,265.96	-396.35	700.24	387.64	0.00	0.00	0.00
3,500.00	21.17	117.81	3,359.21	-413.20	732.18	404.09	0.00	0.00	0.00
3,600.00	21.17	117.81	3,452.47	-430.04	764.12	420.54	0.00	0.00	0.00
3,700.00	21.17	117.81	3,545.72	-446.89	796.06	436.99	0.00	0.00	0.00
3,800.00	21.17	117.81	3,638.97	-463.74	828.01	453.45	0.00	0.00	0.00
3,805.40	21.17	117.81	3,644.00	-464.65	829.73	454.33	0.00	0.00	0.00
Parkman									
3,900.00	21.17	117.81	3,732.22	-480.59	859.95	469.90	0.00	0.00	0.00
4,000.00	21.17	117.81	3,825.47	-497.44	891.89	486.35	0.00	0.00	0.00

## Planning Report

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<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Site:</b>	3N-67W-30 RADEMACHER 14-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RADEMACHER SOUTH 30-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

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)
4,100.00	21.17	117.81	3,918.72	-514.29	923.83	502.80	0.00	0.00	0.00
4,200.00	21.17	117.81	4,011.97	-531.13	955.78	519.25	0.00	0.00	0.00
4,271.88	21.17	117.81	4,079.00	-543.25	978.73	531.08	0.00	0.00	0.00
<b>Sussex</b>									
4,300.00	21.17	117.81	4,105.22	-547.98	987.72	535.70	0.00	0.00	0.00
4,400.00	21.17	117.81	4,198.48	-564.83	1,019.66	552.15	0.00	0.00	0.00
4,500.00	21.17	117.81	4,291.73	-581.68	1,051.60	568.60	0.00	0.00	0.00
4,600.00	21.17	117.81	4,384.98	-598.53	1,083.55	585.06	0.00	0.00	0.00
4,700.00	21.17	117.81	4,478.23	-615.38	1,115.49	601.51	0.00	0.00	0.00
4,800.00	21.17	117.81	4,571.48	-632.23	1,147.43	617.96	0.00	0.00	0.00
4,900.00	21.17	117.81	4,664.73	-649.07	1,179.37	634.41	0.00	0.00	0.00
5,000.00	21.17	117.81	4,757.98	-665.92	1,211.32	650.86	0.00	0.00	0.00
5,100.00	21.17	117.81	4,851.23	-682.77	1,243.26	667.31	0.00	0.00	0.00
5,200.00	21.17	117.81	4,944.49	-699.62	1,275.20	683.76	0.00	0.00	0.00
5,300.00	21.17	117.81	5,037.74	-716.47	1,307.14	700.22	0.00	0.00	0.00
5,400.00	21.17	117.81	5,130.99	-733.32	1,339.09	716.67	0.00	0.00	0.00
5,500.00	21.17	117.81	5,224.24	-750.17	1,371.03	733.12	0.00	0.00	0.00
5,600.00	21.17	117.81	5,317.49	-767.01	1,402.97	749.57	0.00	0.00	0.00
5,700.00	21.17	117.81	5,410.74	-783.86	1,434.91	766.02	0.00	0.00	0.00
5,800.00	21.17	117.81	5,503.99	-800.71	1,466.86	782.47	0.00	0.00	0.00
5,900.00	21.17	117.81	5,597.25	-817.56	1,498.80	798.92	0.00	0.00	0.00
6,000.00	21.17	117.81	5,690.50	-834.41	1,530.74	815.38	0.00	0.00	0.00
6,100.00	21.17	117.81	5,783.75	-851.26	1,562.68	831.83	0.00	0.00	0.00
6,200.00	21.17	117.81	5,877.00	-868.10	1,594.63	848.28	0.00	0.00	0.00
6,300.00	21.17	117.81	5,970.25	-884.95	1,626.57	864.73	0.00	0.00	0.00
6,400.00	21.17	117.81	6,063.50	-901.80	1,658.51	881.18	0.00	0.00	0.00
6,500.00	21.17	117.81	6,156.75	-918.65	1,690.45	897.63	0.00	0.00	0.00
6,600.00	21.17	117.81	6,250.00	-935.50	1,722.40	914.08	0.00	0.00	0.00
6,700.00	21.17	117.81	6,343.26	-952.35	1,754.34	930.54	0.00	0.00	0.00
6,800.00	21.17	117.81	6,436.51	-969.20	1,786.28	946.99	0.00	0.00	0.00
6,900.00	21.17	117.81	6,529.76	-986.04	1,818.22	963.44	0.00	0.00	0.00
7,000.00	21.17	117.81	6,623.01	-1,002.89	1,850.17	979.89	0.00	0.00	0.00
7,060.95	21.17	117.81	6,679.85	-1,013.16	1,869.63	989.92	0.00	0.00	0.00
<b>KOP @ 7060.95ft :: DLS = 8°/100'</b>									
7,100.00	22.68	125.15	6,716.08	-1,020.79	1,882.03	997.39	8.00	3.86	18.79
7,150.00	25.02	133.17	6,761.82	-1,033.58	1,897.63	1,009.98	8.00	4.70	16.05
7,200.00	27.73	139.81	6,806.62	-1,049.71	1,912.85	1,025.92	8.00	5.41	13.28
7,206.09	28.08	140.54	6,812.00	-1,051.89	1,914.68	1,028.09	8.00	5.73	11.92
<b>Sharon Springs</b>									
7,250.00	30.70	145.31	6,850.26	-1,069.09	1,927.63	1,045.13	8.00	5.97	10.87
7,283.80	32.82	148.50	6,879.00	-1,084.00	1,937.33	1,059.91	8.00	6.27	9.43
<b>Niobrara</b>									
7,300.00	33.86	149.90	6,892.53	-1,091.65	1,941.89	1,067.50	8.00	6.44	8.64
7,348.46	37.07	153.67	6,932.00	-1,116.43	1,955.14	1,092.12	8.00	6.61	7.77
<b>Nio B</b>									
7,350.00	37.17	153.78	6,933.23	-1,117.26	1,955.56	1,092.95	8.00	6.73	7.17
7,400.00	40.59	157.10	6,972.15	-1,145.81	1,968.57	1,121.33	8.00	6.83	6.64
7,431.95	42.81	158.98	6,996.00	-1,165.52	1,976.50	1,140.94	8.00	6.97	5.90
<b>Nio C</b>									
7,450.00	44.09	159.98	7,009.11	-1,177.15	1,980.86	1,152.51	8.00	7.04	5.52
7,500.00	47.65	162.52	7,043.92	-1,211.12	1,992.37	1,186.34	8.00	7.12	5.07
7,550.00	51.26	164.78	7,076.42	-1,247.58	2,003.04	1,222.66	8.00	7.22	4.53
7,600.00	54.91	166.82	7,106.45	-1,286.33	2,012.83	1,261.28	8.00	7.30	4.09

# Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Site:</b>	3N-67W-30 RADEMACHER 14-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RADEMACHER SOUTH 30-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

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)
7,640.76	57.91	168.36	7,129.00	-1,319.48	2,020.12	1,294.35	8.00	7.36	3.76
Fort Hayes									
7,650.00	58.59	168.69	7,133.86	-1,327.18	2,021.68	1,302.03	8.00	7.39	3.61
7,680.01	60.82	169.74	7,149.00	-1,352.64	2,026.53	1,327.42	8.00	7.41	3.50
Codell									
7,700.00	62.30	170.42	7,158.52	-1,369.95	2,029.55	1,344.69	8.00	7.43	3.38
7,750.00	66.03	172.03	7,180.30	-1,414.42	2,036.41	1,389.07	8.00	7.46	3.22
7,800.00	69.77	173.55	7,199.11	-1,460.37	2,042.22	1,434.95	8.00	7.49	3.04
7,850.00	73.53	175.00	7,214.85	-1,507.58	2,046.94	1,482.10	8.00	7.51	2.90
7,900.00	77.29	176.39	7,227.44	-1,555.82	2,050.57	1,530.29	8.00	7.53	2.79
7,950.00	81.07	177.75	7,236.83	-1,604.86	2,053.07	1,579.29	8.00	7.55	2.71
8,000.00	84.84	179.07	7,242.96	-1,654.45	2,054.45	1,628.87	8.00	7.56	2.65
8,050.00	88.62	180.38	7,245.81	-1,704.36	2,054.69	1,678.77	8.00	7.56	2.62
8,062.39	89.56	180.71	7,246.00	-1,716.75	2,054.57	1,691.16	8.00	7.56	2.61
End Build @ 8062.39ft									
8,100.00	89.56	180.71	7,246.29	-1,754.35	2,054.10	1,728.76	0.00	0.00	0.00
8,200.00	89.56	180.71	7,247.06	-1,854.34	2,052.87	1,828.76	0.00	0.00	0.00
8,300.00	89.56	180.71	7,247.82	-1,954.33	2,051.64	1,928.76	0.00	0.00	0.00
8,400.00	89.56	180.71	7,248.59	-2,054.32	2,050.41	2,028.76	0.00	0.00	0.00
8,500.00	89.56	180.71	7,249.35	-2,154.31	2,049.17	2,128.75	0.00	0.00	0.00
8,600.00	89.56	180.71	7,250.11	-2,254.30	2,047.94	2,228.75	0.00	0.00	0.00
8,700.00	89.56	180.71	7,250.88	-2,354.29	2,046.71	2,328.75	0.00	0.00	0.00
8,800.00	89.56	180.71	7,251.64	-2,454.28	2,045.48	2,428.74	0.00	0.00	0.00
8,900.00	89.56	180.71	7,252.41	-2,554.27	2,044.24	2,528.74	0.00	0.00	0.00
9,000.00	89.56	180.71	7,253.17	-2,654.26	2,043.01	2,628.74	0.00	0.00	0.00
9,100.00	89.56	180.71	7,253.94	-2,754.25	2,041.78	2,728.74	0.00	0.00	0.00
9,200.00	89.56	180.71	7,254.70	-2,854.24	2,040.55	2,828.73	0.00	0.00	0.00
9,300.00	89.56	180.71	7,255.47	-2,954.23	2,039.31	2,928.73	0.00	0.00	0.00
9,400.00	89.56	180.71	7,256.23	-3,054.22	2,038.08	3,028.73	0.00	0.00	0.00
9,500.00	89.56	180.71	7,257.00	-3,154.21	2,036.85	3,128.72	0.00	0.00	0.00
9,600.00	89.56	180.71	7,257.76	-3,254.20	2,035.62	3,228.72	0.00	0.00	0.00
9,700.00	89.56	180.71	7,258.53	-3,354.18	2,034.38	3,328.72	0.00	0.00	0.00
9,800.00	89.56	180.71	7,259.29	-3,454.17	2,033.15	3,428.72	0.00	0.00	0.00
9,900.00	89.56	180.71	7,260.06	-3,554.16	2,031.92	3,528.71	0.00	0.00	0.00
10,000.00	89.56	180.71	7,260.82	-3,654.15	2,030.69	3,628.71	0.00	0.00	0.00
10,100.00	89.56	180.71	7,261.59	-3,754.14	2,029.45	3,728.71	0.00	0.00	0.00
10,200.00	89.56	180.71	7,262.35	-3,854.13	2,028.22	3,828.70	0.00	0.00	0.00
10,300.00	89.56	180.71	7,263.12	-3,954.12	2,026.99	3,928.70	0.00	0.00	0.00
10,400.00	89.56	180.71	7,263.88	-4,054.11	2,025.76	4,028.70	0.00	0.00	0.00
10,500.00	89.56	180.71	7,264.64	-4,154.10	2,024.52	4,128.69	0.00	0.00	0.00
10,600.00	89.56	180.71	7,265.41	-4,254.09	2,023.29	4,228.69	0.00	0.00	0.00
10,700.00	89.56	180.71	7,266.17	-4,354.08	2,022.06	4,328.69	0.00	0.00	0.00
10,800.00	89.56	180.71	7,266.94	-4,454.07	2,020.83	4,428.69	0.00	0.00	0.00
10,900.00	89.56	180.71	7,267.70	-4,554.06	2,019.59	4,528.68	0.00	0.00	0.00
11,000.00	89.56	180.71	7,268.47	-4,654.05	2,018.36	4,628.68	0.00	0.00	0.00
11,100.00	89.56	180.71	7,269.23	-4,754.04	2,017.13	4,728.68	0.00	0.00	0.00
11,200.00	89.56	180.71	7,270.00	-4,854.03	2,015.90	4,828.67	0.00	0.00	0.00
11,300.00	89.56	180.71	7,270.76	-4,954.02	2,014.66	4,928.67	0.00	0.00	0.00
11,400.00	89.56	180.71	7,271.53	-5,054.01	2,013.43	5,028.67	0.00	0.00	0.00
11,500.00	89.56	180.71	7,272.29	-5,154.00	2,012.20	5,128.67	0.00	0.00	0.00
11,600.00	89.56	180.71	7,273.06	-5,253.98	2,010.97	5,228.66	0.00	0.00	0.00
11,700.00	89.56	180.71	7,273.82	-5,353.97	2,009.73	5,328.66	0.00	0.00	0.00
11,800.00	89.56	180.71	7,274.59	-5,453.96	2,008.50	5,428.66	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Site:</b>	3N-67W-30 RADEMACHER 14-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RADEMACHER SOUTH 30-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

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)
11,900.00	89.56	180.71	7,275.35	-5,553.95	2,007.27	5,528.65	0.00	0.00	0.00
12,000.00	89.56	180.71	7,276.12	-5,653.94	2,006.04	5,628.65	0.00	0.00	0.00
12,100.00	89.56	180.71	7,276.88	-5,753.93	2,004.80	5,728.65	0.00	0.00	0.00
12,200.00	89.56	180.71	7,277.65	-5,853.92	2,003.57	5,828.65	0.00	0.00	0.00
12,300.00	89.56	180.71	7,278.41	-5,953.91	2,002.34	5,928.64	0.00	0.00	0.00
12,400.00	89.56	180.71	7,279.17	-6,053.90	2,001.11	6,028.64	0.00	0.00	0.00
12,500.00	89.56	180.71	7,279.94	-6,153.89	1,999.87	6,128.64	0.00	0.00	0.00
12,600.00	89.56	180.71	7,280.70	-6,253.88	1,998.64	6,228.63	0.00	0.00	0.00
12,700.00	89.56	180.71	7,281.47	-6,353.87	1,997.41	6,328.63	0.00	0.00	0.00
12,800.00	89.56	180.71	7,282.23	-6,453.86	1,996.18	6,428.63	0.00	0.00	0.00
12,900.00	89.56	180.71	7,283.00	-6,553.85	1,994.94	6,528.62	0.00	0.00	0.00
13,000.00	89.56	180.71	7,283.76	-6,653.84	1,993.71	6,628.62	0.00	0.00	0.00
13,100.00	89.56	180.71	7,284.53	-6,753.83	1,992.48	6,728.62	0.00	0.00	0.00
13,200.00	89.56	180.71	7,285.29	-6,853.82	1,991.25	6,828.62	0.00	0.00	0.00
13,300.00	89.56	180.71	7,286.06	-6,953.81	1,990.01	6,928.61	0.00	0.00	0.00
13,400.00	89.56	180.71	7,286.82	-7,053.80	1,988.78	7,028.61	0.00	0.00	0.00
13,500.00	89.56	180.71	7,287.59	-7,153.79	1,987.55	7,128.61	0.00	0.00	0.00
13,600.00	89.56	180.71	7,288.35	-7,253.77	1,986.32	7,228.60	0.00	0.00	0.00
13,700.00	89.56	180.71	7,289.12	-7,353.76	1,985.08	7,328.60	0.00	0.00	0.00
13,800.00	89.56	180.71	7,289.88	-7,453.75	1,983.85	7,428.60	0.00	0.00	0.00
13,900.00	89.56	180.71	7,290.65	-7,553.74	1,982.62	7,528.60	0.00	0.00	0.00
14,000.00	89.56	180.71	7,291.41	-7,653.73	1,981.39	7,628.59	0.00	0.00	0.00
14,100.00	89.56	180.71	7,292.17	-7,753.72	1,980.15	7,728.59	0.00	0.00	0.00
14,200.00	89.56	180.71	7,292.94	-7,853.71	1,978.92	7,828.59	0.00	0.00	0.00
14,300.00	89.56	180.71	7,293.70	-7,953.70	1,977.69	7,928.58	0.00	0.00	0.00
14,400.00	89.56	180.71	7,294.47	-8,053.69	1,976.46	8,028.58	0.00	0.00	0.00
14,500.00	89.56	180.71	7,295.23	-8,153.68	1,975.22	8,128.58	0.00	0.00	0.00
14,600.00	89.56	180.71	7,296.00	-8,253.67	1,973.99	8,228.58	0.00	0.00	0.00
14,700.00	89.56	180.71	7,296.76	-8,353.66	1,972.76	8,328.57	0.00	0.00	0.00
14,800.00	89.56	180.71	7,297.53	-8,453.65	1,971.53	8,428.57	0.00	0.00	0.00
14,900.00	89.56	180.71	7,298.29	-8,553.64	1,970.29	8,528.57	0.00	0.00	0.00
15,000.00	89.56	180.71	7,299.06	-8,653.63	1,969.06	8,628.56	0.00	0.00	0.00
15,100.00	89.56	180.71	7,299.82	-8,753.62	1,967.83	8,728.56	0.00	0.00	0.00
15,200.00	89.56	180.71	7,300.59	-8,853.61	1,966.60	8,828.56	0.00	0.00	0.00
15,300.00	89.56	180.71	7,301.35	-8,953.60	1,965.36	8,928.55	0.00	0.00	0.00
15,400.00	89.56	180.71	7,302.12	-9,053.59	1,964.13	9,028.55	0.00	0.00	0.00
15,500.00	89.56	180.71	7,302.88	-9,153.57	1,962.90	9,128.55	0.00	0.00	0.00
15,600.00	89.56	180.71	7,303.65	-9,253.56	1,961.67	9,228.55	0.00	0.00	0.00
15,700.00	89.56	180.71	7,304.41	-9,353.55	1,960.43	9,328.54	0.00	0.00	0.00
15,800.00	89.56	180.71	7,305.18	-9,453.54	1,959.20	9,428.54	0.00	0.00	0.00
15,900.00	89.56	180.71	7,305.94	-9,553.53	1,957.97	9,528.54	0.00	0.00	0.00
16,000.00	89.56	180.71	7,306.70	-9,653.52	1,956.74	9,628.53	0.00	0.00	0.00
16,100.00	89.56	180.71	7,307.47	-9,753.51	1,955.50	9,728.53	0.00	0.00	0.00
16,200.00	89.56	180.71	7,308.23	-9,853.50	1,954.27	9,828.53	0.00	0.00	0.00
16,300.00	89.56	180.71	7,309.00	-9,953.49	1,953.04	9,928.53	0.00	0.00	0.00
16,400.00	89.56	180.71	7,309.76	-10,053.48	1,951.81	10,028.52	0.00	0.00	0.00
16,500.00	89.56	180.71	7,310.53	-10,153.47	1,950.57	10,128.52	0.00	0.00	0.00
16,600.00	89.56	180.71	7,311.29	-10,253.46	1,949.34	10,228.52	0.00	0.00	0.00
16,700.00	89.56	180.71	7,312.06	-10,353.45	1,948.11	10,328.51	0.00	0.00	0.00
16,800.00	89.56	180.71	7,312.82	-10,453.44	1,946.88	10,428.51	0.00	0.00	0.00
16,900.00	89.56	180.71	7,313.59	-10,553.43	1,945.64	10,528.51	0.00	0.00	0.00
17,000.00	89.56	180.71	7,314.35	-10,653.42	1,944.41	10,628.50	0.00	0.00	0.00
17,100.00	89.56	180.71	7,315.12	-10,753.41	1,943.18	10,728.50	0.00	0.00	0.00
17,200.00	89.56	180.71	7,315.88	-10,853.40	1,941.95	10,828.50	0.00	0.00	0.00



## Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 4836.00usft (RIG)
<b>Site:</b>	3N-67W-30 RADEMACHER 14-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RADEMACHER SOUTH 30-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

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)
17,300.00	89.56	180.71	7,316.65	-10,953.39	1,940.71	10,928.50	0.00	0.00	0.00
17,379.00	89.56	180.71	7,317.25	-11,032.38	1,939.74	11,007.49	0.00	0.00	0.00
TD Well @ 17379.00ft - 5.5" CSG									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,512.90	1,500.00	9 5/8"	9-5/8	13-1/2	
17,379.00	7,317.25	5.5" CSG	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
36.00	36.00	Fox Hills				
3,805.40	3,644.00	Parkman				
4,271.88	4,079.00	Sussex				
7,206.09	6,812.00	Sharon Springs				
7,283.80	6,879.00	Niobrara				
7,348.46	6,932.00	Nio B				
7,431.95	6,996.00	Nio C				
7,640.76	7,129.00	Fort Hayes				
7,680.01	7,149.00	Codell				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
450.90	450.90	0.00	0.00	Begin Nudge @ 450.90ft	
784.23	783.81	-11.13	9.34	Change Tangent @ 784.23ft	
1,893.76	1,861.37	-142.57	219.10	Hold Tangent @ 1893.76ft	
7,060.95	6,679.85	-1,013.16	1,869.63	KOP @ 7060.95ft :: DLS = 8°/100'	
8,062.39	7,246.00	-1,716.75	2,054.57	End Build @ 8062.39ft	
17,379.00	7,317.25	-11,032.38	1,939.74	TD Well @ 17379.00ft	