

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HEIN 5-1 PAD

Hein 30-1

Hein 30-1

Plan: Hein 30-1 (wp01)

Standard Planning Report

03 October, 2011

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HEIN 5-1 PAD
Well: Hein 30-1
Wellbore: Hein 30-1
Section:
SHL:
Design: Hein 30-1 (wp01)
Latitude: 40.082732
Longitude: -104.845098
GL: 4944.00
KB: 15' rkb + 4944' gl @ 4959.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4059.00	4264.05	PK Depth
4521.00	4756.79	SX Depth
7217.00	7547.43	NIO Depth
7536.00	7866.43	CD Depth
7623.00	7953.43	GH Depth
7977.00	8307.43	J Depth

WELL DETAILS: Hein 30-1						
+N/-S	+E/-W	Northing	Ground Level: Easting	4944.00 Latitude	Longitude	Slot
0.00	0.00	1273660.75	3183248.91	40.082732	-104.845098	

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

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M

Azimuths to True North
Magnetic North: 8.84°

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

DESIGN TARGET DETAILS								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Hein 30-1 BHL	8117.00	1700.85	-995.79	1275354.19	3182240.58	40.087401	-104.848657	

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
1317.19	20.34	329.65	1295.96	154.21	-90.29	2.00	329.65	178.70
5884.93	20.34	329.65	5578.77	1524.61	-892.61	0.00	0.00	1766.68
7047.43	0.00	0.00	6717.00	1700.85	-995.79	1.75	180.00	1970.91
8447.43	0.00	0.00	8117.00	1700.85	-995.79	0.00	0.00	1970.91

Vertical Section at 329.65° (1500 ft/in)

South(-)/North(+) (300 ft/in) vs. West(-)/East(+) (300 ft/in)

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well Hein 30-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4944' gl @ 4959.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4944' gl @ 4959.00ft
Site:	WELD_HEIN 5-1 PAD	North Reference:	True
Well:	Hein 30-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 30-1		
Design:	Hein 30-1 (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_HEIN 5-1 PAD			
Site Position:		Northing:	1,273,690.62 usft	Latitude:	40.082814
From:	Lat/Long	Easting:	3,183,248.41 usft	Longitude:	-104.845099
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	Hein 30-1					
Well Position	+N/-S	-29.88 ft	Northing:	1,273,660.74 usft	Latitude:	40.082732
	+E/-W	0.28 ft	Easting:	3,183,248.91 usft	Longitude:	-104.845098
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,944.00 ft

Wellbore	Hein 30-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/3/2011	8.84	66.77	52,923

Design	Hein 30-1 (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	0.00	0.00	329.65

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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,317.19	20.34	329.65	1,295.96	154.21	-90.29	2.00	2.00	0.00	329.65	
5,884.93	20.34	329.65	5,578.77	1,524.61	-892.61	0.00	0.00	0.00	0.00	
7,047.43	0.00	0.00	6,717.00	1,700.85	-995.79	1.75	-1.75	0.00	180.00	
8,447.43	0.00	0.00	8,117.00	1,700.85	-995.79	0.00	0.00	0.00	0.00	Hein 30-1 BHL

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well Hein 30-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4944' gl @ 4959.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4944' gl @ 4959.00ft
Site:	WELD_HEIN 5-1 PAD	North Reference:	True
Well:	Hein 30-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 30-1		
Design:	Hein 30-1 (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	329.65	399.98	1.51	-0.88	1.75	2.00	2.00	0.00
500.00	4.00	329.65	499.84	6.02	-3.53	6.98	2.00	2.00	0.00
600.00	6.00	329.65	599.45	13.54	-7.93	15.69	2.00	2.00	0.00
700.00	8.00	329.65	698.70	24.06	-14.09	27.88	2.00	2.00	0.00
800.00	10.00	329.65	797.47	37.56	-21.99	43.52	2.00	2.00	0.00
900.00	12.00	329.65	895.62	54.02	-31.63	62.60	2.00	2.00	0.00
919.82	12.40	329.65	915.00	57.64	-33.75	66.79	2.00	2.00	0.00
8-5/8"									
1,000.00	14.00	329.65	993.06	73.44	-42.99	85.10	2.00	2.00	0.00
1,100.00	16.00	329.65	1,089.64	95.77	-56.07	110.98	2.00	2.00	0.00
1,200.00	18.00	329.65	1,185.27	121.00	-70.84	140.21	2.00	2.00	0.00
1,300.00	20.00	329.65	1,279.82	149.09	-87.29	172.77	2.00	2.00	0.00
1,317.19	20.34	329.65	1,295.96	154.21	-90.29	178.70	2.00	2.00	0.00
1,400.00	20.34	329.65	1,373.60	179.05	-104.83	207.48	0.00	0.00	0.00
1,500.00	20.34	329.65	1,467.36	209.06	-122.40	242.25	0.00	0.00	0.00
1,600.00	20.34	329.65	1,561.12	239.06	-139.96	277.02	0.00	0.00	0.00
1,700.00	20.34	329.65	1,654.88	269.06	-157.53	311.78	0.00	0.00	0.00
1,800.00	20.34	329.65	1,748.65	299.06	-175.09	346.55	0.00	0.00	0.00
1,900.00	20.34	329.65	1,842.41	329.06	-192.66	381.31	0.00	0.00	0.00
2,000.00	20.34	329.65	1,936.17	359.06	-210.22	416.08	0.00	0.00	0.00
2,100.00	20.34	329.65	2,029.93	389.07	-227.79	450.84	0.00	0.00	0.00
2,200.00	20.34	329.65	2,123.69	419.07	-245.35	485.61	0.00	0.00	0.00
2,300.00	20.34	329.65	2,217.46	449.07	-262.92	520.37	0.00	0.00	0.00
2,400.00	20.34	329.65	2,311.22	479.07	-280.48	555.14	0.00	0.00	0.00
2,500.00	20.34	329.65	2,404.98	509.07	-298.05	589.90	0.00	0.00	0.00
2,600.00	20.34	329.65	2,498.74	539.07	-315.61	624.67	0.00	0.00	0.00
2,700.00	20.34	329.65	2,592.51	569.08	-333.18	659.43	0.00	0.00	0.00
2,800.00	20.34	329.65	2,686.27	599.08	-350.74	694.20	0.00	0.00	0.00
2,900.00	20.34	329.65	2,780.03	629.08	-368.31	728.96	0.00	0.00	0.00
3,000.00	20.34	329.65	2,873.79	659.08	-385.87	763.73	0.00	0.00	0.00
3,100.00	20.34	329.65	2,967.56	689.08	-403.44	798.49	0.00	0.00	0.00
3,200.00	20.34	329.65	3,061.32	719.08	-421.00	833.26	0.00	0.00	0.00
3,300.00	20.34	329.65	3,155.08	749.09	-438.57	868.03	0.00	0.00	0.00
3,400.00	20.34	329.65	3,248.84	779.09	-456.13	902.79	0.00	0.00	0.00
3,500.00	20.34	329.65	3,342.60	809.09	-473.70	937.56	0.00	0.00	0.00
3,600.00	20.34	329.65	3,436.37	839.09	-491.26	972.32	0.00	0.00	0.00
3,700.00	20.34	329.65	3,530.13	869.09	-508.83	1,007.09	0.00	0.00	0.00
3,800.00	20.34	329.65	3,623.89	899.09	-526.39	1,041.85	0.00	0.00	0.00
3,900.00	20.34	329.65	3,717.65	929.10	-543.96	1,076.62	0.00	0.00	0.00
4,000.00	20.34	329.65	3,811.42	959.10	-561.52	1,111.38	0.00	0.00	0.00
4,100.00	20.34	329.65	3,905.18	989.10	-579.09	1,146.15	0.00	0.00	0.00
4,200.00	20.34	329.65	3,998.94	1,019.10	-596.65	1,180.91	0.00	0.00	0.00
4,264.05	20.34	329.65	4,059.00	1,038.32	-607.90	1,203.18	0.00	0.00	0.00
PK Depth									
4,300.00	20.34	329.65	4,092.70	1,049.10	-614.22	1,215.68	0.00	0.00	0.00
4,400.00	20.34	329.65	4,186.47	1,079.10	-631.78	1,250.44	0.00	0.00	0.00
4,500.00	20.34	329.65	4,280.23	1,109.11	-649.35	1,285.21	0.00	0.00	0.00
4,600.00	20.34	329.65	4,373.99	1,139.11	-666.91	1,319.97	0.00	0.00	0.00
4,700.00	20.34	329.65	4,467.75	1,169.11	-684.48	1,354.74	0.00	0.00	0.00
4,756.79	20.34	329.65	4,521.00	1,186.15	-694.45	1,374.48	0.00	0.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4944' gl @ 4959.00ft
Site:	WELD_HEIN 5-1 PAD	North Reference:	True
Well:	Hein 30-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 30-1		
Design:	Hein 30-1 (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)
SX Depth									
4,800.00	20.34	329.65	4,561.51	1,199.11	-702.04	1,389.51	0.00	0.00	0.00
4,900.00	20.34	329.65	4,655.28	1,229.11	-719.61	1,424.27	0.00	0.00	0.00
5,000.00	20.34	329.65	4,749.04	1,259.11	-737.17	1,459.04	0.00	0.00	0.00
5,100.00	20.34	329.65	4,842.80	1,289.11	-754.74	1,493.80	0.00	0.00	0.00
5,200.00	20.34	329.65	4,936.56	1,319.12	-772.30	1,528.57	0.00	0.00	0.00
5,300.00	20.34	329.65	5,030.33	1,349.12	-789.87	1,563.33	0.00	0.00	0.00
5,400.00	20.34	329.65	5,124.09	1,379.12	-807.43	1,598.10	0.00	0.00	0.00
5,500.00	20.34	329.65	5,217.85	1,409.12	-825.00	1,632.86	0.00	0.00	0.00
5,600.00	20.34	329.65	5,311.61	1,439.12	-842.56	1,667.63	0.00	0.00	0.00
5,700.00	20.34	329.65	5,405.38	1,469.12	-860.13	1,702.39	0.00	0.00	0.00
5,800.00	20.34	329.65	5,499.14	1,499.13	-877.69	1,737.16	0.00	0.00	0.00
5,884.93	20.34	329.65	5,578.77	1,524.61	-892.61	1,766.68	0.00	0.00	0.00
5,900.00	20.08	329.65	5,592.91	1,529.10	-895.24	1,771.89	1.75	-1.75	0.00
6,000.00	18.33	329.65	5,687.34	1,557.49	-911.86	1,804.79	1.75	-1.75	0.00
6,100.00	16.58	329.65	5,782.73	1,583.37	-927.01	1,834.78	1.75	-1.75	0.00
6,200.00	14.83	329.65	5,879.00	1,606.73	-940.69	1,861.85	1.75	-1.75	0.00
6,300.00	13.08	329.65	5,976.04	1,627.54	-952.87	1,885.96	1.75	-1.75	0.00
6,400.00	11.33	329.65	6,073.78	1,645.78	-963.55	1,907.10	1.75	-1.75	0.00
6,500.00	9.58	329.65	6,172.11	1,661.44	-972.72	1,925.25	1.75	-1.75	0.00
6,600.00	7.83	329.65	6,270.96	1,674.50	-980.37	1,940.38	1.75	-1.75	0.00
6,700.00	6.08	329.65	6,370.22	1,684.95	-986.49	1,952.49	1.75	-1.75	0.00
6,800.00	4.33	329.65	6,469.80	1,692.78	-991.07	1,961.56	1.75	-1.75	0.00
6,900.00	2.58	329.65	6,569.62	1,697.98	-994.11	1,967.59	1.75	-1.75	0.00
7,000.00	0.83	329.65	6,669.57	1,700.55	-995.62	1,970.56	1.75	-1.75	0.00
7,047.43	0.00	0.00	6,717.00	1,700.85	-995.79	1,970.91	1.75	-1.75	0.00
7,100.00	0.00	0.00	6,769.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,200.00	0.00	0.00	6,869.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,300.00	0.00	0.00	6,969.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,400.00	0.00	0.00	7,069.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,500.00	0.00	0.00	7,169.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,547.43	0.00	0.00	7,217.00	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
NIO Depth									
7,600.00	0.00	0.00	7,269.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,700.00	0.00	0.00	7,369.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,800.00	0.00	0.00	7,469.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,866.43	0.00	0.00	7,536.00	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
CD Depth									
7,900.00	0.00	0.00	7,569.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
7,953.43	0.00	0.00	7,623.00	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
GH Depth									
8,000.00	0.00	0.00	7,669.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
8,100.00	0.00	0.00	7,769.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
8,200.00	0.00	0.00	7,869.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
8,300.00	0.00	0.00	7,969.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
8,307.43	0.00	0.00	7,977.00	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
J Depth									
8,400.00	0.00	0.00	8,069.57	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
8,447.43	0.00	0.00	8,117.00	1,700.85	-995.79	1,970.91	0.00	0.00	0.00
Hein 30-1 BHL									

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Database:	edmp	Local Co-ordinate Reference:	Well Hein 30-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4944' gl @ 4959.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4944' gl @ 4959.00ft
Site:	WELD_HEIN 5-1 PAD	North Reference:	True
Well:	Hein 30-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 30-1		
Design:	Hein 30-1 (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 30-1 BHL	0.00	0.00	8,117.00	1,700.85	-995.79	1,275,354.19	3,182,240.58	40.087401	-104.848657
- plan hits target center									
- Point									

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

Formations						
Measured Depth	Vertical Depth			Lithology	Dip	Dip Direction
(ft)	(ft)	Name			(°)	(°)
4,264.05	4,059.00	PK Depth				
4,756.79	4,521.00	SX Depth				
7,547.43	7,217.00	NIO Depth				
7,866.43	7,536.00	CD Depth				
7,953.43	7,623.00	GH Depth				
8,307.43	7,977.00	J Depth				