

Project: SEC.31-T5N-R66W
Site: Bernhardt PC J31-32D Pad Sec.31-T5N-R66W
Well: Bernhardt PC J31-30D
Plan: Wellbore #1



NOBLE ENERGY INC WELD COUNTY CO

SEC.31-T5N-R66W

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

Bernhardt PC J31-30D

Wellbore #1

Survey: Survey #1

Standard Survey Report

12 June, 2012



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Bernhardt PC J31-30D
Project:	SEC.31-T5N-R66W	TVD Reference:	WELL @ 4913.0ft (Original Well Elev)
Site:	Bernhardt PC J31-32D Pad Sec.31-T5N-R66W	MD Reference:	WELL @ 4913.0ft (Original Well Elev)
Well:	Bernhardt PC J31-30D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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:	1,374,995.23ft	Latitude:	40.360830
From:	Lat/Long	Easting:	3,186,565.86ft	Longitude:	-104.830510
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.43 °

Well	Bernhardt PC J31-30D					
Well Position	+N/-S	0.0 ft	Northing:	1,375,035.10 ft	Latitude:	40.360940
	+E/-W	0.0 ft	Easting:	3,186,540.48 ft	Longitude:	-104.830600
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	12/19/2011	8.83	66.99	53,049

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	337.51	

Survey Program	Date	6/12/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
111.0	7,648.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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	
111.0	0.40	221.20	111.0	-0.3	-0.3	-0.2	0.36	0.36	0.00	
200.0	0.10	236.60	200.0	-0.6	-0.5	-0.3	0.34	-0.34	17.30	
290.0	0.30	279.50	290.0	-0.6	-0.8	-0.2	0.26	0.22	47.67	
379.0	0.20	317.50	379.0	-0.4	-1.2	0.1	0.21	-0.11	42.70	
472.0	0.10	257.00	472.0	-0.3	-1.3	0.2	0.19	-0.11	-65.05	
565.0	0.10	247.20	565.0	-0.4	-1.5	0.2	0.02	0.00	-10.54	
655.0	0.30	243.10	655.0	-0.5	-1.8	0.2	0.22	0.22	-4.56	
737.0	0.10	136.30	737.0	-0.7	-1.9	0.1	0.42	-0.24	-130.24	
819.0	0.20	21.80	819.0	-0.6	-1.8	0.2	0.31	0.12	-139.63	
901.0	0.30	148.40	901.0	-0.6	-1.7	0.1	0.55	0.12	154.39	
982.0	0.30	262.80	982.0	-0.8	-1.8	-0.1	0.62	0.00	141.23	
1,064.0	1.10	342.50	1,064.0	-0.1	-2.2	0.7	1.33	0.98	97.20	

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Well:	Bernhardt PC J31-30D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)	
1,146.0	2.30	346.20	1,146.0	2.2	-2.8	3.2	1.47	1.46	4.51	
1,228.0	3.50	355.10	1,227.8	6.3	-3.4	7.2	1.56	1.46	10.85	
1,309.0	5.00	347.90	1,308.6	12.2	-4.4	13.0	1.96	1.85	-8.89	
1,391.0	5.90	337.40	1,390.3	19.6	-6.8	20.7	1.63	1.10	-12.80	
1,473.0	7.40	330.50	1,471.7	28.1	-11.0	30.2	2.07	1.83	-8.41	
1,554.0	8.00	329.60	1,552.0	37.5	-16.4	40.9	0.76	0.74	-1.11	
1,636.0	10.50	331.40	1,632.9	49.0	-22.9	54.0	3.07	3.05	2.20	
1,718.0	12.40	336.80	1,713.3	63.7	-29.9	70.3	2.66	2.32	6.59	
1,800.0	13.70	338.60	1,793.1	80.8	-36.9	88.8	1.66	1.59	2.20	
1,881.0	14.90	338.90	1,871.6	99.4	-44.2	108.8	1.48	1.48	0.37	
1,963.0	16.10	342.60	1,950.6	120.1	-51.4	130.6	1.90	1.46	4.51	
2,045.0	17.10	342.80	2,029.2	142.5	-58.3	154.0	1.22	1.22	0.24	
2,127.0	17.10	338.80	2,107.6	165.3	-66.3	178.0	1.43	0.00	-4.88	
2,208.0	18.10	334.70	2,184.8	187.7	-75.9	202.5	1.97	1.23	-5.06	
2,290.0	17.90	336.00	2,262.8	210.8	-86.5	227.8	0.55	-0.24	1.59	
2,372.0	17.50	339.50	2,340.9	233.8	-96.0	252.7	1.39	-0.49	4.27	
2,453.0	17.00	337.70	2,418.3	256.2	-104.7	276.8	0.90	-0.62	-2.22	
2,535.0	17.00	337.00	2,496.7	278.3	-113.9	300.7	0.25	0.00	-0.85	
2,617.0	17.80	338.90	2,574.9	301.0	-123.1	325.2	1.20	0.98	2.32	
2,699.0	18.20	336.50	2,652.9	324.5	-132.8	350.6	1.03	0.49	-2.93	
2,780.0	19.70	336.80	2,729.5	348.6	-143.2	376.9	1.86	1.85	0.37	
2,862.0	20.70	336.50	2,806.5	374.6	-154.4	405.2	1.23	1.22	-0.37	
2,944.0	21.50	337.40	2,883.0	401.8	-166.0	434.7	1.05	0.98	1.10	
3,025.0	19.30	337.00	2,958.9	427.8	-176.9	462.9	2.72	-2.72	-0.49	
3,107.0	18.90	335.80	3,036.4	452.4	-187.6	489.8	0.68	-0.49	-1.46	
3,189.0	18.50	336.50	3,114.1	476.4	-198.3	516.1	0.56	-0.49	0.85	
3,271.0	17.30	336.00	3,192.1	499.5	-208.4	541.2	1.48	-1.46	-0.61	
3,352.0	16.70	333.80	3,269.6	521.0	-218.5	564.9	1.09	-0.74	-2.72	
3,434.0	16.00	334.00	3,348.2	541.7	-228.6	587.9	0.86	-0.85	0.24	
3,516.0	15.60	334.20	3,427.1	561.8	-238.4	610.2	0.49	-0.49	0.24	
3,597.0	14.80	336.30	3,505.3	581.1	-247.3	631.4	1.20	-0.99	2.59	
3,679.0	14.30	339.50	3,584.7	600.1	-255.0	652.0	1.15	-0.61	3.90	
3,761.0	14.70	342.30	3,664.1	619.5	-261.7	672.5	0.98	0.49	3.41	
3,843.0	14.60	342.10	3,743.4	639.3	-268.1	693.2	0.14	-0.12	-0.24	
3,924.0	15.80	340.40	3,821.6	659.4	-274.9	714.4	1.58	1.48	-2.10	
4,006.0	16.20	339.50	3,900.4	680.6	-282.7	737.0	0.57	0.49	-1.10	
4,088.0	16.30	337.90	3,979.1	702.0	-291.0	759.9	0.56	0.12	-1.95	
4,170.0	15.00	337.00	4,058.1	722.4	-299.5	782.0	1.61	-1.59	-1.10	
4,251.0	13.00	337.70	4,136.7	740.5	-307.0	801.6	2.48	-2.47	0.86	
4,333.0	10.40	337.50	4,217.0	755.9	-313.4	818.2	3.17	-3.17	-0.24	
4,415.0	8.90	337.40	4,297.8	768.6	-318.6	832.0	1.83	-1.83	-0.12	
4,496.0	7.80	337.40	4,377.9	779.4	-323.1	843.8	1.36	-1.36	0.00	
4,578.0	5.40	340.00	4,459.4	788.2	-326.6	853.2	2.95	-2.93	3.17	
4,660.0	4.10	338.80	4,541.1	794.5	-329.0	860.0	1.59	-1.59	-1.46	
4,742.0	3.30	345.30	4,622.9	799.6	-330.6	865.2	1.10	-0.98	7.93	
4,823.0	2.00	1.50	4,703.8	803.2	-331.2	868.8	1.84	-1.60	20.00	
4,905.0	1.90	12.90	4,785.8	806.0	-330.9	871.2	0.49	-0.12	13.90	
4,987.0	1.30	35.00	4,867.8	808.1	-330.0	872.9	1.04	-0.73	26.95	
5,068.0	0.30	21.50	4,948.8	809.0	-329.4	873.5	1.25	-1.23	-16.67	
5,119.2	0.30	330.47	4,999.9	809.3	-329.4	873.7	0.51	0.01	-99.73	
TARGET BHL 75'FNL, 75'FWL										
5,150.0	0.40	309.90	5,030.8	809.4	-329.6	873.9	0.51	0.31	-66.72	
5,232.0	0.10	248.40	5,112.8	809.6	-329.8	874.2	0.44	-0.37	-75.00	
5,395.0	0.40	340.00	5,275.8	810.0	-330.2	874.7	0.25	0.18	56.20	

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5,559.0	0.40	282.00	5,439.8	810.7	-330.9	875.6	0.24	0.00	-35.37	
5,722.0	1.10	321.00	5,602.7	812.0	-332.5	877.4	0.51	0.43	23.93	
5,886.0	1.60	335.00	5,766.7	815.3	-334.4	881.2	0.36	0.30	8.54	
6,049.0	0.90	356.90	5,929.7	818.7	-335.5	884.7	0.51	-0.43	13.44	
6,213.0	0.80	9.20	6,093.6	821.1	-335.3	886.9	0.13	-0.06	7.50	
6,376.0	0.40	57.70	6,256.6	822.5	-334.7	888.0	0.38	-0.25	29.75	
6,539.0	0.80	40.00	6,419.6	823.7	-333.5	888.6	0.27	0.25	-10.86	
6,703.0	0.60	22.90	6,583.6	825.4	-332.4	889.7	0.18	-0.12	-10.43	
6,866.0	0.50	23.80	6,746.6	826.8	-331.8	890.8	0.06	-0.06	0.55	
7,030.0	0.40	330.80	6,910.6	828.0	-331.8	891.9	0.25	-0.06	-32.32	
7,172.3	0.05	330.80	7,052.9	828.4	-332.0	892.4	0.25	-0.25	0.00	
TARGET CIRCLE 75'FNL, 75'FWL										
7,193.0	0.00	184.00	7,073.6	828.4	-332.0	892.5	0.25	-0.25	0.00	
7,357.0	0.20	228.00	7,237.6	828.3	-332.3	892.4	0.12	0.12	0.00	
7,520.0	0.20	47.30	7,400.6	828.3	-332.3	892.4	0.25	0.00	110.00	
7,602.0	0.40	67.90	7,482.6	828.5	-331.9	892.4	0.27	0.24	25.12	
7,648.0	0.40	67.90	7,528.6	828.6	-331.6	892.4	0.00	0.00	0.00	
HARD LINES 75'N & 75'W of BHL										

Checked By: _____	Approved By: _____	Date: _____
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