

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

**1N-67W-07 RANGER 18-7HZ PAD**

**RANGER 7-19HZ**

**Plan A**

**Plan: Permit Rev-1**

SHL Lat/Long: 40.070788/-104.936710

Survey Program: MWD+IFR+MSA

## **Standard Planning Report**

**16 May, 2018**

Project: WELD-NAD83-UTMFT13N  
Site: 1N-67W-07 RANGER 18-7HZ PAD  
Well: RANGER 7-19HZ  
Wellbore: Plan A  
Design: Permit Rev-1

## US ROCKIES WATTENBERG PLANNING

### CASING DETAILS

TVD	MD	Size
1500.00	1520.53	9-5/8
7696.00	8218.38	5-1/2

WELL DETAILS: RANGER 7-19HZ

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	240.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00	0.00	
3	1218.67	14.68	90.20	1207.99	-0.44	124.69	1.50	90.20	-0.41	
4	4018.67	14.68	90.20	3916.59	-2.91	834.26	0.00	0.00	-2.77	
5	4752.67	0.00	0.00	4642.59	-3.24	927.78	2.00	180.00	-3.08	
6	7089.89	0.00	0.00	6979.81	-3.24	927.78	0.00	0.00	-3.08	
7	8218.38	90.28	0.01	7696.00	716.45	927.94	8.00	0.01	716.61	
8	18892.70	90.28	0.01	7644.00	11390.64	930.32	0.00	0.00	11390.80	RANGER 7-19HZ_BHL

### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
RANGER 7-19HZ_SHL	0.00	0.00	0.00	40.070788	-104.936710
RANGER 7-19HZ_BHL	7644.00	11390.64	930.32	40.102068	-104.933383

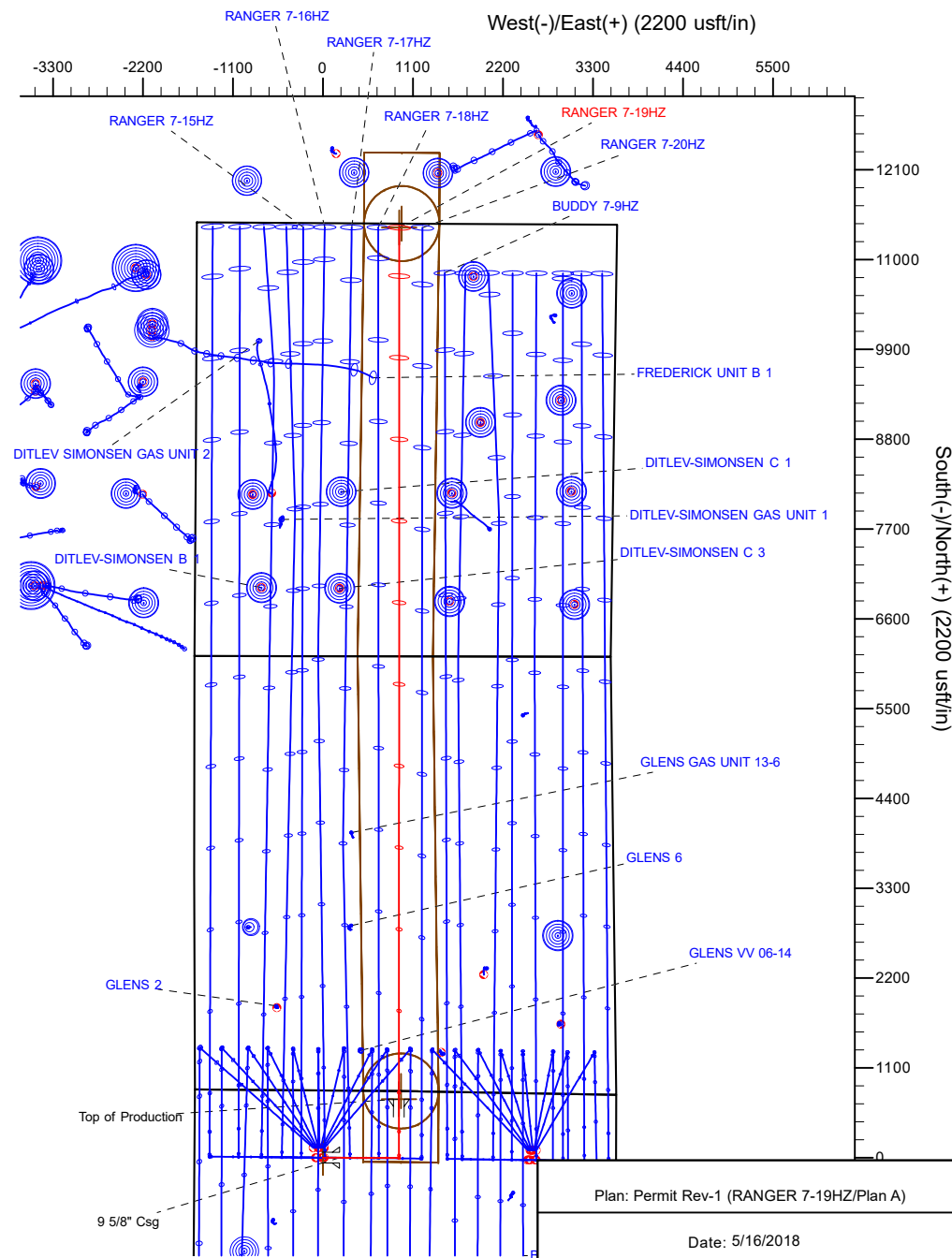
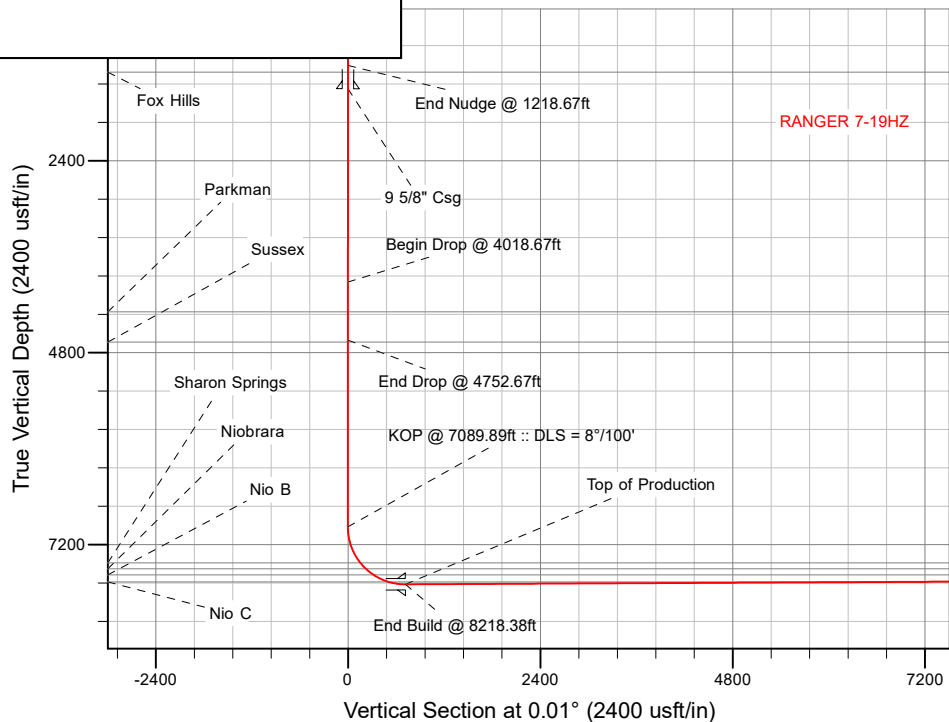
### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1292.00	1305.51	Fox Hills
4288.00	4397.17	Parkman
4667.00	4777.08	Sussex
7427.00	7572.86	Sharon Springs
7502.00	7675.04	Niobrara
7578.00	7797.89	Nio B
7664.00	7999.96	Nio C

**SHL**  
**825' FNL**  
**1574' FWL**

**HEEL**  
**100' FNL**  
**2496' FWL**

**TOE**  
**51' FNL**  
**2474' FWL**



# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well RANGER 7-19HZ
<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-67W-07 RANGER 18-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RANGER 7-19HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

<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)		

Site		1N-67W-07 RANGER 18-7HZ PAD			
Site Position:		Northing:	14,552,637.51 usft	Latitude:	40.071120
From:	Lat/Long	Easting:	1,658,003.51 usft	Longitude:	-104.937136
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.04 °

Well		RANGER 7-19HZ				
Well Position	+N/-S	-120.90 usft	Northing:	14,552,516.69 usft	Latitude:	40.070788
	+E/-W	119.18 usft	Easting:	1,658,122.77 usft	Longitude:	-104.936710
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	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	5/3/2018	8.18	66.54	52,100.46340929

<b>Design</b>	Permit Rev-1			
<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	0.01

<b>Plan Survey Tool Program</b>	<b>Date</b>	5/16/2018		
<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-1 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio
2	1,500.00	18,892.70	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:Rockies, crustal dec +

Corporate  
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well RANGER 7-19HZ
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-67W-07 RANGER 18-7HZ PAD	North Reference:	True
Well:	RANGER 7-19HZ	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	
240.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,218.67	14.68	90.20	1,207.99	-0.44	124.69	1.50	1.50	0.00	90.20	
4,018.67	14.68	90.20	3,916.59	-2.91	834.26	0.00	0.00	0.00	0.00	
4,752.67	0.00	0.00	4,642.59	-3.24	927.78	2.00	-2.00	0.00	180.00	
7,089.89	0.00	0.00	6,979.81	-3.24	927.78	0.00	0.00	0.00	0.00	
8,218.38	90.28	0.01	7,696.00	716.45	927.94	8.00	8.00	0.00	0.01	
18,892.70	90.28	0.01	7,644.00	11,390.64	930.32	0.00	0.00	0.00	0.00	RANGER 6-19HZ_BH

# Corporate Planning Report

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<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-67W-07 RANGER 18-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RANGER 7-19HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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
240.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 240.00ft									
300.00	0.90	90.20	300.00	0.00	0.47	0.00	1.50	1.50	0.00
400.00	2.40	90.20	399.95	-0.01	3.35	-0.01	1.50	1.50	0.00
500.00	3.90	90.20	499.80	-0.03	8.85	-0.03	1.50	1.50	0.00
600.00	5.40	90.20	599.47	-0.06	16.95	-0.06	1.50	1.50	0.00
700.00	6.90	90.20	698.89	-0.10	27.66	-0.09	1.50	1.50	0.00
800.00	8.40	90.20	798.00	-0.14	40.98	-0.14	1.50	1.50	0.00
900.00	9.90	90.20	896.72	-0.20	56.88	-0.19	1.50	1.50	0.00
1,000.00	11.40	90.20	995.00	-0.26	75.36	-0.25	1.50	1.50	0.00
1,100.00	12.90	90.20	1,092.75	-0.34	96.40	-0.32	1.50	1.50	0.00
1,200.00	14.40	90.20	1,189.93	-0.42	120.00	-0.40	1.50	1.50	0.00
1,218.67	14.68	90.20	1,207.99	-0.44	124.69	-0.41	1.50	1.50	0.00
End Nudge @ 1218.67ft									
1,300.00	14.68	90.20	1,286.67	-0.51	145.30	-0.48	0.00	0.00	0.00
1,305.51	14.68	90.20	1,292.00	-0.51	146.70	-0.49	0.00	0.00	0.00
Fox Hills									
1,400.00	14.68	90.20	1,383.41	-0.60	170.64	-0.57	0.00	0.00	0.00
1,500.00	14.68	90.20	1,480.14	-0.68	195.98	-0.65	0.00	0.00	0.00
1,520.53	14.68	90.20	1,500.00	-0.70	201.19	-0.67	0.00	0.00	0.00
9 5/8" Csg									
1,600.00	14.68	90.20	1,576.88	-0.77	221.33	-0.73	0.00	0.00	0.00
1,700.00	14.68	90.20	1,673.62	-0.86	246.67	-0.82	0.00	0.00	0.00
1,800.00	14.68	90.20	1,770.35	-0.95	272.01	-0.90	0.00	0.00	0.00
1,900.00	14.68	90.20	1,867.09	-1.04	297.35	-0.99	0.00	0.00	0.00
2,000.00	14.68	90.20	1,963.82	-1.13	322.69	-1.07	0.00	0.00	0.00
2,100.00	14.68	90.20	2,060.56	-1.21	348.04	-1.15	0.00	0.00	0.00
2,200.00	14.68	90.20	2,157.29	-1.30	373.38	-1.24	0.00	0.00	0.00
2,300.00	14.68	90.20	2,254.03	-1.39	398.72	-1.32	0.00	0.00	0.00
2,400.00	14.68	90.20	2,350.76	-1.48	424.06	-1.41	0.00	0.00	0.00
2,500.00	14.68	90.20	2,447.50	-1.57	449.40	-1.49	0.00	0.00	0.00
2,600.00	14.68	90.20	2,544.24	-1.66	474.74	-1.57	0.00	0.00	0.00
2,700.00	14.68	90.20	2,640.97	-1.75	500.09	-1.66	0.00	0.00	0.00
2,800.00	14.68	90.20	2,737.71	-1.83	525.43	-1.74	0.00	0.00	0.00
2,900.00	14.68	90.20	2,834.44	-1.92	550.77	-1.83	0.00	0.00	0.00
3,000.00	14.68	90.20	2,931.18	-2.01	576.11	-1.91	0.00	0.00	0.00
3,100.00	14.68	90.20	3,027.91	-2.10	601.45	-1.99	0.00	0.00	0.00
3,200.00	14.68	90.20	3,124.65	-2.19	626.80	-2.08	0.00	0.00	0.00
3,300.00	14.68	90.20	3,221.39	-2.28	652.14	-2.16	0.00	0.00	0.00
3,400.00	14.68	90.20	3,318.12	-2.36	677.48	-2.25	0.00	0.00	0.00
3,500.00	14.68	90.20	3,414.86	-2.45	702.82	-2.33	0.00	0.00	0.00
3,600.00	14.68	90.20	3,511.59	-2.54	728.16	-2.41	0.00	0.00	0.00
3,700.00	14.68	90.20	3,608.33	-2.63	753.51	-2.50	0.00	0.00	0.00
3,800.00	14.68	90.20	3,705.06	-2.72	778.85	-2.58	0.00	0.00	0.00
3,900.00	14.68	90.20	3,801.80	-2.81	804.19	-2.67	0.00	0.00	0.00
4,000.00	14.68	90.20	3,898.53	-2.90	829.53	-2.75	0.00	0.00	0.00
4,018.67	14.68	90.20	3,916.59	-2.91	834.26	-2.77	0.00	0.00	0.00
Begin Drop @ 4018.67ft									
4,100.00	13.05	90.20	3,995.55	-2.98	853.75	-2.83	2.00	-2.00	0.00
4,200.00	11.05	90.20	4,093.34	-3.05	874.63	-2.90	2.00	-2.00	0.00
4,300.00	9.05	90.20	4,191.80	-3.11	892.09	-2.96	2.00	-2.00	0.00

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<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-67W-07 RANGER 18-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RANGER 7-19HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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)
4,397.17	7.11	90.20	4,288.00	-3.16	905.75	-3.00	2.00	-2.00	0.00
<b>Parkman</b>									
4,400.00	7.05	90.20	4,290.81	-3.16	906.10	-3.00	2.00	-2.00	0.00
4,500.00	5.05	90.20	4,390.25	-3.20	916.64	-3.04	2.00	-2.00	0.00
4,600.00	3.05	90.20	4,489.99	-3.22	923.71	-3.06	2.00	-2.00	0.00
4,700.00	1.05	90.20	4,589.92	-3.24	927.29	-3.08	2.00	-2.00	0.00
4,752.67	0.00	0.00	4,642.59	-3.24	927.78	-3.08	2.00	-2.00	0.00
<b>End Drop @ 4752.67ft</b>									
4,777.08	0.00	0.00	4,667.00	-3.24	927.78	-3.08	0.00	0.00	0.00
<b>Sussex</b>									
4,800.00	0.00	0.00	4,689.92	-3.24	927.78	-3.08	0.00	0.00	0.00
4,900.00	0.00	0.00	4,789.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,000.00	0.00	0.00	4,889.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,100.00	0.00	0.00	4,989.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,200.00	0.00	0.00	5,089.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,300.00	0.00	0.00	5,189.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,400.00	0.00	0.00	5,289.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,500.00	0.00	0.00	5,389.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,600.00	0.00	0.00	5,489.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,700.00	0.00	0.00	5,589.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,800.00	0.00	0.00	5,689.92	-3.24	927.78	-3.08	0.00	0.00	0.00
5,900.00	0.00	0.00	5,789.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,000.00	0.00	0.00	5,889.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,100.00	0.00	0.00	5,989.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,200.00	0.00	0.00	6,089.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,300.00	0.00	0.00	6,189.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,400.00	0.00	0.00	6,289.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,500.00	0.00	0.00	6,389.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,600.00	0.00	0.00	6,489.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,700.00	0.00	0.00	6,589.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,800.00	0.00	0.00	6,689.92	-3.24	927.78	-3.08	0.00	0.00	0.00
6,900.00	0.00	0.00	6,789.92	-3.24	927.78	-3.08	0.00	0.00	0.00
7,000.00	0.00	0.00	6,889.92	-3.24	927.78	-3.08	0.00	0.00	0.00
7,089.89	0.00	0.00	6,979.81	-3.24	927.78	-3.08	0.00	0.00	0.00
<b>KOP @ 7089.89ft :: DLS = 8°/100'</b>									
7,100.00	0.81	0.01	6,989.92	-3.17	927.78	-3.01	8.00	8.00	0.00
7,200.00	8.81	0.01	7,089.49	5.21	927.78	5.37	8.00	8.00	0.00
7,300.00	16.81	0.01	7,186.92	27.36	927.79	27.52	8.00	8.00	0.00
7,400.00	24.81	0.01	7,280.32	62.86	927.79	63.02	8.00	8.00	0.00
7,500.00	32.81	0.01	7,367.87	111.01	927.80	111.17	8.00	8.00	0.00
7,572.86	38.64	0.01	7,427.00	153.53	927.81	153.69	8.00	8.00	0.00
<b>Sharon Springs</b>									
7,600.00	40.81	0.01	7,447.87	170.87	927.82	171.03	8.00	8.00	0.00
7,675.04	46.81	0.01	7,502.00	222.80	927.83	222.96	8.00	8.00	0.00
<b>Niobrara</b>									
7,700.00	48.81	0.01	7,518.76	241.29	927.83	241.45	8.00	8.00	0.00
7,797.89	56.64	0.01	7,578.00	319.12	927.85	319.28	8.00	8.00	0.00
<b>Nio B</b>									
7,800.00	56.81	0.01	7,579.16	320.89	927.85	321.05	8.00	8.00	0.00
7,900.00	64.81	0.01	7,627.89	408.12	927.87	408.28	8.00	8.00	0.00
7,999.96	72.81	0.01	7,664.00	501.24	927.89	501.40	8.00	8.00	0.00
<b>Nio C</b>									
8,000.00	72.81	0.01	7,664.01	501.28	927.89	501.44	8.00	8.00	0.00

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well RANGER 7-19HZ
<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-67W-07 RANGER 18-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RANGER 7-19HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,100.00	80.81	0.01	7,686.81	598.56	927.91	598.72	8.00	8.00	0.00
8,200.00	88.81	0.01	7,695.85	698.07	927.94	698.23	8.00	8.00	0.00
8,218.38	90.28	0.01	7,696.00	716.45	927.94	716.61	8.00	8.00	0.00
End Build @ 8218.38ft - Top of Production									
8,300.00	90.28	0.01	7,695.60	798.07	927.96	798.23	0.00	0.00	0.00
8,400.00	90.28	0.01	7,695.11	898.07	927.98	898.23	0.00	0.00	0.00
8,500.00	90.28	0.01	7,694.63	998.07	928.00	998.23	0.00	0.00	0.00
8,600.00	90.28	0.01	7,694.14	1,098.06	928.02	1,098.23	0.00	0.00	0.00
8,700.00	90.28	0.01	7,693.65	1,198.06	928.05	1,198.22	0.00	0.00	0.00
8,800.00	90.28	0.01	7,693.17	1,298.06	928.07	1,298.22	0.00	0.00	0.00
8,900.00	90.28	0.01	7,692.68	1,398.06	928.09	1,398.22	0.00	0.00	0.00
9,000.00	90.28	0.01	7,692.19	1,498.06	928.11	1,498.22	0.00	0.00	0.00
9,100.00	90.28	0.01	7,691.70	1,598.06	928.14	1,598.22	0.00	0.00	0.00
9,200.00	90.28	0.01	7,691.22	1,698.06	928.16	1,698.22	0.00	0.00	0.00
9,300.00	90.28	0.01	7,690.73	1,798.06	928.18	1,798.22	0.00	0.00	0.00
9,400.00	90.28	0.01	7,690.24	1,898.05	928.20	1,898.22	0.00	0.00	0.00
9,500.00	90.28	0.01	7,689.76	1,998.05	928.23	1,998.22	0.00	0.00	0.00
9,600.00	90.28	0.01	7,689.27	2,098.05	928.25	2,098.21	0.00	0.00	0.00
9,700.00	90.28	0.01	7,688.78	2,198.05	928.27	2,198.21	0.00	0.00	0.00
9,800.00	90.28	0.01	7,688.29	2,298.05	928.29	2,298.21	0.00	0.00	0.00
9,900.00	90.28	0.01	7,687.81	2,398.05	928.32	2,398.21	0.00	0.00	0.00
10,000.00	90.28	0.01	7,687.32	2,498.05	928.34	2,498.21	0.00	0.00	0.00
10,100.00	90.28	0.01	7,686.83	2,598.05	928.36	2,598.21	0.00	0.00	0.00
10,200.00	90.28	0.01	7,686.35	2,698.05	928.38	2,698.21	0.00	0.00	0.00
10,300.00	90.28	0.01	7,685.86	2,798.04	928.40	2,798.21	0.00	0.00	0.00
10,400.00	90.28	0.01	7,685.37	2,898.04	928.43	2,898.20	0.00	0.00	0.00
10,500.00	90.28	0.01	7,684.88	2,998.04	928.45	2,998.20	0.00	0.00	0.00
10,600.00	90.28	0.01	7,684.40	3,098.04	928.47	3,098.20	0.00	0.00	0.00
10,700.00	90.28	0.01	7,683.91	3,198.04	928.49	3,198.20	0.00	0.00	0.00
10,800.00	90.28	0.01	7,683.42	3,298.04	928.52	3,298.20	0.00	0.00	0.00
10,900.00	90.28	0.01	7,682.94	3,398.04	928.54	3,398.20	0.00	0.00	0.00
11,000.00	90.28	0.01	7,682.45	3,498.04	928.56	3,498.20	0.00	0.00	0.00
11,100.00	90.28	0.01	7,681.96	3,598.03	928.58	3,598.20	0.00	0.00	0.00
11,200.00	90.28	0.01	7,681.47	3,698.03	928.61	3,698.20	0.00	0.00	0.00
11,300.00	90.28	0.01	7,680.99	3,798.03	928.63	3,798.19	0.00	0.00	0.00
11,400.00	90.28	0.01	7,680.50	3,898.03	928.65	3,898.19	0.00	0.00	0.00
11,500.00	90.28	0.01	7,680.01	3,998.03	928.67	3,998.19	0.00	0.00	0.00
11,600.00	90.28	0.01	7,679.53	4,098.03	928.69	4,098.19	0.00	0.00	0.00
11,700.00	90.28	0.01	7,679.04	4,198.03	928.72	4,198.19	0.00	0.00	0.00
11,800.00	90.28	0.01	7,678.55	4,298.03	928.74	4,298.19	0.00	0.00	0.00
11,900.00	90.28	0.01	7,678.06	4,398.02	928.76	4,398.19	0.00	0.00	0.00
12,000.00	90.28	0.01	7,677.58	4,498.02	928.78	4,498.19	0.00	0.00	0.00
12,100.00	90.28	0.01	7,677.09	4,598.02	928.81	4,598.18	0.00	0.00	0.00
12,200.00	90.28	0.01	7,676.60	4,698.02	928.83	4,698.18	0.00	0.00	0.00
12,300.00	90.28	0.01	7,676.12	4,798.02	928.85	4,798.18	0.00	0.00	0.00
12,400.00	90.28	0.01	7,675.63	4,898.02	928.87	4,898.18	0.00	0.00	0.00
12,500.00	90.28	0.01	7,675.14	4,998.02	928.90	4,998.18	0.00	0.00	0.00
12,600.00	90.28	0.01	7,674.65	5,098.02	928.92	5,098.18	0.00	0.00	0.00
12,700.00	90.28	0.01	7,674.17	5,198.02	928.94	5,198.18	0.00	0.00	0.00
12,800.00	90.28	0.01	7,673.68	5,298.01	928.96	5,298.18	0.00	0.00	0.00
12,900.00	90.28	0.01	7,673.19	5,398.01	928.99	5,398.18	0.00	0.00	0.00
13,000.00	90.28	0.01	7,672.71	5,498.01	929.01	5,498.17	0.00	0.00	0.00
13,100.00	90.28	0.01	7,672.22	5,598.01	929.03	5,598.17	0.00	0.00	0.00

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<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-67W-07 RANGER 18-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RANGER 7-19HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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	90.28	0.01	7,671.73	5,698.01	929.05	5,698.17	0.00	0.00	0.00
13,300.00	90.28	0.01	7,671.24	5,798.01	929.07	5,798.17	0.00	0.00	0.00
13,400.00	90.28	0.01	7,670.76	5,898.01	929.10	5,898.17	0.00	0.00	0.00
13,500.00	90.28	0.01	7,670.27	5,998.01	929.12	5,998.17	0.00	0.00	0.00
13,600.00	90.28	0.01	7,669.78	6,098.00	929.14	6,098.17	0.00	0.00	0.00
13,700.00	90.28	0.01	7,669.30	6,198.00	929.16	6,198.17	0.00	0.00	0.00
13,800.00	90.28	0.01	7,668.81	6,298.00	929.19	6,298.16	0.00	0.00	0.00
13,900.00	90.28	0.01	7,668.32	6,398.00	929.21	6,398.16	0.00	0.00	0.00
14,000.00	90.28	0.01	7,667.83	6,498.00	929.23	6,498.16	0.00	0.00	0.00
14,100.00	90.28	0.01	7,667.35	6,598.00	929.25	6,598.16	0.00	0.00	0.00
14,200.00	90.28	0.01	7,666.86	6,698.00	929.28	6,698.16	0.00	0.00	0.00
14,300.00	90.28	0.01	7,666.37	6,798.00	929.30	6,798.16	0.00	0.00	0.00
14,400.00	90.28	0.01	7,665.89	6,898.00	929.32	6,898.16	0.00	0.00	0.00
14,500.00	90.28	0.01	7,665.40	6,997.99	929.34	6,998.16	0.00	0.00	0.00
14,600.00	90.28	0.01	7,664.91	7,097.99	929.37	7,098.16	0.00	0.00	0.00
14,700.00	90.28	0.01	7,664.42	7,197.99	929.39	7,198.15	0.00	0.00	0.00
14,800.00	90.28	0.01	7,663.94	7,297.99	929.41	7,298.15	0.00	0.00	0.00
14,900.00	90.28	0.01	7,663.45	7,397.99	929.43	7,398.15	0.00	0.00	0.00
15,000.00	90.28	0.01	7,662.96	7,497.99	929.45	7,498.15	0.00	0.00	0.00
15,100.00	90.28	0.01	7,662.48	7,597.99	929.48	7,598.15	0.00	0.00	0.00
15,200.00	90.28	0.01	7,661.99	7,697.99	929.50	7,698.15	0.00	0.00	0.00
15,300.00	90.28	0.01	7,661.50	7,797.98	929.52	7,798.15	0.00	0.00	0.00
15,400.00	90.28	0.01	7,661.01	7,897.98	929.54	7,898.15	0.00	0.00	0.00
15,500.00	90.28	0.01	7,660.53	7,997.98	929.57	7,998.14	0.00	0.00	0.00
15,600.00	90.28	0.01	7,660.04	8,097.98	929.59	8,098.14	0.00	0.00	0.00
15,700.00	90.28	0.01	7,659.55	8,197.98	929.61	8,198.14	0.00	0.00	0.00
15,800.00	90.28	0.01	7,659.07	8,297.98	929.63	8,298.14	0.00	0.00	0.00
15,900.00	90.28	0.01	7,658.58	8,397.98	929.66	8,398.14	0.00	0.00	0.00
16,000.00	90.28	0.01	7,658.09	8,497.98	929.68	8,498.14	0.00	0.00	0.00
16,100.00	90.28	0.01	7,657.60	8,597.98	929.70	8,598.14	0.00	0.00	0.00
16,200.00	90.28	0.01	7,657.12	8,697.97	929.72	8,698.14	0.00	0.00	0.00
16,300.00	90.28	0.01	7,656.63	8,797.97	929.75	8,798.13	0.00	0.00	0.00
16,400.00	90.28	0.01	7,656.14	8,897.97	929.77	8,898.13	0.00	0.00	0.00
16,500.00	90.28	0.01	7,655.66	8,997.97	929.79	8,998.13	0.00	0.00	0.00
16,600.00	90.28	0.01	7,655.17	9,097.97	929.81	9,098.13	0.00	0.00	0.00
16,700.00	90.28	0.01	7,654.68	9,197.97	929.83	9,198.13	0.00	0.00	0.00
16,800.00	90.28	0.01	7,654.19	9,297.97	929.86	9,298.13	0.00	0.00	0.00
16,900.00	90.28	0.01	7,653.71	9,397.97	929.88	9,398.13	0.00	0.00	0.00
17,000.00	90.28	0.01	7,653.22	9,497.96	929.90	9,498.13	0.00	0.00	0.00
17,100.00	90.28	0.01	7,652.73	9,597.96	929.92	9,598.13	0.00	0.00	0.00
17,200.00	90.28	0.01	7,652.25	9,697.96	929.95	9,698.12	0.00	0.00	0.00
17,300.00	90.28	0.01	7,651.76	9,797.96	929.97	9,798.12	0.00	0.00	0.00
17,400.00	90.28	0.01	7,651.27	9,897.96	929.99	9,898.12	0.00	0.00	0.00
17,500.00	90.28	0.01	7,650.78	9,997.96	930.01	9,998.12	0.00	0.00	0.00
17,600.00	90.28	0.01	7,650.30	10,097.96	930.04	10,098.12	0.00	0.00	0.00
17,700.00	90.28	0.01	7,649.81	10,197.96	930.06	10,198.12	0.00	0.00	0.00
17,800.00	90.28	0.01	7,649.32	10,297.95	930.08	10,298.12	0.00	0.00	0.00
17,900.00	90.28	0.01	7,648.84	10,397.95	930.10	10,398.12	0.00	0.00	0.00
18,000.00	90.28	0.01	7,648.35	10,497.95	930.13	10,498.11	0.00	0.00	0.00
18,100.00	90.28	0.01	7,647.86	10,597.95	930.15	10,598.11	0.00	0.00	0.00
18,200.00	90.28	0.01	7,647.37	10,697.95	930.17	10,698.11	0.00	0.00	0.00
18,300.00	90.28	0.01	7,646.89	10,797.95	930.19	10,798.11	0.00	0.00	0.00
18,400.00	90.28	0.01	7,646.40	10,897.95	930.21	10,898.11	0.00	0.00	0.00
18,500.00	90.28	0.01	7,645.91	10,997.95	930.24	10,998.11	0.00	0.00	0.00



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<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5129.00usft (Drilling Rig)
<b>Site:</b>	1N-67W-07 RANGER 18-7HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RANGER 7-19HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	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)
18,600.00	90.28	0.01	7,645.43	11,097.95	930.26	11,098.11	0.00	0.00	0.00
18,700.00	90.28	0.01	7,644.94	11,197.94	930.28	11,198.11	0.00	0.00	0.00
18,800.00	90.28	0.01	7,644.45	11,297.94	930.30	11,298.11	0.00	0.00	0.00
18,892.70	90.28	0.01	7,644.00	11,390.64	930.32	11,390.80	0.00	0.00	0.00
TD Well @ 18892.70ft									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,520.53	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
8,218.38	7,696.00	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,305.51	1,292.00	Fox Hills				
4,397.17	4,288.00	Parkman				
4,777.08	4,667.00	Sussex				
7,572.86	7,427.00	Sharon Springs				
7,675.04	7,502.00	Niobrara				
7,797.89	7,578.00	Nio B				
7,999.96	7,664.00	Nio C				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
240.00	240.00	0.00	0.00	Begin Nudge @ 240.00ft	
1,218.67	1,207.99	-0.44	124.69	End Nudge @ 1218.67ft	
4,018.67	3,916.59	-2.91	834.26	Begin Drop @ 4018.67ft	
4,752.67	4,642.59	-3.24	927.78	End Drop @ 4752.67ft	
7,089.89	6,979.81	-3.24	927.78	KOP @ 7089.89ft :: DLS = 8°/100'	
8,218.38	7,696.00	716.45	927.94	End Build @ 8218.38ft	
18,892.70	7,644.00	11,390.64	930.32	TD Well @ 18892.70ft	