

US ROCKIES WATTENBERG PLANNING

**WELD-NAD83-UTMFT13N
5N-67W-09 RAINBOW 24-9HZ PAD
RAINBOW 9-18HZ**

Plan A

Plan: Permit Rev-2

Standard Planning Report

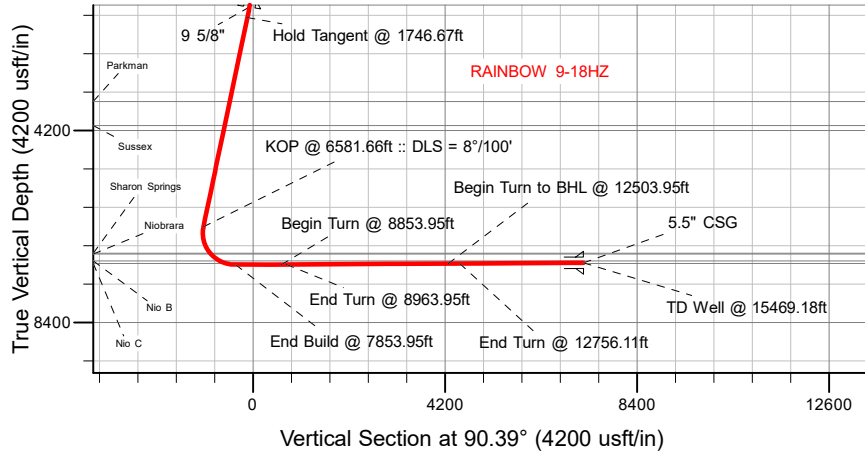
30 August, 2022

Project: WELD-NAD83-UTMFT13N
 Site: 5N-67W-09 RAINBOW 24-9HZ PAD
 Well: RAINBOW 9-18HZ
 Wellbore: Plan A
 Design: Permit Rev-2

US ROCKIES WATTENBERG PLANNING

CASING DETAILS

TVD	MD	Name	Size
1500.00	1511.79	9 5/8"	9-5/8
7092.00	15469.18	5.5" CSG	5-1/2



SHL
2439' FNL
2101' FEL

LP
1247' FSL
2445' FEL

BHL
1214' FSL
70' FEL

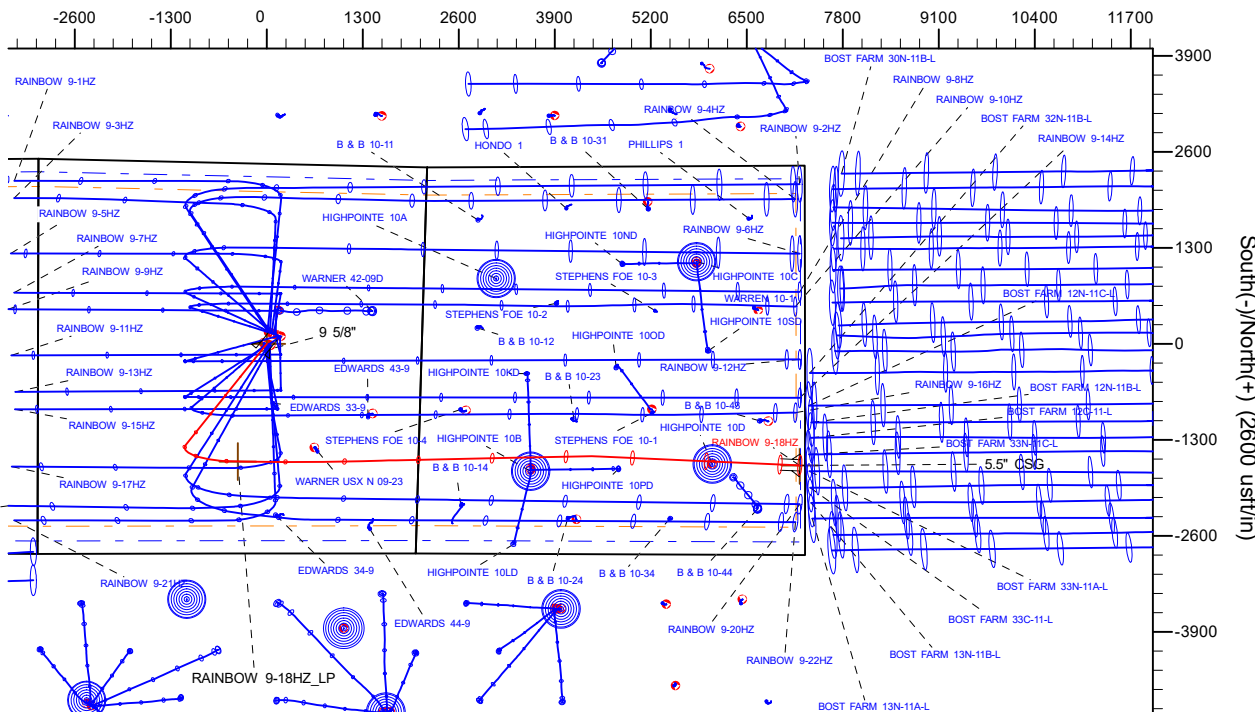
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	
1746.67	18.70	218.75	1724.65	-157.26	-126.21	1.50	218.75	-125.14	
6581.66	18.70	218.75	6304.41	-1366.20	-1096.49	0.00	0.00	-1087.17	
7853.95	90.32	90.40	7134.00	-1592.65	-392.31	8.00	-126.76	-381.46	
8853.95	90.32	90.40	7128.42	-1599.63	607.65	0.00	0.00	618.52	
8963.95	90.32	88.75	7127.80	-1598.81	717.64	1.50	-90.00	728.51	
12503.95	90.32	88.75	7108.03	-1521.59	4256.74	0.00	0.00	4267.00	
12756.11	90.31	92.53	7106.64	-1524.41	4508.83	1.50	90.15	4519.10	
15469.18	90.31	92.53	7092.00	-1644.28	7219.21	0.00	0.00	7230.24	RAINBOW 9-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	Northing	Easting	Latitude	Longitude
RAINBOW 9-18HZ_SHL	0.00	14677760.79	1669354.86	40.414689	-104.896036
RAINBOW 9-18HZ_LP	7134.00	14676167.68	1668964.42	40.410315	-104.897446
RAINBOW 9-18HZ_BHL	7092.00	14676125.00	1676576.00	40.410170	-104.870102

West(-)/East(+) (2600 usft/in)



WELL DETAILS: RAINBOW 9-18HZ

GL = 4949'

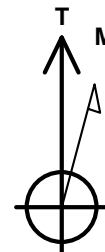
RKB = 17' @ 4966.00usft (RIG)

Plan: Permit Rev-2 (RAINBOW 9-18HZ/Plan A)

Date: 8/31/2022

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
807.00	807.33	Fox Hills
3564.00	3688.53	Parkman
4091.00	4244.90	Sussex
6881.00	7217.07	Sharon Springs
6899.00	7241.51	Niobrara
7051.00	7495.45	Nio B
7106.00	7645.37	Nio C



Azimuths to True North
Magnetic North: 7.80°

Magnetic Field
Strength: 51820.0nT
Dip Angle: 66.60°
Date: 8/28/2022
Model: IGRF2020

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RAINBOW 9-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4966.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4966.00usft (RIG)
Site:	5N-67W-09 RAINBOW 24-9HZ PAD	North Reference:	True
Well:	RAINBOW 9-18HZ	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 5N-67W-09 RAINBOW 24-9HZ PAD			
Site Position:		Northing:	14,677,926.65 usft
From:	Lat/Long	Easting:	1,669,365.10 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	40.415144
		Longitude:	-104.895999

Well RAINBOW 9-18HZ			
Well Position	+N/-S	0.00 usft	Northing: 14,677,760.79 usft
	+E/-W	0.00 usft	Easting: 1,669,354.86 usft
Position Uncertainty		3.28 usft	Wellhead Elevation: usft
Grid Convergence:		0.07 °	Ground Level: 4,949.00 usft
			Latitude: 40.414689
			Longitude: -104.896037

Wellbore Plan A					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF202013	8/28/2022	7.80	66.60	51,820.02379407

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	90.39

Plan Survey Tool Program		Date	8/30/2022		
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+I Fixed:v2:crustal field declinatio	
2	1,500.00	15,469.18	Permit Rev-2 (Plan A)	APC_ISCWSA REV 2 MWD+I Fixed:v2:Rockies, crustal dec +	

Planning Report

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Well:	RAINBOW 9-18HZ	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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,746.67	18.70	218.75	1,724.65	-157.26	-126.21	1.50	1.50	0.00	218.75	
6,581.66	18.70	218.75	6,304.41	-1,366.20	-1,096.49	0.00	0.00	0.00	0.00	
7,853.96	90.32	90.40	7,134.00	-1,592.65	-392.31	8.00	5.63	-10.09	-126.76	
8,853.96	90.32	90.40	7,128.42	-1,599.63	607.65	0.00	0.00	0.00	0.00	
8,963.95	90.32	88.75	7,127.80	-1,598.81	717.64	1.50	0.00	-1.50	-90.00	
12,503.95	90.32	88.75	7,108.03	-1,521.59	4,256.74	0.00	0.00	0.00	0.00	
12,756.11	90.31	92.53	7,106.64	-1,524.41	4,508.83	1.50	0.00	1.50	90.15	
15,469.18	90.31	92.53	7,092.00	-1,644.28	7,219.21	0.00	0.00	0.00	0.00	RAINBOW 9-18HZ_B

Planning Report

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Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4966.00usft (RIG)
Site:	5N-67W-09 RAINBOW 24-9HZ PAD	North Reference:	True
Well:	RAINBOW 9-18HZ	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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
Begin Nudge @ 500.00ft										
600.00	1.50	218.75	599.99	-1.02	-0.82	-0.81	1.50	1.50	0.00	
700.00	3.00	218.75	699.91	-4.08	-3.28	-3.25	1.50	1.50	0.00	
800.00	4.50	218.75	799.69	-9.18	-7.37	-7.31	1.50	1.50	0.00	
807.33	4.61	218.75	807.00	-9.64	-7.73	-7.67	1.50	1.50	0.00	
Fox Hills										
900.00	6.00	218.75	899.27	-16.32	-13.10	-12.99	1.50	1.50	0.00	
1,000.00	7.50	218.75	998.57	-25.49	-20.45	-20.28	1.50	1.50	0.00	
1,100.00	9.00	218.75	1,097.54	-36.68	-29.44	-29.19	1.50	1.50	0.00	
1,200.00	10.50	218.75	1,196.09	-49.88	-40.04	-39.69	1.50	1.50	0.00	
1,300.00	12.00	218.75	1,294.16	-65.10	-52.25	-51.80	1.50	1.50	0.00	
1,400.00	13.50	218.75	1,391.70	-82.31	-66.06	-65.50	1.50	1.50	0.00	
1,500.00	15.00	218.75	1,488.62	-101.50	-81.47	-80.77	1.50	1.50	0.00	
1,511.79	15.18	218.75	1,500.00	-103.90	-83.39	-82.68	1.50	1.50	0.00	
9 5/8"										
1,600.00	16.50	218.75	1,584.86	-122.67	-98.46	-97.62	1.50	1.50	0.00	
1,700.00	18.00	218.75	1,680.36	-145.80	-117.02	-116.02	1.50	1.50	0.00	
1,746.67	18.70	218.75	1,724.65	-157.26	-126.21	-125.14	1.50	1.50	0.00	
Hold Tangent @ 1746.67ft										
1,800.00	18.70	218.75	1,775.17	-170.59	-136.92	-135.75	0.00	0.00	0.00	
1,900.00	18.70	218.75	1,869.89	-195.60	-156.98	-155.65	0.00	0.00	0.00	
2,000.00	18.70	218.75	1,964.61	-220.60	-177.05	-175.55	0.00	0.00	0.00	
2,100.00	18.70	218.75	2,059.33	-245.61	-197.12	-195.44	0.00	0.00	0.00	
2,200.00	18.70	218.75	2,154.05	-270.61	-217.19	-215.34	0.00	0.00	0.00	
2,300.00	18.70	218.75	2,248.77	-295.61	-237.25	-235.24	0.00	0.00	0.00	
2,400.00	18.70	218.75	2,343.50	-320.62	-257.32	-255.13	0.00	0.00	0.00	
2,500.00	18.70	218.75	2,438.22	-345.62	-277.39	-275.03	0.00	0.00	0.00	
2,600.00	18.70	218.75	2,532.94	-370.63	-297.46	-294.93	0.00	0.00	0.00	
2,700.00	18.70	218.75	2,627.66	-395.63	-317.53	-314.83	0.00	0.00	0.00	
2,800.00	18.70	218.75	2,722.38	-420.63	-337.59	-334.72	0.00	0.00	0.00	
2,900.00	18.70	218.75	2,817.10	-445.64	-357.66	-354.62	0.00	0.00	0.00	
3,000.00	18.70	218.75	2,911.82	-470.64	-377.73	-374.52	0.00	0.00	0.00	
3,100.00	18.70	218.75	3,006.54	-495.65	-397.80	-394.42	0.00	0.00	0.00	
3,200.00	18.70	218.75	3,101.26	-520.65	-417.87	-414.31	0.00	0.00	0.00	
3,300.00	18.70	218.75	3,195.98	-545.65	-437.93	-434.21	0.00	0.00	0.00	
3,400.00	18.70	218.75	3,290.71	-570.66	-458.00	-454.11	0.00	0.00	0.00	
3,500.00	18.70	218.75	3,385.43	-595.66	-478.07	-474.00	0.00	0.00	0.00	
3,600.00	18.70	218.75	3,480.15	-620.67	-498.14	-493.90	0.00	0.00	0.00	
3,688.53	18.70	218.75	3,564.00	-642.80	-515.90	-511.52	0.00	0.00	0.00	
Parkman										
3,700.00	18.70	218.75	3,574.87	-645.67	-518.21	-513.80	0.00	0.00	0.00	
3,800.00	18.70	218.75	3,669.59	-670.68	-538.27	-533.70	0.00	0.00	0.00	
3,900.00	18.70	218.75	3,764.31	-695.68	-558.34	-553.59	0.00	0.00	0.00	
4,000.00	18.70	218.75	3,859.03	-720.68	-578.41	-573.49	0.00	0.00	0.00	
4,100.00	18.70	218.75	3,953.75	-745.69	-598.48	-593.39	0.00	0.00	0.00	
4,200.00	18.70	218.75	4,048.47	-770.69	-618.55	-613.29	0.00	0.00	0.00	
4,244.90	18.70	218.75	4,091.00	-781.92	-627.56	-622.22	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RAINBOW 9-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4966.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4966.00usft (RIG)
Site:	5N-67W-09 RAINBOW 24-9HZ PAD	North Reference:	True
Well:	RAINBOW 9-18HZ	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)
Sussex									
4,300.00	18.70	218.75	4,143.20	-795.70	-638.61	-633.18	0.00	0.00	0.00
4,400.00	18.70	218.75	4,237.92	-820.70	-658.68	-653.08	0.00	0.00	0.00
4,500.00	18.70	218.75	4,332.64	-845.70	-678.75	-672.98	0.00	0.00	0.00
4,600.00	18.70	218.75	4,427.36	-870.71	-698.82	-692.87	0.00	0.00	0.00
4,700.00	18.70	218.75	4,522.08	-895.71	-718.88	-712.77	0.00	0.00	0.00
4,800.00	18.70	218.75	4,616.80	-920.72	-738.95	-732.67	0.00	0.00	0.00
4,900.00	18.70	218.75	4,711.52	-945.72	-759.02	-752.57	0.00	0.00	0.00
5,000.00	18.70	218.75	4,806.24	-970.72	-779.09	-772.46	0.00	0.00	0.00
5,100.00	18.70	218.75	4,900.96	-995.73	-799.16	-792.36	0.00	0.00	0.00
5,200.00	18.70	218.75	4,995.68	-1,020.73	-819.22	-812.26	0.00	0.00	0.00
5,300.00	18.70	218.75	5,090.41	-1,045.74	-839.29	-832.15	0.00	0.00	0.00
5,400.00	18.70	218.75	5,185.13	-1,070.74	-859.36	-852.05	0.00	0.00	0.00
5,500.00	18.70	218.75	5,279.85	-1,095.74	-879.43	-871.95	0.00	0.00	0.00
5,600.00	18.70	218.75	5,374.57	-1,120.75	-899.50	-891.85	0.00	0.00	0.00
5,700.00	18.70	218.75	5,469.29	-1,145.75	-919.56	-911.74	0.00	0.00	0.00
5,800.00	18.70	218.75	5,564.01	-1,170.76	-939.63	-931.64	0.00	0.00	0.00
5,900.00	18.70	218.75	5,658.73	-1,195.76	-959.70	-951.54	0.00	0.00	0.00
6,000.00	18.70	218.75	5,753.45	-1,220.77	-979.77	-971.44	0.00	0.00	0.00
6,100.00	18.70	218.75	5,848.17	-1,245.77	-999.84	-991.33	0.00	0.00	0.00
6,200.00	18.70	218.75	5,942.89	-1,270.77	-1,019.90	-1,011.23	0.00	0.00	0.00
6,300.00	18.70	218.75	6,037.62	-1,295.78	-1,039.97	-1,031.13	0.00	0.00	0.00
6,400.00	18.70	218.75	6,132.34	-1,320.78	-1,060.04	-1,051.02	0.00	0.00	0.00
6,500.00	18.70	218.75	6,227.06	-1,345.79	-1,080.11	-1,070.92	0.00	0.00	0.00
6,581.66	18.70	218.75	6,304.41	-1,366.20	-1,096.49	-1,087.17	0.00	0.00	0.00
KOP @ 6581.66ft :: DLS = 8°/100'									
6,600.00	17.86	214.91	6,321.82	-1,370.80	-1,099.95	-1,090.59	8.00	-4.58	-20.91
6,650.00	16.02	202.69	6,369.67	-1,383.46	-1,107.00	-1,097.55	8.00	-3.69	-24.45
6,700.00	15.01	188.17	6,417.86	-1,396.24	-1,110.58	-1,101.05	8.00	-2.01	-29.04
6,750.00	15.02	172.69	6,466.18	-1,409.08	-1,110.68	-1,101.06	8.00	0.01	-30.97
6,800.00	16.03	158.18	6,514.37	-1,421.91	-1,107.28	-1,097.58	8.00	2.02	-29.01
6,850.00	17.88	145.97	6,562.21	-1,434.69	-1,100.42	-1,090.63	8.00	3.70	-24.41
6,900.00	20.33	136.30	6,609.46	-1,447.33	-1,090.12	-1,080.25	8.00	4.92	-19.34
6,950.00	23.21	128.79	6,655.90	-1,459.79	-1,076.44	-1,066.47	8.00	5.75	-15.04
7,000.00	26.36	122.91	6,701.30	-1,472.00	-1,059.43	-1,049.39	8.00	6.31	-11.75
7,050.00	29.71	118.24	6,745.43	-1,483.90	-1,039.18	-1,029.06	8.00	6.69	-9.34
7,100.00	33.19	114.46	6,788.08	-1,495.43	-1,015.80	-1,005.60	8.00	6.96	-7.57
7,150.00	36.77	111.32	6,829.05	-1,506.54	-989.39	-979.12	8.00	7.15	-6.27
7,200.00	40.41	108.67	6,868.12	-1,517.18	-960.09	-949.74	8.00	7.29	-5.29
7,217.07	41.67	107.86	6,881.00	-1,520.69	-949.44	-939.07	8.00	7.36	-4.77
Sharon Springs									
7,241.51	43.48	106.76	6,899.00	-1,525.61	-933.66	-923.25	8.00	7.40	-4.49
Niobrara									
7,250.00	44.11	106.40	6,905.13	-1,527.28	-928.03	-917.61	8.00	7.43	-4.29
7,300.00	47.84	104.41	6,939.87	-1,536.81	-893.37	-882.89	8.00	7.47	-3.98
7,350.00	51.61	102.64	6,972.19	-1,545.71	-856.29	-845.75	8.00	7.53	-3.53
7,400.00	55.40	101.05	7,001.92	-1,553.95	-816.96	-806.36	8.00	7.58	-3.18
7,450.00	59.21	99.60	7,028.93	-1,561.48	-775.57	-764.92	8.00	7.62	-2.90
7,495.45	62.68	98.37	7,051.00	-1,567.68	-736.33	-725.64	8.00	7.65	-2.69
Nio B									
7,500.00	63.03	98.26	7,053.08	-1,568.26	-732.33	-721.64	8.00	7.66	-2.59
7,550.00	66.87	97.00	7,074.24	-1,574.27	-687.44	-676.71	8.00	7.67	-2.51
7,600.00	70.71	95.82	7,092.33	-1,579.47	-641.13	-630.36	8.00	7.69	-2.37

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RAINBOW 9-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4966.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4966.00usft (RIG)
Site:	5N-67W-09 RAINBOW 24-9HZ PAD	North Reference:	True
Well:	RAINBOW 9-18HZ	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)
7,645.37	74.21	94.80	7,106.00	-1,583.46	-598.06	-587.27	8.00	7.70	-2.26
Nio C									
7,650.00	74.56	94.69	7,107.25	-1,583.83	-593.62	-582.82	8.00	7.71	-2.22
7,700.00	78.42	93.61	7,118.92	-1,587.35	-545.14	-534.32	8.00	7.72	-2.17
7,750.00	82.28	92.55	7,127.30	-1,589.99	-495.92	-485.09	8.00	7.72	-2.11
7,800.00	86.15	91.51	7,132.34	-1,591.75	-446.22	-435.37	8.00	7.73	-2.08
7,853.96	90.32	90.40	7,134.00	-1,592.65	-392.31	-381.46	8.00	7.73	-2.06
End Build @ 7853.95ft									
7,900.00	90.32	90.40	7,133.74	-1,592.97	-346.27	-335.42	0.00	0.00	0.00
8,000.00	90.32	90.40	7,133.18	-1,593.67	-246.27	-235.42	0.00	0.00	0.00
8,100.00	90.32	90.40	7,132.63	-1,594.36	-146.28	-135.42	0.00	0.00	0.00
8,200.00	90.32	90.40	7,132.07	-1,595.06	-46.28	-35.42	0.00	0.00	0.00
8,300.00	90.32	90.40	7,131.51	-1,595.76	53.72	64.58	0.00	0.00	0.00
8,400.00	90.32	90.40	7,130.95	-1,596.46	153.71	164.58	0.00	0.00	0.00
8,500.00	90.32	90.40	7,130.39	-1,597.16	253.71	264.57	0.00	0.00	0.00
8,600.00	90.32	90.40	7,129.83	-1,597.86	353.70	364.57	0.00	0.00	0.00
8,700.00	90.32	90.40	7,129.28	-1,598.55	453.70	464.57	0.00	0.00	0.00
8,800.00	90.32	90.40	7,128.72	-1,599.25	553.70	564.57	0.00	0.00	0.00
8,853.96	90.32	90.40	7,128.42	-1,599.63	607.65	618.52	0.00	0.00	0.00
Begin Turn @ 8853.95ft									
8,900.00	90.32	89.71	7,128.16	-1,599.67	653.69	664.57	1.50	0.00	-1.50
8,963.95	90.32	88.75	7,127.80	-1,598.81	717.64	728.51	1.50	0.00	-1.50
End Turn @ 8963.95ft									
9,000.00	90.32	88.75	7,127.60	-1,598.03	753.68	764.54	0.00	0.00	0.00
9,100.00	90.32	88.75	7,127.04	-1,595.84	853.65	864.49	0.00	0.00	0.00
9,200.00	90.32	88.75	7,126.48	-1,593.66	953.63	964.45	0.00	0.00	0.00
9,300.00	90.32	88.75	7,125.92	-1,591.48	1,053.60	1,064.41	0.00	0.00	0.00
9,400.00	90.32	88.75	7,125.37	-1,589.30	1,153.58	1,164.37	0.00	0.00	0.00
9,500.00	90.32	88.75	7,124.81	-1,587.12	1,253.55	1,264.32	0.00	0.00	0.00
9,600.00	90.32	88.75	7,124.25	-1,584.94	1,353.52	1,364.28	0.00	0.00	0.00
9,700.00	90.32	88.75	7,123.69	-1,582.76	1,453.50	1,464.24	0.00	0.00	0.00
9,800.00	90.32	88.75	7,123.13	-1,580.57	1,553.47	1,564.20	0.00	0.00	0.00
9,900.00	90.32	88.75	7,122.57	-1,578.39	1,653.45	1,664.15	0.00	0.00	0.00
10,000.00	90.32	88.75	7,122.01	-1,576.21	1,753.42	1,764.11	0.00	0.00	0.00
10,100.00	90.32	88.75	7,121.46	-1,574.03	1,853.40	1,864.07	0.00	0.00	0.00
10,200.00	90.32	88.75	7,120.90	-1,571.85	1,953.37	1,964.03	0.00	0.00	0.00
10,300.00	90.32	88.75	7,120.34	-1,569.67	2,053.35	2,063.98	0.00	0.00	0.00
10,400.00	90.32	88.75	7,119.78	-1,567.49	2,153.32	2,163.94	0.00	0.00	0.00
10,500.00	90.32	88.75	7,119.22	-1,565.30	2,253.30	2,263.90	0.00	0.00	0.00
10,600.00	90.32	88.75	7,118.66	-1,563.12	2,353.27	2,363.86	0.00	0.00	0.00
10,700.00	90.32	88.75	7,118.11	-1,560.94	2,453.25	2,463.81	0.00	0.00	0.00
10,800.00	90.32	88.75	7,117.55	-1,558.76	2,553.22	2,563.77	0.00	0.00	0.00
10,900.00	90.32	88.75	7,116.99	-1,556.58	2,653.20	2,663.73	0.00	0.00	0.00
11,000.00	90.32	88.75	7,116.43	-1,554.40	2,753.17	2,763.69	0.00	0.00	0.00
11,100.00	90.32	88.75	7,115.87	-1,552.22	2,853.14	2,863.64	0.00	0.00	0.00
11,200.00	90.32	88.75	7,115.31	-1,550.03	2,953.12	2,963.60	0.00	0.00	0.00
11,300.00	90.32	88.75	7,114.75	-1,547.85	3,053.09	3,063.56	0.00	0.00	0.00
11,400.00	90.32	88.75	7,114.20	-1,545.67	3,153.07	3,163.52	0.00	0.00	0.00
11,500.00	90.32	88.75	7,113.64	-1,543.49	3,253.04	3,263.47	0.00	0.00	0.00
11,600.00	90.32	88.75	7,113.08	-1,541.31	3,353.02	3,363.43	0.00	0.00	0.00
11,700.00	90.32	88.75	7,112.52	-1,539.13	3,452.99	3,463.39	0.00	0.00	0.00
11,800.00	90.32	88.75	7,111.96	-1,536.95	3,552.97	3,563.35	0.00	0.00	0.00
11,900.00	90.32	88.75	7,111.40	-1,534.76	3,652.94	3,663.30	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well RAINBOW 9-18HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4966.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4966.00usft (RIG)
Site:	5N-67W-09 RAINBOW 24-9HZ PAD	North Reference:	True
Well:	RAINBOW 9-18HZ	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)	
12,000.00	90.32	88.75	7,110.84	-1,532.58	3,752.92	3,763.26	0.00	0.00	0.00	
12,100.00	90.32	88.75	7,110.29	-1,530.40	3,852.89	3,863.22	0.00	0.00	0.00	
12,200.00	90.32	88.75	7,109.73	-1,528.22	3,952.87	3,963.18	0.00	0.00	0.00	
12,300.00	90.32	88.75	7,109.17	-1,526.04	4,052.84	4,063.13	0.00	0.00	0.00	
12,400.00	90.32	88.75	7,108.61	-1,523.86	4,152.82	4,163.09	0.00	0.00	0.00	
12,503.95	90.32	88.75	7,108.03	-1,521.59	4,256.74	4,267.00	0.00	0.00	0.00	
Begin Turn to BHL @ 12503.95ft										
12,600.00	90.32	90.19	7,107.50	-1,520.70	4,352.78	4,363.03	1.50	0.00	1.50	
12,700.00	90.31	91.69	7,106.95	-1,522.34	4,452.76	4,463.02	1.50	0.00	1.50	
12,756.11	90.31	92.53	7,106.64	-1,524.41	4,508.83	4,519.10	1.50	0.00	1.50	
End Turn @ 12756.11ft										
12,800.00	90.31	92.53	7,106.41	-1,526.35	4,552.68	4,562.96	0.00	0.00	0.00	
12,900.00	90.31	92.53	7,105.87	-1,530.77	4,652.58	4,662.89	0.00	0.00	0.00	
13,000.00	90.31	92.53	7,105.33	-1,535.19	4,752.48	4,762.82	0.00	0.00	0.00	
13,100.00	90.31	92.53	7,104.79	-1,539.60	4,852.38	4,862.75	0.00	0.00	0.00	
13,200.00	90.31	92.53	7,104.25	-1,544.02	4,952.28	4,962.68	0.00	0.00	0.00	
13,300.00	90.31	92.53	7,103.71	-1,548.44	5,052.18	5,062.61	0.00	0.00	0.00	
13,400.00	90.31	92.53	7,103.17	-1,552.86	5,152.09	5,162.54	0.00	0.00	0.00	
13,500.00	90.31	92.53	7,102.63	-1,557.28	5,251.99	5,262.46	0.00	0.00	0.00	
13,600.00	90.31	92.53	7,102.09	-1,561.70	5,351.89	5,362.39	0.00	0.00	0.00	
13,700.00	90.31	92.53	7,101.55	-1,566.11	5,451.79	5,462.32	0.00	0.00	0.00	
13,800.00	90.31	92.53	7,101.01	-1,570.53	5,551.69	5,562.25	0.00	0.00	0.00	
13,900.00	90.31	92.53	7,100.47	-1,574.95	5,651.59	5,662.18	0.00	0.00	0.00	
14,000.00	90.31	92.53	7,099.93	-1,579.37	5,751.49	5,762.11	0.00	0.00	0.00	
14,100.00	90.31	92.53	7,099.39	-1,583.79	5,851.39	5,862.04	0.00	0.00	0.00	
14,200.00	90.31	92.53	7,098.85	-1,588.21	5,951.29	5,961.96	0.00	0.00	0.00	
14,300.00	90.31	92.53	7,098.31	-1,592.63	6,051.19	6,061.89	0.00	0.00	0.00	
14,400.00	90.31	92.53	7,097.77	-1,597.04	6,151.09	6,161.82	0.00	0.00	0.00	
14,500.00	90.31	92.53	7,097.23	-1,601.46	6,250.99	6,261.75	0.00	0.00	0.00	
14,600.00	90.31	92.53	7,096.69	-1,605.88	6,350.90	6,361.68	0.00	0.00	0.00	
14,700.00	90.31	92.53	7,096.15	-1,610.30	6,450.80	6,461.61	0.00	0.00	0.00	
14,800.00	90.31	92.53	7,095.61	-1,614.72	6,550.70	6,561.54	0.00	0.00	0.00	
14,900.00	90.31	92.53	7,095.07	-1,619.14	6,650.60	6,661.47	0.00	0.00	0.00	
15,000.00	90.31	92.53	7,094.53	-1,623.55	6,750.50	6,761.39	0.00	0.00	0.00	
15,100.00	90.31	92.53	7,093.99	-1,627.97	6,850.40	6,861.32	0.00	0.00	0.00	
15,200.00	90.31	92.53	7,093.45	-1,632.39	6,950.30	6,961.25	0.00	0.00	0.00	
15,300.00	90.31	92.53	7,092.91	-1,636.81	7,050.20	7,061.18	0.00	0.00	0.00	
15,400.00	90.31	92.53	7,092.37	-1,641.23	7,150.10	7,161.11	0.00	0.00	0.00	
15,469.18	90.31	92.53	7,092.00	-1,644.28	7,219.21	7,230.24	0.00	0.00	0.00	
TD Well @ 15469.18ft										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,511.79	1,500.00	9 5/8"	9-5/8	13-1/2	
15,469.18	7,092.00	5.5" CSG	5-1/2	7-7/8	

Planning Report

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Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 4966.00usft (RIG)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 4966.00usft (RIG)
Site:	5N-67W-09 RAINBOW 24-9HZ PAD	North Reference:	True
Well:	RAINBOW 9-18HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-2		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
807.33	807.00	Fox Hills			
3,688.53	3,564.00	Parkman			
4,244.90	4,091.00	Sussex			
7,217.07	6,881.00	Sharon Springs			
7,241.51	6,899.00	Niobrara			
7,495.45	7,051.00	Nio B			
7,645.37	7,106.00	Nio C			

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
500.00	500.00	0.00	0.00	Begin Nudge @ 500.00ft	
1,746.67	1,724.65	-157.26	-126.21	Hold Tangent @ 1746.67ft	
6,581.66	6,304.41	-1,366.20	-1,096.49	KOP @ 6581.66ft :: DLS = 8"/100'	
7,853.96	7,134.00	-1,592.65	-392.31	End Build @ 7853.95ft	
8,853.96	7,128.42	-1,599.63	607.65	Begin Turn @ 8853.95ft	
8,963.95	7,127.80	-1,598.81	717.64	End Turn @ 8963.95ft	
12,503.95	7,108.03	-1,521.59	4,256.74	Begin Turn to BHL @ 12503.95ft	
12,756.11	7,106.64	-1,524.41	4,508.83	End Turn @ 12756.11ft	
15,469.18	7,092.00	-1,644.28	7,219.21	TD Well @ 15469.18ft	