

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HOWARD 4 PAD

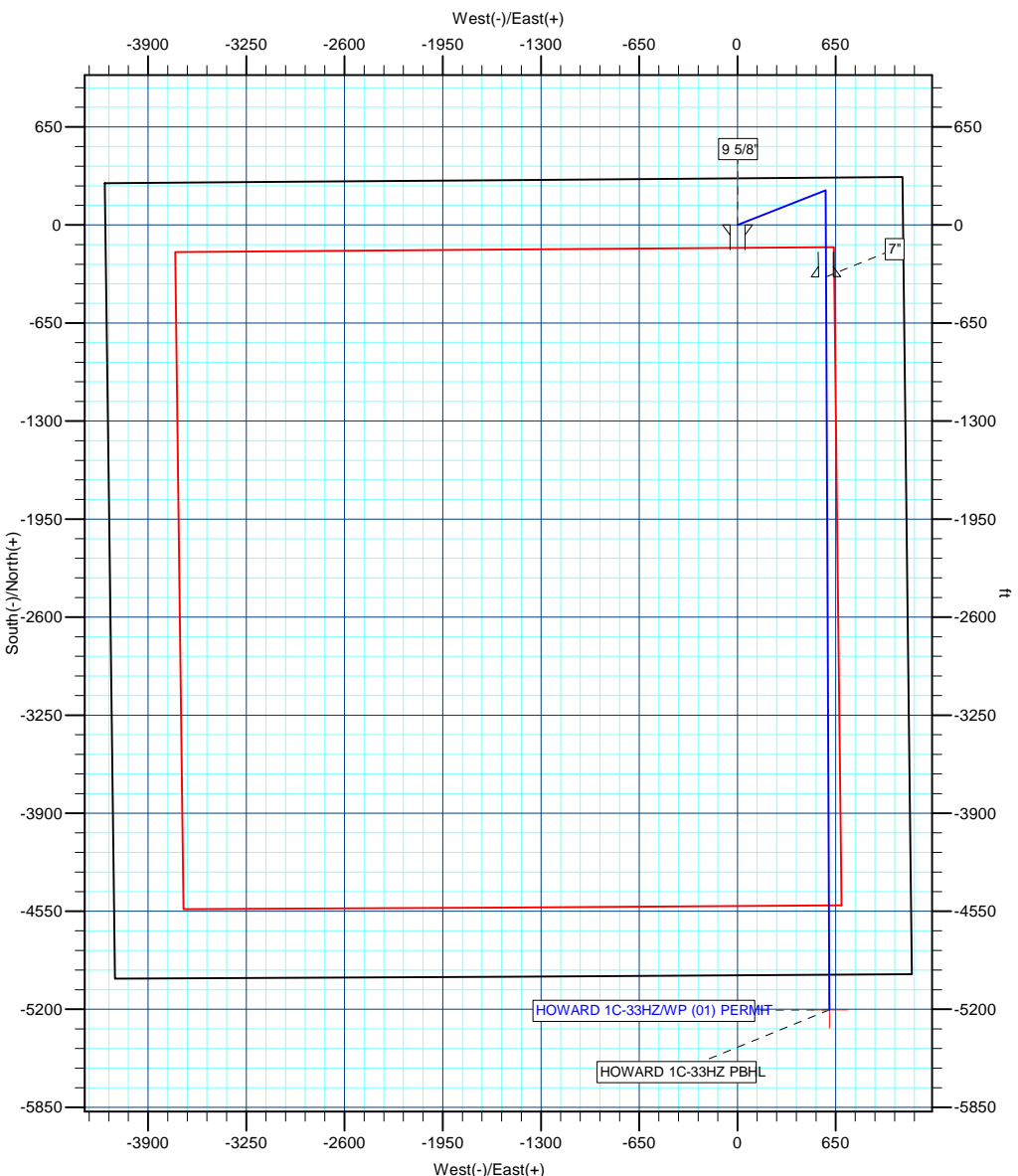
HOWARD 1C-33HZ

Wellbore #1

Plan: WP (01) PERMIT

Standard Planning Report

10 December, 2012



Azimuths to True North
Magnetic North: 8.7°

Magnetic Field
Strength: 52764.2nT
Dip Angle: 66.68°
Date: 12/10/2012
Model: IGRF2010

Anadarko
Petroleum Corporation

Project: COLORADO NORTHERN ZONE - 83
Site: WELD HOWARD 4 PAD
Well: HOWARD 1C-33HZ
Wellbore: Wellbore #1
Design: WP (01) PERMIT
Latitude: 40.028556
Longitude: -104.890030
GL: 4983.00
KB: 17'RKB+4983'GL @ 5000.00ft

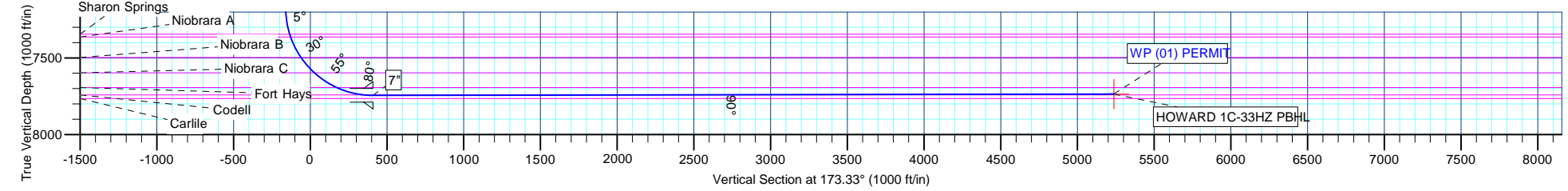
WELL DETAILS: HOWARD 1C-33HZ						
+N/-S 0.00	+E/-W 0.00	Northing 1253836.51	Ground Level: Easting 3170812.39	4983.00 Latitude 40.028556	Longitude -104.890030	Slot

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
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00
1410.90	6.22	68.50	1410.29	6.18	15.68	2.00	68.50	-4.31
6894.62	6.22	68.50	6861.75	223.82	568.32	0.00	0.00	-156.31
7205.52	0.00	0.00	7172.04	230.00	584.00	2.00	180.00	-160.62
8106.58	90.11	179.74	7745.00	-344.01	586.57	10.00	179.74	409.81
2965.54	90.11	179.74	7736.00	-5202.91	608.37	0.00	0.00	5238.36

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
HOWARD 1C-33HZ PBHL	7736.00	-5202.91	608.37	40.014273	-104.887858	Point	

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4780.00	4800.55	Sussex
7345.00	7381.22	Sharon Springs
7364.00	7401.27	Niobrara A
7497.00	7551.05	Niobrara B
7597.00	7684.28	Niobrara C
7693.00	7859.53	Fort Hays
7741.00	8037.79	Codell

CASING DETAILS			
TVD	MD	Name	Size
900.00	900.00	9 5/8"	9-5/8
7745.00	8106.58	7"	7



Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 1C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 1C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

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 4 PAD			
Site Position:		Northing:	1,253,776.80 usft	Latitude: 40.028392
From:	Lat/Long	Easting:	3,170,813.08 usft	Longitude: -104.890029
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.39 °

Well	HOWARD 1C-33HZ			
Well Position	+N/-S	59.72 ft	Northing:	1,253,836.51 usft
	+E/-W	-0.28 ft	Easting:	3,170,812.39 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 4,983.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/10/2012	8.70	66.68	52,764

Design	WP (01) PERMIT			
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	173.33

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
1,410.90	6.22	68.50	1,410.29	6.18	15.68	2.00	2.00	0.00	68.50	
6,894.62	6.22	68.50	6,861.75	223.82	568.32	0.00	0.00	0.00	0.00	
7,205.52	0.00	0.00	7,172.04	230.00	584.00	2.00	-2.00	0.00	180.00	
8,106.58	90.11	179.74	7,745.00	-344.01	586.57	10.00	10.00	0.00	179.74	
12,965.54	90.11	179.74	7,736.00	-5,202.91	608.37	0.00	0.00	0.00	0.00	HOWARD 1C-33HZ F

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 1C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 1C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
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
Start Build 2.00									
1,200.00	2.00	68.50	1,199.98	0.64	1.62	-0.45	2.00	2.00	0.00
1,300.00	4.00	68.50	1,299.84	2.56	6.49	-1.79	2.00	2.00	0.00
1,400.00	6.00	68.50	1,399.45	5.75	14.60	-4.02	2.00	2.00	0.00
1,410.90	6.22	68.50	1,410.29	6.18	15.68	-4.31	2.00	2.00	0.00
Start 5483.72 hold at 1410.90 MD									
1,500.00	6.22	68.50	1,498.87	9.71	24.66	-6.78	0.00	0.00	0.00
1,600.00	6.22	68.50	1,598.28	13.68	34.74	-9.55	0.00	0.00	0.00
1,700.00	6.22	68.50	1,697.69	17.65	44.82	-12.33	0.00	0.00	0.00
1,800.00	6.22	68.50	1,797.10	21.62	54.89	-15.10	0.00	0.00	0.00
1,900.00	6.22	68.50	1,896.51	25.59	64.97	-17.87	0.00	0.00	0.00
2,000.00	6.22	68.50	1,995.92	29.56	75.05	-20.64	0.00	0.00	0.00
2,100.00	6.22	68.50	2,095.34	33.53	85.13	-23.41	0.00	0.00	0.00
2,200.00	6.22	68.50	2,194.75	37.50	95.21	-26.18	0.00	0.00	0.00
2,300.00	6.22	68.50	2,294.16	41.46	105.28	-28.96	0.00	0.00	0.00
2,400.00	6.22	68.50	2,393.57	45.43	115.36	-31.73	0.00	0.00	0.00
2,500.00	6.22	68.50	2,492.98	49.40	125.44	-34.50	0.00	0.00	0.00
2,600.00	6.22	68.50	2,592.39	53.37	135.52	-37.27	0.00	0.00	0.00
2,700.00	6.22	68.50	2,691.81	57.34	145.59	-40.04	0.00	0.00	0.00
2,800.00	6.22	68.50	2,791.22	61.31	155.67	-42.81	0.00	0.00	0.00
2,900.00	6.22	68.50	2,890.63	65.28	165.75	-45.59	0.00	0.00	0.00
3,000.00	6.22	68.50	2,990.04	69.25	175.83	-48.36	0.00	0.00	0.00
3,100.00	6.22	68.50	3,089.45	73.22	185.91	-51.13	0.00	0.00	0.00
3,200.00	6.22	68.50	3,188.86	77.19	195.98	-53.90	0.00	0.00	0.00
3,300.00	6.22	68.50	3,288.28	81.15	206.06	-56.67	0.00	0.00	0.00
3,400.00	6.22	68.50	3,387.69	85.12	216.14	-59.45	0.00	0.00	0.00
3,500.00	6.22	68.50	3,487.10	89.09	226.22	-62.22	0.00	0.00	0.00
3,600.00	6.22	68.50	3,586.51	93.06	236.29	-64.99	0.00	0.00	0.00
3,700.00	6.22	68.50	3,685.92	97.03	246.37	-67.76	0.00	0.00	0.00
3,800.00	6.22	68.50	3,785.34	101.00	256.45	-70.53	0.00	0.00	0.00
3,900.00	6.22	68.50	3,884.75	104.97	266.53	-73.30	0.00	0.00	0.00
4,000.00	6.22	68.50	3,984.16	108.94	276.61	-76.08	0.00	0.00	0.00
4,100.00	6.22	68.50	4,083.57	112.91	286.68	-78.85	0.00	0.00	0.00
4,200.00	6.22	68.50	4,182.98	116.87	296.76	-81.62	0.00	0.00	0.00
4,300.00	6.22	68.50	4,282.39	120.84	306.84	-84.39	0.00	0.00	0.00
4,400.00	6.22	68.50	4,381.81	124.81	316.92	-87.16	0.00	0.00	0.00
4,500.00	6.22	68.50	4,481.22	128.78	326.99	-89.93	0.00	0.00	0.00
4,600.00	6.22	68.50	4,580.63	132.75	337.07	-92.71	0.00	0.00	0.00
4,700.00	6.22	68.50	4,680.04	136.72	347.15	-95.48	0.00	0.00	0.00
4,800.00	6.22	68.50	4,779.45	140.69	357.23	-98.25	0.00	0.00	0.00

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 1C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 1C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,800.55	6.22	68.50	4,780.00	140.71	357.28	-98.26	0.00	0.00	0.00
Sussex									
4,900.00	6.22	68.50	4,878.86	144.66	367.31	-101.02	0.00	0.00	0.00
5,000.00	6.22	68.50	4,978.28	148.63	377.38	-103.79	0.00	0.00	0.00
5,100.00	6.22	68.50	5,077.69	152.60	387.46	-106.56	0.00	0.00	0.00
5,200.00	6.22	68.50	5,177.10	156.56	397.54	-109.34	0.00	0.00	0.00
5,300.00	6.22	68.50	5,276.51	160.53	407.62	-112.11	0.00	0.00	0.00
5,400.00	6.22	68.50	5,375.92	164.50	417.69	-114.88	0.00	0.00	0.00
5,500.00	6.22	68.50	5,475.33	168.47	427.77	-117.65	0.00	0.00	0.00
5,600.00	6.22	68.50	5,574.75	172.44	437.85	-120.42	0.00	0.00	0.00
5,700.00	6.22	68.50	5,674.16	176.41	447.93	-123.20	0.00	0.00	0.00
5,800.00	6.22	68.50	5,773.57	180.38	458.01	-125.97	0.00	0.00	0.00
5,900.00	6.22	68.50	5,872.98	184.35	468.08	-128.74	0.00	0.00	0.00
6,000.00	6.22	68.50	5,972.39	188.32	478.16	-131.51	0.00	0.00	0.00
6,100.00	6.22	68.50	6,071.80	192.29	488.24	-134.28	0.00	0.00	0.00
6,200.00	6.22	68.50	6,171.22	196.25	498.32	-137.05	0.00	0.00	0.00
6,300.00	6.22	68.50	6,270.63	200.22	508.39	-139.83	0.00	0.00	0.00
6,400.00	6.22	68.50	6,370.04	204.19	518.47	-142.60	0.00	0.00	0.00
6,500.00	6.22	68.50	6,469.45	208.16	528.55	-145.37	0.00	0.00	0.00
6,600.00	6.22	68.50	6,568.86	212.13	538.63	-148.14	0.00	0.00	0.00
6,700.00	6.22	68.50	6,668.27	216.10	548.71	-150.91	0.00	0.00	0.00
6,800.00	6.22	68.50	6,767.69	220.07	558.78	-153.68	0.00	0.00	0.00
6,894.62	6.22	68.50	6,861.75	223.82	568.32	-156.31	0.00	0.00	0.00
Start Drop -2.00									
6,900.00	6.11	68.50	6,867.10	224.04	568.86	-156.45	2.00	-2.00	0.00
7,000.00	4.11	68.50	6,966.70	227.30	577.14	-158.73	2.00	-2.00	0.00
7,100.00	2.11	68.50	7,066.54	229.29	582.19	-160.12	2.00	-2.00	0.00
7,205.52	0.00	0.00	7,172.04	230.00	584.00	-160.62	2.00	-2.00	0.00
Start Build 10.00									
7,250.00	4.45	179.74	7,216.47	228.27	584.01	-158.90	10.00	10.00	0.00
7,300.00	9.45	179.74	7,266.09	222.23	584.03	-152.90	10.00	10.00	0.00
7,350.00	14.45	179.74	7,314.99	211.88	584.08	-142.61	10.00	10.00	0.00
7,381.22	17.57	179.74	7,345.00	203.27	584.12	-134.06	10.00	10.00	0.00
Sharon Springs									
7,400.00	19.45	179.74	7,362.81	197.31	584.15	-128.13	10.00	10.00	0.00
7,401.27	19.57	179.74	7,364.00	196.89	584.15	-127.71	10.00	10.00	0.00
Niobrara A									
7,450.00	24.45	179.74	7,409.17	178.63	584.23	-109.57	10.00	10.00	0.00
7,500.00	29.45	179.74	7,453.72	155.98	584.33	-87.06	10.00	10.00	0.00
7,550.00	34.45	179.74	7,496.14	129.53	584.45	-60.77	10.00	10.00	0.00
7,551.05	34.55	179.74	7,497.00	128.94	584.45	-60.19	10.00	10.00	0.00
Niobrara B									
7,600.00	39.45	179.74	7,536.08	99.48	584.59	-30.92	10.00	10.00	0.00
7,650.00	44.45	179.74	7,573.26	66.07	584.74	2.29	10.00	10.00	0.00
7,684.28	47.88	179.74	7,597.00	41.35	584.85	26.85	10.00	10.00	0.00
Niobrara C									
7,700.00	49.45	179.74	7,607.38	29.55	584.90	38.58	10.00	10.00	0.00
7,750.00	54.45	179.74	7,638.19	-9.81	585.08	77.70	10.00	10.00	0.00
7,800.00	59.45	179.74	7,665.45	-51.71	585.26	119.33	10.00	10.00	0.00
7,850.00	64.45	179.74	7,688.96	-95.82	585.46	163.16	10.00	10.00	0.00
7,859.53	65.40	179.74	7,693.00	-104.45	585.50	171.75	10.00	10.00	0.00
Fort Hays									
7,900.00	69.45	179.74	7,708.53	-141.81	585.67	208.87	10.00	10.00	0.00

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 1C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 1C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,950.00	74.45	179.74	7,724.02	-189.33	585.88	256.10	10.00	10.00	0.00
8,000.00	79.45	179.74	7,735.31	-238.03	586.10	304.48	10.00	10.00	0.00
8,037.79	83.23	179.74	7,741.00	-275.38	586.27	341.60	10.00	10.00	0.00
Codell									
8,050.00	84.45	179.74	7,742.31	-287.52	586.32	353.67	10.00	10.00	0.00
8,100.00	89.45	179.74	7,744.97	-337.43	586.55	403.27	10.00	10.00	0.00
8,106.58	90.11	179.74	7,745.00	-344.01	586.57	409.81	10.00	10.00	0.00
Start 4858.96 hold at 8106.58 MD - 7"									
8,200.00	90.11	179.74	7,744.83	-437.43	586.99	502.64	0.00	0.00	0.00
8,300.00	90.11	179.74	7,744.64	-537.43	587.44	602.02	0.00	0.00	0.00
8,400.00	90.11	179.74	7,744.45	-637.43	587.89	701.39	0.00	0.00	0.00
8,500.00	90.11	179.74	7,744.27	-737.43	588.34	800.76	0.00	0.00	0.00
8,600.00	90.11	179.74	7,744.08	-837.42	588.79	900.14	0.00	0.00	0.00
8,700.00	90.11	179.74	7,743.90	-937.42	589.24	999.51	0.00	0.00	0.00
8,800.00	90.11	179.74	7,743.71	-1,037.42	589.68	1,098.89	0.00	0.00	0.00
8,900.00	90.11	179.74	7,743.53	-1,137.42	590.13	1,198.26	0.00	0.00	0.00
9,000.00	90.11	179.74	7,743.34	-1,237.42	590.58	1,297.64	0.00	0.00	0.00
9,100.00	90.11	179.74	7,743.16	-1,337.42	591.03	1,397.01	0.00	0.00	0.00
9,200.00	90.11	179.74	7,742.97	-1,437.42	591.48	1,496.38	0.00	0.00	0.00
9,300.00	90.11	179.74	7,742.79	-1,537.42	591.93	1,595.76	0.00	0.00	0.00
9,400.00	90.11	179.74	7,742.60	-1,637.42	592.38	1,695.13	0.00	0.00	0.00
9,500.00	90.11	179.74	7,742.42	-1,737.41	592.82	1,794.51	0.00	0.00	0.00
9,600.00	90.11	179.74	7,742.23	-1,837.41	593.27	1,893.88	0.00	0.00	0.00
9,700.00	90.11	179.74	7,742.05	-1,937.41	593.72	1,993.25	0.00	0.00	0.00
9,800.00	90.11	179.74	7,741.86	-2,037.41	594.17	2,092.63	0.00	0.00	0.00
9,900.00	90.11	179.74	7,741.68	-2,137.41	594.62	2,192.00	0.00	0.00	0.00
10,000.00	90.11	179.74	7,741.49	-2,237.41	595.07	2,291.38	0.00	0.00	0.00
10,100.00	90.11	179.74	7,741.31	-2,337.41	595.52	2,390.75	0.00	0.00	0.00
10,200.00	90.11	179.74	7,741.12	-2,437.41	595.96	2,490.13	0.00	0.00	0.00
10,300.00	90.11	179.74	7,740.94	-2,537.40	596.41	2,589.50	0.00	0.00	0.00
10,400.00	90.11	179.74	7,740.75	-2,637.40	596.86	2,688.87	0.00	0.00	0.00
10,500.00	90.11	179.74	7,740.57	-2,737.40	597.31	2,788.25	0.00	0.00	0.00
10,600.00	90.11	179.74	7,740.38	-2,837.40	597.76	2,887.62	0.00	0.00	0.00
10,700.00	90.11	179.74	7,740.20	-2,937.40	598.21	2,987.00	0.00	0.00	0.00
10,800.00	90.11	179.74	7,740.01	-3,037.40	598.65	3,086.37	0.00	0.00	0.00
10,900.00	90.11	179.74	7,739.83	-3,137.40	599.10	3,185.75	0.00	0.00	0.00
11,000.00	90.11	179.74	7,739.64	-3,237.40	599.55	3,285.12	0.00	0.00	0.00
11,100.00	90.11	179.74	7,739.45	-3,337.40	600.00	3,384.49	0.00	0.00	0.00
11,200.00	90.11	179.74	7,739.27	-3,437.39	600.45	3,483.87	0.00	0.00	0.00
11,300.00	90.11	179.74	7,739.08	-3,537.39	600.90	3,583.24	0.00	0.00	0.00
11,400.00	90.11	179.74	7,738.90	-3,637.39	601.35	3,682.62	0.00	0.00	0.00
11,500.00	90.11	179.74	7,738.71	-3,737.39	601.79	3,781.99	0.00	0.00	0.00
11,600.00	90.11	179.74	7,738.53	-3,837.39	602.24	3,881.37	0.00	0.00	0.00
11,700.00	90.11	179.74	7,738.34	-3,937.39	602.69	3,980.74	0.00	0.00	0.00
11,800.00	90.11	179.74	7,738.16	-4,037.39	603.14	4,080.11	0.00	0.00	0.00
11,900.00	90.11	179.74	7,737.97	-4,137.39	603.59	4,179.49	0.00	0.00	0.00
12,000.00	90.11	179.74	7,737.79	-4,237.38	604.04	4,278.86	0.00	0.00	0.00
12,100.00	90.11	179.74	7,737.60	-4,337.38	604.49	4,378.24	0.00	0.00	0.00
12,200.00	90.11	179.74	7,737.42	-4,437.38	604.93	4,477.61	0.00	0.00	0.00
12,300.00	90.11	179.74	7,737.23	-4,537.38	605.38	4,576.99	0.00	0.00	0.00
12,400.00	90.11	179.74	7,737.05	-4,637.38	605.83	4,676.36	0.00	0.00	0.00
12,500.00	90.11	179.74	7,736.86	-4,737.38	606.28	4,775.73	0.00	0.00	0.00
12,600.00	90.11	179.74	7,736.68	-4,837.38	606.73	4,875.11	0.00	0.00	0.00
12,700.00	90.11	179.74	7,736.49	-4,937.38	607.18	4,974.48	0.00	0.00	0.00

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 1C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 1C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,800.00	90.11	179.74	7,736.31	-5,037.38	607.63	5,073.86	0.00	0.00	0.00
12,900.00	90.11	179.74	7,736.12	-5,137.37	608.07	5,173.23	0.00	0.00	0.00
12,965.54	90.11	179.74	7,736.00	-5,202.91	608.37	5,238.36	0.00	0.00	0.00
TD at 12965.54 - HOWARD 1C-33HZ PBHL									

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									
HOWARD 1C-33HZ PBI	0.00	0.00	7,736.00	-5,202.91	608.37	1,248,637.92	3,171,456.53	40.014273	-104.887858
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
900.00	900.00	9 5/8"	9-5/8	12-1/4	
8,106.58	7,745.00	7"	7	7-1/2	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,800.55	4,780.00	Sussex			
7,381.22	7,345.00	Sharon Springs			
7,401.27	7,364.00	Niobrara A			
7,551.05	7,497.00	Niobrara B			
7,684.28	7,597.00	Niobrara C			
7,859.53	7,693.00	Fort Hays			
8,037.79	7,741.00	Codell			

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,100.00	1,100.00	0.00	0.00	Start Build 2.00	
1,410.90	1,410.29	6.18	15.68	Start 5483.72 hold at 1410.90 MD	
6,894.62	6,861.75	223.82	568.32	Start Drop -2.00	
7,205.52	7,172.04	230.00	584.00	Start Build 10.00	
8,106.58	7,745.00	-344.01	586.57	Start 4858.96 hold at 8106.58 MD	
12,965.54	7,736.00	-5,202.91	608.37	TD at 12965.54	