

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

MAB 15-4HZ

Plan A

Plan: Permit Rev-1

SHL Lat/Long: 40.045476/-104.761652

Survey Program: MWD+IFR+MSA

Standard Planning Report

06 July, 2018

Project: WELD-NAD83-UTMFT13N
Site: 1N-66W-15 MAB 15-15HZ PAD
Well: MAB 15-4HZ
Wellbore: Plan A
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Size
1500.00	1517.20	9-5/8
7474.00	7963.76	5-1/2

WELL DETAILS: MAB 15-4HZ

GL = 5112.00

RKB = 17' @ 5129.00usft (Drilling Rig)

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	1096.67	12.70	129.00	1089.75	-58.81	72.63	1.50	129.00	-58.92	
4	3896.67	12.70	129.00	3821.25	-446.20	551.01	0.00	0.00	-447.07	
5	4531.67	0.00	0.00	4451.06	-490.31	605.48	2.00	-180.00	-491.26	
6	6838.41	0.00	0.00	6757.80	-490.31	605.48	0.00	0.00	-491.26	
7	7963.76	90.03	0.82	7474.00	226.17	615.71	8.00	0.82	225.20	
8	16180.59	90.03	0.82	7469.94	8442.16	733.00	0.00	0.00	8441.00	MAB 15-4HZ_target
9	16558.96	90.03	355.14	7469.75	8820.14	719.67	1.50	-90.00	8819.00	
10	18116.42	90.03	355.14	7469.00	10372.01	587.78	0.00	0.00	10371.07	MAB 15-4HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
MAB 15-4HZ_SHL	0.00	0.00	0.00	40.045476	-104.761652
MAB 15-4HZ_BHL	7469.00	10372.01	587.78	40.073959	-104.759551

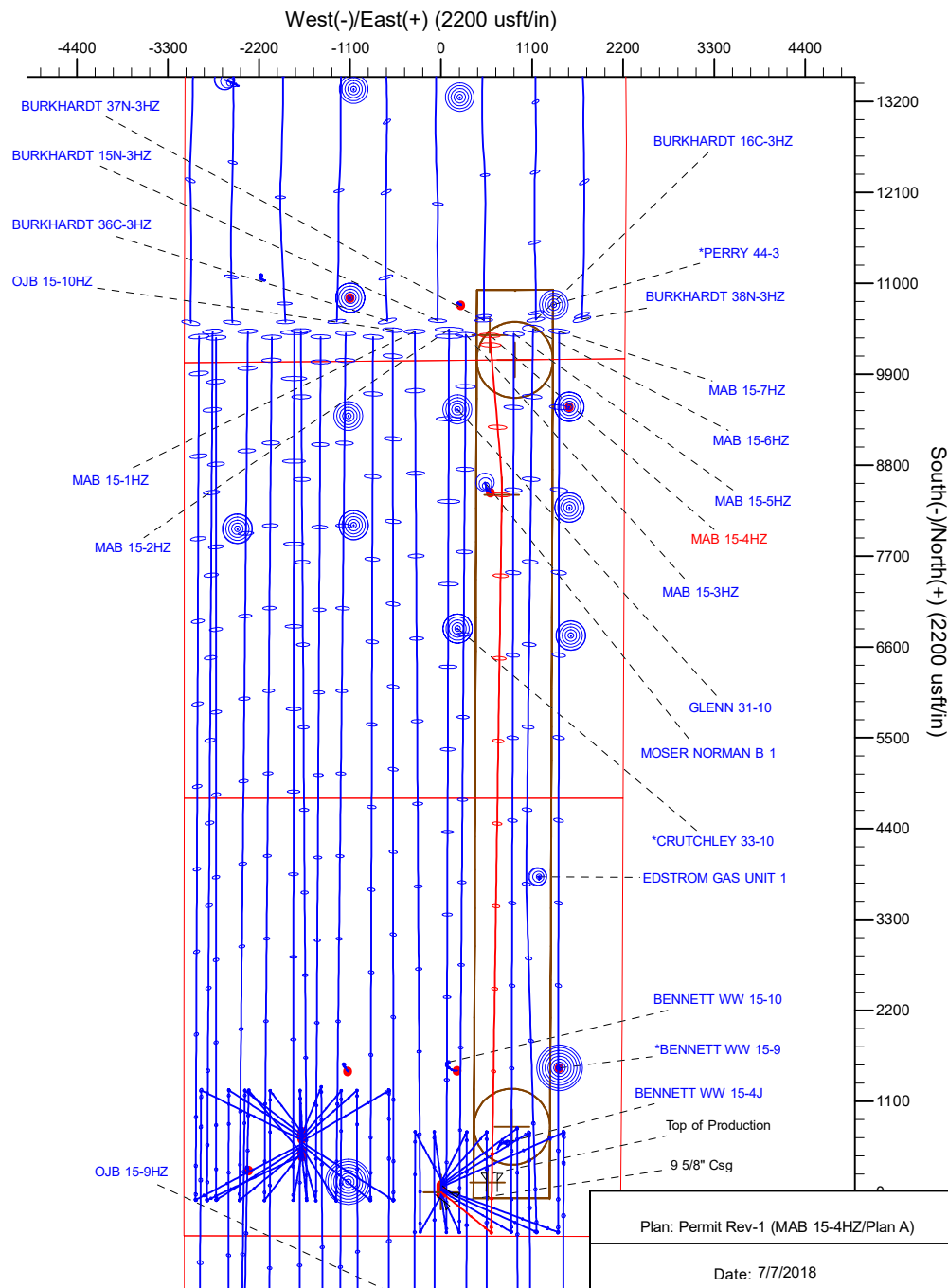
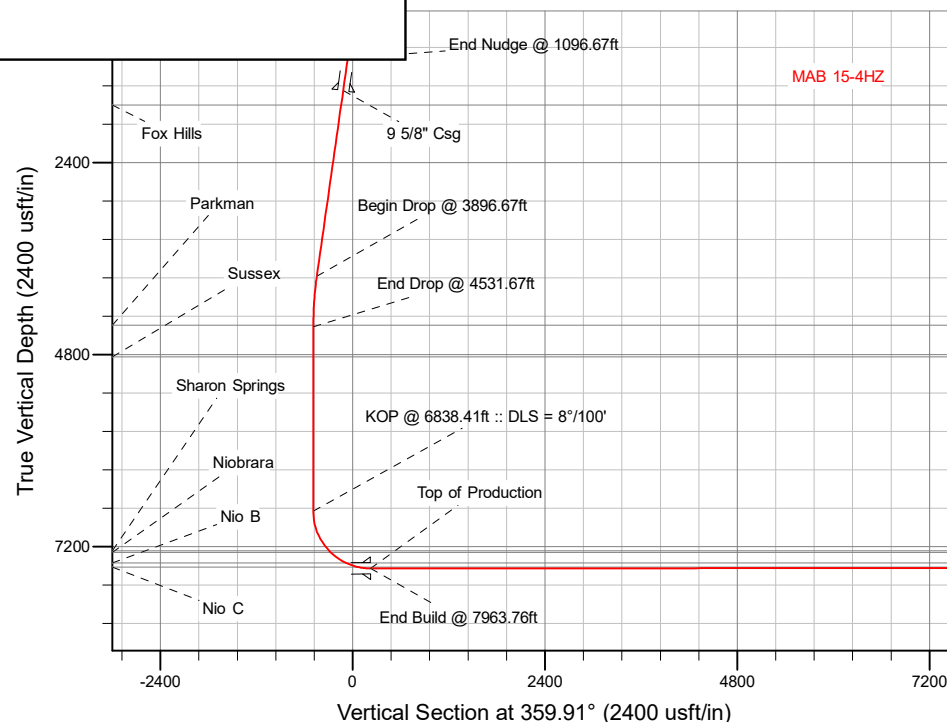
FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
1679.00	1700.69	Fox Hills
4432.00	4512.61	Parkman
4828.00	4908.61	Sussex
7253.00	7385.20	Sharon Springs
7273.00	7413.42	Niobrara
7404.00	7644.12	Nio B
7456.00	7802.51	Nio C

SHL
533' FSL
2171' FEL

HEEL
758' FSL
1555' FEL

TOE
300' FSL
1636' FEL



Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-4HZ
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 15-4HZ	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 15-4HZ					
Well Position	+N-S	45.15 usft	Northing:	14,543,382.45 usft	Latitude:	40.045476
	+E-W	0.56 usft	Easting:	1,707,121.98 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	66.54	52,087.11612887

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	359.91	

Plan Survey Tool Program	Date	7/6/2018			
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	18,116.42	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+I	
				Fixed:v2:Rockies, crustal dec +	

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Planning Report

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Well:	MAB 15-4HZ	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	
1,096.67	12.70	129.00	1,089.75	-58.81	72.63	1.50	1.50	0.00	129.00	
3,896.67	12.70	129.00	3,821.25	-446.20	551.01	0.00	0.00	0.00	0.00	
4,531.67	0.00	0.00	4,451.06	-490.31	605.48	2.00	-2.00	-20.31	-180.00	
6,838.41	0.00	0.00	6,757.80	-490.31	605.48	0.00	0.00	0.00	0.00	
7,963.76	90.03	0.82	7,474.00	226.17	615.71	8.00	8.00	0.07	0.82	
16,180.59	90.03	0.82	7,469.94	8,442.16	733.00	0.00	0.00	0.00	0.00	MAB 15-4HZ_target
16,558.96	90.03	355.14	7,469.75	8,820.14	719.67	1.50	0.00	-1.50	-90.00	
18,116.42	90.03	355.14	7,469.00	10,372.01	587.78	0.00	0.00	0.00	0.00	MAB 15-4HZ_BHL

Corporate Planning Report

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Well:	MAB 15-4HZ	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
Begin Nudge @ 250.00ft									
300.00	0.75	129.00	300.00	-0.21	0.25	-0.21	1.50	1.50	0.00
400.00	2.25	129.00	399.96	-1.85	2.29	-1.86	1.50	1.50	0.00
500.00	3.75	129.00	499.82	-5.15	6.36	-5.16	1.50	1.50	0.00
600.00	5.25	129.00	599.51	-10.08	12.45	-10.10	1.50	1.50	0.00
700.00	6.75	129.00	698.96	-16.66	20.58	-16.69	1.50	1.50	0.00
800.00	8.25	129.00	798.10	-24.88	30.72	-24.92	1.50	1.50	0.00
900.00	9.75	129.00	896.87	-34.72	42.88	-34.79	1.50	1.50	0.00
1,000.00	11.25	129.00	995.19	-46.19	57.04	-46.28	1.50	1.50	0.00
1,096.67	12.70	129.00	1,089.75	-58.81	72.63	-58.92	1.50	1.50	0.00
End Nudge @ 1096.67ft									
1,100.00	12.70	129.00	1,093.00	-59.27	73.19	-59.39	0.00	0.00	0.00
1,200.00	12.70	129.00	1,190.56	-73.11	90.28	-73.25	0.00	0.00	0.00
1,300.00	12.70	129.00	1,288.11	-86.94	107.37	-87.11	0.00	0.00	0.00
1,400.00	12.70	129.00	1,385.66	-100.78	124.45	-100.97	0.00	0.00	0.00
1,500.00	12.70	129.00	1,483.22	-114.61	141.54	-114.84	0.00	0.00	0.00
1,517.20	12.70	129.00	1,500.00	-116.99	144.48	-117.22	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	12.70	129.00	1,580.77	-128.45	158.62	-128.70	0.00	0.00	0.00
1,700.00	12.70	129.00	1,678.32	-142.28	175.71	-142.56	0.00	0.00	0.00
1,700.69	12.70	129.00	1,679.00	-142.38	175.82	-142.66	0.00	0.00	0.00
Fox Hills									
1,800.00	12.70	129.00	1,775.88	-156.12	192.79	-156.42	0.00	0.00	0.00
1,900.00	12.70	129.00	1,873.43	-169.95	209.88	-170.28	0.00	0.00	0.00
2,000.00	12.70	129.00	1,970.98	-183.79	226.96	-184.15	0.00	0.00	0.00
2,100.00	12.70	129.00	2,068.54	-197.63	244.05	-198.01	0.00	0.00	0.00
2,200.00	12.70	129.00	2,166.09	-211.46	261.13	-211.87	0.00	0.00	0.00
2,300.00	12.70	129.00	2,263.64	-225.30	278.22	-225.73	0.00	0.00	0.00
2,400.00	12.70	129.00	2,361.20	-239.13	295.30	-239.60	0.00	0.00	0.00
2,500.00	12.70	129.00	2,458.75	-252.97	312.39	-253.46	0.00	0.00	0.00
2,600.00	12.70	129.00	2,556.30	-266.80	329.47	-267.32	0.00	0.00	0.00
2,700.00	12.70	129.00	2,653.86	-280.64	346.56	-281.18	0.00	0.00	0.00
2,800.00	12.70	129.00	2,751.41	-294.47	363.64	-295.04	0.00	0.00	0.00
2,900.00	12.70	129.00	2,848.96	-308.31	380.73	-308.91	0.00	0.00	0.00
3,000.00	12.70	129.00	2,946.52	-322.14	397.81	-322.77	0.00	0.00	0.00
3,100.00	12.70	129.00	3,044.07	-335.98	414.90	-336.63	0.00	0.00	0.00
3,200.00	12.70	129.00	3,141.63	-349.81	431.99	-350.49	0.00	0.00	0.00
3,300.00	12.70	129.00	3,239.18	-363.65	449.07	-364.35	0.00	0.00	0.00
3,400.00	12.70	129.00	3,336.73	-377.49	466.16	-378.22	0.00	0.00	0.00
3,500.00	12.70	129.00	3,434.29	-391.32	483.24	-392.08	0.00	0.00	0.00
3,600.00	12.70	129.00	3,531.84	-405.16	500.33	-405.94	0.00	0.00	0.00
3,700.00	12.70	129.00	3,629.39	-418.99	517.41	-419.80	0.00	0.00	0.00
3,800.00	12.70	129.00	3,726.95	-432.83	534.50	-433.67	0.00	0.00	0.00
3,896.67	12.70	129.00	3,821.25	-446.20	551.01	-447.07	0.00	0.00	0.00
Begin Drop @ 3896.67ft									
3,900.00	12.63	129.00	3,824.50	-446.66	551.58	-447.53	2.00	-2.00	0.00
4,000.00	10.63	129.00	3,922.44	-459.35	567.25	-460.24	2.00	-2.00	0.00
4,100.00	8.63	129.00	4,021.03	-469.88	580.25	-470.79	2.00	-2.00	0.00
4,200.00	6.63	129.00	4,120.13	-478.24	590.58	-479.17	2.00	-2.00	0.00
4,300.00	4.63	129.00	4,219.65	-484.42	598.21	-485.36	2.00	-2.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-4HZ
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 15-4HZ	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)
4,400.00	2.63	129.00	4,319.44	-488.41	603.13	-489.35	2.00	-2.00	0.00
4,500.00	0.63	129.00	4,419.39	-490.20	605.35	-491.15	2.00	-2.00	0.00
4,512.61	0.38	129.00	4,432.00	-490.27	605.43	-491.22	2.00	-2.00	0.00
Parkman									
4,531.67	0.00	0.00	4,451.06	-490.31	605.48	-491.26	2.00	-2.00	-676.79
End Drop @ 4531.67ft									
4,600.00	0.00	0.00	4,519.39	-490.31	605.48	-491.26	0.00	0.00	0.00
4,700.00	0.00	0.00	4,619.39	-490.31	605.48	-491.26	0.00	0.00	0.00
4,800.00	0.00	0.00	4,719.39	-490.31	605.48	-491.26	0.00	0.00	0.00
4,900.00	0.00	0.00	4,819.39	-490.31	605.48	-491.26	0.00	0.00	0.00
4,908.61	0.00	0.00	4,828.00	-490.31	605.48	-491.26	0.00	0.00	0.00
Sussex									
5,000.00	0.00	0.00	4,919.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,100.00	0.00	0.00	5,019.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,200.00	0.00	0.00	5,119.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,300.00	0.00	0.00	5,219.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,400.00	0.00	0.00	5,319.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,500.00	0.00	0.00	5,419.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,600.00	0.00	0.00	5,519.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,700.00	0.00	0.00	5,619.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,800.00	0.00	0.00	5,719.39	-490.31	605.48	-491.26	0.00	0.00	0.00
5,900.00	0.00	0.00	5,819.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,000.00	0.00	0.00	5,919.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,100.00	0.00	0.00	6,019.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,200.00	0.00	0.00	6,119.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,300.00	0.00	0.00	6,219.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,400.00	0.00	0.00	6,319.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,500.00	0.00	0.00	6,419.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,600.00	0.00	0.00	6,519.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,700.00	0.00	0.00	6,619.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,800.00	0.00	0.00	6,719.39	-490.31	605.48	-491.26	0.00	0.00	0.00
6,838.41	0.00	0.00	6,757.80	-490.31	605.48	-491.26	0.00	0.00	0.00
KOP @ 6838.41ft :: DLS = 8°/100'									
6,900.00	4.93	0.82	6,819.32	-487.66	605.52	-488.61	8.00	8.00	1.33
7,000.00	12.93	0.82	6,918.03	-472.16	605.74	-473.11	8.00	8.00	0.00
7,100.00	20.93	0.82	7,013.62	-443.07	606.16	-444.02	8.00	8.00	0.00
7,200.00	28.93	0.82	7,104.23	-400.96	606.76	-401.91	8.00	8.00	0.00
7,300.00	36.93	0.82	7,188.09	-346.65	607.53	-347.61	8.00	8.00	0.00
7,385.20	43.74	0.82	7,253.00	-291.54	608.32	-292.50	8.00	8.00	0.00
Sharon Springs									
7,400.00	44.93	0.82	7,263.59	-281.20	608.47	-282.16	8.00	8.00	0.00
7,413.42	46.00	0.82	7,273.00	-271.64	608.60	-272.59	8.00	8.00	0.00
Niobrara									
7,500.00	52.93	0.82	7,329.23	-205.88	609.54	-206.84	8.00	8.00	0.00
7,600.00	60.93	0.82	7,383.76	-122.16	610.74	-123.12	8.00	8.00	0.00
7,644.12	64.46	0.82	7,404.00	-82.96	611.30	-83.92	8.00	8.00	0.00
Nio B									
7,700.00	68.93	0.82	7,426.10	-31.67	612.03	-32.63	8.00	8.00	0.00
7,800.00	76.93	0.82	7,455.44	63.84	613.39	62.88	8.00	8.00	0.00
7,802.51	77.13	0.82	7,456.00	66.28	613.43	65.32	8.00	8.00	0.00
Nio C									
7,900.00	84.93	0.82	7,471.19	162.50	614.80	161.53	8.00	8.00	0.00
7,963.76	90.03	0.82	7,474.00	226.17	615.71	225.20	8.00	8.00	0.00

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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 15-4HZ	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)
End Build @ 7963.76ft - Top of Production									
8,000.00	90.03	0.82	7,473.98	262.40	616.23	261.44	0.00	0.00	0.00
8,100.00	90.03	0.82	7,473.93	362.39	617.65	361.42	0.00	0.00	0.00
8,200.00	90.03	0.82	7,473.88	462.38	619.08	461.41	0.00	0.00	0.00
8,300.00	90.03	0.82	7,473.83	562.37	620.51	561.40	0.00	0.00	0.00
8,400.00	90.03	0.82	7,473.78	662.36	621.94	661.39	0.00	0.00	0.00
8,500.00	90.03	0.82	7,473.73	762.35	623.36	761.37	0.00	0.00	0.00
8,600.00	90.03	0.82	7,473.68	862.34	624.79	861.36	0.00	0.00	0.00
8,700.00	90.03	0.82	7,473.63	962.33	626.22	961.35	0.00	0.00	0.00
8,800.00	90.03	0.82	7,473.58	1,062.32	627.65	1,061.34	0.00	0.00	0.00
8,900.00	90.03	0.82	7,473.54	1,162.31	629.07	1,161.32	0.00	0.00	0.00
9,000.00	90.03	0.82	7,473.49	1,262.30	630.50	1,261.31	0.00	0.00	0.00
9,100.00	90.03	0.82	7,473.44	1,362.29	631.93	1,361.30	0.00	0.00	0.00
9,200.00	90.03	0.82	7,473.39	1,462.28	633.36	1,461.29	0.00	0.00	0.00
9,300.00	90.03	0.82	7,473.34	1,562.27	634.78	1,561.27	0.00	0.00	0.00
9,400.00	90.03	0.82	7,473.29	1,662.26	636.21	1,661.26	0.00	0.00	0.00
9,500.00	90.03	0.82	7,473.24	1,762.25	637.64	1,761.25	0.00	0.00	0.00
9,600.00	90.03	0.82	7,473.19	1,862.24	639.07	1,861.24	0.00	0.00	0.00
9,700.00	90.03	0.82	7,473.14	1,962.23	640.49	1,961.22	0.00	0.00	0.00
9,800.00	90.03	0.82	7,473.09	2,062.22	641.92	2,061.21	0.00	0.00	0.00
9,900.00	90.03	0.82	7,473.04	2,162.21	643.35	2,161.20	0.00	0.00	0.00
10,000.00	90.03	0.82	7,472.99	2,262.20	644.78	2,261.19	0.00	0.00	0.00
10,100.00	90.03	0.82	7,472.94	2,362.19	646.20	2,361.17	0.00	0.00	0.00
10,200.00	90.03	0.82	7,472.89	2,462.18	647.63	2,461.16	0.00	0.00	0.00
10,300.00	90.03	0.82	7,472.84	2,562.17	649.06	2,561.15	0.00	0.00	0.00
10,400.00	90.03	0.82	7,472.79	2,662.16	650.49	2,661.13	0.00	0.00	0.00
10,500.00	90.03	0.82	7,472.75	2,762.15	651.91	2,761.12	0.00	0.00	0.00
10,600.00	90.03	0.82	7,472.70	2,862.14	653.34	2,861.11	0.00	0.00	0.00
10,700.00	90.03	0.82	7,472.65	2,962.13	654.77	2,961.10	0.00	0.00	0.00
10,800.00	90.03	0.82	7,472.60	3,062.12	656.20	3,061.08	0.00	0.00	0.00
10,900.00	90.03	0.82	7,472.55	3,162.11	657.62	3,161.07	0.00	0.00	0.00
11,000.00	90.03	0.82	7,472.50	3,262.10	659.05	3,261.06	0.00	0.00	0.00
11,100.00	90.03	0.82	7,472.45	3,362.09	660.48	3,361.05	0.00	0.00	0.00
11,200.00	90.03	0.82	7,472.40	3,462.08	661.91	3,461.03	0.00	0.00	0.00
11,300.00	90.03	0.82	7,472.35	3,562.07	663.33	3,561.02	0.00	0.00	0.00
11,400.00	90.03	0.82	7,472.30	3,662.06	664.76	3,661.01	0.00	0.00	0.00
11,500.00	90.03	0.82	7,472.25	3,762.05	666.19	3,761.00	0.00	0.00	0.00
11,600.00	90.03	0.82	7,472.20	3,862.04	667.61	3,860.98	0.00	0.00	0.00
11,700.00	90.03	0.82	7,472.15	3,962.03	669.04	3,960.97	0.00	0.00	0.00
11,800.00	90.03	0.82	7,472.10	4,062.02	670.47	4,060.96	0.00	0.00	0.00
11,900.00	90.03	0.82	7,472.05	4,162.01	671.90	4,160.95	0.00	0.00	0.00
12,000.00	90.03	0.82	7,472.00	4,262.00	673.32	4,260.93	0.00	0.00	0.00
12,100.00	90.03	0.82	7,471.96	4,361.99	674.75	4,360.92	0.00	0.00	0.00
12,200.00	90.03	0.82	7,471.91	4,461.98	676.18	4,460.91	0.00	0.00	0.00
12,300.00	90.03	0.82	7,471.86	4,561.97	677.61	4,560.90	0.00	0.00	0.00
12,400.00	90.03	0.82	7,471.81	4,661.96	679.03	4,660.88	0.00	0.00	0.00
12,500.00	90.03	0.82	7,471.76	4,761.95	680.46	4,760.87	0.00	0.00	0.00
12,600.00	90.03	0.82	7,471.71	4,861.94	681.89	4,860.86	0.00	0.00	0.00
12,700.00	90.03	0.82	7,471.66	4,961.93	683.32	4,960.85	0.00	0.00	0.00
12,800.00	90.03	0.82	7,471.61	5,061.92	684.74	5,060.83	0.00	0.00	0.00
12,900.00	90.03	0.82	7,471.56	5,161.91	686.17	5,160.82	0.00	0.00	0.00
13,000.00	90.03	0.82	7,471.51	5,261.89	687.60	5,260.81	0.00	0.00	0.00
13,100.00	90.03	0.82	7,471.46	5,361.88	689.03	5,360.80	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-4HZ
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 15-4HZ	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)
13,200.00	90.03	0.82	7,471.41	5,461.87	690.45	5,460.78	0.00	0.00	0.00
13,300.00	90.03	0.82	7,471.36	5,561.86	691.88	5,560.77	0.00	0.00	0.00
13,400.00	90.03	0.82	7,471.31	5,661.85	693.31	5,660.76	0.00	0.00	0.00
13,500.00	90.03	0.82	7,471.26	5,761.84	694.74	5,760.75	0.00	0.00	0.00
13,600.00	90.03	0.82	7,471.21	5,861.83	696.16	5,860.73	0.00	0.00	0.00
13,700.00	90.03	0.82	7,471.17	5,961.82	697.59	5,960.72	0.00	0.00	0.00
13,800.00	90.03	0.82	7,471.12	6,061.81	699.02	6,060.71	0.00	0.00	0.00
13,900.00	90.03	0.82	7,471.07	6,161.80	700.45	6,160.70	0.00	0.00	0.00
14,000.00	90.03	0.82	7,471.02	6,261.79	701.87	6,260.68	0.00	0.00	0.00
14,100.00	90.03	0.82	7,470.97	6,361.78	703.30	6,360.67	0.00	0.00	0.00
14,200.00	90.03	0.82	7,470.92	6,461.77	704.73	6,460.66	0.00	0.00	0.00
14,300.00	90.03	0.82	7,470.87	6,561.76	706.16	6,560.64	0.00	0.00	0.00
14,400.00	90.03	0.82	7,470.82	6,661.75	707.58	6,660.63	0.00	0.00	0.00
14,500.00	90.03	0.82	7,470.77	6,761.74	709.01	6,760.62	0.00	0.00	0.00
14,600.00	90.03	0.82	7,470.72	6,861.73	710.44	6,860.61	0.00	0.00	0.00
14,700.00	90.03	0.82	7,470.67	6,961.72	711.87	6,960.59	0.00	0.00	0.00
14,800.00	90.03	0.82	7,470.62	7,061.71	713.29	7,060.58	0.00	0.00	0.00
14,900.00	90.03	0.82	7,470.57	7,161.70	714.72	7,160.57	0.00	0.00	0.00
15,000.00	90.03	0.82	7,470.52	7,261.69	716.15	7,260.56	0.00	0.00	0.00
15,100.00	90.03	0.82	7,470.47	7,361.68	717.58	7,360.54	0.00	0.00	0.00
15,200.00	90.03	0.82	7,470.42	7,461.67	719.00	7,460.53	0.00	0.00	0.00
15,300.00	90.03	0.82	7,470.38	7,561.66	720.43	7,560.52	0.00	0.00	0.00
15,400.00	90.03	0.82	7,470.33	7,661.65	721.86	7,660.51	0.00	0.00	0.00
15,500.00	90.03	0.82	7,470.28	7,761.64	723.29	7,760.49	0.00	0.00	0.00
15,600.00	90.03	0.82	7,470.23	7,861.63	724.71	7,860.48	0.00	0.00	0.00
15,700.00	90.03	0.82	7,470.18	7,961.62	726.14	7,960.47	0.00	0.00	0.00
15,800.00	90.03	0.82	7,470.13	8,061.61	727.57	8,060.46	0.00	0.00	0.00
15,900.00	90.03	0.82	7,470.08	8,161.60	728.99	8,160.44	0.00	0.00	0.00
16,000.00	90.03	0.82	7,470.03	8,261.59	730.42	8,260.43	0.00	0.00	0.00
16,100.00	90.03	0.82	7,469.98	8,361.58	731.85	8,360.42	0.00	0.00	0.00
16,180.59	90.03	0.82	7,469.94	8,442.16	733.00	8,441.00	0.00	0.00	0.00
Begin Turn to BHL @ 16180.59ft									
16,200.00	90.03	0.53	7,469.93	8,461.57	733.23	8,460.41	1.50	0.00	-1.50
16,300.00	90.03	359.03	7,469.88	8,561.57	732.84	8,560.40	1.50	0.00	-1.50
16,400.00	90.03	357.53	7,469.83	8,661.52	729.83	8,660.36	1.50	0.00	-1.50
16,500.00	90.03	356.03	7,469.78	8,761.36	724.21	8,760.21	1.50	0.00	-1.50
16,558.96	90.03	355.14	7,469.75	8,820.14	719.67	8,819.00	1.50	0.00	-1.50
End Turn @ 16558.96ft									
16,600.00	90.03	355.14	7,469.74	8,861.03	716.19	8,859.90	0.00	0.00	0.00
16,700.00	90.03	355.14	7,469.69	8,960.67	707.73	8,959.55	0.00	0.00	0.00
16,800.00	90.03	355.14	7,469.64	9,060.31	699.26	9,059.21	0.00	0.00	0.00
16,900.00	90.03	355.14	7,469.59	9,159.96	690.79	9,158.86	0.00	0.00	0.00
17,000.00	90.03	355.14	7,469.54	9,259.60	682.32	9,258.51	0.00	0.00	0.00
17,100.00	90.03	355.14	7,469.49	9,359.24	673.85	9,358.17	0.00	0.00	0.00
17,200.00	90.03	355.14	7,469.44	9,458.88	665.39	9,457.82	0.00	0.00	0.00
17,300.00	90.03	355.14	7,469.40	9,558.52	656.92	9,557.48	0.00	0.00	0.00
17,400.00	90.03	355.14	7,469.35	9,658.16	648.45	9,657.13	0.00	0.00	0.00
17,500.00	90.03	355.14	7,469.30	9,757.80	639.98	9,756.78	0.00	0.00	0.00
17,600.00	90.03	355.14	7,469.25	9,857.44	631.51	9,856.44	0.00	0.00	0.00
17,700.00	90.03	355.14	7,469.20	9,957.08	623.05	9,956.09	0.00	0.00	0.00
17,800.00	90.03	355.14	7,469.15	10,056.72	614.58	10,055.75	0.00	0.00	0.00
17,900.00	90.03	355.14	7,469.11	10,156.36	606.11	10,155.40	0.00	0.00	0.00
18,000.00	90.03	355.14	7,469.06	10,256.00	597.64	10,255.05	0.00	0.00	0.00
18,100.00	90.03	355.14	7,469.01	10,355.65	589.17	10,354.71	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-4HZ
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 15-4HZ	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)
18,116.42	90.03	355.14	7,469.00	10,372.01	587.78	10,371.07	0.00	0.00	0.00
TD Well @ 18116.42ft									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,517.20	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
7,963.76	7,474.00	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,700.69	1,679.00	Fox Hills				
4,512.61	4,432.00	Parkman				
4,908.61	4,828.00	Sussex				
7,385.20	7,253.00	Sharon Springs				
7,413.42	7,273.00	Niobrara				
7,644.12	7,404.00	Nio B				
7,802.51	7,456.00	Nio C				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
250.00	250.00	0.00	0.00	Begin Nudge @ 250.00ft	
1,096.67	1,089.75	-58.81	72.63	End Nudge @ 1096.67ft	
3,896.67	3,821.25	-446.20	551.01	Begin Drop @ 3896.67ft	
4,531.67	4,451.06	-490.31	605.48	End Drop @ 4531.67ft	
6,838.41	6,757.80	-490.31	605.48	KOP @ 6838.41ft :: DLS = 8°/100'	
7,963.76	7,474.00	226.17	615.71	End Build @ 7963.76ft	
16,180.59	7,469.94	8,442.16	733.00	Begin Turn to BHL @ 16180.59ft	
16,558.96	7,469.75	8,820.14	719.67	End Turn @ 16558.96ft	
18,116.42	7,469.00	10,372.01	587.78	TD Well @ 18116.42ft	