

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

1N-66W-15 MAB 15-15HZ PAD

MAB 15-5HZ

Plan A

Plan: Permit Rev-1

SHL Lat/Long: 40.045517/-104.761652

Survey Program: MWD+IFR+MSA

Standard Planning Report

07 July, 2018

Project: WELD-NAD83-UTMFT13N
Site: 1N-66W-15 MAB 15-15HZ PAD
Well: MAB 15-5HZ
Wellbore: Plan A
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS		
TVD	MD	Size
1500.00	1522.93	9-5/8
7605.00	8135.41	5-1/2

WELL DETAILS: MAB 15-5HZ
GL = 5112.00
RKB = 17' @ 5129.00usft (Drilling Rig)

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	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	1225.33	15.38	120.35	1213.06	-69.12	118.04	1.50	120.35	-68.79	
4	4025.33	15.38	120.35	3912.79	-444.35	758.89	0.00	0.00	-442.23	
5	4794.33	0.00	0.00	4672.59	-496.19	847.42	2.00	-180.00	-493.82	
6	7010.55	0.00	0.00	6888.81	-496.19	847.42	0.00	0.00	-493.82	
7	8135.41	89.99	0.16	7605.00	219.87	849.44	8.00	0.16	222.24	
8	18290.79	89.99	0.16	7607.00	10375.21	877.99	0.00	0.00	10377.62	MAB 15-5HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
MAB 15-5HZ_SHL	0.00	0.00	0.00	40.045517	-104.761652
MAB 15-5HZ_BHL	7607.00	10375.21	877.99	40.074009	-104.758513

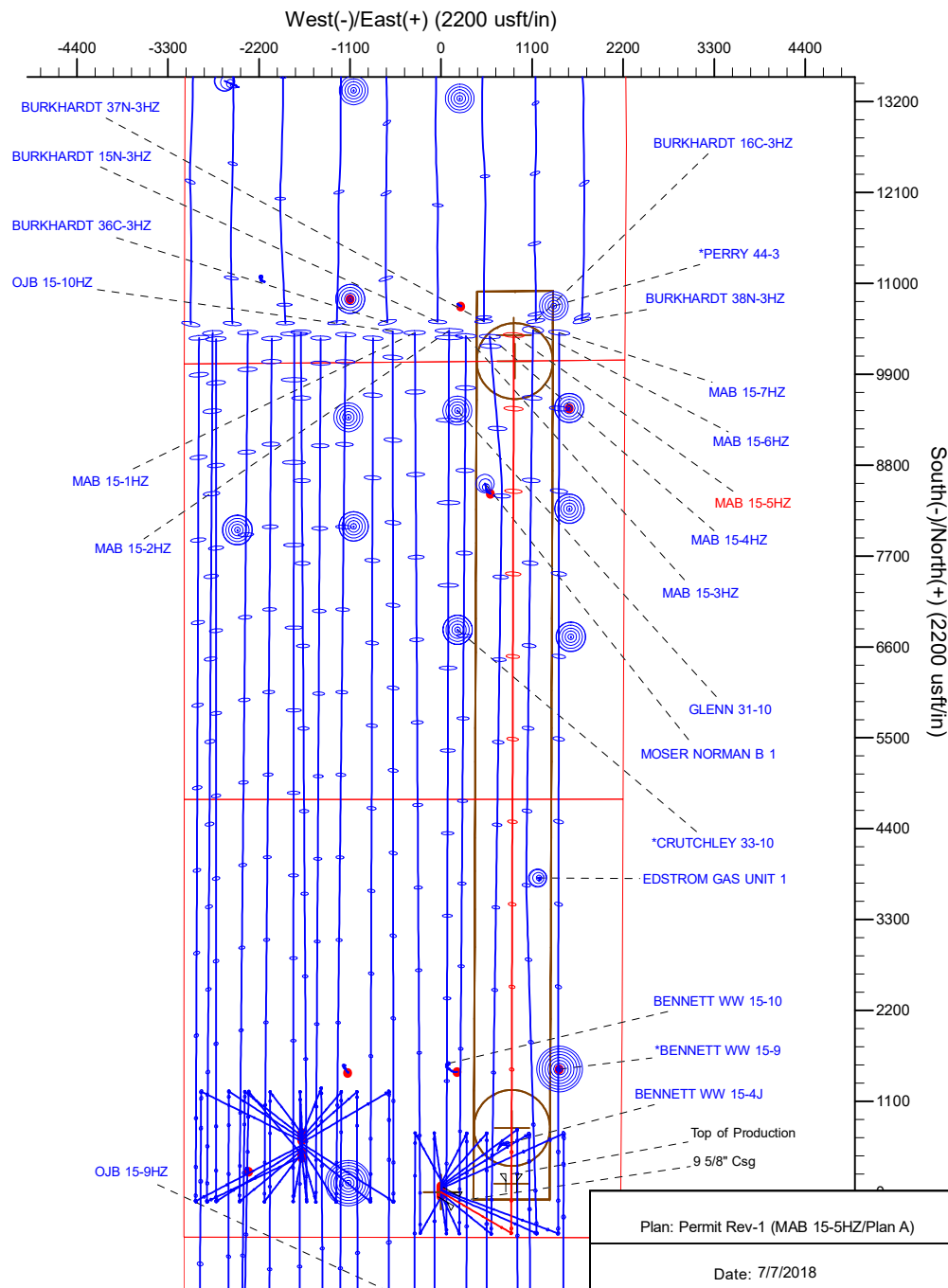
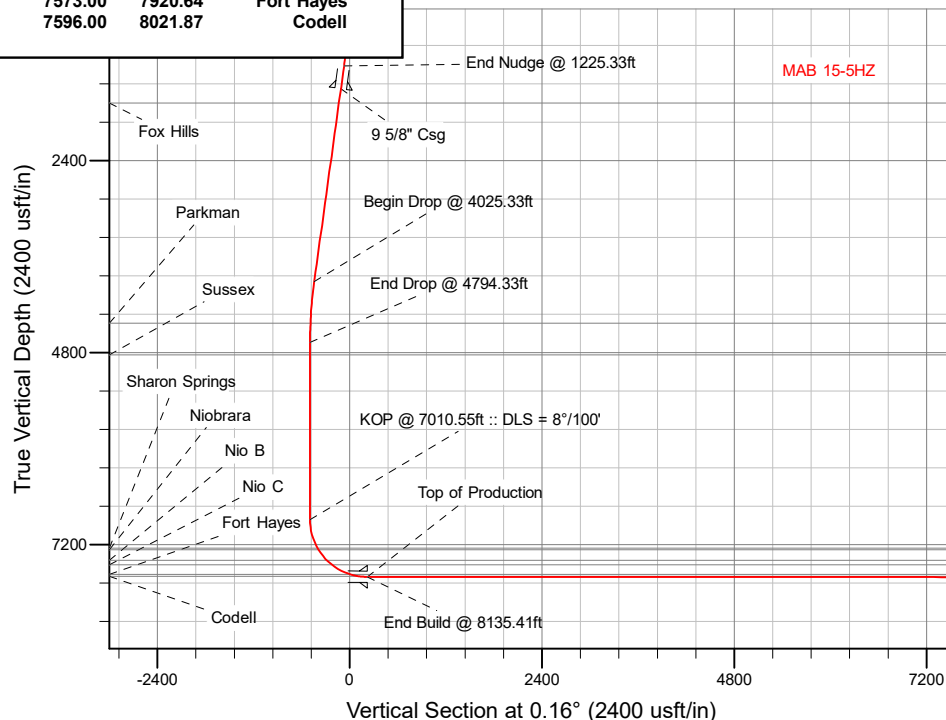
FORMATION TOP DETAILS

TVDPth	MDPth	Formation
1679.00	1708.58	Fox Hills
4432.00	4553.46	Parkman
4828.00	4949.74	Sussex
7244.00	7382.20	Sharon Springs
7264.00	7405.45	Niobrara
7398.00	7576.97	Nio B
7453.00	7660.26	Nio C
7573.00	7920.64	Fort Hayes
7596.00	8021.87	Codell

SHL
548' FSL
2171' FEL

HEEL
765' FSL
1319' FEL

TOE
316' FSL
1345' FEL



Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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-66W-15 MAB 15-15HZ PAD			
Site Position:		Northing:	14,543,337.30 usft	Latitude:	40.045352
From:	Lat/Long	Easting:	1,707,121.54 usft	Longitude:	-104.761654
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.15 °

Well	MAB 15-5HZ					
Well Position	+N/-S	60.08 usft	Northing:	14,543,397.38 usft	Latitude:	40.045517
	+E/-W	0.56 usft	Easting:	1,707,121.94 usft	Longitude:	-104.761652
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	5,112.00 usft

Wellbore	Plan A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/2/2018	8.07	66.55	52,087.13755095

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	0.16

Plan Survey Tool Program	Date	7/7/2018		
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	18,290.79	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:Rockies, crustal dec +

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,225.33	15.38	120.35	1,213.06	-69.12	118.04	1.50	1.50	0.00	120.35	
4,025.33	15.38	120.35	3,912.79	-444.35	758.89	0.00	0.00	0.00	0.00	
4,794.33	0.00	0.00	4,672.59	-496.19	847.42	2.00	-2.00	-15.65	-180.00	
7,010.55	0.00	0.00	6,888.81	-496.19	847.42	0.00	0.00	0.00	0.00	
8,135.41	89.99	0.16	7,605.00	219.87	849.44	8.00	8.00	0.01	0.16	
18,290.79	89.99	0.16	7,607.00	10,375.21	877.99	0.00	0.00	0.00	0.00	MAB 15-5HZ_BHL

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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
Begin Nudge @ 200.00ft									
300.00	1.50	120.35	299.99	-0.66	1.13	-0.66	1.50	1.50	0.00
400.00	3.00	120.35	399.91	-2.65	4.52	-2.63	1.50	1.50	0.00
500.00	4.50	120.35	499.69	-5.95	10.16	-5.92	1.50	1.50	0.00
600.00	6.00	120.35	599.27	-10.57	18.06	-10.52	1.50	1.50	0.00
700.00	7.50	120.35	698.57	-16.51	28.20	-16.43	1.50	1.50	0.00
800.00	9.00	120.35	797.54	-23.76	40.58	-23.65	1.50	1.50	0.00
900.00	10.50	120.35	896.09	-32.32	55.20	-32.16	1.50	1.50	0.00
1,000.00	12.00	120.35	994.16	-42.18	72.03	-41.97	1.50	1.50	0.00
1,100.00	13.50	120.35	1,091.70	-53.33	91.08	-53.07	1.50	1.50	0.00
1,200.00	15.00	120.35	1,188.62	-65.76	112.32	-65.45	1.50	1.50	0.00
1,225.33	15.38	120.35	1,213.06	-69.12	118.04	-68.79	1.50	1.50	0.00
End Nudge @ 1225.33ft									
1,300.00	15.38	120.35	1,285.06	-79.12	135.13	-78.75	0.00	0.00	0.00
1,400.00	15.38	120.35	1,381.48	-92.53	158.02	-92.08	0.00	0.00	0.00
1,500.00	15.38	120.35	1,477.89	-105.93	180.91	-105.42	0.00	0.00	0.00
1,522.93	15.38	120.35	1,500.00	-109.00	186.16	-108.48	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	15.38	120.35	1,574.31	-119.33	203.80	-118.76	0.00	0.00	0.00
1,700.00	15.38	120.35	1,670.73	-132.73	226.68	-132.09	0.00	0.00	0.00
1,708.58	15.38	120.35	1,679.00	-133.88	228.65	-133.24	0.00	0.00	0.00
Fox Hills									
1,800.00	15.38	120.35	1,767.15	-146.13	249.57	-145.43	0.00	0.00	0.00
1,900.00	15.38	120.35	1,863.57	-159.53	272.46	-158.77	0.00	0.00	0.00
2,000.00	15.38	120.35	1,959.99	-172.93	295.34	-172.11	0.00	0.00	0.00
2,100.00	15.38	120.35	2,056.41	-186.33	318.23	-185.44	0.00	0.00	0.00
2,200.00	15.38	120.35	2,152.83	-199.73	341.12	-198.78	0.00	0.00	0.00
2,300.00	15.38	120.35	2,249.24	-213.13	364.01	-212.12	0.00	0.00	0.00
2,400.00	15.38	120.35	2,345.66	-226.54	386.89	-225.45	0.00	0.00	0.00
2,500.00	15.38	120.35	2,442.08	-239.94	409.78	-238.79	0.00	0.00	0.00
2,600.00	15.38	120.35	2,538.50	-253.34	432.67	-252.13	0.00	0.00	0.00
2,700.00	15.38	120.35	2,634.92	-266.74	455.56	-265.47	0.00	0.00	0.00
2,800.00	15.38	120.35	2,731.34	-280.14	478.44	-278.80	0.00	0.00	0.00
2,900.00	15.38	120.35	2,827.76	-293.54	501.33	-292.14	0.00	0.00	0.00
3,000.00	15.38	120.35	2,924.18	-306.94	524.22	-305.48	0.00	0.00	0.00
3,100.00	15.38	120.35	3,020.60	-320.34	547.10	-318.81	0.00	0.00	0.00
3,200.00	15.38	120.35	3,117.01	-333.74	569.99	-332.15	0.00	0.00	0.00
3,300.00	15.38	120.35	3,213.43	-347.15	592.88	-345.49	0.00	0.00	0.00
3,400.00	15.38	120.35	3,309.85	-360.55	615.77	-358.83	0.00	0.00	0.00
3,500.00	15.38	120.35	3,406.27	-373.95	638.65	-372.16	0.00	0.00	0.00
3,600.00	15.38	120.35	3,502.69	-387.35	661.54	-385.50	0.00	0.00	0.00
3,700.00	15.38	120.35	3,599.11	-400.75	684.43	-398.84	0.00	0.00	0.00
3,800.00	15.38	120.35	3,695.53	-414.15	707.32	-412.17	0.00	0.00	0.00
3,900.00	15.38	120.35	3,791.95	-427.55	730.20	-425.51	0.00	0.00	0.00
4,000.00	15.38	120.35	3,888.36	-440.95	753.09	-438.85	0.00	0.00	0.00
4,025.33	15.38	120.35	3,912.79	-444.35	758.89	-442.23	0.00	0.00	0.00
Begin Drop @ 4025.33ft									
4,100.00	13.89	120.35	3,985.03	-453.88	775.17	-451.71	2.00	-2.00	0.00
4,200.00	11.89	120.35	4,082.51	-465.15	794.41	-462.93	2.00	-2.00	0.00
4,300.00	9.89	120.35	4,180.70	-474.69	810.71	-472.42	2.00	-2.00	0.00
4,400.00	7.89	120.35	4,279.50	-482.49	824.04	-480.19	2.00	-2.00	0.00

Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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)
4,500.00	5.89	120.35	4,378.77	-488.55	834.39	-486.22	2.00	-2.00	0.00
4,553.46	4.82	120.35	4,432.00	-491.07	838.69	-488.73	2.00	-2.00	0.00
Parkman									
4,600.00	3.89	120.35	4,478.40	-492.86	841.74	-490.50	2.00	-2.00	0.00
4,700.00	1.89	120.35	4,578.27	-495.40	846.08	-493.04	2.00	-2.00	0.00
4,794.33	0.00	0.00	4,672.59	-496.19	847.42	-493.82	2.00	-2.00	-127.58
End Drop @ 4794.33ft									
4,800.00	0.00	0.00	4,678.26	-496.19	847.42	-493.82	0.00	0.00	0.00
4,900.00	0.00	0.00	4,778.26	-496.19	847.42	-493.82	0.00	0.00	0.00
4,949.74	0.00	0.00	4,828.00	-496.19	847.42	-493.82	0.00	0.00	0.00
Sussex									
5,000.00	0.00	0.00	4,878.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,100.00	0.00	0.00	4,978.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,200.00	0.00	0.00	5,078.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,300.00	0.00	0.00	5,178.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,400.00	0.00	0.00	5,278.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,500.00	0.00	0.00	5,378.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,600.00	0.00	0.00	5,478.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,700.00	0.00	0.00	5,578.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,800.00	0.00	0.00	5,678.26	-496.19	847.42	-493.82	0.00	0.00	0.00
5,900.00	0.00	0.00	5,778.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,000.00	0.00	0.00	5,878.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,100.00	0.00	0.00	5,978.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,200.00	0.00	0.00	6,078.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,300.00	0.00	0.00	6,178.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,400.00	0.00	0.00	6,278.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,500.00	0.00	0.00	6,378.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,600.00	0.00	0.00	6,478.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,700.00	0.00	0.00	6,578.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,800.00	0.00	0.00	6,678.26	-496.19	847.42	-493.82	0.00	0.00	0.00
6,900.00	0.00	0.00	6,778.26	-496.19	847.42	-493.82	0.00	0.00	0.00
7,000.00	0.00	0.00	6,878.26	-496.19	847.42	-493.82	0.00	0.00	0.00
7,010.55	0.00	0.00	6,888.81	-496.19	847.42	-493.82	0.00	0.00	0.00
KOP @ 7010.55ft :: DLS = 8°/100'									
7,100.00	7.16	0.16	6,978.02	-490.61	847.44	-488.24	8.00	8.00	0.18
7,200.00	15.16	0.16	7,076.05	-471.27	847.49	-468.91	8.00	8.00	0.00
7,300.00	23.16	0.16	7,170.44	-438.49	847.58	-436.12	8.00	8.00	0.00
7,382.20	29.73	0.16	7,244.00	-401.90	847.69	-399.53	8.00	8.00	0.00
Sharon Springs									
7,400.00	31.16	0.16	7,259.34	-392.88	847.71	-390.51	8.00	8.00	0.00
7,405.45	31.59	0.16	7,264.00	-390.04	847.72	-387.68	8.00	8.00	0.00
Niobrara									
7,500.00	39.16	0.16	7,341.04	-335.35	847.87	-332.98	8.00	8.00	0.00
7,576.97	45.31	0.16	7,398.00	-283.64	848.02	-281.27	8.00	8.00	0.00
Nio B									
7,600.00	47.16	0.16	7,413.93	-267.01	848.07	-264.64	8.00	8.00	0.00
7,660.26	51.98	0.16	7,453.00	-221.15	848.20	-218.78	8.00	8.00	0.00
Nio C									
7,700.00	55.16	0.16	7,476.60	-189.18	848.29	-186.82	8.00	8.00	0.00
7,800.00	63.16	0.16	7,527.82	-103.40	848.53	-101.03	8.00	8.00	0.00
7,900.00	71.16	0.16	7,566.62	-11.32	848.79	-8.95	8.00	8.00	0.00
7,920.64	72.81	0.16	7,573.00	8.31	848.84	10.68	8.00	8.00	0.00
Fort Hayes									

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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)
8,000.00	79.16	0.16	7,592.21	85.27	849.06	87.64	8.00	8.00	0.00
8,021.87	80.91	0.16	7,596.00	106.81	849.12	109.18	8.00	8.00	0.00
Codell									
8,100.00	87.16	0.16	7,604.12	184.47	849.34	186.84	8.00	8.00	0.00
8,135.41	89.99	0.16	7,605.00	219.87	849.44	222.24	8.00	8.00	0.00
End Build @ 8135.41ft - Top of Production									
8,200.00	89.99	0.16	7,605.02	284.46	849.62	286.83	0.00	0.00	0.00
8,300.00	89.99	0.16	7,605.04	384.46	849.90	386.83	0.00	0.00	0.00
8,400.00	89.99	0.16	7,605.05	484.46	850.18	486.83	0.00	0.00	0.00
8,500.00	89.99	0.16	7,605.07	584.46	850.46	586.83	0.00	0.00	0.00
8,600.00	89.99	0.16	7,605.09	684.46	850.74	686.83	0.00	0.00	0.00
8,700.00	89.99	0.16	7,605.11	784.46	851.02	786.83	0.00	0.00	0.00
8,800.00	89.99	0.16	7,605.13	884.46	851.30	886.83	0.00	0.00	0.00
8,900.00	89.99	0.16	7,605.15	984.46	851.59	986.83	0.00	0.00	0.00
9,000.00	89.99	0.16	7,605.17	1,084.46	851.87	1,086.83	0.00	0.00	0.00
9,100.00	89.99	0.16	7,605.19	1,184.45	852.15	1,186.83	0.00	0.00	0.00
9,200.00	89.99	0.16	7,605.21	1,284.45	852.43	1,286.83	0.00	0.00	0.00
9,300.00	89.99	0.16	7,605.23	1,384.45	852.71	1,386.83	0.00	0.00	0.00
9,400.00	89.99	0.16	7,605.25	1,484.45	852.99	1,486.83	0.00	0.00	0.00
9,500.00	89.99	0.16	7,605.27	1,584.45	853.27	1,586.83	0.00	0.00	0.00
9,600.00	89.99	0.16	7,605.29	1,684.45	853.55	1,686.83	0.00	0.00	0.00
9,700.00	89.99	0.16	7,605.31	1,784.45	853.83	1,786.83	0.00	0.00	0.00
9,800.00	89.99	0.16	7,605.33	1,884.45	854.12	1,886.83	0.00	0.00	0.00
9,900.00	89.99	0.16	7,605.35	1,984.45	854.40	1,986.83	0.00	0.00	0.00
10,000.00	89.99	0.16	7,605.37	2,084.45	854.68	2,086.83	0.00	0.00	0.00
10,100.00	89.99	0.16	7,605.39	2,184.45	854.96	2,186.83	0.00	0.00	0.00
10,200.00	89.99	0.16	7,605.41	2,284.45	855.24	2,286.83	0.00	0.00	0.00
10,300.00	89.99	0.16	7,605.43	2,384.45	855.52	2,386.83	0.00	0.00	0.00
10,400.00	89.99	0.16	7,605.45	2,484.45	855.80	2,486.83	0.00	0.00	0.00
10,500.00	89.99	0.16	7,605.47	2,584.45	856.08	2,586.83	0.00	0.00	0.00
10,600.00	89.99	0.16	7,605.49	2,684.45	856.37	2,686.83	0.00	0.00	0.00
10,700.00	89.99	0.16	7,605.51	2,784.45	856.65	2,786.83	0.00	0.00	0.00
10,800.00	89.99	0.16	7,605.53	2,884.45	856.93	2,886.83	0.00	0.00	0.00
10,900.00	89.99	0.16	7,605.55	2,984.45	857.21	2,986.83	0.00	0.00	0.00
11,000.00	89.99	0.16	7,605.57	3,084.45	857.49	3,086.83	0.00	0.00	0.00
11,100.00	89.99	0.16	7,605.59	3,184.45	857.77	3,186.83	0.00	0.00	0.00
11,200.00	89.99	0.16	7,605.61	3,284.45	858.05	3,286.83	0.00	0.00	0.00
11,300.00	89.99	0.16	7,605.63	3,384.45	858.33	3,386.83	0.00	0.00	0.00
11,400.00	89.99	0.16	7,605.64	3,484.45	858.61	3,486.83	0.00	0.00	0.00
11,500.00	89.99	0.16	7,605.66	3,584.45	858.90	3,586.83	0.00	0.00	0.00
11,600.00	89.99	0.16	7,605.68	3,684.44	859.18	3,686.83	0.00	0.00	0.00
11,700.00	89.99	0.16	7,605.70	3,784.44	859.46	3,786.83	0.00	0.00	0.00
11,800.00	89.99	0.16	7,605.72	3,884.44	859.74	3,886.83	0.00	0.00	0.00
11,900.00	89.99	0.16	7,605.74	3,984.44	860.02	3,986.83	0.00	0.00	0.00
12,000.00	89.99	0.16	7,605.76	4,084.44	860.30	4,086.83	0.00	0.00	0.00
12,100.00	89.99	0.16	7,605.78	4,184.44	860.58	4,186.83	0.00	0.00	0.00
12,200.00	89.99	0.16	7,605.80	4,284.44	860.86	4,286.83	0.00	0.00	0.00
12,300.00	89.99	0.16	7,605.82	4,384.44	861.15	4,386.83	0.00	0.00	0.00
12,400.00	89.99	0.16	7,605.84	4,484.44	861.43	4,486.83	0.00	0.00	0.00
12,500.00	89.99	0.16	7,605.86	4,584.44	861.71	4,586.83	0.00	0.00	0.00
12,600.00	89.99	0.16	7,605.88	4,684.44	861.99	4,686.83	0.00	0.00	0.00
12,700.00	89.99	0.16	7,605.90	4,784.44	862.27	4,786.83	0.00	0.00	0.00
12,800.00	89.99	0.16	7,605.92	4,884.44	862.55	4,886.83	0.00	0.00	0.00
12,900.00	89.99	0.16	7,605.94	4,984.44	862.83	4,986.83	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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)
13,000.00	89.99	0.16	7,605.96	5,084.44	863.11	5,086.83	0.00	0.00	0.00
13,100.00	89.99	0.16	7,605.98	5,184.44	863.39	5,186.83	0.00	0.00	0.00
13,200.00	89.99	0.16	7,606.00	5,284.44	863.68	5,286.83	0.00	0.00	0.00
13,300.00	89.99	0.16	7,606.02	5,384.44	863.96	5,386.83	0.00	0.00	0.00
13,400.00	89.99	0.16	7,606.04	5,484.44	864.24	5,486.83	0.00	0.00	0.00
13,500.00	89.99	0.16	7,606.06	5,584.44	864.52	5,586.83	0.00	0.00	0.00
13,600.00	89.99	0.16	7,606.08	5,684.44	864.80	5,686.83	0.00	0.00	0.00
13,700.00	89.99	0.16	7,606.10	5,784.44	865.08	5,786.83	0.00	0.00	0.00
13,800.00	89.99	0.16	7,606.12	5,884.44	865.36	5,886.83	0.00	0.00	0.00
13,900.00	89.99	0.16	7,606.14	5,984.44	865.64	5,986.83	0.00	0.00	0.00
14,000.00	89.99	0.16	7,606.16	6,084.44	865.93	6,086.83	0.00	0.00	0.00
14,100.00	89.99	0.16	7,606.18	6,184.44	866.21	6,186.83	0.00	0.00	0.00
14,200.00	89.99	0.16	7,606.20	6,284.43	866.49	6,286.83	0.00	0.00	0.00
14,300.00	89.99	0.16	7,606.22	6,384.43	866.77	6,386.83	0.00	0.00	0.00
14,400.00	89.99	0.16	7,606.23	6,484.43	867.05	6,486.83	0.00	0.00	0.00
14,500.00	89.99	0.16	7,606.25	6,584.43	867.33	6,586.83	0.00	0.00	0.00
14,600.00	89.99	0.16	7,606.27	6,684.43	867.61	6,686.83	0.00	0.00	0.00
14,700.00	89.99	0.16	7,606.29	6,784.43	867.89	6,786.83	0.00	0.00	0.00
14,800.00	89.99	0.16	7,606.31	6,884.43	868.17	6,886.83	0.00	0.00	0.00
14,900.00	89.99	0.16	7,606.33	6,984.43	868.46	6,986.83	0.00	0.00	0.00
15,000.00	89.99	0.16	7,606.35	7,084.43	868.74	7,086.83	0.00	0.00	0.00
15,100.00	89.99	0.16	7,606.37	7,184.43	869.02	7,186.83	0.00	0.00	0.00
15,200.00	89.99	0.16	7,606.39	7,284.43	869.30	7,286.83	0.00	0.00	0.00
15,300.00	89.99	0.16	7,606.41	7,384.43	869.58	7,386.83	0.00	0.00	0.00
15,400.00	89.99	0.16	7,606.43	7,484.43	869.86	7,486.83	0.00	0.00	0.00
15,500.00	89.99	0.16	7,606.45	7,584.43	870.14	7,586.83	0.00	0.00	0.00
15,600.00	89.99	0.16	7,606.47	7,684.43	870.42	7,686.83	0.00	0.00	0.00
15,700.00	89.99	0.16	7,606.49	7,784.43	870.71	7,786.83	0.00	0.00	0.00
15,800.00	89.99	0.16	7,606.51	7,884.43	870.99	7,886.83	0.00	0.00	0.00
15,900.00	89.99	0.16	7,606.53	7,984.43	871.27	7,986.83	0.00	0.00	0.00
16,000.00	89.99	0.16	7,606.55	8,084.43	871.55	8,086.83	0.00	0.00	0.00
16,100.00	89.99	0.16	7,606.57	8,184.43	871.83	8,186.83	0.00	0.00	0.00
16,200.00	89.99	0.16	7,606.59	8,284.43	872.11	8,286.83	0.00	0.00	0.00
16,300.00	89.99	0.16	7,606.61	8,384.43	872.39	8,386.83	0.00	0.00	0.00
16,400.00	89.99	0.16	7,606.63	8,484.43	872.67	8,486.83	0.00	0.00	0.00
16,500.00	89.99	0.16	7,606.65	8,584.43	872.95	8,586.83	0.00	0.00	0.00
16,600.00	89.99	0.16	7,606.67	8,684.43	873.24	8,686.83	0.00	0.00	0.00
16,700.00	89.99	0.16	7,606.69	8,784.42	873.52	8,786.83	0.00	0.00	0.00
16,800.00	89.99	0.16	7,606.71	8,884.42	873.80	8,886.83	0.00	0.00	0.00
16,900.00	89.99	0.16	7,606.73	8,984.42	874.08	8,986.83	0.00	0.00	0.00
17,000.00	89.99	0.16	7,606.75	9,084.42	874.36	9,086.83	0.00	0.00	0.00
17,100.00	89.99	0.16	7,606.77	9,184.42	874.64	9,186.83	0.00	0.00	0.00
17,200.00	89.99	0.16	7,606.79	9,284.42	874.92	9,286.83	0.00	0.00	0.00
17,300.00	89.99	0.16	7,606.81	9,384.42	875.20	9,386.83	0.00	0.00	0.00
17,400.00	89.99	0.16	7,606.82	9,484.42	875.49	9,486.83	0.00	0.00	0.00
17,500.00	89.99	0.16	7,606.84	9,584.42	875.77	9,586.83	0.00	0.00	0.00
17,600.00	89.99	0.16	7,606.86	9,684.42	876.05	9,686.83	0.00	0.00	0.00
17,700.00	89.99	0.16	7,606.88	9,784.42	876.33	9,786.83	0.00	0.00	0.00
17,800.00	89.99	0.16	7,606.90	9,884.42	876.61	9,886.83	0.00	0.00	0.00
17,900.00	89.99	0.16	7,606.92	9,984.42	876.89	9,986.83	0.00	0.00	0.00
18,000.00	89.99	0.16	7,606.94	10,084.42	877.17	10,086.83	0.00	0.00	0.00
18,100.00	89.99	0.16	7,606.96	10,184.42	877.45	10,186.83	0.00	0.00	0.00
18,200.00	89.99	0.16	7,606.98	10,284.42	877.73	10,286.83	0.00	0.00	0.00
18,290.79	89.99	0.16	7,607.00	10,375.21	877.99	10,377.62	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5129.00usft (Drilling Rig)
Site:	1N-66W-15 MAB 15-15HZ PAD	North Reference:	True
Well:	MAB 15-5HZ	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)
TD Well @ 18290.79ft									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,522.93	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
8,135.41	7,605.00	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,708.58	1,679.00	Fox Hills				
4,553.46	4,432.00	Parkman				
4,949.74	4,828.00	Sussex				
7,382.20	7,244.00	Sharon Springs				
7,405.45	7,264.00	Niobrara				
7,576.97	7,398.00	Nio B				
7,660.26	7,453.00	Nio C				
7,920.64	7,573.00	Fort Hayes				
8,021.87	7,596.00	Codell				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
200.00	200.00	0.00	0.00	Begin Nudge @ 200.00ft	
1,225.33	1,213.06	-69.12	118.04	End Nudge @ 1225.33ft	
4,025.33	3,912.79	-444.35	758.89	Begin Drop @ 4025.33ft	
4,794.33	4,672.59	-496.19	847.42	End Drop @ 4794.33ft	
7,010.55	6,888.81	-496.19	847.42	KOP @ 7010.55ft :: DLS = 8°/100'	
8,135.41	7,605.00	219.87	849.44	End Build @ 8135.41ft	
18,290.79	7,607.00	10,375.21	877.99	TD Well @ 18290.79ft	