

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_FEHRN 17-32 PAD**

**FEHRN 25-32**

**FEHRN 25-32**

**Plan: FEHRN 25-32 (wp01)**

## **Standard Planning Report**

**03 February, 2011**



Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD\_FEHRN 17-32 PAD  
 Well: FEHRN 25-32  
 Wellbore: FEHRN 25-32  
 Section:  
 SHL:  
 Design: FEHRN 25-32 (wp01)  
 Latitude: 40.097328  
 Longitude: -104.795664  
 GL: 4916.00  
 KB: GL @ 4916.00ft

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4116.00	4365.19	PK Depth
4486.00	4761.01	SX Depth
7131.00	7424.89	NIO Depth
7456.00	7749.89	CD Depth
7546.00	7839.89	GH Depth
7896.00	8189.89	J Depth



Azimuths to True North  
 Magnetic North: 8.93°

Magnetic Field  
 Strength: 53024.1snT  
 Dip Angle: 66.82°  
 Date: 12/3/2010  
 Model: IGRF2010

#### WELL DETAILS: FEHRN 25-32

+N/-S	+E/-W	Northing	Ground Level: Easting	4916.00 Latitude	Longitude	Slot
0.00	0.00	1279083.59	3197038.58	40.097328	-104.795664	

#### CASING DETAILS

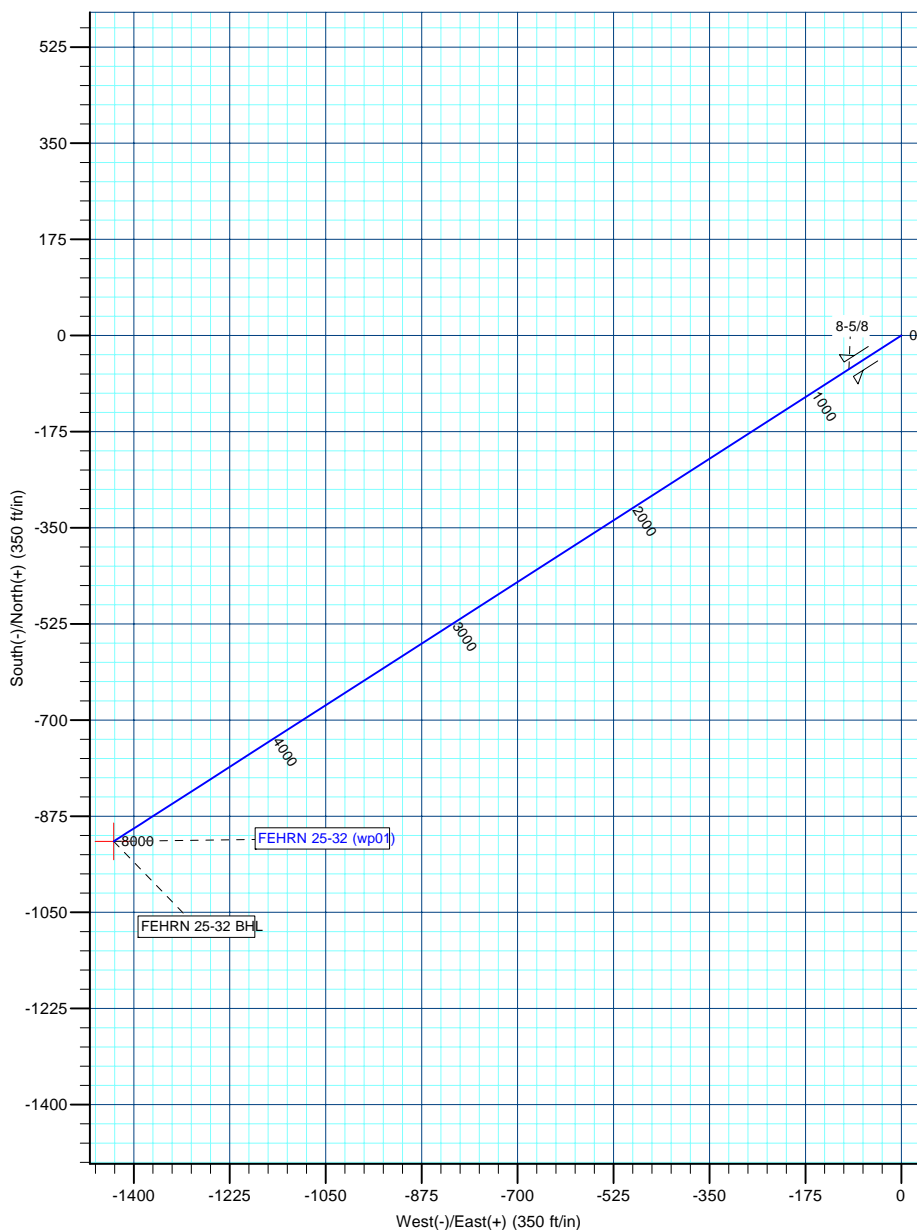
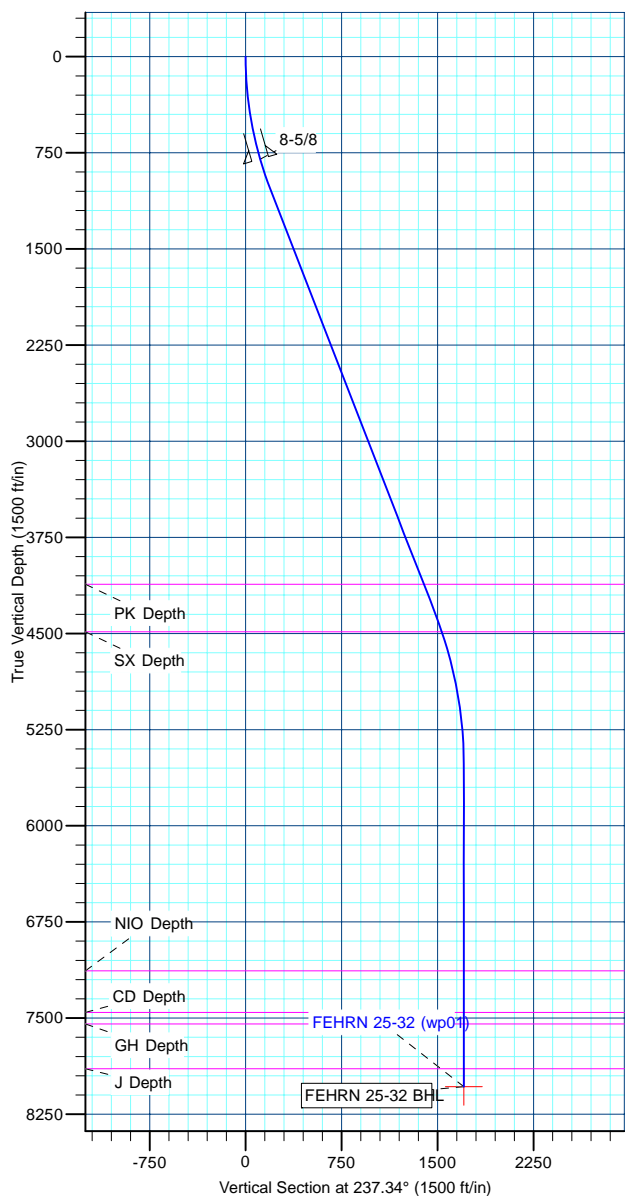
TVD	MD	Name	Size
800.00	810.78	8-5/8	8-5/8

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
FEHRN 25-32 BHL	8036.00	-920.84	-1436.59	1278151.36	3195609.35	40.094800	-104.800799	

#### 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
1063.55	21.27	237.34	1039.28	-105.32	-164.31	2.00	237.34	195.16
4614.41	21.27	237.34	4348.25	-800.48	-1248.81	0.00	0.00	1483.34
5829.89	0.00	0.00	5536.00	-920.84	-1436.59	1.75	180.00	1706.38
8329.89	0.00	0.00	8036.00	-920.84	-1436.59	0.00	0.00	1706.38



<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well FEHRN 25-32
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL @ 4916.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL @ 4916.00ft
<b>Site:</b>	WELD_FEHRN 17-32 PAD	<b>North Reference:</b>	True
<b>Well:</b>	FEHRN 25-32	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	FEHRN 25-32		
<b>Design:</b>	FEHRN 25-32 (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_FEHRN 17-32 PAD			
Site Position:		Northing:	1,279,083.46 ft	Latitude:	40.097327
From:	Lat/Long	Easting:	3,197,067.90 ft	Longitude:	-104.795559
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence:	0.46

Well	FEHRN 25-32					
Well Position	+N-S	0.36 ft	Northing:	1,279,083.59 ft	Latitude:	40.097328
	+E-W	-29.32 ft	Easting:	3,197,038.58 ft	Longitude:	-104.795664
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,916.00 ft

<b>Wellbore</b>	FEHRN 25-32				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/3/2010	8.93	66.82	53,024

<b>Design</b>	FEHRN 25-32 (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	237.34	

<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	
1,063.55	21.27	237.34	1,039.28	-105.32	-164.31	2.00	2.00	0.00	237.34	
4,614.41	21.27	237.34	4,348.25	-800.48	-1,248.81	0.00	0.00	0.00	0.00	
5,829.89	0.00	0.00	5,536.00	-920.84	-1,436.59	1.75	-1.75	0.00	180.00	
8,329.89	0.00	0.00	8,036.00	-920.84	-1,436.59	0.00	0.00	0.00	0.00	FEHRN 25-32 BHL

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well FEHRN 25-32
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL @ 4916.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL @ 4916.00ft
<b>Site:</b>	WELD_FEHRN 17-32 PAD	<b>North Reference:</b>	True
<b>Well:</b>	FEHRN 25-32	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	FEHRN 25-32		
<b>Design:</b>	FEHRN 25-32 (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	2.00	237.34	99.98	-0.94	-1.47	1.75	2.00	2.00	0.00
200.00	4.00	237.34	199.84	-3.77	-5.88	6.98	2.00	2.00	0.00
300.00	6.00	237.34	299.45	-8.47	-13.21	15.69	2.00	2.00	0.00
400.00	8.00	237.34	398.70	-15.05	-23.47	27.88	2.00	2.00	0.00
500.00	10.00	237.34	497.47	-23.49	-36.64	43.52	2.00	2.00	0.00
600.00	12.00	237.34	595.62	-33.78	-52.70	62.60	2.00	2.00	0.00
700.00	14.00	237.34	693.06	-45.92	-71.64	85.10	2.00	2.00	0.00
800.00	16.00	237.34	789.64	-59.89	-93.43	110.98	2.00	2.00	0.00
810.78	16.22	237.34	800.00	-61.50	-95.95	113.97	2.00	2.00	0.00
8-5/8									
900.00	18.00	237.34	885.27	-75.67	-118.04	140.21	2.00	2.00	0.00
1,000.00	20.00	237.34	979.82	-93.23	-145.45	172.77	2.00	2.00	0.00
1,063.55	21.27	237.34	1,039.28	-105.32	-164.31	195.16	2.00	2.00	0.00
1,100.00	21.27	237.34	1,073.25	-112.46	-175.44	208.39	0.00	0.00	0.00
1,200.00	21.27	237.34	1,166.44	-132.03	-205.98	244.66	0.00	0.00	0.00
1,300.00	21.27	237.34	1,259.63	-151.61	-236.52	280.94	0.00	0.00	0.00
1,400.00	21.27	237.34	1,352.82	-171.19	-267.07	317.22	0.00	0.00	0.00
1,500.00	21.27	237.34	1,446.00	-190.76	-297.61	353.50	0.00	0.00	0.00
1,600.00	21.27	237.34	1,539.19	-210.34	-328.15	389.78	0.00	0.00	0.00
1,700.00	21.27	237.34	1,632.38	-229.92	-358.69	426.05	0.00	0.00	0.00
1,800.00	21.27	237.34	1,725.57	-249.50	-389.23	462.33	0.00	0.00	0.00
1,900.00	21.27	237.34	1,818.75	-269.07	-419.78	498.61	0.00	0.00	0.00
2,000.00	21.27	237.34	1,911.94	-288.65	-450.32	534.89	0.00	0.00	0.00
2,100.00	21.27	237.34	2,005.13	-308.23	-480.86	571.17	0.00	0.00	0.00
2,200.00	21.27	237.34	2,098.32	-327.81	-511.40	607.44	0.00	0.00	0.00
2,300.00	21.27	237.34	2,191.50	-347.38	-541.94	643.72	0.00	0.00	0.00
2,400.00	21.27	237.34	2,284.69	-366.96	-572.49	680.00	0.00	0.00	0.00
2,500.00	21.27	237.34	2,377.88	-386.54	-603.03	716.28	0.00	0.00	0.00
2,600.00	21.27	237.34	2,471.07	-406.11	-633.57	752.55	0.00	0.00	0.00
2,700.00	21.27	237.34	2,564.25	-425.69	-664.11	788.83	0.00	0.00	0.00
2,800.00	21.27	237.34	2,657.44	-445.27	-694.65	825.11	0.00	0.00	0.00
2,900.00	21.27	237.34	2,750.63	-464.85	-725.20	861.39	0.00	0.00	0.00
3,000.00	21.27	237.34	2,843.82	-484.42	-755.74	897.67	0.00	0.00	0.00
3,100.00	21.27	237.34	2,937.00	-504.00	-786.28	933.94	0.00	0.00	0.00
3,200.00	21.27	237.34	3,030.19	-523.58	-816.82	970.22	0.00	0.00	0.00
3,300.00	21.27	237.34	3,123.38	-543.15	-847.36	1,006.50	0.00	0.00	0.00
3,400.00	21.27	237.34	3,216.57	-562.73	-877.91	1,042.78	0.00	0.00	0.00
3,500.00	21.27	237.34	3,309.75	-582.31	-908.45	1,079.06	0.00	0.00	0.00
3,600.00	21.27	237.34	3,402.94	-601.89	-938.99	1,115.33	0.00	0.00	0.00
3,700.00	21.27	237.34	3,496.13	-621.46	-969.53	1,151.61	0.00	0.00	0.00
3,800.00	21.27	237.34	3,589.32	-641.04	-1,000.07	1,187.89	0.00	0.00	0.00
3,900.00	21.27	237.34	3,682.51	-660.62	-1,030.62	1,224.17	0.00	0.00	0.00
4,000.00	21.27	237.34	3,775.69	-680.20	-1,061.16	1,260.44	0.00	0.00	0.00
4,100.00	21.27	237.34	3,868.88	-699.77	-1,091.70	1,296.72	0.00	0.00	0.00
4,200.00	21.27	237.34	3,962.07	-719.35	-1,122.24	1,333.00	0.00	0.00	0.00
4,300.00	21.27	237.34	4,055.26	-738.93	-1,152.78	1,369.28	0.00	0.00	0.00
4,365.19	21.27	237.34	4,116.00	-751.69	-1,172.69	1,392.93	0.00	0.00	0.00
PK Depth									
4,400.00	21.27	237.34	4,148.44	-758.50	-1,183.33	1,405.56	0.00	0.00	0.00
4,500.00	21.27	237.34	4,241.63	-778.08	-1,213.87	1,441.83	0.00	0.00	0.00
4,600.00	21.27	237.34	4,334.82	-797.66	-1,244.41	1,478.11	0.00	0.00	0.00
4,614.41	21.27	237.34	4,348.25	-800.48	-1,248.81	1,483.34	0.00	0.00	0.00
4,700.00	19.77	237.34	4,428.40	-816.67	-1,274.07	1,513.34	1.75	-1.75	0.00

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well FEHRN 25-32
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL @ 4916.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL @ 4916.00ft
<b>Site:</b>	WELD_FEHRN 17-32 PAD	<b>North Reference:</b>	True
<b>Well:</b>	FEHRN 25-32	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	FEHRN 25-32		
<b>Design:</b>	FEHRN 25-32 (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)
4,761.01	18.71	237.34	4,486.00	-827.52	-1,290.99	1,533.45	1.75	-1.75	0.00
<b>SX Depth</b>									
4,800.00	18.02	237.34	4,523.01	-834.15	-1,301.34	1,545.73	1.75	-1.75	0.00
4,900.00	16.27	237.34	4,618.56	-850.06	-1,326.16	1,575.21	1.75	-1.75	0.00
5,000.00	14.52	237.34	4,714.97	-864.39	-1,348.51	1,601.77	1.75	-1.75	0.00
5,100.00	12.77	237.34	4,812.14	-877.12	-1,368.38	1,625.36	1.75	-1.75	0.00
5,200.00	11.02	237.34	4,909.99	-888.25	-1,385.73	1,645.98	1.75	-1.75	0.00
5,300.00	9.27	237.34	5,008.42	-897.75	-1,400.57	1,663.60	1.75	-1.75	0.00
5,400.00	7.52	237.34	5,107.34	-905.64	-1,412.86	1,678.20	1.75	-1.75	0.00
5,500.00	5.77	237.34	5,206.67	-911.88	-1,422.61	1,689.78	1.75	-1.75	0.00
5,600.00	4.02	237.34	5,306.30	-916.49	-1,429.80	1,698.31	1.75	-1.75	0.00
5,700.00	2.27	237.34	5,406.14	-919.45	-1,434.42	1,703.81	1.75	-1.75	0.00
5,800.00	0.52	237.34	5,506.11	-920.77	-1,436.47	1,706.25	1.75	-1.75	0.00
5,829.89	0.00	0.00	5,536.00	-920.84	-1,436.59	1,706.38	1.75	-1.75	0.00
5,900.00	0.00	0.00	5,606.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,000.00	0.00	0.00	5,706.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,100.00	0.00	0.00	5,806.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,200.00	0.00	0.00	5,906.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,300.00	0.00	0.00	6,006.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,400.00	0.00	0.00	6,106.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,500.00	0.00	0.00	6,206.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,600.00	0.00	0.00	6,306.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,700.00	0.00	0.00	6,406.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,800.00	0.00	0.00	6,506.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
6,900.00	0.00	0.00	6,606.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,000.00	0.00	0.00	6,706.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,100.00	0.00	0.00	6,806.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,200.00	0.00	0.00	6,906.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,300.00	0.00	0.00	7,006.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,400.00	0.00	0.00	7,106.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,424.89	0.00	0.00	7,131.00	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
<b>NIO Depth</b>									
7,500.00	0.00	0.00	7,206.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,600.00	0.00	0.00	7,306.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,700.00	0.00	0.00	7,406.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,749.89	0.00	0.00	7,456.00	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
<b>CD Depth</b>									
7,800.00	0.00	0.00	7,506.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
7,839.89	0.00	0.00	7,546.00	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
<b>GH Depth</b>									
7,900.00	0.00	0.00	7,606.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
8,000.00	0.00	0.00	7,706.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
8,100.00	0.00	0.00	7,806.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
8,189.89	0.00	0.00	7,896.00	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
<b>J Depth</b>									
8,200.00	0.00	0.00	7,906.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
8,300.00	0.00	0.00	8,006.11	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
8,329.89	0.00	0.00	8,036.00	-920.84	-1,436.59	1,706.38	0.00	0.00	0.00
<b>FEHRN 25-32 BHL</b>									

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well FEHRN 25-32
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL @ 4916.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL @ 4916.00ft
<b>Site:</b>	WELD_FEHRN 17-32 PAD	<b>North Reference:</b>	True
<b>Well:</b>	FEHRN 25-32	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	FEHRN 25-32		
<b>Design:</b>	FEHRN 25-32 (wp01)		

#### Design Targets

##### Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
FEHRN 25-32 BHL	0.00	0.00	8,036.00	-920.84	-1,436.59	1,278,151.36	3,195,609.35	40.094800	-104.800799
- plan hits target center									
- Point									

#### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
810.78	800.00	8-5/8	8-5/8	11

#### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,365.19	4,116.00	PK Depth			
4,761.01	4,486.00	SX Depth			
7,424.89	7,131.00	NIO Depth			
7,749.89	7,456.00	CD Depth			
7,839.89	7,546.00	GH Depth			
8,189.89	7,896.00	J Depth			