

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_UNDERHILL 15-17HZ PAD

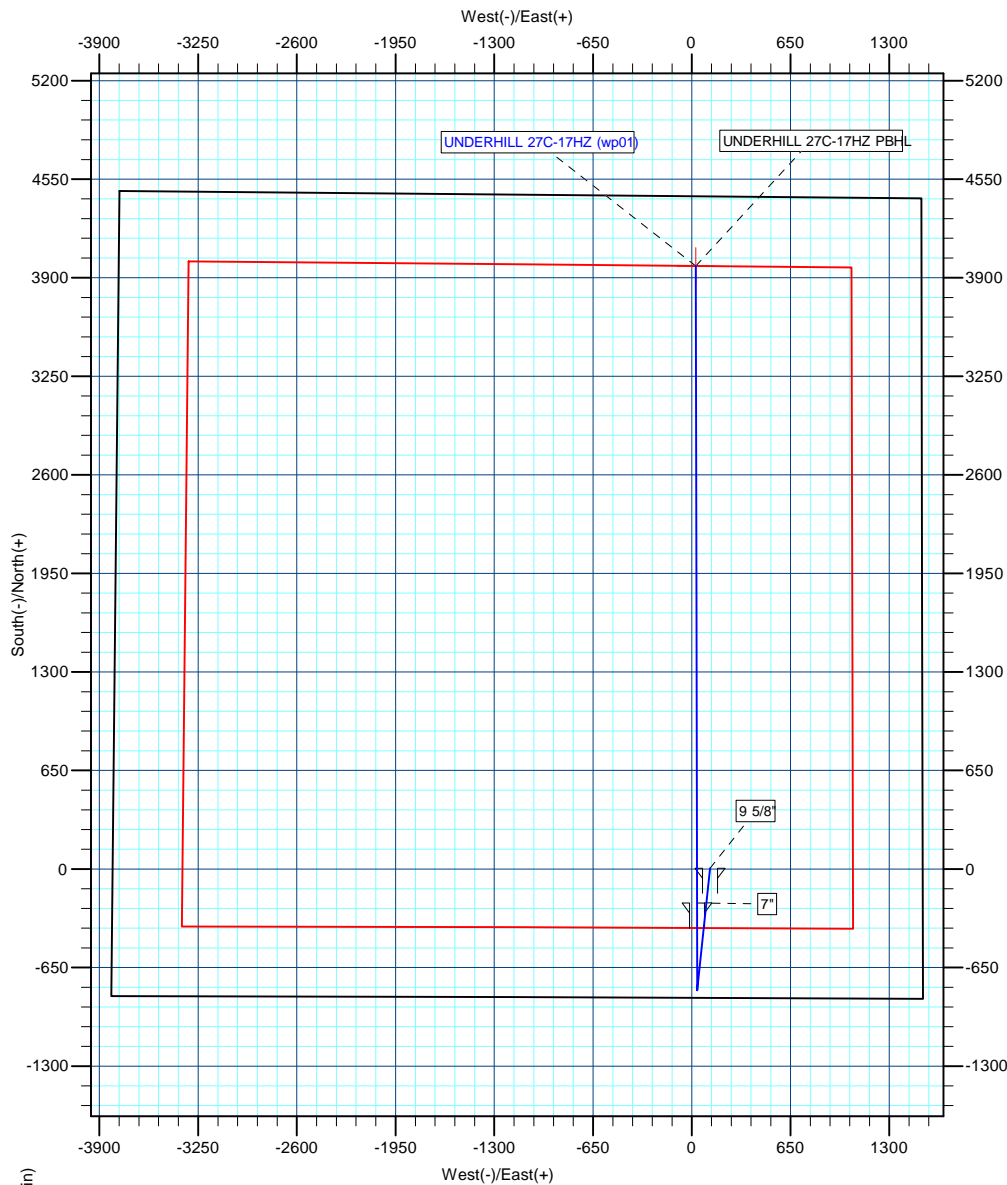
UNDERHILL 27C-17HZ

UNDERHILL 27C-17HZ

Plan: UNDERHILL 27C-17HZ (wp01)

Standard Planning Report

05 November, 2012



Azimuths to True North
Magnetic North: 8.72°

Magnetic Field
Strength: 52781.8snT
Dip Angle: 66.69°
Date: 10/31/2012
Model: IGRF2010



Project: COLORADO NORTHERN ZONE - 83
Site: WELD UNDERHILL 15-17HZ PAD
Well: UNDERHILL 27C-17HZ
Wellbore: UNDERHILL 27C-17HZ
Section: SEC. 17 T1N R67W
SHL: 854' FSL 1401' FEL Sec. 17
Design: UNDERHILL 27C-17HZ (wp01)
Latitude: 40.046134
Longitude: -104.910061
GL: 5110.00
KB: 17' RKB + 5110' GL @ 5127.00ft

WELL DETAILS: UNDERHILL 27C-17HZ

+N/-S	+E/-W	Northing	Ground Level: Easting	5110.00 Latitude	Longitude	Slot
4.72	119.82	1260201.66	3165160.51	40.046134	-104.910061	

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	4.72	119.82	0.00	0.00	0.00
1200.00	0.00	0.00	1200.00	4.72	119.82	0.00	0.00	0.00
1818.95	12.38	185.97	1814.14	-61.52	112.90	2.00	185.97	-66.06
4963.77	12.38	185.97	4885.86	-732.04	42.75	0.00	0.00	-734.75
5582.72	0.00	0.00	5500.00	-798.28	35.82	2.00	180.00	-800.81
7306.76	0.00	0.00	7224.04	-798.28	35.82	0.00	0.00	-800.81
8208.26	90.15	359.89	7797.00	-223.82	34.72	10.00	359.89	-226.48
2409.64	90.12	359.89	7787.00	3977.54	26.59	0.00	-176.37	3973.91

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

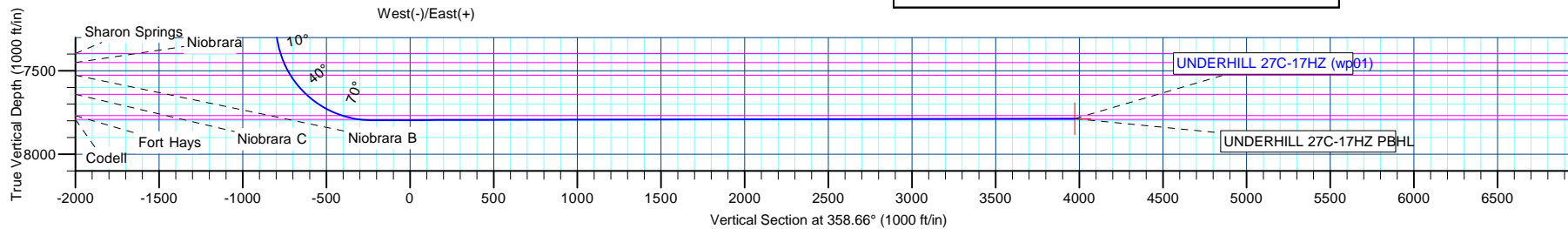
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
UNDERHILL 27C-17HZ PBHL	7787.00	3977.54	26.59	40.057040	-104.910394	Point

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4652.00	4724.35	Sussex
5261.00	5343.44	Shannon
7397.00	7482.46	Sharon Springs
7451.00	7540.12	Niobrara
7527.00	7625.98	Niobrara B
7641.00	7773.73	Niobrara C
7769.00	8026.90	Fort Hays
7791.00	8123.78	Codell

CASING DETAILS

TVD	MD	Name	Size
917.00	917.00	9 5/8"	9-5/8
7797.00	8208.26	7"	7



Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Site WELD_UNDERHILL 15-17HZ PAD
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5110' GL @ 5127.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5110' GL @ 5127.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 27C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 27C-17HZ		
Design:	UNDERHILL 27C-17HZ (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_UNDERHILL 15-17HZ PAD, SEC. 17 T1N R67W			
Site Position:		Northing:	1,260,196.14 usft	Latitude: 40.046121
From:	Lat/Long	Easting:	3,165,040.72 usft	Longitude: -104.910489
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.38 °

Well	UNDERHILL 27C-17HZ			
Well Position	+N/-S	4.72 ft	Northing:	1,260,201.66 usft
	+E/-W	119.82 ft	Easting:	3,165,160.51 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	
			Ground Level:	5,110.00 ft

Wellbore	UNDERHILL 27C-17HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/31/2012	8.73	66.69	52,782

Design	UNDERHILL 27C-17HZ (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	4.72	119.82	358.66

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	4.72	119.82	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	4.72	119.82	0.00	0.00	0.00	0.00	
1,818.95	12.38	185.97	1,814.14	-61.52	112.90	2.00	2.00	0.00	185.97	
4,963.77	12.38	185.97	4,885.86	-732.04	42.75	0.00	0.00	0.00	0.00	
5,582.72	0.00	0.00	5,500.00	-798.28	35.82	2.00	-2.00	0.00	180.00	
7,306.76	0.00	0.00	7,224.04	-798.28	35.82	0.00	0.00	0.00	0.00	
8,208.26	90.15	359.89	7,797.00	-223.82	34.72	10.00	10.00	0.00	359.89	
12,409.64	90.12	359.89	7,787.00	3,977.54	26.59	0.00	0.00	0.00	-176.37	UNDERHILL 27C-17H

Andarko Petroleum Corporation

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5110' GL @ 5127.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5110' GL @ 5127.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 27C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 27C-17HZ		
Design:	UNDERHILL 27C-17HZ (wp01)		

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	4.72	119.82	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4.72	119.82	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4.72	119.82	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4.72	119.82	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4.72	119.82	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4.72	119.82	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4.72	119.82	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	4.72	119.82	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	4.72	119.82	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	4.72	119.82	0.00	0.00	0.00	0.00
917.00	0.00	0.00	917.00	4.72	119.82	0.00	0.00	0.00	0.00
9 5/8"									
1,000.00	0.00	0.00	1,000.00	4.72	119.82	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	4.72	119.82	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	4.72	119.82	0.00	0.00	0.00	0.00
Start Build 2.00									
1,300.00	2.00	185.97	1,299.98	2.99	119.64	-1.73	2.00	2.00	0.00
1,400.00	4.00	185.97	1,399.84	-2.22	119.10	-6.92	2.00	2.00	0.00
1,500.00	6.00	185.97	1,499.45	-10.89	118.19	-15.57	2.00	2.00	0.00
1,600.00	8.00	185.97	1,598.70	-23.01	116.92	-27.65	2.00	2.00	0.00
1,700.00	10.00	185.97	1,697.47	-38.56	115.30	-43.17	2.00	2.00	0.00
1,800.00	12.00	185.97	1,795.62	-57.54	113.31	-62.09	2.00	2.00	0.00
1,818.95	12.38	185.97	1,814.14	-61.52	112.90	-66.06	2.00	2.00	0.00
Start 3144.83 hold at 1818.95 MD									
1,900.00	12.38	185.97	1,893.31	-78.80	111.09	-83.30	0.00	0.00	0.00
2,000.00	12.38	185.97	1,990.99	-100.12	108.86	-104.56	0.00	0.00	0.00
2,100.00	12.38	185.97	2,088.66	-121.44	106.63	-125.82	0.00	0.00	0.00
2,200.00	12.38	185.97	2,186.34	-142.76	104.40	-147.08	0.00	0.00	0.00
2,300.00	12.38	185.97	2,284.01	-164.08	102.17	-168.35	0.00	0.00	0.00
2,400.00	12.38	185.97	2,381.69	-185.41	99.94	-189.61	0.00	0.00	0.00
2,500.00	12.38	185.97	2,479.36	-206.73	97.71	-210.87	0.00	0.00	0.00
2,600.00	12.38	185.97	2,577.04	-228.05	95.48	-232.14	0.00	0.00	0.00
2,700.00	12.38	185.97	2,674.71	-249.37	93.24	-253.40	0.00	0.00	0.00
2,800.00	12.38	185.97	2,772.39	-270.69	91.01	-274.66	0.00	0.00	0.00
2,900.00	12.38	185.97	2,870.06	-292.01	88.78	-295.93	0.00	0.00	0.00
3,000.00	12.38	185.97	2,967.74	-313.33	86.55	-317.19	0.00	0.00	0.00
3,100.00	12.38	185.97	3,065.41	-334.65	84.32	-338.45	0.00	0.00	0.00
3,200.00	12.38	185.97	3,163.09	-355.98	82.09	-359.71	0.00	0.00	0.00
3,300.00	12.38	185.97	3,260.76	-377.30	79.86	-380.98	0.00	0.00	0.00
3,400.00	12.38	185.97	3,358.44	-398.62	77.63	-402.24	0.00	0.00	0.00
3,500.00	12.38	185.97	3,456.11	-419.94	75.40	-423.50	0.00	0.00	0.00
3,600.00	12.38	185.97	3,553.79	-441.26	73.17	-444.77	0.00	0.00	0.00
3,700.00	12.38	185.97	3,651.46	-462.58	70.94	-466.03	0.00	0.00	0.00
3,800.00	12.38	185.97	3,749.14	-483.90	68.71	-487.29	0.00	0.00	0.00
3,900.00	12.38	185.97	3,846.81	-505.23	66.48	-508.56	0.00	0.00	0.00
4,000.00	12.38	185.97	3,944.49	-526.55	64.25	-529.82	0.00	0.00	0.00
4,100.00	12.38	185.97	4,042.16	-547.87	62.02	-551.08	0.00	0.00	0.00
4,200.00	12.38	185.97	4,139.84	-569.19	59.79	-572.35	0.00	0.00	0.00
4,300.00	12.38	185.97	4,237.51	-590.51	57.56	-593.61	0.00	0.00	0.00
4,400.00	12.38	185.97	4,335.19	-611.83	55.33	-614.87	0.00	0.00	0.00
4,500.00	12.38	185.97	4,432.86	-633.15	53.10	-636.13	0.00	0.00	0.00
4,600.00	12.38	185.97	4,530.54	-654.47	50.87	-657.40	0.00	0.00	0.00
4,700.00	12.38	185.97	4,628.22	-675.80	48.64	-678.66	0.00	0.00	0.00

Andarko Petroleum Corporation

Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5110' GL @ 5127.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5110' GL @ 5127.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 27C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 27C-17HZ		
Design:	UNDERHILL 27C-17HZ (wp01)		

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)
4,724.35	12.38	185.97	4,652.00	-680.99	48.09	-683.84	0.00	0.00	0.00
Sussex									
4,800.00	12.38	185.97	4,725.89	-697.12	46.41	-699.92	0.00	0.00	0.00
4,900.00	12.38	185.97	4,823.57	-718.44	44.18	-721.19	0.00	0.00	0.00
4,963.77	12.38	185.97	4,885.86	-732.04	42.75	-734.75	0.00	0.00	0.00
Start Drop -2.00									
5,000.00	11.65	185.97	4,921.29	-739.54	41.97	-742.23	2.00	-2.00	0.00
5,100.00	9.65	185.97	5,019.56	-757.92	40.05	-760.57	2.00	-2.00	0.00
5,200.00	7.65	185.97	5,118.42	-772.89	38.48	-775.49	2.00	-2.00	0.00
5,300.00	5.65	185.97	5,217.74	-784.41	37.28	-786.98	2.00	-2.00	0.00
5,343.44	4.79	185.97	5,261.00	-788.34	36.86	-790.90	2.00	-2.00	0.00
Shannon									
5,400.00	3.65	185.97	5,317.40	-792.48	36.43	-795.03	2.00	-2.00	0.00
5,500.00	1.65	185.97	5,417.29	-797.09	35.95	-799.62	2.00	-2.00	0.00
5,582.72	0.00	0.00	5,500.00	-798.28	35.82	-800.81	2.00	-2.00	0.00
Start 1724.04 hold at 5582.72 MD									
5,600.00	0.00	0.00	5,517.28	-798.28	35.82	-800.81	0.00	0.00	0.00
5,700.00	0.00	0.00	5,617.28	-798.28	35.82	-800.81	0.00	0.00	0.00
5,800.00	0.00	0.00	5,717.28	-798.28	35.82	-800.81	0.00	0.00	0.00
5,900.00	0.00	0.00	5,817.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,000.00	0.00	0.00	5,917.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,100.00	0.00	0.00	6,017.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,200.00	0.00	0.00	6,117.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,300.00	0.00	0.00	6,217.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,400.00	0.00	0.00	6,317.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,500.00	0.00	0.00	6,417.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,600.00	0.00	0.00	6,517.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,700.00	0.00	0.00	6,617.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,800.00	0.00	0.00	6,717.28	-798.28	35.82	-800.81	0.00	0.00	0.00
6,900.00	0.00	0.00	6,817.28	-798.28	35.82	-800.81	0.00	0.00	0.00
7,000.00	0.00	0.00	6,917.28	-798.28	35.82	-800.81	0.00	0.00	0.00
7,100.00	0.00	0.00	7,017.28	-798.28	35.82	-800.81	0.00	0.00	0.00
7,200.00	0.00	0.00	7,117.28	-798.28	35.82	-800.81	0.00	0.00	0.00
7,306.76	0.00	0.00	7,224.04	-798.28	35.82	-800.81	0.00	0.00	0.00
Start Build 10.00									
7,350.00	4.32	359.89	7,267.24	-796.65	35.82	-799.18	10.00	10.00	0.00
7,400.00	9.32	359.89	7,316.87	-790.71	35.81	-793.24	10.00	10.00	0.00
7,450.00	14.32	359.89	7,365.79	-780.47	35.79	-783.00	10.00	10.00	0.00
7,482.46	17.57	359.89	7,397.00	-771.55	35.77	-774.09	10.00	10.00	0.00
Sharon Springs									
7,500.00	19.32	359.89	7,413.64	-766.00	35.76	-768.54	10.00	10.00	0.00
7,540.12	23.34	359.89	7,451.00	-751.41	35.73	-753.95	10.00	10.00	0.00
Niobrara									
7,550.00	24.32	359.89	7,460.04	-747.42	35.73	-749.96	10.00	10.00	0.00
7,600.00	29.32	359.89	7,504.64	-724.86	35.68	-727.41	10.00	10.00	0.00
7,625.98	31.92	359.89	7,527.00	-711.63	35.66	-714.18	10.00	10.00	0.00
Niobrara B									
7,650.00	34.32	359.89	7,547.11	-698.50	35.63	-701.06	10.00	10.00	0.00
7,700.00	39.32	359.89	7,587.13	-668.55	35.58	-671.11	10.00	10.00	0.00
7,750.00	44.32	359.89	7,624.37	-635.21	35.51	-637.78	10.00	10.00	0.00
7,773.73	46.70	359.89	7,641.00	-618.29	35.48	-620.86	10.00	10.00	0.00
Niobrara C									
7,800.00	49.32	359.89	7,658.57	-598.76	35.44	-601.34	10.00	10.00	0.00

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5110' GL @ 5127.00ft
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Wellbore:	UNDERHILL 27C-17HZ		
Design:	UNDERHILL 27C-17HZ (wp01)		

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)
7,850.00	54.32	359.89	7,689.47	-559.47	35.37	-562.06	10.00	10.00	0.00
7,900.00	59.32	359.89	7,716.82	-517.63	35.29	-520.23	10.00	10.00	0.00
7,950.00	64.32	359.89	7,740.42	-473.57	35.20	-476.18	10.00	10.00	0.00
8,000.00	69.32	359.89	7,760.09	-427.62	35.11	-430.24	10.00	10.00	0.00
8,026.90	72.01	359.89	7,769.00	-402.24	35.06	-404.86	10.00	10.00	0.00
Fort Hays									
8,050.00	74.32	359.89	7,775.69	-380.13	35.02	-382.76	10.00	10.00	0.00
8,100.00	79.32	359.89	7,787.08	-331.47	34.93	-334.10	10.00	10.00	0.00
8,123.78	81.70	359.89	7,791.00	-308.01	34.88	-310.66	10.00	10.00	0.00
Codell									
8,150.00	84.32	359.89	7,794.19	-281.99	34.83	-284.64	10.00	10.00	0.00
8,200.00	89.32	359.89	7,796.96	-232.08	34.74	-234.74	10.00	10.00	0.00
8,208.26	90.15	359.89	7,797.00	-223.82	34.72	-226.49	10.00	10.00	0.00
Start DLS 0.00 TFO -177.46 - 7"									
8,300.00	90.15	359.89	7,796.76	-132.08	34.55	-134.77	0.00	0.00	0.00
8,400.00	90.15	359.89	7,796.50	-32.08	34.35	-34.79	0.00	0.00	0.00
8,500.00	90.15	359.89	7,796.24	67.92	34.16	65.19	0.00	0.00	0.00
8,600.00	90.15	359.89	7,795.98	167.92	33.97	165.16	0.00	0.00	0.00
8,700.00	90.15	359.89	7,795.72	267.92	33.78	265.14	0.00	0.00	0.00
8,800.00	90.15	359.89	7,795.47	367.91	33.58	365.11	0.00	0.00	0.00
8,900.00	90.15	359.89	7,795.21	467.91	33.39	465.09	0.00	0.00	0.00
9,000.00	90.14	359.89	7,794.96	567.91	33.20	565.07	0.00	0.00	0.00
9,100.00	90.14	359.89	7,794.71	667.91	33.01	665.04	0.00	0.00	0.00
9,200.00	90.14	359.89	7,794.46	767.91	32.81	765.02	0.00	0.00	0.00
9,300.00	90.14	359.89	7,794.21	867.91	32.62	865.00	0.00	0.00	0.00
9,400.00	90.14	359.89	7,793.96	967.91	32.43	964.97	0.00	0.00	0.00
9,500.00	90.14	359.89	7,793.71	1,067.91	32.24	1,064.95	0.00	0.00	0.00
9,600.00	90.14	359.89	7,793.46	1,167.91	32.04	1,164.93	0.00	0.00	0.00
9,700.00	90.14	359.89	7,793.22	1,267.91	31.85	1,264.90	0.00	0.00	0.00
9,800.00	90.14	359.89	7,792.97	1,367.91	31.66	1,364.88	0.00	0.00	0.00
9,900.00	90.14	359.89	7,792.73	1,467.91	31.46	1,464.86	0.00	0.00	0.00
10,000.00	90.14	359.89	7,792.49	1,567.91	31.27	1,564.83	0.00	0.00	0.00
10,100.00	90.14	359.89	7,792.25	1,667.91	31.08	1,664.81	0.00	0.00	0.00
10,200.00	90.14	359.89	7,792.01	1,767.91	30.88	1,764.79	0.00	0.00	0.00
10,300.00	90.14	359.89	7,791.77	1,867.91	30.69	1,864.76	0.00	0.00	0.00
10,400.00	90.14	359.89	7,791.53	1,967.91	30.50	1,964.74	0.00	0.00	0.00
10,500.00	90.14	359.89	7,791.30	2,067.91	30.30	2,064.72	0.00	0.00	0.00
10,600.00	90.13	359.89	7,791.06	2,167.91	30.11	2,164.69	0.00	0.00	0.00
10,700.00	90.13	359.89	7,790.83	2,267.91	29.92	2,264.67	0.00	0.00	0.00
10,800.00	90.13	359.89	7,790.59	2,367.91	29.72	2,364.65	0.00	0.00	0.00
10,900.00	90.13	359.89	7,790.36	2,467.90	29.53	2,464.62	0.00	0.00	0.00
11,000.00	90.13	359.89	7,790.13	2,567.90	29.33	2,564.60	0.00	0.00	0.00
11,100.00	90.13	359.89	7,789.90	2,667.90	29.14	2,664.57	0.00	0.00	0.00
11,200.00	90.13	359.89	7,789.67	2,767.90	28.95	2,764.55	0.00	0.00	0.00
11,300.00	90.13	359.89	7,789.45	2,867.90	28.75	2,864.53	0.00	0.00	0.00
11,400.00	90.13	359.89	7,789.22	2,967.90	28.56	2,964.50	0.00	0.00	0.00
11,500.00	90.13	359.89	7,788.99	3,067.90	28.36	3,064.48	0.00	0.00	0.00
11,600.00	90.13	359.89	7,788.77	3,167.90	28.17	3,164.46	0.00	0.00	0.00
11,700.00	90.13	359.89	7,788.55	3,267.90	27.97	3,264.43	0.00	0.00	0.00
11,800.00	90.13	359.89	7,788.33	3,367.90	27.78	3,364.41	0.00	0.00	0.00
11,900.00	90.13	359.89	7,788.11	3,467.90	27.59	3,464.39	0.00	0.00	0.00
12,000.00	90.13	359.89	7,787.89	3,567.90	27.39	3,564.36	0.00	0.00	0.00
12,100.00	90.12	359.89	7,787.67	3,667.90	27.20	3,664.34	0.00	0.00	0.00

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Site WELD_UNDERHILL 15-17HZ PAD
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5110' GL @ 5127.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5110' GL @ 5127.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 27C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 27C-17HZ		
Design:	UNDERHILL 27C-17HZ (wp01)		

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)
12,200.00	90.12	359.89	7,787.45	3,767.90	27.00	3,764.32	0.00	0.00	0.00
12,300.00	90.12	359.89	7,787.24	3,867.90	26.81	3,864.29	0.00	0.00	0.00
12,409.64	90.12	359.89	7,787.00	3,977.54	26.59	3,973.91	0.00	0.00	0.00
TD at 12409.64 - UNDERHILL 27C-17HZ 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									
UNDERHILL 27C-17HZ	0.00	0.00	7,787.00	3,977.54	26.59	1,264,173.76	3,165,040.87	40.057040	-104.910394
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
917.00	917.00	9 5/8"	9-5/8	12-1/4	
8,208.26	7,797.00	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,724.35	4,654.00	Sussex				
5,343.44	5,263.00	Shannon				
7,482.46	7,399.00	Sharon Springs				
7,540.12	7,453.00	Niobrara				
7,625.98	7,529.00	Niobrara B				
7,773.73	7,643.00	Niobrara C				
8,026.90	7,771.00	Fort Hays				
8,123.78	7,793.00	Codell				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
1,200.00	1,200.00	4.72	119.82	Start Build 2.00	
1,818.95	1,814.14	-61.52	112.90	Start 3144.83 hold at 1818.95 MD	
4,963.77	4,885.86	-732.04	42.75	Start Drop -2.00	
5,582.72	5,500.00	-798.28	35.82	Start 1724.04 hold at 5582.72 MD	
7,306.76	7,224.04	-798.28	35.82	Start Build 10.00	
8,208.26	7,797.00	-223.82	34.72	Start DLS 0.00 TFO -177.46	
12,409.64	7,787.00	3,977.54	26.59	TD at 12409.64	