

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_HOWARD 20-29 PAD**

**Howard 39-29**

**Howard 39-29**

**Plan: Howard 39-29 (wp01)**

## **Standard Planning Report**

**10 May, 2011**



Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD\_HOWARD 20-29 PAD  
 Well: Howard 39-29  
 Wellbore: Howard 39-29  
 Section:  
 SHL:  
 Design: Howard 39-29 (wp01)  
 Latitude: 40.017815  
 Longitude: -104.909484  
 GL: 5023.00  
 KB: 15' RKB + 5023' GL @ 5038.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3888.00	3970.99	PK Depth
4838.00	4945.98	SX Depth
7356.00	7490.55	NIO Depth
7775.00	7909.55	CD Depth
7854.00	7988.55	GH Depth
8208.00	8342.55	J Depth



Azimuths to True North  
 Magnetic North: 8.92°

Magnetic Field  
 Strength: 52924.0snT  
 Dip Angle: 66.72°  
 Date: 5/6/2011  
 Model: IGRF2010

#### WELL DETAILS: Howard 39-29

+N/-S	+E/-W	Northing	Ground Level: Easting	5023.00 Latitude	Longitude	Slot
0.00	0.00	1249887.05	3165390.74	40.017815	-104.909484	

#### CASING DETAILS

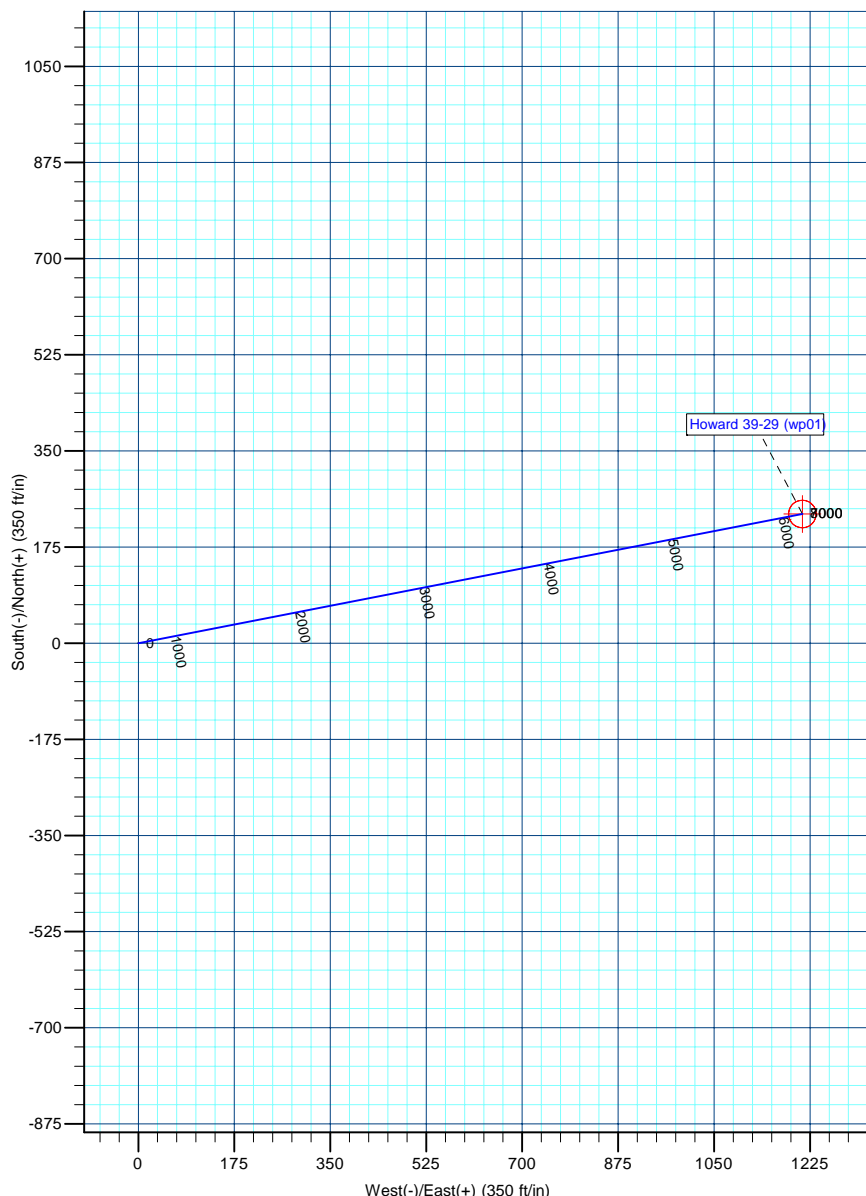
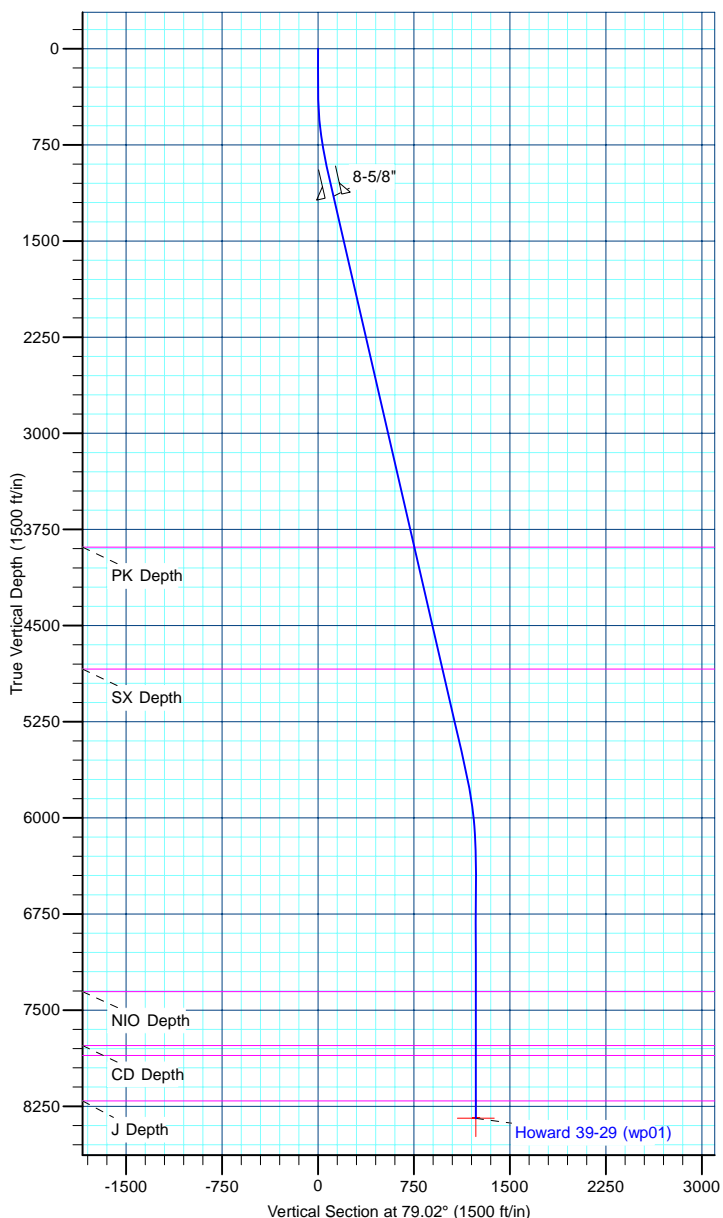
TVD	MD	Name	Size
1150.00	1160.97	8-5/8"	8-5/8

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Howard 39-29 BHL	8343.00	235.01	1211.06	1250130.12	3166600.20	40.018460	-104.905160	Circle (Radius: 25.00)

#### 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
949.99	13.00	79.02	944.43	13.99	72.08	2.00	79.02	73.42
5734.70	13.00	79.02	5606.51	219.02	1128.68	0.00	0.00	1149.74
6477.55	0.00	0.00	6343.00	235.01	1211.06	1.75	180.00	1233.65
8477.55	0.00	0.00	8343.00	235.01	1211.06	0.00	0.00	1233.65



<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well Howard 39-29
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Site:</b>	WELD_HOWARD 20-29 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Howard 39-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Howard 39-29		
<b>Design:</b>	Howard 39-29 (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_HOWARD 20-29 PAD			
Site Position:		Northing:	1,249,878.45 ft	Latitude:	40.017791
From:	Lat/Long	Easting:	3,165,409.00 ft	Longitude:	-104.909419
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence:	0.38 °

Well	Howard 39-29					
Well Position	+N-S	8.72 ft	Northing:	1,249,887.05 ft	Latitude:	40.017815
	+E-W	-18.21 ft	Easting:	3,165,390.74 ft	Longitude:	-104.909484
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,023.00 ft

<b>Wellbore</b>	Howard 39-29				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	5/6/2011	8.92	66.72	52,924

<b>Design</b>	Howard 39-29 (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	79.02

<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	
949.99	13.00	79.02	944.43	13.99	72.08	2.00	2.00	0.00	79.02	
5,734.70	13.00	79.02	5,606.51	219.02	1,128.68	0.00	0.00	0.00	0.00	
6,477.55	0.00	0.00	6,343.00	235.01	1,211.06	1.75	-1.75	0.00	180.00	
8,477.55	0.00	0.00	8,343.00	235.01	1,211.06	0.00	0.00	0.00	0.00	Howard 39-29 BHL

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well Howard 39-29
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Site:</b>	WELD_HOWARD 20-29 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Howard 39-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Howard 39-29		
<b>Design:</b>	Howard 39-29 (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
400.00	2.00	79.02	399.98	0.33	1.71	1.75	2.00	2.00	0.00
500.00	4.00	79.02	499.84	1.33	6.85	6.98	2.00	2.00	0.00
600.00	6.00	79.02	599.45	2.99	15.41	15.69	2.00	2.00	0.00
700.00	8.00	79.02	698.70	5.31	27.37	27.88	2.00	2.00	0.00
800.00	10.00	79.02	797.47	8.29	42.73	43.52	2.00	2.00	0.00
900.00	12.00	79.02	895.62	11.93	61.46	62.60	2.00	2.00	0.00
949.99	13.00	79.02	944.43	13.99	72.08	73.42	2.00	2.00	0.00
1,000.00	13.00	79.02	993.16	16.13	83.12	84.67	0.00	0.00	0.00
1,100.00	13.00	79.02	1,090.59	20.42	105.20	107.17	0.00	0.00	0.00
1,160.97	13.00	79.02	1,150.00	23.03	118.67	120.88	0.00	0.00	0.00
8-5/8"									
1,200.00	13.00	79.02	1,188.03	24.70	127.29	129.66	0.00	0.00	0.00
1,300.00	13.00	79.02	1,285.47	28.99	149.37	152.16	0.00	0.00	0.00
1,400.00	13.00	79.02	1,382.90	33.27	171.45	174.65	0.00	0.00	0.00
1,500.00	13.00	79.02	1,480.34	37.56	193.54	197.15	0.00	0.00	0.00
1,600.00	13.00	79.02	1,577.78	41.84	215.62	219.64	0.00	0.00	0.00
1,700.00	13.00	79.02	1,675.22	46.13	237.70	242.14	0.00	0.00	0.00
1,800.00	13.00	79.02	1,772.65	50.41	259.78	264.63	0.00	0.00	0.00
1,900.00	13.00	79.02	1,870.09	54.70	281.87	287.13	0.00	0.00	0.00
2,000.00	13.00	79.02	1,967.53	58.98	303.95	309.62	0.00	0.00	0.00
2,100.00	13.00	79.02	2,064.96	63.27	326.03	332.12	0.00	0.00	0.00
2,200.00	13.00	79.02	2,162.40	67.55	348.12	354.61	0.00	0.00	0.00
2,300.00	13.00	79.02	2,259.84	71.84	370.20	377.10	0.00	0.00	0.00
2,400.00	13.00	79.02	2,357.27	76.12	392.28	399.60	0.00	0.00	0.00
2,500.00	13.00	79.02	2,454.71	80.41	414.37	422.09	0.00	0.00	0.00
2,600.00	13.00	79.02	2,552.15	84.69	436.45	444.59	0.00	0.00	0.00
2,700.00	13.00	79.02	2,649.59	88.98	458.53	467.08	0.00	0.00	0.00
2,800.00	13.00	79.02	2,747.02	93.26	480.61	489.58	0.00	0.00	0.00
2,900.00	13.00	79.02	2,844.46	97.55	502.70	512.07	0.00	0.00	0.00
3,000.00	13.00	79.02	2,941.90	101.83	524.78	534.57	0.00	0.00	0.00
3,100.00	13.00	79.02	3,039.33	106.12	546.86	557.06	0.00	0.00	0.00
3,200.00	13.00	79.02	3,136.77	110.40	568.95	579.56	0.00	0.00	0.00
3,300.00	13.00	79.02	3,234.21	114.69	591.03	602.05	0.00	0.00	0.00
3,400.00	13.00	79.02	3,331.65	118.98	613.11	624.55	0.00	0.00	0.00
3,500.00	13.00	79.02	3,429.08	123.26	635.19	647.04	0.00	0.00	0.00
3,600.00	13.00	79.02	3,526.52	127.55	657.28	669.54	0.00	0.00	0.00
3,700.00	13.00	79.02	3,623.96	131.83	679.36	692.03	0.00	0.00	0.00
3,800.00	13.00	79.02	3,721.39	136.12	701.44	714.53	0.00	0.00	0.00
3,900.00	13.00	79.02	3,818.83	140.40	723.53	737.02	0.00	0.00	0.00
3,970.99	13.00	79.02	3,888.00	143.44	739.20	752.99	0.00	0.00	0.00
PK Depth									
4,000.00	13.00	79.02	3,916.27	144.69	745.61	759.52	0.00	0.00	0.00
4,100.00	13.00	79.02	4,013.70	148.97	767.69	782.01	0.00	0.00	0.00
4,200.00	13.00	79.02	4,111.14	153.26	789.77	804.51	0.00	0.00	0.00
4,300.00	13.00	79.02	4,208.58	157.54	811.86	827.00	0.00	0.00	0.00
4,400.00	13.00	79.02	4,306.02	161.83	833.94	849.50	0.00	0.00	0.00
4,500.00	13.00	79.02	4,403.45	166.11	856.02	871.99	0.00	0.00	0.00
4,600.00	13.00	79.02	4,500.89	170.40	878.11	894.49	0.00	0.00	0.00
4,700.00	13.00	79.02	4,598.33	174.68	900.19	916.98	0.00	0.00	0.00
4,800.00	13.00	79.02	4,695.76	178.97	922.27	939.48	0.00	0.00	0.00

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well Howard 39-29
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Site:</b>	WELD_HOWARD 20-29 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Howard 39-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Howard 39-29		
<b>Design:</b>	Howard 39-29 (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)
4,900.00	13.00	79.02	4,793.20	183.25	944.36	961.97	0.00	0.00	0.00
4,945.98	13.00	79.02	4,838.00	185.22	954.51	972.31	0.00	0.00	0.00
<b>SX Depth</b>									
5,000.00	13.00	79.02	4,890.64	187.54	966.44	984.47	0.00	0.00	0.00
5,100.00	13.00	79.02	4,988.08	191.82	988.52	1,006.96	0.00	0.00	0.00
5,200.00	13.00	79.02	5,085.51	196.11	1,010.60	1,029.46	0.00	0.00	0.00
5,300.00	13.00	79.02	5,182.95	200.39	1,032.69	1,051.95	0.00	0.00	0.00
5,400.00	13.00	79.02	5,280.39	204.68	1,054.77	1,074.45	0.00	0.00	0.00
5,500.00	13.00	79.02	5,377.82	208.97	1,076.85	1,096.94	0.00	0.00	0.00
5,600.00	13.00	79.02	5,475.26	213.25	1,098.94	1,119.44	0.00	0.00	0.00
5,700.00	13.00	79.02	5,572.70	217.54	1,121.02	1,141.93	0.00	0.00	0.00
5,734.70	13.00	79.02	5,606.51	219.02	1,128.68	1,149.74	0.00	0.00	0.00
5,800.00	11.86	79.02	5,670.28	221.70	1,142.48	1,163.79	1.75	-1.75	0.00
5,900.00	10.11	79.02	5,768.44	225.33	1,161.18	1,182.84	1.75	-1.75	0.00
6,000.00	8.36	79.02	5,867.14	228.38	1,176.93	1,198.88	1.75	-1.75	0.00
6,100.00	6.61	79.02	5,966.29	230.87	1,189.71	1,211.90	1.75	-1.75	0.00
6,200.00	4.86	79.02	6,065.78	232.77	1,199.51	1,221.89	1.75	-1.75	0.00
6,300.00	3.11	79.02	6,165.54	234.09	1,206.33	1,228.83	1.75	-1.75	0.00
6,400.00	1.36	79.02	6,265.46	234.83	1,210.15	1,232.73	1.75	-1.75	0.00
6,477.55	0.00	0.00	6,343.00	235.01	1,211.06	1,233.65	1.75	-1.75	0.00
6,500.00	0.00	0.00	6,365.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
6,600.00	0.00	0.00	6,465.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
6,700.00	0.00	0.00	6,565.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
6,800.00	0.00	0.00	6,665.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
6,900.00	0.00	0.00	6,765.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,000.00	0.00	0.00	6,865.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,100.00	0.00	0.00	6,965.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,200.00	0.00	0.00	7,065.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,300.00	0.00	0.00	7,165.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,400.00	0.00	0.00	7,265.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,490.55	0.00	0.00	7,356.00	235.01	1,211.06	1,233.65	0.00	0.00	0.00
<b>NIO Depth</b>									
7,500.00	0.00	0.00	7,365.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,600.00	0.00	0.00	7,465.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,700.00	0.00	0.00	7,565.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,800.00	0.00	0.00	7,665.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,900.00	0.00	0.00	7,765.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
7,909.55	0.00	0.00	7,775.00	235.01	1,211.06	1,233.65	0.00	0.00	0.00
<b>CD Depth</b>									
7,988.55	0.00	0.00	7,854.00	235.01	1,211.06	1,233.65	0.00	0.00	0.00
<b>GH Depth</b>									
8,000.00	0.00	0.00	7,865.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
8,100.00	0.00	0.00	7,965.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
8,200.00	0.00	0.00	8,065.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
8,300.00	0.00	0.00	8,165.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
8,342.55	0.00	0.00	8,208.00	235.01	1,211.06	1,233.65	0.00	0.00	0.00
<b>J Depth</b>									
8,400.00	0.00	0.00	8,265.45	235.01	1,211.06	1,233.65	0.00	0.00	0.00
8,477.55	0.00	0.00	8,343.00	235.01	1,211.06	1,233.65	0.00	0.00	0.00
<b>Howard 39-29 BHL</b>									

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well Howard 39-29
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 5023' GL @ 5038.00ft
<b>Site:</b>	WELD_HOWARD 20-29 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Howard 39-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Howard 39-29		
<b>Design:</b>	Howard 39-29 (wp01)		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Howard 39-29 BHL	0.00	0.00	8,343.00	235.01	1,211.06	1,250,130.12	3,166,600.21	40.018460	-104.905160
- plan hits target center									
- Circle (radius 25.00)									

Casing Points					
Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter
(ft)	(ft)		Name	(")	(")
1,160.97	1,150.00	8-5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth				Dip	Dip Direction
(ft)	(ft)		Name	Lithology	(°)	(°)
3,970.99	3,888.00	PK Depth				
4,945.98	4,838.00	SX Depth				
7,490.55	7,356.00	NIO Depth				
7,909.55	7,775.00	CD Depth				
7,988.55	7,854.00	GH Depth				
8,342.55	8,208.00	J Depth				