

Well Name: **Wardell H19-32D**

Surface Location: Wardell H19-32D Pad Sec.19-T3N-R65W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4990.0

+N/-S +E/-W
0.0 0.0

Northing
1319710.16

Easting
3219969.27

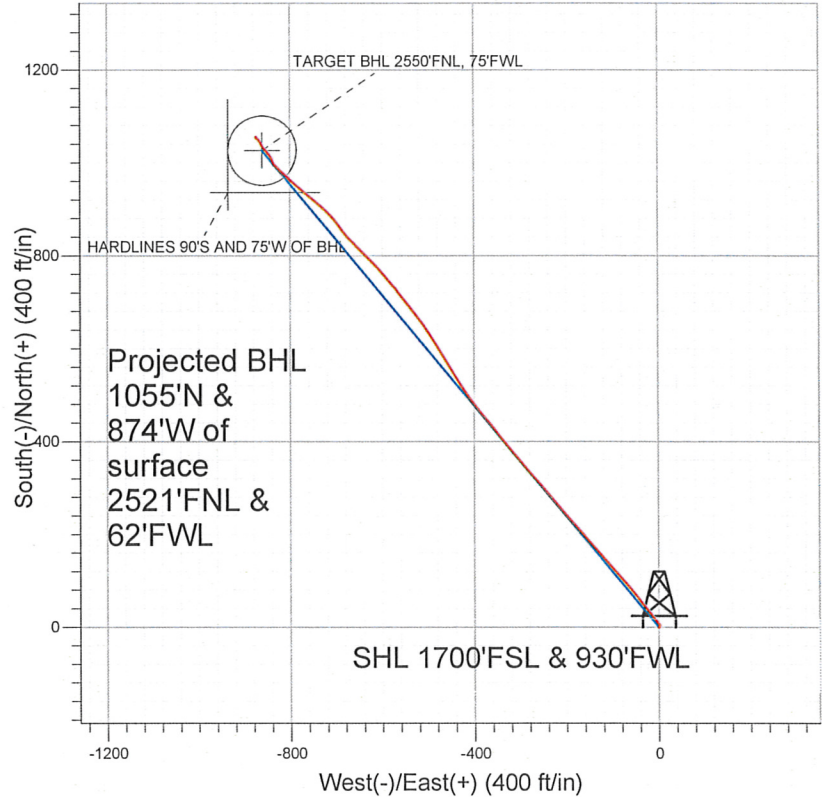
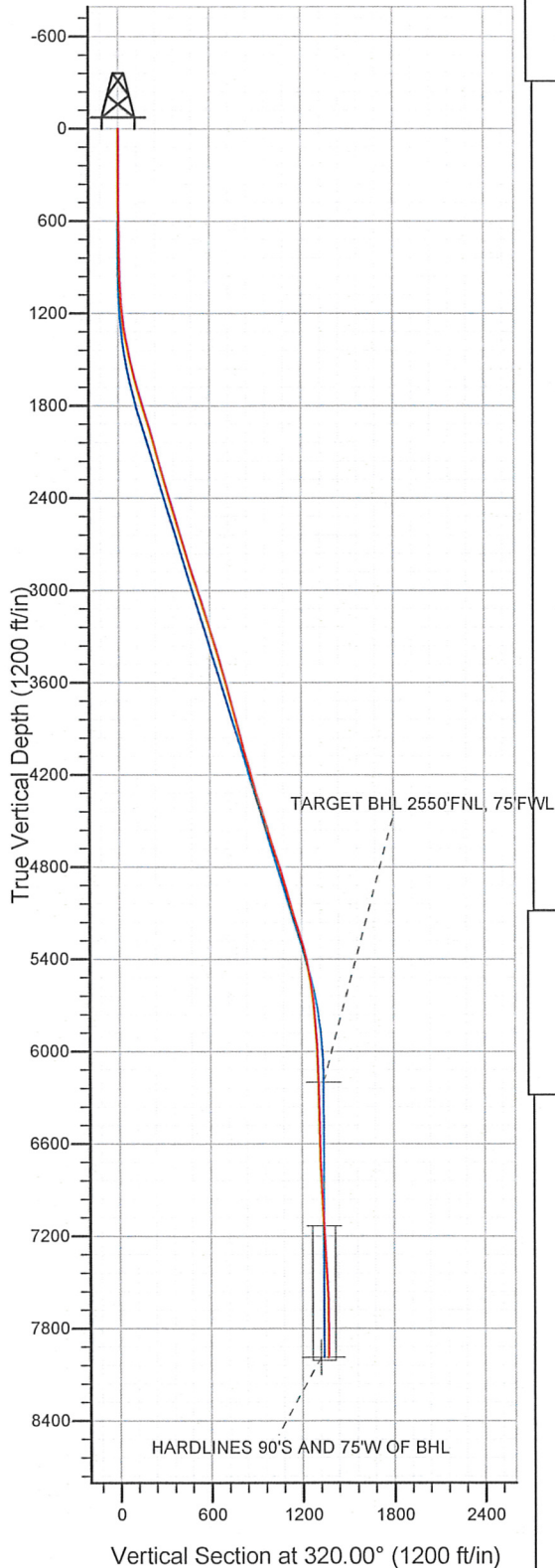
Latitude
40° 12' 29.952 N

Longitude
104° 42' 44.676 W

Slot

Original Well Elev WELL @ 5003.0ft (Original Well Elev)

NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- ✕ Wardell H19-32D, Wellbore #1, Noble Wardell H19-32D Plan #4 (03-25-10) VO
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
8169'MD & 7988'TVD @ 1363'VS
0.4 deg Inc 195.3 deg AZ

Project: SEC.19-T3N-R65W
Site: Wardell H19-32D Pad Sec.19-T3N-R65W
Well: Wardell H19-32D
Plan: Wellbore #1

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R65W
Site: Wardell H19-32D Pad Sec.19-T3N-R65W
Well: Wardell H19-32D
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Wardell H19-32D
TVD Reference: WELL @ 5003.0ft (Original Well Elev)
MD Reference: WELL @ 5003.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Landmark

Project	SEC.19-T3N-R65W, 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	Wardell H19-32D Pad Sec.19-T3N-R65W				
Site Position:		Northing:	1,319,655.62 ft	Latitude:	40° 12' 29.412 N
From:	Lat/Long	Easting:	3,219,980.93 ft	Longitude:	104° 42' 44.532 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.51 °

Well	Wardell H19-32D					
Well Position	+N/-S	0.0 ft	Northing:	1,319,710.16 ft	Latitude:	40° 12' 29.952 N
	+E/-W	0.0 ft	Easting:	3,219,969.27 ft	Longitude:	104° 42' 44.676 W
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,990.0 ft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	7/14/2009	9.04	66.98	53,256
	IGRF200510	12/31/2009	8.98	66.96	53,208

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 (°)	
	6,200.0	0.0	0.0	320.00	

Survey Program	Date 4/1/2011				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
205.0	8,169.0	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	
205.0	0.50	57.60	205.0	0.5	0.8	-0.1	0.24	0.24	0.00	
357.0	0.90	48.00	357.0	1.6	2.2	-0.2	0.27	0.26	-6.32	
541.0	1.10	339.40	541.0	4.3	2.7	1.6	0.62	0.11	-37.28	
665.0	0.90	322.00	664.9	6.1	1.6	3.6	0.29	-0.16	-14.03	
750.0	0.80	333.80	749.9	7.2	1.0	4.9	0.24	-0.12	13.88	
885.0	0.90	290.00	884.9	8.4	-0.4	6.7	0.47	0.07	-32.44	
979.0	1.80	326.00	978.9	9.9	-2.0	8.8	1.27	0.96	38.30	
1,073.0	4.20	323.30	1,072.8	13.9	-4.9	13.7	2.56	2.55	-2.87	
1,167.0	5.10	318.90	1,166.5	19.8	-9.7	21.4	1.03	0.96	-4.68	
1,261.0	7.50	323.90	1,259.9	27.9	-16.0	31.7	2.62	2.55	5.32	
1,355.0	9.60	324.10	1,352.8	39.2	-24.2	45.6	2.23	2.23	0.21	

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Local Co-ordinate Reference: Well Wardell H19-32D
 TVD Reference: WELL @ 5003.0ft (Original Well Elev)
 MD Reference: WELL @ 5003.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 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)
1,449.0	11.70	320.20	1,445.2	52.9	-34.9	62.9	2.36	2.23	-4.15
1,543.0	13.40	319.70	1,537.0	68.5	-48.1	83.4	1.81	1.81	-0.53
1,637.0	15.30	319.30	1,628.0	86.2	-63.2	106.7	2.02	2.02	-0.43
1,731.0	16.40	319.20	1,718.4	105.6	-80.0	132.3	1.17	1.17	-0.11
1,825.0	16.80	318.90	1,808.5	125.9	-97.6	159.2	0.44	0.43	-0.32
1,919.0	17.60	318.10	1,898.3	146.7	-116.0	187.0	0.89	0.85	-0.85
2,013.0	16.30	318.20	1,988.2	167.2	-134.3	214.4	1.38	-1.38	0.11
2,107.0	16.20	318.90	2,078.5	186.9	-151.7	240.7	0.23	-0.11	0.74
2,200.0	15.90	319.10	2,167.9	206.3	-168.6	266.4	0.33	-0.32	0.22
2,294.0	16.10	318.80	2,258.2	225.8	-185.6	292.3	0.23	0.21	-0.32
2,388.0	16.50	318.80	2,348.4	245.7	-202.9	318.6	0.43	0.43	0.00
2,482.0	17.30	320.00	2,438.4	266.4	-220.7	346.0	0.93	0.85	1.28
2,576.0	16.30	319.20	2,528.4	287.1	-238.3	373.1	1.09	-1.06	-0.85
2,670.0	16.70	318.50	2,618.5	307.2	-255.9	399.8	0.48	0.43	-0.74
2,764.0	17.60	319.60	2,708.3	328.2	-274.1	427.5	1.02	0.96	1.17
2,858.0	17.50	319.10	2,797.9	349.7	-292.5	455.9	0.19	-0.11	-0.53
2,952.0	18.30	320.30	2,887.4	371.7	-311.2	484.8	0.94	0.85	1.28
3,046.0	17.60	319.60	2,976.8	393.9	-329.8	513.7	0.78	-0.74	-0.74
3,140.0	17.40	323.20	3,066.5	415.9	-347.5	542.0	1.17	-0.21	3.83
3,234.0	18.40	321.00	3,155.9	438.7	-365.2	570.9	1.28	1.06	-2.34
3,327.0	17.70	319.50	3,244.3	460.9	-383.6	599.7	0.90	-0.75	-1.61
3,421.0	17.00	322.10	3,334.1	482.6	-401.4	627.7	1.11	-0.74	2.77
3,515.0	16.70	326.00	3,424.0	504.6	-417.4	654.9	1.24	-0.32	4.15
3,609.0	15.60	326.00	3,514.3	526.3	-432.0	680.9	1.17	-1.17	0.00
3,703.0	15.80	332.00	3,604.8	548.1	-445.1	705.9	1.74	0.21	6.38
3,797.0	15.40	326.90	3,695.4	569.9	-457.9	730.9	1.52	-0.43	-5.43
3,891.0	15.00	328.40	3,786.1	590.7	-471.1	755.3	0.60	-0.43	1.60
3,985.0	15.70	327.50	3,876.7	611.8	-484.3	779.9	0.79	0.74	-0.96
4,079.0	14.90	327.90	3,967.4	632.7	-497.5	804.5	0.86	-0.85	0.43
4,173.0	15.80	323.80	4,058.0	653.3	-511.5	829.2	1.50	0.96	-4.36
4,267.0	16.00	320.60	4,148.4	673.6	-527.3	855.0	0.96	0.21	-3.40
4,361.0	16.00	322.50	4,238.8	693.9	-543.4	880.9	0.56	0.00	2.02
4,455.0	16.50	323.00	4,329.0	714.9	-559.3	907.1	0.55	0.53	0.53
4,549.0	18.20	319.00	4,418.8	736.6	-577.0	935.1	2.21	1.81	-4.26
4,643.0	16.90	319.30	4,508.4	758.0	-595.5	963.5	1.39	-1.38	0.32
4,737.0	17.70	316.50	4,598.1	778.8	-614.3	991.4	1.23	0.85	-2.98
4,831.0	18.50	315.20	4,687.5	799.7	-634.6	1,020.5	0.95	0.85	-1.38
4,925.0	17.90	314.50	4,776.8	820.4	-655.4	1,049.8	0.68	-0.64	-0.74
5,019.0	15.60	316.70	4,866.8	839.7	-674.4	1,076.8	2.54	-2.45	2.34
5,113.0	15.80	324.60	4,957.3	859.4	-690.5	1,102.2	2.28	0.21	8.40
5,207.0	16.50	319.80	5,047.6	880.0	-706.5	1,128.3	1.60	0.74	-5.11
5,301.0	17.30	312.10	5,137.5	899.6	-725.5	1,155.5	2.53	0.85	-8.19
5,395.0	18.10	310.50	5,227.1	918.4	-747.0	1,183.7	1.00	0.85	-1.70
5,489.0	15.10	309.50	5,317.2	935.7	-767.5	1,210.2	3.21	-3.19	-1.06
5,582.0	12.00	310.40	5,407.6	949.7	-784.3	1,231.6	3.34	-3.33	0.97
5,676.0	9.90	312.40	5,499.8	961.5	-797.7	1,249.2	2.27	-2.23	2.13
5,770.0	8.40	313.10	5,592.6	971.6	-808.7	1,264.1	1.60	-1.60	0.74
5,864.0	6.50	311.80	5,685.8	979.8	-817.6	1,276.2	2.03	-2.02	-1.38
5,958.0	5.10	316.60	5,779.4	986.4	-824.5	1,285.6	1.57	-1.49	5.11
6,052.0	4.30	314.00	5,873.0	991.9	-829.9	1,293.3	0.88	-0.85	-2.77
6,146.0	2.90	321.80	5,966.9	996.2	-833.9	1,299.2	1.57	-1.49	8.30
6,240.0	2.10	333.20	6,060.8	999.6	-836.1	1,303.2	1.00	-0.85	12.13
6,333.0	1.40	348.60	6,153.7	1,002.3	-837.1	1,305.9	0.90	-0.75	16.56
6,380.1	1.64	340.57	6,200.8	1,003.5	-837.5	1,307.0	0.68	0.51	-17.03

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TARGET BHL 2550'FNL, 75'FWL									
6,427.0	1.90	334.70	6,247.7	1,004.8	-838.0	1,308.4	0.68	0.56	-12.53
6,521.0	1.60	344.50	6,341.6	1,007.5	-839.0	1,311.1	0.45	-0.32	10.43
6,615.0	1.10	330.40	6,435.6	1,009.5	-839.8	1,313.2	0.63	-0.53	-15.00
6,709.0	1.40	322.00	6,529.6	1,011.2	-841.0	1,315.2	0.37	0.32	-8.94
6,803.0	1.70	321.40	6,623.6	1,013.2	-842.6	1,317.7	0.32	0.32	-0.64
6,897.0	2.00	325.50	6,717.5	1,015.6	-844.4	1,320.8	0.35	0.32	4.36
6,991.0	2.20	322.90	6,811.4	1,018.4	-846.4	1,324.2	0.24	0.21	-2.77
7,084.0	3.20	320.20	6,904.3	1,021.8	-849.1	1,328.6	1.08	1.08	-2.90
7,178.0	3.60	320.30	6,998.2	1,026.1	-852.7	1,334.2	0.43	0.43	0.11
7,272.0	3.20	321.30	7,092.0	1,030.5	-856.2	1,339.7	0.43	-0.43	1.06
7,312.9	3.42	322.15	7,132.8	1,032.3	-857.7	1,342.1	0.54	0.53	2.07
TARGET CIRCLE 2550'FNL, 75'FWL									
7,366.0	3.70	323.10	7,185.8	1,034.9	-859.7	1,345.4	0.54	0.53	1.79
7,460.0	3.30	336.30	7,279.7	1,039.8	-862.6	1,351.0	0.95	-0.43	14.04
7,554.0	4.00	329.30	7,373.5	1,045.1	-865.3	1,356.8	0.88	0.74	-7.45
7,648.0	3.20	317.50	7,467.3	1,049.9	-868.8	1,362.7	1.16	-0.85	-12.55
7,774.0	1.00	305.80	7,593.2	1,053.1	-872.0	1,367.3	1.77	-1.75	-9.29
7,836.0	1.10	320.50	7,655.2	1,053.9	-872.9	1,368.4	0.46	0.16	23.71
7,940.0	0.60	338.30	7,759.2	1,055.2	-873.7	1,369.9	0.54	-0.48	17.12
8,129.0	0.40	195.30	7,948.2	1,055.5	-874.2	1,370.5	0.50	-0.11	-75.66
8,169.0	0.40	195.30	7,988.2	1,055.2	-874.3	1,370.3	0.00	0.00	0.00
HARDLINES 90'S AND 75'W OF BHL									

Checked By: _____ Approved By: _____ Date: _____