

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HEIN 2-1 PAD

HEIN 2-1

HEIN 2-1

Plan: HEIN 2-1 (wp02)

Standard Planning Report

09 January, 2012

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HEIN 2-1 PAD
Well: HEIN 2-1
Wellbore: HEIN 2-1
Section:
SHL:
Design: HEIN 2-1 (wp02)
Latitude: 40.082149
Longitude: -104.836626
GL: 4893.00
KB: 15' rkb + 4893' GL @ 4908.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4008.00	4196.71	PK Depth
4470.00	4668.52	SX Depth
7166.00	7365.66	NIO Depth
7485.00	7684.66	CD Depth
7572.00	7771.66	GH Depth
7926.00	8125.66	J Depth
8098.00	8297.66	DK Depth

WELL DETAILS: HEIN 2-1						
+N/-S	+E/-W	Northing	Ground Level: Easting	4893.00 Latitude	Longitude	Slot
0.00	0.00	1273466.00	3185621.01	40.082149	-104.836626	

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

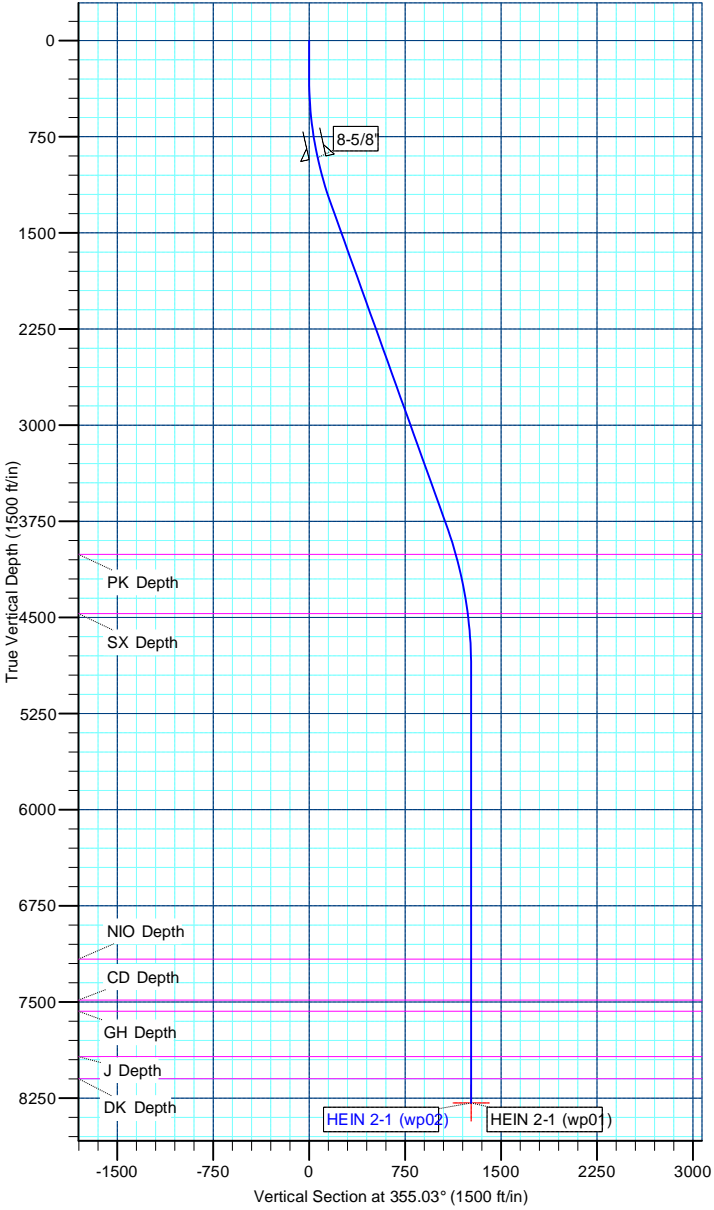
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Azimuths to True North
Magnetic North: 8.95°

Magnetic Field
Strength: 53012.2snT
Dip Angle: 66.80°
Date: 12/1/2010
Model: IGRF2010

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
HEIN 2-1 (wp01)	8288.00	1261.49	-109.68	1274726.63	3185501.89	40.085612	-104.837018	Point	

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
1290.20	19.80	355.03	1270.61	168.80	-14.68	2.00	355.03	169.43
3956.00	19.80	355.03	3778.74	1068.58	-92.91	0.00	0.00	1072.62
5087.66	0.00	0.00	4888.00	1261.49	-109.68	1.75	180.00	1266.25
8487.66	0.00	0.00	8288.00	1261.49	-109.68	0.00	0.00	1266.25



Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 2-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' GL @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' GL @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 2-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 2-1		
Design:	HEIN 2-1 (wp02)		

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 2-1 PAD			
Site Position:		Northing:	1,273,385.87 usft	Latitude: 40.081929
From:	Lat/Long	Easting:	3,185,622.17 usft	Longitude: -104.836624
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence: 0.43 °

Well	HEIN 2-1			
Well Position	+N/-S	80.13 ft	Northing:	1,273,466.00 usft
	+E/-W	-0.56 ft	Easting:	3,185,621.01 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Latitude: 40.082149
				Longitude: -104.836626
				Ground Level: 4,893.00 ft

Wellbore	HEIN 2-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/1/2010	8.95	66.80	53,012

Design	HEIN 2-1 (wp02)			
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	355.03

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	
1,290.20	19.80	355.03	1,270.61	168.80	-14.68	2.00	2.00	0.00	355.03	
3,956.00	19.80	355.03	3,778.74	1,068.58	-92.91	0.00	0.00	0.00	0.00	
5,087.66	0.00	0.00	4,888.00	1,261.49	-109.68	1.75	-1.75	0.00	180.00	
8,487.66	0.00	0.00	8,288.00	1,261.49	-109.68	0.00	0.00	0.00	0.00	HEIN 2-1 (wp01)

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 2-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' GL @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' GL @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 2-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 2-1		
Design:	HEIN 2-1 (wp02)		

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
Start Build 2.00									
400.00	2.00	355.03	399.98	1.74	-0.15	1.75	2.00	2.00	0.00
500.00	4.00	355.03	499.84	6.95	-0.60	6.98	2.00	2.00	0.00
600.00	6.00	355.03	599.45	15.63	-1.36	15.69	2.00	2.00	0.00
700.00	8.00	355.03	698.70	27.78	-2.41	27.88	2.00	2.00	0.00
800.00	10.00	355.03	797.47	43.36	-3.77	43.52	2.00	2.00	0.00
900.00	12.00	355.03	895.62	62.37	-5.42	62.60	2.00	2.00	0.00
919.82	12.40	355.03	915.00	66.54	-5.79	66.79	2.00	2.00	0.00
8-5/8"									
1,000.00	14.00	355.03	993.06	84.78	-7.37	85.10	2.00	2.00	0.00
1,100.00	16.00	355.03	1,089.64	110.56	-9.61	110.98	2.00	2.00	0.00
1,200.00	18.00	355.03	1,185.27	139.69	-12.15	140.21	2.00	2.00	0.00
1,290.20	19.80	355.03	1,270.61	168.80	-14.68	169.43	2.00	2.00	0.00
Start 2665.80 hold at 1290.20 MD									
1,300.00	19.80	355.03	1,279.82	172.10	-14.96	172.75	0.00	0.00	0.00
1,400.00	19.80	355.03	1,373.91	205.86	-17.90	206.63	0.00	0.00	0.00
1,500.00	19.80	355.03	1,467.99	239.61	-20.83	240.51	0.00	0.00	0.00
1,600.00	19.80	355.03	1,562.08	273.36	-23.77	274.39	0.00	0.00	0.00
1,700.00	19.80	355.03	1,656.16	307.11	-26.70	308.27	0.00	0.00	0.00
1,800.00	19.80	355.03	1,750.25	340.87	-29.64	342.15	0.00	0.00	0.00
1,900.00	19.80	355.03	1,844.34	374.62	-32.57	376.03	0.00	0.00	0.00
2,000.00	19.80	355.03	1,938.42	408.37	-35.51	409.91	0.00	0.00	0.00
2,100.00	19.80	355.03	2,032.51	442.13	-38.44	443.80	0.00	0.00	0.00
2,200.00	19.80	355.03	2,126.59	475.88	-41.38	477.68	0.00	0.00	0.00
2,300.00	19.80	355.03	2,220.68	509.63	-44.31	511.56	0.00	0.00	0.00
2,400.00	19.80	355.03	2,314.76	543.39	-47.25	545.44	0.00	0.00	0.00
2,500.00	19.80	355.03	2,408.85	577.14	-50.18	579.32	0.00	0.00	0.00
2,600.00	19.80	355.03	2,502.94	610.89	-53.11	613.20	0.00	0.00	0.00
2,700.00	19.80	355.03	2,597.02	644.65	-56.05	647.08	0.00	0.00	0.00
2,800.00	19.80	355.03	2,691.11	678.40	-58.98	680.96	0.00	0.00	0.00
2,900.00	19.80	355.03	2,785.19	712.15	-61.92	714.84	0.00	0.00	0.00
3,000.00	19.80	355.03	2,879.28	745.91	-64.85	748.72	0.00	0.00	0.00
3,100.00	19.80	355.03	2,973.36	779.66	-67.79	782.60	0.00	0.00	0.00
3,200.00	19.80	355.03	3,067.45	813.41	-70.72	816.48	0.00	0.00	0.00
3,300.00	19.80	355.03	3,161.54	847.16	-73.66	850.36	0.00	0.00	0.00
3,400.00	19.80	355.03	3,255.62	880.92	-76.59	884.24	0.00	0.00	0.00
3,500.00	19.80	355.03	3,349.71	914.67	-79.53	918.12	0.00	0.00	0.00
3,600.00	19.80	355.03	3,443.79	948.42	-82.46	952.00	0.00	0.00	0.00
3,700.00	19.80	355.03	3,537.88	982.18	-85.40	985.88	0.00	0.00	0.00
3,800.00	19.80	355.03	3,631.96	1,015.93	-88.33	1,019.76	0.00	0.00	0.00
3,900.00	19.80	355.03	3,726.05	1,049.68	-91.27	1,053.64	0.00	0.00	0.00
3,956.00	19.80	355.03	3,778.74	1,068.58	-92.91	1,072.62	0.00	0.00	0.00
Start Drop -1.75									
4,000.00	19.03	355.03	3,820.23	1,083.16	-94.18	1,087.25	1.75	-1.75	0.00
4,100.00	17.28	355.03	3,915.25	1,114.21	-96.88	1,118.41	1.75	-1.75	0.00
4,196.71	15.59	355.03	4,008.00	1,141.47	-99.25	1,145.77	1.75	-1.75	0.00
PK Depth									
4,200.00	15.53	355.03	4,011.17	1,142.35	-99.32	1,146.66	1.75	-1.75	0.00
4,300.00	13.78	355.03	4,107.91	1,167.56	-101.52	1,171.96	1.75	-1.75	0.00
4,400.00	12.03	355.03	4,205.38	1,189.81	-103.45	1,194.30	1.75	-1.75	0.00

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Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' GL @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' GL @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 2-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 2-1		
Design:	HEIN 2-1 (wp02)		

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)
4,500.00	10.28	355.03	4,303.49	1,209.09	-105.13	1,213.66	1.75	-1.75	0.00
4,600.00	8.53	355.03	4,402.14	1,225.38	-106.54	1,230.00	1.75	-1.75	0.00
4,668.52	7.34	355.03	4,470.00	1,234.80	-107.36	1,239.46	1.75	-1.75	0.00
SX Depth									
4,700.00	6.78	355.03	4,501.24	1,238.66	-107.70	1,243.33	1.75	-1.75	0.00
4,800.00	5.03	355.03	4,600.71	1,248.91	-108.59	1,253.63	1.75	-1.75	0.00
4,900.00	3.28	355.03	4,700.44	1,256.14	-109.22	1,260.88	1.75	-1.75	0.00
5,000.00	1.53	355.03	4,800.35	1,260.33	-109.58	1,265.08	1.75	-1.75	0.00
5,087.66	0.00	0.00	4,888.00	1,261.49	-109.68	1,266.25	1.75	-1.75	0.00
Start 3400.00 hold at 5087.66 MD									
5,100.00	0.00	0.00	4,900.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,200.00	0.00	0.00	5,000.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,300.00	0.00	0.00	5,100.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,400.00	0.00	0.00	5,200.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,500.00	0.00	0.00	5,300.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,600.00	0.00	0.00	5,400.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,700.00	0.00	0.00	5,500.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,800.00	0.00	0.00	5,600.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
5,900.00	0.00	0.00	5,700.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,000.00	0.00	0.00	5,800.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,100.00	0.00	0.00	5,900.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,200.00	0.00	0.00	6,000.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,300.00	0.00	0.00	6,100.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,400.00	0.00	0.00	6,200.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,500.00	0.00	0.00	6,300.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,600.00	0.00	0.00	6,400.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,700.00	0.00	0.00	6,500.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,800.00	0.00	0.00	6,600.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
6,900.00	0.00	0.00	6,700.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,000.00	0.00	0.00	6,800.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,100.00	0.00	0.00	6,900.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,200.00	0.00	0.00	7,000.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,300.00	0.00	0.00	7,100.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,365.66	0.00	0.00	7,166.00	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
NIO Depth									
7,400.00	0.00	0.00	7,200.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,500.00	0.00	0.00	7,300.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,600.00	0.00	0.00	7,400.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,684.66	0.00	0.00	7,485.00	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
CD Depth									
7,700.00	0.00	0.00	7,500.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,771.66	0.00	0.00	7,572.00	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
GH Depth									
7,800.00	0.00	0.00	7,600.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
7,900.00	0.00	0.00	7,700.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
8,000.00	0.00	0.00	7,800.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
8,100.00	0.00	0.00	7,900.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
8,125.66	0.00	0.00	7,926.00	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
J Depth									
8,200.00	0.00	0.00	8,000.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
8,297.66	0.00	0.00	8,098.00	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
DK Depth									
8,300.00	0.00	0.00	8,100.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00

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Database:	edmp	Local Co-ordinate Reference:	Well HEIN 2-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' GL @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' GL @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 2-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 2-1		
Design:	HEIN 2-1 (wp02)		

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)
8,400.00	0.00	0.00	8,200.34	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
8,487.66	0.00	0.00	8,288.00	1,261.49	-109.68	1,266.25	0.00	0.00	0.00
TD at 8487.66 - HEIN 2-1 (wp01)									

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									
HEIN 2-1 (wp01)	0.00	0.00	8,288.00	1,261.49	-109.68	1,274,726.63	3,185,501.90	40.085612	-104.837018
- plan hits target center									
- Point									

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

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,196.71	4,008.00	PK Depth		0.00		
4,668.52	4,470.00	SX Depth				
7,365.66	7,166.00	NIO Depth				
7,684.66	7,485.00	CD Depth				
7,771.66	7,572.00	GH Depth				
8,125.66	7,926.00	J Depth				
8,297.66	8,098.00	DK Depth				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
300.00	300.00	0.00	0.00	Start Build 2.00	
1,290.20	1,270.61	168.80	-14.68	Start 2665.80 hold at 1290.20 MD	
3,956.00	3,778.74	1,068.58	-92.91	Start Drop -1.75	
5,087.66	4,888.00	1,261.49	-109.68	Start 3400.00 hold at 5087.66 MD	
8,487.66	8,288.00	1,261.49	-109.68	TD at 8487.66	