

*Paper 37*

**Genetic unit and prediction of petrophysical parameters  
— a case study**

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The “*genetic petrophysics*” concept that is used to predict petrophysical parameters using genetically focused neural nets (GFNN) simulator has only been introduced recently. It only requires a minimum number of Special Core Analysis data from a chosen representative genetic unit (RGU).

Combinations of wireline logs and core data from a short 7 m RGU interval in PEGASUS Well 2 were used to train the genetically focused neural network predictors which were then applied to predict the residual  $S_w$  throughout the whole logged section in the well and adjacent well (PEGASUS Well 2b) in the same field. Traditional hydraulic unit analysis or global hydraulic element grids provided the basis for selecting the training plugs. Only 4 core plugs were finally required to represent the hydraulic units in the RGU elements and provide good results. This approach is very cost effective in terms of core material and computing time.

The result of this study shows that the neural network  $S_w$  predictor is capable of predicting residual  $S_w$  in the training well and adjacent well. In this particular case, the application of genetic petrophysics approach to predict residual  $S_w$  is a reliable technique and has potential for a wider scope of application such as full field review or asset evaluation where data, costs and time are normally limited.

However, it was only tested in oil bearing shoreface reservoirs. Thus, it is recommended that this approach be tested in other environments.