

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

RADEMACHER SOUTH 30-18HZ

Plan A

Plan: Permit Rev-1

Standard Planning Report

26 April, 2023

Project: WELD-NAD83-UTMFT13N

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

Well: RADEMACHER SOUTH 30-18HZ

Wellbore: Plan A

Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1500.00	1523.56	9 5/8"	9-5/8
7179.75	25232.70	5.5" CSG	5-1/2

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	203.00	0.00	0.00	203.00	0.00	0.00	0.00	0.00	0.00	
3	1265.00	15.93	234.82	1251.37	-84.51	-119.89	1.50	234.82	84.11	
4	6717.98	15.93	234.82	6494.94	-946.80	-1343.17	0.00	0.00	942.34	
5	7725.01	89.68	180.12	7082.00	-1649.75	-1480.60	8.00	-55.82	1644.83	
6	12725.01	89.68	180.12	7109.93	-6649.65	-1491.07	0.00	0.00	6644.67	
7	12850.34	89.68	182.00	7110.63	-6774.96	-1493.39	1.50	90.01	6769.97	
8	16583.99	89.68	182.00	7131.48	-10506.27	-1623.69	0.00	0.00	10500.83	
9	16717.32	89.68	180.00	7132.23	-10639.58	-1626.02	1.50	-90.01	10634.12	
10	19109.99	89.68	180.00	7145.59	-13032.21	-1626.02	0.00	0.00	13026.74	
11	19539.98	89.68	173.55	7147.99	-13461.29	-1601.84	1.50	-90.02	13455.90	
12	23086.66	89.68	173.55	7167.80	-16985.46	-1203.43	0.00	0.00	16981.37	
13	23516.65	89.68	180.00	7170.20	-17414.53	-1179.25	1.50	90.01	17410.53	
14	25232.70	89.68	180.00	7179.75	-19130.56	-1179.25	0.00	0.00	19126.54	RADEMACHER SOUTH 30-18HZ BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RADEMACHER SOUTH 30-18HZ SHL	0.00	14596405.67	1658657.34	40.191312	-104.934684
RADEMACHER SOUTH 30-18HZ LP	7082.00	14594754.83	1657177.95	40.186781	-104.939985
RADEMACHER SOUTH 30-18HZ BHL	7179.75	14577274.25	1657492.17	40.138777	-104.938903

WELL DETAILS: RADEMACHER SOUTH 30-18HZ

GL = 4819'

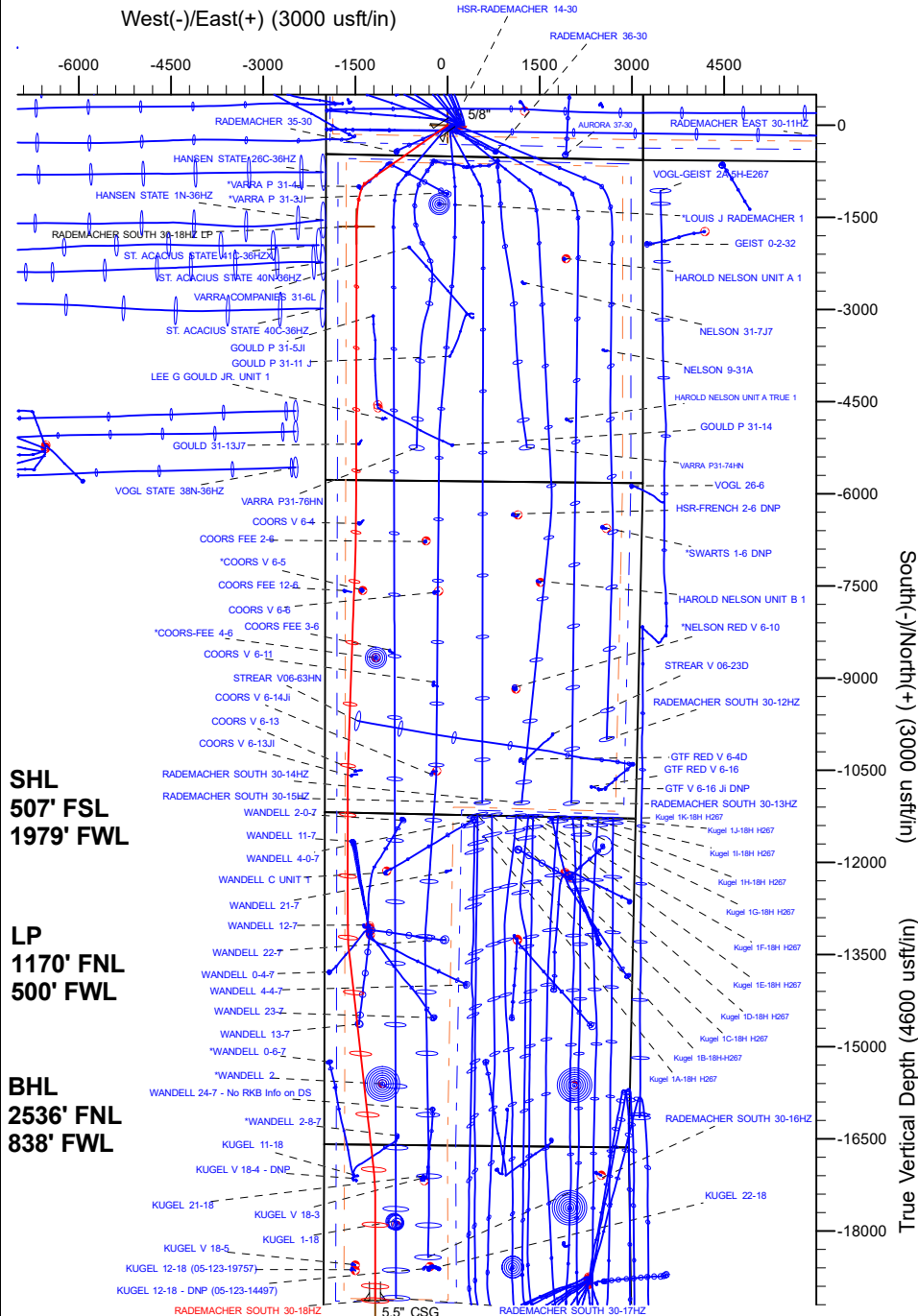
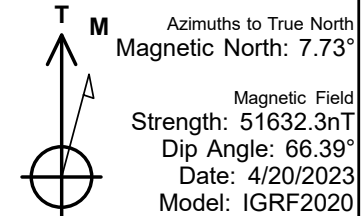
RKB = 17' @ 4836.00usft (RIG)

Plan: Permit Rev-1 (RADEMACHER SOUTH 30-18HZ/Plan A)

Date: 4/27/2023

FORMATION TOP DETAILS

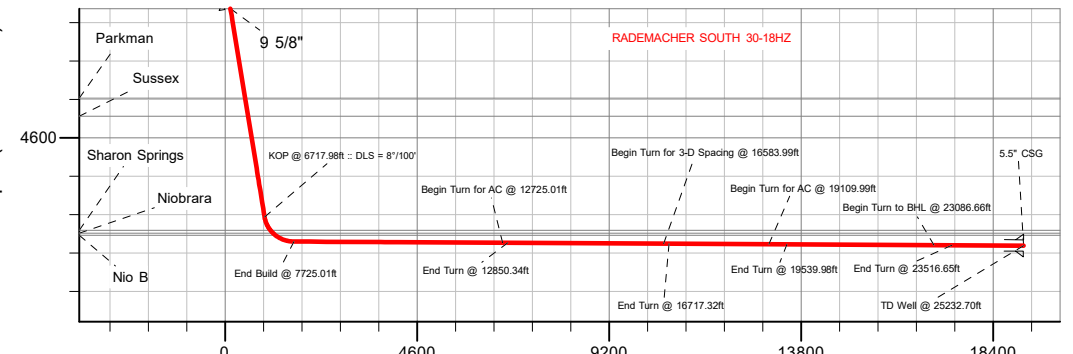
TVDPath	MDPath	Formation
36.00	36.00	Fox Hills
3644.00	3753.18	Parkman
4079.00	4205.55	Sussex
6812.00	7076.59	Sharon Springs
6879.00	7168.48	Niobrara
6932.00	7250.54	Nio B



True Vertical Depth (4600 usft/in)

(u/mjn 0000) (+) u/mjn/(-) u/mjn

Vertical Section at 179.81° (4600 usft/in)



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-18HZ
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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Project	WELD-NAD83-UTMFT13N		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	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 30-18HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,596,405.67 usft	Latitude:	40.191312
	+E/-W	0.00 usft	Easting:	1,658,657.34 usft	Longitude:	-104.934684
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	4,819.00 usft
Grid Convergence:		0.04 °				

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	4/20/2023	7.73	66.39	51,632.25444470

Design	Permit Rev-1				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	179.81	

Plan Survey Tool Program		Date	4/24/2023		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
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	25,232.70	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:Rockies, crustal dec +	

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Site:	3N-67W-30 RADEMACHER 14-30HZ PAD	North Reference:	True
Well:	RADEMACHER SOUTH 30-18HZ	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	
203.00	0.00	0.00	203.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,265.00	15.93	234.82	1,251.37	-84.51	-119.89	1.50	1.50	0.00	234.82	
6,717.98	15.93	234.82	6,494.94	-946.80	-1,343.17	0.00	0.00	0.00	0.00	
7,725.01	89.68	180.12	7,082.00	-1,649.75	-1,480.60	8.00	7.32	-5.43	-55.82	
12,725.01	89.68	180.12	7,109.93	-6,649.65	-1,491.07	0.00	0.00	0.00	0.00	
12,850.34	89.68	182.00	7,110.63	-6,774.96	-1,493.39	1.50	0.00	1.50	90.01	
16,583.99	89.68	182.00	7,131.48	-10,506.27	-1,623.69	0.00	0.00	0.00	0.00	
16,717.32	89.68	180.00	7,132.23	-10,639.58	-1,626.02	1.50	0.00	-1.50	-90.01	
19,109.99	89.68	180.00	7,145.59	-13,032.21	-1,626.02	0.00	0.00	0.00	0.00	
19,539.98	89.68	173.55	7,147.99	-13,461.29	-1,601.84	1.50	0.00	-1.50	-90.02	
23,086.66	89.68	173.55	7,167.80	-16,985.46	-1,203.43	0.00	0.00	0.00	0.00	
23,516.65	89.68	180.00	7,170.20	-17,414.54	-1,179.25	1.50	0.00	1.50	90.01	
25,232.70	89.68	180.00	7,179.75	-19,130.56	-1,179.25	0.00	0.00	0.00	0.00	RADEMACHER SOU

Planning Report

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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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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
203.00	0.00	0.00	203.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 203.00ft									
300.00	1.46	234.82	299.99	-0.71	-1.01	0.71	1.50	1.50	0.00
400.00	2.96	234.82	399.91	-2.93	-4.15	2.91	1.50	1.50	0.00
500.00	4.46	234.82	499.70	-6.65	-9.43	6.62	1.50	1.50	0.00
600.00	5.96	234.82	599.29	-11.88	-16.85	11.82	1.50	1.50	0.00
700.00	7.46	234.82	698.60	-18.60	-26.39	18.51	1.50	1.50	0.00
800.00	8.96	234.82	797.57	-26.82	-38.05	26.70	1.50	1.50	0.00
900.00	10.46	234.82	896.14	-36.54	-51.83	36.36	1.50	1.50	0.00
1,000.00	11.96	234.82	994.23	-47.73	-67.72	47.51	1.50	1.50	0.00
1,100.00	13.46	234.82	1,091.78	-60.40	-85.69	60.12	1.50	1.50	0.00
1,200.00	14.96	234.82	1,188.72	-74.54	-105.75	74.19	1.50	1.50	0.00
1,265.00	15.93	234.82	1,251.37	-84.51	-119.89	84.11	1.50	1.50	0.00
Hold Tangent @ 1265.00ft									
1,300.00	15.93	234.82	1,285.03	-90.05	-127.74	89.62	0.00	0.00	0.00
1,400.00	15.93	234.82	1,381.19	-105.86	-150.18	105.36	0.00	0.00	0.00
1,500.00	15.93	234.82	1,477.35	-121.67	-172.61	121.10	0.00	0.00	0.00
1,523.56	15.93	234.82	1,500.00	-125.40	-177.90	124.81	0.00	0.00	0.00
9 5/8"									
1,600.00	15.93	234.82	1,573.51	-137.49	-195.04	136.84	0.00	0.00	0.00
1,700.00	15.93	234.82	1,669.67	-153.30	-217.48	152.58	0.00	0.00	0.00
1,800.00	15.93	234.82	1,765.83	-169.11	-239.91	168.32	0.00	0.00	0.00
1,900.00	15.93	234.82	1,861.99	-184.93	-262.34	184.05	0.00	0.00	0.00
2,000.00	15.93	234.82	1,958.14	-200.74	-284.78	199.79	0.00	0.00	0.00
2,100.00	15.93	234.82	2,054.30	-216.55	-307.21	215.53	0.00	0.00	0.00
2,200.00	15.93	234.82	2,150.46	-232.37	-329.64	231.27	0.00	0.00	0.00
2,300.00	15.93	234.82	2,246.62	-248.18	-352.08	247.01	0.00	0.00	0.00
2,400.00	15.93	234.82	2,342.78	-263.99	-374.51	262.75	0.00	0.00	0.00
2,500.00	15.93	234.82	2,438.94	-279.80	-396.94	278.49	0.00	0.00	0.00
2,600.00	15.93	234.82	2,535.10	-295.62	-419.38	294.23	0.00	0.00	0.00
2,700.00	15.93	234.82	2,631.26	-311.43	-441.81	309.96	0.00	0.00	0.00
2,800.00	15.93	234.82	2,727.42	-327.24	-464.24	325.70	0.00	0.00	0.00
2,900.00	15.93	234.82	2,823.58	-343.06	-486.67	341.44	0.00	0.00	0.00
3,000.00	15.93	234.82	2,919.74	-358.87	-509.11	357.18	0.00	0.00	0.00
3,100.00	15.93	234.82	3,015.90	-374.68	-531.54	372.92	0.00	0.00	0.00
3,200.00	15.93	234.82	3,112.06	-390.50	-553.97	388.66	0.00	0.00	0.00
3,300.00	15.93	234.82	3,208.22	-406.31	-576.41	404.40	0.00	0.00	0.00
3,400.00	15.93	234.82	3,304.38	-422.12	-598.84	420.13	0.00	0.00	0.00
3,500.00	15.93	234.82	3,400.54	-437.94	-621.27	435.87	0.00	0.00	0.00
3,600.00	15.93	234.82	3,496.70	-453.75	-643.71	451.61	0.00	0.00	0.00
3,700.00	15.93	234.82	3,592.86	-469.56	-666.14	467.35	0.00	0.00	0.00
3,753.18	15.93	234.82	3,644.00	-477.97	-678.07	475.72	0.00	0.00	0.00
Parkman									
3,800.00	15.93	234.82	3,689.02	-485.37	-688.57	483.09	0.00	0.00	0.00
3,900.00	15.93	234.82	3,785.18	-501.19	-711.01	498.83	0.00	0.00	0.00
4,000.00	15.93	234.82	3,881.34	-517.00	-733.44	514.57	0.00	0.00	0.00
4,100.00	15.93	234.82	3,977.50	-532.81	-755.87	530.30	0.00	0.00	0.00
4,200.00	15.93	234.82	4,073.66	-548.63	-778.30	546.04	0.00	0.00	0.00
4,205.55	15.93	234.82	4,079.00	-549.51	-779.55	546.92	0.00	0.00	0.00

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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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
Sussex									
4,300.00	15.93	234.82	4,169.82	-564.44	-800.74	561.78	0.00	0.00	0.00
4,400.00	15.93	234.82	4,265.98	-580.25	-823.17	577.52	0.00	0.00	0.00
4,500.00	15.93	234.82	4,362.14	-596.07	-845.60	593.26	0.00	0.00	0.00
4,600.00	15.93	234.82	4,458.30	-611.88	-868.04	609.00	0.00	0.00	0.00
4,700.00	15.93	234.82	4,554.46	-627.69	-890.47	624.74	0.00	0.00	0.00
4,800.00	15.93	234.82	4,650.62	-643.51	-912.90	640.47	0.00	0.00	0.00
4,900.00	15.93	234.82	4,746.78	-659.32	-935.34	656.21	0.00	0.00	0.00
5,000.00	15.93	234.82	4,842.94	-675.13	-957.77	671.95	0.00	0.00	0.00
5,100.00	15.93	234.82	4,939.10	-690.94	-980.20	687.69	0.00	0.00	0.00
5,200.00	15.93	234.82	5,035.26	-706.76	-1,002.64	703.43	0.00	0.00	0.00
5,300.00	15.93	234.82	5,131.42	-722.57	-1,025.07	719.17	0.00	0.00	0.00
5,400.00	15.93	234.82	5,227.58	-738.38	-1,047.50	734.91	0.00	0.00	0.00
5,500.00	15.93	234.82	5,323.74	-754.20	-1,069.94	750.64	0.00	0.00	0.00
5,600.00	15.93	234.82	5,419.90	-770.01	-1,092.37	766.38	0.00	0.00	0.00
5,700.00	15.93	234.82	5,516.06	-785.82	-1,114.80	782.12	0.00	0.00	0.00
5,800.00	15.93	234.82	5,612.22	-801.64	-1,137.23	797.86	0.00	0.00	0.00
5,900.00	15.93	234.82	5,708.38	-817.45	-1,159.67	813.60	0.00	0.00	0.00
6,000.00	15.93	234.82	5,804.54	-833.26	-1,182.10	829.34	0.00	0.00	0.00
6,100.00	15.93	234.82	5,900.70	-849.08	-1,204.53	845.08	0.00	0.00	0.00
6,200.00	15.93	234.82	5,996.86	-864.89	-1,226.97	860.82	0.00	0.00	0.00
6,300.00	15.93	234.82	6,093.02	-880.70	-1,249.40	876.55	0.00	0.00	0.00
6,400.00	15.93	234.82	6,189.17	-896.51	-1,271.83	892.29	0.00	0.00	0.00
6,500.00	15.93	234.82	6,285.33	-912.33	-1,294.27	908.03	0.00	0.00	0.00
6,600.00	15.93	234.82	6,381.49	-928.14	-1,316.70	923.77	0.00	0.00	0.00
6,700.00	15.93	234.82	6,477.65	-943.95	-1,339.13	939.51	0.00	0.00	0.00
6,717.98	15.93	234.82	6,494.94	-946.80	-1,343.17	942.34	0.00	0.00	0.00
KOP @ 6717.98ft :: DLS = 8°/100'									
6,750.00	17.49	227.75	6,525.61	-952.57	-1,350.32	948.08	8.00	4.89	-22.07
6,800.00	20.33	219.03	6,572.92	-964.37	-1,361.36	959.85	8.00	5.68	-17.44
6,850.00	23.50	212.47	6,619.31	-979.54	-1,372.19	974.98	8.00	6.33	-13.13
6,900.00	26.88	207.43	6,664.55	-997.99	-1,382.75	993.40	8.00	6.76	-10.08
6,950.00	30.40	203.46	6,708.43	-1,019.63	-1,393.00	1,015.01	8.00	7.04	-7.94
7,000.00	34.02	200.25	6,750.73	-1,044.37	-1,402.88	1,039.71	8.00	7.24	-6.41
7,050.00	37.71	197.60	6,791.25	-1,072.08	-1,412.35	1,067.39	8.00	7.37	-5.31
7,076.59	39.69	196.36	6,812.00	-1,087.98	-1,417.20	1,083.28	8.00	7.45	-4.65
Sharon Springs									
7,100.00	41.44	195.36	6,829.78	-1,102.62	-1,421.36	1,097.90	8.00	7.50	-4.30
7,150.00	45.22	193.43	6,866.15	-1,135.85	-1,429.87	1,131.10	8.00	7.55	-3.86
7,168.48	46.62	192.77	6,879.00	-1,148.78	-1,432.87	1,144.02	8.00	7.59	-3.52
Niobrara									
7,200.00	49.02	191.73	6,900.17	-1,171.60	-1,437.83	1,166.83	8.00	7.61	-3.31
7,250.00	52.84	190.22	6,931.67	-1,209.71	-1,445.20	1,204.91	8.00	7.65	-3.02
7,250.54	52.89	190.21	6,932.00	-1,210.13	-1,445.28	1,205.33	8.00	7.67	-2.86
Nio B									
7,300.00	56.69	188.86	6,960.52	-1,249.97	-1,451.96	1,245.15	8.00	7.68	-2.72
7,350.00	60.54	187.61	6,986.55	-1,292.21	-1,458.06	1,287.37	8.00	7.71	-2.49
7,400.00	64.41	186.46	7,009.65	-1,336.21	-1,463.48	1,331.35	8.00	7.73	-2.31
7,450.00	68.28	185.37	7,029.71	-1,381.76	-1,468.20	1,376.88	8.00	7.75	-2.17
7,500.00	72.17	184.35	7,046.63	-1,428.63	-1,472.18	1,423.74	8.00	7.76	-2.05
7,550.00	76.05	183.37	7,060.31	-1,476.60	-1,475.41	1,471.70	8.00	7.77	-1.96
7,600.00	79.94	182.42	7,070.71	-1,525.43	-1,477.87	1,520.52	8.00	7.78	-1.90
7,650.00	83.84	181.49	7,077.76	-1,574.90	-1,479.55	1,569.98	8.00	7.79	-1.85

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-18HZ
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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
7,700.00	87.73	180.57	7,081.44	-1,624.74	-1,480.45	1,619.82	8.00	7.79	-1.83
7,725.01	89.68	180.12	7,082.00	-1,649.75	-1,480.60	1,644.83	8.00	7.79	-1.82
End Build @ 7725.01ft									
7,800.00	89.68	180.12	7,082.42	-1,724.73	-1,480.76	1,719.81	0.00	0.00	0.00
7,900.00	89.68	180.12	7,082.98	-1,824.73	-1,480.97	1,819.81	0.00	0.00	0.00
8,000.00	89.68	180.12	7,083.54	-1,924.73	-1,481.18	1,919.81	0.00	0.00	0.00
8,100.00	89.68	180.12	7,084.10	-2,024.73	-1,481.39	2,019.80	0.00	0.00	0.00
8,200.00	89.68	180.12	7,084.66	-2,124.73	-1,481.60	2,119.80	0.00	0.00	0.00
8,300.00	89.68	180.12	7,085.21	-2,224.72	-1,481.81	2,219.80	0.00	0.00	0.00
8,400.00	89.68	180.12	7,085.77	-2,324.72	-1,482.01	2,319.79	0.00	0.00	0.00
8,500.00	89.68	180.12	7,086.33	-2,424.72	-1,482.22	2,419.79	0.00	0.00	0.00
8,600.00	89.68	180.12	7,086.89	-2,524.72	-1,482.43	2,519.79	0.00	0.00	0.00
8,700.00	89.68	180.12	7,087.45	-2,624.72	-1,482.64	2,619.79	0.00	0.00	0.00
8,800.00	89.68	180.12	7,088.01	-2,724.71	-1,482.85	2,719.78	0.00	0.00	0.00
8,900.00	89.68	180.12	7,088.57	-2,824.71	-1,483.06	2,819.78	0.00	0.00	0.00
9,000.00	89.68	180.12	7,089.12	-2,924.71	-1,483.27	2,919.78	0.00	0.00	0.00
9,100.00	89.68	180.12	7,089.68	-3,024.71	-1,483.48	3,019.77	0.00	0.00	0.00
9,200.00	89.68	180.12	7,090.24	-3,124.71	-1,483.69	3,119.77	0.00	0.00	0.00
9,300.00	89.68	180.12	7,090.80	-3,224.71	-1,483.90	3,219.77	0.00	0.00	0.00
9,400.00	89.68	180.12	7,091.36	-3,324.70	-1,484.11	3,319.76	0.00	0.00	0.00
9,500.00	89.68	180.12	7,091.92	-3,424.70	-1,484.32	3,419.76	0.00	0.00	0.00
9,600.00	89.68	180.12	7,092.47	-3,524.70	-1,484.53	3,519.76	0.00	0.00	0.00
9,700.00	89.68	180.12	7,093.03	-3,624.70	-1,484.74	3,619.76	0.00	0.00	0.00
9,800.00	89.68	180.12	7,093.59	-3,724.70	-1,484.95	3,719.75	0.00	0.00	0.00
9,900.00	89.68	180.12	7,094.15	-3,824.69	-1,485.16	3,819.75	0.00	0.00	0.00
10,000.00	89.68	180.12	7,094.71	-3,924.69	-1,485.37	3,919.75	0.00	0.00	0.00
10,100.00	89.68	180.12	7,095.27	-4,024.69	-1,485.58	4,019.74	0.00	0.00	0.00
10,200.00	89.68	180.12	7,095.83	-4,124.69	-1,485.78	4,119.74	0.00	0.00	0.00
10,300.00	89.68	180.12	7,096.38	-4,224.69	-1,485.99	4,219.74	0.00	0.00	0.00
10,400.00	89.68	180.12	7,096.94	-4,324.69	-1,486.20	4,319.73	0.00	0.00	0.00
10,500.00	89.68	180.12	7,097.50	-4,424.68	-1,486.41	4,419.73	0.00	0.00	0.00
10,600.00	89.68	180.12	7,098.06	-4,524.68	-1,486.62	4,519.73	0.00	0.00	0.00
10,700.00	89.68	180.12	7,098.62	-4,624.68	-1,486.83	4,619.72	0.00	0.00	0.00
10,800.00	89.68	180.12	7,099.18	-4,724.68	-1,487.04	4,719.72	0.00	0.00	0.00
10,900.00	89.68	180.12	7,099.74	-4,824.68	-1,487.25	4,819.72	0.00	0.00	0.00
11,000.00	89.68	180.12	7,100.29	-4,924.68	-1,487.46	4,919.72	0.00	0.00	0.00
11,100.00	89.68	180.12	7,100.85	-5,024.67	-1,487.67	5,019.71	0.00	0.00	0.00
11,200.00	89.68	180.12	7,101.41	-5,124.67	-1,487.88	5,119.71	0.00	0.00	0.00
11,300.00	89.68	180.12	7,101.97	-5,224.67	-1,488.09	5,219.71	0.00	0.00	0.00
11,400.00	89.68	180.12	7,102.53	-5,324.67	-1,488.30	5,319.70	0.00	0.00	0.00
11,500.00	89.68	180.12	7,103.09	-5,424.67	-1,488.51	5,419.70	0.00	0.00	0.00
11,600.00	89.68	180.12	7,103.64	-5,524.66	-1,488.72	5,519.70	0.00	0.00	0.00
11,700.00	89.68	180.12	7,104.20	-5,624.66	-1,488.93	5,619.69	0.00	0.00	0.00
11,800.00	89.68	180.12	7,104.76	-5,724.66	-1,489.14	5,719.69	0.00	0.00	0.00
11,900.00	89.68	180.12	7,105.32	-5,824.66	-1,489.35	5,819.69	0.00	0.00	0.00
12,000.00	89.68	180.12	7,105.88	-5,924.66	-1,489.55	5,919.69	0.00	0.00	0.00
12,100.00	89.68	180.12	7,106.44	-6,024.66	-1,489.76	6,019.68	0.00	0.00	0.00
12,200.00	89.68	180.12	7,107.00	-6,124.65	-1,489.97	6,119.68	0.00	0.00	0.00
12,300.00	89.68	180.12	7,107.55	-6,224.65	-1,490.18	6,219.68	0.00	0.00	0.00
12,400.00	89.68	180.12	7,108.11	-6,324.65	-1,490.39	6,319.67	0.00	0.00	0.00
12,500.00	89.68	180.12	7,108.67	-6,424.65	-1,490.60	6,419.67	0.00	0.00	0.00
12,600.00	89.68	180.12	7,109.23	-6,524.65	-1,490.81	6,519.67	0.00	0.00	0.00
12,700.00	89.68	180.12	7,109.79	-6,624.65	-1,491.02	6,619.66	0.00	0.00	0.00
12,725.01	89.68	180.12	7,109.93	-6,649.65	-1,491.07	6,644.67	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-18HZ
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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
Begin Turn for AC @ 12725.01ft									
12,800.00	89.68	181.24	7,110.35	-6,724.64	-1,491.97	6,719.65	1.50	0.00	1.50
12,850.34	89.68	182.00	7,110.63	-6,774.96	-1,493.39	6,769.97	1.50	0.00	1.50
End Turn @ 12850.34ft									
12,900.00	89.68	182.00	7,110.91	-6,824.58	-1,495.12	6,819.59	0.00	0.00	0.00
13,000.00	89.68	182.00	7,111.46	-6,924.52	-1,498.61	6,919.51	0.00	0.00	0.00
13,100.00	89.68	182.00	7,112.02	-7,024.46	-1,502.10	7,019.44	0.00	0.00	0.00
13,200.00	89.68	182.00	7,112.58	-7,124.40	-1,505.59	7,119.37	0.00	0.00	0.00
13,300.00	89.68	182.00	7,113.14	-7,224.33	-1,509.08	7,219.29	0.00	0.00	0.00
13,400.00	89.68	182.00	7,113.70	-7,324.27	-1,512.57	7,319.22	0.00	0.00	0.00
13,500.00	89.68	182.00	7,114.26	-7,424.21	-1,516.06	7,419.14	0.00	0.00	0.00
13,600.00	89.68	182.00	7,114.82	-7,524.15	-1,519.55	7,519.07	0.00	0.00	0.00
13,700.00	89.68	182.00	7,115.37	-7,624.08	-1,523.04	7,618.99	0.00	0.00	0.00
13,800.00	89.68	182.00	7,115.93	-7,724.02	-1,526.53	7,718.92	0.00	0.00	0.00
13,900.00	89.68	182.00	7,116.49	-7,823.96	-1,530.02	7,818.84	0.00	0.00	0.00
14,000.00	89.68	182.00	7,117.05	-7,923.90	-1,533.51	7,918.77	0.00	0.00	0.00
14,100.00	89.68	182.00	7,117.61	-8,023.84	-1,537.00	8,018.69	0.00	0.00	0.00
14,200.00	89.68	182.00	7,118.17	-8,123.77	-1,540.49	8,118.62	0.00	0.00	0.00
14,300.00	89.68	182.00	7,118.72	-8,223.71	-1,543.98	8,218.54	0.00	0.00	0.00
14,400.00	89.68	182.00	7,119.28	-8,323.65	-1,547.47	8,318.47	0.00	0.00	0.00
14,500.00	89.68	182.00	7,119.84	-8,423.59	-1,550.96	8,418.40	0.00	0.00	0.00
14,600.00	89.68	182.00	7,120.40	-8,523.52	-1,554.45	8,518.32	0.00	0.00	0.00
14,700.00	89.68	182.00	7,120.96	-8,623.46	-1,557.94	8,618.25	0.00	0.00	0.00
14,800.00	89.68	182.00	7,121.52	-8,723.40	-1,561.43	8,718.17	0.00	0.00	0.00
14,900.00	89.68	182.00	7,122.08	-8,823.34	-1,564.92	8,818.10	0.00	0.00	0.00
15,000.00	89.68	182.00	7,122.63	-8,923.27	-1,568.41	8,918.02	0.00	0.00	0.00
15,100.00	89.68	182.00	7,123.19	-9,023.21	-1,571.90	9,017.95	0.00	0.00	0.00
15,200.00	89.68	182.00	7,123.75	-9,123.15	-1,575.39	9,117.87	0.00	0.00	0.00
15,300.00	89.68	182.00	7,124.31	-9,223.09	-1,578.88	9,217.80	0.00	0.00	0.00
15,400.00	89.68	182.00	7,124.87	-9,323.02	-1,582.37	9,317.72	0.00	0.00	0.00
15,500.00	89.68	182.00	7,125.43	-9,422.96	-1,585.86	9,417.65	0.00	0.00	0.00
15,600.00	89.68	182.00	7,125.99	-9,522.90	-1,589.35	9,517.58	0.00	0.00	0.00
15,700.00	89.68	182.00	7,126.54	-9,622.84	-1,592.84	9,617.50	0.00	0.00	0.00
15,800.00	89.68	182.00	7,127.10	-9,722.77	-1,596.33	9,717.43	0.00	0.00	0.00
15,900.00	89.68	182.00	7,127.66	-9,822.71	-1,599.82	9,817.35	0.00	0.00	0.00
16,000.00	89.68	182.00	7,128.22	-9,922.65	-1,603.31	9,917.28	0.00	0.00	0.00
16,100.00	89.68	182.00	7,128.78	-10,022.59	-1,606.80	10,017.20	0.00	0.00	0.00
16,200.00	89.68	182.00	7,129.34	-10,122.52	-1,610.29	10,117.13	0.00	0.00	0.00
16,300.00	89.68	182.00	7,129.89	-10,222.46	-1,613.78	10,217.05	0.00	0.00	0.00
16,400.00	89.68	182.00	7,130.45	-10,322.40	-1,617.27	10,316.98	0.00	0.00	0.00
16,500.00	89.68	182.00	7,131.01	-10,422.34	-1,620.76	10,416.90	0.00	0.00	0.00
16,583.99	89.68	182.00	7,131.48	-10,506.27	-1,623.69	10,500.83	0.00	0.00	0.00
Begin Turn for 3-D Spacing @ 16583.99ft									
16,600.00	89.68	181.76	7,131.57	-10,522.27	-1,624.22	10,516.83	1.50	0.00	-1.50
16,700.00	89.68	180.26	7,132.13	-10,622.25	-1,625.98	10,616.80	1.50	0.00	-1.50
16,717.32	89.68	180.00	7,132.23	-10,639.58	-1,626.02	10,634.12	1.50	0.00	-1.50
End Turn @ 16717.32ft									
16,800.00	89.68	180.00	7,132.69	-10,722.25	-1,626.02	10,716.80	0.00	0.00	0.00
16,900.00	89.68	180.00	7,133.25	-10,822.25	-1,626.02	10,816.80	0.00	0.00	0.00
17,000.00	89.68	180.00	7,133.80	-10,922.25	-1,626.02	10,916.80	0.00	0.00	0.00
17,100.00	89.68	180.00	7,134.36	-11,022.25	-1,626.02	11,016.80	0.00	0.00	0.00
17,200.00	89.68	180.00	7,134.92	-11,122.25	-1,626.02	11,116.79	0.00	0.00	0.00
17,300.00	89.68	180.00	7,135.48	-11,222.24	-1,626.02	11,216.79	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-18HZ
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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
17,400.00	89.68	180.00	7,136.04	-11,322.24	-1,626.02	11,316.79	0.00	0.00	0.00
17,500.00	89.68	180.00	7,136.60	-11,422.24	-1,626.02	11,416.79	0.00	0.00	0.00
17,600.00	89.68	180.00	7,137.16	-11,522.24	-1,626.02	11,516.78	0.00	0.00	0.00
17,700.00	89.68	180.00	7,137.71	-11,622.24	-1,626.02	11,616.78	0.00	0.00	0.00
17,800.00	89.68	180.00	7,138.27	-11,722.24	-1,626.02	11,716.78	0.00	0.00	0.00
17,900.00	89.68	180.00	7,138.83	-11,822.24	-1,626.02	11,816.78	0.00	0.00	0.00
18,000.00	89.68	180.00	7,139.39	-11,922.23	-1,626.02	11,916.78	0.00	0.00	0.00
18,100.00	89.68	180.00	7,139.95	-12,022.23	-1,626.02	12,016.77	0.00	0.00	0.00
18,200.00	89.68	180.00	7,140.51	-12,122.23	-1,626.02	12,116.77	0.00	0.00	0.00
18,300.00	89.68	180.00	7,141.06	-12,222.23	-1,626.02	12,216.77	0.00	0.00	0.00
18,400.00	89.68	180.00	7,141.62	-12,322.23	-1,626.02	12,316.77	0.00	0.00	0.00
18,500.00	89.68	180.00	7,142.18	-12,422.23	-1,626.02	12,416.77	0.00	0.00	0.00
18,600.00	89.68	180.00	7,142.74	-12,522.22	-1,626.02	12,516.76	0.00	0.00	0.00
18,700.00	89.68	180.00	7,143.30	-12,622.22	-1,626.02	12,616.76	0.00	0.00	0.00
18,800.00	89.68	180.00	7,143.86	-12,722.22	-1,626.02	12,716.76	0.00	0.00	0.00
18,900.00	89.68	180.00	7,144.42	-12,822.22	-1,626.02	12,816.76	0.00	0.00	0.00
19,000.00	89.68	180.00	7,144.97	-12,922.22	-1,626.02	12,916.76	0.00	0.00	0.00
19,109.99	89.68	180.00	7,145.59	-13,032.21	-1,626.02	13,026.74	0.00	0.00	0.00
Begin Turn for AC @ 19109.99ft									
19,200.00	89.68	178.65	7,146.09	-13,122.21	-1,624.96	13,116.75	1.50	0.00	-1.50
19,300.00	89.68	177.15	7,146.65	-13,222.14	-1,621.29	13,216.69	1.50	0.00	-1.50
19,400.00	89.68	175.65	7,147.21	-13,321.93	-1,615.01	13,316.50	1.50	0.00	-1.50
19,500.00	89.68	174.15	7,147.77	-13,421.53	-1,606.13	13,416.13	1.50	0.00	-1.50
19,539.98	89.68	173.55	7,147.99	-13,461.29	-1,601.84	13,455.90	1.50	0.00	-1.50
End Turn @ 19539.98ft									
19,600.00	89.68	173.55	7,148.33	-13,520.92	-1,595.10	13,515.56	0.00	0.00	0.00
19,700.00	89.68	173.55	7,148.89	-13,620.29	-1,583.87	13,614.96	0.00	0.00	0.00
19,800.00	89.68	173.55	7,149.44	-13,719.65	-1,572.63	13,714.36	0.00	0.00	0.00
19,900.00	89.68	173.55	7,150.00	-13,819.02	-1,561.40	13,813.76	0.00	0.00	0.00
20,000.00	89.68	173.55	7,150.56	-13,918.38	-1,550.17	13,913.17	0.00	0.00	0.00
20,100.00	89.68	173.55	7,151.12	-14,017.75	-1,538.93	14,012.57	0.00	0.00	0.00
20,200.00	89.68	173.55	7,151.68	-14,117.11	-1,527.70	14,111.97	0.00	0.00	0.00
20,300.00	89.68	173.55	7,152.24	-14,216.48	-1,516.47	14,211.37	0.00	0.00	0.00
20,400.00	89.68	173.55	7,152.80	-14,315.85	-1,505.23	14,310.78	0.00	0.00	0.00
20,500.00	89.68	173.55	7,153.35	-14,415.21	-1,494.00	14,410.18	0.00	0.00	0.00
20,600.00	89.68	173.55	7,153.91	-14,514.58	-1,482.77	14,509.58	0.00	0.00	0.00
20,700.00	89.68	173.55	7,154.47	-14,613.94	-1,471.53	14,608.98	0.00	0.00	0.00
20,800.00	89.68	173.55	7,155.03	-14,713.31	-1,460.30	14,708.38	0.00	0.00	0.00
20,900.00	89.68	173.55	7,155.59	-14,812.67	-1,449.07	14,807.79	0.00	0.00	0.00
21,000.00	89.68	173.55	7,156.15	-14,912.04	-1,437.83	14,907.19	0.00	0.00	0.00
21,100.00	89.68	173.55	7,156.71	-15,011.40	-1,426.60	15,006.59	0.00	0.00	0.00
21,200.00	89.68	173.55	7,157.26	-15,110.77	-1,415.36	15,105.99	0.00	0.00	0.00
21,300.00	89.68	173.55	7,157.82	-15,210.13	-1,404.13	15,205.39	0.00	0.00	0.00
21,400.00	89.68	173.55	7,158.38	-15,309.50	-1,392.90	15,304.80	0.00	0.00	0.00
21,500.00	89.68	173.55	7,158.94	-15,408.87	-1,381.66	15,404.20	0.00	0.00	0.00
21,600.00	89.68	173.55	7,159.50	-15,508.23	-1,370.43	15,503.60	0.00	0.00	0.00
21,700.00	89.68	173.55	7,160.06	-15,607.60	-1,359.20	15,603.00	0.00	0.00	0.00
21,800.00	89.68	173.55	7,160.61	-15,706.96	-1,347.96	15,702.41	0.00	0.00	0.00
21,900.00	89.68	173.55	7,161.17	-15,806.33	-1,336.73	15,801.81	0.00	0.00	0.00
22,000.00	89.68	173.55	7,161.73	-15,905.69	-1,325.50	15,901.21	0.00	0.00	0.00
22,100.00	89.68	173.55	7,162.29	-16,005.06	-1,314.26	16,000.61	0.00	0.00	0.00
22,200.00	89.68	173.55	7,162.85	-16,104.42	-1,303.03	16,100.01	0.00	0.00	0.00
22,300.00	89.68	173.55	7,163.41	-16,203.79	-1,291.80	16,199.42	0.00	0.00	0.00
22,400.00	89.68	173.55	7,163.97	-16,303.16	-1,280.56	16,298.82	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-18HZ
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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
22,500.00	89.68	173.55	7,164.52	-16,402.52	-1,269.33	16,398.22	0.00	0.00	0.00
22,600.00	89.68	173.55	7,165.08	-16,501.89	-1,258.10	16,497.62	0.00	0.00	0.00
22,700.00	89.68	173.55	7,165.64	-16,601.25	-1,246.86	16,597.03	0.00	0.00	0.00
22,800.00	89.68	173.55	7,166.20	-16,700.62	-1,235.63	16,696.43	0.00	0.00	0.00
22,900.00	89.68	173.55	7,166.76	-16,799.98	-1,224.40	16,795.83	0.00	0.00	0.00
23,000.00	89.68	173.55	7,167.32	-16,899.35	-1,213.16	16,895.23	0.00	0.00	0.00
23,086.66	89.68	173.55	7,167.80	-16,985.46	-1,203.43	16,981.37	0.00	0.00	0.00
Begin Turn to BHL @ 23086.66ft									
23,100.00	89.68	173.75	7,167.88	-16,998.72	-1,201.95	16,994.64	1.50	0.00	1.50
23,200.00	89.68	175.25	7,168.43	-17,098.25	-1,192.37	17,094.20	1.50	0.00	1.50
23,300.00	89.68	176.75	7,168.99	-17,198.00	-1,185.39	17,193.98	1.50	0.00	1.50
23,400.00	89.68	178.25	7,169.55	-17,297.90	-1,181.03	17,293.89	1.50	0.00	1.50
23,500.00	89.68	179.75	7,170.11	-17,397.88	-1,179.29	17,393.88	1.50	0.00	1.50
23,516.65	89.68	180.00	7,170.20	-17,414.54	-1,179.25	17,410.53	1.50	0.00	1.50
End Turn @ 23516.65ft									
23,600.00	89.68	180.00	7,170.66	-17,497.88	-1,179.25	17,493.88	0.00	0.00	0.00
23,700.00	89.68	180.00	7,171.22	-17,597.88	-1,179.25	17,593.87	0.00	0.00	0.00
23,800.00	89.68	180.00	7,171.78	-17,697.88	-1,179.25	17,693.87	0.00	0.00	0.00
23,900.00	89.68	180.00	7,172.33	-17,797.88	-1,179.25	17,793.87	0.00	0.00	0.00
24,000.00	89.68	180.00	7,172.89	-17,897.88	-1,179.25	17,893.87	0.00	0.00	0.00
24,100.00	89.68	180.00	7,173.45	-17,997.87	-1,179.25	17,993.87	0.00	0.00	0.00
24,200.00	89.68	180.00	7,174.00	-18,097.87	-1,179.25	18,093.86	0.00	0.00	0.00
24,300.00	89.68	180.00	7,174.56	-18,197.87	-1,179.25	18,193.86	0.00	0.00	0.00
24,400.00	89.68	180.00	7,175.12	-18,297.87	-1,179.25	18,293.86	0.00	0.00	0.00
24,500.00	89.68	180.00	7,175.67	-18,397.87	-1,179.25	18,393.86	0.00	0.00	0.00
24,600.00	89.68	180.00	7,176.23	-18,497.87	-1,179.25	18,493.85	0.00	0.00	0.00
24,700.00	89.68	180.00	7,176.79	-18,597.87	-1,179.25	18,593.85	0.00	0.00	0.00
24,800.00	89.68	180.00	7,177.34	-18,697.86	-1,179.25	18,693.85	0.00	0.00	0.00
24,900.00	89.68	180.00	7,177.90	-18,797.86	-1,179.25	18,793.85	0.00	0.00	0.00
25,000.00	89.68	180.00	7,178.46	-18,897.86	-1,179.25	18,893.85	0.00	0.00	0.00
25,100.00	89.68	180.00	7,179.01	-18,997.86	-1,179.25	18,993.84	0.00	0.00	0.00
25,200.00	89.68	180.00	7,179.57	-19,097.86	-1,179.25	19,093.84	0.00	0.00	0.00
25,232.70	89.68	180.00	7,179.75	-19,130.56	-1,179.25	19,126.54	0.00	0.00	0.00
TD Well @ 25232.70ft - 5.5" CSG									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,523.56	1,500.00	9 5/8"	9-5/8	13-1/2	
25,232.70	7,179.75	5.5" CSG	5-1/2	7-7/8	

Planning Report

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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 30-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
36.00	36.00	Fox Hills				
3,753.18	3,644.00	Parkman				
4,205.55	4,079.00	Sussex				
7,076.59	6,812.00	Sharon Springs				
7,168.48	6,879.00	Niobrara				
7,250.54	6,932.00	Nio B				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
203.00	203.00	0.00	0.00	Begin Nudge @ 203.00ft	
1,265.00	1,251.37	-84.51	-119.89	Hold Tangent @ 1265.00ft	
6,717.98	6,494.94	-946.80	-1,343.17	KOP @ 6717.98ft :: DLS = 8°/100'	
7,725.01	7,082.00	-1,649.75	-1,480.60	End Build @ 7725.01ft	
12,725.01	7,109.93	-6,649.65	-1,491.07	Begin Turn for AC @ 12725.01ft	
12,850.34	7,110.63	-6,774.96	-1,493.39	End Turn @ 12850.34ft	
16,583.99	7,131.48	-10,506.27	-1,623.69	Begin Turn for 3-D Spacing @ 16583.99ft	
16,717.32	7,132.23	-10,639.58	-1,626.02	End Turn @ 16717.32ft	
19,109.99	7,145.59	-13,032.21	-1,626.02	Begin Turn for AC @ 19109.99ft	
19,539.98	7,147.99	-13,461.29	-1,601.84	End Turn @ 19539.98ft	
23,086.66	7,167.80	-16,985.46	-1,203.43	Begin Turn to BHL @ 23086.66ft	
23,516.65	7,170.20	-17,414.54	-1,179.25	End Turn @ 23516.65ft	
25,232.70	7,179.75	-19,130.56	-1,179.25	TD Well @ 25232.70ft	