

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_RIVERBEND 4-13 PAD**

**Riverbend 22-13**

**Riverbend 22-13**

**Plan: Riverbend 22-13 (wp01)**

## **Standard Planning Report**

**11 July, 2011**



Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD\_RIVERBEND 4-13 PAD  
 Well: Riverbend 22-13  
 Wellbore: Riverbend 22-13  
 Section:  
 SHL:  
 Design: Riverbend 22-13 (wp01)  
 Latitude: 40.055852  
 Longitude: -104.847381  
 GL: 4952.00  
 KB: 15' RKB + 4952' GL @ 4967.00ft

FORMATION TOP DETAILS		
TVDPATH	MDPATH	FORMATION
4052.00	4250.53	PK Depth
4638.00	4874.23	SX Depth
7170.00	7495.51	NIO Depth
7517.00	7842.51	CD Depth
7602.00	7927.51	GH Depth
7952.00	8277.51	J Depth



Azimuths to True North  
 Magnetic North: 8.87°

Magnetic Field  
 Strength: 52932.6snT  
 Dip Angle: 66.76°  
 Date: 7/11/2011  
 Model: IGRF2010

#### WELL DETAILS: Riverbend 22-13

+N/-S	+E/-W	Northing	Ground Level: Easting	4952.00 Latitude	Longitude	Slot
0.00	0.00	1263864.55	3182682.17	40.055852	-104.847381	

#### CASING DETAILS

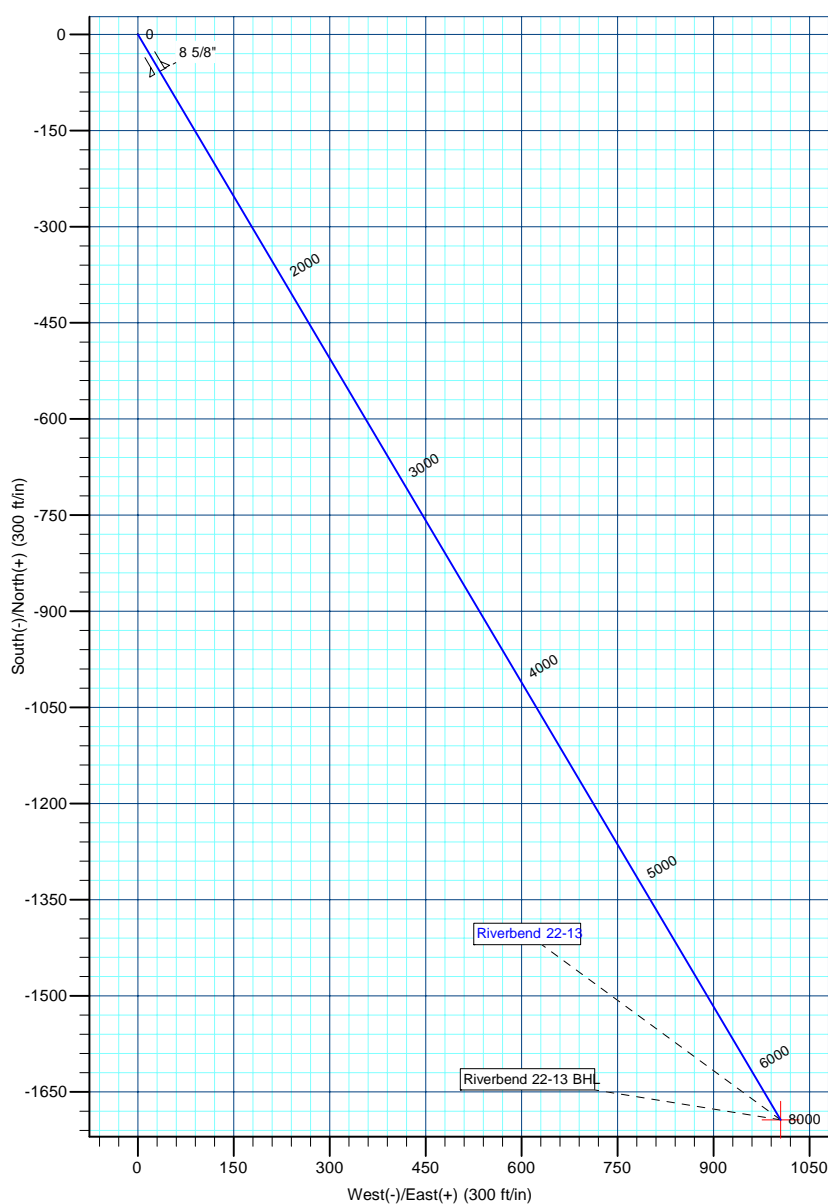
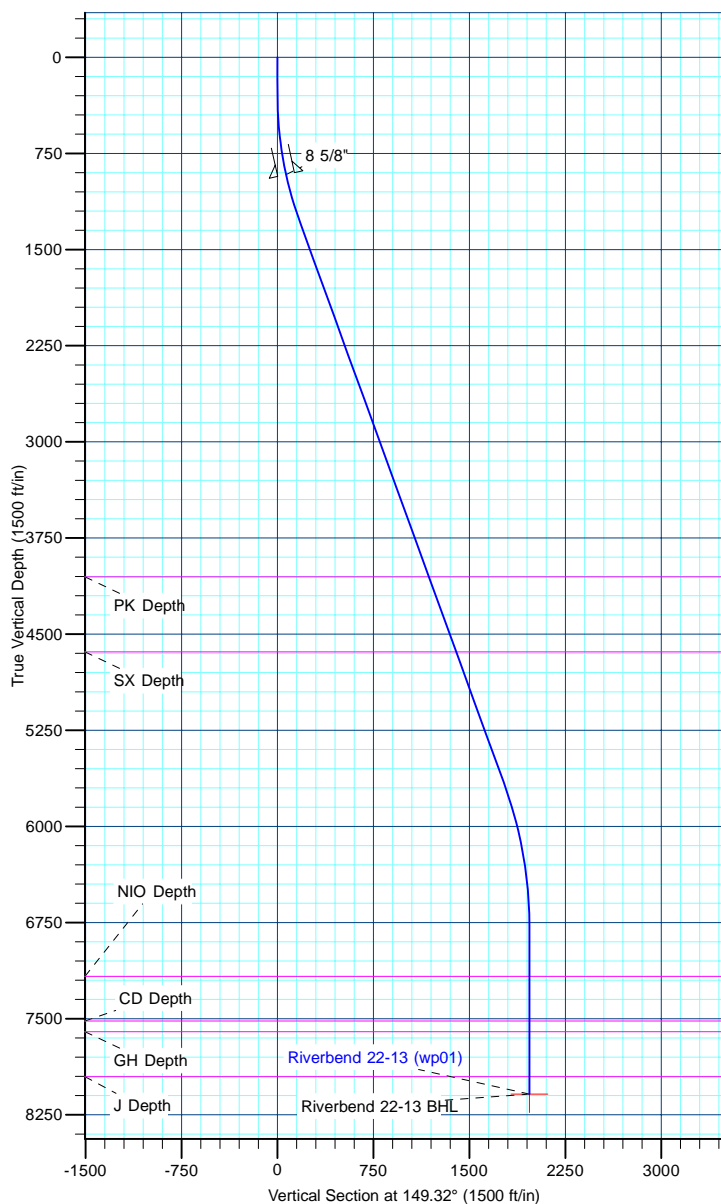
TVD	MD	Name	Size
915.00	919.82	8 5/8"	8-5/8

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Riverbend 22-13 BHL	8087.00	-1693.49	1004.72	1262178.50	3183699.32	40.051203	-104.843792	

#### 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
1301.15	20.02	149.32	1280.90	-148.93	88.35	2.00	149.32	173.16
5968.33	20.02	149.32	5665.97	-1523.29	903.74	0.00	0.00	1771.20
7112.51	0.00	0.00	6787.00	-1693.49	1004.72	1.75	180.00	1969.10
8412.51	0.00	0.00	8087.00	-1693.49	1004.72	0.00	0.00	1969.10



<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well Riverbend 22-13
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4952' GL @ 4967.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4952' GL @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 22-13	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 22-13		
<b>Design:</b>	Riverbend 22-13 (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		

Site						WELD_RIVERBEND 4-13 PAD											
Site Position:			Northing:			1,263,964.36 ft			Latitude:			40.056126					
From:			Lat/Long			Easting:			3,182,681.16 ft			Longitude:			-104.847382		
Position Uncertainty:			0.00 ft			Slot Radius:			0 "			Grid Convergence:			0.42		

Well	Riverbend 22-13					
Well Position	+N-S	-99.82 ft	Northing:	1,263,864.54 ft	Latitude:	40.055852
	+E-W	0.28 ft	Easting:	3,182,682.17 ft	Longitude:	-104.847381
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,952.00 ft

<b>Wellbore</b>	Riverbend 22-13				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/11/2011	8.87	66.76	52,933

<b>Design</b>	Riverbend 22-13 (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	149.32

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	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	
1,301.15	20.02	149.32	1,280.90	-148.93	88.35	2.00	2.00	0.00	149.32	
5,968.33	20.02	149.32	5,665.97	-1,523.29	903.74	0.00	0.00	0.00	0.00	
7,112.51	0.00	0.00	6,787.00	-1,693.49	1,004.72	1.75	-1.75	0.00	180.00	
8,412.51	0.00	0.00	8,087.00	-1,693.49	1,004.72	0.00	0.00	0.00	0.00	Riverbend 22-13 Bt

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4952' GL @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 22-13	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 22-13		
<b>Design:</b>	Riverbend 22-13 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
<b>Start Build 2.00</b>									
400.00	2.00	149.32	399.98	-1.50	0.89	1.75	2.00	2.00	0.00
500.00	4.00	149.32	499.84	-6.00	3.56	6.98	2.00	2.00	0.00
600.00	6.00	149.32	599.45	-13.50	8.01	15.69	2.00	2.00	0.00
700.00	8.00	149.32	698.70	-23.98	14.23	27.88	2.00	2.00	0.00
800.00	10.00	149.32	797.47	-37.43	22.21	43.52	2.00	2.00	0.00
900.00	12.00	149.32	895.62	-53.84	31.94	62.60	2.00	2.00	0.00
919.82	12.40	149.32	915.00	-57.44	34.08	66.79	2.00	2.00	0.00
<b>8 5/8"</b>									
1,000.00	14.00	149.32	993.06	-73.19	43.42	85.10	2.00	2.00	0.00
1,100.00	16.00	149.32	1,089.64	-95.44	56.63	110.98	2.00	2.00	0.00
1,200.00	18.00	149.32	1,185.27	-120.59	71.54	140.21	2.00	2.00	0.00
1,300.00	20.00	149.32	1,279.82	-148.59	88.15	172.77	2.00	2.00	0.00
1,301.15	20.02	149.32	1,280.90	-148.93	88.35	173.16	2.00	2.00	0.00
<b>Start 4667.18 hold at 1301.15 MD</b>									
1,400.00	20.02	149.32	1,373.77	-178.03	105.62	207.01	0.00	0.00	0.00
1,500.00	20.02	149.32	1,467.73	-207.48	123.09	241.25	0.00	0.00	0.00
1,600.00	20.02	149.32	1,561.68	-236.93	140.57	275.49	0.00	0.00	0.00
1,700.00	20.02	149.32	1,655.64	-266.37	158.04	309.73	0.00	0.00	0.00
1,800.00	20.02	149.32	1,749.59	-295.82	175.51	343.97	0.00	0.00	0.00
1,900.00	20.02	149.32	1,843.55	-325.27	192.98	378.21	0.00	0.00	0.00
2,000.00	20.02	149.32	1,937.50	-354.72	210.45	412.45	0.00	0.00	0.00
2,100.00	20.02	149.32	2,031.46	-384.16	227.92	446.69	0.00	0.00	0.00
2,200.00	20.02	149.32	2,125.42	-413.61	245.39	480.93	0.00	0.00	0.00
2,300.00	20.02	149.32	2,219.37	-443.06	262.86	515.17	0.00	0.00	0.00
2,400.00	20.02	149.32	2,313.33	-472.51	280.33	549.41	0.00	0.00	0.00
2,500.00	20.02	149.32	2,407.28	-501.95	297.80	583.65	0.00	0.00	0.00
2,600.00	20.02	149.32	2,501.24	-531.40	315.27	617.89	0.00	0.00	0.00
2,700.00	20.02	149.32	2,595.19	-560.85	332.74	652.13	0.00	0.00	0.00
2,800.00	20.02	149.32	2,689.15	-590.30	350.21	686.37	0.00	0.00	0.00
2,900.00	20.02	149.32	2,783.10	-619.74	367.68	720.61	0.00	0.00	0.00
3,000.00	20.02	149.32	2,877.06	-649.19	385.15	754.85	0.00	0.00	0.00
3,100.00	20.02	149.32	2,971.01	-678.64	402.62	789.08	0.00	0.00	0.00
3,200.00	20.02	149.32	3,064.97	-708.08	420.09	823.32	0.00	0.00	0.00
3,300.00	20.02	149.32	3,158.93	-737.53	437.57	857.56	0.00	0.00	0.00
3,400.00	20.02	149.32	3,252.88	-766.98	455.04	891.80	0.00	0.00	0.00
3,500.00	20.02	149.32	3,346.84	-796.43	472.51	926.04	0.00	0.00	0.00
3,600.00	20.02	149.32	3,440.79	-825.87	489.98	960.28	0.00	0.00	0.00
3,700.00	20.02	149.32	3,534.75	-855.32	507.45	994.52	0.00	0.00	0.00
3,800.00	20.02	149.32	3,628.70	-884.77	524.92	1,028.76	0.00	0.00	0.00
3,900.00	20.02	149.32	3,722.66	-914.22	542.39	1,063.00	0.00	0.00	0.00
4,000.00	20.02	149.32	3,816.61	-943.66	559.86	1,097.24	0.00	0.00	0.00
4,100.00	20.02	149.32	3,910.57	-973.11	577.33	1,131.48	0.00	0.00	0.00
4,200.00	20.02	149.32	4,004.52	-1,002.56	594.80	1,165.72	0.00	0.00	0.00
4,250.53	20.02	149.32	4,052.00	-1,017.44	603.63	1,183.02	0.00	0.00	0.00
<b>PK Depth</b>									
4,300.00	20.02	149.32	4,098.48	-1,032.01	612.27	1,199.96	0.00	0.00	0.00
4,400.00	20.02	149.32	4,192.44	-1,061.45	629.74	1,234.20	0.00	0.00	0.00
4,500.00	20.02	149.32	4,286.39	-1,090.90	647.21	1,268.44	0.00	0.00	0.00
4,600.00	20.02	149.32	4,380.35	-1,120.35	664.68	1,302.68	0.00	0.00	0.00

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4952' GL @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 22-13	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 22-13		
<b>Design:</b>	Riverbend 22-13 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,700.00	20.02	149.32	4,474.30	-1,149.79	682.15	1,336.92	0.00	0.00	0.00
4,800.00	20.02	149.32	4,568.26	-1,179.24	699.62	1,371.16	0.00	0.00	0.00
4,874.23	20.02	149.32	4,638.00	-1,201.10	712.59	1,396.58	0.00	0.00	0.00
<b>SX Depth</b>									
4,900.00	20.02	149.32	4,662.21	-1,208.69	717.09	1,405.40	0.00	0.00	0.00
5,000.00	20.02	149.32	4,756.17	-1,238.14	734.57	1,439.64	0.00	0.00	0.00
5,100.00	20.02	149.32	4,850.12	-1,267.58	752.04	1,473.88	0.00	0.00	0.00
5,200.00	20.02	149.32	4,944.08	-1,297.03	769.51	1,508.12	0.00	0.00	0.00
5,300.00	20.02	149.32	5,038.04	-1,326.48	786.98	1,542.36	0.00	0.00	0.00
5,400.00	20.02	149.32	5,131.99	-1,355.93	804.45	1,576.60	0.00	0.00	0.00
5,500.00	20.02	149.32	5,225.95	-1,385.37	821.92	1,610.84	0.00	0.00	0.00
5,600.00	20.02	149.32	5,319.90	-1,414.82	839.39	1,645.08	0.00	0.00	0.00
5,700.00	20.02	149.32	5,413.86	-1,444.27	856.86	1,679.32	0.00	0.00	0.00
5,800.00	20.02	149.32	5,507.81	-1,473.72	874.33	1,713.56	0.00	0.00	0.00
5,900.00	20.02	149.32	5,601.77	-1,503.16	891.80	1,747.80	0.00	0.00	0.00
5,968.33	20.02	149.32	5,665.97	-1,523.29	903.74	1,771.20	0.00	0.00	0.00
<b>Start Drop -1.75</b>									
6,000.00	19.47	149.32	5,695.78	-1,532.49	909.20	1,781.90	1.75	-1.75	0.00
6,100.00	17.72	149.32	5,790.55	-1,559.91	925.47	1,813.78	1.75	-1.75	0.00
6,200.00	15.97	149.32	5,886.26	-1,584.83	940.25	1,842.76	1.75	-1.75	0.00
6,300.00	14.22	149.32	5,982.80	-1,607.22	953.54	1,868.80	1.75	-1.75	0.00
6,400.00	12.47	149.32	6,080.10	-1,627.07	965.31	1,891.87	1.75	-1.75	0.00
6,500.00	10.72	149.32	6,178.06	-1,644.35	975.57	1,911.97	1.75	-1.75	0.00
6,600.00	8.97	149.32	6,276.58	-1,659.06	984.29	1,929.07	1.75	-1.75	0.00
6,700.00	7.22	149.32	6,375.58	-1,671.17	991.47	1,943.15	1.75	-1.75	0.00
6,800.00	5.47	149.32	6,474.96	-1,680.67	997.11	1,954.20	1.75	-1.75	0.00
6,900.00	3.72	149.32	6,574.64	-1,687.56	1,001.20	1,962.20	1.75	-1.75	0.00
7,000.00	1.97	149.32	6,674.51	-1,691.82	1,003.73	1,967.17	1.75	-1.75	0.00
7,100.00	0.22	149.32	6,774.49	-1,693.47	1,004.70	1,969.07	1.75	-1.75	0.00
7,112.51	0.00	0.00	6,787.00	-1,693.49	1,004.72	1,969.10	1.75	-1.75	0.00
<b>Start 1300.00 hold at 7112.51 MD</b>									
7,200.00	0.00	0.00	6,874.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,300.00	0.00	0.00	6,974.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,400.00	0.00	0.00	7,074.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,495.51	0.00	0.00	7,170.00	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
<b>NIO Depth</b>									
7,500.00	0.00	0.00	7,174.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,600.00	0.00	0.00	7,274.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,700.00	0.00	0.00	7,374.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,800.00	0.00	0.00	7,474.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,842.51	0.00	0.00	7,517.00	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
<b>CD Depth</b>									
7,900.00	0.00	0.00	7,574.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
7,927.51	0.00	0.00	7,602.00	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
<b>GH Depth</b>									
8,000.00	0.00	0.00	7,674.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
8,100.00	0.00	0.00	7,774.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
8,200.00	0.00	0.00	7,874.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
8,277.51	0.00	0.00	7,952.00	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
<b>J Depth</b>									
8,300.00	0.00	0.00	7,974.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
8,400.00	0.00	0.00	8,074.49	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00
8,412.51	0.00	0.00	8,087.00	-1,693.49	1,004.72	1,969.10	0.00	0.00	0.00

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4952' GL @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 22-13	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 22-13		
<b>Design:</b>	Riverbend 22-13 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
TD at 8412.51 - Riverbend 22-13 BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Riverbend 22-13 BHL	0.00	0.00	8,087.00	-1,693.49	1,004.72	1,262,178.50	3,183,699.32	40.051203	-104.843792
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
919.82	915.00	8 5/8"	8-5/8	11	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,250.53	4,052.00	PK Depth				
4,874.23	4,638.00	SX Depth				
7,495.51	7,170.00	NIO Depth				
7,842.51	7,517.00	CD Depth				
7,927.51	7,602.00	GH Depth				
8,277.51	7,952.00	J Depth				

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
300.00	300.00	0.00	0.00	Start Build 2.00
1,301.15	1,280.90	-148.93	88.35	Start 4667.18 hold at 1301.15 MD
5,968.33	5,665.97	-1,523.29	903.74	Start Drop -1.75
7,112.51	6,787.00	-1,693.49	1,004.72	Start 1300.00 hold at 7112.51 MD
8,412.51	8,087.00	-1,693.49	1,004.72	TD at 8412.51