

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

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

MAB 15-8HZ

Plan A

Plan: Permit Rev-2

SHL Lat/Long: 40.045640/-104.761650

Survey Program: MWD+IFR

Standard Planning Report

12 July, 2018

US ROCKIES WATTENBERG PLANNING

CASING DETAILS			WELL DETAILS: MAB 15-8HZ GL = 5112.00 RKB = 17' @ 5129.00usft (Drilling Rig)
TVD	MD	Size	
1500.00	1523.46	9-5/8	
7406.00	8119.58	5-1/2	

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	1819.33	23.54	62.10	1775.55	148.74	280.92	1.50	62.10	-149.43	
4	4619.33	23.54	62.10	4342.54	672.02	1269.23	0.00	0.00	-675.12	
5	5796.33	0.00	0.00	5486.71	783.58	1479.92	2.00	-180.00	-787.19	
6	6999.44	0.00	0.00	6689.81	783.58	1479.92	0.00	0.00	-787.19	
7	8119.58	89.61	180.14	7406.00	72.24	1478.19	8.00	180.14	-75.86	
8	18875.21	89.61	180.14	7479.00	-10683.10	1452.03	0.00	0.00	10679.52	MAB 15-8HZ_BHL

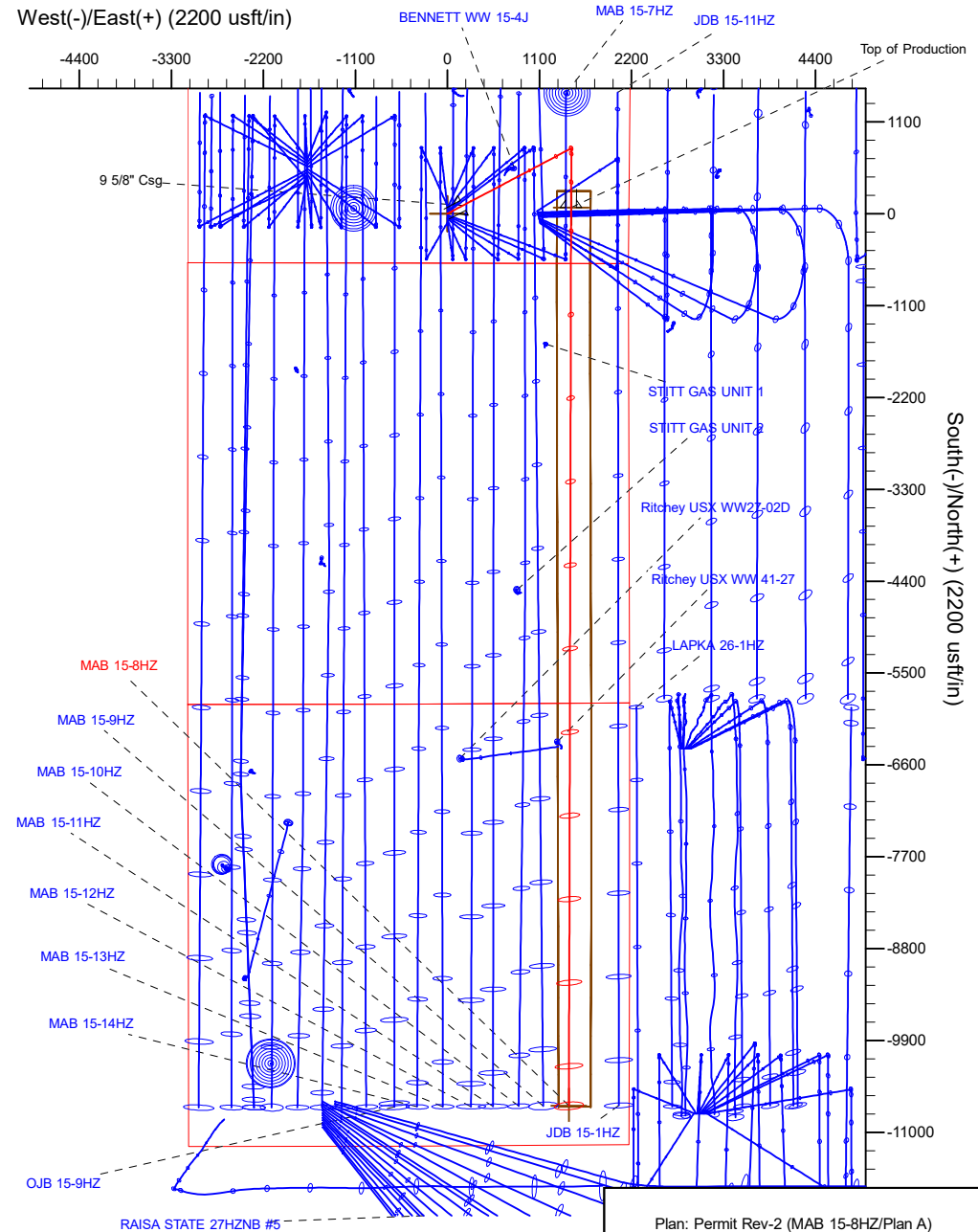
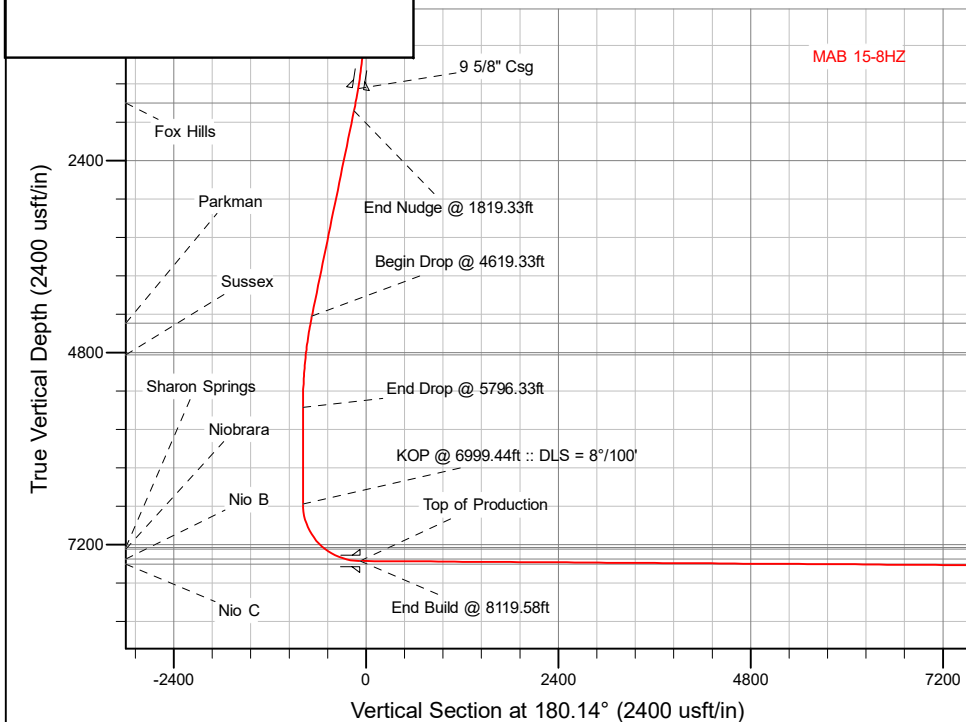
WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
MAB 15-8HZ_SHL	0.00	0.00	0.00	40.045640	-104.761650
MAB 15-8HZ_BHL	7479.00	-10683.10	1452.03	40.016302	-104.756464

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
1679.00	1714.63	Fox Hills
4432.00	4716.22	Parkman
4828.00	5131.68	Sussex
7237.00	7622.18	Sharon Springs
7257.00	7654.03	Niobrara
7379.00	7927.11	Nio B
7447.00	14160.69	Nio C

SHL
593' FSL
2171' FEL

HEEL
670' FSL
690' FEL

TOE
470' FSL
719' FEL



Plan: Permit Rev-2 (MAB 15-8HZ/Plan A)

Date: 7/12/2018

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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		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 15-8HZ					
Well Position	+N/-S	104.87 usft	Northing:	14,543,442.17 usft	Latitude:	40.045640
	+E/-W	1.12 usft	Easting:	1,707,122.38 usft	Longitude:	-104.761650
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	52,087.20202797

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	180.14

Plan Survey Tool Program	Date	7/12/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	1,500.00	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio
2	1,500.00	18,875.21	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio

Corporate
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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	
1,819.33	23.54	62.10	1,775.55	148.74	280.92	1.50	1.50	0.00	62.10	
4,619.33	23.54	62.10	4,342.54	672.02	1,269.23	0.00	0.00	0.00	0.00	
5,796.33	0.00	0.00	5,486.71	783.58	1,479.92	2.00	-2.00	-5.28	-180.00	
6,999.44	0.00	0.00	6,689.82	783.58	1,479.92	0.00	0.00	0.00	0.00	
8,119.58	89.61	180.14	7,406.00	72.24	1,478.19	8.00	8.00	-16.06	180.14	
18,875.21	89.61	180.14	7,479.00	-10,683.10	1,452.03	0.00	0.00	0.00	0.00	MAB 15-8HZ_BHL

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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
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	62.10	300.00	0.15	0.29	-0.15	1.50	1.50	0.00
400.00	2.25	62.10	399.96	1.38	2.60	-1.38	1.50	1.50	0.00
500.00	3.75	62.10	499.82	3.83	7.23	-3.84	1.50	1.50	0.00
600.00	5.25	62.10	599.51	7.50	14.16	-7.53	1.50	1.50	0.00
700.00	6.75	62.10	698.96	12.39	23.40	-12.45	1.50	1.50	0.00
800.00	8.25	62.10	798.10	18.50	34.93	-18.58	1.50	1.50	0.00
900.00	9.75	62.10	896.87	25.82	48.76	-25.94	1.50	1.50	0.00
1,000.00	11.25	62.10	995.19	34.34	64.86	-34.50	1.50	1.50	0.00
1,100.00	12.75	62.10	1,093.00	44.07	83.24	-44.28	1.50	1.50	0.00
1,200.00	14.25	62.10	1,190.24	55.00	103.87	-55.25	1.50	1.50	0.00
1,300.00	15.75	62.10	1,286.83	67.11	126.74	-67.42	1.50	1.50	0.00
1,400.00	17.25	62.10	1,382.71	80.40	151.84	-80.77	1.50	1.50	0.00
1,500.00	18.75	62.10	1,477.81	94.85	179.15	-95.29	1.50	1.50	0.00
1,523.46	19.10	62.10	1,500.00	98.42	185.87	-98.87	1.50	1.50	0.00
9 5/8" Csg									
1,600.00	20.25	62.10	1,572.07	110.47	208.65	-110.98	1.50	1.50	0.00
1,700.00	21.75	62.10	1,665.43	127.24	240.32	-127.83	1.50	1.50	0.00
1,714.63	21.97	62.10	1,679.00	129.79	245.13	-130.39	1.50	1.50	0.00
Fox Hills									
1,800.00	23.25	62.10	1,757.81	145.15	274.14	-145.82	1.50	1.50	0.00
1,819.33	23.54	62.10	1,775.55	148.74	280.92	-149.43	1.50	1.50	0.00
End Nudge @ 1819.33ft									
1,900.00	23.54	62.10	1,849.51	163.82	309.40	-164.57	0.00	0.00	0.00
2,000.00	23.54	62.10	1,941.19	182.51	344.69	-183.35	0.00	0.00	0.00
2,100.00	23.54	62.10	2,032.86	201.19	379.99	-202.12	0.00	0.00	0.00
2,200.00	23.54	62.10	2,124.54	219.88	415.29	-220.90	0.00	0.00	0.00
2,300.00	23.54	62.10	2,216.22	238.57	450.58	-239.67	0.00	0.00	0.00
2,400.00	23.54	62.10	2,307.90	257.26	485.88	-258.45	0.00	0.00	0.00
2,500.00	23.54	62.10	2,399.58	275.95	521.18	-277.22	0.00	0.00	0.00
2,600.00	23.54	62.10	2,491.26	294.64	556.47	-296.00	0.00	0.00	0.00
2,700.00	23.54	62.10	2,582.93	313.33	591.77	-314.77	0.00	0.00	0.00
2,800.00	23.54	62.10	2,674.61	332.01	627.07	-333.55	0.00	0.00	0.00
2,900.00	23.54	62.10	2,766.29	350.70	662.36	-352.32	0.00	0.00	0.00
3,000.00	23.54	62.10	2,857.97	369.39	697.66	-371.10	0.00	0.00	0.00
3,100.00	23.54	62.10	2,949.65	388.08	732.96	-389.87	0.00	0.00	0.00
3,200.00	23.54	62.10	3,041.32	406.77	768.25	-408.64	0.00	0.00	0.00
3,300.00	23.54	62.10	3,133.00	425.46	803.55	-427.42	0.00	0.00	0.00
3,400.00	23.54	62.10	3,224.68	444.15	838.85	-446.19	0.00	0.00	0.00
3,500.00	23.54	62.10	3,316.36	462.83	874.14	-464.97	0.00	0.00	0.00
3,600.00	23.54	62.10	3,408.04	481.52	909.44	-483.74	0.00	0.00	0.00
3,700.00	23.54	62.10	3,499.71	500.21	944.74	-502.52	0.00	0.00	0.00
3,800.00	23.54	62.10	3,591.39	518.90	980.03	-521.29	0.00	0.00	0.00
3,900.00	23.54	62.10	3,683.07	537.59	1,015.33	-540.07	0.00	0.00	0.00
4,000.00	23.54	62.10	3,774.75	556.28	1,050.63	-558.84	0.00	0.00	0.00
4,100.00	23.54	62.10	3,866.43	574.97	1,085.92	-577.62	0.00	0.00	0.00
4,200.00	23.54	62.10	3,958.11	593.66	1,121.22	-596.39	0.00	0.00	0.00
4,300.00	23.54	62.10	4,049.78	612.34	1,156.52	-615.17	0.00	0.00	0.00
4,400.00	23.54	62.10	4,141.46	631.03	1,191.81	-633.94	0.00	0.00	0.00
4,500.00	23.54	62.10	4,233.14	649.72	1,227.11	-652.72	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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)
4,600.00	23.54	62.10	4,324.82	668.41	1,262.41	-671.49	0.00	0.00	0.00
4,619.33	23.54	62.10	4,342.54	672.02	1,269.23	-675.12	0.00	0.00	0.00
Begin Drop @ 4619.33ft									
4,700.00	21.93	62.10	4,416.94	686.61	1,296.78	-689.78	2.00	-2.00	0.00
4,716.22	21.60	62.10	4,432.00	689.42	1,302.09	-692.60	2.00	-2.00	0.00
Parkman									
4,800.00	19.93	62.10	4,510.34	703.32	1,328.34	-706.56	2.00	-2.00	0.00
4,900.00	17.93	62.10	4,604.93	718.50	1,357.01	-721.81	2.00	-2.00	0.00
5,000.00	15.93	62.10	4,700.59	732.12	1,382.74	-735.50	2.00	-2.00	0.00
5,100.00	13.93	62.10	4,797.21	744.17	1,405.50	-747.61	2.00	-2.00	0.00
5,131.68	13.29	62.10	4,828.00	747.66	1,412.09	-751.11	2.00	-2.00	0.00
Sussex									
5,200.00	11.93	62.10	4,894.67	754.64	1,425.27	-758.12	2.00	-2.00	0.00
5,300.00	9.93	62.10	4,992.85	763.51	1,442.02	-767.03	2.00	-2.00	0.00
5,400.00	7.93	62.10	5,091.64	770.77	1,455.73	-774.33	2.00	-2.00	0.00
5,500.00	5.93	62.10	5,190.90	776.41	1,466.39	-779.99	2.00	-2.00	0.00
5,600.00	3.93	62.10	5,290.53	780.43	1,473.98	-784.03	2.00	-2.00	0.00
5,700.00	1.93	62.10	5,390.39	782.82	1,478.49	-786.43	2.00	-2.00	0.00
5,796.33	0.00	0.00	5,486.71	783.58	1,479.92	-787.19	2.00	-2.00	-64.46
End Drop @ 5796.33ft									
5,800.00	0.00	0.00	5,490.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
5,900.00	0.00	0.00	5,590.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,000.00	0.00	0.00	5,690.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,100.00	0.00	0.00	5,790.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,200.00	0.00	0.00	5,890.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,300.00	0.00	0.00	5,990.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,400.00	0.00	0.00	6,090.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,500.00	0.00	0.00	6,190.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,600.00	0.00	0.00	6,290.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,700.00	0.00	0.00	6,390.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,800.00	0.00	0.00	6,490.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,900.00	0.00	0.00	6,590.38	783.58	1,479.92	-787.19	0.00	0.00	0.00
6,999.44	0.00	0.00	6,689.82	783.58	1,479.92	-787.19	0.00	0.00	0.00
KOP @ 6999.44ft :: DLS = 8°/100'									
7,000.00	0.04	180.14	6,690.38	783.58	1,479.92	-787.19	8.00	8.00	-32,117.97
7,100.00	8.04	180.14	6,790.04	776.53	1,479.91	-780.14	8.00	8.00	0.00
7,200.00	16.04	180.14	6,887.76	755.68	1,479.85	-759.29	8.00	8.00	0.00
7,300.00	24.04	180.14	6,981.63	721.43	1,479.77	-725.05	8.00	8.00	0.00
7,400.00	32.04	180.14	7,069.82	674.45	1,479.66	-678.07	8.00	8.00	0.00
7,500.00	40.04	180.14	7,150.61	615.66	1,479.51	-619.27	8.00	8.00	0.00
7,600.00	48.04	180.14	7,222.43	546.20	1,479.35	-549.81	8.00	8.00	0.00
7,622.18	49.82	180.14	7,237.00	529.47	1,479.30	-533.09	8.00	8.00	0.00
Sharon Springs									
7,654.03	52.37	180.14	7,257.00	504.69	1,479.24	-508.30	8.00	8.00	0.00
Niobrara									
7,700.00	56.04	180.14	7,283.88	467.41	1,479.15	-471.02	8.00	8.00	0.00
7,800.00	64.04	180.14	7,333.77	380.84	1,478.94	-384.45	8.00	8.00	0.00
7,900.00	72.04	180.14	7,371.13	288.17	1,478.72	-291.78	8.00	8.00	0.00
7,927.11	74.21	180.14	7,379.00	262.22	1,478.65	-265.83	8.00	8.00	0.00
Nio B									
8,000.00	80.04	180.14	7,395.23	191.20	1,478.48	-194.81	8.00	8.00	0.00
8,100.00	88.04	180.14	7,405.60	91.82	1,478.24	-95.43	8.00	8.00	0.00
8,119.58	89.61	180.14	7,406.00	72.24	1,478.19	-75.86	8.00	8.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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)
End Build @ 8119.58ft - Top of Production									
8,200.00	89.61	180.14	7,406.54	-8.17	1,478.00	4.56	0.00	0.00	0.00
8,300.00	89.61	180.14	7,407.22	-108.17	1,477.75	104.56	0.00	0.00	0.00
8,400.00	89.61	180.14	7,407.90	-208.17	1,477.51	204.56	0.00	0.00	0.00
8,500.00	89.61	180.14	7,408.58	-308.17	1,477.27	304.56	0.00	0.00	0.00
8,600.00	89.61	180.14	7,409.26	-408.16	1,477.02	404.55	0.00	0.00	0.00
8,700.00	89.61	180.14	7,409.94	-508.16	1,476.78	504.55	0.00	0.00	0.00
8,800.00	89.61	180.14	7,410.61	-608.16	1,476.54	604.55	0.00	0.00	0.00
8,900.00	89.61	180.14	7,411.29	-708.16	1,476.29	704.55	0.00	0.00	0.00
9,000.00	89.61	180.14	7,411.97	-808.15	1,476.05	804.54	0.00	0.00	0.00
9,100.00	89.61	180.14	7,412.65	-908.15	1,475.81	904.54	0.00	0.00	0.00
9,200.00	89.61	180.14	7,413.33	-1,008.15	1,475.56	1,004.54	0.00	0.00	0.00
9,300.00	89.61	180.14	7,414.01	-1,108.15	1,475.32	1,104.54	0.00	0.00	0.00
9,400.00	89.61	180.14	7,414.69	-1,208.14	1,475.08	1,204.54	0.00	0.00	0.00
9,500.00	89.61	180.14	7,415.37	-1,308.14	1,474.83	1,304.53	0.00	0.00	0.00
9,600.00	89.61	180.14	7,416.04	-1,408.14	1,474.59	1,404.53	0.00	0.00	0.00
9,700.00	89.61	180.14	7,416.72	-1,508.14	1,474.35	1,504.53	0.00	0.00	0.00
9,800.00	89.61	180.14	7,417.40	-1,608.13	1,474.10	1,604.53	0.00	0.00	0.00
9,900.00	89.61	180.14	7,418.08	-1,708.13	1,473.86	1,704.52	0.00	0.00	0.00
10,000.00	89.61	180.14	7,418.76	-1,808.13	1,473.62	1,804.52	0.00	0.00	0.00
10,100.00	89.61	180.14	7,419.44	-1,908.12	1,473.37	1,904.52	0.00	0.00	0.00
10,200.00	89.61	180.14	7,420.12	-2,008.12	1,473.13	2,004.52	0.00	0.00	0.00
10,300.00	89.61	180.14	7,420.80	-2,108.12	1,472.89	2,104.51	0.00	0.00	0.00
10,400.00	89.61	180.14	7,421.47	-2,208.12	1,472.64	2,204.51	0.00	0.00	0.00
10,500.00	89.61	180.14	7,422.15	-2,308.11	1,472.40	2,304.51	0.00	0.00	0.00
10,600.00	89.61	180.14	7,422.83	-2,408.11	1,472.16	2,404.51	0.00	0.00	0.00
10,700.00	89.61	180.14	7,423.51	-2,508.11	1,471.92	2,504.51	0.00	0.00	0.00
10,800.00	89.61	180.14	7,424.19	-2,608.11	1,471.67	2,604.50	0.00	0.00	0.00
10,900.00	89.61	180.14	7,424.87	-2,708.10	1,471.43	2,704.50	0.00	0.00	0.00
11,000.00	89.61	180.14	7,425.55	-2,808.10	1,471.19	2,804.50	0.00	0.00	0.00
11,100.00	89.61	180.14	7,426.23	-2,908.10	1,470.94	2,904.50	0.00	0.00	0.00
11,200.00	89.61	180.14	7,426.90	-3,008.10	1,470.70	3,004.49	0.00	0.00	0.00
11,300.00	89.61	180.14	7,427.58	-3,108.09	1,470.46	3,104.49	0.00	0.00	0.00
11,400.00	89.61	180.14	7,428.26	-3,208.09	1,470.21	3,204.49	0.00	0.00	0.00
11,500.00	89.61	180.14	7,428.94	-3,308.09	1,469.97	3,304.49	0.00	0.00	0.00
11,600.00	89.61	180.14	7,429.62	-3,408.09	1,469.73	3,404.48	0.00	0.00	0.00
11,700.00	89.61	180.14	7,430.30	-3,508.08	1,469.48	3,504.48	0.00	0.00	0.00
11,800.00	89.61	180.14	7,430.98	-3,608.08	1,469.24	3,604.48	0.00	0.00	0.00
11,900.00	89.61	180.14	7,431.66	-3,708.08	1,469.00	3,704.48	0.00	0.00	0.00
12,000.00	89.61	180.14	7,432.33	-3,808.08	1,468.75	3,804.48	0.00	0.00	0.00
12,100.00	89.61	180.14	7,433.01	-3,908.07	1,468.51	3,904.47	0.00	0.00	0.00
12,200.00	89.61	180.14	7,433.69	-4,008.07	1,468.27	4,004.47	0.00	0.00	0.00
12,300.00	89.61	180.14	7,434.37	-4,108.07	1,468.02	4,104.47	0.00	0.00	0.00
12,400.00	89.61	180.14	7,435.05	-4,208.07	1,467.78	4,204.47	0.00	0.00	0.00
12,500.00	89.61	180.14	7,435.73	-4,308.06	1,467.54	4,304.46	0.00	0.00	0.00
12,600.00	89.61	180.14	7,436.41	-4,408.06	1,467.29	4,404.46	0.00	0.00	0.00
12,700.00	89.61	180.14	7,437.09	-4,508.06	1,467.05	4,504.46	0.00	0.00	0.00
12,800.00	89.61	180.14	7,437.76	-4,608.05	1,466.81	4,604.46	0.00	0.00	0.00
12,900.00	89.61	180.14	7,438.44	-4,708.05	1,466.56	4,704.45	0.00	0.00	0.00
13,000.00	89.61	180.14	7,439.12	-4,808.05	1,466.32	4,804.45	0.00	0.00	0.00
13,100.00	89.61	180.14	7,439.80	-4,908.05	1,466.08	4,904.45	0.00	0.00	0.00
13,200.00	89.61	180.14	7,440.48	-5,008.04	1,465.83	5,004.45	0.00	0.00	0.00
13,300.00	89.61	180.14	7,441.16	-5,108.04	1,465.59	5,104.45	0.00	0.00	0.00

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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)	
13,400.00	89.61	180.14	7,441.84	-5,208.04	1,465.35	5,204.44	0.00	0.00	0.00	
13,500.00	89.61	180.14	7,442.52	-5,308.04	1,465.10	5,304.44	0.00	0.00	0.00	
13,600.00	89.61	180.14	7,443.19	-5,408.03	1,464.86	5,404.44	0.00	0.00	0.00	
13,700.00	89.61	180.14	7,443.87	-5,508.03	1,464.62	5,504.44	0.00	0.00	0.00	
13,800.00	89.61	180.14	7,444.55	-5,608.03	1,464.37	5,604.43	0.00	0.00	0.00	
13,900.00	89.61	180.14	7,445.23	-5,708.03	1,464.13	5,704.43	0.00	0.00	0.00	
14,000.00	89.61	180.14	7,445.91	-5,808.02	1,463.89	5,804.43	0.00	0.00	0.00	
14,100.00	89.61	180.14	7,446.59	-5,908.02	1,463.64	5,904.43	0.00	0.00	0.00	
14,160.69	89.61	180.14	7,447.00	-5,968.71	1,463.50	5,965.11	0.00	0.00	0.00	
Nio C										
14,200.00	89.61	180.14	7,447.27	-6,008.02	1,463.40	6,004.42	0.00	0.00	0.00	
14,300.00	89.61	180.14	7,447.95	-6,108.02	1,463.16	6,104.42	0.00	0.00	0.00	
14,400.00	89.61	180.14	7,448.62	-6,208.01	1,462.91	6,204.42	0.00	0.00	0.00	
14,500.00	89.61	180.14	7,449.30	-6,308.01	1,462.67	6,304.42	0.00	0.00	0.00	
14,600.00	89.61	180.14	7,449.98	-6,408.01	1,462.43	6,404.42	0.00	0.00	0.00	
14,700.00	89.61	180.14	7,450.66	-6,508.01	1,462.18	6,504.41	0.00	0.00	0.00	
14,800.00	89.61	180.14	7,451.34	-6,608.00	1,461.94	6,604.41	0.00	0.00	0.00	
14,900.00	89.61	180.14	7,452.02	-6,708.00	1,461.70	6,704.41	0.00	0.00	0.00	
15,000.00	89.61	180.14	7,452.70	-6,808.00	1,461.45	6,804.41	0.00	0.00	0.00	
15,100.00	89.61	180.14	7,453.38	-6,908.00	1,461.21	6,904.40	0.00	0.00	0.00	
15,200.00	89.61	180.14	7,454.05	-7,007.99	1,460.97	7,004.40	0.00	0.00	0.00	
15,300.00	89.61	180.14	7,454.73	-7,107.99	1,460.72	7,104.40	0.00	0.00	0.00	
15,400.00	89.61	180.14	7,455.41	-7,207.99	1,460.48	7,204.40	0.00	0.00	0.00	
15,500.00	89.61	180.14	7,456.09	-7,307.98	1,460.24	7,304.39	0.00	0.00	0.00	
15,600.00	89.61	180.14	7,456.77	-7,407.98	1,460.00	7,404.39	0.00	0.00	0.00	
15,700.00	89.61	180.14	7,457.45	-7,507.98	1,459.75	7,504.39	0.00	0.00	0.00	
15,800.00	89.61	180.14	7,458.13	-7,607.98	1,459.51	7,604.39	0.00	0.00	0.00	
15,900.00	89.61	180.14	7,458.81	-7,707.97	1,459.27	7,704.39	0.00	0.00	0.00	
16,000.00	89.61	180.14	7,459.48	-7,807.97	1,459.02	7,804.38	0.00	0.00	0.00	
16,100.00	89.61	180.14	7,460.16	-7,907.97	1,458.78	7,904.38	0.00	0.00	0.00	
16,200.00	89.61	180.14	7,460.84	-8,007.97	1,458.54	8,004.38	0.00	0.00	0.00	
16,300.00	89.61	180.14	7,461.52	-8,107.96	1,458.29	8,104.38	0.00	0.00	0.00	
16,400.00	89.61	180.14	7,462.20	-8,207.96	1,458.05	8,204.37	0.00	0.00	0.00	
16,500.00	89.61	180.14	7,462.88	-8,307.96	1,457.81	8,304.37	0.00	0.00	0.00	
16,600.00	89.61	180.14	7,463.56	-8,407.96	1,457.56	8,404.37	0.00	0.00	0.00	
16,700.00	89.61	180.14	7,464.24	-8,507.95	1,457.32	8,504.37	0.00	0.00	0.00	
16,800.00	89.61	180.14	7,464.91	-8,607.95	1,457.08	8,604.36	0.00	0.00	0.00	
16,900.00	89.61	180.14	7,465.59	-8,707.95	1,456.83	8,704.36	0.00	0.00	0.00	
17,000.00	89.61	180.14	7,466.27	-8,807.95	1,456.59	8,804.36	0.00	0.00	0.00	
17,100.00	89.61	180.14	7,466.95	-8,907.94	1,456.35	8,904.36	0.00	0.00	0.00	
17,200.00	89.61	180.14	7,467.63	-9,007.94	1,456.10	9,004.36	0.00	0.00	0.00	
17,300.00	89.61	180.14	7,468.31	-9,107.94	1,455.86	9,104.35	0.00	0.00	0.00	
17,400.00	89.61	180.14	7,468.99	-9,207.94	1,455.62	9,204.35	0.00	0.00	0.00	
17,500.00	89.61	180.14	7,469.67	-9,307.93	1,455.37	9,304.35	0.00	0.00	0.00	
17,600.00	89.61	180.14	7,470.34	-9,407.93	1,455.13	9,404.35	0.00	0.00	0.00	
17,700.00	89.61	180.14	7,471.02	-9,507.93	1,454.89	9,504.34	0.00	0.00	0.00	
17,800.00	89.61	180.14	7,471.70	-9,607.92	1,454.64	9,604.34	0.00	0.00	0.00	
17,900.00	89.61	180.14	7,472.38	-9,707.92	1,454.40	9,704.34	0.00	0.00	0.00	
18,000.00	89.61	180.14	7,473.06	-9,807.92	1,454.16	9,804.34	0.00	0.00	0.00	
18,100.00	89.61	180.14	7,473.74	-9,907.92	1,453.91	9,904.34	0.00	0.00	0.00	
18,200.00	89.61	180.14	7,474.42	-10,007.91	1,453.67	10,004.33	0.00	0.00	0.00	
18,300.00	89.61	180.14	7,475.10	-10,107.91	1,453.43	10,104.33	0.00	0.00	0.00	
18,400.00	89.61	180.14	7,475.77	-10,207.91	1,453.18	10,204.33	0.00	0.00	0.00	
18,500.00	89.61	180.14	7,476.45	-10,307.91	1,452.94	10,304.33	0.00	0.00	0.00	

Corporate Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-8HZ
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 15-8HZ	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)
18,600.00	89.61	180.14	7,477.13	-10,407.90	1,452.70	10,404.32	0.00	0.00	0.00
18,700.00	89.61	180.14	7,477.81	-10,507.90	1,452.45	10,504.32	0.00	0.00	0.00
18,800.00	89.61	180.14	7,478.49	-10,607.90	1,452.21	10,604.32	0.00	0.00	0.00
18,875.21	89.61	180.14	7,479.00	-10,683.10	1,452.03	10,679.52	0.00	0.00	0.00
TD Well @ 18875.21ft									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,523.46	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
8,119.58	7,406.00	Top of Production	5-1/2	7-7/8	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,714.63	1,679.00	Fox Hills			
4,716.22	4,432.00	Parkman			
5,131.68	4,828.00	Sussex			
7,622.18	7,237.00	Sharon Springs			
7,654.03	7,257.00	Niobrara			
7,927.11	7,379.00	Nio B			
14,160.69	7,447.00	Nio C			

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
1,819.33	1,775.55	148.74	280.92	End Nudge @ 1819.33ft
4,619.33	4,342.54	672.02	1,269.23	Begin Drop @ 4619.33ft
5,796.33	5,486.71	783.58	1,479.92	End Drop @ 5796.33ft
6,999.44	6,689.82	783.58	1,479.92	KOP @ 6999.44ft :: DLS = 8°/100'
8,119.58	7,406.00	72.24	1,478.19	End Build @ 8119.58ft
18,875.21	7,479.00	-10,683.10	1,452.03	TD Well @ 18875.21ft