

85-10013



Noble Energy PENS1EHS Gyro+MWD 0ft to 12590ft MD Survey Report



Received Office of Oil & Gas NOV 21 2014

(Def Survey)

Report Date: December 09, 2013 - 09:04 AM
Client: Noble Energy
Field: WV Ritchie County (NAD27)
Structure / Slot: Noble Energy PENS1 Pad / PENS1EHS
Well: PENS1EHS
Borehole: Original Borehole
UWI / AP#s: Unknown / Unknown
Survey Name: Noble Energy PENS1EHS Gyro+MWD 0ft to 12590ft MD
Survey Date: November 30, 2013
Tort / AHD / DDI / ERD Ratio: 179.886 / 7246.847 ft / 6.411 / 1.138
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 20' 5.49700", W 80° 59' 34.80600"
Location Grid N/E Y/X: N 307581 996 RUS, E 1577714 227 RUS
CRS Grid Convergence Angle: -0.9522"
Grid Scale Factor: 0.99995358
Version / Patch: 2.7.998.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 151.378 (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB
TVD Reference Elevation: 1137.750 ft above MSL
Seabed / Ground Elevation: 1112.050 ft above MSL
Magnetic Declination: -7.802"
Total Gravity Field Strength: 999.3002mg (9.80665 Beaud)
Gravity Model: GARM
Total Magnetic Field Strength: 52294.477 nT
Magnetic Dip Angle: 66.877"
Declination Date: November 30, 2013
Magnetic Declination Model: HDGM 2013
North Reference: Grid North
Grid Convergence: -0.9522"
Total Corr Mag North+Grid North: -6.8498"
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim Grid (°), TVD (ft), TVDSS (ft), VSEC (ft), NS (ft), EW (ft), DLS (ft/100ft), BR (ft/100ft), TR (ft/100ft), Northing (RUS), Easting (RUS), Latitude (N/S/E/W), Longitude (E/W/N/S), Directional Difficulty Index. The table contains multiple rows of survey data points.

12/05/2014

85-100B

Table with columns: Comments, MD (ft), Incl (°), Adm Grid (ft), TVD (ft), TVDSS (ft), VSEC (ft), NS (ft), EW (ft), DLS (ft/100ft), BR (ft/100ft), TR (ft/100ft), Northing (ftUS), Easting (ftUS), Latitude (N/S ° ° ' "), Longitude (E/W ° ° ' "), Directional Difficulty Index. Rows include wellbore data from 7680.00 to 12500.00 ft.

Survey Type: Def Survey

Survey Error Model: ISOWSA Rev 0 *** 3-D 95.000% Confidence 2.7956 sigma
Survey Program:

Table with columns: Description, Part, MD From (ft), MD To (ft), EOU Freq (ft), Hole Size (in), Casing Diameter (in), Survey Tool Type, Borehole / Survey. Rows describe survey segments from 0.000 to 12512.000 ft.

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