

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HOWARD 17-32 PAD

Howard 41-32

Howard 41-32

Plan: Howard 41-32 (wp01)

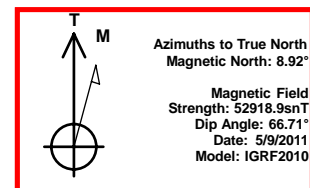
Standard Planning Report

10 May, 2011



Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_HOWARD 17-32 PAD
 Well: Howard 41-32
 Wellbore: Howard 41-32
 Section:
 SHL:
 Design: Howard 41-32 (wp01)
 Latitude: 40.010452
 Longitude: -104.910516
 GL: 5047.00
 KB: 15' RKB + 5047' GL @ 5062.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3912.00	4047.33	PK Depth
4879.00	5057.18	SX Depth
7387.00	7603.67	NIO Depth
7820.00	8036.67	CD Depth
7898.00	8114.67	GH Depth
8250.00	8466.67	J Depth



WELL DETAILS: Howard 41-32

+N/-S	+E/-W	Northing	Ground Level: Easting	5047.00 Latitude	Longitude	Slot
0.00	0.00	1247203.05	3165119.53	40.010452	-104.910516	

CASING DETAILS

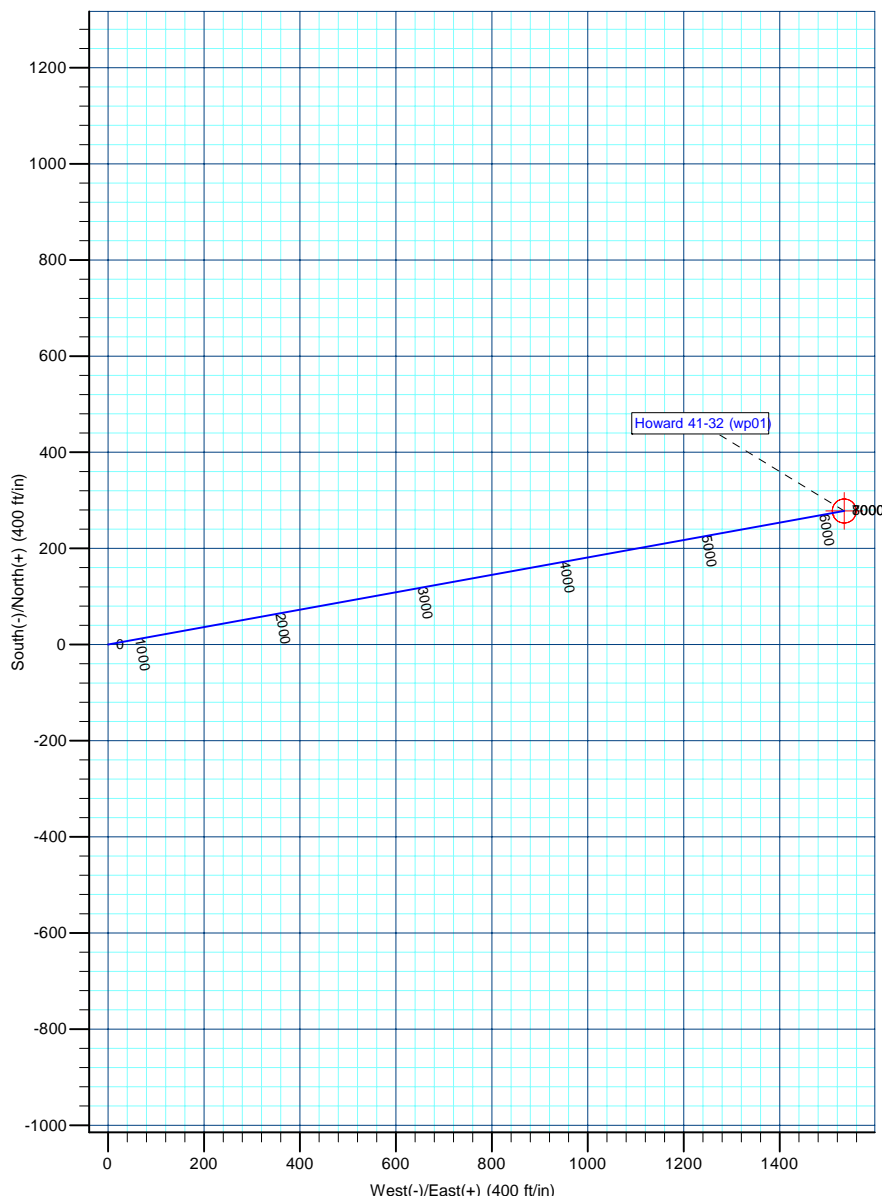
TVD	MD	Name	Size
1150.00	1162.96	8 5/8"	8-5/8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Howard 41-32 BHL	8385.00	277.63	1534.43	1247490.88	3166652.08	40.011214	-104.905038	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
1137.48	16.75	79.74	1125.60	21.64	119.60	2.00	79.74	121.54
5644.55	16.75	79.74	5441.45	252.90	1397.74	0.00	0.00	1420.44
6601.67	0.00	0.00	6385.00	277.63	1534.43	1.75	180.00	1559.34
8601.67	0.00	0.00	8385.00	277.63	1534.43	0.00	0.00	1559.34



Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 41-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5047' GL @ 5062.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 41-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 41-32		
Design:	Howard 41-32 (wp01)		

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

Site		WELD_HOWARD 17-32 PAD			
Site Position:		Northing:	1,247,203.06 ft	Latitude:	40.010452
From:	Lat/Long	Easting:	3,165,119.53 ft	Longitude:	-104.910516
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence:	0.38

Well	Howard 41-32					
Well Position	+N-S	0.00 ft	Northing:	1,247,203.05 ft	Latitude:	40.010452
	+E-W	0.00 ft	Easting:	3,165,119.53 ft	Longitude:	-104.910516
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,047.00 ft

Wellbore	Howard 41-32				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/9/2011	8.92	66.71	52,919

Design	Howard 41-32 (wp01)				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	79.74	

Plan Sections										
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	
1,137.48	16.75	79.74	1,125.60	21.64	119.60	2.00	2.00	0.00	79.74	
5,644.55	16.75	79.74	5,441.45	252.90	1,397.74	0.00	0.00	0.00	0.00	
6,601.67	0.00	0.00	6,385.00	277.63	1,534.43	1.75	-1.75	0.00	180.00	
8,601.67	0.00	0.00	8,385.00	277.63	1,534.43	0.00	0.00	0.00	0.00	Howard 41-32 BHL

Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 41-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5047' GL @ 5062.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 41-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 41-32		
Design:	Howard 41-32 (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	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	79.74	399.98	0.31	1.72	1.75	2.00	2.00	0.00
500.00	4.00	79.74	499.84	1.24	6.87	6.98	2.00	2.00	0.00
600.00	6.00	79.74	599.45	2.79	15.44	15.69	2.00	2.00	0.00
700.00	8.00	79.74	698.70	4.96	27.43	27.88	2.00	2.00	0.00
800.00	10.00	79.74	797.47	7.75	42.83	43.52	2.00	2.00	0.00
900.00	12.00	79.74	895.62	11.15	61.60	62.60	2.00	2.00	0.00
1,000.00	14.00	79.74	993.06	15.15	83.74	85.10	2.00	2.00	0.00
1,100.00	16.00	79.74	1,089.64	19.76	109.20	110.98	2.00	2.00	0.00
1,137.48	16.75	79.74	1,125.60	21.64	119.60	121.54	2.00	2.00	0.00
1,162.96	16.75	79.74	1,150.00	22.95	126.83	128.89	0.00	0.00	0.00
8 5/8"									
1,200.00	16.75	79.74	1,185.47	24.85	137.33	139.56	0.00	0.00	0.00
1,300.00	16.75	79.74	1,281.23	29.98	165.69	168.38	0.00	0.00	0.00
1,400.00	16.75	79.74	1,376.98	35.11	194.05	197.20	0.00	0.00	0.00
1,500.00	16.75	79.74	1,472.74	40.24	222.41	226.02	0.00	0.00	0.00
1,600.00	16.75	79.74	1,568.50	45.37	250.77	254.84	0.00	0.00	0.00
1,700.00	16.75	79.74	1,664.26	50.50	279.12	283.66	0.00	0.00	0.00
1,800.00	16.75	79.74	1,760.01	55.63	307.48	312.47	0.00	0.00	0.00
1,900.00	16.75	79.74	1,855.77	60.76	335.84	341.29	0.00	0.00	0.00
2,000.00	16.75	79.74	1,951.53	65.90	364.20	370.11	0.00	0.00	0.00
2,100.00	16.75	79.74	2,047.29	71.03	392.56	398.93	0.00	0.00	0.00
2,200.00	16.75	79.74	2,143.04	76.16	420.92	427.75	0.00	0.00	0.00
2,300.00	16.75	79.74	2,238.80	81.29	449.28	456.57	0.00	0.00	0.00
2,400.00	16.75	79.74	2,334.56	86.42	477.63	485.39	0.00	0.00	0.00
2,500.00	16.75	79.74	2,430.32	91.55	505.99	514.21	0.00	0.00	0.00
2,600.00	16.75	79.74	2,526.07	96.68	534.35	543.03	0.00	0.00	0.00
2,700.00	16.75	79.74	2,621.83	101.81	562.71	571.85	0.00	0.00	0.00
2,800.00	16.75	79.74	2,717.59	106.94	591.07	600.66	0.00	0.00	0.00
2,900.00	16.75	79.74	2,813.34	112.07	619.43	629.48	0.00	0.00	0.00
3,000.00	16.75	79.74	2,909.10	117.21	647.79	658.30	0.00	0.00	0.00
3,100.00	16.75	79.74	3,004.86	122.34	676.14	687.12	0.00	0.00	0.00
3,200.00	16.75	79.74	3,100.62	127.47	704.50	715.94	0.00	0.00	0.00
3,300.00	16.75	79.74	3,196.37	132.60	732.86	744.76	0.00	0.00	0.00
3,400.00	16.75	79.74	3,292.13	137.73	761.22	773.58	0.00	0.00	0.00
3,500.00	16.75	79.74	3,387.89	142.86	789.58	802.40	0.00	0.00	0.00
3,600.00	16.75	79.74	3,483.65	147.99	817.94	831.22	0.00	0.00	0.00
3,700.00	16.75	79.74	3,579.40	153.12	846.29	860.04	0.00	0.00	0.00
3,800.00	16.75	79.74	3,675.16	158.25	874.65	888.85	0.00	0.00	0.00
3,900.00	16.75	79.74	3,770.92	163.38	903.01	917.67	0.00	0.00	0.00
4,000.00	16.75	79.74	3,866.68	168.52	931.37	946.49	0.00	0.00	0.00
4,047.33	16.75	79.74	3,912.00	170.94	944.79	960.13	0.00	0.00	0.00
PK Depth									
4,100.00	16.75	79.74	3,962.43	173.65	959.73	975.31	0.00	0.00	0.00
4,200.00	16.75	79.74	4,058.19	178.78	988.09	1,004.13	0.00	0.00	0.00
4,300.00	16.75	79.74	4,153.95	183.91	1,016.45	1,032.95	0.00	0.00	0.00
4,400.00	16.75	79.74	4,249.70	189.04	1,044.80	1,061.77	0.00	0.00	0.00
4,500.00	16.75	79.74	4,345.46	194.17	1,073.16	1,090.59	0.00	0.00	0.00
4,600.00	16.75	79.74	4,441.22	199.30	1,101.52	1,119.41	0.00	0.00	0.00
4,700.00	16.75	79.74	4,536.98	204.43	1,129.88	1,148.23	0.00	0.00	0.00
4,800.00	16.75	79.74	4,632.73	209.56	1,158.24	1,177.04	0.00	0.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 41-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 41-32		
Design:	Howard 41-32 (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)
4,900.00	16.75	79.74	4,728.49	214.69	1,186.60	1,205.86	0.00	0.00	0.00
5,000.00	16.75	79.74	4,824.25	219.83	1,214.96	1,234.68	0.00	0.00	0.00
5,057.18	16.75	79.74	4,879.00	222.76	1,231.17	1,251.16	0.00	0.00	0.00
SX Depth									
5,100.00	16.75	79.74	4,920.01	224.96	1,243.31	1,263.50	0.00	0.00	0.00
5,200.00	16.75	79.74	5,015.76	230.09	1,271.67	1,292.32	0.00	0.00	0.00
5,300.00	16.75	79.74	5,111.52	235.22	1,300.03	1,321.14	0.00	0.00	0.00
5,400.00	16.75	79.74	5,207.28	240.35	1,328.39	1,349.96	0.00	0.00	0.00
5,500.00	16.75	79.74	5,303.04	245.48	1,356.75	1,378.78	0.00	0.00	0.00
5,600.00	16.75	79.74	5,398.79	250.61	1,385.11	1,407.60	0.00	0.00	0.00
5,644.55	16.75	79.74	5,441.45	252.90	1,397.74	1,420.44	0.00	0.00	0.00
5,700.00	15.78	79.74	5,494.68	255.66	1,413.02	1,435.97	1.75	-1.75	0.00
5,800.00	14.03	79.74	5,591.31	260.24	1,438.33	1,461.68	1.75	-1.75	0.00
5,900.00	12.28	79.74	5,688.69	264.29	1,460.72	1,484.44	1.75	-1.75	0.00
6,000.00	10.53	79.74	5,786.71	267.81	1,480.18	1,504.21	1.75	-1.75	0.00
6,100.00	8.78	79.74	5,885.29	270.80	1,496.68	1,520.98	1.75	-1.75	0.00
6,200.00	7.03	79.74	5,984.33	273.25	1,510.21	1,534.73	1.75	-1.75	0.00
6,300.00	5.28	79.74	6,083.75	275.16	1,520.76	1,545.45	1.75	-1.75	0.00
6,400.00	3.53	79.74	6,183.46	276.52	1,528.32	1,553.13	1.75	-1.75	0.00
6,500.00	1.78	79.74	6,283.34	277.35	1,532.88	1,557.76	1.75	-1.75	0.00
6,600.00	0.03	79.74	6,383.33	277.63	1,534.43	1,559.34	1.75	-1.75	0.00
6,601.67	0.00	0.00	6,385.00	277.63	1,534.43	1,559.34	1.75	-1.75	0.00
6,700.00	0.00	0.00	6,483.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
6,800.00	0.00	0.00	6,583.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
6,900.00	0.00	0.00	6,683.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,000.00	0.00	0.00	6,783.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,100.00	0.00	0.00	6,883.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,200.00	0.00	0.00	6,983.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,300.00	0.00	0.00	7,083.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,400.00	0.00	0.00	7,183.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,500.00	0.00	0.00	7,283.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,600.00	0.00	0.00	7,383.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,603.67	0.00	0.00	7,387.00	277.63	1,534.43	1,559.34	0.00	0.00	0.00
NIO Depth									
7,700.00	0.00	0.00	7,483.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,800.00	0.00	0.00	7,583.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
7,900.00	0.00	0.00	7,683.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,000.00	0.00	0.00	7,783.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,036.67	0.00	0.00	7,820.00	277.63	1,534.43	1,559.34	0.00	0.00	0.00
CD Depth									
8,100.00	0.00	0.00	7,883.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,114.67	0.00	0.00	7,898.00	277.63	1,534.43	1,559.34	0.00	0.00	0.00
GH Depth									
8,200.00	0.00	0.00	7,983.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,300.00	0.00	0.00	8,083.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,400.00	0.00	0.00	8,183.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,466.67	0.00	0.00	8,250.00	277.63	1,534.43	1,559.34	0.00	0.00	0.00
J Depth									
8,500.00	0.00	0.00	8,283.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,600.00	0.00	0.00	8,383.33	277.63	1,534.43	1,559.34	0.00	0.00	0.00
8,601.67	0.00	0.00	8,385.00	277.63	1,534.43	1,559.34	0.00	0.00	0.00
Howard 41-32 BHL									

Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 41-32
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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 41-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 41-32		
Design:	Howard 41-32 (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 41-32 BHL	0.00	0.00	8,385.00	277.63	1,534.43	1,247,490.87	3,166,652.08	40.011214	-104.905038
- plan hits target center									
- Circle (radius 25.00)									

Casing Points					
Measured Depth	Vertical Depth		Name	Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
1,162.96	1,150.00	8 5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth		Name	Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
4,047.33	3,912.00	PK Depth				
5,057.18	4,879.00	SX Depth				
7,603.67	7,387.00	NIO Depth				
8,036.67	7,820.00	CD Depth				
8,114.67	7,898.00	GH Depth				
8,466.67	8,250.00	J Depth				