

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HEIN 5-1 PAD

Hein 4-1

Hein 4-1

Plan: Hein 4-1 (wp01)

Standard Planning Report

03 October, 2011

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HEIN 5-1 PAD
Well: Hein 4-1
Wellbore: Hein 4-1
Section:
SHL:
Design: Hein 4-1 (wp01)
Latitude: 40.082787
Longitude: -104.845099
GL: 4944.00
KB: 15' rkb + 4944' gl @ 4959.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4002.00	4163.19	PK Depth
4464.00	4630.01	SX Depth
7160.00	7326.18	NIO Depth
7479.00	7645.18	CD Depth
7566.00	7732.18	GH Depth
7920.00	8086.18	J Depth
8092.00	8258.18	DK Depth

WELL DETAILS: Hein 4-1						
+N/-S	+E/-W	Northing	Ground Level: Easting	4944.00 Latitude	Longitude	Slot
0.00	0.00	1273680.78	3183248.48	40.082787	-104.845099	

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

T
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 4-1 BHL	8282.00	1063.34	-380.53	1274741.28	3182860.10	40.085706	-104.846459	

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
1222.57	18.45	340.31	1206.71	138.66	-49.62	2.00	340.31	147.27
3793.81	18.45	340.31	3645.76	904.87	-323.82	0.00	0.00	961.07
4848.18	0.00	0.00	4682.00	1063.34	-380.53	1.75	180.00	1129.38
8448.18	0.00	0.00	8282.00	1063.34	-380.53	0.00	0.00	1129.38

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well Hein 4-1
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 4-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 4-1		
Design:	Hein 4-1 (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 4-1			
Well Position	+N/-S	-9.85 ft	Northing:	1,273,680.78 usft
	+E/-W	0.00 ft	Easting:	3,183,248.48 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 4,944.00 ft

Wellbore	Hein 4-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/3/2011	8.84	66.77	52,923

Design	Hein 4-1 (wp01)			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	340.31

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	
1,222.57	18.45	340.31	1,206.71	138.66	-49.62	2.00	2.00	0.00	340.31	
3,793.81	18.45	340.31	3,645.76	904.87	-323.82	0.00	0.00	0.00	0.00	
4,848.18	0.00	0.00	4,682.00	1,063.34	-380.53	1.75	-1.75	0.00	180.00	
8,448.18	0.00	0.00	8,282.00	1,063.34	-380.53	0.00	0.00	0.00	0.00	Hein 4-1 BHL

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well Hein 4-1
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 4-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 4-1		
Design:	Hein 4-1 (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	340.31	399.98	1.64	-0.59	1.75	2.00	2.00	0.00
500.00	4.00	340.31	499.84	6.57	-2.35	6.98	2.00	2.00	0.00
600.00	6.00	340.31	599.45	14.78	-5.29	15.69	2.00	2.00	0.00
700.00	8.00	340.31	698.70	26.25	-9.39	27.88	2.00	2.00	0.00
800.00	10.00	340.31	797.47	40.98	-14.66	43.52	2.00	2.00	0.00
900.00	12.00	340.31	895.62	58.94	-21.09	62.60	2.00	2.00	0.00
919.82	12.40	340.31	915.00	62.89	-22.50	66.79	2.00	2.00	0.00
8-5/8"									
1,000.00	14.00	340.31	993.06	80.12	-28.67	85.10	2.00	2.00	0.00
1,100.00	16.00	340.31	1,089.64	104.49	-37.39	110.98	2.00	2.00	0.00
1,200.00	18.00	340.31	1,185.27	132.01	-47.24	140.21	2.00	2.00	0.00
1,222.57	18.45	340.31	1,206.71	138.66	-49.62	147.27	2.00	2.00	0.00
1,300.00	18.45	340.31	1,280.16	161.73	-57.88	171.78	0.00	0.00	0.00
1,400.00	18.45	340.31	1,375.01	191.53	-68.54	203.43	0.00	0.00	0.00
1,500.00	18.45	340.31	1,469.87	221.33	-79.21	235.08	0.00	0.00	0.00
1,600.00	18.45	340.31	1,564.73	251.13	-89.87	266.73	0.00	0.00	0.00
1,700.00	18.45	340.31	1,659.59	280.93	-100.53	298.38	0.00	0.00	0.00
1,800.00	18.45	340.31	1,754.45	310.73	-111.20	330.03	0.00	0.00	0.00
1,900.00	18.45	340.31	1,849.31	340.53	-121.86	361.68	0.00	0.00	0.00
2,000.00	18.45	340.31	1,944.17	370.33	-132.53	393.33	0.00	0.00	0.00
2,100.00	18.45	340.31	2,039.03	400.13	-143.19	424.98	0.00	0.00	0.00
2,200.00	18.45	340.31	2,133.89	429.93	-153.86	456.63	0.00	0.00	0.00
2,300.00	18.45	340.31	2,228.75	459.73	-164.52	488.28	0.00	0.00	0.00
2,400.00	18.45	340.31	2,323.61	489.53	-175.18	519.93	0.00	0.00	0.00
2,500.00	18.45	340.31	2,418.47	519.33	-185.85	551.58	0.00	0.00	0.00
2,600.00	18.45	340.31	2,513.33	549.13	-196.51	583.23	0.00	0.00	0.00
2,700.00	18.45	340.31	2,608.18	578.93	-207.18	614.88	0.00	0.00	0.00
2,800.00	18.45	340.31	2,703.04	608.72	-217.84	646.53	0.00	0.00	0.00
2,900.00	18.45	340.31	2,797.90	638.52	-228.50	678.18	0.00	0.00	0.00
3,000.00	18.45	340.31	2,892.76	668.32	-239.17	709.83	0.00	0.00	0.00
3,100.00	18.45	340.31	2,987.62	698.12	-249.83	741.48	0.00	0.00	0.00
3,200.00	18.45	340.31	3,082.48	727.92	-260.50	773.13	0.00	0.00	0.00
3,300.00	18.45	340.31	3,177.34	757.72	-271.16	804.78	0.00	0.00	0.00
3,400.00	18.45	340.31	3,272.20	787.52	-281.82	836.43	0.00	0.00	0.00
3,500.00	18.45	340.31	3,367.06	817.32	-292.49	868.08	0.00	0.00	0.00
3,600.00	18.45	340.31	3,461.92	847.12	-303.15	899.73	0.00	0.00	0.00
3,700.00	18.45	340.31	3,556.78	876.92	-313.82	931.38	0.00	0.00	0.00
3,793.81	18.45	340.31	3,645.76	904.87	-323.82	961.07	0.00	0.00	0.00
3,800.00	18.34	340.31	3,651.64	906.71	-324.48	963.02	1.75	-1.75	0.00
3,900.00	16.59	340.31	3,747.02	934.97	-334.59	993.04	1.75	-1.75	0.00
4,000.00	14.84	340.31	3,843.28	960.48	-343.72	1,020.13	1.75	-1.75	0.00
4,100.00	13.09	340.31	3,940.32	983.21	-351.85	1,044.27	1.75	-1.75	0.00
4,163.19	11.99	340.31	4,002.00	996.12	-356.48	1,057.99	1.75	-1.75	0.00
PK Depth									
4,200.00	11.34	340.31	4,038.05	1,003.13	-358.98	1,065.43	1.75	-1.75	0.00
4,300.00	9.59	340.31	4,136.38	1,020.24	-365.10	1,083.60	1.75	-1.75	0.00
4,400.00	7.84	340.31	4,235.22	1,034.51	-370.21	1,098.75	1.75	-1.75	0.00
4,500.00	6.09	340.31	4,334.48	1,045.93	-374.30	1,110.89	1.75	-1.75	0.00
4,600.00	4.34	340.31	4,434.06	1,054.49	-377.36	1,119.98	1.75	-1.75	0.00
4,630.01	3.82	340.31	4,464.00	1,056.50	-378.08	1,122.12	1.75	-1.75	0.00

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Planning Report

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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 4-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 4-1		
Design:	Hein 4-1 (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									
4,700.00	2.59	340.31	4,533.88	1,060.19	-379.40	1,126.03	1.75	-1.75	0.00
4,800.00	0.84	340.31	4,633.83	1,063.01	-380.41	1,129.03	1.75	-1.75	0.00
4,848.18	0.00	0.00	4,682.00	1,063.34	-380.53	1,129.38	1.75	-1.75	0.00
4,900.00	0.00	0.00	4,733.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,000.00	0.00	0.00	4,833.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,100.00	0.00	0.00	4,933.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,200.00	0.00	0.00	5,033.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,300.00	0.00	0.00	5,133.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,400.00	0.00	0.00	5,233.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,500.00	0.00	0.00	5,333.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,600.00	0.00	0.00	5,433.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,700.00	0.00	0.00	5,533.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,800.00	0.00	0.00	5,633.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
5,900.00	0.00	0.00	5,733.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,000.00	0.00	0.00	5,833.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,100.00	0.00	0.00	5,933.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,200.00	0.00	0.00	6,033.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,300.00	0.00	0.00	6,133.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,400.00	0.00	0.00	6,233.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,500.00	0.00	0.00	6,333.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,600.00	0.00	0.00	6,433.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,700.00	0.00	0.00	6,533.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,800.00	0.00	0.00	6,633.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
6,900.00	0.00	0.00	6,733.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,000.00	0.00	0.00	6,833.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,100.00	0.00	0.00	6,933.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,200.00	0.00	0.00	7,033.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,300.00	0.00	0.00	7,133.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,326.18	0.00	0.00	7,160.00	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
NIO Depth									
7,400.00	0.00	0.00	7,233.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,500.00	0.00	0.00	7,333.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,600.00	0.00	0.00	7,433.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,645.18	0.00	0.00	7,479.00	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
CD Depth									
7,700.00	0.00	0.00	7,533.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,732.18	0.00	0.00	7,566.00	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
GH Depth									
7,800.00	0.00	0.00	7,633.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
7,900.00	0.00	0.00	7,733.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
8,000.00	0.00	0.00	7,833.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
8,086.18	0.00	0.00	7,920.00	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
J Depth									
8,100.00	0.00	0.00	7,933.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
8,200.00	0.00	0.00	8,033.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
8,258.18	0.00	0.00	8,092.00	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
DK Depth									
8,300.00	0.00	0.00	8,133.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
8,400.00	0.00	0.00	8,233.82	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
8,448.18	0.00	0.00	8,282.00	1,063.34	-380.53	1,129.38	0.00	0.00	0.00
Hein 4-1 BHL									

Anadarko Petroleum Corp

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Database:	edmp	Local Co-ordinate Reference:	Well Hein 4-1
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 4-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hein 4-1		
Design:	Hein 4-1 (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 4-1 BHL	0.00	0.00	8,282.00	1,063.34	-380.53	1,274,741.28	3,182,860.11	40.085706	-104.846459
- 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			Dip	Dip Direction	
(ft)	(ft)	Name		(°)	(°)	
4,163.19	4,002.00	PK Depth		0.00		
4,630.01	4,464.00	SX Depth		0.00		
7,326.18	7,160.00	NIO Depth		0.00		
7,645.18	7,479.00	CD Depth				
7,732.18	7,566.00	GH Depth				
8,086.18	7,920.00	J Depth		0.00		
8,258.18	8,092.00	DK Depth				