

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	1771.7	11.43	228.37	1767.9	-37.8	-42.5	2.00	228.37	56.9	
4	4489.8	11.43	228.37	4432.1	-395.7	-445.2	0.00	0.00	595.7	
5	5061.5	0.00	0.00	5000.0	-433.5	-487.7	2.00	180.00	652.5	TARGET BHL 1320'FNL, 75'FEL
6	7604.5	0.00	0.00	7543.0	-433.5	-487.7	0.00	0.00	652.5	



NOBLE ENERGY INC WELD COUNTY CO

SEC.31-T5N-R66W

Bernhardt PC J31-32D Pad Sec.31-T5N-R66W

Bernhardt PC J31-31D

Wellbore #1

Plan: Noble Bernhardt PC J31-31D Plan #1 (10-19-10)

Standard Planning Report

22 October, 2010



Database:	Landmark	Local Co-ordinate Reference:	Well Bernhardt PC J31-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4913.0ft (Original Well Elev)
Project:	SEC.31-T5N-R66W	MD Reference:	WELL @ 4913.0ft (Original Well Elev)
Site:	Bernhardt PC J31-32D Pad Sec.31-T5N-R66W	North Reference:	True
Well:	Bernhardt PC J31-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Bernhardt PC J31-31D Plan #1 (10-19-1		

Project	SEC.31-T5N-R66W, WELD COUNTY, cOLORADO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Bernhardt PC J31-32D Pad Sec.31-T5N-R66W				
Site Position:		Northing:	1,374,995.23 ft	Latitude:	40° 21' 38.988 N
From:	Lat/Long	Easting:	3,186,565.86 ft	Longitude:	104° 49' 49.836 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.43 °

Well	Bernhardt PC J31-31D					
Well Position	+N/-S	21.8 ft	Northing:	1,375,016.99 ft	Latitude:	40° 21' 39.204 N
	+E/-W	-11.1 ft	Easting:	3,186,554.55 ft	Longitude:	104° 49' 49.980 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,900.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/22/2010	8.98	67.03	53,171

Design	Noble Bernhardt PC J31-31D Plan #1 (10-19-10)				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	228.37	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,771.7	11.43	228.37	1,767.9	-37.8	-42.5	2.00	2.00	0.00	228.37	
4,489.8	11.43	228.37	4,432.1	-395.7	-445.2	0.00	0.00	0.00	0.00	
5,061.5	0.00	0.00	5,000.0	-433.5	-487.7	2.00	-2.00	0.00	180.00	TARGET BHL 132C
7,604.5	0.00	0.00	7,543.0	-433.5	-487.7	0.00	0.00	0.00	0.00	

Database: Landmark
 Company: NOBLE ENERGY INC WELD COUNTY CO
 Project: SEC.31-T5N-R66W
 Site: Bernhardt PC J31-32D Pad
 Sec.31-T5N-R66W
 Well: Bernhardt PC J31-31D
 Wellbore: Wellbore #1
 Design: Noble Bernhardt PC J31-31D Plan #1 (10-19-1

Local Co-ordinate Reference: Well Bernhardt PC J31-31D
 TVD Reference: WELL @ 4913.0ft (Original Well Elev)
 MD Reference: WELL @ 4913.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.00	0.00	1,160.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,240.0	0.80	228.37	1,240.0	-0.2	-0.2	0.3	2.00	2.00	0.00
1,280.0	1.60	228.37	1,280.0	-0.7	-0.8	1.1	2.00	2.00	0.00
1,320.0	2.40	228.37	1,320.0	-1.7	-1.9	2.5	2.00	2.00	0.00
1,360.0	3.20	228.37	1,359.9	-3.0	-3.3	4.5	2.00	2.00	0.00
1,400.0	4.00	228.37	1,399.8	-4.6	-5.2	7.0	2.00	2.00	0.00
1,440.0	4.80	228.37	1,439.7	-6.7	-7.5	10.0	2.00	2.00	0.00
1,480.0	5.60	228.37	1,479.6	-9.1	-10.2	13.7	2.00	2.00	0.00
1,520.0	6.40	228.37	1,519.3	-11.9	-13.3	17.9	2.00	2.00	0.00
1,560.0	7.20	228.37	1,559.1	-15.0	-16.9	22.6	2.00	2.00	0.00
1,600.0	8.00	228.37	1,598.7	-18.5	-20.8	27.9	2.00	2.00	0.00
1,640.0	8.80	228.37	1,638.3	-22.4	-25.2	33.7	2.00	2.00	0.00
1,680.0	9.60	228.37	1,677.8	-26.7	-30.0	40.1	2.00	2.00	0.00
1,720.0	10.40	228.37	1,717.1	-31.3	-35.2	47.1	2.00	2.00	0.00
1,760.0	11.20	228.37	1,756.4	-36.2	-40.8	54.6	2.00	2.00	0.00
1,771.7	11.43	228.37	1,767.9	-37.8	-42.5	56.9	2.00	2.00	0.00
1,800.0	11.43	228.37	1,795.7	-41.5	-46.7	62.5	0.00	0.00	0.00
1,840.0	11.43	228.37	1,834.9	-46.8	-52.6	70.4	0.00	0.00	0.00
1,880.0	11.43	228.37	1,874.1	-52.0	-58.5	78.3	0.00	0.00	0.00
1,920.0	11.43	228.37	1,913.3	-57.3	-64.5	86.3	0.00	0.00	0.00
1,960.0	11.43	228.37	1,952.5	-62.6	-70.4	94.2	0.00	0.00	0.00
2,000.0	11.43	228.37	1,991.7	-67.8	-76.3	102.1	0.00	0.00	0.00
2,040.0	11.43	228.37	2,030.9	-73.1	-82.2	110.0	0.00	0.00	0.00

Database: Landmark
 Company: NOBLE ENERGY INC WELD COUNTY CO
 Project: SEC.31-T5N-R66W
 Site: Bernhardt PC J31-32D Pad
 Sec.31-T5N-R66W
 Well: Bernhardt PC J31-31D
 Wellbore: Wellbore #1
 Design: Noble Bernhardt PC J31-31D Plan #1 (10-19-1

Local Co-ordinate Reference: Well Bernhardt PC J31-31D
 TVD Reference: WELL @ 4913.0ft (Original Well Elev)
 MD Reference: WELL @ 4913.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,080.0	11.43	228.37	2,070.1	-78.4	-88.2	118.0	0.00	0.00	0.00
2,120.0	11.43	228.37	2,109.3	-83.6	-94.1	125.9	0.00	0.00	0.00
2,160.0	11.43	228.37	2,148.5	-88.9	-100.0	133.8	0.00	0.00	0.00
2,200.0	11.43	228.37	2,187.7	-94.2	-106.0	141.8	0.00	0.00	0.00
2,240.0	11.43	228.37	2,226.9	-99.4	-111.9	149.7	0.00	0.00	0.00
2,280.0	11.43	228.37	2,266.1	-104.7	-117.8	157.6	0.00	0.00	0.00
2,320.0	11.43	228.37	2,305.3	-110.0	-123.7	165.5	0.00	0.00	0.00
2,360.0	11.43	228.37	2,344.5	-115.2	-129.7	173.5	0.00	0.00	0.00
2,400.0	11.43	228.37	2,383.7	-120.5	-135.6	181.4	0.00	0.00	0.00
2,440.0	11.43	228.37	2,423.0	-125.8	-141.5	189.3	0.00	0.00	0.00
2,480.0	11.43	228.37	2,462.2	-131.1	-147.4	197.3	0.00	0.00	0.00
2,520.0	11.43	228.37	2,501.4	-136.3	-153.4	205.2	0.00	0.00	0.00
2,560.0	11.43	228.37	2,540.6	-141.6	-159.3	213.1	0.00	0.00	0.00
2,600.0	11.43	228.37	2,579.8	-146.9	-165.2	221.0	0.00	0.00	0.00
2,640.0	11.43	228.37	2,619.0	-152.1	-171.1	229.0	0.00	0.00	0.00
2,680.0	11.43	228.37	2,658.2	-157.4	-177.1	236.9	0.00	0.00	0.00
2,720.0	11.43	228.37	2,697.4	-162.7	-183.0	244.8	0.00	0.00	0.00
2,760.0	11.43	228.37	2,736.6	-167.9	-188.9	252.8	0.00	0.00	0.00
2,800.0	11.43	228.37	2,775.8	-173.2	-194.8	260.7	0.00	0.00	0.00
2,840.0	11.43	228.37	2,815.0	-178.5	-200.8	268.6	0.00	0.00	0.00
2,880.0	11.43	228.37	2,854.2	-183.7	-206.7	276.6	0.00	0.00	0.00
2,920.0	11.43	228.37	2,893.4	-189.0	-212.6	284.5	0.00	0.00	0.00
2,960.0	11.43	228.37	2,932.6	-194.3	-218.6	292.4	0.00	0.00	0.00
3,000.0	11.43	228.37	2,971.8	-199.5	-224.5	300.3	0.00	0.00	0.00
3,040.0	11.43	228.37	3,011.0	-204.8	-230.4	308.3	0.00	0.00	0.00
3,080.0	11.43	228.37	3,050.3	-210.1	-236.3	316.2	0.00	0.00	0.00
3,120.0	11.43	228.37	3,089.5	-215.3	-242.3	324.1	0.00	0.00	0.00
3,160.0	11.43	228.37	3,128.7	-220.6	-248.2	332.1	0.00	0.00	0.00
3,200.0	11.43	228.37	3,167.9	-225.9	-254.1	340.0	0.00	0.00	0.00
3,240.0	11.43	228.37	3,207.1	-231.1	-260.0	347.9	0.00	0.00	0.00
3,280.0	11.43	228.37	3,246.3	-236.4	-266.0	355.8	0.00	0.00	0.00
3,320.0	11.43	228.37	3,285.5	-241.7	-271.9	363.8	0.00	0.00	0.00
3,360.0	11.43	228.37	3,324.7	-246.9	-277.8	371.7	0.00	0.00	0.00
3,400.0	11.43	228.37	3,363.9	-252.2	-283.7	379.6	0.00	0.00	0.00
3,440.0	11.43	228.37	3,403.1	-257.5	-289.7	387.6	0.00	0.00	0.00
3,480.0	11.43	228.37	3,442.3	-262.7	-295.6	395.5	0.00	0.00	0.00
3,520.0	11.43	228.37	3,481.5	-268.0	-301.5	403.4	0.00	0.00	0.00
3,560.0	11.43	228.37	3,520.7	-273.3	-307.4	411.4	0.00	0.00	0.00
3,600.0	11.43	228.37	3,559.9	-278.6	-313.4	419.3	0.00	0.00	0.00
3,640.0	11.43	228.37	3,599.1	-283.8	-319.3	427.2	0.00	0.00	0.00
3,680.0	11.43	228.37	3,638.3	-289.1	-325.2	435.1	0.00	0.00	0.00
3,720.0	11.43	228.37	3,677.5	-294.4	-331.2	443.1	0.00	0.00	0.00
3,760.0	11.43	228.37	3,716.8	-299.6	-337.1	451.0	0.00	0.00	0.00
3,800.0	11.43	228.37	3,756.0	-304.9	-343.0	458.9	0.00	0.00	0.00
3,840.0	11.43	228.37	3,795.2	-310.2	-348.9	466.9	0.00	0.00	0.00
3,880.0	11.43	228.37	3,834.4	-315.4	-354.9	474.8	0.00	0.00	0.00
3,920.0	11.43	228.37	3,873.6	-320.7	-360.8	482.7	0.00	0.00	0.00
3,960.0	11.43	228.37	3,912.8	-326.0	-366.7	490.6	0.00	0.00	0.00
4,000.0	11.43	228.37	3,952.0	-331.2	-372.6	498.6	0.00	0.00	0.00
4,040.0	11.43	228.37	3,991.2	-336.5	-378.6	506.5	0.00	0.00	0.00
4,080.0	11.43	228.37	4,030.4	-341.8	-384.5	514.4	0.00	0.00	0.00
4,120.0	11.43	228.37	4,069.6	-347.0	-390.4	522.4	0.00	0.00	0.00
4,160.0	11.43	228.37	4,108.8	-352.3	-396.3	530.3	0.00	0.00	0.00

Database: Landmark
 Company: NOBLE ENERGY INC WELD COUNTY CO
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 TVD Reference: WELL @ 4913.0ft (Original Well Elev)
 MD Reference: WELL @ 4913.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,200.0	11.43	228.37	4,148.0	-357.6	-402.3	538.2	0.00	0.00	0.00
4,240.0	11.43	228.37	4,187.2	-362.8	-408.2	546.1	0.00	0.00	0.00
4,280.0	11.43	228.37	4,226.4	-368.1	-414.1	554.1	0.00	0.00	0.00
4,320.0	11.43	228.37	4,265.6	-373.4	-420.1	562.0	0.00	0.00	0.00
4,360.0	11.43	228.37	4,304.8	-378.6	-426.0	569.9	0.00	0.00	0.00
4,400.0	11.43	228.37	4,344.1	-383.9	-431.9	577.9	0.00	0.00	0.00
4,440.0	11.43	228.37	4,383.3	-389.2	-437.8	585.8	0.00	0.00	0.00
4,480.0	11.43	228.37	4,422.5	-394.4	-443.8	593.7	0.00	0.00	0.00
4,489.8	11.43	228.37	4,432.1	-395.7	-445.2	595.7	0.00	0.00	0.00
4,520.0	10.83	228.37	4,461.7	-399.6	-449.6	601.5	2.00	-2.00	0.00
4,560.0	10.03	228.37	4,501.0	-404.4	-455.0	608.7	2.00	-2.00	0.00
4,600.0	9.23	228.37	4,540.5	-408.9	-460.0	615.4	2.00	-2.00	0.00
4,640.0	8.43	228.37	4,580.0	-412.9	-464.6	621.6	2.00	-2.00	0.00
4,680.0	7.63	228.37	4,619.6	-416.7	-468.7	627.2	2.00	-2.00	0.00
4,720.0	6.83	228.37	4,659.3	-420.0	-472.5	632.2	2.00	-2.00	0.00
4,760.0	6.03	228.37	4,699.0	-423.0	-475.9	636.7	2.00	-2.00	0.00
4,800.0	5.23	228.37	4,738.8	-425.6	-478.8	640.6	2.00	-2.00	0.00
4,840.0	4.43	228.37	4,778.7	-427.8	-481.3	644.0	2.00	-2.00	0.00
4,880.0	3.63	228.37	4,818.6	-429.7	-483.4	646.8	2.00	-2.00	0.00
4,920.0	2.83	228.37	4,858.5	-431.2	-485.1	649.0	2.00	-2.00	0.00
4,960.0	2.03	228.37	4,898.5	-432.3	-486.4	650.7	2.00	-2.00	0.00
5,000.0	1.23	228.37	4,938.5	-433.1	-487.2	651.9	2.00	-2.00	0.00
5,040.0	0.43	228.37	4,978.5	-433.5	-487.6	652.4	2.00	-2.00	0.00
5,061.5	0.00	0.00	5,000.0	-433.5	-487.7	652.5	2.00	-2.00	0.00
5,080.0	0.00	0.00	5,018.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,120.0	0.00	0.00	5,058.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,160.0	0.00	0.00	5,098.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,138.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,240.0	0.00	0.00	5,178.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,280.0	0.00	0.00	5,218.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,320.0	0.00	0.00	5,258.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,360.0	0.00	0.00	5,298.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,400.0	0.00	0.00	5,338.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,440.0	0.00	0.00	5,378.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,480.0	0.00	0.00	5,418.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,520.0	0.00	0.00	5,458.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,560.0	0.00	0.00	5,498.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,600.0	0.00	0.00	5,538.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,640.0	0.00	0.00	5,578.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,680.0	0.00	0.00	5,618.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,720.0	0.00	0.00	5,658.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,760.0	0.00	0.00	5,698.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,738.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,840.0	0.00	0.00	5,778.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,880.0	0.00	0.00	5,818.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,920.0	0.00	0.00	5,858.5	-433.5	-487.7	652.5	0.00	0.00	0.00
5,960.0	0.00	0.00	5,898.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,938.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,040.0	0.00	0.00	5,978.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,080.0	0.00	0.00	6,018.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,120.0	0.00	0.00	6,058.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,160.0	0.00	0.00	6,098.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,138.5	-433.5	-487.7	652.5	0.00	0.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.31-T5N-R66W
Site: Bernhardt PC J31-32D Pad
 Sec.31-T5N-R66W
Well: Bernhardt PC J31-31D
Wellbore: Wellbore #1
Design: Noble Bernhardt PC J31-31D Plan #1 (10-19-1

Local Co-ordinate Reference: Well Bernhardt PC J31-31D
TVD Reference: WELL @ 4913.0ft (Original Well Elev)
MD Reference: WELL @ 4913.0ft (Original Well Elev)
North Reference: True

Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,240.0	0.00	0.00	6,178.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,280.0	0.00	0.00	6,218.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,320.0	0.00	0.00	6,258.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,360.0	0.00	0.00	6,298.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,338.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,440.0	0.00	0.00	6,378.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,480.0	0.00	0.00	6,418.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,520.0	0.00	0.00	6,458.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,560.0	0.00	0.00	6,498.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,538.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,640.0	0.00	0.00	6,578.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,680.0	0.00	0.00	6,618.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,720.0	0.00	0.00	6,658.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,760.0	0.00	0.00	6,698.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,738.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,840.0	0.00	0.00	6,778.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,880.0	0.00	0.00	6,818.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,920.0	0.00	0.00	6,858.5	-433.5	-487.7	652.5	0.00	0.00	0.00
6,960.0	0.00	0.00	6,898.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,938.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,040.0	0.00	0.00	6,978.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,080.0	0.00	0.00	7,018.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,120.0	0.00	0.00	7,058.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,160.0	0.00	0.00	7,098.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,200.0	0.00	0.00	7,138.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,240.0	0.00	0.00	7,178.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,280.0	0.00	0.00	7,218.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,320.0	0.00	0.00	7,258.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,360.0	0.00	0.00	7,298.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,338.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,440.0	0.00	0.00	7,378.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,480.0	0.00	0.00	7,418.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,520.0	0.00	0.00	7,458.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,560.0	0.00	0.00	7,498.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,538.5	-433.5	-487.7	652.5	0.00	0.00	0.00
7,604.5	0.00	0.00	7,543.0	-433.5	-487.7	652.5	0.00	0.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.31-T5N-R66W
Site: Bernhardt PC J31-32D Pad
 Sec.31-T5N-R66W
Well: Bernhardt PC J31-31D
Wellbore: Wellbore #1
Design: Noble Bernhardt PC J31-31D Plan #1 (10-19-1

Local Co-ordinate Reference: Well Bernhardt PC J31-31D
TVD Reference: WELL @ 4913.0ft (Original Well Elev)
MD Reference: WELL @ 4913.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
TARGET BHL 1320'F - plan hits target - Point	0.00	0.00	5,000.0	-433.5	-487.7	1,374,579.83	3,186,070.15	40° 21' 34.920 N	104° 49' 56.280 W
TARGET CIRCLE 132 - plan hits target - Circle (radius 75.0)	0.00	0.00	7,053.0	-433.5	-487.7	1,374,579.83	3,186,070.15	40° 21' 34.920 N	104° 49' 56.280 W
HARD LINES 75'E of - plan misses by 125.0ft at 7604.5ft MD (7543.0 TVD, -433.5 N, -487.7 E) - Polygon	0.00	0.00	7,543.0	-533.5	-412.7	1,374,480.41	3,186,145.91	40° 21' 33.932 N	104° 49' 55.311 W
Point 1			7,543.0	0.0	0.0	1,374,480.41	3,186,145.91		
Point 2			7,543.0	200.0	0.0	1,374,680.40	3,186,144.40		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
600.0	600.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,114.5	7,053.0	NIOBRARA		0.00	
7,454.5	7,393.0	CODELL		0.00	