

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

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

**MAB 15-13HZ**

**Plan A**

**Plan: Permit Rev-2**

SHL Lat/Long: 40.045846/-104.761648

Survey Program: MWD+IFR+MSA

## **Standard Planning Report**

**12 July, 2018**

Project: WELD-NAD83-UTMFT13N  
Site: 1N-66W-15 MAB 15-15HZ PAD  
Well: MAB 15-13HZ  
Wellbore: Plan A  
Design: Permit Rev-2

## US ROCKIES WATTENBERG PLANNING

### CASING DETAILS

TVD	MD	Size
1500.00	1515.81	9-5/8
7489.00	7964.11	5-1/2

WELL DETAILS: MAB 15-13HZ

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	1042.00	11.88	353.20	1036.34	81.24	-9.69	1.50	353.20	-81.26	
4	3842.00	11.88	353.20	3776.36	653.60	-77.94	0.00	0.00	-653.80	
5	4436.00	0.00	0.00	4366.12	714.53	-85.20	2.00	180.00	-714.75	
6	6842.70	0.00	0.00	6772.82	714.53	-85.20	0.00	0.00	-714.75	
7	7964.11	89.71	179.85	7489.00	1.93	-83.36	8.00	179.85	-2.14	
8	18734.43	89.71	179.85	7543.00	-10768.23	-55.56	0.00	0.00	10768.04	MAB 15-13HZ_BHL

### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
MAB 15-13HZ_SHL	0.00	0.00	0.00	40.045846	-104.761648
MAB 15-13HZ_BHL	7543.00	-10768.23	-55.56	40.016275	-104.761846

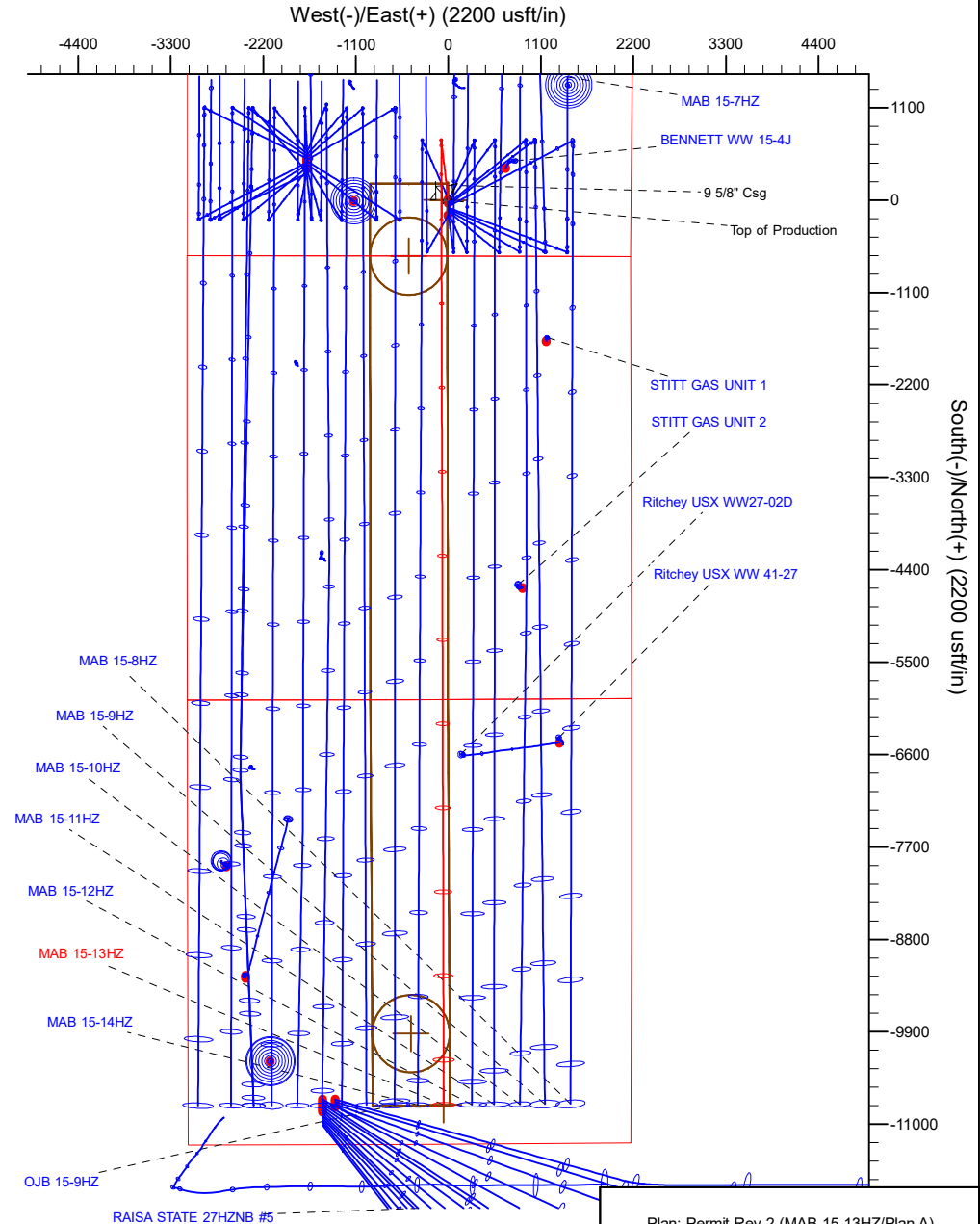
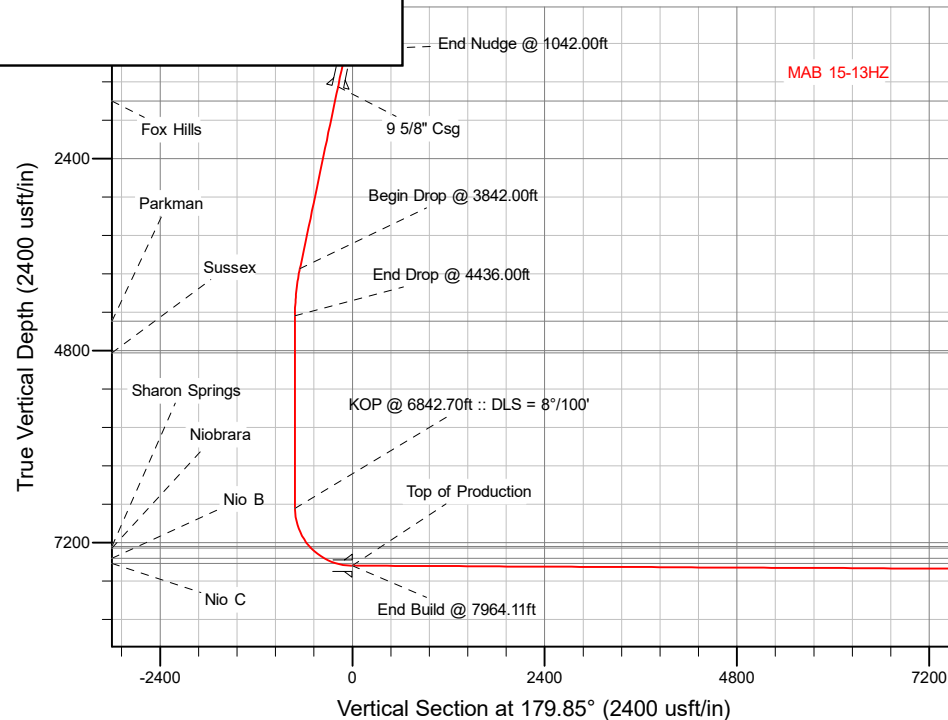
### FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
1679.00	1698.73	Fox Hills
4432.00	4501.88	Parkman
4828.00	4897.88	Sussex
7248.00	7362.27	Sharon Springs
7268.00	7389.47	Niobrara
7399.00	7604.75	Nio B
7461.00	7766.72	Nio C

**SHL**  
**668' FSL**  
**2171' FEL**

**HEEL**  
**670' FSL**  
**2251' FEL**

**TOE**  
**471' FSL**  
**2227' FEL**



Plan: Permit Rev-2 (MAB 15-13HZ/Plan A)

Date: 7/12/2018

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MAB 15-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-66W-15 MAB 15-15HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MAB 15-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

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

<b>Site</b>	1N-66W-15 MAB 15-15HZ PAD			
<b>Site Position:</b>		<b>Northing:</b>	14,543,337.30 usft	<b>Latitude:</b> 40.045352
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,707,121.54 usft	<b>Longitude:</b> -104.761654
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.15 °

<b>Well</b>	MAB 15-13HZ			
<b>Well Position</b>	<b>+N/-S</b>	179.89 usft	<b>Northing:</b>	14,543,517.19 usft
	<b>+E/-W</b>	1.68 usft	<b>Easting:</b>	1,707,122.74 usft
<b>Position Uncertainty</b>		3.28 usft	<b>Wellhead Elevation:</b>	<b>Ground Level:</b> 5,112.00 usft

<b>Wellbore</b>	Plan A				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	7/2/2018	8.07	66.55	52,087.30987112

<b>Design</b>	Permit Rev-2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	179.85

<b>Plan Survey Tool Program</b>	<b>Date</b>	7/12/2018		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
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	18,734.43	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:Rockies, crustal dec +

Corporate  
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MAB 15-13HZ
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 15-13HZ	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	
1,042.00	11.88	353.20	1,036.34	81.24	-9.69	1.50	1.50	0.00	353.20	
3,842.00	11.88	353.20	3,776.36	653.60	-77.94	0.00	0.00	0.00	0.00	
4,436.00	0.00	0.00	4,366.12	714.53	-85.20	2.00	-2.00	0.00	180.00	
6,842.70	0.00	0.00	6,772.82	714.53	-85.20	0.00	0.00	0.00	0.00	
7,964.11	89.71	179.85	7,489.01	1.93	-83.36	8.00	8.00	16.04	179.85	
18,734.43	89.71	179.85	7,543.00	-10,768.23	-55.56	0.00	0.00	0.00	0.00	MAB 15-13HZ_BHL

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MAB 15-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-66W-15 MAB 15-15HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MAB 15-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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	353.20	300.00	0.32	-0.04	-0.33	1.50	1.50	0.00
400.00	2.25	353.20	399.96	2.92	-0.35	-2.93	1.50	1.50	0.00
500.00	3.75	353.20	499.82	8.12	-0.97	-8.12	1.50	1.50	0.00
600.00	5.25	353.20	599.51	15.91	-1.90	-15.92	1.50	1.50	0.00
700.00	6.75	353.20	698.96	26.29	-3.13	-26.30	1.50	1.50	0.00
800.00	8.25	353.20	798.10	39.25	-4.68	-39.26	1.50	1.50	0.00
900.00	9.75	353.20	896.87	54.78	-6.53	-54.80	1.50	1.50	0.00
1,000.00	11.25	353.20	995.19	72.88	-8.69	-72.90	1.50	1.50	0.00
1,042.00	11.88	353.20	1,036.34	81.24	-9.69	-81.26	1.50	1.50	0.00
End Nudge @ 1042.00ft									
1,100.00	11.88	353.20	1,093.09	93.10	-11.10	-93.12	0.00	0.00	0.00
1,200.00	11.88	353.20	1,190.95	113.54	-13.54	-113.57	0.00	0.00	0.00
1,300.00	11.88	353.20	1,288.81	133.98	-15.98	-134.02	0.00	0.00	0.00
1,400.00	11.88	353.20	1,386.67	154.42	-18.41	-154.47	0.00	0.00	0.00
1,500.00	11.88	353.20	1,484.53	174.86	-20.85	-174.92	0.00	0.00	0.00
1,515.81	11.88	353.20	1,500.00	178.09	-21.24	-178.15	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	11.88	353.20	1,582.39	195.30	-23.29	-195.36	0.00	0.00	0.00
1,698.73	11.88	353.20	1,679.00	215.48	-25.69	-215.55	0.00	0.00	0.00
Fox Hills									
1,700.00	11.88	353.20	1,680.24	215.74	-25.73	-215.81	0.00	0.00	0.00
1,800.00	11.88	353.20	1,778.10	236.19	-28.16	-236.26	0.00	0.00	0.00
1,900.00	11.88	353.20	1,875.96	256.63	-30.60	-256.71	0.00	0.00	0.00
2,000.00	11.88	353.20	1,973.82	277.07	-33.04	-277.15	0.00	0.00	0.00
2,100.00	11.88	353.20	2,071.68	297.51	-35.48	-297.60	0.00	0.00	0.00
2,200.00	11.88	353.20	2,169.53	317.95	-37.91	-318.05	0.00	0.00	0.00
2,300.00	11.88	353.20	2,267.39	338.39	-40.35	-338.50	0.00	0.00	0.00
2,400.00	11.88	353.20	2,365.25	358.83	-42.79	-358.95	0.00	0.00	0.00
2,500.00	11.88	353.20	2,463.11	379.28	-45.23	-379.39	0.00	0.00	0.00
2,600.00	11.88	353.20	2,560.97	399.72	-47.66	-399.84	0.00	0.00	0.00
2,700.00	11.88	353.20	2,658.82	420.16	-50.10	-420.29	0.00	0.00	0.00
2,800.00	11.88	353.20	2,756.68	440.60	-52.54	-440.74	0.00	0.00	0.00
2,900.00	11.88	353.20	2,854.54	461.04	-54.98	-461.18	0.00	0.00	0.00
3,000.00	11.88	353.20	2,952.40	481.48	-57.41	-481.63	0.00	0.00	0.00
3,100.00	11.88	353.20	3,050.26	501.92	-59.85	-502.08	0.00	0.00	0.00
3,200.00	11.88	353.20	3,148.11	522.37	-62.29	-522.53	0.00	0.00	0.00
3,300.00	11.88	353.20	3,245.97	542.81	-64.73	-542.97	0.00	0.00	0.00
3,400.00	11.88	353.20	3,343.83	563.25	-67.16	-563.42	0.00	0.00	0.00
3,500.00	11.88	353.20	3,441.69	583.69	-69.60	-583.87	0.00	0.00	0.00
3,600.00	11.88	353.20	3,539.55	604.13	-72.04	-604.32	0.00	0.00	0.00
3,700.00	11.88	353.20	3,637.41	624.57	-74.48	-624.77	0.00	0.00	0.00
3,800.00	11.88	353.20	3,735.26	645.01	-76.91	-645.21	0.00	0.00	0.00
3,842.00	11.88	353.20	3,776.36	653.60	-77.94	-653.80	0.00	0.00	0.00
Begin Drop @ 3842.00ft									
3,900.00	10.72	353.20	3,833.24	664.88	-79.28	-665.09	2.00	-2.00	0.00
4,000.00	8.72	353.20	3,931.80	681.65	-81.28	-681.86	2.00	-2.00	0.00
4,100.00	6.72	353.20	4,030.89	694.99	-82.87	-695.20	2.00	-2.00	0.00
4,200.00	4.72	353.20	4,130.38	704.88	-84.05	-705.10	2.00	-2.00	0.00
4,300.00	2.72	353.20	4,230.17	711.32	-84.82	-711.54	2.00	-2.00	0.00

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MAB 15-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-66W-15 MAB 15-15HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MAB 15-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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)
4,400.00	0.72	353.20	4,330.12	714.30	-85.18	-714.53	2.00	-2.00	0.00
4,436.00	0.00	0.00	4,366.12	714.53	-85.20	-714.75	2.00	-2.00	0.00
End Drop @ 4436.00ft									
4,500.00	0.00	0.00	4,430.12	714.53	-85.20	-714.75	0.00	0.00	0.00
4,501.88	0.00	0.00	4,432.00	714.53	-85.20	-714.75	0.00	0.00	0.00
Parkman									
4,600.00	0.00	0.00	4,530.12	714.53	-85.20	-714.75	0.00	0.00	0.00
4,700.00	0.00	0.00	4,630.12	714.53	-85.20	-714.75	0.00	0.00	0.00
4,800.00	0.00	0.00	4,730.12	714.53	-85.20	-714.75	0.00	0.00	0.00
4,897.88	0.00	0.00	4,828.00	714.53	-85.20	-714.75	0.00	0.00	0.00
Sussex									
4,900.00	0.00	0.00	4,830.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,000.00	0.00	0.00	4,930.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,100.00	0.00	0.00	5,030.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,200.00	0.00	0.00	5,130.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,300.00	0.00	0.00	5,230.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,400.00	0.00	0.00	5,330.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,500.00	0.00	0.00	5,430.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,600.00	0.00	0.00	5,530.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,700.00	0.00	0.00	5,630.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,800.00	0.00	0.00	5,730.12	714.53	-85.20	-714.75	0.00	0.00	0.00
5,900.00	0.00	0.00	5,830.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,000.00	0.00	0.00	5,930.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,100.00	0.00	0.00	6,030.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,200.00	0.00	0.00	6,130.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,300.00	0.00	0.00	6,230.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,400.00	0.00	0.00	6,330.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,500.00	0.00	0.00	6,430.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,600.00	0.00	0.00	6,530.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,700.00	0.00	0.00	6,630.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,800.00	0.00	0.00	6,730.12	714.53	-85.20	-714.75	0.00	0.00	0.00
6,842.70	0.00	0.00	6,772.82	714.53	-85.20	-714.75	0.00	0.00	0.00
KOP @ 6842.70ft :: DLS = 8°/100'									
6,900.00	4.58	179.85	6,830.06	712.24	-85.20	-712.46	8.00	8.00	0.00
7,000.00	12.58	179.85	6,928.86	697.32	-85.16	-697.55	8.00	8.00	0.00
7,100.00	20.58	179.85	7,024.62	668.81	-85.08	-669.03	8.00	8.00	0.00
7,200.00	28.58	179.85	7,115.48	627.24	-84.98	-627.46	8.00	8.00	0.00
7,300.00	36.58	179.85	7,199.67	573.43	-84.84	-573.65	8.00	8.00	0.00
7,362.27	41.57	179.85	7,248.00	534.19	-84.74	-534.41	8.00	8.00	0.00
Sharon Springs									
7,389.47	43.74	179.85	7,268.00	515.76	-84.69	-515.98	8.00	8.00	0.00
Niobrara									
7,400.00	44.58	179.85	7,275.55	508.42	-84.67	-508.64	8.00	8.00	0.00
7,500.00	52.58	179.85	7,341.65	433.49	-84.48	-433.71	8.00	8.00	0.00
7,600.00	60.58	179.85	7,396.68	350.09	-84.26	-350.31	8.00	8.00	0.00
7,604.75	60.96	179.85	7,399.00	345.94	-84.25	-346.16	8.00	8.00	0.00
Nio B									
7,700.00	68.58	179.85	7,439.56	259.84	-84.03	-260.06	8.00	8.00	0.00
7,766.72	73.92	179.85	7,461.00	196.68	-83.87	-196.90	8.00	8.00	0.00
Nio C									
7,800.00	76.58	179.85	7,469.47	164.51	-83.78	-164.72	8.00	8.00	0.00
7,900.00	84.58	179.85	7,485.82	65.93	-83.53	-66.15	8.00	8.00	0.00
7,964.11	89.71	179.85	7,489.01	1.92	-83.36	-2.14	8.00	8.00	0.00

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MAB 15-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-66W-15 MAB 15-15HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MAB 15-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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 @ 7964.11ft - Top of Production									
8,000.00	89.71	179.85	7,489.19	-33.96	-83.27	33.75	0.00	0.00	0.00
8,100.00	89.71	179.85	7,489.69	-133.96	-83.01	133.75	0.00	0.00	0.00
8,200.00	89.71	179.85	7,490.19	-233.96	-82.75	233.74	0.00	0.00	0.00
8,300.00	89.71	179.85	7,490.69	-333.96	-82.50	333.74	0.00	0.00	0.00
8,400.00	89.71	179.85	7,491.19	-433.96	-82.24	433.74	0.00	0.00	0.00
8,500.00	89.71	179.85	7,491.69	-533.96	-81.98	533.74	0.00	0.00	0.00
8,600.00	89.71	179.85	7,492.19	-633.96	-81.72	633.74	0.00	0.00	0.00
8,700.00	89.71	179.85	7,492.69	-733.95	-81.46	733.74	0.00	0.00	0.00
8,800.00	89.71	179.85	7,493.20	-833.95	-81.21	833.74	0.00	0.00	0.00
8,900.00	89.71	179.85	7,493.70	-933.95	-80.95	933.74	0.00	0.00	0.00
9,000.00	89.71	179.85	7,494.20	-1,033.95	-80.69	1,033.73	0.00	0.00	0.00
9,100.00	89.71	179.85	7,494.70	-1,133.95	-80.43	1,133.73	0.00	0.00	0.00
9,200.00	89.71	179.85	7,495.20	-1,233.95	-80.17	1,233.73	0.00	0.00	0.00
9,300.00	89.71	179.85	7,495.70	-1,333.94	-79.91	1,333.73	0.00	0.00	0.00
9,400.00	89.71	179.85	7,496.20	-1,433.94	-79.66	1,433.73	0.00	0.00	0.00
9,500.00	89.71	179.85	7,496.71	-1,533.94	-79.40	1,533.73	0.00	0.00	0.00
9,600.00	89.71	179.85	7,497.21	-1,633.94	-79.14	1,633.73	0.00	0.00	0.00
9,700.00	89.71	179.85	7,497.71	-1,733.94	-78.88	1,733.73	0.00	0.00	0.00
9,800.00	89.71	179.85	7,498.21	-1,833.94	-78.62	1,833.72	0.00	0.00	0.00
9,900.00	89.71	179.85	7,498.71	-1,933.93	-78.37	1,933.72	0.00	0.00	0.00
10,000.00	89.71	179.85	7,499.21	-2,033.93	-78.11	2,033.72	0.00	0.00	0.00
10,100.00	89.71	179.85	7,499.71	-2,133.93	-77.85	2,133.72	0.00	0.00	0.00
10,200.00	89.71	179.85	7,500.21	-2,233.93	-77.59	2,233.72	0.00	0.00	0.00
10,300.00	89.71	179.85	7,500.72	-2,333.93	-77.33	2,333.72	0.00	0.00	0.00
10,400.00	89.71	179.85	7,501.22	-2,433.93	-77.07	2,433.72	0.00	0.00	0.00
10,500.00	89.71	179.85	7,501.72	-2,533.93	-76.82	2,533.72	0.00	0.00	0.00
10,600.00	89.71	179.85	7,502.22	-2,633.92	-76.56	2,633.71	0.00	0.00	0.00
10,700.00	89.71	179.85	7,502.72	-2,733.92	-76.30	2,733.71	0.00	0.00	0.00
10,800.00	89.71	179.85	7,503.22	-2,833.92	-76.04	2,833.71	0.00	0.00	0.00
10,900.00	89.71	179.85	7,503.72	-2,933.92	-75.78	2,933.71	0.00	0.00	0.00
11,000.00	89.71	179.85	7,504.23	-3,033.92	-75.53	3,033.71	0.00	0.00	0.00
11,100.00	89.71	179.85	7,504.73	-3,133.92	-75.27	3,133.71	0.00	0.00	0.00
11,200.00	89.71	179.85	7,505.23	-3,233.91	-75.01	3,233.71	0.00	0.00	0.00
11,300.00	89.71	179.85	7,505.73	-3,333.91	-74.75	3,333.71	0.00	0.00	0.00
11,400.00	89.71	179.85	7,506.23	-3,433.91	-74.49	3,433.70	0.00	0.00	0.00
11,500.00	89.71	179.85	7,506.73	-3,533.91	-74.24	3,533.70	0.00	0.00	0.00
11,600.00	89.71	179.85	7,507.23	-3,633.91	-73.98	3,633.70	0.00	0.00	0.00
11,700.00	89.71	179.85	7,507.73	-3,733.91	-73.72	3,733.70	0.00	0.00	0.00
11,800.00	89.71	179.85	7,508.24	-3,833.90	-73.46	3,833.70	0.00	0.00	0.00
11,900.00	89.71	179.85	7,508.74	-3,933.90	-73.20	3,933.70	0.00	0.00	0.00
12,000.00	89.71	179.85	7,509.24	-4,033.90	-72.94	4,033.70	0.00	0.00	0.00
12,100.00	89.71	179.85	7,509.74	-4,133.90	-72.69	4,133.70	0.00	0.00	0.00
12,200.00	89.71	179.85	7,510.24	-4,233.90	-72.43	4,233.69	0.00	0.00	0.00
12,300.00	89.71	179.85	7,510.74	-4,333.90	-72.17	4,333.69	0.00	0.00	0.00
12,400.00	89.71	179.85	7,511.24	-4,433.90	-71.91	4,433.69	0.00	0.00	0.00
12,500.00	89.71	179.85	7,511.74	-4,533.89	-71.65	4,533.69	0.00	0.00	0.00
12,600.00	89.71	179.85	7,512.25	-4,633.89	-71.40	4,633.69	0.00	0.00	0.00
12,700.00	89.71	179.85	7,512.75	-4,733.89	-71.14	4,733.69	0.00	0.00	0.00
12,800.00	89.71	179.85	7,513.25	-4,833.89	-70.88	4,833.69	0.00	0.00	0.00
12,900.00	89.71	179.85	7,513.75	-4,933.89	-70.62	4,933.69	0.00	0.00	0.00
13,000.00	89.71	179.85	7,514.25	-5,033.89	-70.36	5,033.68	0.00	0.00	0.00
13,100.00	89.71	179.85	7,514.75	-5,133.88	-70.10	5,133.68	0.00	0.00	0.00

**Corporate**  
**Planning Report**

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MAB 15-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-66W-15 MAB 15-15HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MAB 15-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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)	
13,200.00	89.71	179.85	7,515.25	-5,233.88	-69.85	5,233.68	0.00	0.00	0.00	
13,300.00	89.71	179.85	7,515.76	-5,333.88	-69.59	5,333.68	0.00	0.00	0.00	
13,400.00	89.71	179.85	7,516.26	-5,433.88	-69.33	5,433.68	0.00	0.00	0.00	
13,500.00	89.71	179.85	7,516.76	-5,533.88	-69.07	5,533.68	0.00	0.00	0.00	
13,600.00	89.71	179.85	7,517.26	-5,633.88	-68.81	5,633.68	0.00	0.00	0.00	
13,700.00	89.71	179.85	7,517.76	-5,733.87	-68.56	5,733.68	0.00	0.00	0.00	
13,800.00	89.71	179.85	7,518.26	-5,833.87	-68.30	5,833.67	0.00	0.00	0.00	
13,900.00	89.71	179.85	7,518.76	-5,933.87	-68.04	5,933.67	0.00	0.00	0.00	
14,000.00	89.71	179.85	7,519.26	-6,033.87	-67.78	6,033.67	0.00	0.00	0.00	
14,100.00	89.71	179.85	7,519.77	-6,133.87	-67.52	6,133.67	0.00	0.00	0.00	
14,200.00	89.71	179.85	7,520.27	-6,233.87	-67.27	6,233.67	0.00	0.00	0.00	
14,300.00	89.71	179.85	7,520.77	-6,333.86	-67.01	6,333.67	0.00	0.00	0.00	
14,400.00	89.71	179.85	7,521.27	-6,433.86	-66.75	6,433.67	0.00	0.00	0.00	
14,500.00	89.71	179.85	7,521.77	-6,533.86	-66.49	6,533.67	0.00	0.00	0.00	
14,600.00	89.71	179.85	7,522.27	-6,633.86	-66.23	6,633.66	0.00	0.00	0.00	
14,700.00	89.71	179.85	7,522.77	-6,733.86	-65.97	6,733.66	0.00	0.00	0.00	
14,800.00	89.71	179.85	7,523.28	-6,833.86	-65.72	6,833.66	0.00	0.00	0.00	
14,900.00	89.71	179.85	7,523.78	-6,933.86	-65.46	6,933.66	0.00	0.00	0.00	
15,000.00	89.71	179.85	7,524.28	-7,033.85	-65.20	7,033.66	0.00	0.00	0.00	
15,100.00	89.71	179.85	7,524.78	-7,133.85	-64.94	7,133.66	0.00	0.00	0.00	
15,200.00	89.71	179.85	7,525.28	-7,233.85	-64.68	7,233.66	0.00	0.00	0.00	
15,300.00	89.71	179.85	7,525.78	-7,333.85	-64.43	7,333.66	0.00	0.00	0.00	
15,400.00	89.71	179.85	7,526.28	-7,433.85	-64.17	7,433.65	0.00	0.00	0.00	
15,500.00	89.71	179.85	7,526.78	-7,533.85	-63.91	7,533.65	0.00	0.00	0.00	
15,600.00	89.71	179.85	7,527.29	-7,633.84	-63.65	7,633.65	0.00	0.00	0.00	
15,700.00	89.71	179.85	7,527.79	-7,733.84	-63.39	7,733.65	0.00	0.00	0.00	
15,800.00	89.71	179.85	7,528.29	-7,833.84	-63.14	7,833.65	0.00	0.00	0.00	
15,900.00	89.71	179.85	7,528.79	-7,933.84	-62.88	7,933.65	0.00	0.00	0.00	
16,000.00	89.71	179.85	7,529.29	-8,033.84	-62.62	8,033.65	0.00	0.00	0.00	
16,100.00	89.71	179.85	7,529.79	-8,133.84	-62.36	8,133.65	0.00	0.00	0.00	
16,200.00	89.71	179.85	7,530.29	-8,233.83	-62.10	8,233.64	0.00	0.00	0.00	
16,300.00	89.71	179.85	7,530.80	-8,333.83	-61.84	8,333.64	0.00	0.00	0.00	
16,400.00	89.71	179.85	7,531.30	-8,433.83	-61.59	8,433.64	0.00	0.00	0.00	
16,500.00	89.71	179.85	7,531.80	-8,533.83	-61.33	8,533.64	0.00	0.00	0.00	
16,600.00	89.71	179.85	7,532.30	-8,633.83	-61.07	8,633.64	0.00	0.00	0.00	
16,700.00	89.71	179.85	7,532.80	-8,733.83	-60.81	8,733.64	0.00	0.00	0.00	
16,800.00	89.71	179.85	7,533.30	-8,833.83	-60.55	8,833.64	0.00	0.00	0.00	
16,900.00	89.71	179.85	7,533.80	-8,933.82	-60.30	8,933.64	0.00	0.00	0.00	
17,000.00	89.71	179.85	7,534.30	-9,033.82	-60.04	9,033.63	0.00	0.00	0.00	
17,100.00	89.71	179.85	7,534.81	-9,133.82	-59.78	9,133.63	0.00	0.00	0.00	
17,200.00	89.71	179.85	7,535.31	-9,233.82	-59.52	9,233.63	0.00	0.00	0.00	
17,300.00	89.71	179.85	7,535.81	-9,333.82	-59.26	9,333.63	0.00	0.00	0.00	
17,400.00	89.71	179.85	7,536.31	-9,433.82	-59.00	9,433.63	0.00	0.00	0.00	
17,500.00	89.71	179.85	7,536.81	-9,533.81	-58.75	9,533.63	0.00	0.00	0.00	
17,600.00	89.71	179.85	7,537.31	-9,633.81	-58.49	9,633.63	0.00	0.00	0.00	
17,700.00	89.71	179.85	7,537.81	-9,733.81	-58.23	9,733.63	0.00	0.00	0.00	
17,800.00	89.71	179.85	7,538.32	-9,833.81	-57.97	9,833.62	0.00	0.00	0.00	
17,900.00	89.71	179.85	7,538.82	-9,933.81	-57.71	9,933.62	0.00	0.00	0.00	
18,000.00	89.71	179.85	7,539.32	-10,033.81	-57.46	10,033.62	0.00	0.00	0.00	
18,100.00	89.71	179.85	7,539.82	-10,133.80	-57.20	10,133.62	0.00	0.00	0.00	
18,200.00	89.71	179.85	7,540.32	-10,233.80	-56.94	10,233.62	0.00	0.00	0.00	
18,300.00	89.71	179.85	7,540.82	-10,333.80	-56.68	10,333.62	0.00	0.00	0.00	
18,400.00	89.71	179.85	7,541.32	-10,433.80	-56.42	10,433.62	0.00	0.00	0.00	
18,500.00	89.71	179.85	7,541.82	-10,533.80	-56.17	10,533.62	0.00	0.00	0.00	



# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MAB 15-13HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-66W-15 MAB 15-15HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MAB 15-13HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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	89.71	179.85	7,542.33	-10,633.80	-55.91	10,633.61	0.00	0.00	0.00
18,700.00	89.71	179.85	7,542.83	-10,733.79	-55.65	10,733.61	0.00	0.00	0.00
18,734.43	89.71	179.85	7,543.00	-10,768.23	-55.56	10,768.04	0.00	0.00	0.00
TD Well @ 18734.43ft									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,515.81	1,500.00	9 5/8" Csg	9-5/8	13-1/2
7,964.11	7,489.01	Top of Production	5-1/2	7-7/8

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,698.73	1,679.00	Fox Hills			
4,501.88	4,432.00	Parkman			
4,897.88	4,828.00	Sussex			
7,362.27	7,248.00	Sharon Springs			
7,389.47	7,268.00	Niobrara			
7,604.75	7,399.00	Nio B			
7,766.72	7,461.00	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
1,042.00	1,036.34	81.24	-9.69	End Nudge @ 1042.00ft
3,842.00	3,776.36	653.60	-77.94	Begin Drop @ 3842.00ft
4,436.00	4,366.12	714.53	-85.20	End Drop @ 4436.00ft
6,842.70	6,772.82	714.53	-85.20	KOP @ 6842.70ft :: DLS = 8°/100'
7,964.11	7,489.01	1.93	-83.36	End Build @ 7964.11ft
18,734.43	7,543.00	-10,768.23	-55.56	TD Well @ 18734.43ft