

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

RADEMACHER SOUTH 30-15HZ

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 30-15HZ

Wellbore: Plan A

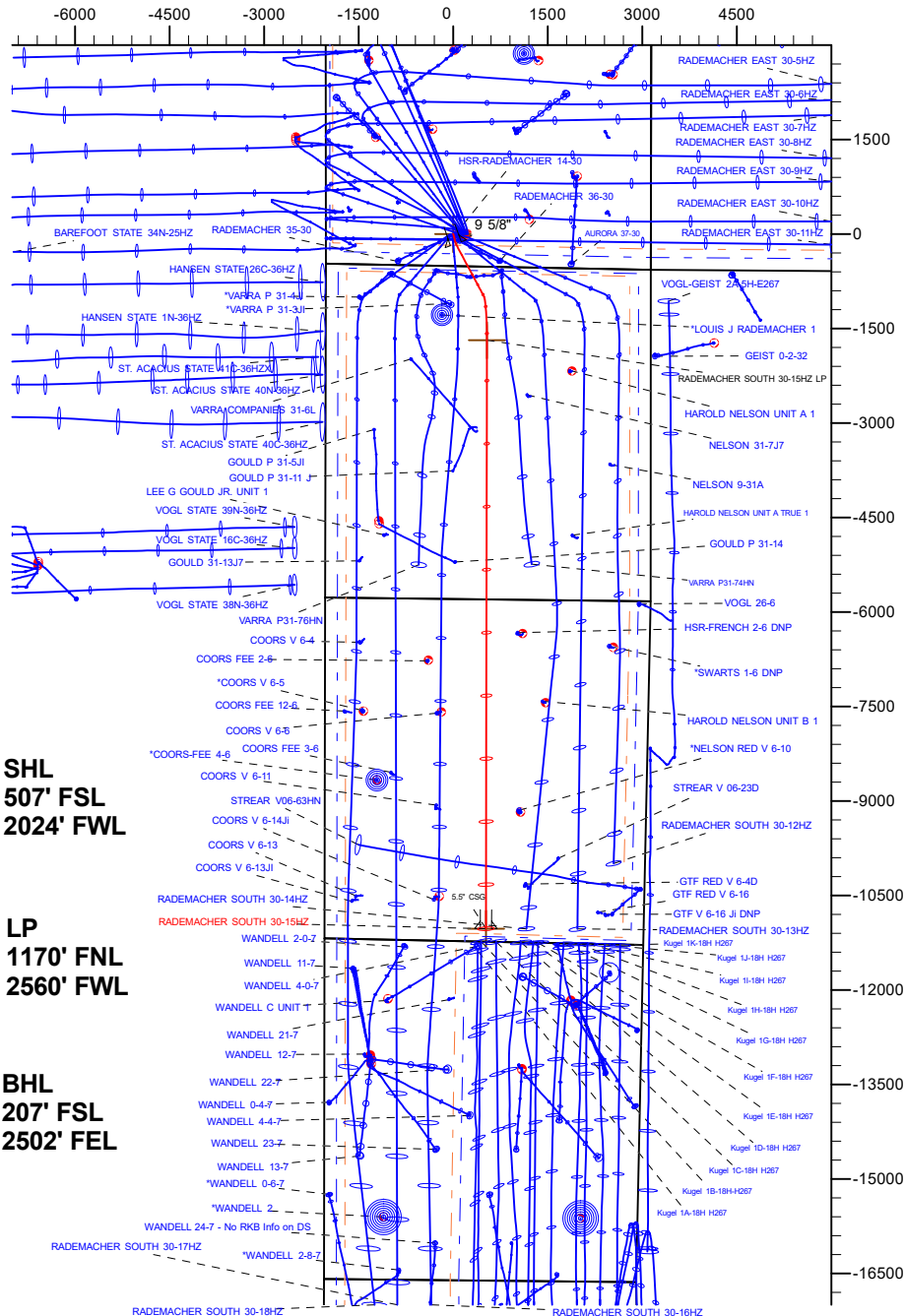
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1500.00	1512.72	9 5/8"	9-5/8
7325.50	17100.00	5.5" CSG	5-1/2

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



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Target
2	268.50	0.00	0.00	268.50	0.00	0.00	0.00	0.00	0.00	
3	957.17	10.33	165.00	953.44	-59.80	16.02	1.50	165.00	59.78	
4	1458.67	10.33	165.00	1446.82	-146.67	39.30	0.00	0.00	146.60	
5	1615.54	10.33	151.85	1601.16	-172.66	49.58	1.50	-96.47	172.57	
6	6752.80	10.33	151.85	6655.16	-984.89	484.18	0.00	0.00	984.05	
7	7758.88	89.57	180.10	7256.00	-1686.88	534.44	8.00	28.68	1685.94	
8	17100.00	89.57	180.10	7325.50	-11027.72	518.61	0.00	0.00	11026.80	RADEMACHER SOUTH 30-15HZ BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RADEMACHER SOUTH 30-15HZ SHL	0.00	14596405.42	1658702.32	40.191311	-104.934523
RADEMACHER SOUTH 30-15HZ LP	7256.00	14594718.93	1659238.00	40.186679	-104.932609
RADEMACHER SOUTH 30-15HZ BHL	7325.50	14585378.09	1659229.06	40.161028	-104.932667

WELL DETAILS: RADEMACHER SOUTH 30-15HZ

GL = 4819'

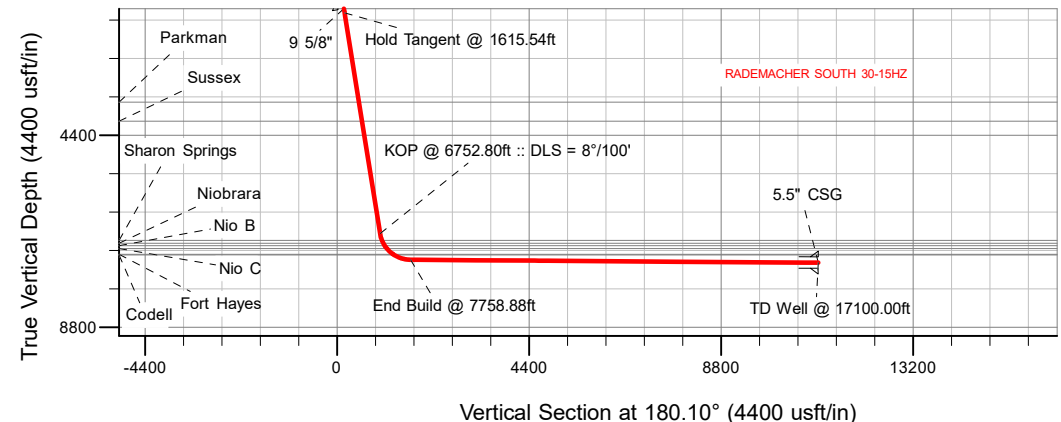
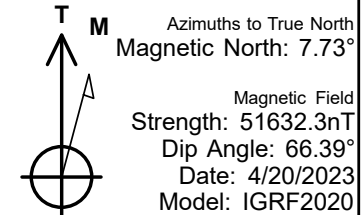
RKB = 17' @ 4836.00usft (RIG)

Plan: Permit Rev-1 (RADEMACHER SOUTH 30-15HZ/Plan A)

Date: 4/27/2023

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
36.00	36.00	Fox Hills
3644.00	3692.03	Parkman
4079.00	4134.20	Sussex
6812.00	6916.64	Sharon Springs
6879.00	6990.97	Niobrara
6932.00	7052.80	Nio B
6996.00	7132.52	Nio C
7129.00	7330.28	Fort Hayes
7149.00	7366.89	Codell



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-15HZ
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 30-15HZ	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 30-15HZ				
Well Position	+N/-S	0.00 usft	Northing:	14,596,405.42 usft	Latitude:	40.191311
	+E/-W	0.00 usft	Easting:	1,658,702.32 usft	Longitude:	-104.934523
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	51,632.27087277

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	180.10	

Plan Survey Tool Program		Date	4/25/2023		
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	17,100.00	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 30-15HZ	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	
268.50	0.00	0.00	268.50	0.00	0.00	0.00	0.00	0.00	0.00	
957.17	10.33	165.00	953.44	-59.80	16.02	1.50	1.50	0.00	165.00	
1,458.67	10.33	165.00	1,446.82	-146.67	39.30	0.00	0.00	0.00	0.00	
1,615.54	10.33	151.85	1,601.16	-172.66	49.58	1.50	0.00	-8.38	-96.47	
6,752.80	10.33	151.85	6,655.16	-984.89	484.18	0.00	0.00	0.00	0.00	
7,758.88	89.57	180.10	7,256.00	-1,686.88	534.44	8.00	7.88	2.81	28.68	
17,100.00	89.57	180.10	7,325.50	-11,027.72	518.61	0.00	0.00	0.00	0.00	RADEMACHER SOU

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 30-15HZ	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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
268.50	0.00	0.00	268.50	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 268.50ft									
300.00	0.47	165.00	300.00	-0.13	0.03	0.13	1.50	1.50	0.00
400.00	1.97	165.00	399.97	-2.19	0.59	2.19	1.50	1.50	0.00
500.00	3.47	165.00	499.86	-6.77	1.82	6.77	1.50	1.50	0.00
600.00	4.97	165.00	599.58	-13.89	3.72	13.88	1.50	1.50	0.00
700.00	6.47	165.00	699.08	-23.52	6.30	23.51	1.50	1.50	0.00
800.00	7.97	165.00	798.29	-35.66	9.56	35.64	1.50	1.50	0.00
900.00	9.47	165.00	897.13	-50.31	13.48	50.28	1.50	1.50	0.00
957.17	10.33	165.00	953.44	-59.80	16.02	59.78	1.50	1.50	0.00
Hold Tangent @ 957.17ft									
1,000.00	10.33	165.00	995.58	-67.22	18.01	67.19	0.00	0.00	0.00
1,100.00	10.33	165.00	1,093.96	-84.54	22.65	84.50	0.00	0.00	0.00
1,200.00	10.33	165.00	1,192.34	-101.86	27.29	101.82	0.00	0.00	0.00
1,300.00	10.33	165.00	1,290.72	-119.18	31.94	119.13	0.00	0.00	0.00
1,400.00	10.33	165.00	1,389.10	-136.51	36.58	136.44	0.00	0.00	0.00
1,458.67	10.33	165.00	1,446.82	-146.67	39.30	146.60	0.00	0.00	0.00
Change Tangent Direction @ 1458.67ft									
1,500.00	10.28	161.55	1,487.48	-153.74	41.43	153.67	1.50	-0.12	-8.36
1,512.72	10.27	160.48	1,500.00	-155.89	42.16	155.82	1.50	-0.07	-8.40
9 5/8"									
1,600.00	10.31	153.14	1,585.88	-170.19	48.29	170.10	1.50	0.04	-8.40
1,615.54	10.33	151.85	1,601.16	-172.66	49.58	172.57	1.50	0.15	-8.33
Hold Tangent @ 1615.54ft									
1,700.00	10.33	151.85	1,684.26	-186.01	56.72	185.91	0.00	0.00	0.00
1,800.00	10.33	151.85	1,782.64	-201.82	65.18	201.71	0.00	0.00	0.00
1,900.00	10.33	151.85	1,881.01	-217.63	73.64	217.50	0.00	0.00	0.00
2,000.00	10.33	151.85	1,979.39	-233.44	82.10	233.30	0.00	0.00	0.00
2,100.00	10.33	151.85	2,077.77	-249.25	90.56	249.10	0.00	0.00	0.00
2,200.00	10.33	151.85	2,176.15	-265.06	99.02	264.89	0.00	0.00	0.00
2,300.00	10.33	151.85	2,274.53	-280.88	107.48	280.69	0.00	0.00	0.00
2,400.00	10.33	151.85	2,372.91	-296.69	115.94	296.48	0.00	0.00	0.00
2,500.00	10.33	151.85	2,471.29	-312.50	124.40	312.28	0.00	0.00	0.00
2,600.00	10.33	151.85	2,569.67	-328.31	132.86	328.07	0.00	0.00	0.00
2,700.00	10.33	151.85	2,668.05	-344.12	141.32	343.87	0.00	0.00	0.00
2,800.00	10.33	151.85	2,766.43	-359.93	149.78	359.67	0.00	0.00	0.00
2,900.00	10.33	151.85	2,864.81	-375.74	158.24	375.46	0.00	0.00	0.00
3,000.00	10.33	151.85	2,963.19	-391.55	166.70	391.26	0.00	0.00	0.00
3,100.00	10.33	151.85	3,061.56	-407.36	175.16	407.05	0.00	0.00	0.00
3,200.00	10.33	151.85	3,159.94	-423.17	183.62	422.85	0.00	0.00	0.00
3,300.00	10.33	151.85	3,258.32	-438.98	192.08	438.65	0.00	0.00	0.00
3,400.00	10.33	151.85	3,356.70	-454.79	200.54	454.44	0.00	0.00	0.00
3,500.00	10.33	151.85	3,455.08	-470.60	209.00	470.24	0.00	0.00	0.00
3,600.00	10.33	151.85	3,553.46	-486.41	217.46	486.03	0.00	0.00	0.00
3,692.03	10.33	151.85	3,644.00	-500.97	225.24	500.57	0.00	0.00	0.00
Parkman									
3,700.00	10.33	151.85	3,651.84	-502.22	225.92	501.83	0.00	0.00	0.00
3,800.00	10.33	151.85	3,750.22	-518.04	234.38	517.63	0.00	0.00	0.00

Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
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Well:	RADEMACHER SOUTH 30-15HZ	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)
3,900.00	10.33	151.85	3,848.60	-533.85	242.84	533.42	0.00	0.00	0.00
4,000.00	10.33	151.85	3,946.98	-549.66	251.30	549.22	0.00	0.00	0.00
4,100.00	10.33	151.85	4,045.36	-565.47	259.76	565.01	0.00	0.00	0.00
4,134.20	10.33	151.85	4,079.00	-570.87	262.65	570.42	0.00	0.00	0.00
Sussex									
4,200.00	10.33	151.85	4,143.73	-581.28	268.22	580.81	0.00	0.00	0.00
4,300.00	10.33	151.85	4,242.11	-597.09	276.68	596.61	0.00	0.00	0.00
4,400.00	10.33	151.85	4,340.49	-612.90	285.14	612.40	0.00	0.00	0.00
4,500.00	10.33	151.85	4,438.87	-628.71	293.60	628.20	0.00	0.00	0.00
4,600.00	10.33	151.85	4,537.25	-644.52	302.06	643.99	0.00	0.00	0.00
4,700.00	10.33	151.85	4,635.63	-660.33	310.52	659.79	0.00	0.00	0.00
4,800.00	10.33	151.85	4,734.01	-676.14	318.98	675.58	0.00	0.00	0.00
4,900.00	10.33	151.85	4,832.39	-691.95	327.44	691.38	0.00	0.00	0.00
5,000.00	10.33	151.85	4,930.77	-707.76	335.90	707.18	0.00	0.00	0.00
5,100.00	10.33	151.85	5,029.15	-723.57	344.36	722.97	0.00	0.00	0.00
5,200.00	10.33	151.85	5,127.53	-739.39	352.82	738.77	0.00	0.00	0.00
5,300.00	10.33	151.85	5,225.91	-755.20	361.28	754.56	0.00	0.00	0.00
5,400.00	10.33	151.85	5,324.28	-771.01	369.74	770.36	0.00	0.00	0.00
5,500.00	10.33	151.85	5,422.66	-786.82	378.20	786.16	0.00	0.00	0.00
5,600.00	10.33	151.85	5,521.04	-802.63	386.66	801.95	0.00	0.00	0.00
5,700.00	10.33	151.85	5,619.42	-818.44	395.12	817.75	0.00	0.00	0.00
5,800.00	10.33	151.85	5,717.80	-834.25	403.58	833.54	0.00	0.00	0.00
5,900.00	10.33	151.85	5,816.18	-850.06	412.04	849.34	0.00	0.00	0.00
6,000.00	10.33	151.85	5,914.56	-865.87	420.50	865.14	0.00	0.00	0.00
6,100.00	10.33	151.85	6,012.94	-881.68	428.96	880.93	0.00	0.00	0.00
6,200.00	10.33	151.85	6,111.32	-897.49	437.42	896.73	0.00	0.00	0.00
6,300.00	10.33	151.85	6,209.70	-913.30	445.88	912.52	0.00	0.00	0.00
6,400.00	10.33	151.85	6,308.08	-929.11	454.34	928.32	0.00	0.00	0.00
6,500.00	10.33	151.85	6,406.45	-944.92	462.80	944.12	0.00	0.00	0.00
6,600.00	10.33	151.85	6,504.83	-960.73	471.25	959.91	0.00	0.00	0.00
6,700.00	10.33	151.85	6,603.21	-976.55	479.71	975.71	0.00	0.00	0.00
6,752.80	10.33	151.85	6,655.16	-984.89	484.18	984.05	0.00	0.00	0.00
KOP @ 6752.80ft :: DLS = 8°/100'									
6,800.00	13.76	159.48	6,701.31	-993.89	488.15	993.03	8.00	7.27	16.17
6,850.00	17.55	164.28	6,749.45	-1,006.72	492.27	1,005.86	8.00	7.58	9.60
6,900.00	21.41	167.41	6,796.58	-1,022.89	496.31	1,022.02	8.00	7.73	6.25
6,916.64	22.71	168.22	6,812.00	-1,028.99	497.62	1,028.12	8.00	7.79	4.88
Sharon Springs									
6,950.00	25.32	169.61	6,842.47	-1,042.32	500.23	1,041.44	8.00	7.82	4.17
6,990.97	28.53	170.99	6,879.00	-1,060.60	503.34	1,059.72	8.00	7.85	3.37
Niobrara									
7,000.00	29.24	171.26	6,886.91	-1,064.91	504.01	1,064.03	8.00	7.87	2.95
7,050.00	33.19	172.55	6,929.66	-1,090.57	507.64	1,089.68	8.00	7.89	2.57
7,052.80	33.41	172.61	6,932.00	-1,092.09	507.84	1,091.20	8.00	7.90	2.28
Nio B									
7,100.00	37.14	173.59	6,970.52	-1,119.15	511.11	1,118.25	8.00	7.91	2.07
7,132.53	39.72	174.17	6,996.00	-1,139.25	513.26	1,138.35	8.00	7.92	1.78
Nio C									
7,150.00	41.11	174.45	7,009.31	-1,150.52	514.38	1,149.62	8.00	7.93	1.64
7,200.00	45.07	175.19	7,045.81	-1,184.53	517.46	1,183.63	8.00	7.94	1.48
7,250.00	49.05	175.84	7,079.87	-1,221.02	520.31	1,220.11	8.00	7.94	1.29
7,300.00	53.02	176.41	7,111.30	-1,259.80	522.94	1,258.88	8.00	7.95	1.14
7,330.28	55.43	176.72	7,129.00	-1,284.32	524.41	1,283.40	8.00	7.95	1.05

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Well:	RADEMACHER SOUTH 30-15HZ	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)
Fort Hayes									
7,350.00	57.00	176.92	7,139.97	-1,300.68	525.32	1,299.76	8.00	7.96	1.00
7,366.89	58.34	177.08	7,149.00	-1,314.94	526.06	1,314.02	8.00	7.96	0.96
Codell									
7,400.00	60.98	177.39	7,165.72	-1,343.48	527.44	1,342.55	8.00	7.96	0.92
7,450.00	64.96	177.82	7,188.44	-1,387.97	529.30	1,387.04	8.00	7.96	0.87
7,500.00	68.94	178.23	7,208.01	-1,433.94	530.88	1,433.01	8.00	7.96	0.81
7,550.00	72.93	178.61	7,224.34	-1,481.17	532.18	1,480.24	8.00	7.97	0.77
7,600.00	76.91	178.98	7,237.35	-1,529.43	533.19	1,528.49	8.00	7.97	0.74
7,650.00	80.90	179.34	7,246.97	-1,578.48	533.91	1,577.54	8.00	7.97	0.72
7,700.00	84.88	179.69	7,253.16	-1,628.08	534.33	1,627.14	8.00	7.97	0.70
7,750.00	88.87	180.04	7,255.88	-1,677.99	534.45	1,677.06	8.00	7.97	0.69
7,758.88	89.57	180.10	7,256.00	-1,686.88	534.44	1,685.94	8.00	7.97	0.69
End Build @ 7758.88ft									
7,800.00	89.57	180.10	7,256.31	-1,727.99	534.37	1,727.06	0.00	0.00	0.00
7,900.00	89.57	180.10	7,257.05	-1,827.99	534.20	1,827.05	0.00	0.00	0.00
8,000.00	89.57	180.10	7,257.80	-1,927.99	534.03	1,927.05	0.00	0.00	0.00
8,100.00	89.57	180.10	7,258.54	-2,027.98	533.86	2,027.05	0.00	0.00	0.00
8,200.00	89.57	180.10	7,259.29	-2,127.98	533.69	2,127.05	0.00	0.00	0.00
8,300.00	89.57	180.10	7,260.03	-2,227.98	533.52	2,227.04	0.00	0.00	0.00
8,400.00	89.57	180.10	7,260.77	-2,327.98	533.35	2,327.04	0.00	0.00	0.00
8,500.00	89.57	180.10	7,261.52	-2,427.97	533.18	2,427.04	0.00	0.00	0.00
8,600.00	89.57	180.10	7,262.26	-2,527.97	533.01	2,527.04	0.00	0.00	0.00
8,700.00	89.57	180.10	7,263.01	-2,627.97	532.84	2,627.03	0.00	0.00	0.00
8,800.00	89.57	180.10	7,263.75	-2,727.96	532.67	2,727.03	0.00	0.00	0.00
8,900.00	89.57	180.10	7,264.49	-2,827.96	532.50	2,827.03	0.00	0.00	0.00
9,000.00	89.57	180.10	7,265.24	-2,927.96	532.33	2,927.02	0.00	0.00	0.00
9,100.00	89.57	180.10	7,265.98	-3,027.95	532.16	3,027.02	0.00	0.00	0.00
9,200.00	89.57	180.10	7,266.73	-3,127.95	531.99	3,127.02	0.00	0.00	0.00
9,300.00	89.57	180.10	7,267.47	-3,227.95	531.82	3,227.02	0.00	0.00	0.00
9,400.00	89.57	180.10	7,268.21	-3,327.95	531.65	3,327.01	0.00	0.00	0.00
9,500.00	89.57	180.10	7,268.96	-3,427.94	531.49	3,427.01	0.00	0.00	0.00
9,600.00	89.57	180.10	7,269.70	-3,527.94	531.32	3,527.01	0.00	0.00	0.00
9,700.00	89.57	180.10	7,270.45	-3,627.94	531.15	3,627.00	0.00	0.00	0.00
9,800.00	89.57	180.10	7,271.19	-3,727.93	530.98	3,727.00	0.00	0.00	0.00
9,900.00	89.57	180.10	7,271.93	-3,827.93	530.81	3,827.00	0.00	0.00	0.00
10,000.00	89.57	180.10	7,272.68	-3,927.93	530.64	3,927.00	0.00	0.00	0.00
10,100.00	89.57	180.10	7,273.42	-4,027.93	530.47	4,026.99	0.00	0.00	0.00
10,200.00	89.57	180.10	7,274.17	-4,127.92	530.30	4,126.99	0.00	0.00	0.00
10,300.00	89.57	180.10	7,274.91	-4,227.92	530.13	4,226.99	0.00	0.00	0.00
10,400.00	89.57	180.10	7,275.65	-4,327.92	529.96	4,326.99	0.00	0.00	0.00
10,500.00	89.57	180.10	7,276.40	-4,427.91	529.79	4,426.98	0.00	0.00	0.00
10,600.00	89.57	180.10	7,277.14	-4,527.91	529.62	4,526.98	0.00	0.00	0.00
10,700.00	89.57	180.10	7,277.89	-4,627.91	529.45	4,626.98	0.00	0.00	0.00
10,800.00	89.57	180.10	7,278.63	-4,727.91	529.28	4,726.97	0.00	0.00	0.00
10,900.00	89.57	180.10	7,279.37	-4,827.90	529.11	4,826.97	0.00	0.00	0.00
11,000.00	89.57	180.10	7,280.12	-4,927.90	528.94	4,926.97	0.00	0.00	0.00
11,100.00	89.57	180.10	7,280.86	-5,027.90	528.77	5,026.97	0.00	0.00	0.00
11,200.00	89.57	180.10	7,281.61	-5,127.89	528.61	5,126.96	0.00	0.00	0.00
11,300.00	89.57	180.10	7,282.35	-5,227.89	528.44	5,226.96	0.00	0.00	0.00
11,400.00	89.57	180.10	7,283.09	-5,327.89	528.27	5,326.96	0.00	0.00	0.00
11,500.00	89.57	180.10	7,283.84	-5,427.88	528.10	5,426.96	0.00	0.00	0.00
11,600.00	89.57	180.10	7,284.58	-5,527.88	527.93	5,526.95	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-15HZ
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 30-15HZ	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)
11,700.00	89.57	180.10	7,285.33	-5,627.88	527.76	5,626.95	0.00	0.00	0.00
11,800.00	89.57	180.10	7,286.07	-5,727.88	527.59	5,726.95	0.00	0.00	0.00
11,900.00	89.57	180.10	7,286.81	-5,827.87	527.42	5,826.94	0.00	0.00	0.00
12,000.00	89.57	180.10	7,287.56	-5,927.87	527.25	5,926.94	0.00	0.00	0.00
12,100.00	89.57	180.10	7,288.30	-6,027.87	527.08	6,026.94	0.00	0.00	0.00
12,200.00	89.57	180.10	7,289.05	-6,127.86	526.91	6,126.94	0.00	0.00	0.00
12,300.00	89.57	180.10	7,289.79	-6,227.86	526.74	6,226.93	0.00	0.00	0.00
12,400.00	89.57	180.10	7,290.53	-6,327.86	526.57	6,326.93	0.00	0.00	0.00
12,500.00	89.57	180.10	7,291.28	-6,427.86	526.40	6,426.93	0.00	0.00	0.00
12,600.00	89.57	180.10	7,292.02	-6,527.85	526.23	6,526.92	0.00	0.00	0.00
12,700.00	89.57	180.10	7,292.76	-6,627.85	526.06	6,626.92	0.00	0.00	0.00
12,800.00	89.57	180.10	7,293.51	-6,727.85	525.89	6,726.92	0.00	0.00	0.00
12,900.00	89.57	180.10	7,294.25	-6,827.84	525.73	6,826.92	0.00	0.00	0.00
13,000.00	89.57	180.10	7,295.00	-6,927.84	525.56	6,926.91	0.00	0.00	0.00
13,100.00	89.57	180.10	7,295.74	-7,027.84	525.39	7,026.91	0.00	0.00	0.00
13,200.00	89.57	180.10	7,296.48	-7,127.84	525.22	7,126.91	0.00	0.00	0.00
13,300.00	89.57	180.10	7,297.23	-7,227.83	525.05	7,226.91	0.00	0.00	0.00
13,400.00	89.57	180.10	7,297.97	-7,327.83	524.88	7,326.90	0.00	0.00	0.00
13,500.00	89.57	180.10	7,298.72	-7,427.83	524.71	7,426.90	0.00	0.00	0.00
13,600.00	89.57	180.10	7,299.46	-7,527.82	524.54	7,526.90	0.00	0.00	0.00
13,700.00	89.57	180.10	7,300.20	-7,627.82	524.37	7,626.89	0.00	0.00	0.00
13,800.00	89.57	180.10	7,300.95	-7,727.82	524.20	7,726.89	0.00	0.00	0.00
13,900.00	89.57	180.10	7,301.69	-7,827.82	524.03	7,826.89	0.00	0.00	0.00
14,000.00	89.57	180.10	7,302.44	-7,927.81	523.86	7,926.89	0.00	0.00	0.00
14,100.00	89.57	180.10	7,303.18	-8,027.81	523.69	8,026.88	0.00	0.00	0.00
14,200.00	89.57	180.10	7,303.92	-8,127.81	523.52	8,126.88	0.00	0.00	0.00
14,300.00	89.57	180.10	7,304.67	-8,227.80	523.35	8,226.88	0.00	0.00	0.00
14,400.00	89.57	180.10	7,305.41	-8,327.80	523.18	8,326.87	0.00	0.00	0.00
14,500.00	89.57	180.10	7,306.16	-8,427.80	523.01	8,426.87	0.00	0.00	0.00
14,600.00	89.57	180.10	7,306.90	-8,527.79	522.85	8,526.87	0.00	0.00	0.00
14,700.00	89.57	180.10	7,307.64	-8,627.79	522.68	8,626.87	0.00	0.00	0.00
14,800.00	89.57	180.10	7,308.39	-8,727.79	522.51	8,726.86	0.00	0.00	0.00
14,900.00	89.57	180.10	7,309.13	-8,827.79	522.34	8,826.86	0.00	0.00	0.00
15,000.00	89.57	180.10	7,309.88	-8,927.78	522.17	8,926.86	0.00	0.00	0.00
15,100.00	89.57	180.10	7,310.62	-9,027.78	522.00	9,026.86	0.00	0.00	0.00
15,200.00	89.57	180.10	7,311.36	-9,127.78	521.83	9,126.85	0.00	0.00	0.00
15,300.00	89.57	180.10	7,312.11	-9,227.77	521.66	9,226.85	0.00	0.00	0.00
15,400.00	89.57	180.10	7,312.85	-9,327.77	521.49	9,326.85	0.00	0.00	0.00
15,500.00	89.57	180.10	7,313.60	-9,427.77	521.32	9,426.84	0.00	0.00	0.00
15,600.00	89.57	180.10	7,314.34	-9,527.77	521.15	9,526.84	0.00	0.00	0.00
15,700.00	89.57	180.10	7,315.08	-9,627.76	520.98	9,626.84	0.00	0.00	0.00
15,800.00	89.57	180.10	7,315.83	-9,727.76	520.81	9,726.84	0.00	0.00	0.00
15,900.00	89.57	180.10	7,316.57	-9,827.76	520.64	9,826.83	0.00	0.00	0.00
16,000.00	89.57	180.10	7,317.32	-9,927.75	520.47	9,926.83	0.00	0.00	0.00
16,100.00	89.57	180.10	7,318.06	-10,027.75	520.30	10,026.83	0.00	0.00	0.00
16,200.00	89.57	180.10	7,318.80	-10,127.75	520.13	10,126.83	0.00	0.00	0.00
16,300.00	89.57	180.10	7,319.55	-10,227.75	519.97	10,226.82	0.00	0.00	0.00
16,400.00	89.57	180.10	7,320.29	-10,327.74	519.80	10,326.82	0.00	0.00	0.00
16,500.00	89.57	180.10	7,321.04	-10,427.74	519.63	10,426.82	0.00	0.00	0.00
16,600.00	89.57	180.10	7,321.78	-10,527.74	519.46	10,526.81	0.00	0.00	0.00
16,700.00	89.57	180.10	7,322.52	-10,627.73	519.29	10,626.81	0.00	0.00	0.00
16,800.00	89.57	180.10	7,323.27	-10,727.73	519.12	10,726.81	0.00	0.00	0.00
16,900.00	89.57	180.10	7,324.01	-10,827.73	518.95	10,826.81	0.00	0.00	0.00
17,000.00	89.57	180.10	7,324.76	-10,927.73	518.78	10,926.80	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-15HZ
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 30-15HZ	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)
17,100.00	89.57	180.10	7,325.50	-11,027.72	518.61	11,026.80	0.00	0.00	0.00
TD Well @ 17100.00ft									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,512.72	1,500.00	9 5/8"	9-5/8	13-1/2	
17,100.00	7,325.50	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				
3,692.03	3,644.00	Parkman				
4,134.20	4,079.00	Sussex				
6,916.64	6,812.00	Sharon Springs				
6,990.97	6,879.00	Niobrara				
7,052.80	6,932.00	Nio B				
7,132.53	6,996.00	Nio C				
7,330.28	7,129.00	Fort Hayes				
7,366.89	7,149.00	Codell				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
268.50	268.50	0.00	0.00	Begin Nudge @ 268.50ft	
957.17	953.44	-59.80	16.02	Hold Tangent @ 957.17ft	
1,458.67	1,446.82	-146.67	39.30	Change Tangent Direction @ 1458.67ft	
1,615.54	1,601.16	-172.66	49.58	Hold Tangent @ 1615.54ft	
6,752.80	6,655.16	-984.89	484.18	KOP @ 6752.80ft :: DLS = 8°/100'	
7,758.88	7,256.00	-1,686.88	534.44	End Build @ 7758.88ft	
17,100.00	7,325.50	-11,027.72	518.61	TD Well @ 17100.00ft	