Petrophysical evaluation of the Upper and Lower shaly gas sand reservoirs of the Sahara field, using conventional well log interpretation techniques and relating the results to core data, shows that the Upper reservoir is of very good quality and apparently better than the Lower reservoir. Evaluation of the petrophysical parameters from the wells in the field show porosities ranging from 12 to 20% and permeabilities of about 500 mD, which are similar to regional values of 12 to 20% porosity and 1000 mD permeability. A crossplot-based lithological study shows that the matrix is dominantly quartz, with calcitic and dolomitic cements, a high percentage of montmorillonite clays, and a smaller percentage of illite and micas. A study of lateral variations of petrophysical parameters shows that porosities increase from NE to SW, similar to the saturations. This study shows the role of wireline petrophysical analysis as a tool in reservoir characterization of shaly sands in the Sahara field. This paper examines the use of log analysis and mean petrophysical reservoir parameters as a tool in successfully establishing reservoir architecture and fluid-flow trends. Data from Gamma Ray, Neutron, Density, Sonic and Resistivity logs was utilized for petrophysical analysis to correlate layers in this reservoir characterization study. Petrophysical evaluation of the Shaly Sand gas reservoir (TAGS) of the Rhourde Hamra field, using conventional well log interpretation techniques and relating the results to core data, shows that the reservoir is of very good quality