

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

RADEMACHER SOUTH 30-17HZ

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 30-17HZ

Wellbore: Plan A

Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1500.00	1516.09	9 5/8"	9-5/8
7374.00	25250.62	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	223.00	0.00	0.00	223.00	0.00	0.00	0.00	0.00	0.00	
3	1003.67	11.71	220.48	998.24	-60.47	-51.61	1.50	220.48	60.34	
4	6809.80	11.71	220.48	6683.54	-956.80	-816.61	0.00	0.00	954.80	
5	7820.36	89.70	179.86	7284.00	-1660.98	-895.51	8.00	-41.25	1658.78	
6	25250.62	89.70	179.86	7374.00	-19090.96	-853.39	0.00	0.00	19088.81	RADEMACHER SOUTH 30-17HZ BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RADEMACHER SOUTH 30-17HZ SHL	0.00	14596405.58	1658672.33	40.191311	-104.934630
RADEMACHER SOUTH 30-17HZ LP	7284.00	14594743.94	1657778.04	40.186750	-104.937837
RADEMACHER SOUTH 30-17HZ BHL	7374.00	14577314.00	1657833.00	40.138885	-104.937684

WELL DETAILS: RADEMACHER SOUTH 30-17HZ

GL = 4819'

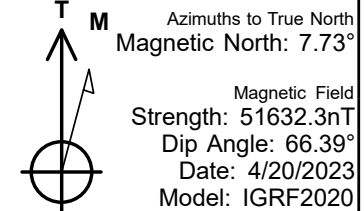
RKB = 17' @ 4836.00usft (RIG)

Plan: Permit Rev-1 (RADEMACHER SOUTH 30-17HZ/Plan A)

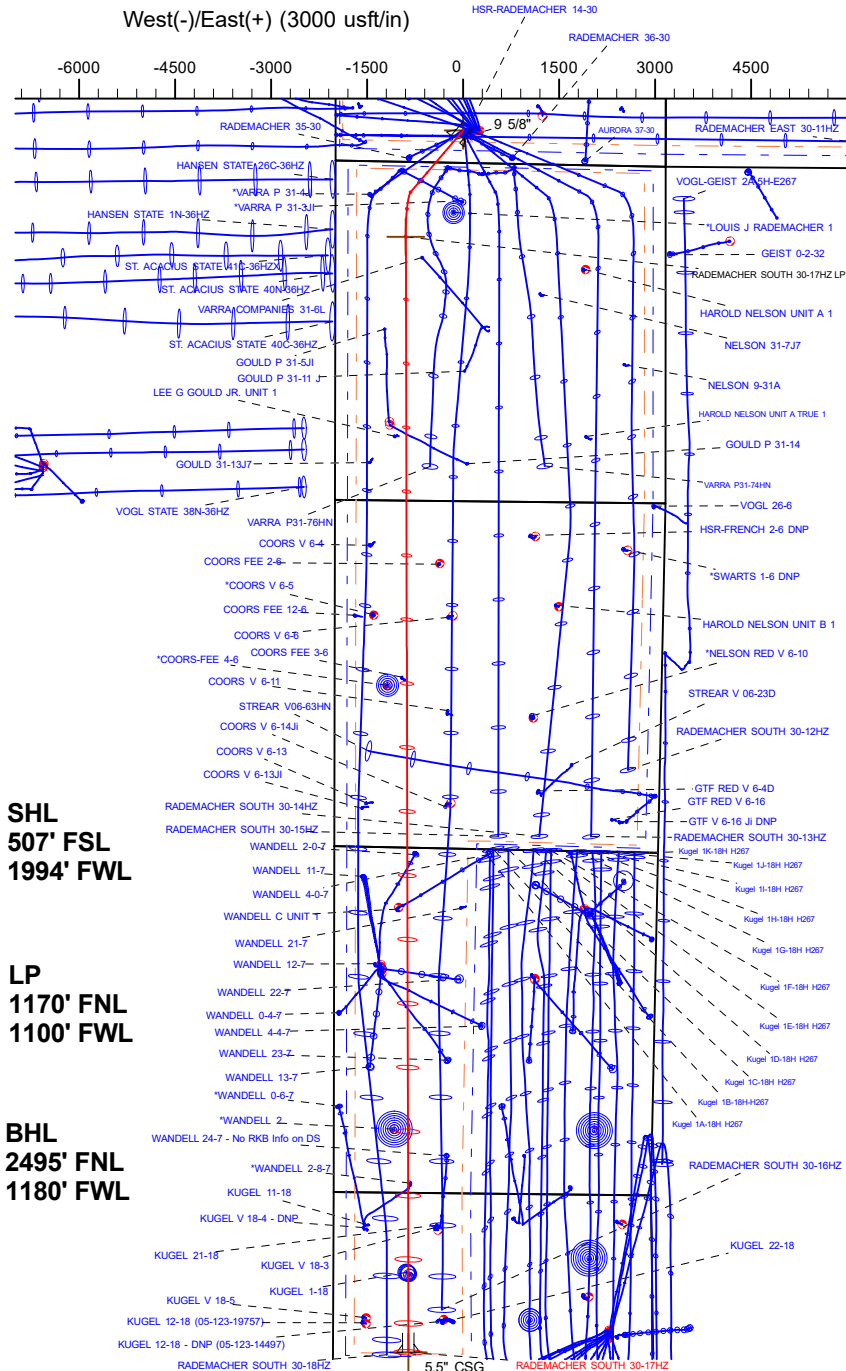
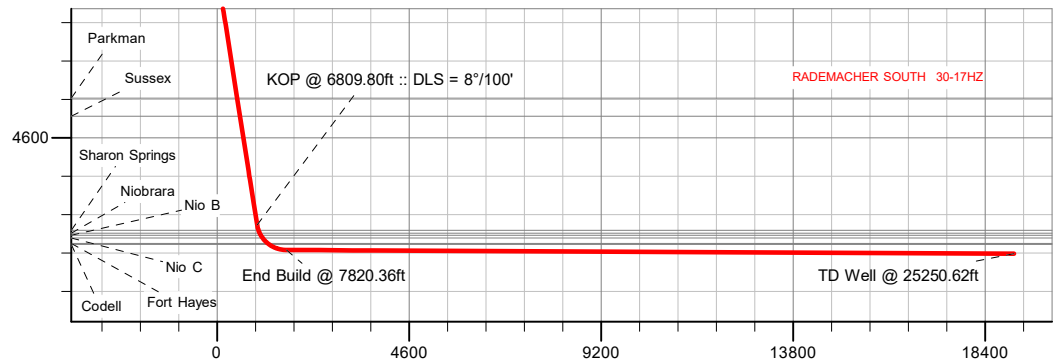
Date: 4/27/2023

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
36.00	36.00	Fox Hills
3644.00	3705.66	Parkman
4079.00	4149.90	Sussex
6812.00	6943.72	Sharon Springs
6879.00	7016.93	Niobrara
6932.00	7077.43	Nio B
6996.00	7154.79	Nio C
7129.00	7341.68	Fort Hayes
7149.00	7375.02	Codell



True Vertical Depth (4600 usft/in)



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-17HZ
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 30-17HZ	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 30-17HZ			
Well Position	+N/-S	0.00 usft	Northing:	14,596,405.58 usft
	+E/-W	0.00 usft	Easting:	1,658,672.33 usft
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft
Grid Convergence:		0.04 °	Ground Level:	4,819.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	4/20/2023	7.73	66.39	51,632.25990990

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	179.86	

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	25,250.62	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:Rockies, crustal dec +	

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4836.00usft (RIG)
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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	
223.00	0.00	0.00	223.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,003.67	11.71	220.48	998.24	-60.47	-51.61	1.50	1.50	0.00	220.48	
6,809.80	11.71	220.48	6,683.54	-956.80	-816.61	0.00	0.00	0.00	0.00	
7,820.36	89.70	179.86	7,284.00	-1,660.98	-895.51	8.00	7.72	-4.02	-41.25	
25,250.62	89.70	179.86	7,374.00	-19,090.96	-853.39	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 30-17HZ	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
223.00	0.00	0.00	223.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 223.00ft									
300.00	1.16	220.48	299.99	-0.59	-0.50	0.59	1.50	1.50	0.00
400.00	2.66	220.48	399.94	-3.12	-2.66	3.11	1.50	1.50	0.00
500.00	4.16	220.48	499.76	-7.64	-6.52	7.62	1.50	1.50	0.00
600.00	5.66	220.48	599.39	-14.14	-12.07	14.11	1.50	1.50	0.00
700.00	7.16	220.48	698.76	-22.62	-19.31	22.58	1.50	1.50	0.00
800.00	8.66	220.48	797.81	-33.09	-28.24	33.02	1.50	1.50	0.00
900.00	10.16	220.48	896.46	-45.51	-38.85	45.42	1.50	1.50	0.00
1,003.67	11.71	220.48	998.24	-60.47	-51.61	60.34	1.50	1.50	0.00
Hold Tangent @ 1003.67ft									
1,100.00	11.71	220.48	1,092.57	-75.34	-64.30	75.18	0.00	0.00	0.00
1,200.00	11.71	220.48	1,190.49	-90.78	-77.48	90.59	0.00	0.00	0.00
1,300.00	11.71	220.48	1,288.41	-106.22	-90.65	105.99	0.00	0.00	0.00
1,400.00	11.71	220.48	1,386.33	-121.65	-103.83	121.40	0.00	0.00	0.00
1,500.00	11.71	220.48	1,484.25	-137.09	-117.00	136.80	0.00	0.00	0.00
1,516.09	11.71	220.48	1,500.00	-139.57	-119.12	139.28	0.00	0.00	0.00
9 5/8"									
1,600.00	11.71	220.48	1,582.17	-152.53	-130.18	152.21	0.00	0.00	0.00
1,700.00	11.71	220.48	1,680.08	-167.97	-143.36	167.62	0.00	0.00	0.00
1,800.00	11.71	220.48	1,778.00	-183.40	-156.53	183.02	0.00	0.00	0.00
1,900.00	11.71	220.48	1,875.92	-198.84	-169.71	198.43	0.00	0.00	0.00
2,000.00	11.71	220.48	1,973.84	-214.28	-182.88	213.83	0.00	0.00	0.00
2,100.00	11.71	220.48	2,071.76	-229.72	-196.06	229.24	0.00	0.00	0.00
2,200.00	11.71	220.48	2,169.68	-245.15	-209.23	244.64	0.00	0.00	0.00
2,300.00	11.71	220.48	2,267.60	-260.59	-222.41	260.05	0.00	0.00	0.00
2,400.00	11.71	220.48	2,365.52	-276.03	-235.59	275.45	0.00	0.00	0.00
2,500.00	11.71	220.48	2,463.43	-291.47	-248.76	290.86	0.00	0.00	0.00
2,600.00	11.71	220.48	2,561.35	-306.91	-261.94	306.26	0.00	0.00	0.00
2,700.00	11.71	220.48	2,659.27	-322.34	-275.11	321.67	0.00	0.00	0.00
2,800.00	11.71	220.48	2,757.19	-337.78	-288.29	337.08	0.00	0.00	0.00
2,900.00	11.71	220.48	2,855.11	-353.22	-301.46	352.48	0.00	0.00	0.00
3,000.00	11.71	220.48	2,953.03	-368.66	-314.64	367.89	0.00	0.00	0.00
3,100.00	11.71	220.48	3,050.95	-384.09	-327.82	383.29	0.00	0.00	0.00
3,200.00	11.71	220.48	3,148.87	-399.53	-340.99	398.70	0.00	0.00	0.00
3,300.00	11.71	220.48	3,246.78	-414.97	-354.17	414.10	0.00	0.00	0.00
3,400.00	11.71	220.48	3,344.70	-430.41	-367.34	429.51	0.00	0.00	0.00
3,500.00	11.71	220.48	3,442.62	-445.84	-380.52	444.91	0.00	0.00	0.00
3,600.00	11.71	220.48	3,540.54	-461.28	-393.69	460.32	0.00	0.00	0.00
3,700.00	11.71	220.48	3,638.46	-476.72	-406.87	475.72	0.00	0.00	0.00
3,705.66	11.71	220.48	3,644.00	-477.59	-407.62	476.60	0.00	0.00	0.00
Parkman									
3,800.00	11.71	220.48	3,736.38	-492.16	-420.05	491.13	0.00	0.00	0.00
3,900.00	11.71	220.48	3,834.30	-507.60	-433.22	506.54	0.00	0.00	0.00
4,000.00	11.71	220.48	3,932.22	-523.03	-446.40	521.94	0.00	0.00	0.00
4,100.00	11.71	220.48	4,030.13	-538.47	-459.57	537.35	0.00	0.00	0.00
4,149.90	11.71	220.48	4,079.00	-546.17	-466.15	545.03	0.00	0.00	0.00
Sussex									

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 30-17HZ	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)
4,200.00	11.71	220.48	4,128.05	-553.91	-472.75	552.75	0.00	0.00	0.00
4,300.00	11.71	220.48	4,225.97	-569.35	-485.92	568.16	0.00	0.00	0.00
4,400.00	11.71	220.48	4,323.89	-584.78	-499.10	583.56	0.00	0.00	0.00
4,500.00	11.71	220.48	4,421.81	-600.22	-512.28	598.97	0.00	0.00	0.00
4,600.00	11.71	220.48	4,519.73	-615.66	-525.45	614.37	0.00	0.00	0.00
4,700.00	11.71	220.48	4,617.65	-631.10	-538.63	629.78	0.00	0.00	0.00
4,800.00	11.71	220.48	4,715.57	-646.53	-551.80	645.18	0.00	0.00	0.00
4,900.00	11.71	220.48	4,813.48	-661.97	-564.98	660.59	0.00	0.00	0.00
5,000.00	11.71	220.48	4,911.40	-677.41	-578.15	675.99	0.00	0.00	0.00
5,100.00	11.71	220.48	5,009.32	-692.85	-591.33	691.40	0.00	0.00	0.00
5,200.00	11.71	220.48	5,107.24	-708.28	-604.50	706.81	0.00	0.00	0.00
5,300.00	11.71	220.48	5,205.16	-723.72	-617.68	722.21	0.00	0.00	0.00
5,400.00	11.71	220.48	5,303.08	-739.16	-630.86	737.62	0.00	0.00	0.00
5,500.00	11.71	220.48	5,401.00	-754.60	-644.03	753.02	0.00	0.00	0.00
5,600.00	11.71	220.48	5,498.92	-770.04	-657.21	768.43	0.00	0.00	0.00
5,700.00	11.71	220.48	5,596.83	-785.47	-670.38	783.83	0.00	0.00	0.00
5,800.00	11.71	220.48	5,694.75	-800.91	-683.56	799.24	0.00	0.00	0.00
5,900.00	11.71	220.48	5,792.67	-816.35	-696.73	814.64	0.00	0.00	0.00
6,000.00	11.71	220.48	5,890.59	-831.79	-709.91	830.05	0.00	0.00	0.00
6,100.00	11.71	220.48	5,988.51	-847.22	-723.09	845.45	0.00	0.00	0.00
6,200.00	11.71	220.48	6,086.43	-862.66	-736.26	860.86	0.00	0.00	0.00
6,300.00	11.71	220.48	6,184.35	-878.10	-749.44	876.27	0.00	0.00	0.00
6,400.00	11.71	220.48	6,282.26	-893.54	-762.61	891.67	0.00	0.00	0.00
6,500.00	11.71	220.48	6,380.18	-908.97	-775.79	907.08	0.00	0.00	0.00
6,600.00	11.71	220.48	6,478.10	-924.41	-788.96	922.48	0.00	0.00	0.00
6,700.00	11.71	220.48	6,576.02	-939.85	-802.14	937.89	0.00	0.00	0.00
6,809.80	11.71	220.48	6,683.54	-956.80	-816.61	954.80	0.00	0.00	0.00
KOP @ 6809.80ft :: DLS = 8°/100'									
6,850.00	14.28	211.86	6,722.71	-964.12	-821.87	962.11	8.00	6.40	-21.45
6,900.00	17.77	204.74	6,770.76	-976.29	-828.33	974.27	8.00	6.98	-14.24
6,943.72	20.97	200.45	6,812.00	-989.69	-833.85	987.65	8.00	7.31	-9.80
Sharon Springs									
6,950.00	21.44	199.94	6,817.86	-991.82	-834.64	989.78	8.00	7.43	-8.18
7,000.00	25.20	196.50	6,863.77	-1,010.63	-840.78	1,008.57	8.00	7.53	-6.88
7,016.93	26.49	195.54	6,879.00	-1,017.72	-842.81	1,015.66	8.00	7.61	-5.64
Niobrara									
7,050.00	29.02	193.91	6,908.26	-1,032.62	-846.72	1,030.54	8.00	7.66	-4.95
7,077.43	31.14	192.74	6,932.00	-1,045.99	-849.88	1,043.91	8.00	7.71	-4.27
Nio B									
7,100.00	32.89	191.88	6,951.14	-1,057.68	-852.43	1,055.60	8.00	7.74	-3.81
7,150.00	36.77	190.23	6,992.17	-1,085.71	-857.89	1,083.61	8.00	7.78	-3.29
7,154.79	37.15	190.09	6,996.00	-1,088.54	-858.39	1,086.44	8.00	7.80	-2.96
Nio C									
7,200.00	40.68	188.86	7,031.17	-1,116.55	-863.06	1,114.44	8.00	7.82	-2.72
7,250.00	44.60	187.69	7,067.94	-1,150.06	-867.92	1,147.94	8.00	7.84	-2.34
7,300.00	48.53	186.68	7,102.31	-1,186.08	-872.45	1,183.94	8.00	7.86	-2.03
7,341.68	51.82	185.92	7,129.00	-1,217.89	-875.95	1,215.75	8.00	7.88	-1.82
Fort Hayes									
7,350.00	52.47	185.78	7,134.11	-1,224.43	-876.62	1,222.28	8.00	7.88	-1.72
7,375.02	54.45	185.36	7,149.00	-1,244.43	-878.57	1,242.28	8.00	7.89	-1.66
Codell									
7,400.00	56.42	184.97	7,163.18	-1,264.92	-880.42	1,262.77	8.00	7.89	-1.58
7,450.00	60.37	184.23	7,189.37	-1,307.36	-883.83	1,305.20	8.00	7.90	-1.48

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Well:	RADEMACHER SOUTH 30-17HZ	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)
7,500.00	64.32	183.54	7,212.58	-1,351.54	-886.82	1,349.37	8.00	7.91	-1.37
7,550.00	68.28	182.91	7,232.67	-1,397.24	-889.40	1,395.06	8.00	7.91	-1.28
7,600.00	72.24	182.30	7,249.55	-1,444.24	-891.53	1,442.06	8.00	7.92	-1.21
7,650.00	76.20	181.72	7,263.15	-1,492.32	-893.22	1,490.13	8.00	7.92	-1.16
7,700.00	80.16	181.16	7,273.39	-1,541.23	-894.45	1,539.04	8.00	7.92	-1.12
7,750.00	84.13	180.62	7,280.22	-1,590.75	-895.21	1,588.56	8.00	7.93	-1.09
7,800.00	88.09	180.08	7,283.61	-1,640.62	-895.52	1,638.43	8.00	7.93	-1.08
7,820.36	89.70	179.86	7,284.00	-1,660.98	-895.51	1,658.78	8.00	7.93	-1.07
End Build @ 7820.36ft									
7,900.00	89.70	179.86	7,284.41	-1,740.62	-895.31	1,738.42	0.00	0.00	0.00
8,000.00	89.70	179.86	7,284.93	-1,840.61	-895.07	1,838.42	0.00	0.00	0.00
8,100.00	89.70	179.86	7,285.45	-1,940.61	-894.83	1,938.42	0.00	0.00	0.00
8,200.00	89.70	179.86	7,285.96	-2,040.61	-894.59	2,038.42	0.00	0.00	0.00
8,300.00	89.70	179.86	7,286.48	-2,140.61	-894.35	2,138.42	0.00	0.00	0.00
8,400.00	89.70	179.86	7,287.00	-2,240.61	-894.11	2,238.42	0.00	0.00	0.00
8,500.00	89.70	179.86	7,287.51	-2,340.61	-893.86	2,338.41	0.00	0.00	0.00
8,600.00	89.70	179.86	7,288.03	-2,440.60	-893.62	2,438.41	0.00	0.00	0.00
8,700.00	89.70	179.86	7,288.54	-2,540.60	-893.38	2,538.41	0.00	0.00	0.00
8,800.00	89.70	179.86	7,289.06	-2,640.60	-893.14	2,638.41	0.00	0.00	0.00
8,900.00	89.70	179.86	7,289.58	-2,740.60	-892.90	2,738.41	0.00	0.00	0.00
9,000.00	89.70	179.86	7,290.09	-2,840.60	-892.66	2,838.41	0.00	0.00	0.00
9,100.00	89.70	179.86	7,290.61	-2,940.60	-892.41	2,938.41	0.00	0.00	0.00
9,200.00	89.70	179.86	7,291.13	-3,040.59	-892.17	3,038.41	0.00	0.00	0.00
9,300.00	89.70	179.86	7,291.64	-3,140.59	-891.93	3,138.40	0.00	0.00	0.00
9,400.00	89.70	179.86	7,292.16	-3,240.59	-891.69	3,238.40	0.00	0.00	0.00
9,500.00	89.70	179.86	7,292.68	-3,340.59	-891.45	3,338.40	0.00	0.00	0.00
9,600.00	89.70	179.86	7,293.19	-3,440.59	-891.21	3,438.40	0.00	0.00	0.00
9,700.00	89.70	179.86	7,293.71	-3,540.59	-890.96	3,538.40	0.00	0.00	0.00
9,800.00	89.70	179.86	7,294.22	-3,640.58	-890.72	3,638.40	0.00	0.00	0.00
9,900.00	89.70	179.86	7,294.74	-3,740.58	-890.48	3,738.40	0.00	0.00	0.00
10,000.00	89.70	179.86	7,295.26	-3,840.58	-890.24	3,838.39	0.00	0.00	0.00
10,100.00	89.70	179.86	7,295.77	-3,940.58	-890.00	3,938.39	0.00	0.00	0.00
10,200.00	89.70	179.86	7,296.29	-4,040.58	-889.76	4,038.39	0.00	0.00	0.00
10,300.00	89.70	179.86	7,296.81	-4,140.58	-889.51	4,138.39	0.00	0.00	0.00
10,400.00	89.70	179.86	7,297.32	-4,240.58	-889.27	4,238.39	0.00	0.00	0.00
10,500.00	89.70	179.86	7,297.84	-4,340.57	-889.03	4,338.39	0.00	0.00	0.00
10,600.00	89.70	179.86	7,298.35	-4,440.57	-888.79	4,438.39	0.00	0.00	0.00
10,700.00	89.70	179.86	7,298.87	-4,540.57	-888.55	4,538.39	0.00	0.00	0.00
10,800.00	89.70	179.86	7,299.39	-4,640.57	-888.31	4,638.38	0.00	0.00	0.00
10,900.00	89.70	179.86	7,299.90	-4,740.57	-888.06	4,738.38	0.00	0.00	0.00
11,000.00	89.70	179.86	7,300.42	-4,840.57	-887.82	4,838.38	0.00	0.00	0.00
11,100.00	89.70	179.86	7,300.94	-4,940.56	-887.58	4,938.38	0.00	0.00	0.00
11,200.00	89.70	179.86	7,301.45	-5,040.56	-887.34	5,038.38	0.00	0.00	0.00
11,300.00	89.70	179.86	7,301.97	-5,140.56	-887.10	5,138.38	0.00	0.00	0.00
11,400.00	89.70	179.86	7,302.49	-5,240.56	-886.86	5,238.38	0.00	0.00	0.00
11,500.00	89.70	179.86	7,303.00	-5,340.56	-886.61	5,338.37	0.00	0.00	0.00
11,600.00	89.70	179.86	7,303.52	-5,440.56	-886.37	5,438.37	0.00	0.00	0.00
11,700.00	89.70	179.86	7,304.03	-5,540.55	-886.13	5,538.37	0.00	0.00	0.00
11,800.00	89.70	179.86	7,304.55	-5,640.55	-885.89	5,638.37	0.00	0.00	0.00
11,900.00	89.70	179.86	7,305.07	-5,740.55	-885.65	5,738.37	0.00	0.00	0.00
12,000.00	89.70	179.86	7,305.58	-5,840.55	-885.41	5,838.37	0.00	0.00	0.00
12,100.00	89.70	179.86	7,306.10	-5,940.55	-885.17	5,938.37	0.00	0.00	0.00
12,200.00	89.70	179.86	7,306.62	-6,040.55	-884.92	6,038.37	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-17HZ
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 30-17HZ	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)	
12,300.00	89.70	179.86	7,307.13	-6,140.54	-884.68	6,138.36	0.00	0.00	0.00	
12,400.00	89.70	179.86	7,307.65	-6,240.54	-884.44	6,238.36	0.00	0.00	0.00	
12,500.00	89.70	179.86	7,308.17	-6,340.54	-884.20	6,338.36	0.00	0.00	0.00	
12,600.00	89.70	179.86	7,308.68	-6,440.54	-883.96	6,438.36	0.00	0.00	0.00	
12,700.00	89.70	179.86	7,309.20	-6,540.54	-883.72	6,538.36	0.00	0.00	0.00	
12,800.00	89.70	179.86	7,309.71	-6,640.54	-883.47	6,638.36	0.00	0.00	0.00	
12,900.00	89.70	179.86	7,310.23	-6,740.53	-883.23	6,738.36	0.00	0.00	0.00	
13,000.00	89.70	179.86	7,310.75	-6,840.53	-882.99	6,838.35	0.00	0.00	0.00	
13,100.00	89.70	179.86	7,311.26	-6,940.53	-882.75	6,938.35	0.00	0.00	0.00	
13,200.00	89.70	179.86	7,311.78	-7,040.53	-882.51	7,038.35	0.00	0.00	0.00	
13,300.00	89.70	179.86	7,312.30	-7,140.53	-882.27	7,138.35	0.00	0.00	0.00	
13,400.00	89.70	179.86	7,312.81	-7,240.53	-882.02	7,238.35	0.00	0.00	0.00	
13,500.00	89.70	179.86	7,313.33	-7,340.52	-881.78	7,338.35	0.00	0.00	0.00	
13,600.00	89.70	179.86	7,313.84	-7,440.52	-881.54	7,438.35	0.00	0.00	0.00	
13,700.00	89.70	179.86	7,314.36	-7,540.52	-881.30	7,538.35	0.00	0.00	0.00	
13,800.00	89.70	179.86	7,314.88	-7,640.52	-881.06	7,638.34	0.00	0.00	0.00	
13,900.00	89.70	179.86	7,315.39	-7,740.52	-880.82	7,738.34	0.00	0.00	0.00	
14,000.00	89.70	179.86	7,315.91	-7,840.52	-880.57	7,838.34	0.00	0.00	0.00	
14,100.00	89.70	179.86	7,316.43	-7,940.52	-880.33	7,938.34	0.00	0.00	0.00	
14,200.00	89.70	179.86	7,316.94	-8,040.51	-880.09	8,038.34	0.00	0.00	0.00	
14,300.00	89.70	179.86	7,317.46	-8,140.51	-879.85	8,138.34	0.00	0.00	0.00	
14,400.00	89.70	179.86	7,317.98	-8,240.51	-879.61	8,238.34	0.00	0.00	0.00	
14,500.00	89.70	179.86	7,318.49	-8,340.51	-879.37	8,338.33	0.00	0.00	0.00	
14,600.00	89.70	179.86	7,319.01	-8,440.51	-879.12	8,438.33	0.00	0.00	0.00	
14,700.00	89.70	179.86	7,319.52	-8,540.51	-878.88	8,538.33	0.00	0.00	0.00	
14,800.00	89.70	179.86	7,320.04	-8,640.50	-878.64	8,638.33	0.00	0.00	0.00	
14,900.00	89.70	179.86	7,320.56	-8,740.50	-878.40	8,738.33	0.00	0.00	0.00	
15,000.00	89.70	179.86	7,321.07	-8,840.50	-878.16	8,838.33	0.00	0.00	0.00	
15,100.00	89.70	179.86	7,321.59	-8,940.50	-877.92	8,938.33	0.00	0.00	0.00	
15,200.00	89.70	179.86	7,322.11	-9,040.50	-877.67	9,038.33	0.00	0.00	0.00	
15,300.00	89.70	179.86	7,322.62	-9,140.50	-877.43	9,138.32	0.00	0.00	0.00	
15,400.00	89.70	179.86	7,323.14	-9,240.49	-877.19	9,238.32	0.00	0.00	0.00	
15,500.00	89.70	179.86	7,323.66	-9,340.49	-876.95	9,338.32	0.00	0.00	0.00	
15,600.00	89.70	179.86	7,324.17	-9,440.49	-876.71	9,438.32	0.00	0.00	0.00	
15,700.00	89.70	179.86	7,324.69	-9,540.49	-876.47	9,538.32	0.00	0.00	0.00	
15,800.00	89.70	179.86	7,325.20	-9,640.49	-876.22	9,638.32	0.00	0.00	0.00	
15,900.00	89.70	179.86	7,325.72	-9,740.49	-875.98	9,738.32	0.00	0.00	0.00	
16,000.00	89.70	179.86	7,326.24	-9,840.48	-875.74	9,838.32	0.00	0.00	0.00	
16,100.00	89.70	179.86	7,326.75	-9,940.48	-875.50	9,938.31	0.00	0.00	0.00	
16,200.00	89.70	179.86	7,327.27	-10,040.48	-875.26	10,038.31	0.00	0.00	0.00	
16,300.00	89.70	179.86	7,327.79	-10,140.48	-875.02	10,138.31	0.00	0.00	0.00	
16,400.00	89.70	179.86	7,328.30	-10,240.48	-874.77	10,238.31	0.00	0.00	0.00	
16,500.00	89.70	179.86	7,328.82	-10,340.48	-874.53	10,338.31	0.00	0.00	0.00	
16,600.00	89.70	179.86	7,329.33	-10,440.47	-874.29	10,438.31	0.00	0.00	0.00	
16,700.00	89.70	179.86	7,329.85	-10,540.47	-874.05	10,538.31	0.00	0.00	0.00	
16,800.00	89.70	179.86	7,330.37	-10,640.47	-873.81	10,638.30	0.00	0.00	0.00	
16,900.00	89.70	179.86	7,330.88	-10,740.47	-873.57	10,738.30	0.00	0.00	0.00	
17,000.00	89.70	179.86	7,331.40	-10,840.47	-873.32	10,838.30	0.00	0.00	0.00	
17,100.00	89.70	179.86	7,331.92	-10,940.47	-873.08	10,938.30	0.00	0.00	0.00	
17,200.00	89.70	179.86	7,332.43	-11,040.46	-872.84	11,038.30	0.00	0.00	0.00	
17,300.00	89.70	179.86	7,332.95	-11,140.46	-872.60	11,138.30	0.00	0.00	0.00	
17,400.00	89.70	179.86	7,333.47	-11,240.46	-872.36	11,238.30	0.00	0.00	0.00	
17,500.00	89.70	179.86	7,333.98	-11,340.46	-872.12	11,338.30	0.00	0.00	0.00	
17,600.00	89.70	179.86	7,334.50	-11,440.46	-871.87	11,438.29	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-17HZ
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 30-17HZ	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)
17,700.00	89.70	179.86	7,335.01	-11,540.46	-871.63	11,538.29	0.00	0.00	0.00
17,800.00	89.70	179.86	7,335.53	-11,640.46	-871.39	11,638.29	0.00	0.00	0.00
17,900.00	89.70	179.86	7,336.05	-11,740.45	-871.15	11,738.29	0.00	0.00	0.00
18,000.00	89.70	179.86	7,336.56	-11,840.45	-870.91	11,838.29	0.00	0.00	0.00
18,100.00	89.70	179.86	7,337.08	-11,940.45	-870.67	11,938.29	0.00	0.00	0.00
18,200.00	89.70	179.86	7,337.60	-12,040.45	-870.42	12,038.29	0.00	0.00	0.00
18,300.00	89.70	179.86	7,338.11	-12,140.45	-870.18	12,138.28	0.00	0.00	0.00
18,400.00	89.70	179.86	7,338.63	-12,240.45	-869.94	12,238.28	0.00	0.00	0.00
18,500.00	89.70	179.86	7,339.14	-12,340.44	-869.70	12,338.28	0.00	0.00	0.00
18,600.00	89.70	179.86	7,339.66	-12,440.44	-869.46	12,438.28	0.00	0.00	0.00
18,700.00	89.70	179.86	7,340.18	-12,540.44	-869.22	12,538.28	0.00	0.00	0.00
18,800.00	89.70	179.86	7,340.69	-12,640.44	-868.97	12,638.28	0.00	0.00	0.00
18,900.00	89.70	179.86	7,341.21	-12,740.44	-868.73	12,738.28	0.00	0.00	0.00
19,000.00	89.70	179.86	7,341.73	-12,840.44	-868.49	12,838.28	0.00	0.00	0.00
19,100.00	89.70	179.86	7,342.24	-12,940.43	-868.25	12,938.27	0.00	0.00	0.00
19,200.00	89.70	179.86	7,342.76	-13,040.43	-868.01	13,038.27	0.00	0.00	0.00
19,300.00	89.70	179.86	7,343.28	-13,140.43	-867.77	13,138.27	0.00	0.00	0.00
19,400.00	89.70	179.86	7,343.79	-13,240.43	-867.53	13,238.27	0.00	0.00	0.00
19,500.00	89.70	179.86	7,344.31	-13,340.43	-867.28	13,338.27	0.00	0.00	0.00
19,600.00	89.70	179.86	7,344.82	-13,440.43	-867.04	13,438.27	0.00	0.00	0.00
19,700.00	89.70	179.86	7,345.34	-13,540.42	-866.80	13,538.27	0.00	0.00	0.00
19,800.00	89.70	179.86	7,345.86	-13,640.42	-866.56	13,638.26	0.00	0.00	0.00
19,900.00	89.70	179.86	7,346.37	-13,740.42	-866.32	13,738.26	0.00	0.00	0.00
20,000.00	89.70	179.86	7,346.89	-13,840.42	-866.08	13,838.26	0.00	0.00	0.00
20,100.00	89.70	179.86	7,347.41	-13,940.42	-865.83	13,938.26	0.00	0.00	0.00
20,200.00	89.70	179.86	7,347.92	-14,040.42	-865.59	14,038.26	0.00	0.00	0.00
20,300.00	89.70	179.86	7,348.44	-14,140.41	-865.35	14,138.26	0.00	0.00	0.00
20,400.00	89.70	179.86	7,348.96	-14,240.41	-865.11	14,238.26	0.00	0.00	0.00
20,500.00	89.70	179.86	7,349.47	-14,340.41	-864.87	14,338.26	0.00	0.00	0.00
20,600.00	89.70	179.86	7,349.99	-14,440.41	-864.63	14,438.25	0.00	0.00	0.00
20,700.00	89.70	179.86	7,350.50	-14,540.41	-864.38	14,538.25	0.00	0.00	0.00
20,800.00	89.70	179.86	7,351.02	-14,640.41	-864.14	14,638.25	0.00	0.00	0.00
20,900.00	89.70	179.86	7,351.54	-14,740.40	-863.90	14,738.25	0.00	0.00	0.00
21,000.00	89.70	179.86	7,352.05	-14,840.40	-863.66	14,838.25	0.00	0.00	0.00
21,100.00	89.70	179.86	7,352.57	-14,940.40	-863.42	14,938.25	0.00	0.00	0.00
21,200.00	89.70	179.86	7,353.09	-15,040.40	-863.18	15,038.25	0.00	0.00	0.00
21,300.00	89.70	179.86	7,353.60	-15,140.40	-862.93	15,138.24	0.00	0.00	0.00
21,400.00	89.70	179.86	7,354.12	-15,240.40	-862.69	15,238.24	0.00	0.00	0.00
21,500.00	89.70	179.86	7,354.63	-15,340.39	-862.45	15,338.24	0.00	0.00	0.00
21,600.00	89.70	179.86	7,355.15	-15,440.39	-862.21	15,438.24	0.00	0.00	0.00
21,700.00	89.70	179.86	7,355.67	-15,540.39	-861.97	15,538.24	0.00	0.00	0.00
21,800.00	89.70	179.86	7,356.18	-15,640.39	-861.73	15,638.24	0.00	0.00	0.00
21,900.00	89.70	179.86	7,356.70	-15,740.39	-861.48	15,738.24	0.00	0.00	0.00
22,000.00	89.70	179.86	7,357.22	-15,840.39	-861.24	15,838.24	0.00	0.00	0.00
22,100.00	89.70	179.86	7,357.73	-15,940.39	-861.00	15,938.23	0.00	0.00	0.00
22,200.00	89.70	179.86	7,358.25	-16,040.38	-860.76	16,038.23	0.00	0.00	0.00
22,300.00	89.70	179.86	7,358.77	-16,140.38	-860.52	16,138.23	0.00	0.00	0.00
22,400.00	89.70	179.86	7,359.28	-16,240.38	-860.28	16,238.23	0.00	0.00	0.00
22,500.00	89.70	179.86	7,359.80	-16,340.38	-860.03	16,338.23	0.00	0.00	0.00
22,600.00	89.70	179.86	7,360.31	-16,440.38	-859.79	16,438.23	0.00	0.00	0.00
22,700.00	89.70	179.86	7,360.83	-16,540.38	-859.55	16,538.23	0.00	0.00	0.00
22,800.00	89.70	179.86	7,361.35	-16,640.37	-859.31	16,638.22	0.00	0.00	0.00
22,900.00	89.70	179.86	7,361.86	-16,740.37	-859.07	16,738.22	0.00	0.00	0.00
23,000.00	89.70	179.86	7,362.38	-16,840.37	-858.83	16,838.22	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RADEMACHER SOUTH 30-17HZ
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 30-17HZ	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)	
23,100.00	89.70	179.86	7,362.90	-16,940.37	-858.58	16,938.22	0.00	0.00	0.00	
23,200.00	89.70	179.86	7,363.41	-17,040.37	-858.34	17,038.22	0.00	0.00	0.00	
23,300.00	89.70	179.86	7,363.93	-17,140.37	-858.10	17,138.22	0.00	0.00	0.00	
23,400.00	89.70	179.86	7,364.44	-17,240.36	-857.86	17,238.22	0.00	0.00	0.00	
23,500.00	89.70	179.86	7,364.96	-17,340.36	-857.62	17,338.22	0.00	0.00	0.00	
23,600.00	89.70	179.86	7,365.48	-17,440.36	-857.38	17,438.21	0.00	0.00	0.00	
23,700.00	89.70	179.86	7,365.99	-17,540.36	-857.13	17,538.21	0.00	0.00	0.00	
23,800.00	89.70	179.86	7,366.51	-17,640.36	-856.89	17,638.21	0.00	0.00	0.00	
23,900.00	89.70	179.86	7,367.03	-17,740.36	-856.65	17,738.21	0.00	0.00	0.00	
24,000.00	89.70	179.86	7,367.54	-17,840.35	-856.41	17,838.21	0.00	0.00	0.00	
24,100.00	89.70	179.86	7,368.06	-17,940.35	-856.17	17,938.21	0.00	0.00	0.00	
24,200.00	89.70	179.86	7,368.58	-18,040.35	-855.93	18,038.21	0.00	0.00	0.00	
24,300.00	89.70	179.86	7,369.09	-18,140.35	-855.68	18,138.20	0.00	0.00	0.00	
24,400.00	89.70	179.86	7,369.61	-18,240.35	-855.44	18,238.20	0.00	0.00	0.00	
24,500.00	89.70	179.86	7,370.12	-18,340.35	-855.20	18,338.20	0.00	0.00	0.00	
24,600.00	89.70	179.86	7,370.64	-18,440.34	-854.96	18,438.20	0.00	0.00	0.00	
24,700.00	89.70	179.86	7,371.16	-18,540.34	-854.72	18,538.20	0.00	0.00	0.00	
24,800.00	89.70	179.86	7,371.67	-18,640.34	-854.48	18,638.20	0.00	0.00	0.00	
24,900.00	89.70	179.86	7,372.19	-18,740.34	-854.23	18,738.20	0.00	0.00	0.00	
25,000.00	89.70	179.86	7,372.71	-18,840.34	-853.99	18,838.20	0.00	0.00	0.00	
25,100.00	89.70	179.86	7,373.22	-18,940.34	-853.75	18,938.19	0.00	0.00	0.00	
25,200.00	89.70	179.86	7,373.74	-19,040.33	-853.51	19,038.19	0.00	0.00	0.00	
25,250.62	89.70	179.86	7,374.00	-19,090.95	-853.39	19,088.81	0.00	0.00	0.00	
TD Well @ 25250.62ft - 5.5" CSG										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,516.09	1,500.00	9 5/8"	9-5/8	13-1/2	
25,250.62	7,374.00	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				
3,705.66	3,644.00	Parkman				
4,149.90	4,079.00	Sussex				
6,943.72	6,812.00	Sharon Springs				
7,016.93	6,879.00	Niobrara				
7,077.43	6,932.00	Nio B				
7,154.79	6,996.00	Nio C				
7,341.68	7,129.00	Fort Hayes				
7,375.02	7,149.00	Codell				

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 30-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
223.00	223.00	0.00	0.00	Begin Nudge @ 223.00ft
1,003.67	998.24	-60.47	-51.61	Hold Tangent @ 1003.67ft
6,809.80	6,683.54	-956.80	-816.61	KOP @ 6809.80ft :: DLS = 8"/100'
7,820.36	7,284.00	-1,660.98	-895.51	End Build @ 7820.36ft
25,250.62	7,374.00	-19,090.96	-853.39	TD Well @ 25250.62ft