

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N  
1N-67W-07 BUDDY 17-7HZ PAD  
BUDDY 7-16HZ**

## **Plan A**

### **Plan: Permit Rev-2**

SHL Lat/Long: 40.070707/-104.927393  
Survey Program: MWD+IFR+MSA

## **Standard Planning Report**

**17 May, 2018**

Project: WELD-NAD83-UTMFT13N  
Site: 1N-67W-07 BUDDY 17-7HZ PAD  
Well: BUDDY 7-16HZ  
Wellbore: Plan A  
Design: Permit Rev-2

# US ROCKIES WATTENBERG PLANNING

CASING DETAILS		
TVD	MD	Size
1500.00	1520.00	9-5/8
7629.00	8142.53	5-1/2

WELL DETAILS: BUDDY 7-16HZ  
GL = 5072.00  
RKB = 17' @ 5089.00usft (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	230.00	0.00	0.00	230.00	0.00	0.00	0.00	0.00	0.00	
3	1170.00	14.10	91.20	1160.54	-2.41	115.06	1.50	91.20	-3.21	
4	3970.00	14.10	91.20	3876.18	-16.70	797.03	0.00	0.00	-22.26	
5	4675.00	0.00	0.00	4574.09	-18.50	883.32	2.00	-180.00	-24.67	
6	7013.72	0.00	0.00	6912.81	-18.50	883.32	0.00	0.00	-24.67	
7	8142.53	90.30	359.60	7629.00	701.48	878.23	8.00	359.60	695.34	
8	18298.56	90.30	359.60	7575.00	10857.12	806.52	0.00	0.00	10851.22	BUDDY 7-16HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BUDDY 7-16HZ_SHL	0.00	0.00	0.00	40.070707	-104.927393
BUDDY 7-16HZ_BHL	7575.00	10857.12	806.52	40.100522	-104.924509

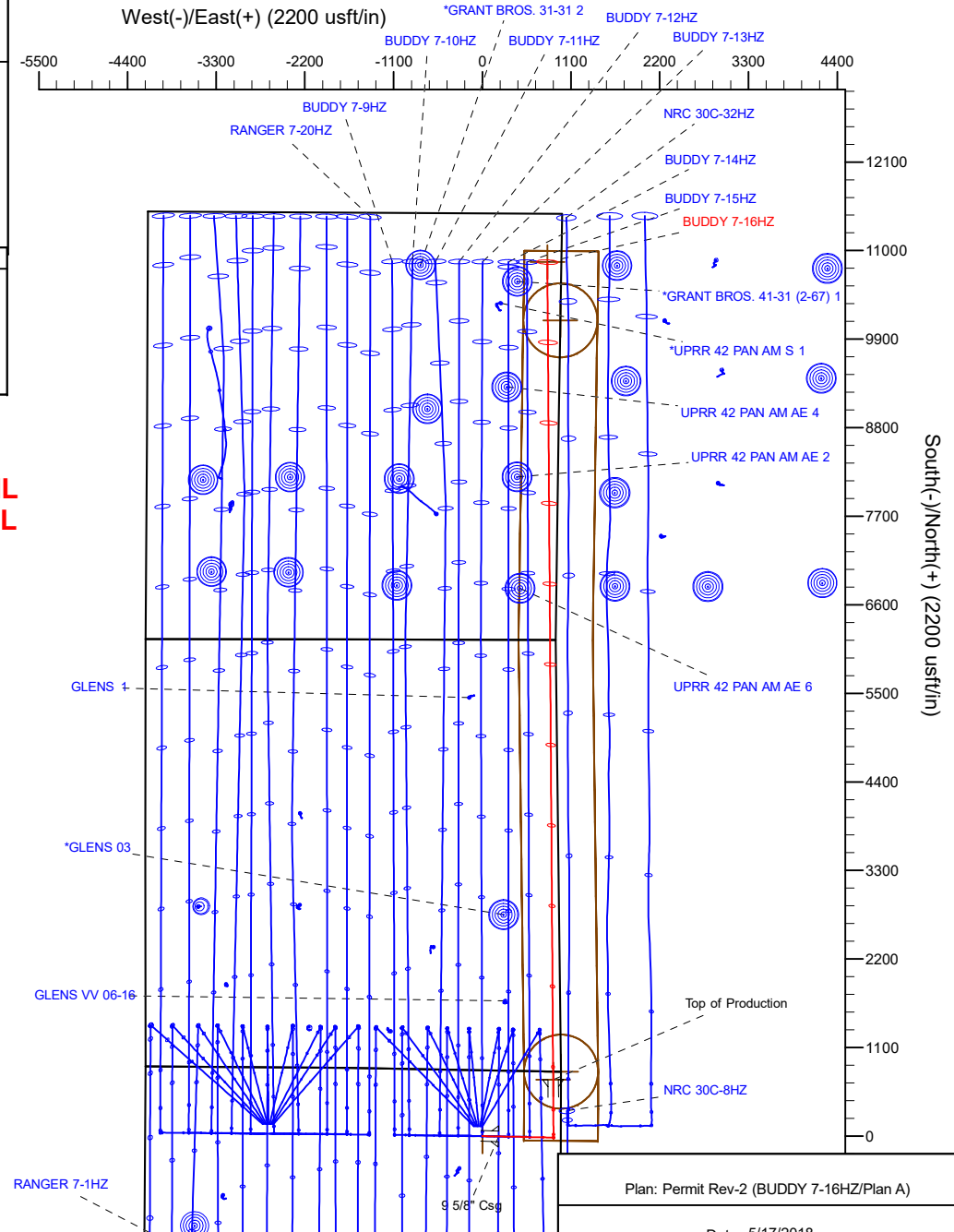
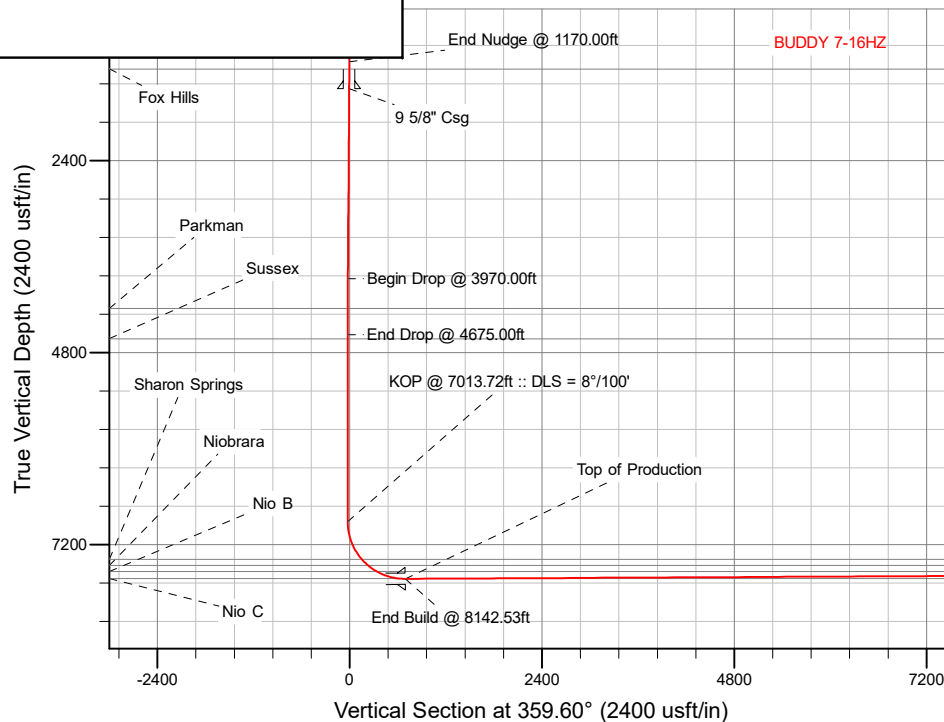
## FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
1252.00	1264.30	Fox Hills
4248.00	4348.20	Parkman
4627.00	4727.91	Sussex
7387.00	7531.97	Sharon Springs
7462.00	7639.58	Niobrara
7538.00	7773.74	Nio B
7624.00	8054.00	Nio C

SHL  
818' FNL  
975' FEL

HEEL  
100' FNL  
94' FEL

TOE  
600' FNL  
172' FEL



Plan: Permit Rev-2 (BUDDY 7-16HZ/Plan A)

Date: 5/17/2018

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUDDY 7-16HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 BUDDY 17-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	BUDDY 7-16HZ	<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-67W-07 BUDDY 17-7HZ PAD			
<b>Site Position:</b>		<b>Northing:</b>	14,552,609.64 usft	<b>Latitude:</b> 40.071038
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,660,624.89 usft	<b>Longitude:</b> -104.927766
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.05 °

Well		BUDDY 7-16HZ				
Well Position	+N/-S	-120.53 usft	Northing:	14,552,489.19 usft	Latitude:	40.070707
	+E/-W	104.35 usft	Easting:	1,660,729.34 usft	Longitude:	-104.927393
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	5,072.00 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	5/2/2018	8.18	66.54	52,102.04911885

<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	359.60

<b>Plan Survey Tool Program</b>	<b>Date</b>	5/17/2018		
<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	18,298.56	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 BUDDY 7-16HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5089.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5089.00usft (Drilling Rig)
Site:	1N-67W-07 BUDDY 17-7HZ PAD	North Reference:	True
Well:	BUDDY 7-16HZ	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	
230.00	0.00	0.00	230.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,170.00	14.10	91.20	1,160.54	-2.41	115.06	1.50	1.50	0.00	91.20	
3,970.00	14.10	91.20	3,876.18	-16.70	797.03	0.00	0.00	0.00	0.00	
4,675.00	0.00	0.00	4,574.09	-18.50	883.32	2.00	-2.00	-12.94	-180.00	
7,013.72	0.00	0.00	6,912.81	-18.50	883.32	0.00	0.00	0.00	0.00	
8,142.53	90.30	359.60	7,629.00	701.48	878.23	8.00	8.00	-0.04	359.60	
18,298.56	90.30	359.60	7,575.00	10,857.12	806.52	0.00	0.00	0.00	0.00	BUDDY 7-16HZ_BHL

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUDDY 7-16HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 BUDDY 17-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	BUDDY 7-16HZ	<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
230.00	0.00	0.00	230.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 230.00ft									
300.00	1.05	91.20	300.00	-0.01	0.64	-0.02	1.50	1.50	0.00
400.00	2.55	91.20	399.94	-0.08	3.78	-0.11	1.50	1.50	0.00
500.00	4.05	91.20	499.78	-0.20	9.54	-0.27	1.50	1.50	0.00
600.00	5.55	91.20	599.42	-0.37	17.90	-0.50	1.50	1.50	0.00
700.00	7.05	91.20	698.81	-0.60	28.87	-0.81	1.50	1.50	0.00
800.00	8.55	91.20	797.89	-0.89	42.44	-1.19	1.50	1.50	0.00
900.00	10.05	91.20	896.57	-1.23	58.60	-1.64	1.50	1.50	0.00
1,000.00	11.55	91.20	994.80	-1.62	77.33	-2.16	1.50	1.50	0.00
1,100.00	13.05	91.20	1,092.50	-2.07	98.63	-2.75	1.50	1.50	0.00
1,170.00	14.10	91.20	1,160.54	-2.41	115.06	-3.21	1.50	1.50	0.00
End Nudge @ 1170.00ft									
1,200.00	14.10	91.20	1,189.64	-2.56	122.36	-3.42	0.00	0.00	0.00
1,264.30	14.10	91.20	1,252.00	-2.89	138.02	-3.85	0.00	0.00	0.00
Fox Hills									
1,300.00	14.10	91.20	1,286.62	-3.07	146.72	-4.10	0.00	0.00	0.00
1,400.00	14.10	91.20	1,383.61	-3.58	171.07	-4.78	0.00	0.00	0.00
1,500.00	14.10	91.20	1,480.60	-4.09	195.43	-5.46	0.00	0.00	0.00
1,520.00	14.10	91.20	1,500.00	-4.20	200.30	-5.59	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	14.10	91.20	1,577.59	-4.60	219.79	-6.14	0.00	0.00	0.00
1,700.00	14.10	91.20	1,674.57	-5.11	244.14	-6.82	0.00	0.00	0.00
1,800.00	14.10	91.20	1,771.56	-5.62	268.50	-7.50	0.00	0.00	0.00
1,900.00	14.10	91.20	1,868.55	-6.13	292.86	-8.18	0.00	0.00	0.00
2,000.00	14.10	91.20	1,965.53	-6.64	317.21	-8.86	0.00	0.00	0.00
2,100.00	14.10	91.20	2,062.52	-7.15	341.57	-9.54	0.00	0.00	0.00
2,200.00	14.10	91.20	2,159.51	-7.67	365.92	-10.22	0.00	0.00	0.00
2,300.00	14.10	91.20	2,256.50	-8.18	390.28	-10.90	0.00	0.00	0.00
2,400.00	14.10	91.20	2,353.48	-8.69	414.64	-11.58	0.00	0.00	0.00
2,500.00	14.10	91.20	2,450.47	-9.20	438.99	-12.26	0.00	0.00	0.00
2,600.00	14.10	91.20	2,547.46	-9.71	463.35	-12.94	0.00	0.00	0.00
2,700.00	14.10	91.20	2,644.45	-10.22	487.70	-13.62	0.00	0.00	0.00
2,800.00	14.10	91.20	2,741.43	-10.73	512.06	-14.30	0.00	0.00	0.00
2,900.00	14.10	91.20	2,838.42	-11.24	536.42	-14.98	0.00	0.00	0.00
3,000.00	14.10	91.20	2,935.41	-11.75	560.77	-15.66	0.00	0.00	0.00
3,100.00	14.10	91.20	3,032.39	-12.26	585.13	-16.34	0.00	0.00	0.00
3,200.00	14.10	91.20	3,129.38	-12.77	609.49	-17.02	0.00	0.00	0.00
3,300.00	14.10	91.20	3,226.37	-13.28	633.84	-17.70	0.00	0.00	0.00
3,400.00	14.10	91.20	3,323.36	-13.79	658.20	-18.38	0.00	0.00	0.00
3,500.00	14.10	91.20	3,420.34	-14.30	682.55	-19.06	0.00	0.00	0.00
3,600.00	14.10	91.20	3,517.33	-14.81	706.91	-19.74	0.00	0.00	0.00
3,700.00	14.10	91.20	3,614.32	-15.32	731.27	-20.42	0.00	0.00	0.00
3,800.00	14.10	91.20	3,711.30	-15.83	755.62	-21.10	0.00	0.00	0.00
3,900.00	14.10	91.20	3,808.29	-16.34	779.98	-21.78	0.00	0.00	0.00
3,970.00	14.10	91.20	3,876.18	-16.70	797.03	-22.26	0.00	0.00	0.00
Begin Drop @ 3970.00ft									
4,000.00	13.50	91.20	3,905.32	-16.85	804.18	-22.46	2.00	-2.00	0.00
4,100.00	11.50	91.20	4,002.94	-17.30	825.82	-23.06	2.00	-2.00	0.00
4,200.00	9.50	91.20	4,101.26	-17.68	844.04	-23.57	2.00	-2.00	0.00
4,300.00	7.50	91.20	4,200.16	-17.99	858.82	-23.98	2.00	-2.00	0.00

## Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUDDY 7-16HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 BUDDY 17-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	BUDDY 7-16HZ	<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)
4,348.20	6.54	91.20	4,248.00	-18.11	864.70	-24.15	2.00	-2.00	0.00
Parkman									
4,400.00	5.50	91.20	4,299.51	-18.23	870.13	-24.30	2.00	-2.00	0.00
4,500.00	3.50	91.20	4,399.20	-18.39	877.98	-24.52	2.00	-2.00	0.00
4,600.00	1.50	91.20	4,499.10	-18.48	882.34	-24.64	2.00	-2.00	0.00
4,675.00	0.00	0.00	4,574.09	-18.50	883.32	-24.67	2.00	-2.00	-121.60
End Drop @ 4675.00ft									
4,700.00	0.00	0.00	4,599.09	-18.50	883.32	-24.67	0.00	0.00	0.00
4,727.91	0.00	0.00	4,627.00	-18.50	883.32	-24.67	0.00	0.00	0.00
Sussex									
4,800.00	0.00	0.00	4,699.09	-18.50	883.32	-24.67	0.00	0.00	0.00
4,900.00	0.00	0.00	4,799.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,000.00	0.00	0.00	4,899.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,100.00	0.00	0.00	4,999.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,200.00	0.00	0.00	5,099.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,300.00	0.00	0.00	5,199.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,400.00	0.00	0.00	5,299.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,500.00	0.00	0.00	5,399.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,600.00	0.00	0.00	5,499.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,700.00	0.00	0.00	5,599.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,800.00	0.00	0.00	5,699.09	-18.50	883.32	-24.67	0.00	0.00	0.00
5,900.00	0.00	0.00	5,799.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,000.00	0.00	0.00	5,899.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,100.00	0.00	0.00	5,999.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,200.00	0.00	0.00	6,099.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,300.00	0.00	0.00	6,199.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,400.00	0.00	0.00	6,299.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,500.00	0.00	0.00	6,399.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,600.00	0.00	0.00	6,499.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,700.00	0.00	0.00	6,599.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,800.00	0.00	0.00	6,699.09	-18.50	883.32	-24.67	0.00	0.00	0.00
6,900.00	0.00	0.00	6,799.09	-18.50	883.32	-24.67	0.00	0.00	0.00
7,000.00	0.00	0.00	6,899.09	-18.50	883.32	-24.67	0.00	0.00	0.00
7,013.72	0.00	0.00	6,912.81	-18.50	883.32	-24.67	0.00	0.00	0.00
KOP @ 7013.72ft :: DLS = 8°/100'									
7,100.00	6.90	359.60	6,998.88	-13.31	883.28	-19.48	8.00	8.00	-0.47
7,200.00	14.90	359.60	7,096.99	5.59	883.15	-0.58	8.00	8.00	0.00
7,300.00	22.90	359.60	7,191.53	37.95	882.92	31.79	8.00	8.00	0.00
7,400.00	30.90	359.60	7,280.63	83.16	882.60	77.00	8.00	8.00	0.00
7,500.00	38.90	359.60	7,362.58	140.33	882.20	134.17	8.00	8.00	0.00
7,531.97	41.46	359.60	7,387.00	160.96	882.05	154.80	8.00	8.00	0.00
Sharon Springs									
7,600.00	46.90	359.60	7,435.77	208.35	881.72	202.19	8.00	8.00	0.00
7,639.58	50.07	359.60	7,462.00	237.99	881.51	231.83	8.00	8.00	0.00
Niobrara									
7,700.00	54.90	359.60	7,498.78	285.89	881.17	279.74	8.00	8.00	0.00
7,773.74	60.80	359.60	7,538.00	348.30	880.73	342.14	8.00	8.00	0.00
Nio B									
7,800.00	62.90	359.60	7,550.39	371.45	880.57	365.29	8.00	8.00	0.00
7,900.00	70.90	359.60	7,589.59	463.36	879.92	457.20	8.00	8.00	0.00
8,000.00	78.90	359.60	7,615.61	559.83	879.24	553.67	8.00	8.00	0.00
8,054.00	83.22	359.60	7,624.00	613.15	878.86	607.00	8.00	8.00	0.00
Nio C									

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well BUDDY 7-16HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 BUDDY 17-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	BUDDY 7-16HZ	<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)
8,100.00	86.90	359.60	7,627.96	658.98	878.53	652.83	8.00	8.00	0.00
8,142.53	90.30	359.60	7,629.00	701.49	878.23	695.34	8.00	8.00	0.00
End Build @ 8142.53ft - Top of Production									
8,200.00	90.30	359.60	7,628.69	758.95	877.83	752.81	0.00	0.00	0.00
8,300.00	90.30	359.60	7,628.16	858.95	877.12	852.81	0.00	0.00	0.00
8,400.00	90.30	359.60	7,627.63	958.95	876.42	952.80	0.00	0.00	0.00
8,500.00	90.30	359.60	7,627.09	1,058.94	875.71	1,052.80	0.00	0.00	0.00
8,600.00	90.30	359.60	7,626.56	1,158.94	875.00	1,152.80	0.00	0.00	0.00
8,700.00	90.30	359.60	7,626.03	1,258.93	874.30	1,252.80	0.00	0.00	0.00
8,800.00	90.30	359.60	7,625.50	1,358.93	873.59	1,352.80	0.00	0.00	0.00
8,900.00	90.30	359.60	7,624.97	1,458.93	872.89	1,452.80	0.00	0.00	0.00
9,000.00	90.30	359.60	7,624.44	1,558.92	872.18	1,552.80	0.00	0.00	0.00
9,100.00	90.30	359.60	7,623.90	1,658.92	871.47	1,652.79	0.00	0.00	0.00
9,200.00	90.30	359.60	7,623.37	1,758.92	870.77	1,752.79	0.00	0.00	0.00
9,300.00	90.30	359.60	7,622.84	1,858.91	870.06	1,852.79	0.00	0.00	0.00
9,400.00	90.30	359.60	7,622.31	1,958.91	869.36	1,952.79	0.00	0.00	0.00
9,500.00	90.30	359.60	7,621.78	2,058.90	868.65	2,052.79	0.00	0.00	0.00
9,600.00	90.30	359.60	7,621.25	2,158.90	867.94	2,152.79	0.00	0.00	0.00
9,700.00	90.30	359.60	7,620.71	2,258.90	867.24	2,252.79	0.00	0.00	0.00
9,800.00	90.30	359.60	7,620.18	2,358.89	866.53	2,352.78	0.00	0.00	0.00
9,900.00	90.30	359.60	7,619.65	2,458.89	865.82	2,452.78	0.00	0.00	0.00
10,000.00	90.30	359.60	7,619.12	2,558.88	865.12	2,552.78	0.00	0.00	0.00
10,100.00	90.30	359.60	7,618.59	2,658.88	864.41	2,652.78	0.00	0.00	0.00
10,200.00	90.30	359.60	7,618.06	2,758.88	863.71	2,752.78	0.00	0.00	0.00
10,300.00	90.30	359.60	7,617.52	2,858.87	863.00	2,852.78	0.00	0.00	0.00
10,400.00	90.30	359.60	7,616.99	2,958.87	862.29	2,952.78	0.00	0.00	0.00
10,500.00	90.30	359.60	7,616.46	3,058.86	861.59	3,052.77	0.00	0.00	0.00
10,600.00	90.30	359.60	7,615.93	3,158.86	860.88	3,152.77	0.00	0.00	0.00
10,700.00	90.30	359.60	7,615.40	3,258.86	860.18	3,252.77	0.00	0.00	0.00
10,800.00	90.30	359.60	7,614.87	3,358.85	859.47	3,352.77	0.00	0.00	0.00
10,900.00	90.30	359.60	7,614.34	3,458.85	858.76	3,452.77	0.00	0.00	0.00
11,000.00	90.30	359.60	7,613.80	3,558.84	858.06	3,552.77	0.00	0.00	0.00
11,100.00	90.30	359.60	7,613.27	3,658.84	857.35	3,652.77	0.00	0.00	0.00
11,200.00	90.30	359.60	7,612.74	3,758.84	856.65	3,752.77	0.00	0.00	0.00
11,300.00	90.30	359.60	7,612.21	3,858.83	855.94	3,852.76	0.00	0.00	0.00
11,400.00	90.30	359.60	7,611.68	3,958.83	855.23	3,952.76	0.00	0.00	0.00
11,500.00	90.30	359.60	7,611.15	4,058.83	854.53	4,052.76	0.00	0.00	0.00
11,600.00	90.30	359.60	7,610.61	4,158.82	853.82	4,152.76	0.00	0.00	0.00
11,700.00	90.30	359.60	7,610.08	4,258.82	853.11	4,252.76	0.00	0.00	0.00
11,800.00	90.30	359.60	7,609.55	4,358.81	852.41	4,352.76	0.00	0.00	0.00
11,900.00	90.30	359.60	7,609.02	4,458.81	851.70	4,452.76	0.00	0.00	0.00
12,000.00	90.30	359.60	7,608.49	4,558.81	851.00	4,552.75	0.00	0.00	0.00
12,100.00	90.30	359.60	7,607.96	4,658.80	850.29	4,652.75	0.00	0.00	0.00
12,200.00	90.30	359.60	7,607.42	4,758.80	849.58	4,752.75	0.00	0.00	0.00
12,300.00	90.30	359.60	7,606.89	4,858.79	848.88	4,852.75	0.00	0.00	0.00
12,400.00	90.30	359.60	7,606.36	4,958.79	848.17	4,952.75	0.00	0.00	0.00
12,500.00	90.30	359.60	7,605.83	5,058.79	847.47	5,052.75	0.00	0.00	0.00
12,600.00	90.30	359.60	7,605.30	5,158.78	846.76	5,152.75	0.00	0.00	0.00
12,700.00	90.30	359.60	7,604.77	5,258.78	846.05	5,252.74	0.00	0.00	0.00
12,800.00	90.30	359.60	7,604.23	5,358.77	845.35	5,352.74	0.00	0.00	0.00
12,900.00	90.30	359.60	7,603.70	5,458.77	844.64	5,452.74	0.00	0.00	0.00
13,000.00	90.30	359.60	7,603.17	5,558.77	843.93	5,552.74	0.00	0.00	0.00
13,100.00	90.30	359.60	7,602.64	5,658.76	843.23	5,652.74	0.00	0.00	0.00

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<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 BUDDY 17-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	BUDDY 7-16HZ	<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	90.30	359.60	7,602.11	5,758.76	842.52	5,752.74	0.00	0.00	0.00	
13,300.00	90.30	359.60	7,601.58	5,858.76	841.82	5,852.74	0.00	0.00	0.00	
13,400.00	90.30	359.60	7,601.04	5,958.75	841.11	5,952.73	0.00	0.00	0.00	
13,500.00	90.30	359.60	7,600.51	6,058.75	840.40	6,052.73	0.00	0.00	0.00	
13,600.00	90.30	359.60	7,599.98	6,158.74	839.70	6,152.73	0.00	0.00	0.00	
13,700.00	90.30	359.60	7,599.45	6,258.74	838.99	6,252.73	0.00	0.00	0.00	
13,800.00	90.30	359.60	7,598.92	6,358.74	838.29	6,352.73	0.00	0.00	0.00	
13,900.00	90.30	359.60	7,598.39	6,458.73	837.58	6,452.73	0.00	0.00	0.00	
14,000.00	90.30	359.60	7,597.85	6,558.73	836.87	6,552.73	0.00	0.00	0.00	
14,100.00	90.30	359.60	7,597.32	6,658.72	836.17	6,652.72	0.00	0.00	0.00	
14,200.00	90.30	359.60	7,596.79	6,758.72	835.46	6,752.72	0.00	0.00	0.00	
14,300.00	90.30	359.60	7,596.26	6,858.72	834.76	6,852.72	0.00	0.00	0.00	
14,400.00	90.30	359.60	7,595.73	6,958.71	834.05	6,952.72	0.00	0.00	0.00	
14,500.00	90.30	359.60	7,595.20	7,058.71	833.34	7,052.72	0.00	0.00	0.00	
14,600.00	90.30	359.60	7,594.66	7,158.70	832.64	7,152.72	0.00	0.00	0.00	
14,700.00	90.30	359.60	7,594.13	7,258.70	831.93	7,252.72	0.00	0.00	0.00	
14,800.00	90.30	359.60	7,593.60	7,358.70	831.22	7,352.71	0.00	0.00	0.00	
14,900.00	90.30	359.60	7,593.07	7,458.69	830.52	7,452.71	0.00	0.00	0.00	
15,000.00	90.30	359.60	7,592.54	7,558.69	829.81	7,552.71	0.00	0.00	0.00	
15,100.00	90.30	359.60	7,592.01	7,658.68	829.11	7,652.71	0.00	0.00	0.00	
15,200.00	90.30	359.60	7,591.47	7,758.68	828.40	7,752.71	0.00	0.00	0.00	
15,300.00	90.30	359.60	7,590.94	7,858.68	827.69	7,852.71	0.00	0.00	0.00	
15,400.00	90.30	359.60	7,590.41	7,958.67	826.99	7,952.71	0.00	0.00	0.00	
15,500.00	90.30	359.60	7,589.88	8,058.67	826.28	8,052.70	0.00	0.00	0.00	
15,600.00	90.30	359.60	7,589.35	8,158.67	825.58	8,152.70	0.00	0.00	0.00	
15,700.00	90.30	359.60	7,588.82	8,258.66	824.87	8,252.70	0.00	0.00	0.00	
15,800.00	90.30	359.60	7,588.28	8,358.66	824.16	8,352.70	0.00	0.00	0.00	
15,900.00	90.30	359.60	7,587.75	8,458.65	823.46	8,452.70	0.00	0.00	0.00	
16,000.00	90.30	359.60	7,587.22	8,558.65	822.75	8,552.70	0.00	0.00	0.00	
16,100.00	90.30	359.60	7,586.69	8,658.65	822.04	8,652.70	0.00	0.00	0.00	
16,200.00	90.30	359.60	7,586.16	8,758.64	821.34	8,752.69	0.00	0.00	0.00	
16,300.00	90.30	359.60	7,585.63	8,858.64	820.63	8,852.69	0.00	0.00	0.00	
16,400.00	90.30	359.60	7,585.09	8,958.63	819.93	8,952.69	0.00	0.00	0.00	
16,500.00	90.30	359.60	7,584.56	9,058.63	819.22	9,052.69	0.00	0.00	0.00	
16,600.00	90.30	359.60	7,584.03	9,158.63	818.51	9,152.69	0.00	0.00	0.00	
16,700.00	90.30	359.60	7,583.50	9,258.62	817.81	9,252.69	0.00	0.00	0.00	
16,800.00	90.30	359.60	7,582.97	9,358.62	817.10	9,352.69	0.00	0.00	0.00	
16,900.00	90.30	359.60	7,582.44	9,458.61	816.40	9,452.68	0.00	0.00	0.00	
17,000.00	90.30	359.60	7,581.90	9,558.61	815.69	9,552.68	0.00	0.00	0.00	
17,100.00	90.30	359.60	7,581.37	9,658.61	814.98	9,652.68	0.00	0.00	0.00	
17,200.00	90.30	359.60	7,580.84	9,758.60	814.28	9,752.68	0.00	0.00	0.00	
17,300.00	90.30	359.60	7,580.31	9,858.60	813.57	9,852.68	0.00	0.00	0.00	
17,400.00	90.30	359.60	7,579.78	9,958.60	812.87	9,952.68	0.00	0.00	0.00	
17,500.00	90.30	359.60	7,579.25	10,058.59	812.16	10,052.68	0.00	0.00	0.00	
17,600.00	90.30	359.60	7,578.71	10,158.59	811.45	10,152.67	0.00	0.00	0.00	
17,700.00	90.30	359.60	7,578.18	10,258.58	810.75	10,252.67	0.00	0.00	0.00	
17,800.00	90.30	359.60	7,577.65	10,358.58	810.04	10,352.67	0.00	0.00	0.00	
17,900.00	90.30	359.60	7,577.12	10,458.58	809.33	10,452.67	0.00	0.00	0.00	
18,000.00	90.30	359.60	7,576.59	10,558.57	808.63	10,552.67	0.00	0.00	0.00	
18,100.00	90.30	359.60	7,576.06	10,658.57	807.92	10,652.67	0.00	0.00	0.00	
18,200.00	90.30	359.60	7,575.52	10,758.56	807.22	10,752.67	0.00	0.00	0.00	
18,298.56	90.30	359.60	7,575.00	10,857.12	806.52	10,851.22	0.00	0.00	0.00	
TD Well @ 18298.56ft										



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<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5089.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 BUDDY 17-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	BUDDY 7-16HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-2		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,520.00	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
8,142.53	7,629.00	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,264.30	1,252.00	Fox Hills				
4,348.20	4,248.00	Parkman				
4,727.91	4,627.00	Sussex				
7,531.97	7,387.00	Sharon Springs				
7,639.58	7,462.00	Niobrara				
7,773.74	7,538.00	Nio B				
8,054.00	7,624.00	Nio C				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
230.00	230.00	0.00	0.00	Begin Nudge @ 230.00ft	
1,170.00	1,160.54	-2.41	115.06	End Nudge @ 1170.00ft	
3,970.00	3,876.18	-16.70	797.03	Begin Drop @ 3970.00ft	
4,675.00	4,574.09	-18.50	883.32	End Drop @ 4675.00ft	
7,013.72	6,912.81	-18.50	883.32	KOP @ 7013.72ft :: DLS = 8°/100'	
8,142.53	7,629.00	701.48	878.23	End Build @ 8142.53ft	
18,298.56	7,575.00	10,857.12	806.52	TD Well @ 18298.56ft	