

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HEIN 2-1 PAD

HEIN 21-1

HEIN 21-1

Plan: HEIN 21-1 (wp02)

Standard Planning Report

10 January, 2012

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HEIN 2-1 PAD
Well: HEIN 21-1
Wellbore: HEIN 21-1
Section:
SHL:
Design: HEIN 21-1 (wp02)
Latitude: 40.081885
Longitude: -104.836623
GL: 4893.00
KB: 15' rkb + 4893' gl @ 4908.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4008.00	4161.50	PK Depth
4470.00	4623.77	SX Depth
7166.00	7319.77	NIO Depth
7485.00	7638.77	CD Depth
7572.00	7725.77	GH Depth

WELL DETAILS: HEIN 21-1						
+N/-S	+E/-W	Northing	Ground Level: Easting	4893.00 Latitude	Longitude	Slot
0.00	0.00	1273369.84	3185622.57	40.081885	-104.836623	

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

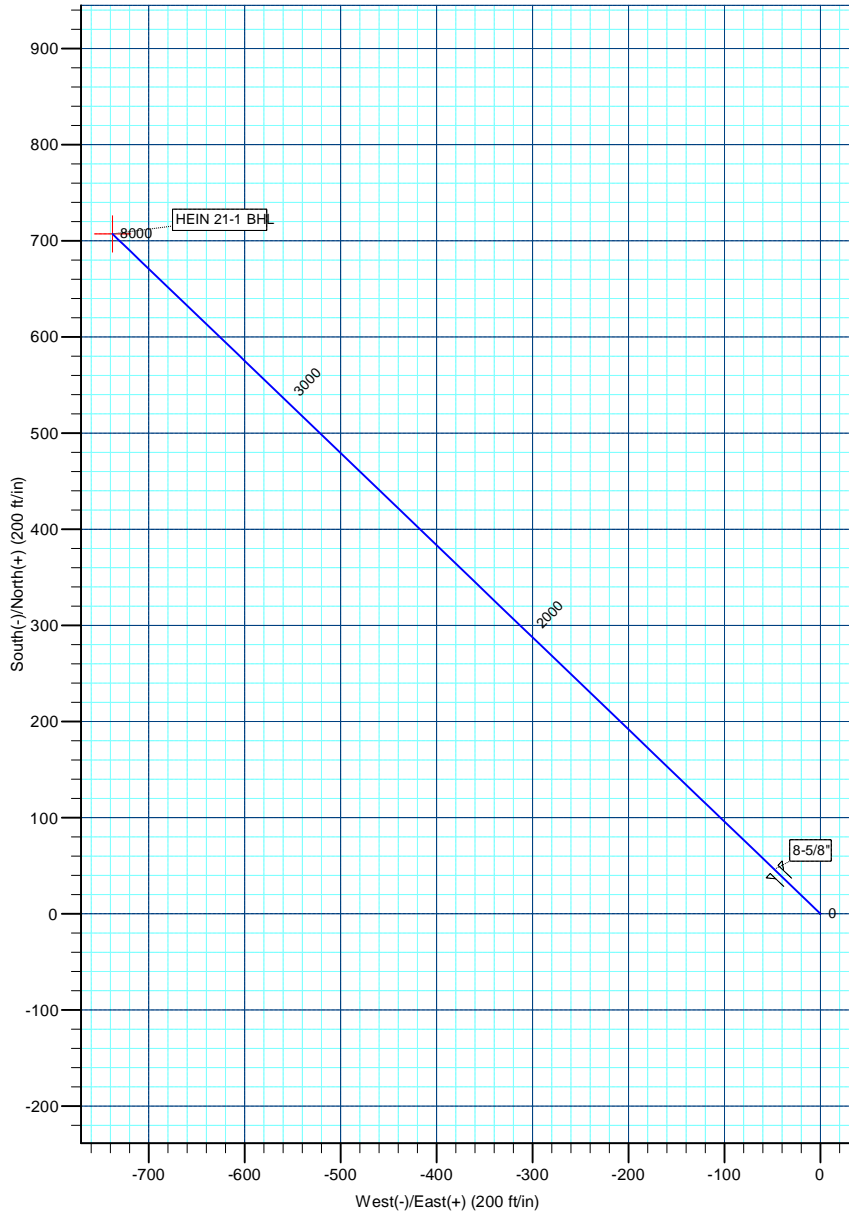
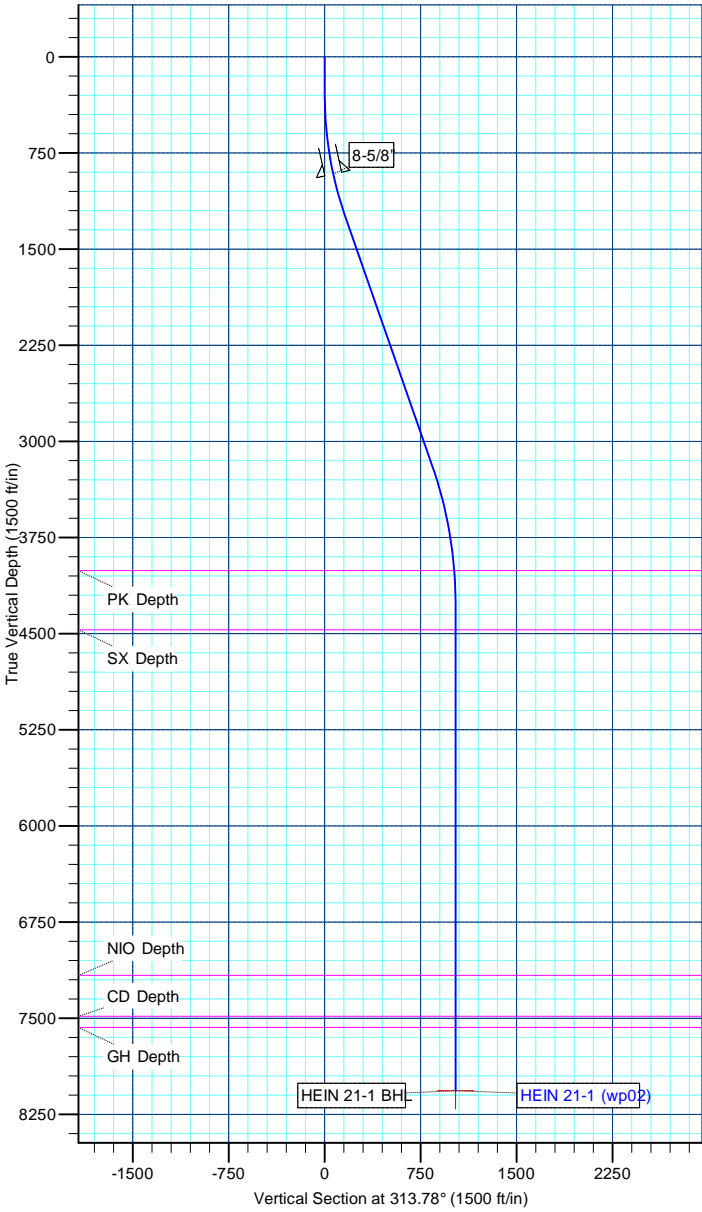
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Azimuths to True North
Magnetic North: 8.95°

Magnetic Field
Strength: 53012.0snT
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 21-1 BHL	8066.01	707.09	-737.86	1274071.38	3184879.44	40.083826	-104.839260	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
1263.19	19.26	313.78	1245.15	110.98	-115.81	2.00	313.78	160.40
3318.99	19.26	313.78	3185.84	580.25	-605.50	0.00	0.00	838.65
4419.78	0.00	0.00	4266.01	707.09	-737.86	1.75	180.00	1021.96
8219.78	0.00	0.00	8066.01	707.09	-737.86	0.00	0.00	1021.96



Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 21-1
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 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 21-1		
Design:	HEIN 21-1 (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 21-1					
Well Position	+N/-S	-16.04 ft	Northing:	1,273,369.84 usft	Latitude:	40.081885
	+E/-W	0.28 ft	Easting:	3,185,622.57 usft	Longitude:	-104.836623
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,893.00 ft

Wellbore	HEIN 21-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/1/2010	8.95	66.80	53,012

Design	HEIN 21-1 (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	313.78

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	
1,263.19	19.26	313.78	1,245.15	110.98	-115.81	2.00	2.00	0.00	313.78	
3,318.99	19.26	313.78	3,185.84	580.25	-605.50	0.00	0.00	0.00	0.00	
4,419.78	0.00	0.00	4,266.01	707.09	-737.86	1.75	-1.75	0.00	180.00	
8,219.78	0.00	0.00	8,066.01	707.09	-737.86	0.00	0.00	0.00	0.00	HEIN 21-1 BHL

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 21-1
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 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 21-1		
Design:	HEIN 21-1 (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	313.78	399.98	1.21	-1.26	1.75	2.00	2.00	0.00
500.00	4.00	313.78	499.84	4.83	-5.04	6.98	2.00	2.00	0.00
600.00	6.00	313.78	599.45	10.86	-11.33	15.69	2.00	2.00	0.00
700.00	8.00	313.78	698.70	19.29	-20.13	27.88	2.00	2.00	0.00
800.00	10.00	313.78	797.47	30.11	-31.42	43.52	2.00	2.00	0.00
900.00	12.00	313.78	895.62	43.31	-45.20	62.60	2.00	2.00	0.00
919.82	12.40	313.78	915.00	46.21	-48.22	66.79	2.00	2.00	0.00
8-5/8"									
1,000.00	14.00	313.78	993.06	58.88	-61.44	85.10	2.00	2.00	0.00
1,100.00	16.00	313.78	1,089.64	76.78	-80.13	110.98	2.00	2.00	0.00
1,200.00	18.00	313.78	1,185.27	97.01	-101.23	140.21	2.00	2.00	0.00
1,263.19	19.26	313.78	1,245.15	110.98	-115.81	160.40	2.00	2.00	0.00
Start 2055.80 hold at 1263.19 MD									
1,300.00	19.26	313.78	1,279.89	119.38	-124.58	172.54	0.00	0.00	0.00
1,400.00	19.26	313.78	1,374.30	142.21	-148.40	205.54	0.00	0.00	0.00
1,500.00	19.26	313.78	1,468.70	165.04	-172.22	238.53	0.00	0.00	0.00
1,600.00	19.26	313.78	1,563.10	187.86	-196.04	271.52	0.00	0.00	0.00
1,700.00	19.26	313.78	1,657.50	210.69	-219.86	304.51	0.00	0.00	0.00
1,800.00	19.26	313.78	1,751.90	233.52	-243.68	337.50	0.00	0.00	0.00
1,900.00	19.26	313.78	1,846.30	256.34	-267.50	370.50	0.00	0.00	0.00
2,000.00	19.26	313.78	1,940.70	279.17	-291.32	403.49	0.00	0.00	0.00
2,100.00	19.26	313.78	2,035.10	302.00	-315.14	436.48	0.00	0.00	0.00
2,200.00	19.26	313.78	2,129.50	324.82	-338.96	469.47	0.00	0.00	0.00
2,300.00	19.26	313.78	2,223.90	347.65	-362.78	502.46	0.00	0.00	0.00
2,400.00	19.26	313.78	2,318.31	370.48	-386.60	535.45	0.00	0.00	0.00
2,500.00	19.26	313.78	2,412.71	393.30	-410.42	568.45	0.00	0.00	0.00
2,600.00	19.26	313.78	2,507.11	416.13	-434.24	601.44	0.00	0.00	0.00
2,700.00	19.26	313.78	2,601.51	438.96	-458.06	634.43	0.00	0.00	0.00
2,800.00	19.26	313.78	2,695.91	461.78	-481.88	667.42	0.00	0.00	0.00
2,900.00	19.26	313.78	2,790.31	484.61	-505.70	700.41	0.00	0.00	0.00
3,000.00	19.26	313.78	2,884.71	507.44	-529.52	733.41	0.00	0.00	0.00
3,100.00	19.26	313.78	2,979.11	530.26	-553.34	766.40	0.00	0.00	0.00
3,200.00	19.26	313.78	3,073.51	553.09	-577.16	799.39	0.00	0.00	0.00
3,300.00	19.26	313.78	3,167.91	575.92	-600.98	832.38	0.00	0.00	0.00
3,318.99	19.26	313.78	3,185.84	580.25	-605.50	838.65	0.00	0.00	0.00
Start Drop -1.75									
3,400.00	17.85	313.78	3,262.64	598.09	-624.12	864.42	1.75	-1.75	0.00
3,500.00	16.10	313.78	3,358.28	618.28	-645.19	893.61	1.75	-1.75	0.00
3,600.00	14.35	313.78	3,454.77	636.45	-664.14	919.87	1.75	-1.75	0.00
3,700.00	12.60	313.78	3,552.01	652.56	-680.96	943.16	1.75	-1.75	0.00
3,800.00	10.85	313.78	3,649.92	666.62	-695.63	963.47	1.75	-1.75	0.00
3,900.00	9.10	313.78	3,748.41	678.60	-708.13	980.79	1.75	-1.75	0.00
4,000.00	7.35	313.78	3,847.38	688.49	-718.46	995.09	1.75	-1.75	0.00
4,100.00	5.60	313.78	3,946.74	696.29	-726.59	1,006.36	1.75	-1.75	0.00
4,161.50	4.52	313.78	4,008.00	700.04	-730.51	1,011.78	1.75	-1.75	0.00
PK Depth									
4,200.00	3.85	313.78	4,046.39	701.98	-732.53	1,014.59	1.75	-1.75	0.00
4,300.00	2.10	313.78	4,146.25	705.57	-736.28	1,019.77	1.75	-1.75	0.00
4,400.00	0.35	313.78	4,246.23	707.05	-737.82	1,021.90	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 + 4893' gl @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 21-1		
Design:	HEIN 21-1 (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)
4,419.78	0.00	0.00	4,266.01	707.09	-737.86	1,021.96	1.75	-1.75	0.00
Start 3800.00 hold at 4419.78 MD									
4,500.00	0.00	0.00	4,346.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
4,600.00	0.00	0.00	4,446.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
4,623.77	0.00	0.00	4,470.00	707.09	-737.86	1,021.96	0.00	0.00	0.00
SX Depth									
4,700.00	0.00	0.00	4,546.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
4,800.00	0.00	0.00	4,646.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
4,900.00	0.00	0.00	4,746.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,000.00	0.00	0.00	4,846.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,100.00	0.00	0.00	4,946.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,200.00	0.00	0.00	5,046.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,300.00	0.00	0.00	5,146.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,400.00	0.00	0.00	5,246.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,500.00	0.00	0.00	5,346.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,600.00	0.00	0.00	5,446.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,700.00	0.00	0.00	5,546.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,800.00	0.00	0.00	5,646.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
5,900.00	0.00	0.00	5,746.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,000.00	0.00	0.00	5,846.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,100.00	0.00	0.00	5,946.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,200.00	0.00	0.00	6,046.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,300.00	0.00	0.00	6,146.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,400.00	0.00	0.00	6,246.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,500.00	0.00	0.00	6,346.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,600.00	0.00	0.00	6,446.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,700.00	0.00	0.00	6,546.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,800.00	0.00	0.00	6,646.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
6,900.00	0.00	0.00	6,746.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,000.00	0.00	0.00	6,846.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,100.00	0.00	0.00	6,946.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,200.00	0.00	0.00	7,046.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,300.00	0.00	0.00	7,146.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,319.77	0.00	0.00	7,166.00	707.09	-737.86	1,021.96	0.00	0.00	0.00
NIO Depth									
7,400.00	0.00	0.00	7,246.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,500.00	0.00	0.00	7,346.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,600.00	0.00	0.00	7,446.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,638.77	0.00	0.00	7,485.00	707.09	-737.86	1,021.96	0.00	0.00	0.00
CD Depth									
7,700.00	0.00	0.00	7,546.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,725.77	0.00	0.00	7,572.00	707.09	-737.86	1,021.96	0.00	0.00	0.00
GH Depth									
7,800.00	0.00	0.00	7,646.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
7,900.00	0.00	0.00	7,746.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
8,000.00	0.00	0.00	7,846.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
8,100.00	0.00	0.00	7,946.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
8,200.00	0.00	0.00	8,046.23	707.09	-737.86	1,021.96	0.00	0.00	0.00
8,219.78	0.00	0.00	8,066.01	707.09	-737.86	1,021.96	0.00	0.00	0.00
TD at 8219.78 - HEIN 21-1 BHL									

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Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 21-1
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 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 21-1		
Design:	HEIN 21-1 (wp02)		

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 21-1 BHL	0.00	0.00	8,066.01	707.09	-737.86	1,274,071.38	3,184,879.44	40.083826	-104.839260
- 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)				(°)	(°)
4,161.50	4,008.00	PK Depth				
4,623.77	4,470.00	SX Depth				
7,319.77	7,166.00	NIO Depth				
7,638.77	7,485.00	CD Depth				
7,725.77	7,572.00	GH Depth				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)		
300.00	300.00	0.00	0.00	Start Build 2.00	
1,263.19	1,245.15	110.98	-115.81	Start 2055.80 hold at 1263.19 MD	
3,318.99	3,185.84	580.25	-605.50	Start Drop -1.75	
4,419.78	4,266.01	707.09	-737.86	Start 3800.00 hold at 4419.78 MD	
8,219.78	8,066.01	707.09	-737.86	TD at 8219.78	