

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
1N-68W-08 SHUMAKER PAD
SHUMAKER 8-17HZ**

Plan A

Plan: Permit Rev-1

Standard Planning Report

16 March, 2017



Azimuths to True North
Magnetic North: 8.20°

Magnetic Field
Strength: 52320.2snT
Dip Angle: 66.54°
Date: 3/8/2017
Model: IGRF2010

SITE: 1N-68W-08 SHUMAKER PAD

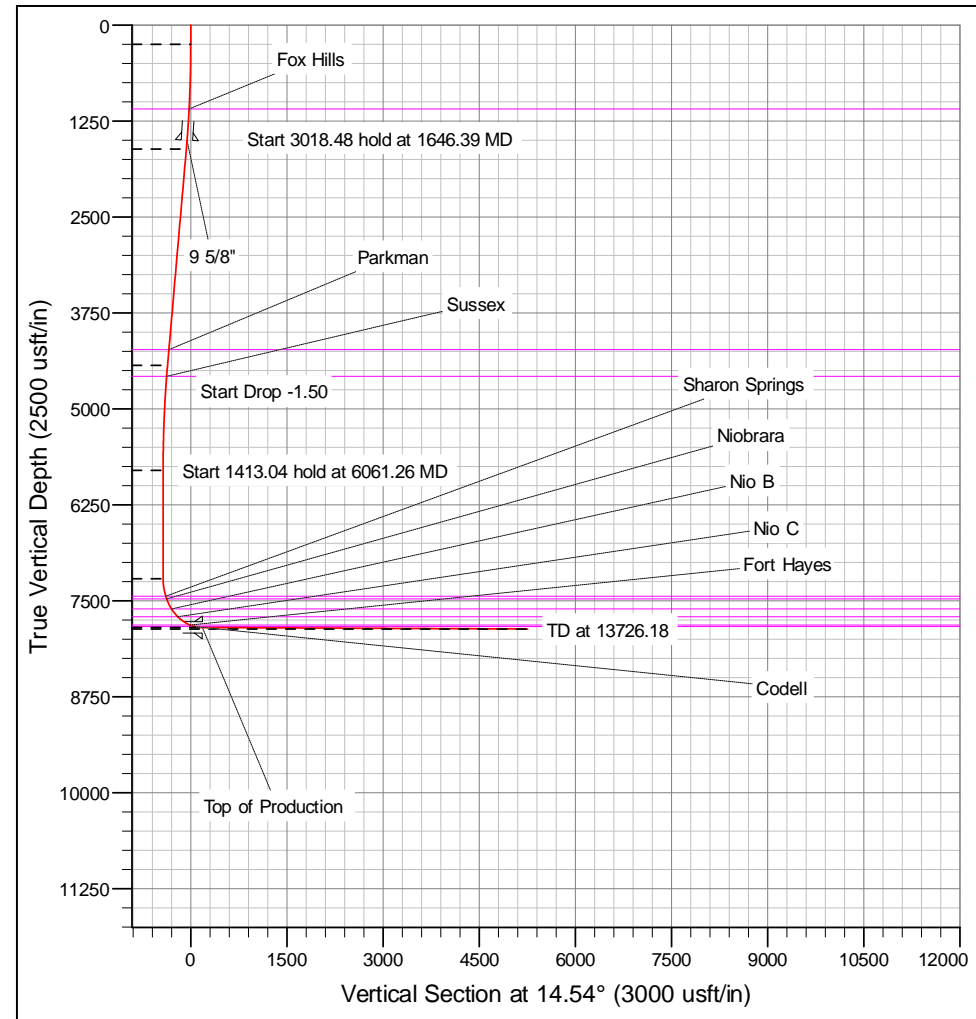
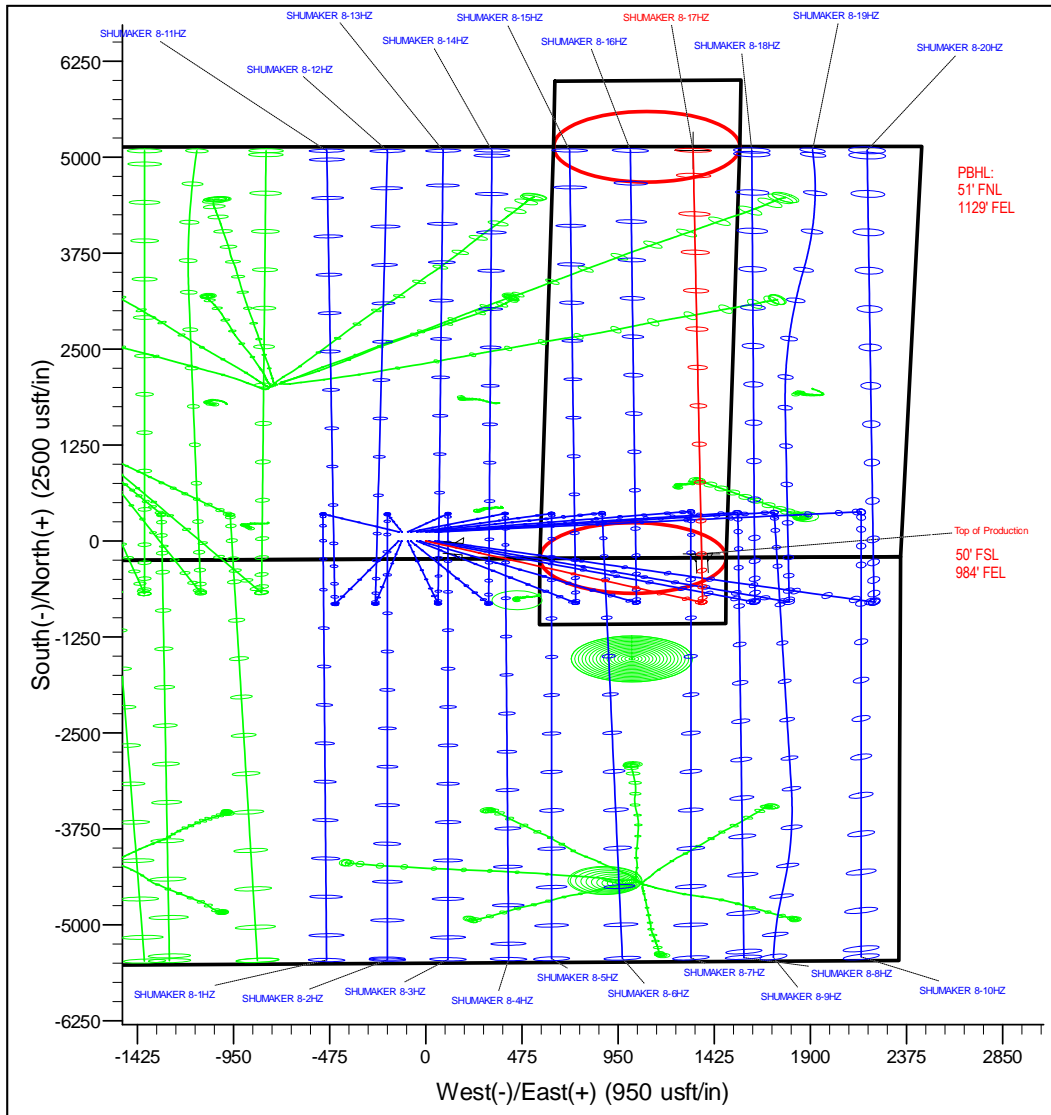
Well: SHUMAKER 8-17HZ
Wellbore: Plan A
Design: Permit Rev-1

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
1053.00	1100.00	Fox Hills
4228.00	4443.75	Parkman
4576.00	4815.28	Sussex
7440.00	7706.36	Sharon Springs
7475.00	7744.28	Niobrara
7607.00	7899.08	Nio B
7709.00	8042.89	Nio C
7817.00	8269.49	Fort Hayes
7837.00	8347.11	Codell

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHUMAKER 8-17HZ_PBL	7868.00	5088.28	1320.01	14553273.00	1634307.00	40.072880	-105.021840

WELL DETAILS: SHUMAKER 8-17HZ					
		GL: 5104.00	RKB @ 5121.00usft (D Rig)		
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	14548185.11	1632985.47	40.058907	-105.026558

SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	Vsect		
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		
1646.39	20.95	120.34	1615.49	-127.49	217.85	1.50	-68.70		
4664.87	20.95	120.34	4434.51	-672.51	1149.15	0.00	-362.40		
6061.26	0.00	0.00	5800.00	-800.00	1367.00	1.50	-431.10		
7474.30	0.00	0.00	7213.04	-800.00	1367.00	0.00	-431.10		
8472.08	89.80	359.54	7849.66	-165.62	1361.94	9.00	181.68		
13726.18	89.80	359.54	7868.00	5088.28	1320.01	0.00	5256.71		



Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-17HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-17HZ	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		1N-68W-08 SHUMAKER PAD			
Site Position:		Northing:	14,548,245.20 usft	Latitude:	40.059072
From:	Map	Easting:	1,632,948.27 usft	Longitude:	-105.026691
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.02 °

Well	SHUMAKER 8-17HZ					
Well Position	+N/-S	-60.08 usft	Northing:	14,548,185.11 usft	Latitude:	40.058907
	+E/-W	37.21 usft	Easting:	1,632,985.47 usft	Longitude:	-105.026558
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	5,104.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/8/2017	8.20	66.54	52,320.24571434

Design	Permit Rev-1				
Audit Notes:					
Version:		Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	14.54	

Plan Survey Tool Program	Date	3/16/2017			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	1,523.46	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWI	
				Fixed:v2:standard declination	
2	1,523.46	13,726.18	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWI	
				Fixed:v2:crustal field declinat	

Corporate Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-17HZ	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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,646.39	20.95	120.34	1,615.49	-127.49	217.85	1.50	1.50	0.00	120.34	
4,664.87	20.95	120.34	4,434.51	-672.51	1,149.15	0.00	0.00	0.00	0.00	
6,061.26	0.00	0.00	5,800.00	-800.00	1,367.00	1.50	-1.50	0.00	180.00	
7,474.30	0.00	0.00	7,213.04	-800.00	1,367.00	0.00	0.00	0.00	0.00	
8,472.08	89.80	359.54	7,849.66	-165.62	1,361.94	9.00	9.00	0.00	359.54	
13,726.18	89.80	359.54	7,868.00	5,088.28	1,320.01	0.00	0.00	0.00	0.00	SHUMAKER 8-17H

Corporate Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-17HZ	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
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
300.00	0.75	120.34	300.00	-0.17	0.28	-0.09	1.50	1.50	0.00
400.00	2.25	120.34	399.96	-1.49	2.54	-0.80	1.50	1.50	0.00
500.00	3.75	120.34	499.82	-4.13	7.06	-2.23	1.50	1.50	0.00
600.00	5.25	120.34	599.51	-8.09	13.83	-4.36	1.50	1.50	0.00
700.00	6.75	120.34	698.96	-13.37	22.85	-7.21	1.50	1.50	0.00
800.00	8.25	120.34	798.10	-19.97	34.12	-10.76	1.50	1.50	0.00
900.00	9.75	120.34	896.87	-27.87	47.62	-15.02	1.50	1.50	0.00
1,000.00	11.25	120.34	995.19	-37.07	63.34	-19.98	1.50	1.50	0.00
1,100.00	12.75	120.34	1,093.00	-47.57	81.29	-25.64	1.50	1.50	0.00
Fox Hills									
1,200.00	14.25	120.34	1,190.24	-59.36	101.44	-31.99	1.50	1.50	0.00
1,300.00	15.75	120.34	1,286.83	-72.43	123.77	-39.03	1.50	1.50	0.00
1,400.00	17.25	120.34	1,382.71	-86.78	148.28	-46.76	1.50	1.50	0.00
1,500.00	18.75	120.34	1,477.81	-102.39	174.95	-55.17	1.50	1.50	0.00
1,523.46	19.10	120.34	1,500.00	-106.23	181.52	-57.25	1.50	1.50	0.00
9 5/8"									
1,600.00	20.25	120.34	1,572.07	-119.25	203.76	-64.26	1.50	1.50	0.00
1,646.39	20.95	120.34	1,615.49	-127.49	217.85	-68.70	1.50	1.50	0.00
1,700.00	20.95	120.34	1,665.56	-137.17	234.39	-73.92	0.00	0.00	0.00
1,800.00	20.95	120.34	1,758.95	-155.23	265.24	-83.65	0.00	0.00	0.00
1,900.00	20.95	120.34	1,852.35	-173.28	296.10	-93.38	0.00	0.00	0.00
2,000.00	20.95	120.34	1,945.74	-191.34	326.95	-103.11	0.00	0.00	0.00
2,100.00	20.95	120.34	2,039.13	-209.39	357.80	-112.84	0.00	0.00	0.00
2,200.00	20.95	120.34	2,132.52	-227.45	388.66	-122.57	0.00	0.00	0.00
2,300.00	20.95	120.34	2,225.91	-245.51	419.51	-132.30	0.00	0.00	0.00
2,400.00	20.95	120.34	2,319.30	-263.56	450.36	-142.03	0.00	0.00	0.00
2,500.00	20.95	120.34	2,412.70	-281.62	481.22	-151.76	0.00	0.00	0.00
2,600.00	20.95	120.34	2,506.09	-299.68	512.07	-161.49	0.00	0.00	0.00
2,700.00	20.95	120.34	2,599.48	-317.73	542.92	-171.22	0.00	0.00	0.00
2,800.00	20.95	120.34	2,692.87	-335.79	573.78	-180.95	0.00	0.00	0.00
2,900.00	20.95	120.34	2,786.26	-353.84	604.63	-190.68	0.00	0.00	0.00
3,000.00	20.95	120.34	2,879.66	-371.90	635.48	-200.41	0.00	0.00	0.00
3,100.00	20.95	120.34	2,973.05	-389.96	666.34	-210.14	0.00	0.00	0.00
3,200.00	20.95	120.34	3,066.44	-408.01	697.19	-219.87	0.00	0.00	0.00
3,300.00	20.95	120.34	3,159.83	-426.07	728.04	-229.60	0.00	0.00	0.00
3,400.00	20.95	120.34	3,253.22	-444.12	758.90	-239.33	0.00	0.00	0.00
3,500.00	20.95	120.34	3,346.62	-462.18	789.75	-249.06	0.00	0.00	0.00
3,600.00	20.95	120.34	3,440.01	-480.24	820.60	-258.79	0.00	0.00	0.00
3,700.00	20.95	120.34	3,533.40	-498.29	851.46	-268.52	0.00	0.00	0.00
3,800.00	20.95	120.34	3,626.79	-516.35	882.31	-278.25	0.00	0.00	0.00
3,900.00	20.95	120.34	3,720.18	-534.40	913.16	-287.98	0.00	0.00	0.00
4,000.00	20.95	120.34	3,813.57	-552.46	944.02	-297.71	0.00	0.00	0.00
4,100.00	20.95	120.34	3,906.97	-570.52	974.87	-307.44	0.00	0.00	0.00
4,200.00	20.95	120.34	4,000.36	-588.57	1,005.72	-317.17	0.00	0.00	0.00
4,300.00	20.95	120.34	4,093.75	-606.63	1,036.58	-326.90	0.00	0.00	0.00
4,400.00	20.95	120.34	4,187.14	-624.69	1,067.43	-336.63	0.00	0.00	0.00
4,443.75	20.95	120.34	4,228.00	-632.58	1,080.93	-340.88	0.00	0.00	0.00
Parkman									
4,500.00	20.95	120.34	4,280.53	-642.74	1,098.28	-346.36	0.00	0.00	0.00

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-17HZ	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)
4,600.00	20.95	120.34	4,373.93	-660.80	1,129.14	-356.09	0.00	0.00	0.00
4,664.87	20.95	120.34	4,434.51	-672.51	1,149.15	-362.40	0.00	0.00	0.00
4,700.00	20.42	120.34	4,467.38	-678.78	1,159.86	-365.78	1.50	-1.50	0.00
4,800.00	18.92	120.34	4,561.54	-695.78	1,188.91	-374.94	1.50	-1.50	0.00
4,815.28	18.69	120.34	4,576.00	-698.26	1,193.16	-376.28	1.50	-1.50	0.00
Sussex									
4,900.00	17.42	120.34	4,656.55	-711.53	1,215.82	-383.42	1.50	-1.50	0.00
5,000.00	15.92	120.34	4,752.34	-726.01	1,240.58	-391.23	1.50	-1.50	0.00
5,100.00	14.42	120.34	4,848.86	-739.23	1,263.16	-398.35	1.50	-1.50	0.00
5,200.00	12.92	120.34	4,946.02	-751.17	1,283.55	-404.78	1.50	-1.50	0.00
5,300.00	11.42	120.34	5,043.77	-761.81	1,301.75	-410.52	1.50	-1.50	0.00
5,400.00	9.92	120.34	5,142.04	-771.16	1,317.72	-415.56	1.50	-1.50	0.00
5,500.00	8.42	120.34	5,240.76	-779.21	1,331.48	-419.90	1.50	-1.50	0.00
5,600.00	6.92	120.34	5,339.86	-785.95	1,342.99	-423.53	1.50	-1.50	0.00
5,700.00	5.42	120.34	5,439.28	-791.38	1,352.27	-426.45	1.50	-1.50	0.00
5,800.00	3.92	120.34	5,538.95	-795.49	1,359.29	-428.67	1.50	-1.50	0.00
5,900.00	2.42	120.34	5,638.79	-798.28	1,364.06	-430.17	1.50	-1.50	0.00
6,000.00	0.92	120.34	5,738.75	-799.75	1,366.58	-430.97	1.50	-1.50	0.00
6,061.26	0.00	0.00	5,800.00	-800.00	1,367.00	-431.10	1.50	-1.50	0.00
6,100.00	0.00	0.00	5,838.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,200.00	0.00	0.00	5,938.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,300.00	0.00	0.00	6,038.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,400.00	0.00	0.00	6,138.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,500.00	0.00	0.00	6,238.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,600.00	0.00	0.00	6,338.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,700.00	0.00	0.00	6,438.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,800.00	0.00	0.00	6,538.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
6,900.00	0.00	0.00	6,638.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,000.00	0.00	0.00	6,738.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,100.00	0.00	0.00	6,838.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,200.00	0.00	0.00	6,938.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,300.00	0.00	0.00	7,038.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,400.00	0.00	0.00	7,138.74	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,474.30	0.00	0.00	7,213.04	-800.00	1,367.00	-431.10	0.00	0.00	0.00
7,500.00	2.31	359.54	7,238.74	-799.48	1,367.00	-430.60	9.00	9.00	0.00
7,600.00	11.31	359.54	7,337.93	-787.63	1,366.90	-419.15	9.00	9.00	0.00
7,700.00	20.31	359.54	7,434.05	-760.41	1,366.68	-392.86	9.00	9.00	0.00
7,706.36	20.89	359.54	7,440.00	-758.17	1,366.67	-390.70	9.00	9.00	0.00
Sharon Springs									
7,744.28	24.30	359.54	7,475.00	-743.61	1,366.55	-376.63	9.00	9.00	0.00
Niobrara									
7,800.00	29.31	359.54	7,524.72	-718.49	1,366.35	-352.36	9.00	9.00	0.00
7,899.08	38.23	359.54	7,607.00	-663.47	1,365.91	-299.22	9.00	9.00	0.00
Nio B									
7,900.00	38.31	359.54	7,607.72	-662.90	1,365.91	-298.67	9.00	9.00	0.00
8,000.00	47.31	359.54	7,681.00	-595.01	1,365.36	-233.09	9.00	9.00	0.00
8,042.89	51.17	359.54	7,709.00	-562.53	1,365.10	-201.71	9.00	9.00	0.00
Nio C									
8,100.00	56.31	359.54	7,742.76	-516.49	1,364.74	-157.25	9.00	9.00	0.00
8,200.00	65.31	359.54	7,791.48	-429.28	1,364.04	-73.01	9.00	9.00	0.00
8,269.49	71.57	359.54	7,817.00	-364.69	1,363.53	-10.61	9.00	9.00	0.00
Fort Hayes									
8,300.00	74.31	359.54	7,825.95	-335.53	1,363.29	17.56	9.00	9.00	0.00

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-17HZ	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)
8,347.11	78.55	359.54	7,837.00	-289.74	1,362.93	61.78	9.00	9.00	0.00
Codell									
8,400.00	83.31	359.54	7,845.33	-237.53	1,362.51	112.22	9.00	9.00	0.00
8,472.08	89.80	359.54	7,849.66	-165.62	1,361.94	181.68	9.00	9.00	0.00
Top of Production - SHUMAKER 8-17HZ_PHL									
8,500.00	89.80	359.54	7,849.76	-137.70	1,361.71	208.65	0.00	0.00	0.00
8,600.00	89.80	359.54	7,850.11	-37.71	1,360.92	305.24	0.00	0.00	0.00
8,700.00	89.80	359.54	7,850.46	62.29	1,360.12	401.83	0.00	0.00	0.00
8,800.00	89.80	359.54	7,850.80	162.29	1,359.32	498.43	0.00	0.00	0.00
8,900.00	89.80	359.54	7,851.15	262.28	1,358.52	595.02	0.00	0.00	0.00
9,000.00	89.80	359.54	7,851.50	362.28	1,357.72	691.61	0.00	0.00	0.00
9,100.00	89.80	359.54	7,851.85	462.28	1,356.93	788.20	0.00	0.00	0.00
9,200.00	89.80	359.54	7,852.20	562.27	1,356.13	884.79	0.00	0.00	0.00
9,300.00	89.80	359.54	7,852.55	662.27	1,355.33	981.38	0.00	0.00	0.00
9,400.00	89.80	359.54	7,852.90	762.26	1,354.53	1,077.98	0.00	0.00	0.00
9,500.00	89.80	359.54	7,853.25	862.26	1,353.73	1,174.57	0.00	0.00	0.00
9,600.00	89.80	359.54	7,853.60	962.26	1,352.94	1,271.16	0.00	0.00	0.00
9,700.00	89.80	359.54	7,853.95	1,062.25	1,352.14	1,367.75	0.00	0.00	0.00
9,800.00	89.80	359.54	7,854.30	1,162.25	1,351.34	1,464.34	0.00	0.00	0.00
9,900.00	89.80	359.54	7,854.64	1,262.25	1,350.54	1,560.94	0.00	0.00	0.00
10,000.00	89.80	359.54	7,854.99	1,362.24	1,349.74	1,657.53	0.00	0.00	0.00
10,100.00	89.80	359.54	7,855.34	1,462.24	1,348.95	1,754.12	0.00	0.00	0.00
10,200.00	89.80	359.54	7,855.69	1,562.23	1,348.15	1,850.71	0.00	0.00	0.00
10,300.00	89.80	359.54	7,856.04	1,662.23	1,347.35	1,947.30	0.00	0.00	0.00
10,400.00	89.80	359.54	7,856.39	1,762.23	1,346.55	2,043.89	0.00	0.00	0.00
10,500.00	89.80	359.54	7,856.74	1,862.22	1,345.75	2,140.49	0.00	0.00	0.00
10,600.00	89.80	359.54	7,857.09	1,962.22	1,344.96	2,237.08	0.00	0.00	0.00
10,700.00	89.80	359.54	7,857.44	2,062.21	1,344.16	2,333.67	0.00	0.00	0.00
10,800.00	89.80	359.54	7,857.79	2,162.21	1,343.36	2,430.26	0.00	0.00	0.00
10,900.00	89.80	359.54	7,858.13	2,262.21	1,342.56	2,526.85	0.00	0.00	0.00
11,000.00	89.80	359.54	7,858.48	2,362.20	1,341.76	2,623.45	0.00	0.00	0.00
11,100.00	89.80	359.54	7,858.83	2,462.20	1,340.97	2,720.04	0.00	0.00	0.00
11,200.00	89.80	359.54	7,859.18	2,562.20	1,340.17	2,816.63	0.00	0.00	0.00
11,300.00	89.80	359.54	7,859.53	2,662.19	1,339.37	2,913.22	0.00	0.00	0.00
11,400.00	89.80	359.54	7,859.88	2,762.19	1,338.57	3,009.81	0.00	0.00	0.00
11,500.00	89.80	359.54	7,860.23	2,862.18	1,337.77	3,106.40	0.00	0.00	0.00
11,600.00	89.80	359.54	7,860.58	2,962.18	1,336.98	3,203.00	0.00	0.00	0.00
11,700.00	89.80	359.54	7,860.93	3,062.18	1,336.18	3,299.59	0.00	0.00	0.00
11,800.00	89.80	359.54	7,861.28	3,162.17	1,335.38	3,396.18	0.00	0.00	0.00
11,900.00	89.80	359.54	7,861.63	3,262.17	1,334.58	3,492.77	0.00	0.00	0.00
12,000.00	89.80	359.54	7,861.97	3,362.17	1,333.78	3,589.36	0.00	0.00	0.00
12,100.00	89.80	359.54	7,862.32	3,462.16	1,332.99	3,685.96	0.00	0.00	0.00
12,200.00	89.80	359.54	7,862.67	3,562.16	1,332.19	3,782.55	0.00	0.00	0.00
12,300.00	89.80	359.54	7,863.02	3,662.15	1,331.39	3,879.14	0.00	0.00	0.00
12,400.00	89.80	359.54	7,863.37	3,762.15	1,330.59	3,975.73	0.00	0.00	0.00
12,500.00	89.80	359.54	7,863.72	3,862.15	1,329.79	4,072.32	0.00	0.00	0.00
12,600.00	89.80	359.54	7,864.07	3,962.14	1,329.00	4,168.91	0.00	0.00	0.00
12,700.00	89.80	359.54	7,864.42	4,062.14	1,328.20	4,265.51	0.00	0.00	0.00
12,800.00	89.80	359.54	7,864.77	4,162.14	1,327.40	4,362.10	0.00	0.00	0.00
12,900.00	89.80	359.54	7,865.12	4,262.13	1,326.60	4,458.69	0.00	0.00	0.00
13,000.00	89.80	359.54	7,865.47	4,362.13	1,325.80	4,555.28	0.00	0.00	0.00
13,100.00	89.80	359.54	7,865.81	4,462.12	1,325.01	4,651.87	0.00	0.00	0.00
13,200.00	89.80	359.54	7,866.16	4,562.12	1,324.21	4,748.47	0.00	0.00	0.00
13,300.00	89.80	359.54	7,866.51	4,662.12	1,323.41	4,845.06	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-17HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB @ 5121.00usft (D Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB @ 5121.00usft (D Rig)
Site:	1N-68W-08 SHUMAKER PAD	North Reference:	True
Well:	SHUMAKER 8-17HZ	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)
13,400.00	89.80	359.54	7,866.86	4,762.11	1,322.61	4,941.65	0.00	0.00	0.00
13,500.00	89.80	359.54	7,867.21	4,862.11	1,321.81	5,038.24	0.00	0.00	0.00
13,600.00	89.80	359.54	7,867.56	4,962.10	1,321.02	5,134.83	0.00	0.00	0.00
13,700.00	89.80	359.54	7,867.91	5,062.10	1,320.22	5,231.42	0.00	0.00	0.00
13,726.18	89.80	359.54	7,868.00	5,088.28	1,320.01	5,256.71	0.00	0.00	0.00
SHUMAKER 8-17HZ_PBHL									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	
	- Shape								Latitude Longitude
SHUMAKER 8-17HZ_	- plan hits target center	0.00	0.00	7,849.66	-165.62	1,361.94	14,548,019.08	1,634,347.35	40.058452 -105.021691
	- Point								
SHUMAKER 8-17HZ_	- plan hits target center	0.00	0.00	7,868.00	5,088.28	1,320.01	14,553,272.99	1,634,306.99	40.072880 -105.021840
	- Point								

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,523.46	1,500.00	9 5/8"	9-5/8	13-1/2	
8,472.08	7,849.66	Top of Production	5-1/2	7-7/8	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,100.00	1,093.00	Fox Hills			
4,443.75	4,228.00	Parkman			
4,815.28	4,576.00	Sussex			
7,706.36	7,440.00	Sharon Springs			
7,744.28	7,475.00	Niobrara			
7,899.08	7,607.00	Nio B			
8,042.89	7,709.00	Nio C			
8,269.49	7,817.00	Fort Hayes			
8,347.11	7,837.00	Codell			