

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_BERGER PAD**

**Berger 21-2**

**Berger 21-2**

**Plan: Berger 21-2 (wp01)**

## **Standard Planning Report**

**06 October, 2011**

Project: COLORADO NORTHERN ZONE - 83  
Site: WELD\_BERGER PAD  
Well: Berger 21-2  
Wellbore: Berger 21-2  
Section:  
SHL:  
Design: Berger 21-2 (wp01)  
Latitude: 40.083844  
Longitude: -104.863725  
GL: 4959.01  
KB: 15' rkb + 4959' gl @ 4974.00ft

FORMATION TOP DETAILS			
	TVDPath	MDPath	Formation
	4061.00	4238.60	PK Depth
	4521.00	4724.67	SX Depth
	7241.00	7466.95	NIO Depth
	7551.00	7776.95	CD Depth
	7639.00	7864.95	GH Depth
	7991.00	8216.95	J Depth

WELL DETAILS: Berger 21-2						
+N/-S	+E/-W	Northing	Ground Level: Easting	4959.01 Latitude	Longitude	Slot
0.00	0.00	1274027.87	3178034.05	40.083844	-104.863725	

CASING DETAILS
No casing data is available

T

M

A

Azimuths to True North

Magnetic North: 8.85°

Magnetic Field

Strength: 52920.4snT

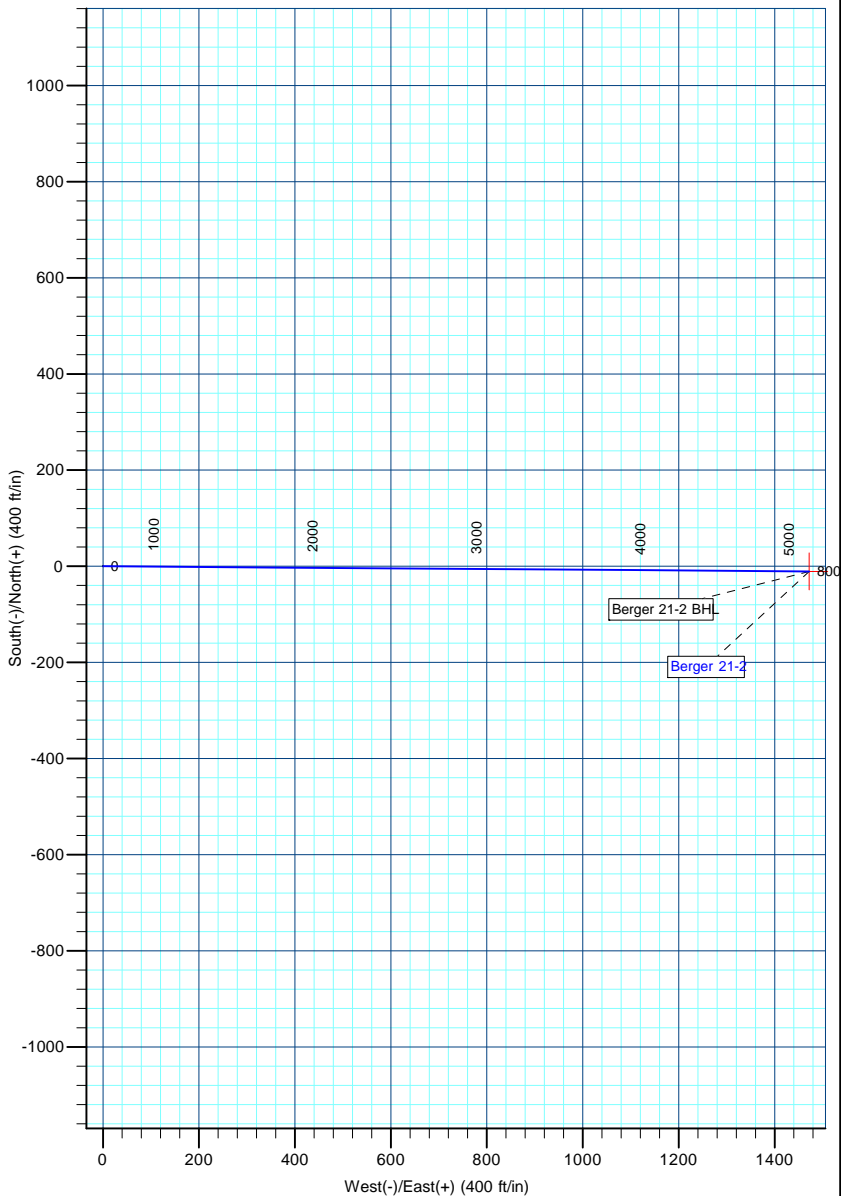
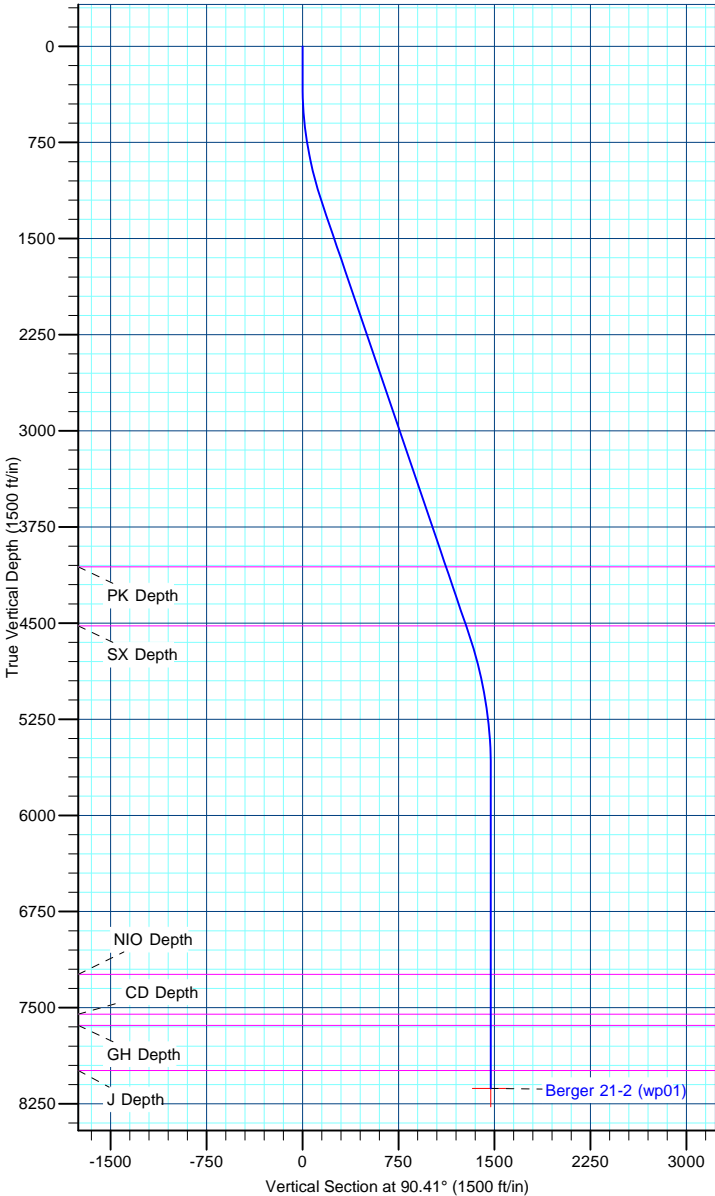
Dip Angle: 66.77°

Date: 10/6/2011

Model: IGRF2010

DESIGN TARGET DETAILS								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Berger 21-2 BHL	8131.00	-10.51	1472.08	1274027.92	3179506.16	40.083815	-104.858464	

SECTION DETAILS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	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
1242.50	18.85	90.41	1225.59	-1.10	153.64	2.00	90.41	153.65
4779.80	18.85	90.41	4573.18	-9.25	1296.49	0.00	0.00	1296.52
5856.95	0.00	0.00	5631.00	-10.51	1472.08	1.75	180.00	1472.12
8356.95	0.00	0.00	8131.00	-10.51	1472.08	0.00	0.00	1472.12



# Anadarko Petroleum Corp

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well Berger 21-2
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Site:</b>	WELD_BERGER PAD	<b>North Reference:</b>	True
<b>Well:</b>	Berger 21-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Berger 21-2		
<b>Design:</b>	Berger 21-2 (wp01)		

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Site</b>	WELD_BERGER PAD			
<b>Site Position:</b>		<b>Northing:</b>	1,274,067.38 usft	<b>Latitude:</b> 40.083952
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,178,056.15 usft	<b>Longitude:</b> -104.863645
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.41 °

<b>Well</b>	Berger 21-2			
<b>Well Position</b>	<b>+N/-S</b>	-39.35 ft	<b>Northing:</b>	1,274,027.86 usft
	<b>+E/-W</b>	-22.38 ft	<b>Easting:</b>	3,178,034.05 usft
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 40.083844
				<b>Longitude:</b> -104.863725
				<b>Ground Level:</b> 4,959.01 ft

<b>Wellbore</b>	Berger 21-2				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/6/2011	8.85	66.77	52,920

<b>Design</b>	Berger 21-2 (wp01)			
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	90.41

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,242.50	18.85	90.41	1,225.59	-1.10	153.64	2.00	2.00	0.00	90.41	
4,779.80	18.85	90.41	4,573.18	-9.25	1,296.49	0.00	0.00	0.00	0.00	
5,856.95	0.00	0.00	5,631.00	-10.51	1,472.08	1.75	-1.75	0.00	180.00	
8,356.95	0.00	0.00	8,131.00	-10.51	1,472.08	0.00	0.00	0.00	0.00	Berger 21-2 BHL

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<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Site:</b>	WELD_BERGER PAD	<b>North Reference:</b>	True
<b>Well:</b>	Berger 21-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Berger 21-2		
<b>Design:</b>	Berger 21-2 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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	2.00	90.41	399.98	-0.01	1.75	1.75	2.00	2.00	0.00
500.00	4.00	90.41	499.84	-0.05	6.98	6.98	2.00	2.00	0.00
600.00	6.00	90.41	599.45	-0.11	15.69	15.69	2.00	2.00	0.00
700.00	8.00	90.41	698.70	-0.20	27.88	27.88	2.00	2.00	0.00
800.00	10.00	90.41	797.47	-0.31	43.52	43.52	2.00	2.00	0.00
900.00	12.00	90.41	895.62	-0.45	62.60	62.60	2.00	2.00	0.00
1,000.00	14.00	90.41	993.06	-0.61	85.09	85.10	2.00	2.00	0.00
1,100.00	16.00	90.41	1,089.64	-0.79	110.97	110.98	2.00	2.00	0.00
1,200.00	18.00	90.41	1,185.27	-1.00	140.21	140.21	2.00	2.00	0.00
1,242.50	18.85	90.41	1,225.59	-1.10	153.64	153.65	2.00	2.00	0.00
1,300.00	18.85	90.41	1,280.01	-1.23	172.22	172.22	0.00	0.00	0.00
1,400.00	18.85	90.41	1,374.64	-1.46	204.53	204.53	0.00	0.00	0.00
1,500.00	18.85	90.41	1,469.28	-1.69	236.84	236.84	0.00	0.00	0.00
1,600.00	18.85	90.41	1,563.92	-1.92	269.14	269.15	0.00	0.00	0.00
1,700.00	18.85	90.41	1,658.55	-2.15	301.45	301.46	0.00	0.00	0.00
1,800.00	18.85	90.41	1,753.19	-2.38	333.76	333.77	0.00	0.00	0.00
1,900.00	18.85	90.41	1,847.83	-2.61	366.07	366.08	0.00	0.00	0.00
2,000.00	18.85	90.41	1,942.46	-2.84	398.38	398.39	0.00	0.00	0.00
2,100.00	18.85	90.41	2,037.10	-3.07	430.69	430.70	0.00	0.00	0.00
2,200.00	18.85	90.41	2,131.74	-3.30	462.99	463.01	0.00	0.00	0.00
2,300.00	18.85	90.41	2,226.37	-3.54	495.30	495.32	0.00	0.00	0.00
2,400.00	18.85	90.41	2,321.01	-3.77	527.61	527.62	0.00	0.00	0.00
2,500.00	18.85	90.41	2,415.65	-4.00	559.92	559.93	0.00	0.00	0.00
2,600.00	18.85	90.41	2,510.28	-4.23	592.23	592.24	0.00	0.00	0.00
2,700.00	18.85	90.41	2,604.92	-4.46	624.54	624.55	0.00	0.00	0.00
2,800.00	18.85	90.41	2,699.56	-4.69	656.84	656.86	0.00	0.00	0.00
2,900.00	18.85	90.41	2,794.19	-4.92	689.15	689.17	0.00	0.00	0.00
3,000.00	18.85	90.41	2,888.83	-5.15	721.46	721.48	0.00	0.00	0.00
3,100.00	18.85	90.41	2,983.47	-5.38	753.77	753.79	0.00	0.00	0.00
3,200.00	18.85	90.41	3,078.10	-5.61	786.08	786.10	0.00	0.00	0.00
3,300.00	18.85	90.41	3,172.74	-5.84	818.39	818.41	0.00	0.00	0.00
3,400.00	18.85	90.41	3,267.38	-6.07	850.70	850.72	0.00	0.00	0.00
3,500.00	18.85	90.41	3,362.01	-6.30	883.00	883.03	0.00	0.00	0.00
3,600.00	18.85	90.41	3,456.65	-6.53	915.31	915.34	0.00	0.00	0.00
3,700.00	18.85	90.41	3,551.29	-6.76	947.62	947.64	0.00	0.00	0.00
3,800.00	18.85	90.41	3,645.92	-6.99	979.93	979.95	0.00	0.00	0.00
3,900.00	18.85	90.41	3,740.56	-7.23	1,012.24	1,012.26	0.00	0.00	0.00
4,000.00	18.85	90.41	3,835.20	-7.46	1,044.55	1,044.57	0.00	0.00	0.00
4,100.00	18.85	90.41	3,929.83	-7.69	1,076.85	1,076.88	0.00	0.00	0.00
4,200.00	18.85	90.41	4,024.47	-7.92	1,109.16	1,109.19	0.00	0.00	0.00
4,238.60	18.85	90.41	4,061.00	-8.01	1,121.63	1,121.66	0.00	0.00	0.00
PK Depth									
4,300.00	18.85	90.41	4,119.11	-8.15	1,141.47	1,141.50	0.00	0.00	0.00
4,400.00	18.85	90.41	4,213.74	-8.38	1,173.78	1,173.81	0.00	0.00	0.00
4,500.00	18.85	90.41	4,308.38	-8.61	1,206.09	1,206.12	0.00	0.00	0.00
4,600.00	18.85	90.41	4,403.02	-8.84	1,238.40	1,238.43	0.00	0.00	0.00
4,700.00	18.85	90.41	4,497.65	-9.07	1,270.70	1,270.74	0.00	0.00	0.00
4,724.67	18.85	90.41	4,521.00	-9.13	1,278.67	1,278.71	0.00	0.00	0.00
SX Depth									
4,779.80	18.85	90.41	4,573.18	-9.25	1,296.49	1,296.52	0.00	0.00	0.00

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## Planning Report

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Site:</b>	WELD_BERGER PAD	<b>North Reference:</b>	True
<b>Well:</b>	Berger 21-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Berger 21-2		
<b>Design:</b>	Berger 21-2 (wp01)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,800.00	18.50	90.41	4,592.31	-9.30	1,302.95	1,302.99	1.75	-1.75	0.00	
4,900.00	16.75	90.41	4,687.62	-9.52	1,333.23	1,333.26	1.75	-1.75	0.00	
5,000.00	15.00	90.41	4,783.80	-9.71	1,360.57	1,360.61	1.75	-1.75	0.00	
5,100.00	13.25	90.41	4,880.77	-9.89	1,384.97	1,385.00	1.75	-1.75	0.00	
5,200.00	11.50	90.41	4,978.45	-10.04	1,406.39	1,406.43	1.75	-1.75	0.00	
5,300.00	9.75	90.41	5,076.73	-10.17	1,424.82	1,424.86	1.75	-1.75	0.00	
5,400.00	8.00	90.41	5,175.53	-10.28	1,440.24	1,440.28	1.75	-1.75	0.00	
5,500.00	6.25	90.41	5,274.76	-10.37	1,452.64	1,452.68	1.75	-1.75	0.00	
5,600.00	4.50	90.41	5,374.31	-10.44	1,462.00	1,462.04	1.75	-1.75	0.00	
5,700.00	2.75	90.41	5,474.11	-10.48	1,468.32	1,468.36	1.75	-1.75	0.00	
5,800.00	1.00	90.41	5,574.05	-10.50	1,471.58	1,471.62	1.75	-1.75	0.00	
5,856.95	0.00	0.00	5,631.00	-10.51	1,472.08	1,472.12	1.75	-1.75	0.00	
5,900.00	0.00	0.00	5,674.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,774.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,874.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,974.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,074.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,174.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,274.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,374.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,474.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,574.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,674.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,774.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,874.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,200.00	0.00	0.00	6,974.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,074.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,174.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,466.95	0.00	0.00	7,241.00	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
<b>NIO Depth</b>										
7,500.00	0.00	0.00	7,274.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,374.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,474.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,776.95	0.00	0.00	7,551.00	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
<b>CD Depth</b>										
7,800.00	0.00	0.00	7,574.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
7,864.95	0.00	0.00	7,639.00	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
<b>GH Depth</b>										
7,900.00	0.00	0.00	7,674.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,774.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
8,100.00	0.00	0.00	7,874.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
8,200.00	0.00	0.00	7,974.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
8,216.95	0.00	0.00	7,991.00	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
<b>J Depth</b>										
8,300.00	0.00	0.00	8,074.05	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
8,356.95	0.00	0.00	8,131.00	-10.51	1,472.08	1,472.12	0.00	0.00	0.00	
<b>Berger 21-2 BHL</b>										

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<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' rkb + 4959' gl @ 4974.00ft
<b>Site:</b>	WELD_BERGER PAD	<b>North Reference:</b>	True
<b>Well:</b>	Berger 21-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Berger 21-2		
<b>Design:</b>	Berger 21-2 (wp01)		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
Berger 21-2 BHL	0.00	0.00	8,131.00	-10.51	1,472.08	1,274,027.92	3,179,506.16	40.083815	-104.858464
- plan hits target center									
- Point									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(ft)	(ft)			(°)	(°)	
4,238.60	4,061.00	PK Depth				
4,724.67	4,521.00	SX Depth				
7,466.95	7,241.00	NIO Depth				
7,776.95	7,551.00	CD Depth				
7,864.95	7,639.00	GH Depth				
8,216.95	7,991.00	J Depth				