

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

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

**RADEMACHER SOUTH 30-12HZ**

**Plan A**

**Plan: Permit Rev-2**

## **Standard Planning Report**

**08 January, 2024**

Project: WELD-NAD83-UTMFT13N

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

Well: RADEMACHER SOUTH 30-12HZ

Wellbore: Plan A

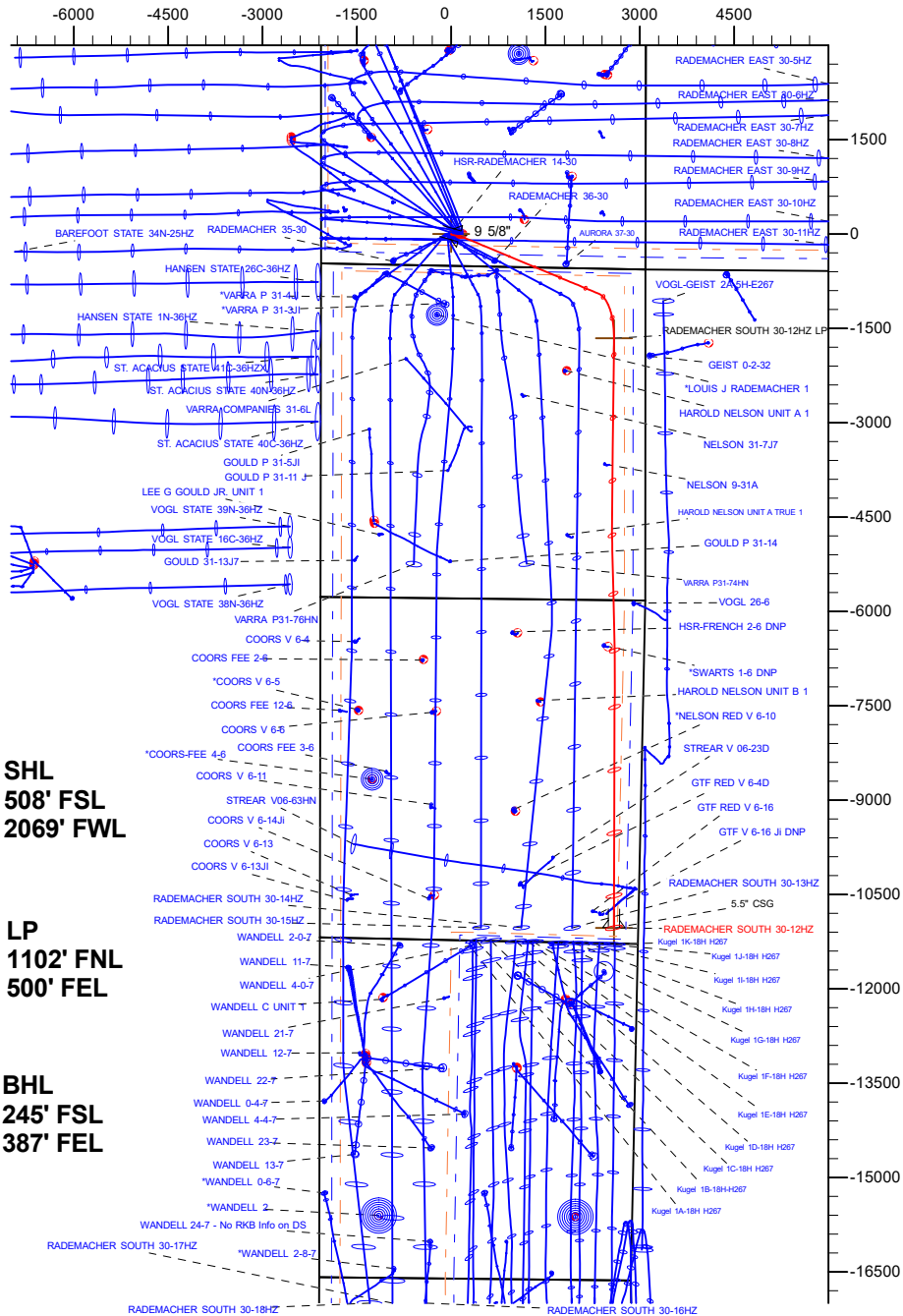
Design: Permit Rev-2

# US ROCKIES WATTENBERG PLANNING

## CASING DETAILS

TVD	MD	Name	Size
1500.00	1512.64	9 5/8"	9-5/8
7172.50	17510.00	5.5" CSG	5-1/2

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



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	360.00	0.00	0.00	360.00	0.00	0.00	0.00	0.00	0.00	
3	493.33	2.00	175.00	493.31	-2.32	0.20	1.50	175.00	2.32	
4	1142.99	10.00	98.00	1139.39	-21.51	57.19	1.50	-88.42	21.51	
5	2240.71	25.96	112.63	2180.57	-127.95	375.52	1.50	22.96	127.95	
6	7132.45	25.96	112.63	6578.73	-951.89	2351.99	0.00	0.00	951.89	
7	8136.12	89.71	180.62	7124.93	-1657.69	2589.53	8.00	70.15	1657.69	
8	11136.12	89.71	180.62	7140.12	-4657.48	2557.07	0.00	0.00	4657.48	
9	11269.46	89.71	178.62	7140.79	-4790.80	2557.95	1.50	-90.01	4790.80	
10	13070.46	89.71	178.62	7149.91	-6591.26	2601.33	0.00	0.00	6591.26	
11	13174.33	89.71	180.18	7150.43	-6695.12	2602.41	1.50	90.06	6695.12	
12	17510.00	89.71	180.18	7172.50	-11030.71	2588.94	0.00	0.00	11030.71	RADEMACHER SOUTH 30-12HZ BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RADEMACHER SOUTH 30-12HZ SHL	0.00	14596405.16	1658747.30	40.191310	-104.934362
RADEMACHER SOUTH 30-12HZ LP	7125.00	14594749.39	1661338.05	40.186758	-104.925090
RADEMACHER SOUTH 30-12HZ BHL	7172.50	14585376.37	1661344.40	40.161018	-104.925095

## WELL DETAILS: RADEMACHER SOUTH 30-12HZ

GL = 4819'

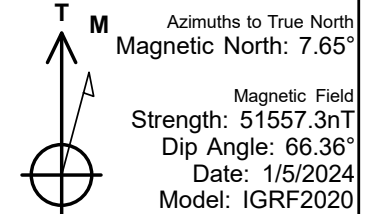
RKB = 17' @ 4836.00usft (RIG)

Plan: Permit Rev-2 (RADEMACHER SOUTH 30-12HZ/Plan A)

Date: 1/8/2024

## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
36.00	36.00	Fox Hills
3644.00	3868.38	Parkman
4079.00	4352.19	Sussex
6812.00	7407.20	Sharon Springs
6879.00	7496.96	Niobrara
6932.00	7574.85	Nio B
6996.00	7682.15	Nio C



SHL  
508' FSL  
2069' FWL

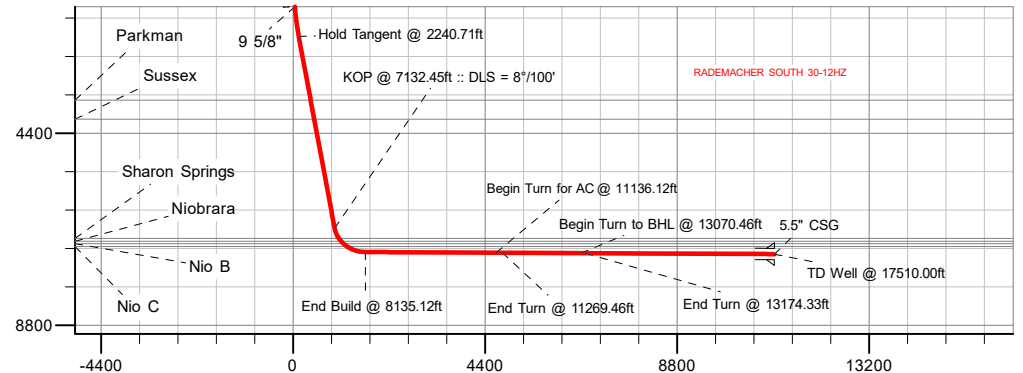
LP  
1102' FNL  
500' FEL

BHL  
245' FSL  
387' FEL

(in/usft 0000) (+)upN/(-)down

True Vertical Depth (4400 usft/in)

Vertical Section at 180.00° (4400 usft/in)



## Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-12HZ
<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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

<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 30-12HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,596,405.16 usft	Latitude:	40.191310
	+E/-W	0.00 usft	Easting:	1,658,747.30 usft	Longitude:	-104.934362
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	1/5/2024	7.65	66.36	51,557.25273264

<b>Design</b>	Permit Rev-2				
<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>	
	7,172.50	0.00	0.00	180.00	

<b>Plan Survey Tool Program</b>		<b>Date</b>	1/8/2024		
<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-2 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:crustal field declinatio	
2	1,500.00	17,510.00	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:Rockies, crustal dec +	

## Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-12HZ
<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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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	
360.00	0.00	0.00	360.00	0.00	0.00	0.00	0.00	0.00	0.00	
493.33	2.00	175.00	493.31	-2.32	0.20	1.50	1.50	0.00	175.00	
1,142.99	10.00	98.00	1,139.39	-21.51	57.19	1.50	1.23	-11.85	-88.42	
2,240.71	25.96	112.63	2,180.57	-127.95	375.52	1.50	1.45	1.33	22.96	
7,132.45	25.96	112.63	6,578.73	-951.89	2,351.99	0.00	0.00	0.00	0.00	
8,136.12	89.71	180.62	7,124.93	-1,657.69	2,589.53	8.00	6.35	6.77	70.15	
11,136.12	89.71	180.62	7,140.12	-4,657.48	2,557.07	0.00	0.00	0.00	0.00	
11,269.46	89.71	178.62	7,140.79	-4,790.80	2,557.95	1.50	0.00	-1.50	-90.01	
13,070.46	89.71	178.62	7,149.91	-6,591.26	2,601.33	0.00	0.00	0.00	0.00	
13,174.33	89.71	180.18	7,150.43	-6,695.12	2,602.41	1.50	0.00	1.50	90.06	
17,510.00	89.71	180.18	7,172.50	-11,030.71	2,588.94	0.00	0.00	0.00	0.00	RADEMACHER SOU

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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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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
360.00	0.00	0.00	360.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 360.00ft									
400.00	0.60	175.00	400.00	-0.21	0.02	0.21	1.50	1.50	0.00
493.33	2.00	175.00	493.31	-2.32	0.20	2.32	1.50	1.50	0.00
Change Tangent @ 493.33ft									
500.00	2.01	172.14	499.97	-2.55	0.23	2.55	1.50	0.08	-42.87
600.00	2.60	136.95	599.89	-5.94	2.01	5.94	1.50	0.59	-35.20
700.00	3.73	118.91	699.74	-9.17	6.41	9.17	1.50	1.14	-18.04
800.00	5.07	109.77	799.45	-12.23	13.42	12.23	1.50	1.33	-9.14
900.00	6.47	104.51	898.94	-15.14	23.03	15.14	1.50	1.41	-5.27
1,000.00	7.91	101.13	998.15	-17.88	35.23	17.88	1.50	1.44	-3.38
1,100.00	9.37	98.80	1,097.01	-20.45	50.03	20.45	1.50	1.46	-2.34
1,142.99	10.00	98.00	1,139.39	-21.51	57.19	21.51	1.50	1.47	-1.85
Change Tangent @ 1142.99ft									
1,200.00	10.79	99.78	1,195.46	-23.10	67.35	23.10	1.50	1.39	3.13
1,300.00	12.20	102.35	1,293.45	-26.95	86.90	26.95	1.50	1.41	2.57
1,400.00	13.63	104.39	1,390.92	-32.14	108.64	32.14	1.50	1.43	2.04
1,500.00	15.07	106.05	1,487.80	-38.67	132.55	38.67	1.50	1.44	1.66
1,512.64	15.26	106.23	1,500.00	-39.59	135.73	39.59	1.50	1.45	1.48
9 5/8"									
1,600.00	16.53	107.42	1,584.02	-46.52	158.62	46.52	1.50	1.45	1.36
1,700.00	17.99	108.58	1,679.91	-55.70	186.83	55.70	1.50	1.46	1.16
1,800.00	19.45	109.56	1,774.22	-66.19	217.16	66.19	1.50	1.47	0.99
1,900.00	20.92	110.42	1,868.07	-78.00	249.59	78.00	1.50	1.47	0.85
2,000.00	22.40	111.16	1,961.01	-91.11	284.09	91.11	1.50	1.47	0.75
2,100.00	23.88	111.82	2,052.96	-105.51	320.65	105.51	1.50	1.48	0.66
2,200.00	25.36	112.41	2,143.87	-121.20	359.24	121.20	1.50	1.48	0.59
2,240.71	25.96	112.63	2,180.57	-127.95	375.52	127.95	1.50	1.48	0.54
Hold Tangent @ 2240.71ft									
2,300.00	25.96	112.63	2,233.87	-137.94	399.48	137.94	0.00	0.00	0.00
2,400.00	25.96	112.63	2,323.78	-154.78	439.88	154.78	0.00	0.00	0.00
2,500.00	25.96	112.63	2,413.69	-171.63	480.29	171.63	0.00	0.00	0.00
2,600.00	25.96	112.63	2,503.60	-188.47	520.69	188.47	0.00	0.00	0.00
2,700.00	25.96	112.63	2,593.51	-205.31	561.09	205.31	0.00	0.00	0.00
2,800.00	25.96	112.63	2,683.42	-222.16	601.50	222.16	0.00	0.00	0.00
2,900.00	25.96	112.63	2,773.33	-239.00	641.90	239.00	0.00	0.00	0.00
3,000.00	25.96	112.63	2,863.24	-255.84	682.31	255.84	0.00	0.00	0.00
3,100.00	25.96	112.63	2,953.15	-272.69	722.71	272.69	0.00	0.00	0.00
3,200.00	25.96	112.63	3,043.06	-289.53	763.11	289.53	0.00	0.00	0.00
3,300.00	25.96	112.63	3,132.97	-306.37	803.52	306.37	0.00	0.00	0.00
3,400.00	25.96	112.63	3,222.88	-323.22	843.92	323.22	0.00	0.00	0.00
3,500.00	25.96	112.63	3,312.79	-340.06	884.33	340.06	0.00	0.00	0.00
3,600.00	25.96	112.63	3,402.70	-356.90	924.73	356.90	0.00	0.00	0.00
3,700.00	25.96	112.63	3,492.61	-373.75	965.13	373.75	0.00	0.00	0.00
3,800.00	25.96	112.63	3,582.52	-390.59	1,005.54	390.59	0.00	0.00	0.00
3,868.38	25.96	112.63	3,644.00	-402.11	1,033.17	402.11	0.00	0.00	0.00
Parkman									

# Planning Report

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<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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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)
3,900.00	25.96	112.63	3,672.43	-407.43	1,045.94	407.43	0.00	0.00	0.00
4,000.00	25.96	112.63	3,762.34	-424.28	1,086.35	424.28	0.00	0.00	0.00
4,100.00	25.96	112.63	3,852.25	-441.12	1,126.75	441.12	0.00	0.00	0.00
4,200.00	25.96	112.63	3,942.16	-457.96	1,167.16	457.96	0.00	0.00	0.00
4,300.00	25.96	112.63	4,032.07	-474.81	1,207.56	474.81	0.00	0.00	0.00
4,352.19	25.96	112.63	4,079.00	-483.60	1,228.65	483.60	0.00	0.00	0.00
Sussex									
4,400.00	25.96	112.63	4,121.98	-491.65	1,247.96	491.65	0.00	0.00	0.00
4,500.00	25.96	112.63	4,211.89	-508.49	1,288.37	508.49	0.00	0.00	0.00
4,600.00	25.96	112.63	4,301.80	-525.34	1,328.77	525.34	0.00	0.00	0.00
4,700.00	25.96	112.63	4,391.71	-542.18	1,369.18	542.18	0.00	0.00	0.00
4,800.00	25.96	112.63	4,481.62	-559.02	1,409.58	559.02	0.00	0.00	0.00
4,900.00	25.96	112.63	4,571.53	-575.87	1,449.98	575.87	0.00	0.00	0.00
5,000.00	25.96	112.63	4,661.44	-592.71	1,490.39	592.71	0.00	0.00	0.00
5,100.00	25.96	112.63	4,751.35	-609.55	1,530.79	609.55	0.00	0.00	0.00
5,200.00	25.96	112.63	4,841.26	-626.40	1,571.20	626.40	0.00	0.00	0.00
5,300.00	25.96	112.63	4,931.17	-643.24	1,611.60	643.24	0.00	0.00	0.00
5,400.00	25.96	112.63	5,021.08	-660.09	1,652.00	660.09	0.00	0.00	0.00
5,500.00	25.96	112.63	5,110.99	-676.93	1,692.41	676.93	0.00	0.00	0.00
5,600.00	25.96	112.63	5,200.90	-693.77	1,732.81	693.77	0.00	0.00	0.00
5,700.00	25.96	112.63	5,290.81	-710.62	1,773.22	710.62	0.00	0.00	0.00
5,800.00	25.96	112.63	5,380.72	-727.46	1,813.62	727.46	0.00	0.00	0.00
5,900.00	25.96	112.63	5,470.63	-744.30	1,854.03	744.30	0.00	0.00	0.00
6,000.00	25.96	112.63	5,560.54	-761.15	1,894.43	761.15	0.00	0.00	0.00
6,100.00	25.96	112.63	5,650.45	-777.99	1,934.83	777.99	0.00	0.00	0.00
6,200.00	25.96	112.63	5,740.36	-794.83	1,975.24	794.83	0.00	0.00	0.00
6,300.00	25.96	112.63	5,830.27	-811.68	2,015.64	811.68	0.00	0.00	0.00
6,400.00	25.96	112.63	5,920.18	-828.52	2,056.05	828.52	0.00	0.00	0.00
6,500.00	25.96	112.63	6,010.09	-845.36	2,096.45	845.36	0.00	0.00	0.00
6,600.00	25.96	112.63	6,100.00	-862.21	2,136.85	862.21	0.00	0.00	0.00
6,700.00	25.96	112.63	6,189.91	-879.05	2,177.26	879.05	0.00	0.00	0.00
6,800.00	25.96	112.63	6,279.82	-895.89	2,217.66	895.89	0.00	0.00	0.00
6,900.00	25.96	112.63	6,369.73	-912.74	2,258.07	912.74	0.00	0.00	0.00
7,000.00	25.96	112.63	6,459.64	-929.58	2,298.47	929.58	0.00	0.00	0.00
7,100.00	25.96	112.63	6,549.55	-946.42	2,338.87	946.42	0.00	0.00	0.00
7,132.45	25.96	112.63	6,578.73	-951.89	2,351.99	951.89	0.00	0.00	0.00
KOP @ 7132.45ft :: DLS = 8°/100'									
7,150.00	26.47	115.59	6,594.47	-955.06	2,359.06	955.06	8.00	2.89	16.89
7,200.00	28.22	123.42	6,638.90	-966.39	2,378.98	966.39	8.00	3.51	15.66
7,250.00	30.38	130.32	6,682.51	-981.09	2,398.50	981.09	8.00	4.30	13.80
7,300.00	32.84	136.33	6,725.10	-999.08	2,417.50	999.08	8.00	4.94	12.02
7,350.00	35.56	141.56	6,766.46	-1,020.29	2,435.91	1,020.29	8.00	5.44	10.45
7,400.00	38.48	146.11	6,806.38	-1,044.60	2,453.63	1,044.60	8.00	5.83	9.10
7,407.20	38.91	146.72	6,812.00	-1,048.35	2,456.12	1,048.35	8.00	6.02	8.43
Sharon Springs									
7,450.00	41.55	150.10	6,844.68	-1,071.90	2,470.58	1,071.90	8.00	6.16	7.91
7,496.96	44.54	153.43	6,879.00	-1,100.14	2,485.72	1,100.14	8.00	6.38	7.08
Niobrara									
7,500.00	44.74	153.63	6,881.16	-1,102.05	2,486.67	1,102.05	8.00	6.48	6.67
7,550.00	48.03	156.77	6,915.65	-1,134.91	2,501.82	1,134.91	8.00	6.58	6.29
7,574.85	49.69	158.22	6,932.00	-1,152.20	2,508.98	1,152.20	8.00	6.70	5.81
Nio B									
7,600.00	51.40	159.61	6,947.98	-1,170.32	2,515.97	1,170.32	8.00	6.77	5.53
7,650.00	54.83	162.18	6,977.99	-1,208.10	2,529.03	1,208.10	8.00	6.86	5.15

## Planning Report

<b>Database:</b>	EDM 5000.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well RADEMACHER SOUTH 30-12HZ
<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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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)
7,682.15	57.06	163.73	6,996.00	-1,233.57	2,536.83	1,233.57	8.00	6.94	4.80
<b>Nio C</b>									
7,700.00	58.30	164.55	7,005.54	-1,248.07	2,540.95	1,248.07	8.00	6.99	4.61
7,750.00	61.82	166.75	7,030.49	-1,290.04	2,551.68	1,290.04	8.00	7.04	4.39
7,800.00	65.38	168.80	7,052.72	-1,333.81	2,561.15	1,333.81	8.00	7.10	4.11
7,850.00	68.95	170.74	7,072.13	-1,379.15	2,569.32	1,379.15	8.00	7.16	3.88
7,900.00	72.55	172.59	7,088.61	-1,425.84	2,576.16	1,425.84	8.00	7.20	3.70
7,950.00	76.17	174.36	7,102.08	-1,473.67	2,581.62	1,473.67	8.00	7.23	3.55
8,000.00	79.80	176.09	7,112.49	-1,522.40	2,585.68	1,522.40	8.00	7.26	3.44
8,050.00	83.43	177.77	7,119.78	-1,571.78	2,588.33	1,571.78	8.00	7.27	3.37
8,100.00	87.08	179.43	7,123.92	-1,621.59	2,589.55	1,621.59	8.00	7.29	3.32
8,135.12	89.64	180.59	7,124.93	-1,656.69	2,589.54	1,656.69	8.00	7.29	3.30
<b>End Build @ 8135.12ft</b>									
8,136.12	89.71	180.62	7,124.93	-1,657.69	2,589.53	1,657.69	8.00	7.29	3.29
8,200.00	89.71	180.62	7,125.25	-1,721.56	2,588.84	1,721.56	0.00	0.00	0.00
8,300.00	89.71	180.62	7,125.76	-1,821.56	2,587.76	1,821.56	0.00	0.00	0.00
8,400.00	89.71	180.62	7,126.27	-1,921.55	2,586.67	1,921.55	0.00	0.00	0.00
8,500.00	89.71	180.62	7,126.77	-2,021.54	2,585.59	2,021.54	0.00	0.00	0.00
8,600.00	89.71	180.62	7,127.28	-2,121.53	2,584.51	2,121.53	0.00	0.00	0.00
8,700.00	89.71	180.62	7,127.79	-2,221.53	2,583.43	2,221.53	0.00	0.00	0.00
8,800.00	89.71	180.62	7,128.29	-2,321.52	2,582.35	2,321.52	0.00	0.00	0.00
8,900.00	89.71	180.62	7,128.80	-2,421.51	2,581.26	2,421.51	0.00	0.00	0.00
9,000.00	89.71	180.62	7,129.30	-2,521.51	2,580.18	2,521.51	0.00	0.00	0.00
9,100.00	89.71	180.62	7,129.81	-2,621.50	2,579.10	2,621.50	0.00	0.00	0.00
9,200.00	89.71	180.62	7,130.32	-2,721.49	2,578.02	2,721.49	0.00	0.00	0.00
9,300.00	89.71	180.62	7,130.82	-2,821.48	2,576.94	2,821.48	0.00	0.00	0.00
9,400.00	89.71	180.62	7,131.33	-2,921.48	2,575.85	2,921.48	0.00	0.00	0.00
9,500.00	89.71	180.62	7,131.83	-3,021.47	2,574.77	3,021.47	0.00	0.00	0.00
9,600.00	89.71	180.62	7,132.34	-3,121.46	2,573.69	3,121.46	0.00	0.00	0.00
9,700.00	89.71	180.62	7,132.85	-3,221.46	2,572.61	3,221.46	0.00	0.00	0.00
9,800.00	89.71	180.62	7,133.35	-3,321.45	2,571.53	3,321.45	0.00	0.00	0.00
9,900.00	89.71	180.62	7,133.86	-3,421.44	2,570.44	3,421.44	0.00	0.00	0.00
10,000.00	89.71	180.62	7,134.37	-3,521.43	2,569.36	3,521.43	0.00	0.00	0.00
10,100.00	89.71	180.62	7,134.87	-3,621.43	2,568.28	3,621.43	0.00	0.00	0.00
10,200.00	89.71	180.62	7,135.38	-3,721.42	2,567.20	3,721.42	0.00	0.00	0.00
10,300.00	89.71	180.62	7,135.88	-3,821.41	2,566.11	3,821.41	0.00	0.00	0.00
10,400.00	89.71	180.62	7,136.39	-3,921.41	2,565.03	3,921.41	0.00	0.00	0.00
10,500.00	89.71	180.62	7,136.90	-4,021.40	2,563.95	4,021.40	0.00	0.00	0.00
10,600.00	89.71	180.62	7,137.40	-4,121.39	2,562.87	4,121.39	0.00	0.00	0.00
10,700.00	89.71	180.62	7,137.91	-4,221.38	2,561.79	4,221.38	0.00	0.00	0.00
10,800.00	89.71	180.62	7,138.41	-4,321.38	2,560.70	4,321.38	0.00	0.00	0.00
10,900.00	89.71	180.62	7,138.92	-4,421.37	2,559.62	4,421.37	0.00	0.00	0.00
11,000.00	89.71	180.62	7,139.43	-4,521.36	2,558.54	4,521.36	0.00	0.00	0.00
11,100.00	89.71	180.62	7,139.93	-4,621.36	2,557.46	4,621.36	0.00	0.00	0.00
11,136.12	89.71	180.62	7,140.12	-4,657.47	2,557.07	4,657.47	0.00	0.00	0.00
<b>Begin Turn for AC @ 11136.12ft</b>									
11,200.00	89.71	179.66	7,140.44	-4,721.35	2,556.91	4,721.35	1.50	0.00	-1.50
11,269.46	89.71	178.62	7,140.79	-4,790.80	2,557.95	4,790.80	1.50	0.00	-1.50
<b>End Turn @ 11269.46ft</b>									
11,300.00	89.71	178.62	7,140.94	-4,821.33	2,558.69	4,821.33	0.00	0.00	0.00
11,400.00	89.71	178.62	7,141.45	-4,921.30	2,561.10	4,921.30	0.00	0.00	0.00
11,500.00	89.71	178.62	7,141.96	-5,021.27	2,563.50	5,021.27	0.00	0.00	0.00
11,600.00	89.71	178.62	7,142.46	-5,121.24	2,565.91	5,121.24	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 30-12HZ
<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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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)
11,700.00	89.71	178.62	7,142.97	-5,221.21	2,568.32	5,221.21	0.00	0.00	0.00
11,800.00	89.71	178.62	7,143.48	-5,321.18	2,570.73	5,321.18	0.00	0.00	0.00
11,900.00	89.71	178.62	7,143.98	-5,421.15	2,573.14	5,421.15	0.00	0.00	0.00
12,000.00	89.71	178.62	7,144.49	-5,521.12	2,575.55	5,521.12	0.00	0.00	0.00
12,100.00	89.71	178.62	7,144.99	-5,621.09	2,577.95	5,621.09	0.00	0.00	0.00
12,200.00	89.71	178.62	7,145.50	-5,721.06	2,580.36	5,721.06	0.00	0.00	0.00
12,300.00	89.71	178.62	7,146.01	-5,821.03	2,582.77	5,821.03	0.00	0.00	0.00
12,400.00	89.71	178.62	7,146.51	-5,921.00	2,585.18	5,921.00	0.00	0.00	0.00
12,500.00	89.71	178.62	7,147.02	-6,020.97	2,587.59	6,020.97	0.00	0.00	0.00
12,600.00	89.71	178.62	7,147.52	-6,120.94	2,590.00	6,120.94	0.00	0.00	0.00
12,700.00	89.71	178.62	7,148.03	-6,220.91	2,592.40	6,220.91	0.00	0.00	0.00
12,800.00	89.71	178.62	7,148.54	-6,320.88	2,594.81	6,320.88	0.00	0.00	0.00
12,900.00	89.71	178.62	7,149.04	-6,420.85	2,597.22	6,420.85	0.00	0.00	0.00
13,000.00	89.71	178.62	7,149.55	-6,520.82	2,599.63	6,520.82	0.00	0.00	0.00
13,070.46	89.71	178.62	7,149.91	-6,591.26	2,601.33	6,591.26	0.00	0.00	0.00
Begin Turn to BHL @ 13070.46ft									
13,100.00	89.71	179.06	7,150.06	-6,620.79	2,601.92	6,620.79	1.50	0.00	1.50
13,174.33	89.71	180.18	7,150.43	-6,695.12	2,602.41	6,695.12	1.50	0.00	1.50
End Turn @ 13174.33ft									
13,200.00	89.71	180.18	7,150.56	-6,720.79	2,602.33	6,720.79	0.00	0.00	0.00
13,300.00	89.71	180.18	7,151.07	-6,820.78	2,602.02	6,820.78	0.00	0.00	0.00
13,400.00	89.71	180.18	7,151.58	-6,920.78	2,601.71	6,920.78	0.00	0.00	0.00
13,500.00	89.71	180.18	7,152.09	-7,020.78	2,601.40	7,020.78	0.00	0.00	0.00
13,600.00	89.71	180.18	7,152.60	-7,120.78	2,601.09	7,120.78	0.00	0.00	0.00
13,700.00	89.71	180.18	7,153.11	-7,220.78	2,600.78	7,220.78	0.00	0.00	0.00
13,800.00	89.71	180.18	7,153.62	-7,320.78	2,600.47	7,320.78	0.00	0.00	0.00
13,900.00	89.71	180.18	7,154.13	-7,420.77	2,600.16	7,420.77	0.00	0.00	0.00
14,000.00	89.71	180.18	7,154.64	-7,520.77	2,599.85	7,520.77	0.00	0.00	0.00
14,100.00	89.71	180.18	7,155.14	-7,620.77	2,599.54	7,620.77	0.00	0.00	0.00
14,200.00	89.71	180.18	7,155.65	-7,720.77	2,599.23	7,720.77	0.00	0.00	0.00
14,300.00	89.71	180.18	7,156.16	-7,820.77	2,598.92	7,820.77	0.00	0.00	0.00
14,400.00	89.71	180.18	7,156.67	-7,920.76	2,598.61	7,920.76	0.00	0.00	0.00
14,500.00	89.71	180.18	7,157.18	-8,020.76	2,598.30	8,020.76	0.00	0.00	0.00
14,600.00	89.71	180.18	7,157.69	-8,120.76	2,597.98	8,120.76	0.00	0.00	0.00
14,700.00	89.71	180.18	7,158.20	-8,220.76	2,597.67	8,220.76	0.00	0.00	0.00
14,800.00	89.71	180.18	7,158.71	-8,320.76	2,597.36	8,320.76	0.00	0.00	0.00
14,900.00	89.71	180.18	7,159.22	-8,420.76	2,597.05	8,420.76	0.00	0.00	0.00
15,000.00	89.71	180.18	7,159.73	-8,520.75	2,596.74	8,520.75	0.00	0.00	0.00
15,100.00	89.71	180.18	7,160.23	-8,620.75	2,596.43	8,620.75	0.00	0.00	0.00
15,200.00	89.71	180.18	7,160.74	-8,720.75	2,596.12	8,720.75	0.00	0.00	0.00
15,300.00	89.71	180.18	7,161.25	-8,820.75	2,595.81	8,820.75	0.00	0.00	0.00
15,400.00	89.71	180.18	7,161.76	-8,920.75	2,595.50	8,920.75	0.00	0.00	0.00
15,500.00	89.71	180.18	7,162.27	-9,020.74	2,595.19	9,020.74	0.00	0.00	0.00
15,600.00	89.71	180.18	7,162.78	-9,120.74	2,594.88	9,120.74	0.00	0.00	0.00
15,700.00	89.71	180.18	7,163.29	-9,220.74	2,594.57	9,220.74	0.00	0.00	0.00
15,800.00	89.71	180.18	7,163.80	-9,320.74	2,594.26	9,320.74	0.00	0.00	0.00
15,900.00	89.71	180.18	7,164.31	-9,420.74	2,593.94	9,420.74	0.00	0.00	0.00
16,000.00	89.71	180.18	7,164.81	-9,520.74	2,593.63	9,520.74	0.00	0.00	0.00
16,100.00	89.71	180.18	7,165.32	-9,620.73	2,593.32	9,620.73	0.00	0.00	0.00
16,200.00	89.71	180.18	7,165.83	-9,720.73	2,593.01	9,720.73	0.00	0.00	0.00
16,300.00	89.71	180.18	7,166.34	-9,820.73	2,592.70	9,820.73	0.00	0.00	0.00
16,400.00	89.71	180.18	7,166.85	-9,920.73	2,592.39	9,920.73	0.00	0.00	0.00
16,500.00	89.71	180.18	7,167.36	-10,020.73	2,592.08	10,020.73	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 30-12HZ
<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 30-12HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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)
16,600.00	89.71	180.18	7,167.87	-10,120.73	2,591.77	10,120.73	0.00	0.00	0.00
16,700.00	89.71	180.18	7,168.38	-10,220.72	2,591.46	10,220.72	0.00	0.00	0.00
16,800.00	89.71	180.18	7,168.89	-10,320.72	2,591.15	10,320.72	0.00	0.00	0.00
16,900.00	89.71	180.18	7,169.40	-10,420.72	2,590.84	10,420.72	0.00	0.00	0.00
17,000.00	89.71	180.18	7,169.90	-10,520.72	2,590.53	10,520.72	0.00	0.00	0.00
17,100.00	89.71	180.18	7,170.41	-10,620.72	2,590.22	10,620.72	0.00	0.00	0.00
17,200.00	89.71	180.18	7,170.92	-10,720.71	2,589.91	10,720.71	0.00	0.00	0.00
17,300.00	89.71	180.18	7,171.43	-10,820.71	2,589.59	10,820.71	0.00	0.00	0.00
17,400.00	89.71	180.18	7,171.94	-10,920.71	2,589.28	10,920.71	0.00	0.00	0.00
17,500.00	89.71	180.18	7,172.45	-11,020.71	2,588.97	11,020.71	0.00	0.00	0.00
17,510.00	89.71	180.18	7,172.50	-11,030.71	2,588.94	11,030.71	0.00	0.00	0.00
TD Well @ 17510.00ft - 5.5" CSG									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,512.64	1,500.00	9 5/8"	9-5/8	13-1/2	
17,510.00	7,172.50	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				
3,868.38	3,644.00	Parkman				
4,352.19	4,079.00	Sussex				
7,407.20	6,812.00	Sharon Springs				
7,496.96	6,879.00	Niobrara				
7,574.85	6,932.00	Nio B				
7,682.15	6,996.00	Nio C				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
360.00	360.00	0.00	0.00	Begin Nudge @ 360.00ft	
493.33	493.31	-2.32	0.20	Change Tangent @ 493.33ft	
1,142.99	1,139.39	-21.51	57.19	Change Tangent @ 1142.99ft	
2,240.71	2,180.57	-127.95	375.52	Hold Tangent @ 2240.71ft	
7,132.45	6,578.73	-951.89	2,351.99	KOP @ 7132.45ft :: DLS = 8°/100'	
8,135.12	7,124.93	-1,656.69	2,589.54	End Build @ 8135.12ft	
11,136.12	7,140.12	-4,657.47	2,557.07	Begin Turn for AC @ 11136.12ft	
11,269.46	7,140.79	-4,790.80	2,557.95	End Turn @ 11269.46ft	
13,070.46	7,149.91	-6,591.26	2,601.33	Begin Turn to BHL @ 13070.46ft	
13,174.33	7,150.43	-6,695.12	2,602.41	End Turn @ 13174.33ft	
17,510.00	7,172.50	-11,030.71	2,588.94	TD Well @ 17510.00ft	