

51-01645



Noble Energy SHL13GHS Gyro+MWD 0ft to 12099ft MD Survey Report

(Def Survey)

Report Date: October 23, 2013 - 10:27 AM
Client: Noble Energy
Field: WV Marshall County (NAD 27)
Structure / Slot: Noble Energy SHL13 Pad / SHL13GHS

Survey / DLS Computation: Minimum Curvature / Lubsenski
Vertical Section Azimuth: 143.947 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB

Table with columns: MD (ft), Incl (°), Azim (°), TVD (ft), TVDSS (ft), VSEC (ft), NS (ft), EW (ft), DLS, BR, TR, Northing, Easting, Latitude, Longitude, Directional Difficulty Index.

11/28/2014

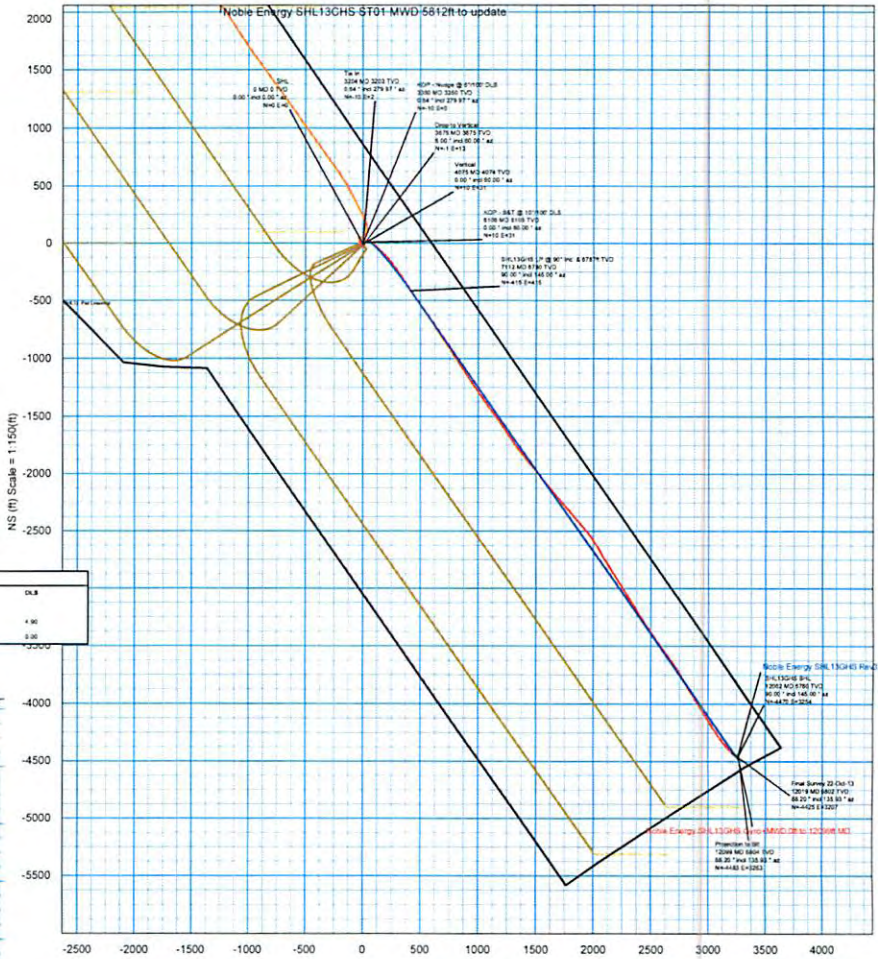
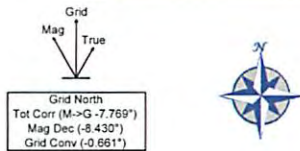
51-01644



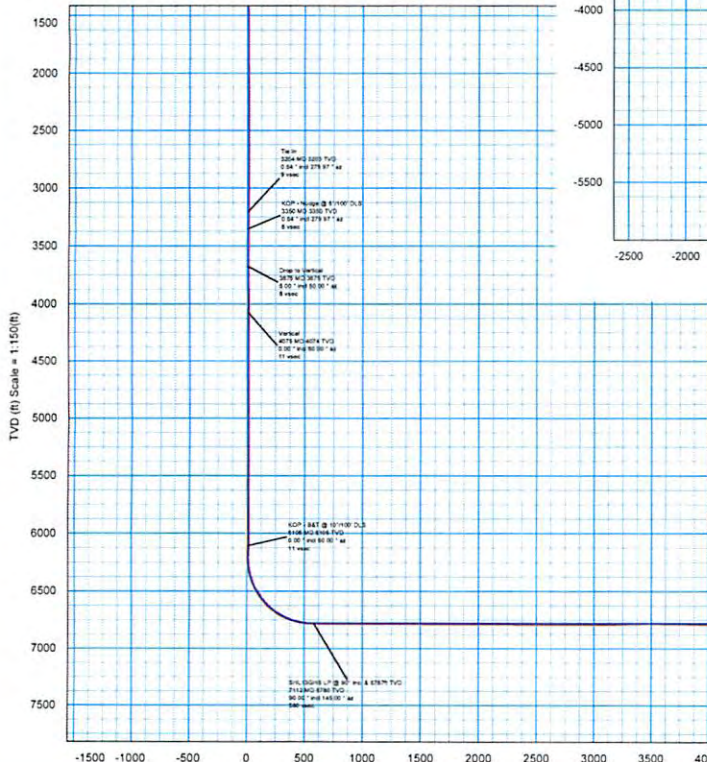
Noble Energy



Borehole: Original Borehole	Well: SHL13GHS	Field: WV Marshall County (NAD 27)	Structure: Precision 543
Gravity & Magnetic Parameters		Surface Location	
Model: HDGM 2013 MagDec: -8.43°	Dip: 67.55° FS: 53180.0231T	Date: 10/11/2013 999.451mg (0.80665 Gauss)	NAD27 West Virginia State Plane, Northern Zone, US Feet Lat: N 40 0 14.83 Lon: W 80 32 8.78 Northing: 549516.174RUS Easting: 1709841.798RUS Grid Conv: -0.661° Scale Fact: 1
		Miscellaneous	
		Slot: SHL13GHS TVD Ref: KB(1300.54ft above MSL) Plan: Noble Energy SHL13GHS Gyro-MWD 0ft to 12099ft MD	



Critical Point	MD	INCL	AZM	TVD	VSEC	N (+Y=1)	E (+X=1)	CLB
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Survey 22 Oct-13	12019.90	88.20	135.83	6807.91	5485.33	-423.19	3207.43	4.90
Projection to SE	12098.36	88.20	135.83	6804.42	5544.51	-482.54	3263.05	0.00



Northing		Easting		Surface Location		Grid Count		Local Count	
Target Name	Shape	Dimension	Latitude	Longitude	Northing	TVD	V-See Azimuth	N (+Y=1)	E (+X=1)
SHL13 Final Location	Point	N/A	N 40 0 14.83	W 80 32 8.85	549517.54	1300.54	15.01	14.86	0.38
SHL13GHS SHL	Point	N/A	N 39 59 37.03	W 80 31 20.22	549516.12	1713090.91	8781.00	3529.24	4479.23
SHL13GHS LP	Point	N/A	N 40 0 14.77	W 80 32 10.38	549516.70	1713290.72	8781.00	546.07	478.43

PART	Seq	Survey Tool	Vendor/Tool	Hole Size (in)	Casing Size (in)	MD From (ft)	MD To (ft)	Survey Frequency (%)	ECU Size (Shank Width)	Commentary
1	1	SLS NSCH-MECHT	Geop Inc	30	30	0	18.63	Act Str	1.25	1.25
1	2	SLS NSCH-MECHT	Geop Inc	30	30	18.63	3203.5	Act Str	5.07	2.39
1	3	SLS MWD-BTD	Geop Inc	30	30	3203.5	12019	Act Str	180.75	7.27
1	4	SLS BLNCH-TRND	Geop Inc	30	30	12019	12099	Act Str	175.8	15.36

Vertical Section (ft) Azim = 143.947° Scale = 1:150(ft) Origin = ON-S, OE-AW