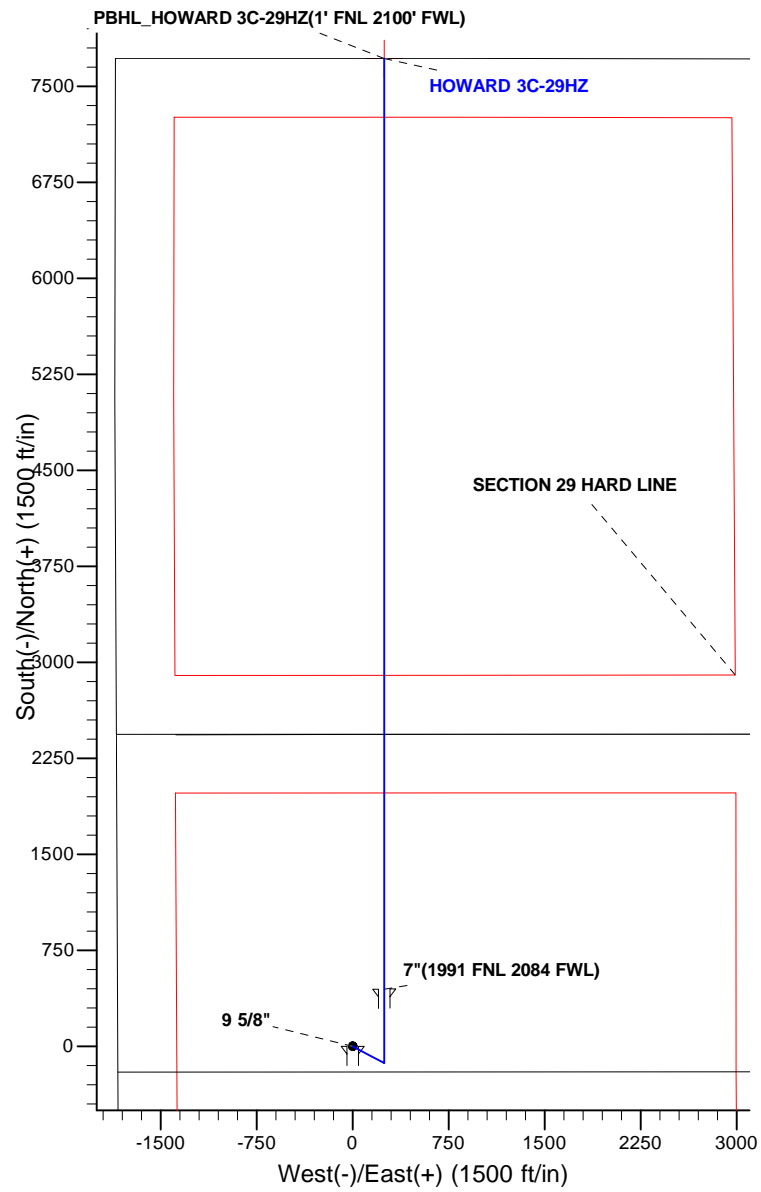
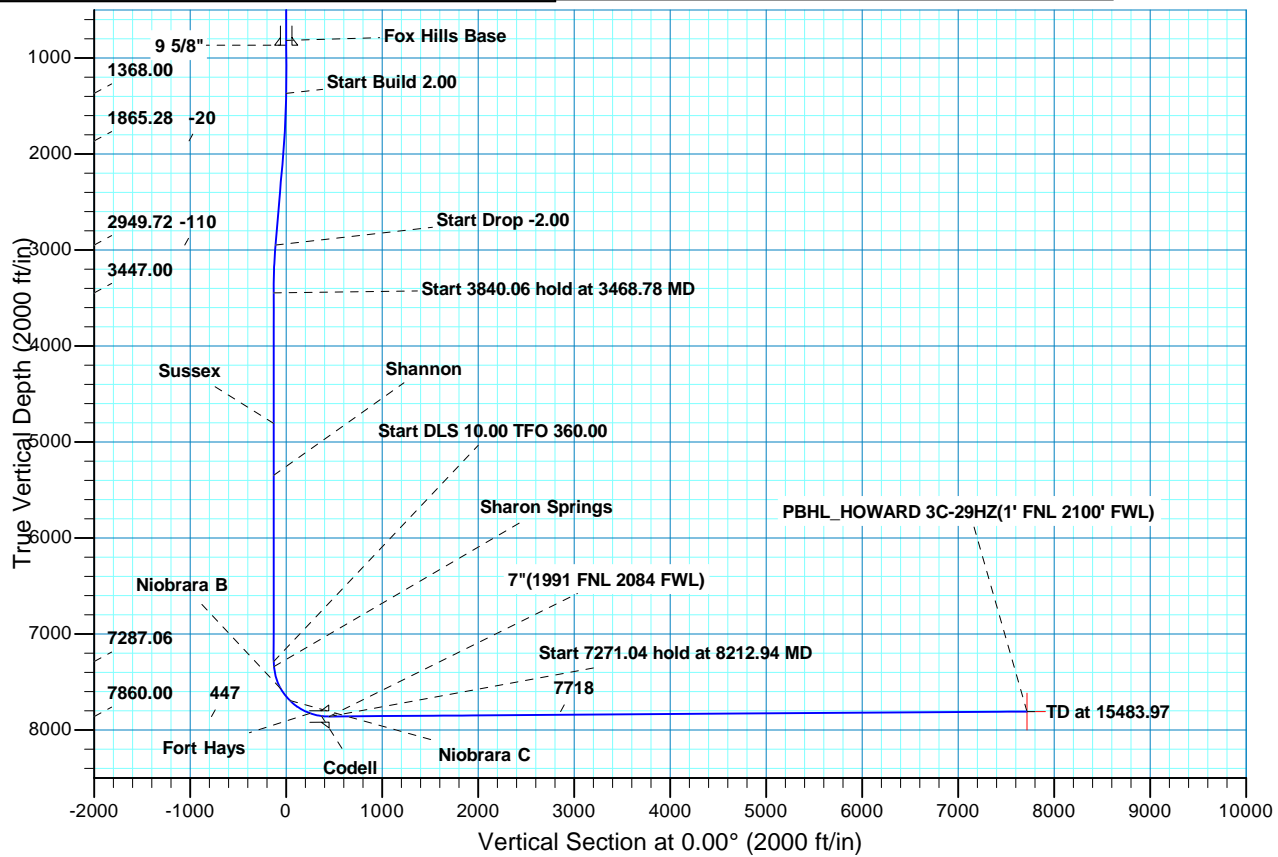




Project: COLORADO NORTHERN ZONE - 83
Site: HOWARD 6-32HZ
Well: HOWARD 3C-29HZ
Wellbore: OH
Design: PLAN #2 PRELIMINARY



WELL DETAILS: HOWARD 3C-29HZ										
GL 5049' & KB 17' @ 5066.00ft (ASSUMED)										
		+N/-S	+E/-W	Northing		Easting		Latitude	Longitude	
		0.00	0.00	1246347.41		3163255.10		40.0081370	-104.9171920	
SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1368.00	0.00	0.00	1368.00	0.00	0.00	0.00	0.00	0.00	0.00	
1867.81	10.00	117.87	1865.28	-20.33	38.45	2.00	117.87	-20.33		
2968.97	10.00	117.87	2949.72	-109.67	207.42	0.00	0.00	-109.67		
3468.78	0.00	0.00	3447.00	-130.00	245.87	2.00	180.00	-130.00		
7308.84	0.00	0.00	7287.06	-130.00	245.87	0.00	0.00	-130.00		
8212.94	90.41	360.00	7860.00	447.06	245.87	10.00	360.00	447.06		
15483.97	90.41	360.00	7808.00	7717.91	245.87	0.00	0.007717.91		PBHL_HOWARD 3C-29HZ(1' FNL 2100' FWL)	
FORMATION TOP DETAILS							CASING DETAILS			
TVDPath	MDPath	Formation				Inc	TVD	MD	Name	Size
816.00	816.00	Fox Hills Base				0.00	866.00	866.00	9 5/8"	9.625
4806.00	4827.78	Sussex				0.00	7860.00	8212.94	7"	7.000
5346.00	5367.78	Shannon				0.00				
7341.00	7362.86	Sharon Springs				5.40				
7427.00	7450.21	Niobrara A				14.12				
7568.00	7602.46	Niobrara B				29.36				
7695.00	7762.81	Niobrara C				45.40				
7826.00	8010.41	Fort Hays				70.16				
7855.00	8132.96	Codell				82.41				





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

HOWARD 6-32HZ

HOWARD 3C-29HZ

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

18 July, 2013

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well HOWARD 3C-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Site:	HOWARD 6-32HZ	North Reference:	True
Well:	HOWARD 3C-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	HOWARD 6-32HZ, SECTION 32 T1N R67W			
Site Position:		Northing:	1,246,347.22 usft	Latitude: 40.0081370
From:	Lat/Long	Easting:	3,163,224.85 usft	Longitude: -104.9173000
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.38 °

Well	HOWARD 3C-29HZ, 2439 FNL 1835 FWL			
Well Position	+N/-S	-0.01 ft	Northing:	1,246,347.41 usft
	+E/-W	30.25 ft	Easting:	3,163,255.10 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 5,049.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	2013/04/08	8.72	66.62	52,620

Design	PLAN #2 PRELIMINARY			
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	0.00

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	
1,368.00	0.00	0.00	1,368.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,867.81	10.00	117.87	1,865.28	-20.33	38.45	2.00	2.00	0.00	117.87	
2,968.97	10.00	117.87	2,949.72	-109.67	207.42	0.00	0.00	0.00	0.00	
3,468.78	0.00	0.00	3,447.00	-130.00	245.87	2.00	-2.00	0.00	180.00	
7,308.84	0.00	0.00	7,287.06	-130.00	245.87	0.00	0.00	0.00	0.00	
8,212.94	90.41	360.00	7,860.00	447.06	245.87	10.00	10.00	0.00	360.00	
15,483.97	90.41	360.00	7,808.00	7,717.91	245.87	0.00	0.00	0.00	0.00	PBHL_HOWARD 3C-

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well HOWARD 3C-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Site:	HOWARD 6-32HZ	North Reference:	True
Well:	HOWARD 3C-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
816.00	0.00	0.00	816.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base									
866.00	0.00	0.00	866.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,368.00	0.00	0.00	1,368.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,400.00	0.64	117.87	1,400.00	-0.08	0.16	-0.08	2.00	2.00	0.00
1,500.00	2.64	117.87	1,499.95	-1.42	2.69	-1.42	2.00	2.00	0.00
1,600.00	4.64	117.87	1,599.75	-4.39	8.30	-4.39	2.00	2.00	0.00
1,700.00	6.64	117.87	1,699.26	-8.98	16.99	-8.98	2.00	2.00	0.00
1,800.00	8.64	117.87	1,798.36	-15.20	28.74	-15.20	2.00	2.00	0.00
1,867.81	10.00	117.87	1,865.28	-20.33	38.45	-20.33	2.00	2.00	0.00
Start 1101.16 hold at 1867.81 MD									
1,900.00	10.00	117.87	1,896.98	-22.94	43.39	-22.94	0.00	0.00	0.00
2,000.00	10.00	117.87	1,995.46	-31.05	58.73	-31.05	0.00	0.00	0.00
2,100.00	10.00	117.87	2,093.94	-39.17	74.08	-39.17	0.00	0.00	0.00
2,200.00	10.00	117.87	2,192.43	-47.28	89.42	-47.28	0.00	0.00	0.00
2,300.00	10.00	117.87	2,290.91	-55.39	104.77	-55.39	0.00	0.00	0.00
2,400.00	10.00	117.87	2,389.39	-63.51	120.11	-63.51	0.00	0.00	0.00
2,500.00	10.00	117.87	2,487.87	-71.62	135.46	-71.62	0.00	0.00	0.00
2,600.00	10.00	117.87	2,586.35	-79.74	150.80	-79.74	0.00	0.00	0.00
2,700.00	10.00	117.87	2,684.83	-87.85	166.15	-87.85	0.00	0.00	0.00
2,800.00	10.00	117.87	2,783.32	-95.96	181.49	-95.96	0.00	0.00	0.00
2,900.00	10.00	117.87	2,881.80	-104.08	196.84	-104.08	0.00	0.00	0.00
2,968.97	10.00	117.87	2,949.72	-109.67	207.42	-109.67	0.00	0.00	0.00
Start Drop -2.00									
3,000.00	9.38	117.87	2,980.31	-112.11	212.04	-112.11	2.00	-2.00	0.00
3,100.00	7.38	117.87	3,079.24	-118.92	224.92	-118.92	2.00	-2.00	0.00
3,200.00	5.38	117.87	3,178.61	-124.11	234.73	-124.11	2.00	-2.00	0.00
3,300.00	3.38	117.87	3,278.32	-127.68	241.48	-127.68	2.00	-2.00	0.00
3,400.00	1.38	117.87	3,378.23	-129.61	245.14	-129.61	2.00	-2.00	0.00
3,468.78	0.00	0.00	3,447.00	-130.00	245.87	-130.00	2.00	-2.00	0.00
Start 3840.06 hold at 3468.78 MD									
3,500.00	0.00	0.00	3,478.22	-130.00	245.87	-130.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,578.22	-130.00	245.87	-130.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,678.22	-130.00	245.87	-130.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,778.22	-130.00	245.87	-130.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,878.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,000.00	0.00	0.00	3,978.22	-130.00	245.87	-130.00	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well HOWARD 3C-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Site:	HOWARD 6-32HZ	North Reference:	True
Well:	HOWARD 3C-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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)
4,100.00	0.00	0.00	4,078.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,178.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,278.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,378.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,478.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,578.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,678.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,778.22	-130.00	245.87	-130.00	0.00	0.00	0.00
4,827.78	0.00	0.00	4,806.00	-130.00	245.87	-130.00	0.00	0.00	0.00
Sussex									
4,900.00	0.00	0.00	4,878.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,978.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,078.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,178.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,278.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,367.78	0.00	0.00	5,346.00	-130.00	245.87	-130.00	0.00	0.00	0.00
Shannon									
5,400.00	0.00	0.00	5,378.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,478.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,578.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,678.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,778.22	-130.00	245.87	-130.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,878.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,978.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,078.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,178.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,278.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,378.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,478.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,578.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,678.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,778.22	-130.00	245.87	-130.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,878.22	-130.00	245.87	-130.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,978.22	-130.00	245.87	-130.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,078.22	-130.00	245.87	-130.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,178.22	-130.00	245.87	-130.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,278.22	-130.00	245.87	-130.00	0.00	0.00	0.00
7,308.84	0.00	0.00	7,287.06	-130.00	245.87	-130.00	0.00	0.00	0.00
Start DLS 10.00 TFO 360.00									
7,362.86	5.40	360.00	7,341.00	-127.46	245.87	-127.46	10.00	10.00	0.00
Sharon Springs									
7,400.00	9.12	360.00	7,377.84	-122.76	245.87	-122.76	10.00	10.00	0.00
7,450.21	14.12	360.00	7,427.00	-112.65	245.87	-112.65	9.96	9.96	0.00
Niobrara A									
7,500.00	19.12	360.00	7,474.69	-98.41	245.87	-98.41	10.04	10.04	0.00
7,600.00	29.12	360.00	7,565.85	-57.60	245.87	-57.60	10.00	10.00	0.00
7,602.46	29.36	360.00	7,568.00	-56.40	245.87	-56.40	10.00	10.00	0.00
Niobrara B									
7,700.00	39.12	360.00	7,648.53	-1.58	245.87	-1.58	10.00	10.00	0.00
7,762.81	45.40	360.00	7,695.00	40.63	245.87	40.63	10.00	10.00	0.00
Niobrara C									
7,800.00	49.12	360.00	7,720.24	67.94	245.87	67.94	10.00	10.00	0.00
7,900.00	59.12	360.00	7,778.78	148.86	245.87	148.86	10.00	10.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well HOWARD 3C-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Site:	HOWARD 6-32HZ	North Reference:	True
Well:	HOWARD 3C-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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)
8,000.00	69.12	360.00	7,822.38	238.71	245.87	238.71	10.00	10.00	0.00
8,010.41	70.16	360.00	7,826.00	248.47	245.87	248.47	10.00	10.00	0.00
Fort Hays									
8,100.00	79.12	360.00	7,849.71	334.77	245.87	334.77	10.00	10.00	0.00
8,132.96	82.41	360.00	7,855.00	367.30	245.87	367.30	10.00	10.00	0.00
Codell									
8,200.00	89.12	360.00	7,859.95	434.12	245.87	434.12	10.00	10.00	0.00
8,212.94	90.41	360.00	7,860.00	447.06	245.87	447.06	10.00	10.00	0.00
Start 7271.04 hold at 8212.94 MD - 7"(1991 FNL 2084 FWL)									
8,300.00	90.41	360.00	7,859.38	534.12	245.87	534.12	0.00	0.00	0.00
8,400.00	90.41	360.00	7,858.67	634.11	245.87	634.11	0.00	0.00	0.00
8,500.00	90.41	360.00	7,857.95	734.11	245.87	734.11	0.00	0.00	0.00
8,600.00	90.41	360.00	7,857.24	834.11	245.87	834.11	0.00	0.00	0.00
8,700.00	90.41	360.00	7,856.52	934.11	245.87	934.11	0.00	0.00	0.00
8,800.00	90.41	360.00	7,855.80	1,034.10	245.87	1,034.10	0.00	0.00	0.00
8,900.00	90.41	360.00	7,855.09	1,134.10	245.87	1,134.10	0.00	0.00	0.00
9,000.00	90.41	360.00	7,854.37	1,234.10	245.87	1,234.10	0.00	0.00	0.00
9,100.00	90.41	360.00	7,853.66	1,334.10	245.87	1,334.10	0.00	0.00	0.00
9,200.00	90.41	360.00	7,852.94	1,434.09	245.87	1,434.09	0.00	0.00	0.00
9,300.00	90.41	360.00	7,852.23	1,534.09	245.87	1,534.09	0.00	0.00	0.00
9,400.00	90.41	360.00	7,851.51	1,634.09	245.87	1,634.09	0.00	0.00	0.00
9,500.00	90.41	360.00	7,850.80	1,734.08	245.87	1,734.08	0.00	0.00	0.00
9,600.00	90.41	360.00	7,850.08	1,834.08	245.87	1,834.08	0.00	0.00	0.00
9,700.00	90.41	360.00	7,849.37	1,934.08	245.87	1,934.08	0.00	0.00	0.00
9,800.00	90.41	360.00	7,848.65	2,034.08	245.87	2,034.08	0.00	0.00	0.00
9,900.00	90.41	360.00	7,847.94	2,134.07	245.87	2,134.07	0.00	0.00	0.00
10,000.00	90.41	360.00	7,847.22	2,234.07	245.87	2,234.07	0.00	0.00	0.00
10,100.00	90.41	360.00	7,846.51	2,334.07	245.87	2,334.07	0.00	0.00	0.00
10,200.00	90.41	360.00	7,845.79	2,434.07	245.87	2,434.07	0.00	0.00	0.00
10,300.00	90.41	360.00	7,845.08	2,534.06	245.87	2,534.06	0.00	0.00	0.00
10,400.00	90.41	360.00	7,844.36	2,634.06	245.87	2,634.06	0.00	0.00	0.00
10,500.00	90.41	360.00	7,843.65	2,734.06	245.87	2,734.06	0.00	0.00	0.00
10,600.00	90.41	360.00	7,842.93	2,834.06	245.87	2,834.06	0.00	0.00	0.00
10,700.00	90.41	360.00	7,842.22	2,934.05	245.87	2,934.05	0.00	0.00	0.00
10,800.00	90.41	360.00	7,841.50	3,034.05	245.87	3,034.05	0.00	0.00	0.00
10,900.00	90.41	360.00	7,840.79	3,134.05	245.87	3,134.05	0.00	0.00	0.00
11,000.00	90.41	360.00	7,840.07	3,234.05	245.87	3,234.05	0.00	0.00	0.00
11,100.00	90.41	360.00	7,839.35	3,334.04	245.87	3,334.04	0.00	0.00	0.00
11,200.00	90.41	360.00	7,838.64	3,434.04	245.87	3,434.04	0.00	0.00	0.00
11,300.00	90.41	360.00	7,837.92	3,534.04	245.87	3,534.04	0.00	0.00	0.00
11,400.00	90.41	360.00	7,837.21	3,634.04	245.87	3,634.04	0.00	0.00	0.00
11,500.00	90.41	360.00	7,836.49	3,734.03	245.87	3,734.03	0.00	0.00	0.00
11,600.00	90.41	360.00	7,835.78	3,834.03	245.87	3,834.03	0.00	0.00	0.00
11,700.00	90.41	360.00	7,835.06	3,934.03	245.87	3,934.03	0.00	0.00	0.00
11,800.00	90.41	360.00	7,834.35	4,034.03	245.87	4,034.03	0.00	0.00	0.00
11,900.00	90.41	360.00	7,833.63	4,134.02	245.87	4,134.02	0.00	0.00	0.00
12,000.00	90.41	360.00	7,832.92	4,234.02	245.87	4,234.02	0.00	0.00	0.00
12,100.00	90.41	360.00	7,832.20	4,334.02	245.87	4,334.02	0.00	0.00	0.00
12,200.00	90.41	360.00	7,831.49	4,434.02	245.87	4,434.02	0.00	0.00	0.00
12,300.00	90.41	360.00	7,830.77	4,534.01	245.87	4,534.01	0.00	0.00	0.00
12,400.00	90.41	360.00	7,830.06	4,634.01	245.87	4,634.01	0.00	0.00	0.00
12,500.00	90.41	360.00	7,829.34	4,734.01	245.87	4,734.01	0.00	0.00	0.00
12,600.00	90.41	360.00	7,828.63	4,834.01	245.87	4,834.01	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well HOWARD 3C-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Site:	HOWARD 6-32HZ	North Reference:	True
Well:	HOWARD 3C-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

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)
12,700.00	90.41	360.00	7,827.91	4,934.00	245.87	4,934.00	0.00	0.00	0.00
12,800.00	90.41	360.00	7,827.20	5,034.00	245.87	5,034.00	0.00	0.00	0.00
12,900.00	90.41	360.00	7,826.48	5,134.00	245.87	5,134.00	0.00	0.00	0.00
13,000.00	90.41	360.00	7,825.77	5,234.00	245.87	5,234.00	0.00	0.00	0.00
13,100.00	90.41	360.00	7,825.05	5,333.99	245.87	5,333.99	0.00	0.00	0.00
13,200.00	90.41	360.00	7,824.34	5,433.99	245.87	5,433.99	0.00	0.00	0.00
13,300.00	90.41	360.00	7,823.62	5,533.99	245.87	5,533.99	0.00	0.00	0.00
13,400.00	90.41	360.00	7,822.90	5,633.99	245.87	5,633.99	0.00	0.00	0.00
13,500.00	90.41	360.00	7,822.19	5,733.98	245.87	5,733.98	0.00	0.00	0.00
13,600.00	90.41	360.00	7,821.47	5,833.98	245.87	5,833.98	0.00	0.00	0.00
13,700.00	90.41	360.00	7,820.76	5,933.98	245.87	5,933.98	0.00	0.00	0.00
13,800.00	90.41	360.00	7,820.04	6,033.97	245.87	6,033.97	0.00	0.00	0.00
13,900.00	90.41	360.00	7,819.33	6,133.97	245.87	6,133.97	0.00	0.00	0.00
14,000.00	90.41	360.00	7,818.61	6,233.97	245.87	6,233.97	0.00	0.00	0.00
14,100.00	90.41	360.00	7,817.90	6,333.97	245.87	6,333.97	0.00	0.00	0.00
14,200.00	90.41	360.00	7,817.18	6,433.96	245.87	6,433.96	0.00	0.00	0.00
14,300.00	90.41	360.00	7,816.47	6,533.96	245.87	6,533.96	0.00	0.00	0.00
14,400.00	90.41	360.00	7,815.75	6,633.96	245.87	6,633.96	0.00	0.00	0.00
14,500.00	90.41	360.00	7,815.04	6,733.96	245.87	6,733.96	0.00	0.00	0.00
14,600.00	90.41	360.00	7,814.32	6,833.95	245.87	6,833.95	0.00	0.00	0.00
14,700.00	90.41	360.00	7,813.61	6,933.95	245.87	6,933.95	0.00	0.00	0.00
14,800.00	90.41	360.00	7,812.89	7,033.95	245.87	7,033.95	0.00	0.00	0.00
14,900.00	90.41	360.00	7,812.18	7,133.95	245.87	7,133.95	0.00	0.00	0.00
15,000.00	90.41	360.00	7,811.46	7,233.94	245.87	7,233.94	0.00	0.00	0.00
15,100.00	90.41	360.00	7,810.75	7,333.94	245.87	7,333.94	0.00	0.00	0.00
15,200.00	90.41	360.00	7,810.03	7,433.94	245.87	7,433.94	0.00	0.00	0.00
15,300.00	90.41	360.00	7,809.32	7,533.94	245.87	7,533.94	0.00	0.00	0.00
15,400.00	90.41	360.00	7,808.60	7,633.93	245.87	7,633.93	0.00	0.00	0.00
15,483.97	90.41	360.00	7,808.00	7,717.91	245.87	7,717.91	0.00	0.00	0.00
TD at 15483.97 - PBHL_HOWARD 3C-29HZ(1' FNL 2100' FWL)									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_HOWARD 3C-29	0.00	0.00	7,808.00	7,717.91	245.87	1,254,066.75	3,163,450.24	40.0293240	-104.9163140
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
866.00	866.00	9 5/8"	9.625	12.250	
8,212.94	7,860.00	7"(1991 FNL 2084 FWL)	7.000	7.500	

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well HOWARD 3C-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049' & KB 17' @ 5066.00ft (ASSUMED)
Site:	HOWARD 6-32HZ	North Reference:	True
Well:	HOWARD 3C-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2 PRELIMINARY		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
816.00	817.00	Fox Hills Base			
4,827.78	4,807.00	Sussex			
5,367.78	5,347.00	Shannon			
7,362.86	7,342.00	Sharon Springs			
7,450.21	7,428.00	Niobrara A			
7,602.46	7,569.00	Niobrara B			
7,762.81	7,696.00	Niobrara C			
8,010.41	7,827.00	Fort Hays			
8,132.96	7,856.00	Codell			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,368.00	1,368.00	0.00	0.00	Start Build 2.00
1,867.81	1,865.28	-20.33	38.45	Start 1101.16 hold at 1867.81 MD
2,968.97	2,949.72	-109.67	207.42	Start Drop -2.00
3,468.78	3,447.00	-130.00	245.87	Start 3840.06 hold at 3468.78 MD
7,308.84	7,287.06	-130.00	245.87	Start DLS 10.00 TFO 360.00
8,212.94	7,860.00	447.06	245.87	Start 7271.04 hold at 8212.94 MD
15,483.97	7,808.00	7,717.91	245.87	TD at 15483.97