

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
1N-68W-08 SHUMAKER PAD
SHUMAKER 8-18HZ**

Plan A

Plan: Permit Rev-1

Standard Planning Report

16 March, 2017



Azimuths to True North
Magnetic North: 8.20°

Magnetic Field
Strength: 52320.3snT
Dip Angle: 66.54°
Date: 3/8/2017
Model: IGRF2010

SITE: 1N-68W-08 SHUMAKER PAD

Well: SHUMAKER 8-18HZ
Wellbore: Plan A
Design: Permit Rev-1

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1053.00	1100.00	Fox Hills
4228.00	4449.39	Parkman
4576.00	4822.77	Sussex
7438.00	7760.63	Sharon Springs
7473.00	7803.00	Niobrara
7604.00	7987.26	Nio B
7707.00	8215.87	Nio C

WELL DETAILS: SHUMAKER 8-18HZ

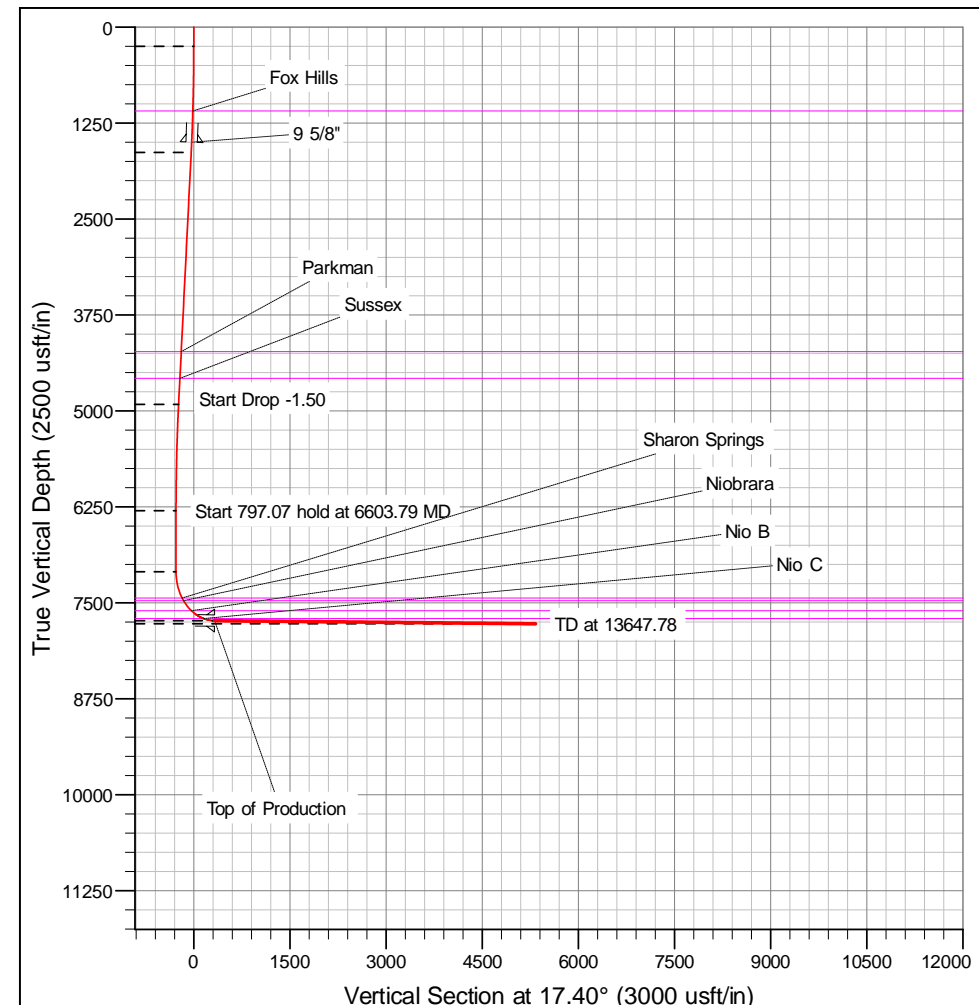
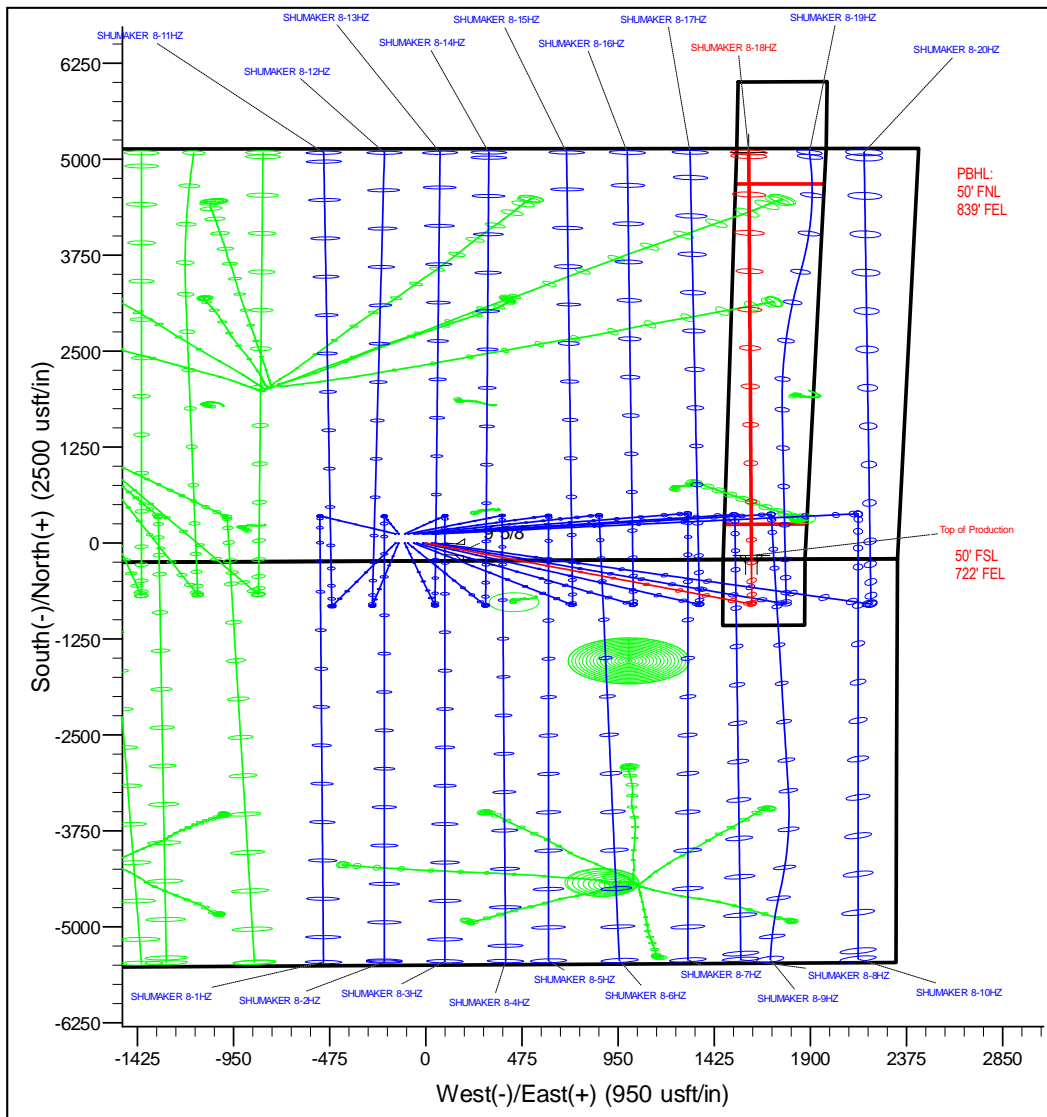
+N/-S	+E/-W	GL: 5104.00 Northing	RKB @ 5121.00usft (D Rig) Easting	Latitude	Longitude	Slot
0.00	0.00	14548185.11	1633000.58	40.058907	-105.026504	

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHUMAKER 8-18HZ_PBL	7774.00	5089.37	1594.91	14553274.00	1634597.00	40.072883	-105.020803

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
1666.40	21.25	116.25	1634.17	-114.83	232.84	1.50	-39.95
5187.38	21.25	116.25	4915.83	-679.17	1377.16	0.00	-236.27
6603.79	0.00	0.00	6300.00	-794.00	1610.00	1.50	-276.21
7400.85	0.00	0.00	7097.07	-794.00	1610.00	0.00	-276.21
8395.97	89.56	359.85	7733.67	-162.27	1608.38	9.00	326.12
13647.78	89.56	359.85	7774.00	5089.37	1594.91	0.00	533.42



Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-18HZ
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 8-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Project	WELD-NAD83-UTMFT13N		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site		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 8-18HZ					
Well Position	+N/-S	-60.08 usft	Northing:	14,548,185.10 usft	Latitude:	40.058907
	+E/-W	52.32 usft	Easting:	1,633,000.57 usft	Longitude:	-105.026504
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	52,320.25133683

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	17.40	

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	13,647.78	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 8-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,666.40	21.25	116.25	1,634.17	-114.83	232.84	1.50	1.50	0.00	116.25	
5,187.38	21.25	116.25	4,915.83	-679.17	1,377.16	0.00	0.00	0.00	0.00	
6,603.79	0.00	0.00	6,300.00	-794.00	1,610.00	1.50	-1.50	0.00	180.00	
7,400.85	0.00	0.00	7,097.07	-794.00	1,610.00	0.00	0.00	0.00	0.00	
8,395.97	89.56	359.85	7,733.67	-162.27	1,608.38	9.00	9.00	0.00	359.85	
13,647.78	89.56	359.85	7,774.00	5,089.37	1,594.91	0.00	0.00	0.00	0.00	SHUMAKER 8-18H.

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-18HZ
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 8-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	116.25	300.00	-0.14	0.29	-0.05	1.50	1.50	0.00
400.00	2.25	116.25	399.96	-1.30	2.64	-0.45	1.50	1.50	0.00
500.00	3.75	116.25	499.82	-3.62	7.33	-1.26	1.50	1.50	0.00
600.00	5.25	116.25	599.51	-7.09	14.37	-2.47	1.50	1.50	0.00
700.00	6.75	116.25	698.96	-11.71	23.75	-4.07	1.50	1.50	0.00
800.00	8.25	116.25	798.10	-17.48	35.45	-6.08	1.50	1.50	0.00
900.00	9.75	116.25	896.87	-24.40	49.48	-8.49	1.50	1.50	0.00
1,000.00	11.25	116.25	995.19	-32.46	65.83	-11.29	1.50	1.50	0.00
1,100.00	12.75	116.25	1,093.00	-41.66	84.47	-14.49	1.50	1.50	0.00
Fox Hills									
1,200.00	14.25	116.25	1,190.24	-51.98	105.41	-18.08	1.50	1.50	0.00
1,300.00	15.75	116.25	1,286.83	-63.43	128.62	-22.07	1.50	1.50	0.00
1,400.00	17.25	116.25	1,382.71	-75.99	154.09	-26.44	1.50	1.50	0.00
1,500.00	18.75	116.25	1,477.81	-89.66	181.81	-31.19	1.50	1.50	0.00
1,523.46	19.10	116.25	1,500.00	-93.03	188.63	-32.36	1.50	1.50	0.00
9 5/8"									
1,600.00	20.25	116.25	1,572.07	-104.42	211.74	-36.33	1.50	1.50	0.00
1,666.40	21.25	116.25	1,634.17	-114.83	232.84	-39.95	1.50	1.50	0.00
1,700.00	21.25	116.25	1,665.48	-120.21	243.76	-41.82	0.00	0.00	0.00
1,800.00	21.25	116.25	1,758.68	-136.24	276.26	-47.40	0.00	0.00	0.00
1,900.00	21.25	116.25	1,851.89	-152.27	308.76	-52.97	0.00	0.00	0.00
2,000.00	21.25	116.25	1,945.09	-168.30	341.26	-58.55	0.00	0.00	0.00
2,100.00	21.25	116.25	2,038.29	-184.33	373.76	-64.12	0.00	0.00	0.00
2,200.00	21.25	116.25	2,131.50	-200.35	406.26	-69.70	0.00	0.00	0.00
2,300.00	21.25	116.25	2,224.70	-216.38	438.76	-75.27	0.00	0.00	0.00
2,400.00	21.25	116.25	2,317.90	-232.41	471.26	-80.85	0.00	0.00	0.00
2,500.00	21.25	116.25	2,411.11	-248.44	503.76	-86.43	0.00	0.00	0.00
2,600.00	21.25	116.25	2,504.31	-264.47	536.26	-92.00	0.00	0.00	0.00
2,700.00	21.25	116.25	2,597.51	-280.49	568.76	-97.58	0.00	0.00	0.00
2,800.00	21.25	116.25	2,690.72	-296.52	601.26	-103.15	0.00	0.00	0.00
2,900.00	21.25	116.25	2,783.92	-312.55	633.76	-108.73	0.00	0.00	0.00
3,000.00	21.25	116.25	2,877.12	-328.58	666.26	-114.30	0.00	0.00	0.00
3,100.00	21.25	116.25	2,970.33	-344.61	698.76	-119.88	0.00	0.00	0.00
3,200.00	21.25	116.25	3,063.53	-360.63	731.26	-125.46	0.00	0.00	0.00
3,300.00	21.25	116.25	3,156.73	-376.66	763.76	-131.03	0.00	0.00	0.00
3,400.00	21.25	116.25	3,249.93	-392.69	796.26	-136.61	0.00	0.00	0.00
3,500.00	21.25	116.25	3,343.14	-408.72	828.76	-142.18	0.00	0.00	0.00
3,600.00	21.25	116.25	3,436.34	-424.75	861.26	-147.76	0.00	0.00	0.00
3,700.00	21.25	116.25	3,529.54	-440.77	893.76	-153.33	0.00	0.00	0.00
3,800.00	21.25	116.25	3,622.75	-456.80	926.26	-158.91	0.00	0.00	0.00
3,900.00	21.25	116.25	3,715.95	-472.83	958.76	-164.49	0.00	0.00	0.00
4,000.00	21.25	116.25	3,809.15	-488.86	991.26	-170.06	0.00	0.00	0.00
4,100.00	21.25	116.25	3,902.36	-504.89	1,023.76	-175.64	0.00	0.00	0.00
4,200.00	21.25	116.25	3,995.56	-520.91	1,056.26	-181.21	0.00	0.00	0.00
4,300.00	21.25	116.25	4,088.76	-536.94	1,088.76	-186.79	0.00	0.00	0.00
4,400.00	21.25	116.25	4,181.97	-552.97	1,121.26	-192.36	0.00	0.00	0.00
4,449.39	21.25	116.25	4,228.00	-560.89	1,137.31	-195.12	0.00	0.00	0.00
Parkman									
4,500.00	21.25	116.25	4,275.17	-569.00	1,153.76	-197.94	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 8-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,600.00	21.25	116.25	4,368.37	-585.03	1,186.26	-203.52	0.00	0.00	0.00
4,700.00	21.25	116.25	4,461.58	-601.05	1,218.76	-209.09	0.00	0.00	0.00
4,800.00	21.25	116.25	4,554.78	-617.08	1,251.26	-214.67	0.00	0.00	0.00
4,822.77	21.25	116.25	4,576.00	-620.73	1,258.66	-215.94	0.00	0.00	0.00
Sussex									
4,900.00	21.25	116.25	4,647.98	-633.11	1,283.76	-220.24	0.00	0.00	0.00
5,000.00	21.25	116.25	4,741.19	-649.14	1,316.26	-225.82	0.00	0.00	0.00
5,100.00	21.25	116.25	4,834.39	-665.17	1,348.76	-231.39	0.00	0.00	0.00
5,187.38	21.25	116.25	4,915.83	-679.17	1,377.16	-236.27	0.00	0.00	0.00
5,200.00	21.06	116.25	4,927.60	-681.18	1,381.24	-236.97	1.50	-1.50	0.00
5,300.00	19.56	116.25	5,021.38	-696.53	1,412.37	-242.31	1.50	-1.50	0.00
5,400.00	18.06	116.25	5,116.04	-710.79	1,441.28	-247.27	1.50	-1.50	0.00
5,500.00	16.56	116.25	5,211.51	-723.95	1,467.96	-251.84	1.50	-1.50	0.00
5,600.00	15.06	116.25	5,307.73	-736.00	1,492.39	-256.04	1.50	-1.50	0.00
5,700.00	13.56	116.25	5,404.62	-746.93	1,514.55	-259.84	1.50	-1.50	0.00
5,800.00	12.06	116.25	5,502.13	-756.73	1,534.43	-263.25	1.50	-1.50	0.00
5,900.00	10.56	116.25	5,600.19	-765.40	1,552.01	-266.26	1.50	-1.50	0.00
6,000.00	9.06	116.25	5,698.73	-772.94	1,567.29	-268.89	1.50	-1.50	0.00
6,100.00	7.56	116.25	5,797.67	-779.33	1,580.25	-271.11	1.50	-1.50	0.00
6,200.00	6.06	116.25	5,896.97	-784.57	1,590.88	-272.93	1.50	-1.50	0.00
6,300.00	4.56	116.25	5,996.53	-788.66	1,599.17	-274.35	1.50	-1.50	0.00
6,400.00	3.06	116.25	6,096.31	-791.60	1,605.13	-275.38	1.50	-1.50	0.00
6,500.00	1.56	116.25	6,196.23	-793.38	1,608.74	-276.00	1.50	-1.50	0.00
6,600.00	0.06	116.25	6,296.21	-794.00	1,610.00	-276.21	1.50	-1.50	0.00
6,603.79	0.00	0.00	6,300.00	-794.00	1,610.00	-276.21	1.50	-1.50	0.00
6,700.00	0.00	0.00	6,396.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
6,800.00	0.00	0.00	6,496.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
6,900.00	0.00	0.00	6,596.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,000.00	0.00	0.00	6,696.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,100.00	0.00	0.00	6,796.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,200.00	0.00	0.00	6,896.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,300.00	0.00	0.00	6,996.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,400.00	0.00	0.00	7,096.21	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,400.85	0.00	0.00	7,097.07	-794.00	1,610.00	-276.21	0.00	0.00	0.00
7,500.00	8.92	359.85	7,195.81	-786.30	1,609.98	-268.87	9.00	9.00	0.00
7,600.00	17.92	359.85	7,292.98	-763.11	1,609.92	-246.76	9.00	9.00	0.00
7,700.00	26.92	359.85	7,385.33	-725.00	1,609.82	-210.42	9.00	9.00	0.00
7,760.63	32.38	359.85	7,438.00	-695.01	1,609.75	-181.83	9.00	9.00	0.00
Sharon Springs									
7,800.00	35.92	359.85	7,470.57	-672.92	1,609.69	-160.76	9.00	9.00	0.00
7,803.00	36.19	359.85	7,473.00	-671.15	1,609.68	-159.08	9.00	9.00	0.00
Niobrara									
7,900.00	44.92	359.85	7,546.62	-608.14	1,609.52	-99.00	9.00	9.00	0.00
7,987.26	52.78	359.85	7,604.00	-542.49	1,609.35	-36.40	9.00	9.00	0.00
Nio B									
8,000.00	53.92	359.85	7,611.60	-532.27	1,609.33	-26.66	9.00	9.00	0.00
8,100.00	62.92	359.85	7,663.91	-447.16	1,609.11	54.49	9.00	9.00	0.00
8,200.00	71.92	359.85	7,702.27	-354.92	1,608.87	142.44	9.00	9.00	0.00
8,215.87	73.35	359.85	7,707.00	-339.78	1,608.83	156.88	9.00	9.00	0.00
Nio C									
8,300.00	80.92	359.85	7,725.72	-257.82	1,608.62	235.03	9.00	9.00	0.00
8,395.97	89.56	359.85	7,733.67	-162.27	1,608.38	326.13	9.00	9.00	0.00
Top of Production - SHUMAKER 8-18HZ_PHL									

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-18HZ
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 8-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,400.00	89.56	359.85	7,733.70	-158.24	1,608.37	329.97	0.00	0.00	0.00
8,500.00	89.56	359.85	7,734.47	-58.24	1,608.11	425.31	0.00	0.00	0.00
8,600.00	89.56	359.85	7,735.24	41.76	1,607.86	520.66	0.00	0.00	0.00
8,700.00	89.56	359.85	7,736.00	141.75	1,607.60	616.00	0.00	0.00	0.00
8,800.00	89.56	359.85	7,736.77	241.75	1,607.34	711.35	0.00	0.00	0.00
8,900.00	89.56	359.85	7,737.54	341.75	1,607.09	806.69	0.00	0.00	0.00
9,000.00	89.56	359.85	7,738.31	441.74	1,606.83	902.04	0.00	0.00	0.00
9,100.00	89.56	359.85	7,739.08	541.74	1,606.57	997.38	0.00	0.00	0.00
9,200.00	89.56	359.85	7,739.84	641.74	1,606.32	1,092.72	0.00	0.00	0.00
9,300.00	89.56	359.85	7,740.61	741.73	1,606.06	1,188.07	0.00	0.00	0.00
9,400.00	89.56	359.85	7,741.38	841.73	1,605.80	1,283.41	0.00	0.00	0.00
9,500.00	89.56	359.85	7,742.15	941.73	1,605.55	1,378.76	0.00	0.00	0.00
9,600.00	89.56	359.85	7,742.92	1,041.72	1,605.29	1,474.10	0.00	0.00	0.00
9,700.00	89.56	359.85	7,743.68	1,141.72	1,605.03	1,569.45	0.00	0.00	0.00
9,800.00	89.56	359.85	7,744.45	1,241.72	1,604.78	1,664.79	0.00	0.00	0.00
9,900.00	89.56	359.85	7,745.22	1,341.71	1,604.52	1,760.13	0.00	0.00	0.00
10,000.00	89.56	359.85	7,745.99	1,441.71	1,604.26	1,855.48	0.00	0.00	0.00
10,100.00	89.56	359.85	7,746.76	1,541.71	1,604.01	1,950.82	0.00	0.00	0.00
10,200.00	89.56	359.85	7,747.52	1,641.70	1,603.75	2,046.17	0.00	0.00	0.00
10,300.00	89.56	359.85	7,748.29	1,741.70	1,603.49	2,141.51	0.00	0.00	0.00
10,400.00	89.56	359.85	7,749.06	1,841.70	1,603.24	2,236.85	0.00	0.00	0.00
10,500.00	89.56	359.85	7,749.83	1,941.69	1,602.98	2,332.20	0.00	0.00	0.00
10,600.00	89.56	359.85	7,750.60	2,041.69	1,602.73	2,427.54	0.00	0.00	0.00
10,700.00	89.56	359.85	7,751.36	2,141.69	1,602.47	2,522.89	0.00	0.00	0.00
10,800.00	89.56	359.85	7,752.13	2,241.68	1,602.21	2,618.23	0.00	0.00	0.00
10,900.00	89.56	359.85	7,752.90	2,341.68	1,601.96	2,713.58	0.00	0.00	0.00
11,000.00	89.56	359.85	7,753.67	2,441.68	1,601.70	2,808.92	0.00	0.00	0.00
11,100.00	89.56	359.85	7,754.43	2,541.67	1,601.44	2,904.26	0.00	0.00	0.00
11,200.00	89.56	359.85	7,755.20	2,641.67	1,601.19	2,999.61	0.00	0.00	0.00
11,300.00	89.56	359.85	7,755.97	2,741.67	1,600.93	3,094.95	0.00	0.00	0.00
11,400.00	89.56	359.85	7,756.74	2,841.66	1,600.67	3,190.30	0.00	0.00	0.00
11,500.00	89.56	359.85	7,757.51	2,941.66	1,600.42	3,285.64	0.00	0.00	0.00
11,600.00	89.56	359.85	7,758.27	3,041.66	1,600.16	3,380.99	0.00	0.00	0.00
11,700.00	89.56	359.85	7,759.04	3,141.65	1,599.90	3,476.33	0.00	0.00	0.00
11,800.00	89.56	359.85	7,759.81	3,241.65	1,599.65	3,571.67	0.00	0.00	0.00
11,900.00	89.56	359.85	7,760.58	3,341.65	1,599.39	3,667.02	0.00	0.00	0.00
12,000.00	89.56	359.85	7,761.35	3,441.65	1,599.13	3,762.36	0.00	0.00	0.00
12,100.00	89.56	359.85	7,762.11	3,541.64	1,598.88	3,857.71	0.00	0.00	0.00
12,200.00	89.56	359.85	7,762.88	3,641.64	1,598.62	3,953.05	0.00	0.00	0.00
12,300.00	89.56	359.85	7,763.65	3,741.64	1,598.36	4,048.40	0.00	0.00	0.00
12,400.00	89.56	359.85	7,764.42	3,841.63	1,598.11	4,143.74	0.00	0.00	0.00
12,500.00	89.56	359.85	7,765.19	3,941.63	1,597.85	4,239.08	0.00	0.00	0.00
12,600.00	89.56	359.85	7,765.95	4,041.63	1,597.59	4,334.43	0.00	0.00	0.00
12,700.00	89.56	359.85	7,766.72	4,141.62	1,597.34	4,429.77	0.00	0.00	0.00
12,800.00	89.56	359.85	7,767.49	4,241.62	1,597.08	4,525.12	0.00	0.00	0.00
12,900.00	89.56	359.85	7,768.26	4,341.62	1,596.82	4,620.46	0.00	0.00	0.00
13,000.00	89.56	359.85	7,769.03	4,441.61	1,596.57	4,715.80	0.00	0.00	0.00
13,100.00	89.56	359.85	7,769.79	4,541.61	1,596.31	4,811.15	0.00	0.00	0.00
13,200.00	89.56	359.85	7,770.56	4,641.61	1,596.06	4,906.49	0.00	0.00	0.00
13,300.00	89.56	359.85	7,771.33	4,741.60	1,595.80	5,001.84	0.00	0.00	0.00
13,400.00	89.56	359.85	7,772.10	4,841.60	1,595.54	5,097.18	0.00	0.00	0.00
13,500.00	89.56	359.85	7,772.87	4,941.60	1,595.29	5,192.53	0.00	0.00	0.00
13,600.00	89.56	359.85	7,773.63	5,041.59	1,595.03	5,287.87	0.00	0.00	0.00
13,647.78	89.56	359.85	7,774.00	5,089.37	1,594.91	5,333.42	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well SHUMAKER 8-18HZ
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 8-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
SHUMAKER 8-18HZ_PBHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHUMAKER 8-18HZ_	0.00	0.00	7,733.67	-162.27	1,608.38	14,548,022.36	1,634,608.91	40.058461	-105.020756
- plan hits target center									
- Point									
SHUMAKER 8-18HZ_	0.00	0.00	7,774.00	5,089.37	1,594.91	14,553,274.00	1,634,597.00	40.072883	-105.020803
- plan hits target center									
- 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	
8,395.97	7,733.67	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				
4,449.39	4,228.00	Parkman				
4,822.77	4,576.00	Sussex				
7,760.63	7,438.00	Sharon Springs				
7,803.00	7,473.00	Niobrara				
7,987.26	7,604.00	Nio B				
8,215.87	7,707.00	Nio C				