

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_HEIN 5-1 PAD**

**Hein 29-1**

**Hein 29-1**

**Plan: Hein 29-1 (wp01)**

## **Standard Planning Report**

**03 October, 2011**

Project: COLORADO NORTHERN ZONE - 83  
Site: WELD\_HEIN 5-1 PAD  
Well: Hein 29-1  
Wellbore: Hein 29-1  
Section:  
SHL:  
Design: Hein 29-1 (wp01)  
Latitude: 40.082814  
Longitude: -104.845099  
GL: 4944.00  
KB: 15' RKB + 4944' GL @ 4959.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4059.00	4246.16	PK Depth
4521.00	4735.92	SX Depth
7217.00	7483.55	NIO Depth
7536.00	7802.55	CD Depth
7623.00	7889.55	GH Depth
7977.00	8243.55	J Depth

CASING DETAILS			
TVD	MD	Name	Size
915.00	919.82	8-5/8"	8-5/8

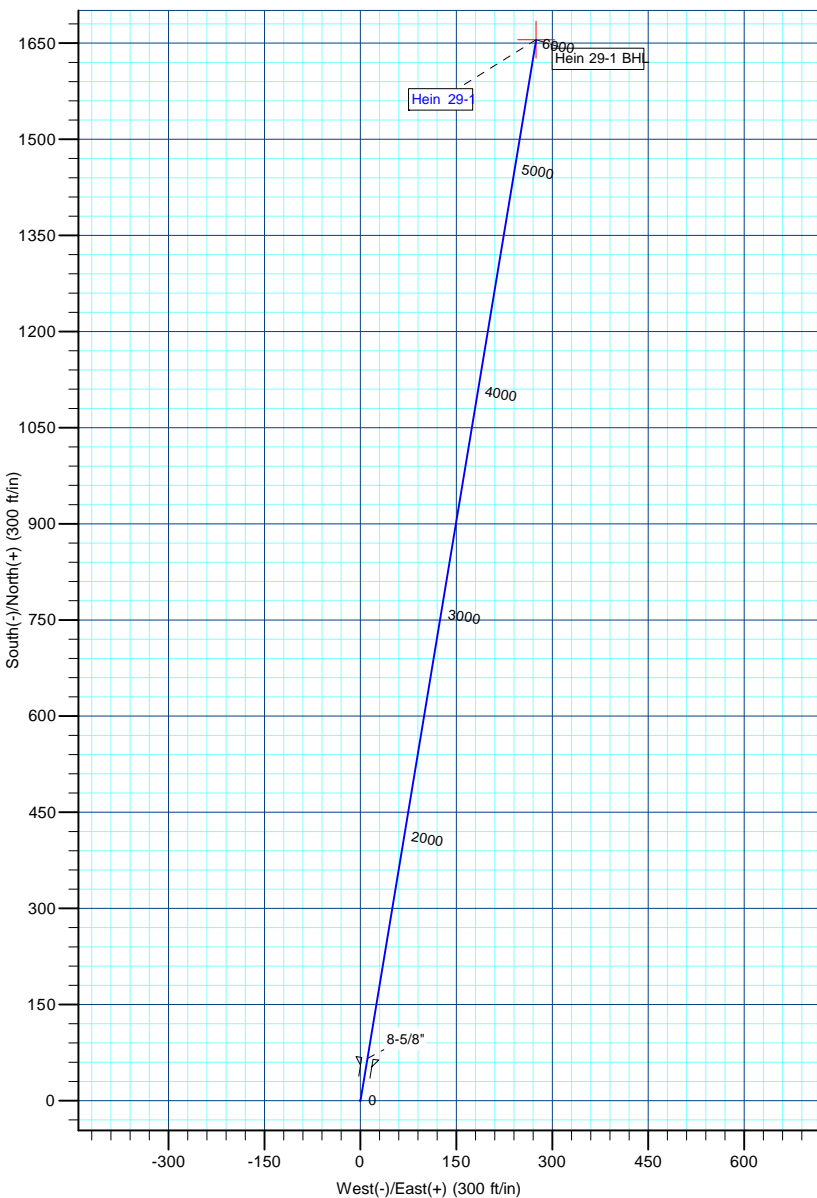
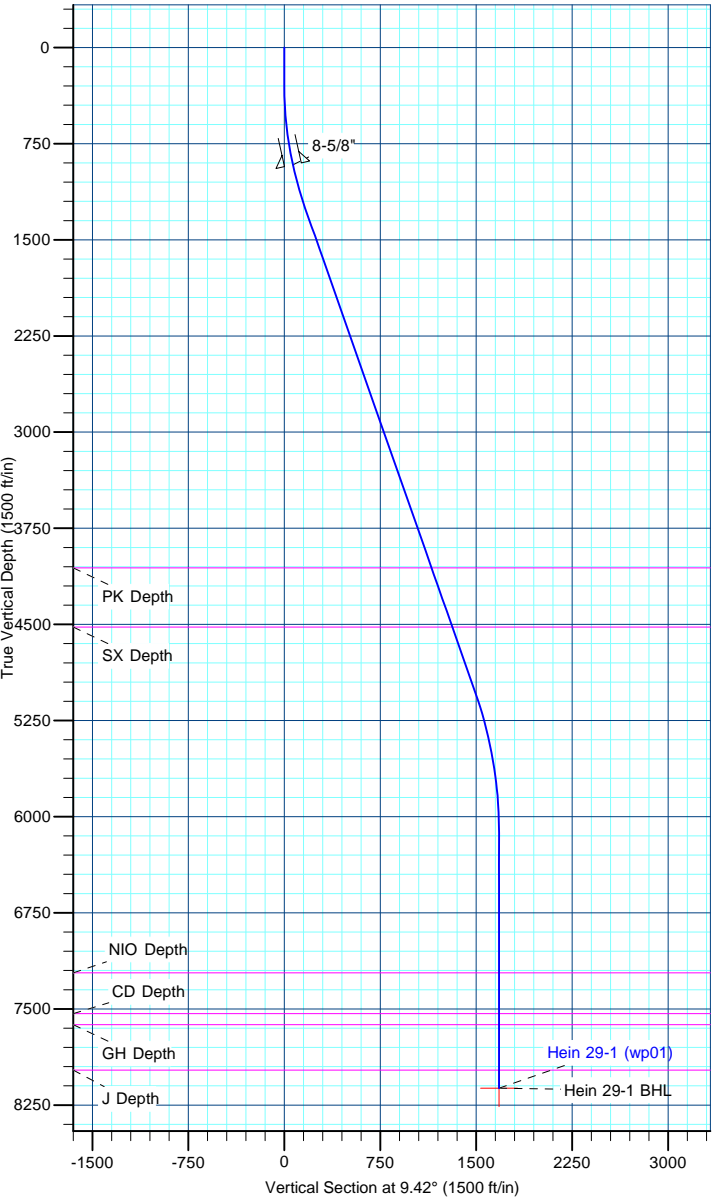
Azimuths to True North  
Magnetic North: 8.84°

Magnetic Field  
Strength: 52922.9snT  
Dip Angle: 66.77°  
Date: 10/3/2011  
Model: IGRF2010

WELL DETAILS: Hein 29-1						
+N/-S	+E/-W	Northing	Ground Level: Easting	4944.00 Latitude	Longitude	Slot
0.00	0.00	1273690.62	3183248.40	40.082814	-104.845099	

DESIGN TARGET DETAILS								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Hein 29-1 BHL	8117.00	1655.29	274.48	1275347.89	3183510.65	40.087358	-104.844118	

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	
1269.28	19.39	9.42	1250.89	160.23	26.57	2.00	9.42	162.42	
5275.80	19.39	9.42	5030.27	1472.17	244.11	0.00	0.00	1492.27	
6383.55	0.00	0.00	6117.00	1655.29	274.48	1.75	180.00	1677.89	
8383.55	0.00	0.00	8117.00	1655.29	274.48	0.00	0.00	1677.89	



# Anadarko Petroleum Corp

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well Hein 29-1
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Site:</b>	WELD_HEIN 5-1 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Hein 29-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hein 29-1		
<b>Design:</b>	Hein 29-1 (wp01)		

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

<b>Site</b>	WELD_HEIN 5-1 PAD			
<b>Site Position:</b>		<b>Northing:</b>	1,273,690.62 usft	<b>Latitude:</b> 40.082814
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,183,248.41 usft	<b>Longitude:</b> -104.845099
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.42 °

<b>Well</b>	Hein 29-1			
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,273,690.62 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,183,248.41 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b> 4,944.00 ft

<b>Wellbore</b>	Hein 29-1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/3/2011	8.84	66.77	52,923

<b>Design</b>	Hein 29-1 (wp01)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	9.42

<b>Plan Sections</b>										
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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,269.28	19.39	9.42	1,250.89	160.23	26.57	2.00	2.00	0.00	9.42	
5,275.80	19.39	9.42	5,030.27	1,472.17	244.11	0.00	0.00	0.00	0.00	
6,383.55	0.00	0.00	6,117.00	1,655.29	274.48	1.75	-1.75	0.00	180.00	
8,383.55	0.00	0.00	8,117.00	1,655.29	274.48	0.00	0.00	0.00	0.00	Hein 29-1 BHL

# Anadarko Petroleum Corp

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well Hein 29-1
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Site:</b>	WELD_HEIN 5-1 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Hein 29-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hein 29-1		
<b>Design:</b>	Hein 29-1 (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	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	9.42	399.98	1.72	0.29	1.75	2.00	2.00	0.00
500.00	4.00	9.42	499.84	6.88	1.14	6.98	2.00	2.00	0.00
600.00	6.00	9.42	599.45	15.48	2.57	15.69	2.00	2.00	0.00
700.00	8.00	9.42	698.70	27.50	4.56	27.88	2.00	2.00	0.00
800.00	10.00	9.42	797.47	42.94	7.12	43.52	2.00	2.00	0.00
900.00	12.00	9.42	895.62	61.76	10.24	62.60	2.00	2.00	0.00
919.82	12.40	9.42	915.00	65.89	10.93	66.79	2.00	2.00	0.00
8-5/8"									
1,000.00	14.00	9.42	993.06	83.95	13.92	85.10	2.00	2.00	0.00
1,100.00	16.00	9.42	1,089.64	109.48	18.15	110.98	2.00	2.00	0.00
1,200.00	18.00	9.42	1,185.27	138.32	22.94	140.21	2.00	2.00	0.00
1,269.28	19.39	9.42	1,250.89	160.23	26.57	162.42	2.00	2.00	0.00
1,300.00	19.39	9.42	1,279.87	170.29	28.24	172.61	0.00	0.00	0.00
1,400.00	19.39	9.42	1,374.20	203.03	33.67	205.80	0.00	0.00	0.00
1,500.00	19.39	9.42	1,468.53	235.78	39.10	239.00	0.00	0.00	0.00
1,600.00	19.39	9.42	1,562.86	268.52	44.53	272.19	0.00	0.00	0.00
1,700.00	19.39	9.42	1,657.19	301.27	49.96	305.38	0.00	0.00	0.00
1,800.00	19.39	9.42	1,751.52	334.01	55.39	338.57	0.00	0.00	0.00
1,900.00	19.39	9.42	1,845.85	366.76	60.82	371.77	0.00	0.00	0.00
2,000.00	19.39	9.42	1,940.19	399.50	66.25	404.96	0.00	0.00	0.00
2,100.00	19.39	9.42	2,034.52	432.25	71.68	438.15	0.00	0.00	0.00
2,200.00	19.39	9.42	2,128.85	464.99	77.11	471.34	0.00	0.00	0.00
2,300.00	19.39	9.42	2,223.18	497.74	82.53	504.54	0.00	0.00	0.00
2,400.00	19.39	9.42	2,317.51	530.48	87.96	537.73	0.00	0.00	0.00
2,500.00	19.39	9.42	2,411.84	563.23	93.39	570.92	0.00	0.00	0.00
2,600.00	19.39	9.42	2,506.17	595.97	98.82	604.11	0.00	0.00	0.00
2,700.00	19.39	9.42	2,600.50	628.72	104.25	637.30	0.00	0.00	0.00
2,800.00	19.39	9.42	2,694.83	661.46	109.68	670.50	0.00	0.00	0.00
2,900.00	19.39	9.42	2,789.16	694.21	115.11	703.69	0.00	0.00	0.00
3,000.00	19.39	9.42	2,883.49	726.95	120.54	736.88	0.00	0.00	0.00
3,100.00	19.39	9.42	2,977.82	759.70	125.97	770.07	0.00	0.00	0.00
3,200.00	19.39	9.42	3,072.15	792.44	131.40	803.27	0.00	0.00	0.00
3,300.00	19.39	9.42	3,166.48	825.19	136.83	836.46	0.00	0.00	0.00
3,400.00	19.39	9.42	3,260.81	857.94	142.26	869.65	0.00	0.00	0.00
3,500.00	19.39	9.42	3,355.15	890.68	147.69	902.84	0.00	0.00	0.00
3,600.00	19.39	9.42	3,449.48	923.43	153.12	936.03	0.00	0.00	0.00
3,700.00	19.39	9.42	3,543.81	956.17	158.55	969.23	0.00	0.00	0.00
3,800.00	19.39	9.42	3,638.14	988.92	163.98	1,002.42	0.00	0.00	0.00
3,900.00	19.39	9.42	3,732.47	1,021.66	169.41	1,035.61	0.00	0.00	0.00
4,000.00	19.39	9.42	3,826.80	1,054.41	174.84	1,068.80	0.00	0.00	0.00
4,100.00	19.39	9.42	3,921.13	1,087.15	180.27	1,102.00	0.00	0.00	0.00
4,200.00	19.39	9.42	4,015.46	1,119.90	185.70	1,135.19	0.00	0.00	0.00
4,246.16	19.39	9.42	4,059.00	1,135.01	188.21	1,150.51	0.00	0.00	0.00
PK Depth									
4,300.00	19.39	9.42	4,109.79	1,152.64	191.13	1,168.38	0.00	0.00	0.00
4,400.00	19.39	9.42	4,204.12	1,185.39	196.56	1,201.57	0.00	0.00	0.00
4,500.00	19.39	9.42	4,298.45	1,218.13	201.99	1,234.77	0.00	0.00	0.00
4,600.00	19.39	9.42	4,392.78	1,250.88	207.42	1,267.96	0.00	0.00	0.00
4,700.00	19.39	9.42	4,487.11	1,283.62	212.85	1,301.15	0.00	0.00	0.00
4,735.92	19.39	9.42	4,521.00	1,295.39	214.80	1,313.07	0.00	0.00	0.00

# Anadarko Petroleum Corp

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well Hein 29-1
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Site:</b>	WELD_HEIN 5-1 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Hein 29-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hein 29-1		
<b>Design:</b>	Hein 29-1 (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)
<b>SX Depth</b>									
4,800.00	19.39	9.42	4,581.44	1,316.37	218.28	1,334.34	0.00	0.00	0.00
4,900.00	19.39	9.42	4,675.77	1,349.11	223.71	1,367.53	0.00	0.00	0.00
5,000.00	19.39	9.42	4,770.11	1,381.86	229.14	1,400.73	0.00	0.00	0.00
5,100.00	19.39	9.42	4,864.44	1,414.60	234.57	1,433.92	0.00	0.00	0.00
5,200.00	19.39	9.42	4,958.77	1,447.35	240.00	1,467.11	0.00	0.00	0.00
5,275.80	19.39	9.42	5,030.27	1,472.17	244.11	1,492.27	0.00	0.00	0.00
5,300.00	18.96	9.42	5,053.13	1,480.01	245.42	1,500.22	1.75	-1.75	0.00
5,400.00	17.21	9.42	5,148.18	1,510.64	250.49	1,531.26	1.75	-1.75	0.00
5,500.00	15.46	9.42	5,244.14	1,538.38	255.09	1,559.39	1.75	-1.75	0.00
5,600.00	13.71	9.42	5,340.91	1,563.23	259.21	1,584.58	1.75	-1.75	0.00
5,700.00	11.96	9.42	5,438.41	1,585.15	262.85	1,606.79	1.75	-1.75	0.00
5,800.00	10.21	9.42	5,536.54	1,604.12	265.99	1,626.02	1.75	-1.75	0.00
5,900.00	8.46	9.42	5,635.21	1,620.12	268.65	1,642.25	1.75	-1.75	0.00
6,000.00	6.71	9.42	5,734.33	1,633.15	270.81	1,655.45	1.75	-1.75	0.00
6,100.00	4.96	9.42	5,833.81	1,643.18	272.47	1,665.62	1.75	-1.75	0.00
6,200.00	3.21	9.42	5,933.55	1,650.21	273.64	1,672.74	1.75	-1.75	0.00
6,300.00	1.46	9.42	6,033.46	1,654.23	274.30	1,676.82	1.75	-1.75	0.00
6,383.55	0.00	0.00	6,117.00	1,655.29	274.48	1,677.89	1.75	-1.75	0.00
6,400.00	0.00	0.00	6,133.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
6,500.00	0.00	0.00	6,233.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
6,600.00	0.00	0.00	6,333.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
6,700.00	0.00	0.00	6,433.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
6,800.00	0.00	0.00	6,533.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
6,900.00	0.00	0.00	6,633.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,000.00	0.00	0.00	6,733.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,100.00	0.00	0.00	6,833.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,200.00	0.00	0.00	6,933.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,300.00	0.00	0.00	7,033.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,400.00	0.00	0.00	7,133.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,483.55	0.00	0.00	7,217.00	1,655.29	274.48	1,677.89	0.00	0.00	0.00
<b>NIO Depth</b>									
7,500.00	0.00	0.00	7,233.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,600.00	0.00	0.00	7,333.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,700.00	0.00	0.00	7,433.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,800.00	0.00	0.00	7,533.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
7,802.55	0.00	0.00	7,536.00	1,655.29	274.48	1,677.89	0.00	0.00	0.00
<b>CD Depth</b>									
7,889.55	0.00	0.00	7,623.00	1,655.29	274.48	1,677.89	0.00	0.00	0.00
<b>GH Depth</b>									
7,900.00	0.00	0.00	7,633.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
8,000.00	0.00	0.00	7,733.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
8,100.00	0.00	0.00	7,833.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
8,200.00	0.00	0.00	7,933.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
8,243.55	0.00	0.00	7,977.00	1,655.29	274.48	1,677.89	0.00	0.00	0.00
<b>J Depth</b>									
8,300.00	0.00	0.00	8,033.46	1,655.29	274.48	1,677.89	0.00	0.00	0.00
8,383.55	0.00	0.00	8,117.00	1,655.29	274.48	1,677.89	0.00	0.00	0.00
<b>Hein 29-1 BHL</b>									

# Anadarko Petroleum Corp

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well Hein 29-1
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4944' GL @ 4959.00ft
<b>Site:</b>	WELD_HEIN 5-1 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Hein 29-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hein 29-1		
<b>Design:</b>	Hein 29-1 (wp01)		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
Hein 29-1 BHL	0.00	0.00	8,117.00	1,655.29	274.48	1,275,347.88	3,183,510.65	40.087358	-104.844118
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
919.82	915.00	8-5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
4,246.16	4,059.00	PK Depth				
4,735.92	4,521.00	SX Depth				
7,483.55	7,217.00	NIO Depth				
7,802.55	7,536.00	CD Depth				
7,889.55	7,623.00	GH Depth				
8,243.55	7,977.00	J Depth				