

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Lorenz F22-67-1HN**

Surface Location: Lorenz F22-67-1HN Pad Sec.22-T5N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4625.0

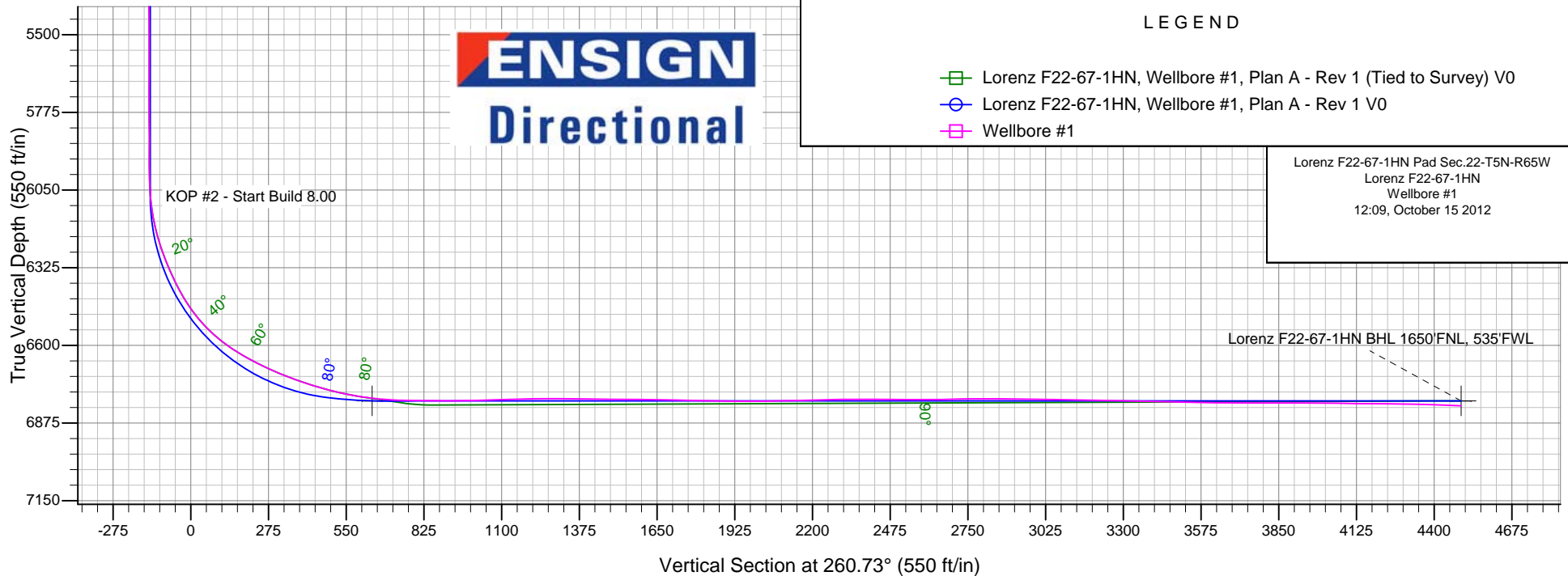
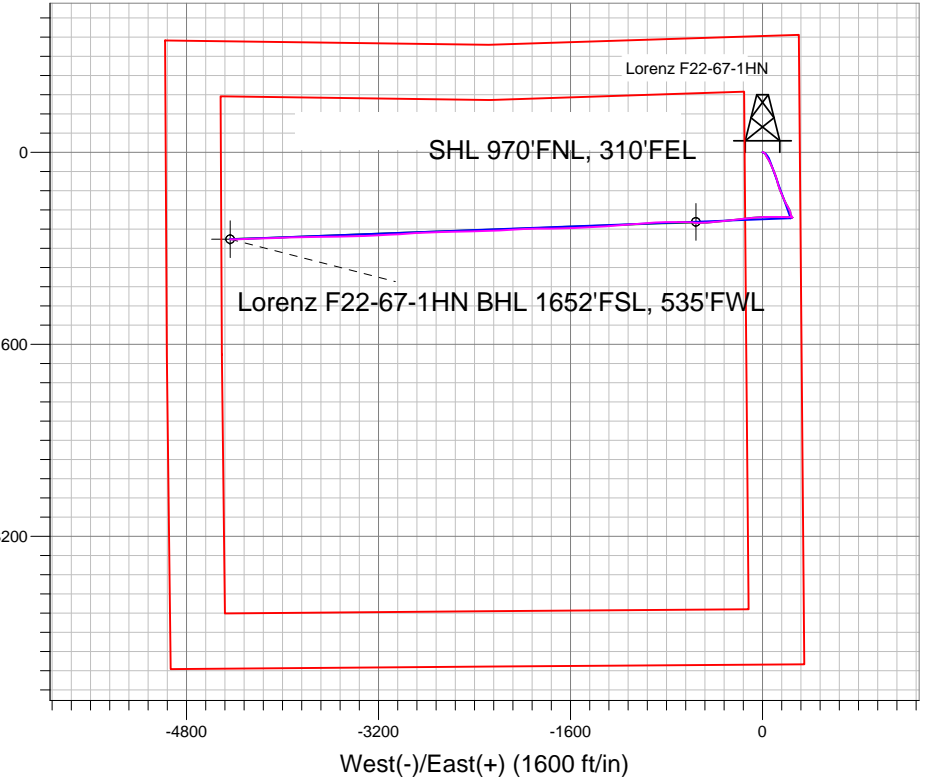
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1385792.19	3239271.91	40.389220	-104.641010	

Original Well Elev WELL @ 4638.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location
11183' MD 6813.7' TVD 726' S & 4436' W
of SHL
87.7 degree Incl @ 268.6 degree AZM

South(-)/North(+) (1600 ft/in)





Noble Energy Inc.- Weld County, CO (Grid North)

Sec.22-T5N-R65W

Lorenz F22-67-1HN Pad Sec.22-T5N-R65W

Lorenz F22-67-1HN

Wellbore #1

Design: Wellbore #1

Standard Survey Report

15 October, 2012

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Lorenz F22-67-1HN
Project:	Sec.22-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Lorenz F22-67-1HN Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	Lorenz F22-67-1HN	North Reference:	Grid
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)
1,305.0	7.70	151.30	1,303.3	-23.8	27.6	-23.4	1.58	1.58	0.84
1,400.0	7.80	149.70	1,397.5	-35.0	33.9	-27.8	0.25	0.11	-1.68
1,493.0	8.20	148.00	1,489.6	-46.0	40.6	-32.6	0.50	0.43	-1.83
1,588.0	9.60	149.90	1,583.4	-58.6	48.1	-38.1	1.51	1.47	2.00
1,684.0	9.80	151.90	1,678.1	-72.8	56.0	-43.6	0.41	0.21	2.08
1,779.0	9.90	155.60	1,771.7	-87.3	63.2	-48.3	0.67	0.11	3.89
1,873.0	10.60	157.70	1,864.2	-102.7	69.8	-52.4	0.84	0.74	2.23
1,968.0	10.90	150.50	1,957.5	-118.6	77.6	-57.4	1.45	0.32	-7.58
2,063.0	11.60	158.50	2,050.7	-135.3	85.5	-62.6	1.80	0.74	8.42
2,158.0	12.70	156.30	2,143.5	-153.7	93.2	-67.2	1.26	1.16	-2.32
2,253.0	12.60	157.70	2,236.2	-172.9	101.3	-72.1	0.34	-0.11	1.47
2,348.0	13.50	163.50	2,328.8	-193.1	108.4	-75.9	1.67	0.95	6.11
2,443.0	13.40	162.40	2,421.2	-214.2	114.9	-78.9	0.29	-0.11	-1.16
2,537.0	13.30	162.40	2,512.6	-234.9	121.4	-82.0	0.11	-0.11	0.00
2,632.0	13.80	166.40	2,605.0	-256.4	127.4	-84.4	1.12	0.53	4.21
2,727.0	15.20	164.90	2,697.0	-279.4	133.3	-86.6	1.53	1.47	-1.58
2,822.0	15.50	159.40	2,788.6	-303.3	141.0	-90.3	1.56	0.32	-5.79
2,917.0	14.70	155.70	2,880.3	-326.2	150.4	-96.0	1.32	-0.84	-3.89
3,012.0	14.80	156.60	2,972.2	-348.3	160.2	-102.0	0.26	0.11	0.95
3,107.0	14.20	158.00	3,064.2	-370.2	169.4	-107.6	0.73	-0.63	1.47
3,202.0	13.50	154.00	3,156.4	-391.0	178.6	-113.3	1.25	-0.74	-4.21
3,297.0	13.90	154.10	3,248.7	-411.2	188.5	-119.8	0.42	0.42	0.11
3,392.0	12.10	154.80	3,341.2	-430.5	197.7	-125.8	1.90	-1.89	0.74
3,487.0	10.70	149.70	3,434.4	-447.1	206.4	-131.7	1.81	-1.47	-5.37
3,582.0	9.10	149.00	3,528.0	-461.2	214.7	-137.6	1.69	-1.68	-0.74
3,677.0	8.20	154.50	3,621.9	-473.7	221.5	-142.3	1.29	-0.95	5.79
3,772.0	7.20	159.40	3,716.0	-485.4	226.5	-145.4	1.26	-1.05	5.16
3,867.0	6.10	158.70	3,810.4	-495.7	230.4	-147.6	1.16	-1.16	-0.74
3,961.0	6.00	172.60	3,903.9	-505.2	232.9	-148.5	1.56	-0.11	14.79
4,056.0	5.50	168.00	3,998.4	-514.6	234.5	-148.5	0.72	-0.53	-4.84
4,151.0	4.80	157.50	4,093.0	-522.7	236.9	-149.7	1.23	-0.74	-11.05
4,246.0	3.80	163.50	4,187.7	-529.4	239.3	-151.0	1.15	-1.05	6.32
4,341.0	3.10	143.90	4,282.6	-534.5	241.8	-152.5	1.43	-0.74	-20.63
4,436.0	2.50	163.80	4,377.5	-538.6	243.8	-153.9	1.19	-0.63	20.95
4,531.0	1.10	107.90	4,472.4	-540.9	245.3	-155.0	2.20	-1.47	-58.84
4,626.0	1.50	127.10	4,567.4	-541.9	247.2	-156.7	0.62	0.42	20.21
4,721.0	1.40	125.80	4,662.4	-543.3	249.1	-158.3	0.11	-0.11	-1.37
4,816.0	1.30	306.70	4,757.3	-543.4	249.2	-158.4	2.84	-0.11	-188.53
4,911.0	1.10	305.50	4,852.3	-542.2	247.6	-157.0	0.21	-0.21	-1.26
5,005.0	1.10	303.00	4,946.3	-541.2	246.1	-155.7	0.05	0.00	-2.66
5,100.0	0.80	278.60	5,041.3	-540.6	244.6	-154.4	0.52	-0.32	-25.68
5,195.0	1.00	281.40	5,136.3	-540.3	243.2	-153.0	0.22	0.21	2.95
5,290.0	1.30	262.60	5,231.3	-540.3	241.3	-151.1	0.50	0.32	-19.79
5,385.0	1.10	269.10	5,326.2	-540.4	239.3	-149.2	0.25	-0.21	6.84
5,480.0	0.90	202.00	5,421.2	-541.1	238.1	-147.9	1.18	-0.21	-70.63
5,575.0	0.80	209.50	5,516.2	-542.4	237.5	-147.1	0.16	-0.11	7.89
5,670.0	0.80	93.50	5,611.2	-543.0	237.9	-147.3	1.43	0.00	-122.11
5,765.0	0.40	356.60	5,706.2	-542.7	238.5	-148.0	0.99	-0.42	-102.00
5,860.0	0.70	286.90	5,801.2	-542.2	237.9	-147.5	0.71	0.32	-73.37
5,955.0	1.00	326.40	5,896.2	-541.4	236.9	-146.6	0.67	0.32	41.58
6,050.0	0.50	325.00	5,991.2	-540.3	236.2	-146.1	0.53	-0.53	-1.47
6,145.0	5.30	267.20	6,086.0	-540.2	231.6	-141.6	5.32	5.05	-60.84
6,240.0	13.30	268.90	6,179.7	-540.6	216.3	-126.4	8.43	8.42	1.79
6,334.0	20.20	271.90	6,269.7	-540.3	189.2	-99.7	7.40	7.34	3.19

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Lorenz F22-67-1HN
Project:	Sec.22-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Lorenz F22-67-1HN Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	Lorenz F22-67-1HN	North Reference:	Grid
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)
6,429.0	25.10	271.90	6,357.3	-539.1	152.6	-63.8	5.16	5.16	0.00
6,524.0	32.00	269.80	6,440.7	-538.5	107.3	-19.2	7.34	7.26	-2.21
6,619.0	41.40	270.20	6,516.8	-538.5	50.6	36.8	9.90	9.89	0.42
6,714.0	52.10	266.60	6,581.8	-540.6	-18.5	105.3	11.59	11.26	-3.79
6,809.0	60.10	263.30	6,634.8	-547.7	-96.9	183.9	8.90	8.42	-3.47
6,904.0	64.70	264.00	6,678.8	-557.0	-180.6	267.9	4.89	4.84	0.74
6,999.0	69.90	264.20	6,715.4	-566.0	-267.7	355.4	5.48	5.47	0.21
7,046.0	71.10	263.30	6,731.1	-570.8	-311.8	399.6	3.13	2.55	-1.91
7,094.0	73.30	263.70	6,745.8	-576.0	-357.2	445.3	4.65	4.58	0.83
7,141.0	75.20	264.50	6,758.5	-580.6	-402.2	490.4	4.36	4.04	1.70
7,207.0	79.00	265.20	6,773.3	-586.4	-466.2	554.6	5.85	5.76	1.06
7,297.0	83.40	273.70	6,787.1	-587.2	-555.1	642.4	10.53	4.89	9.44
7,298.4	83.47	273.68	6,787.2	-587.1	-556.4	643.7	5.62	5.37	-1.70
Lorenz F22-67-1HN Landing Pt.									
7,392.0	88.50	272.10	6,793.8	-582.4	-649.7	735.0	5.62	5.37	-1.68
7,487.0	89.30	270.00	6,795.6	-580.7	-744.6	828.4	2.37	0.84	-2.21
7,582.0	90.50	267.30	6,795.8	-582.9	-839.6	922.5	3.11	1.26	-2.84
7,677.0	91.10	266.10	6,794.4	-588.4	-934.4	1,017.0	1.41	0.63	-1.26
7,772.0	91.90	265.80	6,791.9	-595.1	-1,029.2	1,111.5	0.90	0.84	-0.32
7,867.0	91.50	265.80	6,789.1	-602.0	-1,123.9	1,206.1	0.42	-0.42	0.00
7,962.0	89.50	264.90	6,788.3	-609.7	-1,218.5	1,300.8	2.31	-2.11	-0.95
8,057.0	89.10	266.10	6,789.5	-617.2	-1,313.2	1,395.5	1.33	-0.42	1.26
8,151.0	89.70	266.10	6,790.4	-623.6	-1,407.0	1,489.1	0.64	0.64	0.00
8,246.0	89.10	267.70	6,791.4	-628.7	-1,501.9	1,583.5	1.80	-0.63	1.68
8,341.0	89.50	268.90	6,792.6	-631.5	-1,596.8	1,677.7	1.33	0.42	1.26
8,436.0	88.50	268.20	6,794.3	-633.9	-1,691.8	1,771.8	1.28	-1.05	-0.74
8,531.0	88.50	270.20	6,796.7	-635.3	-1,786.7	1,865.7	2.10	0.00	2.11
8,626.0	90.20	268.80	6,797.8	-636.1	-1,881.7	1,959.6	2.32	1.79	-1.47
8,721.0	90.80	267.30	6,797.0	-639.3	-1,976.6	2,053.8	1.70	0.63	-1.58
8,816.0	91.50	267.30	6,795.1	-643.8	-2,071.5	2,148.2	0.74	0.74	0.00
8,911.0	91.40	267.30	6,792.7	-648.3	-2,166.4	2,242.5	0.11	-0.11	0.00
9,006.0	90.70	267.00	6,790.9	-653.0	-2,261.2	2,336.9	0.80	-0.74	-0.32
9,101.0	89.50	267.50	6,790.8	-657.5	-2,356.1	2,431.3	1.37	-1.26	0.53
9,195.0	89.30	270.00	6,791.8	-659.6	-2,450.1	2,524.3	2.67	-0.21	2.66
9,290.0	90.90	269.30	6,791.6	-660.2	-2,545.1	2,618.2	1.84	1.68	-0.74
9,385.0	91.20	268.10	6,789.9	-662.3	-2,640.0	2,712.3	1.30	0.32	-1.26
9,480.0	90.10	267.30	6,788.8	-666.1	-2,735.0	2,806.5	1.43	-1.16	-0.84
9,575.0	88.90	266.80	6,789.6	-671.0	-2,829.8	2,901.0	1.37	-1.26	-0.53
9,670.0	89.80	266.50	6,790.7	-676.6	-2,924.7	2,995.4	1.00	0.95	-0.32
9,765.0	88.40	266.80	6,792.2	-682.1	-3,019.5	3,089.9	1.51	-1.47	0.32
9,860.0	89.10	267.00	6,794.2	-687.3	-3,114.3	3,184.4	0.77	0.74	0.21
9,955.0	89.10	267.90	6,795.7	-691.5	-3,209.2	3,278.7	0.95	0.00	0.95
10,050.0	88.60	266.80	6,797.6	-695.9	-3,304.1	3,373.0	1.27	-0.53	-1.16
10,145.0	88.90	268.10	6,799.7	-700.1	-3,399.0	3,467.4	1.40	0.32	1.37
10,240.0	88.70	269.30	6,801.7	-702.3	-3,493.9	3,561.4	1.28	-0.21	1.26
10,335.0	89.30	269.30	6,803.4	-703.4	-3,588.9	3,655.3	0.63	0.63	0.00
10,430.0	89.90	269.30	6,804.0	-704.6	-3,683.9	3,749.3	0.63	0.63	0.00
10,525.0	90.10	269.10	6,804.0	-705.9	-3,778.9	3,843.2	0.30	0.21	-0.21
10,619.0	90.20	268.80	6,803.8	-707.6	-3,872.9	3,936.3	0.34	0.11	-0.32
10,714.0	88.80	267.70	6,804.6	-710.5	-3,967.8	4,030.5	1.87	-1.47	-1.16
10,809.0	89.30	268.10	6,806.2	-714.0	-4,062.7	4,124.7	0.67	0.53	0.42
10,904.0	89.90	268.10	6,806.9	-717.2	-4,157.7	4,218.9	0.63	0.63	0.00
10,999.0	89.00	267.70	6,807.8	-720.7	-4,252.6	4,313.2	1.04	-0.95	-0.42

