

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_UNDERHILL 15-17HZ PAD

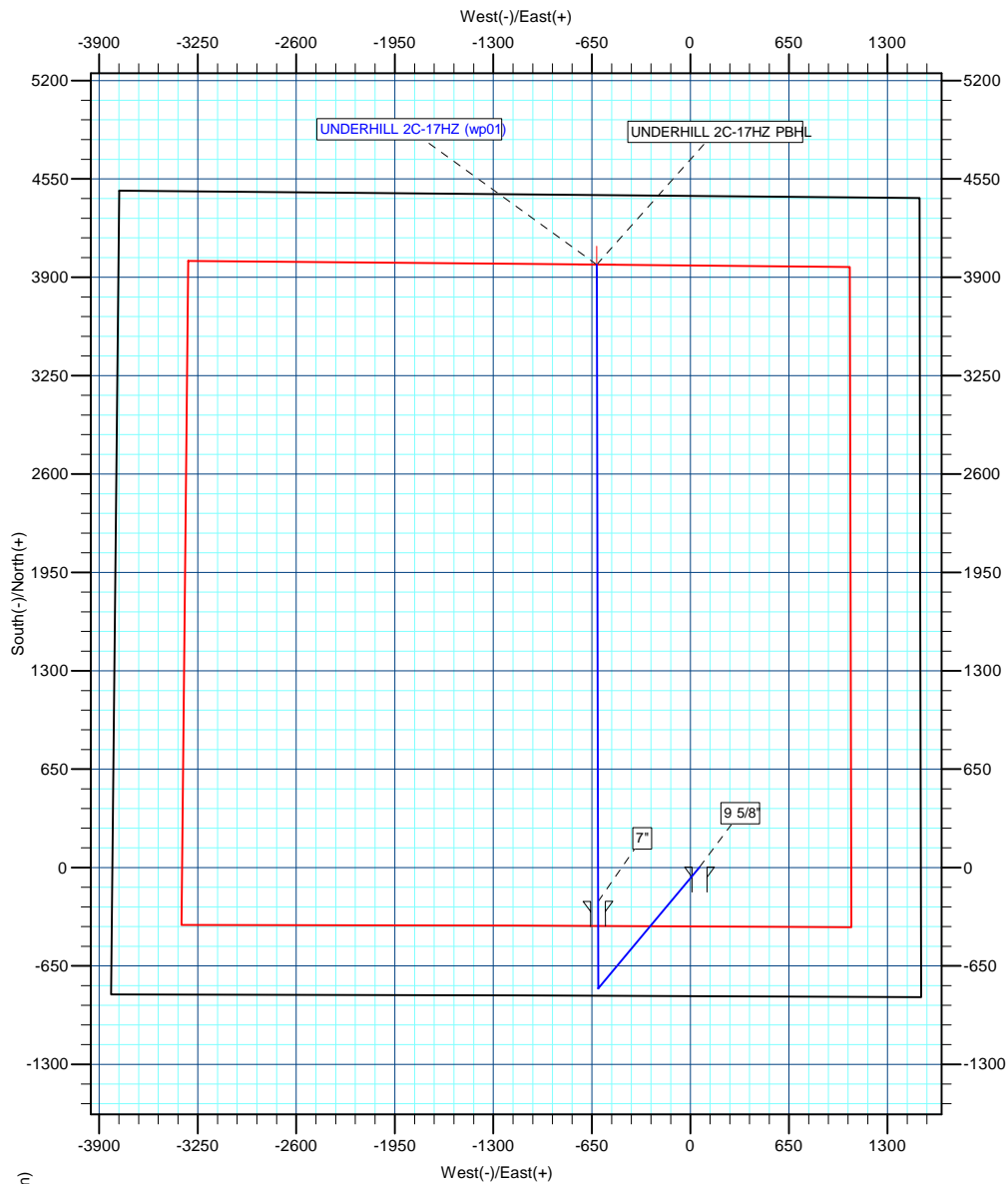
UNDERHILL 2C-17HZ

UNDERHILL 2C-17HZ

Plan: UNDERHILL 2C-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 2C-17HZ
Wellbore: UNDERHILL 2C-17HZ
Section: SEC. 17 T1N R67W
SHL: 852' FSL 1460' FEL
Design: UNDERHILL 2C-17HZ (wp01)
Latitude: 40.046128
Longitude: -104.910275
GL: 5111.00
KB: 17' RKB + 5111' GL @ 5128.00ft

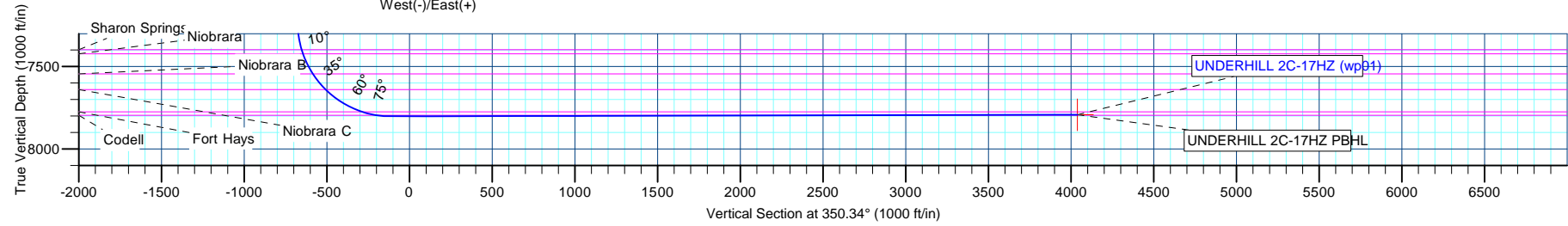
WELL DETAILS: UNDERHILL 2C-17HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	5111.00 Latitude	Longitude	Slot
2.54	59.91	1260199.08	3165100.61	40.046128	-104.910275	

SECTION DETAILS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	2.54	59.91	0.00	0.00	0.00
1100.00	0.00	0.00	1100.00	2.54	59.91	0.00	0.00	0.00
1753.33	13.07	219.83	1747.69	-54.43	12.41	2.00	219.83	-48.19
5710.42	13.07	219.83	5602.31	-741.50	-560.58	0.00	0.00	-629.40
6363.76	0.00	0.00	6250.00	-798.46	-608.09	2.00	180.00	-677.59
7343.80	0.00	0.00	7230.04	-798.46	-608.09	0.00	0.00	-677.59
8245.20	90.14	359.89	7803.00	-224.10	-609.19	10.00	359.89	-111.18
2452.69	90.13	359.88	7793.00	3983.37	-617.50	0.00	-140.36	4038.06

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
UNDERHILL 2C-17HZ PBHL	7793.00	3983.37	-617.50	40.057056	-104.912695	Point

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4653.00	4736.87	Sussex
5262.00	5361.06	Shannon
7398.00	7514.26	Sharon Springs
7423.00	7540.60	Niobrara
7545.00	7677.27	Niobrara B
7640.00	7800.65	Niobrara C
7775.00	8063.94	Fort Hays
7796.00	8154.15	Codell

CASING DETAILS			
TVD	MD	Name	Size
917.00	917.00	9 5/8"	9-5/8
7803.00	8245.20	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 + 5111' GL @ 5128.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5111' GL @ 5128.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 2C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 2C-17HZ		
Design:	UNDERHILL 2C-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 2C-17HZ					
Well Position	+N/-S	2.54 ft	Northing:	1,260,199.08 usft	Latitude:	40.046128
	+E/-W	59.91 ft	Easting:	3,165,100.61 usft	Longitude:	-104.910275
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,111.00 ft

Wellbore	UNDERHILL 2C-17HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/31/2012	8.73	66.69	52,782

Design	UNDERHILL 2C-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	2.54	59.91	350.34

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	2.54	59.91	0.00	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	2.54	59.91	0.00	0.00	0.00	0.00	
1,753.33	13.07	219.83	1,747.69	-54.43	12.41	2.00	2.00	0.00	219.83	
5,710.42	13.07	219.83	5,602.31	-741.50	-560.58	0.00	0.00	0.00	0.00	
6,363.76	0.00	0.00	6,250.00	-798.46	-608.09	2.00	-2.00	0.00	180.00	
7,343.80	0.00	0.00	7,230.04	-798.46	-608.09	0.00	0.00	0.00	0.00	
8,245.20	90.14	359.89	7,803.00	-224.10	-609.19	10.00	10.00	0.00	359.89	
12,452.69	90.13	359.88	7,793.00	3,983.37	-617.50	0.00	0.00	0.00	-140.36	UNDERHILL 2C-17H;

Andarko Petroleum Corporation

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5111' GL @ 5128.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 2C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 2C-17HZ		
Design:	UNDERHILL 2C-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	2.54	59.91	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	2.54	59.91	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	2.54	59.91	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	2.54	59.91	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	2.54	59.91	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	2.54	59.91	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	2.54	59.91	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	2.54	59.91	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	2.54	59.91	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	2.54	59.91	0.00	0.00	0.00	0.00
917.00	0.00	0.00	917.00	2.54	59.91	0.00	0.00	0.00	0.00
9 5/8"									
1,000.00	0.00	0.00	1,000.00	2.54	59.91	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	2.54	59.91	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	2.00	219.83	1,199.98	1.20	58.79	-1.13	2.00	2.00	0.00
1,300.00	4.00	219.83	1,299.84	-2.82	55.44	-4.53	2.00	2.00	0.00
1,400.00	6.00	219.83	1,399.45	-9.52	49.86	-10.20	2.00	2.00	0.00
1,500.00	8.00	219.83	1,498.70	-18.87	42.06	-18.11	2.00	2.00	0.00
1,600.00	10.00	219.83	1,597.47	-30.89	32.04	-28.27	2.00	2.00	0.00
1,700.00	12.00	219.83	1,695.62	-45.54	19.82	-40.67	2.00	2.00	0.00
1,753.33	13.07	219.83	1,747.69	-54.43	12.41	-48.19	2.00	2.00	0.00
Start 3957.09 hold at 1753.33 MD									
1,800.00	13.07	219.83	1,793.14	-62.53	5.65	-55.04	0.00	0.00	0.00
1,900.00	13.07	219.83	1,890.55	-79.89	-8.83	-69.73	0.00	0.00	0.00
2,000.00	13.07	219.83	1,987.96	-97.26	-23.31	-84.42	0.00	0.00	0.00
2,100.00	13.07	219.83	2,085.38	-114.62	-37.79	-99.11	0.00	0.00	0.00
2,200.00	13.07	219.83	2,182.79	-131.98	-52.27	-113.79	0.00	0.00	0.00
2,300.00	13.07	219.83	2,280.20	-149.35	-66.75	-128.48	0.00	0.00	0.00
2,400.00	13.07	219.83	2,377.61	-166.71	-81.23	-143.17	0.00	0.00	0.00
2,500.00	13.07	219.83	2,475.02	-184.07	-95.71	-157.86	0.00	0.00	0.00
2,600.00	13.07	219.83	2,572.43	-201.44	-110.19	-172.55	0.00	0.00	0.00
2,700.00	13.07	219.83	2,669.84	-218.80	-124.67	-187.23	0.00	0.00	0.00
2,800.00	13.07	219.83	2,767.25	-236.16	-139.15	-201.92	0.00	0.00	0.00
2,900.00	13.07	219.83	2,864.66	-253.52	-153.63	-216.61	0.00	0.00	0.00
3,000.00	13.07	219.83	2,962.07	-270.89	-168.11	-231.30	0.00	0.00	0.00
3,100.00	13.07	219.83	3,059.48	-288.25	-182.59	-245.98	0.00	0.00	0.00
3,200.00	13.07	219.83	3,156.89	-305.61	-197.07	-260.67	0.00	0.00	0.00
3,300.00	13.07	219.83	3,254.30	-322.98	-211.55	-275.36	0.00	0.00	0.00
3,400.00	13.07	219.83	3,351.72	-340.34	-226.03	-290.05	0.00	0.00	0.00
3,500.00	13.07	219.83	3,449.13	-357.70	-240.51	-304.74	0.00	0.00	0.00
3,600.00	13.07	219.83	3,546.54	-375.06	-254.99	-319.42	0.00	0.00	0.00
3,700.00	13.07	219.83	3,643.95	-392.43	-269.47	-334.11	0.00	0.00	0.00
3,800.00	13.07	219.83	3,741.36	-409.79	-283.95	-348.80	0.00	0.00	0.00
3,900.00	13.07	219.83	3,838.77	-427.15	-298.43	-363.49	0.00	0.00	0.00
4,000.00	13.07	219.83	3,936.18	-444.52	-312.91	-378.17	0.00	0.00	0.00
4,100.00	13.07	219.83	4,033.59	-461.88	-327.39	-392.86	0.00	0.00	0.00
4,200.00	13.07	219.83	4,131.00	-479.24	-341.87	-407.55	0.00	0.00	0.00
4,300.00	13.07	219.83	4,228.41	-496.61	-356.35	-422.24	0.00	0.00	0.00
4,400.00	13.07	219.83	4,325.82	-513.97	-370.83	-436.93	0.00	0.00	0.00
4,500.00	13.07	219.83	4,423.23	-531.33	-385.31	-451.61	0.00	0.00	0.00
4,600.00	13.07	219.83	4,520.64	-548.69	-399.79	-466.30	0.00	0.00	0.00
4,700.00	13.07	219.83	4,618.06	-566.06	-414.27	-480.99	0.00	0.00	0.00

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Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5111' GL @ 5128.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5111' GL @ 5128.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 2C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 2C-17HZ		
Design:	UNDERHILL 2C-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)	
4,735.87	13.07	219.83	4,653.00	-572.29	-419.47	-486.26	0.00	0.00	0.00	
Sussex										
4,800.00	13.07	219.83	4,715.47	-583.42	-428.75	-495.68	0.00	0.00	0.00	
4,900.00	13.07	219.83	4,812.88	-600.78	-443.23	-510.36	0.00	0.00	0.00	
5,000.00	13.07	219.83	4,910.29	-618.15	-457.71	-525.05	0.00	0.00	0.00	
5,100.00	13.07	219.83	5,007.70	-635.51	-472.19	-539.74	0.00	0.00	0.00	
5,200.00	13.07	219.83	5,105.11	-652.87	-486.67	-554.43	0.00	0.00	0.00	
5,300.00	13.07	219.83	5,202.52	-670.24	-501.15	-569.12	0.00	0.00	0.00	
5,361.06	13.07	219.83	5,262.00	-680.84	-509.99	-578.08	0.00	0.00	0.00	
Shannon										
5,400.00	13.07	219.83	5,299.93	-687.60	-515.63	-583.80	0.00	0.00	0.00	
5,500.00	13.07	219.83	5,397.34	-704.96	-530.11	-598.49	0.00	0.00	0.00	
5,600.00	13.07	219.83	5,494.75	-722.32	-544.59	-613.18	0.00	0.00	0.00	
5,700.00	13.07	219.83	5,592.16	-739.69	-559.07	-627.87	0.00	0.00	0.00	
5,710.42	13.07	219.83	5,602.31	-741.50	-560.58	-629.40	0.00	0.00	0.00	
Start Drop -2.00										
5,800.00	11.28	219.83	5,689.88	-756.00	-572.68	-641.67	2.00	-2.00	0.00	
5,900.00	9.28	219.83	5,788.27	-769.70	-584.10	-653.25	2.00	-2.00	0.00	
6,000.00	7.28	219.83	5,887.22	-780.75	-593.32	-662.60	2.00	-2.00	0.00	
6,100.00	5.28	219.83	5,986.62	-789.14	-600.32	-669.70	2.00	-2.00	0.00	
6,200.00	3.28	219.83	6,086.33	-794.87	-605.09	-674.55	2.00	-2.00	0.00	
6,300.00	1.28	219.83	6,186.25	-797.92	-607.63	-677.13	2.00	-2.00	0.00	
6,363.76	0.00	0.00	6,250.00	-798.46	-608.09	-677.59	2.00	-2.00	0.00	
Start 980.04 hold at 6363.76 MD										
6,400.00	0.00	0.00	6,286.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,386.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,486.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,586.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,686.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,786.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,886.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,986.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,086.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,186.24	-798.46	-608.09	-677.59	0.00	0.00	0.00	
7,343.80	0.00	0.00	7,230.04	-798.46	-608.09	-677.59	0.00	0.00	0.00	
Start Build 10.00										
7,350.00	0.62	359.89	7,236.24	-798.43	-608.09	-677.55	10.00	10.00	0.00	
7,400.00	5.62	359.89	7,286.15	-795.71	-608.09	-674.87	10.00	10.00	0.00	
7,450.00	10.62	359.89	7,335.64	-788.65	-608.11	-667.91	10.00	10.00	0.00	
7,500.00	15.62	359.89	7,384.32	-777.30	-608.13	-656.72	10.00	10.00	0.00	
7,514.26	17.05	359.89	7,398.00	-773.29	-608.14	-652.76	10.00	10.00	0.00	
Sharon Springs										
7,540.60	19.68	359.89	7,423.00	-764.99	-608.15	-644.58	10.00	10.00	0.00	
Niobrara										
7,550.00	20.62	359.89	7,431.82	-761.76	-608.16	-641.39	10.00	10.00	0.00	
7,600.00	25.62	359.89	7,477.79	-742.13	-608.20	-622.03	10.00	10.00	0.00	
7,650.00	30.62	359.89	7,521.88	-718.57	-608.24	-598.80	10.00	10.00	0.00	
7,677.27	33.35	359.89	7,545.00	-704.13	-608.27	-584.56	10.00	10.00	0.00	
Niobrara B										
7,700.00	35.62	359.89	7,563.74	-691.26	-608.29	-571.87	10.00	10.00	0.00	
7,750.00	40.62	359.89	7,603.06	-660.40	-608.35	-541.44	10.00	10.00	0.00	
7,800.00	45.62	359.89	7,639.55	-626.24	-608.42	-507.75	10.00	10.00	0.00	
7,800.65	45.69	359.89	7,640.00	-625.77	-608.42	-507.29	10.00	10.00	0.00	

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5111' GL @ 5128.00ft
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Well:	UNDERHILL 2C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 2C-17HZ		
Design:	UNDERHILL 2C-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)
Niobrara C									
7,850.00	50.62	359.89	7,672.91	-589.02	-608.49	-471.05	10.00	10.00	0.00
7,900.00	55.62	359.89	7,702.91	-549.04	-608.57	-431.62	10.00	10.00	0.00
7,950.00	60.62	359.89	7,729.31	-506.59	-608.65	-389.76	10.00	10.00	0.00
8,000.00	65.62	359.89	7,751.91	-462.01	-608.73	-345.79	10.00	10.00	0.00
8,050.00	70.62	359.89	7,770.54	-415.63	-608.82	-300.05	10.00	10.00	0.00
8,063.94	72.01	359.89	7,775.00	-402.42	-608.85	-287.03	10.00	10.00	0.00
Fort Hays									
8,100.00	75.62	359.89	7,785.05	-367.80	-608.91	-252.89	10.00	10.00	0.00
8,150.00	80.62	359.89	7,795.34	-318.88	-609.01	-204.65	10.00	10.00	0.00
8,154.15	81.04	359.89	7,796.00	-314.79	-609.02	-200.61	10.00	10.00	0.00
Codell									
8,200.00	85.62	359.89	7,801.33	-269.26	-609.10	-155.71	10.00	10.00	0.00
8,245.20	90.14	359.89	7,803.00	-224.10	-609.19	-111.18	10.00	10.00	0.00
Start DLS 0.00 TFO -141.53 - 7"									
8,300.00	90.14	359.89	7,802.86	-169.30	-609.30	-57.14	0.00	0.00	0.00
8,400.00	90.14	359.89	7,802.62	-69.30	-609.49	41.48	0.00	0.00	0.00
8,500.00	90.14	359.89	7,802.38	30.70	-609.68	140.09	0.00	0.00	0.00
8,600.00	90.14	359.89	7,802.13	130.70	-609.87	238.70	0.00	0.00	0.00
8,700.00	90.14	359.89	7,801.89	230.70	-610.07	337.32	0.00	0.00	0.00
8,800.00	90.14	359.89	7,801.65	330.70	-610.26	435.93	0.00	0.00	0.00
8,900.00	90.14	359.89	7,801.40	430.69	-610.45	534.55	0.00	0.00	0.00
9,000.00	90.14	359.89	7,801.16	530.69	-610.65	633.16	0.00	0.00	0.00
9,100.00	90.14	359.89	7,800.92	630.69	-610.84	731.78	0.00	0.00	0.00
9,200.00	90.14	359.89	7,800.68	730.69	-611.04	830.39	0.00	0.00	0.00
9,300.00	90.14	359.89	7,800.44	830.69	-611.23	929.01	0.00	0.00	0.00
9,400.00	90.14	359.89	7,800.20	930.69	-611.43	1,027.62	0.00	0.00	0.00
9,500.00	90.14	359.89	7,799.96	1,030.69	-611.62	1,126.24	0.00	0.00	0.00
9,600.00	90.14	359.89	7,799.72	1,130.69	-611.82	1,224.85	0.00	0.00	0.00
9,700.00	90.14	359.89	7,799.48	1,230.69	-612.01	1,323.47	0.00	0.00	0.00
9,800.00	90.14	359.89	7,799.24	1,330.69	-612.21	1,422.08	0.00	0.00	0.00
9,900.00	90.14	359.89	7,799.00	1,430.69	-612.40	1,520.70	0.00	0.00	0.00
10,000.00	90.14	359.89	7,798.76	1,530.69	-612.60	1,619.31	0.00	0.00	0.00
10,100.00	90.14	359.89	7,798.52	1,630.69	-612.80	1,717.93	0.00	0.00	0.00
10,200.00	90.14	359.89	7,798.28	1,730.69	-612.99	1,816.55	0.00	0.00	0.00
10,300.00	90.14	359.89	7,798.04	1,830.69	-613.19	1,915.16	0.00	0.00	0.00
10,400.00	90.14	359.89	7,797.81	1,930.69	-613.39	2,013.78	0.00	0.00	0.00
10,500.00	90.14	359.89	7,797.57	2,030.69	-613.59	2,112.39	0.00	0.00	0.00
10,600.00	90.14	359.89	7,797.33	2,130.69	-613.78	2,211.01	0.00	0.00	0.00
10,700.00	90.14	359.89	7,797.10	2,230.69	-613.98	2,309.62	0.00	0.00	0.00
10,800.00	90.14	359.89	7,796.86	2,330.69	-614.18	2,408.24	0.00	0.00	0.00
10,900.00	90.14	359.89	7,796.62	2,430.69	-614.38	2,506.85	0.00	0.00	0.00
11,000.00	90.13	359.89	7,796.39	2,530.68	-614.58	2,605.47	0.00	0.00	0.00
11,100.00	90.13	359.89	7,796.15	2,630.68	-614.78	2,704.09	0.00	0.00	0.00
11,200.00	90.13	359.89	7,795.92	2,730.68	-614.98	2,802.70	0.00	0.00	0.00
11,300.00	90.13	359.89	7,795.68	2,830.68	-615.18	2,901.32	0.00	0.00	0.00
11,400.00	90.13	359.89	7,795.45	2,930.68	-615.38	2,999.93	0.00	0.00	0.00
11,500.00	90.13	359.89	7,795.21	3,030.68	-615.58	3,098.55	0.00	0.00	0.00
11,600.00	90.13	359.88	7,794.98	3,130.68	-615.78	3,197.17	0.00	0.00	0.00
11,700.00	90.13	359.88	7,794.75	3,230.68	-615.98	3,295.78	0.00	0.00	0.00
11,800.00	90.13	359.88	7,794.51	3,330.68	-616.18	3,394.40	0.00	0.00	0.00
11,900.00	90.13	359.88	7,794.28	3,430.68	-616.38	3,493.01	0.00	0.00	0.00
12,000.00	90.13	359.88	7,794.05	3,530.68	-616.59	3,591.63	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 + 5111' GL @ 5128.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5111' GL @ 5128.00ft
Site:	WELD_UNDERHILL 15-17HZ PAD	North Reference:	True
Well:	UNDERHILL 2C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 2C-17HZ		
Design:	UNDERHILL 2C-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)	
12,100.00	90.13	359.88	7,793.82	3,630.68	-616.79	3,690.25	0.00	0.00	0.00	
12,200.00	90.13	359.88	7,793.58	3,730.68	-616.99	3,788.86	0.00	0.00	0.00	
12,300.00	90.13	359.88	7,793.35	3,830.68	-617.19	3,887.48	0.00	0.00	0.00	
12,400.00	90.13	359.88	7,793.12	3,930.68	-617.40	3,986.10	0.00	0.00	0.00	
12,452.69	90.13	359.88	7,793.00	3,983.37	-617.50	4,038.06	0.00	0.00	0.00	
TD at 12452.70 - UNDERHILL 2C-17HZ PBHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
UNDERHILL 2C-17HZ F - hit/miss target - Shape - Point	0.00	0.00	7,793.00	3,983.37	-617.50	1,264,175.31	3,164,396.75	40.057056	-104.912695	

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						
8,245.20	7,803.00	7"	7	7-1/2						

Formations										
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)					
4,735.87	4,653.00	Sussex								
5,361.06	5,262.00	Shannon								
7,514.26	7,398.00	Sharon Springs								
7,540.60	7,423.00	Niobrara								
7,677.27	7,545.00	Niobrara B								
7,800.65	7,640.00	Niobrara C								
8,063.94	7,775.00	Fort Hays								
8,154.15	7,796.00	Codell								

Plan Annotations										
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment						
1,100.00	1,100.00	2.54	59.91	Start Build 2.00						
1,753.33	1,747.69	-54.43	12.41	Start 3957.09 hold at 1753.33 MD						
5,710.42	5,602.31	-741.50	-560.58	Start Drop -2.00						
6,363.76	6,250.00	-798.46	-608.09	Start 980.04 hold at 6363.76 MD						
7,343.80	7,230.04	-798.46	-608.09	Start Build 10.00						
8,245.20	7,803.00	-224.10	-609.19	Start DLS 0.00 TFO -141.53						
12,452.69	7,793.00	3,983.37	-617.50	TD at 12452.70						