

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

3N-68W-33 Hergenreder 4-33HZ Pad

HERGENREDER 5N-4HZ

Plan A

Plan: Permit Rev-2

Standard Planning Report

27 June, 2017

Project: WELD-NAD83-UTMFT13N
Site: 3N-68W-33 Hergenreder 4-33HZ Pad
Well: HERGENREDER 5N-4HZ
Wellbore: Plan A
Design: Permit Rev-2

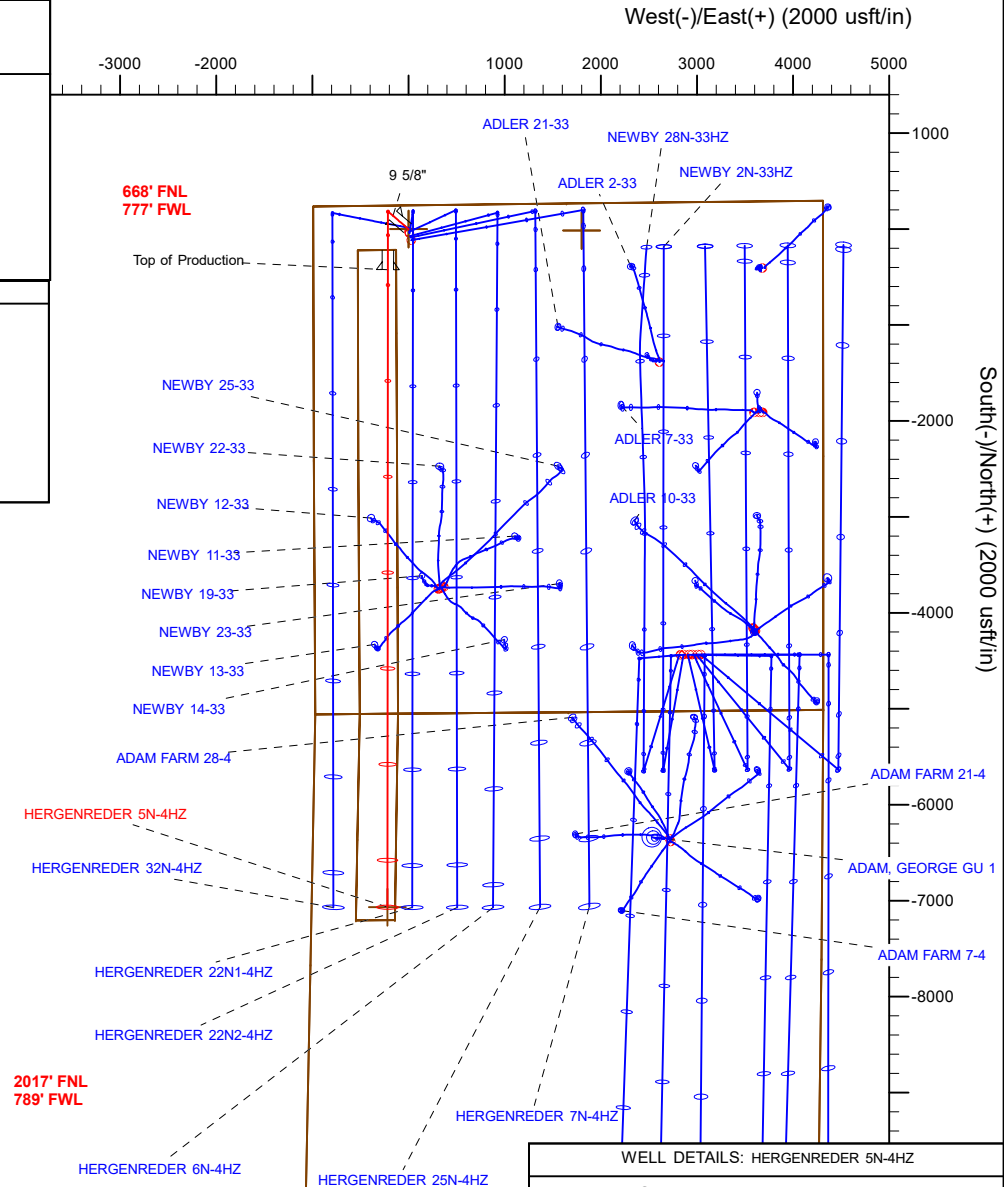
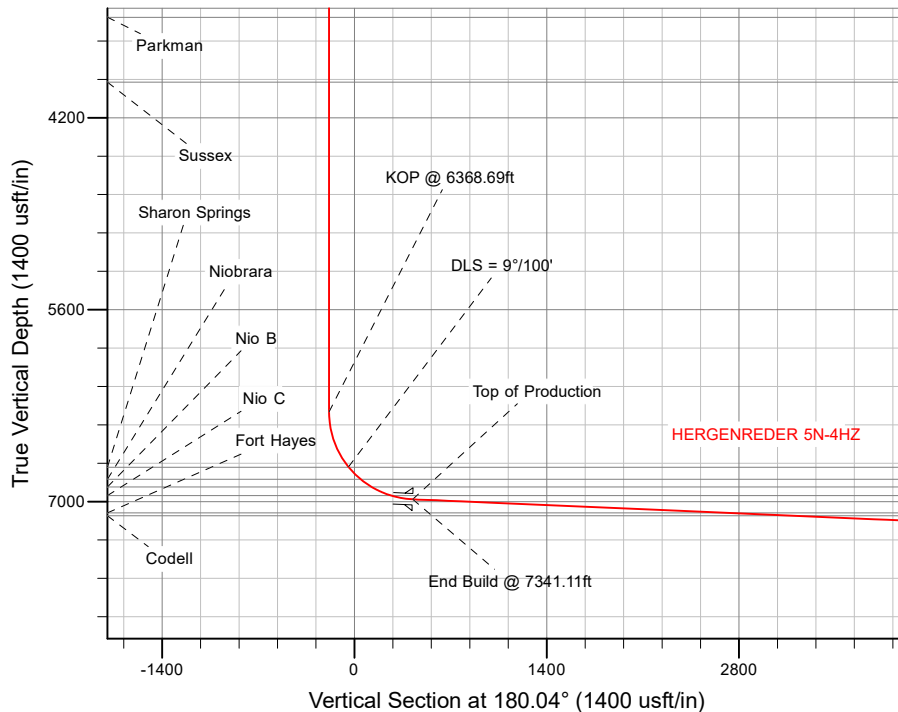
US ROCKIES WATTENBERG PLANNING

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	
3	916.67	10.00	311.00	913.29	38.07	-43.80	1.50	311.00	-38.04	
4	1956.67	10.00	311.00	1937.49	156.55	-180.09	0.00	0.00	-156.43	
5	2456.67	0.00	0.00	2434.95	185.10	-212.94	2.00	180.00	-184.96	
6	6368.69	0.00	0.00	6346.97	185.10	-212.94	0.00	0.00	-184.96	
7	7341.11	87.52	180.04	6983.00	-423.94	-213.38	9.00	180.04	424.09	
8	13990.75	87.52	180.04	7271.00	-7067.35	-218.25	0.00	0.00	7067.50	HERGENREDER 5N-4HZ_TOE

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HERGENREDER 5N-4HZ_SHL	0.00	0.00	0.00	40.188758	-105.013801
HERGENREDER 5N-4HZ_TOE	7271.00	-7067.35	-218.25	40.169350	-105.014582



WELL DETAILS: HERGENREDER 5N-4HZ

Ground Level: 4942'

RKB = 17' @ 4959.00usft (D Rig)

Plan: Permit Rev-2 (HERGENREDER 5N-4HZ/Plan A)

Created By: _____ Date: 6/14/2017
Reviewed: _____ Date: _____

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

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-68W-33 Hergenreder 4-33HZ Pad			
Site Position:		Northing:	14,595,483.88 usft	Latitude: 40.188798
From:	Lat/Long	Easting:	1,636,558.44 usft	Longitude: -105.013815
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: -0.01 °

Well	HERGENREDER 5N-4HZ			
Well Position	+N/-S	-14.57 usft	Northing:	14,595,469.31 usft
	+E/-W	3.91 usft	Easting:	1,636,562.34 usft
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft
			Ground Level:	4,942.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/15/2015	8.41	66.69	52,545.75134745

Design	Permit Rev-2			
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	180.04

Plan Survey Tool Program	Date	6/27/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	1,000.00	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declination
2	1,000.00	13,990.75	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declination

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
916.67	10.00	311.00	913.29	38.07	-43.80	1.50	1.50	0.00	311.00	
1,956.67	10.00	311.00	1,937.49	156.55	-180.09	0.00	0.00	0.00	0.00	
2,456.67	0.00	0.00	2,434.95	185.10	-212.94	2.00	-2.00	0.00	180.00	
6,368.69	0.00	0.00	6,346.97	185.10	-212.94	0.00	0.00	0.00	0.00	
7,341.11	87.52	180.04	6,983.00	-423.94	-213.38	9.00	9.00	-18.51	180.04	
13,990.75	87.52	180.04	7,271.00	-7,067.35	-218.25	0.00	0.00	0.00	0.00	HERGENREDER 5N-

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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
HERGENREDER 5N-4HZ_SHL - HERGENREDER 5N-4HZ_Hardline Box									
30.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00
3N-R68W-Sec. 33_Section Lines - 2N-R68W-Sec. 4_Section Lines									
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
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 250.00ft									
300.00	0.75	311.00	300.00	0.21	-0.25	-0.21	1.50	1.50	0.00
400.00	2.25	311.00	399.96	1.93	-2.22	-1.93	1.50	1.50	0.00
419.06	2.54	311.00	419.00	2.45	-2.82	-2.45	1.50	1.50	0.00
Fox Hills									
500.00	3.75	311.00	499.82	5.37	-6.17	-5.36	1.50	1.50	0.00
600.00	5.25	311.00	599.51	10.51	-12.09	-10.50	1.50	1.50	0.00
700.00	6.75	311.00	698.96	17.37	-19.98	-17.36	1.50	1.50	0.00
800.00	8.25	311.00	798.10	25.93	-29.83	-25.91	1.50	1.50	0.00
900.00	9.75	311.00	896.87	36.20	-41.64	-36.17	1.50	1.50	0.00
916.67	10.00	311.00	913.29	38.07	-43.80	-38.04	1.50	1.50	0.00
End Nudge @ 916.67ft									
1,000.00	10.00	311.00	995.35	47.56	-54.72	-47.53	0.00	0.00	0.00
1,004.72	10.00	311.00	1,000.00	48.10	-55.34	-48.06	0.00	0.00	0.00
9 5/8"									
1,100.00	10.00	311.00	1,093.84	58.96	-67.82	-58.91	0.00	0.00	0.00
1,200.00	10.00	311.00	1,192.32	70.35	-80.93	-70.29	0.00	0.00	0.00
1,300.00	10.00	311.00	1,290.80	81.74	-94.03	-81.68	0.00	0.00	0.00
1,400.00	10.00	311.00	1,389.28	93.13	-107.14	-93.06	0.00	0.00	0.00
1,500.00	10.00	311.00	1,487.76	104.53	-120.24	-104.44	0.00	0.00	0.00
1,600.00	10.00	311.00	1,586.24	115.92	-133.35	-115.83	0.00	0.00	0.00
1,700.00	10.00	311.00	1,684.72	127.31	-146.45	-127.21	0.00	0.00	0.00
1,800.00	10.00	311.00	1,783.20	138.70	-159.56	-138.59	0.00	0.00	0.00
1,900.00	10.00	311.00	1,881.68	150.10	-172.67	-149.98	0.00	0.00	0.00
1,956.67	10.00	311.00	1,937.49	156.55	-180.09	-156.43	0.00	0.00	0.00
Begin Drop @ 1956.67ft									
2,000.00	9.13	311.00	1,980.22	161.28	-185.53	-161.15	2.00	-2.00	0.00
2,100.00	7.13	311.00	2,079.21	170.56	-196.20	-170.42	2.00	-2.00	0.00
2,200.00	5.13	311.00	2,178.63	177.57	-204.27	-177.42	2.00	-2.00	0.00
2,300.00	3.13	311.00	2,278.36	182.30	-209.71	-182.15	2.00	-2.00	0.00
2,400.00	1.13	311.00	2,378.29	184.74	-212.52	-184.59	2.00	-2.00	0.00
2,456.67	0.00	0.00	2,434.96	185.10	-212.94	-184.96	2.00	-2.00	0.00
End Drop @ 2456.67ft									
2,500.00	0.00	0.00	2,478.29	185.10	-212.94	-184.96	0.00	0.00	0.00
2,600.00	0.00	0.00	2,578.29	185.10	-212.94	-184.96	0.00	0.00	0.00
2,700.00	0.00	0.00	2,678.29	185.10	-212.94	-184.96	0.00	0.00	0.00
2,800.00	0.00	0.00	2,778.29	185.10	-212.94	-184.96	0.00	0.00	0.00
2,900.00	0.00	0.00	2,878.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,000.00	0.00	0.00	2,978.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,100.00	0.00	0.00	3,078.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,200.00	0.00	0.00	3,178.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,300.00	0.00	0.00	3,278.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,400.00	0.00	0.00	3,378.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,489.71	0.00	0.00	3,468.00	185.10	-212.94	-184.96	0.00	0.00	0.00
Parkman									
3,500.00	0.00	0.00	3,478.29	185.10	-212.94	-184.96	0.00	0.00	0.00

Corporate
Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
3,600.00	0.00	0.00	3,578.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,700.00	0.00	0.00	3,678.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,800.00	0.00	0.00	3,778.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,900.00	0.00	0.00	3,878.29	185.10	-212.94	-184.96	0.00	0.00	0.00
3,960.71	0.00	0.00	3,939.00	185.10	-212.94	-184.96	0.00	0.00	0.00
Sussex									
4,000.00	0.00	0.00	3,978.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,100.00	0.00	0.00	4,078.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,200.00	0.00	0.00	4,178.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,300.00	0.00	0.00	4,278.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,400.00	0.00	0.00	4,378.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,500.00	0.00	0.00	4,478.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,600.00	0.00	0.00	4,578.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,700.00	0.00	0.00	4,678.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,800.00	0.00	0.00	4,778.29	185.10	-212.94	-184.96	0.00	0.00	0.00
4,900.00	0.00	0.00	4,878.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,000.00	0.00	0.00	4,978.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,100.00	0.00	0.00	5,078.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,200.00	0.00	0.00	5,178.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,300.00	0.00	0.00	5,278.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,400.00	0.00	0.00	5,378.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,500.00	0.00	0.00	5,478.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,600.00	0.00	0.00	5,578.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,700.00	0.00	0.00	5,678.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,800.00	0.00	0.00	5,778.29	185.10	-212.94	-184.96	0.00	0.00	0.00
5,900.00	0.00	0.00	5,878.29	185.10	-212.94	-184.96	0.00	0.00	0.00
6,000.00	0.00	0.00	5,978.29	185.10	-212.94	-184.96	0.00	0.00	0.00
6,100.00	0.00	0.00	6,078.29	185.10	-212.94	-184.96	0.00	0.00	0.00
6,200.00	0.00	0.00	6,178.29	185.10	-212.94	-184.96	0.00	0.00	0.00
6,300.00	0.00	0.00	6,278.29	185.10	-212.94	-184.96	0.00	0.00	0.00
6,368.69	0.00	0.00	6,346.98	185.10	-212.94	-184.96	0.00	0.00	0.00
KOP @ 6368.69ft									
6,400.00	2.82	180.04	6,378.27	184.34	-212.94	-184.19	9.00	9.00	0.00
6,500.00	11.82	180.04	6,477.36	171.61	-212.95	-171.46	9.00	9.00	0.00
6,600.00	20.82	180.04	6,573.23	143.54	-212.97	-143.39	9.00	9.00	0.00
6,700.00	29.82	180.04	6,663.53	100.82	-213.00	-100.67	9.00	9.00	0.00
6,800.00	38.82	180.04	6,746.04	44.50	-213.04	-44.35	9.00	9.00	0.00
DLS = 9°/100'									
6,803.81	39.16	180.04	6,749.00	42.10	-213.04	-41.95	9.00	9.00	0.00
Sharon Springs									
6,900.00	47.82	180.04	6,818.72	-24.03	-213.09	24.18	9.00	9.00	0.00
6,927.91	50.33	180.04	6,837.00	-45.12	-213.11	45.27	9.00	9.00	0.00
Niobrara									
7,000.00	56.82	180.04	6,879.78	-103.09	-213.15	103.24	9.00	9.00	0.00
7,026.85	59.23	180.04	6,894.00	-125.87	-213.17	126.02	9.00	9.00	0.00
Nio B									
7,100.00	65.82	180.04	6,927.73	-190.73	-213.21	190.88	9.00	9.00	0.00
7,184.03	73.38	180.04	6,957.00	-269.44	-213.27	269.59	9.00	9.00	0.00
Nio C									
7,200.00	74.82	180.04	6,961.37	-284.80	-213.28	284.94	9.00	9.00	0.00
7,300.00	83.82	180.04	6,979.89	-382.96	-213.35	383.11	9.00	9.00	0.00
7,341.11	87.52	180.04	6,983.00	-423.95	-213.38	424.10	9.00	9.00	0.00
End Build @ 7341.11ft - Top of Production									

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)
7,400.00	87.52	180.04	6,985.55	-482.78	-213.43	482.93	0.00	0.00	0.00
7,500.00	87.52	180.04	6,989.88	-582.69	-213.50	582.84	0.00	0.00	0.00
7,600.00	87.52	180.04	6,994.21	-682.59	-213.57	682.74	0.00	0.00	0.00
7,700.00	87.52	180.04	6,998.54	-782.50	-213.65	782.65	0.00	0.00	0.00
7,800.00	87.52	180.04	7,002.87	-882.41	-213.72	882.55	0.00	0.00	0.00
7,900.00	87.52	180.04	7,007.20	-982.31	-213.79	982.46	0.00	0.00	0.00
8,000.00	87.52	180.04	7,011.53	-1,082.22	-213.87	1,082.37	0.00	0.00	0.00
8,100.00	87.52	180.04	7,015.86	-1,182.12	-213.94	1,182.27	0.00	0.00	0.00
8,200.00	87.52	180.04	7,020.20	-1,282.03	-214.01	1,282.18	0.00	0.00	0.00
8,300.00	87.52	180.04	7,024.53	-1,381.94	-214.09	1,382.09	0.00	0.00	0.00
8,400.00	87.52	180.04	7,028.86	-1,481.84	-214.16	1,481.99	0.00	0.00	0.00
8,500.00	87.52	180.04	7,033.19	-1,581.75	-214.23	1,581.90	0.00	0.00	0.00
8,600.00	87.52	180.04	7,037.52	-1,681.66	-214.31	1,681.80	0.00	0.00	0.00
8,700.00	87.52	180.04	7,041.85	-1,781.56	-214.38	1,781.71	0.00	0.00	0.00
8,800.00	87.52	180.04	7,046.18	-1,881.47	-214.45	1,881.62	0.00	0.00	0.00
8,900.00	87.52	180.04	7,050.51	-1,981.37	-214.52	1,981.52	0.00	0.00	0.00
9,000.00	87.52	180.04	7,054.84	-2,081.28	-214.60	2,081.43	0.00	0.00	0.00
9,100.00	87.52	180.04	7,059.18	-2,181.19	-214.67	2,181.34	0.00	0.00	0.00
9,200.00	87.52	180.04	7,063.51	-2,281.09	-214.74	2,281.24	0.00	0.00	0.00
9,300.00	87.52	180.04	7,067.84	-2,381.00	-214.82	2,381.15	0.00	0.00	0.00
9,400.00	87.52	180.04	7,072.17	-2,480.90	-214.89	2,481.05	0.00	0.00	0.00
9,500.00	87.52	180.04	7,076.50	-2,580.81	-214.96	2,580.96	0.00	0.00	0.00
9,600.00	87.52	180.04	7,080.83	-2,680.72	-215.04	2,680.87	0.00	0.00	0.00
9,627.00	87.52	180.04	7,082.00	-2,707.69	-215.06	2,707.84	0.00	0.00	0.00
Fort Hayes									
9,700.00	87.52	180.04	7,085.16	-2,780.62	-215.11	2,780.77	0.00	0.00	0.00
9,800.00	87.52	180.04	7,089.49	-2,880.53	-215.18	2,880.68	0.00	0.00	0.00
9,900.00	87.52	180.04	7,093.82	-2,980.43	-215.26	2,980.58	0.00	0.00	0.00
10,000.00	87.52	180.04	7,098.16	-3,080.34	-215.33	3,080.49	0.00	0.00	0.00
10,100.00	87.52	180.04	7,102.49	-3,180.25	-215.40	3,180.40	0.00	0.00	0.00
10,111.86	87.52	180.04	7,103.00	-3,192.09	-215.41	3,192.24	0.00	0.00	0.00
Codell									
10,200.00	87.52	180.04	7,106.82	-3,280.15	-215.48	3,280.30	0.00	0.00	0.00
10,300.00	87.52	180.04	7,111.15	-3,380.06	-215.55	3,380.21	0.00	0.00	0.00
10,400.00	87.52	180.04	7,115.48	-3,479.97	-215.62	3,480.12	0.00	0.00	0.00
10,500.00	87.52	180.04	7,119.81	-3,579.87	-215.70	3,580.02	0.00	0.00	0.00
10,600.00	87.52	180.04	7,124.14	-3,679.78	-215.77	3,679.93	0.00	0.00	0.00
10,700.00	87.52	180.04	7,128.47	-3,779.68	-215.84	3,779.83	0.00	0.00	0.00
10,800.00	87.52	180.04	7,132.80	-3,879.59	-215.91	3,879.74	0.00	0.00	0.00
10,900.00	87.52	180.04	7,137.14	-3,979.50	-215.99	3,979.65	0.00	0.00	0.00
11,000.00	87.52	180.04	7,141.47	-4,079.40	-216.06	4,079.55	0.00	0.00	0.00
11,100.00	87.52	180.04	7,145.80	-4,179.31	-216.13	4,179.46	0.00	0.00	0.00
11,200.00	87.52	180.04	7,150.13	-4,279.21	-216.21	4,279.36	0.00	0.00	0.00
11,300.00	87.52	180.04	7,154.46	-4,379.12	-216.28	4,379.27	0.00	0.00	0.00
11,400.00	87.52	180.04	7,158.79	-4,479.03	-216.35	4,479.18	0.00	0.00	0.00
11,500.00	87.52	180.04	7,163.12	-4,578.93	-216.43	4,579.08	0.00	0.00	0.00
11,600.00	87.52	180.04	7,167.45	-4,678.84	-216.50	4,678.99	0.00	0.00	0.00
11,700.00	87.52	180.04	7,171.78	-4,778.75	-216.57	4,778.90	0.00	0.00	0.00
11,800.00	87.52	180.04	7,176.12	-4,878.65	-216.65	4,878.80	0.00	0.00	0.00
11,900.00	87.52	180.04	7,180.45	-4,978.56	-216.72	4,978.71	0.00	0.00	0.00
12,000.00	87.52	180.04	7,184.78	-5,078.46	-216.79	5,078.61	0.00	0.00	0.00
12,100.00	87.52	180.04	7,189.11	-5,178.37	-216.87	5,178.52	0.00	0.00	0.00
12,200.00	87.52	180.04	7,193.44	-5,278.28	-216.94	5,278.43	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	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)	
12,300.00	87.52	180.04	7,197.77	-5,378.18	-217.01	5,378.33	0.00	0.00	0.00	
12,400.00	87.52	180.04	7,202.10	-5,478.09	-217.08	5,478.24	0.00	0.00	0.00	
12,500.00	87.52	180.04	7,206.43	-5,577.99	-217.16	5,578.14	0.00	0.00	0.00	
12,600.00	87.52	180.04	7,210.76	-5,677.90	-217.23	5,678.05	0.00	0.00	0.00	
12,700.00	87.52	180.04	7,215.10	-5,777.81	-217.30	5,777.96	0.00	0.00	0.00	
12,800.00	87.52	180.04	7,219.43	-5,877.71	-217.38	5,877.86	0.00	0.00	0.00	
12,900.00	87.52	180.04	7,223.76	-5,977.62	-217.45	5,977.77	0.00	0.00	0.00	
13,000.00	87.52	180.04	7,228.09	-6,077.53	-217.52	6,077.68	0.00	0.00	0.00	
13,100.00	87.52	180.04	7,232.42	-6,177.43	-217.60	6,177.58	0.00	0.00	0.00	
13,200.00	87.52	180.04	7,236.75	-6,277.34	-217.67	6,277.49	0.00	0.00	0.00	
13,300.00	87.52	180.04	7,241.08	-6,377.24	-217.74	6,377.39	0.00	0.00	0.00	
13,400.00	87.52	180.04	7,245.41	-6,477.15	-217.82	6,477.30	0.00	0.00	0.00	
13,500.00	87.52	180.04	7,249.75	-6,577.06	-217.89	6,577.21	0.00	0.00	0.00	
13,600.00	87.52	180.04	7,254.08	-6,676.96	-217.96	6,677.11	0.00	0.00	0.00	
13,700.00	87.52	180.04	7,258.41	-6,776.87	-218.04	6,777.02	0.00	0.00	0.00	
13,800.00	87.52	180.04	7,262.74	-6,876.77	-218.11	6,876.92	0.00	0.00	0.00	
13,900.00	87.52	180.04	7,267.07	-6,976.68	-218.18	6,976.83	0.00	0.00	0.00	
13,990.75	87.52	180.04	7,271.00	-7,067.35	-218.25	7,067.50	0.00	0.00	0.00	
TD Well @ 13990.75ft - 4 1/2" - HERGENREDER 5N-4HZ_TOE										

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
2N-R68W-Sec. 4_Sectic	0.00	0.00	30.00	-15.96	1,800.23	14,595,453.07	1,638,362.57	40.188714	-105.007355
- plan misses target center by 1800.30usft at 30.00usft MD (30.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			30.00	-5,040.96	-2,769.50	14,590,412.54	1,635,592.29		
Point 2			30.00	-5,018.95	-136.58	14,590,434.14	1,638,225.21		
Point 3			30.00	-4,995.84	2,515.63	14,590,456.84	1,640,877.42		
Point 4			30.00	-7,591.82	2,497.44	14,587,860.86	1,640,858.83		
Point 5			30.00	-10,216.42	2,462.98	14,585,236.27	1,640,823.96		
Point 6			30.00	-10,271.92	-193.52	14,585,181.18	1,638,167.45		
Point 7			30.00	-10,321.42	-2,870.28	14,585,132.10	1,635,490.69		
Point 8			30.00	-7,652.28	-2,819.20	14,587,801.23	1,635,542.18		
3N-R68W-Sec. 33_Sectic	0.00	0.00	30.00	-15.96	1,800.23	14,595,453.07	1,638,362.57	40.188714	-105.007355
- plan misses target center by 1800.30usft at 30.00usft MD (30.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			30.00	251.45	-2,791.30	14,595,704.96	1,635,571.31		
Point 2			30.00	282.36	-157.69	14,595,735.46	1,638,204.92		
Point 3			30.00	310.96	2,511.36	14,595,763.64	1,640,873.98		
Point 4			30.00	-2,346.36	2,515.74	14,593,106.32	1,640,877.95		
Point 5			30.00	-4,995.84	2,515.63	14,590,456.84	1,640,877.42		
Point 6			30.00	-5,018.95	-136.58	14,590,434.14	1,638,225.21		
Point 7			30.00	-5,040.96	-2,769.50	14,590,412.54	1,635,592.29		
Point 8			30.00	-2,394.09	-2,784.98	14,593,059.41	1,635,577.22		
HERGENREDER 5N-4H	0.00	0.00	0.00	0.00	0.00	14,595,469.31	1,636,562.34	40.188758	-105.013801
- plan hits target center									
- Polygon									
Point 1			0.00	-216.91	-128.94	14,595,252.42	1,636,433.37		
Point 2			0.00	-1,080.91	-124.26	14,594,388.42	1,636,437.92		
Point 3			0.00	-2,404.55	-118.81	14,593,064.78	1,636,443.16		
Point 4			0.00	-3,728.53	-113.38	14,591,740.80	1,636,448.38		
Point 5			0.00	-5,052.13	-109.81	14,590,417.20	1,636,451.75		
Point 6			0.00	-6,356.59	-129.08	14,589,112.74	1,636,432.28		
Point 7			0.00	-7,200.94	-141.56	14,588,268.39	1,636,419.66		
Point 8			0.00	-7,205.47	-546.62	14,588,263.92	1,636,014.60		
Point 9			0.00	-6,360.57	-530.62	14,589,108.82	1,636,030.73		
Point 10			0.00	-5,055.55	-506.08	14,590,413.84	1,636,055.48		
Point 11			0.00	-3,731.97	-514.01	14,591,737.42	1,636,047.75		
Point 12			0.00	-2,408.18	-521.92	14,593,061.21	1,636,040.05		
Point 13			0.00	-1,084.98	-525.09	14,594,384.41	1,636,037.08		
Point 14			0.00	-221.59	-527.15	14,595,247.80	1,636,035.16		
Point 15			0.00	-216.91	-128.94	14,595,252.42	1,636,433.37		
HERGENREDER 5N-4H	0.00	0.00	0.00	0.00	0.00	14,595,469.31	1,636,562.34	40.188758	-105.013801
- plan hits target center									
- Point									
HERGENREDER 5N-4H	0.00	0.00	7,271.00	-7,067.35	-218.25	14,588,402.00	1,636,343.00	40.169350	-105.014583
- plan hits target center									
- Point									

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well HERGENREDER 5N-4HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4959.00usft (D Rig)
Site:	3N-68W-33 Hergenreder 4-33HZ Pad	North Reference:	True
Well:	HERGENREDER 5N-4HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,004.72	1,000.00	9 5/8"	9-5/8	13-1/2	
7,341.11	6,983.00	Top of Production	7	8-3/4	
13,990.75	7,271.00	4 1/2"	4-1/2	6-1/8	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
419.06	419.00	Fox Hills			
3,489.71	3,468.00	Parkman			
3,960.71	3,939.00	Sussex			
6,803.81	6,749.00	Sharon Springs			
6,927.91	6,837.00	Niobrara			
7,026.85	6,894.00	Nio B			
7,184.03	6,957.00	Nio C			
9,627.00	7,082.00	Fort Hayes			
10,111.86	7,103.00	Codell			

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft
916.67	913.29	38.07	-43.80	End Nudge @ 916.67ft
1,956.67	1,937.49	156.55	-180.09	Begin Drop @ 1956.67ft
2,456.67	2,434.96	185.10	-212.94	End Drop @ 2456.67ft
6,368.69	6,346.98	185.10	-212.94	KOP @ 6368.69ft
6,800.00	6,746.04	44.50	-213.04	DLS = 9°/100'
7,341.11	6,983.00	-423.95	-213.38	End Build @ 7341.11ft
13,990.75	7,271.00	-7,067.35	-218.25	TD Well @ 13990.75ft