Evaluation of Thin Bedded Turbidites in the Union Pacific / Ford 98 Area of Wilmington Field Utilizing High-Resolution Processed FMI Resistivity Data

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Petrophysical evaluation of turbidite sands in the Union Pacific / Ford 98 interval of Wilmington field are complicated by the thin-bedded nature of these reservoirs. Previous interpretations made using array induction or laterolog and porosity data resulted in pessimistic determinations of net pay. Special high-resolution processing of resistivity data obtained with Schlumberger's FMI tool in recently drilled well A-415 provided better bed boundary definition and more accurate measurement of resistivity. This resulted in an improved petrophysical interpretation and increased the net pay computation.

A special log interpretation model was developed to match core data from wells located west of the Long Beach Unit fault. This special log model utilizes high-resolution processed FMI resistivity data to help delineate thin beds and provide more accurate measurement of resistivity. The model also improves clay volume estimation by applying the high-resolution measurements. Furthermore, special "alpha-processed" neutron data helped improve the porosity log resolution.

Water saturation calculated using standard "Archie" parameters yielded unusually high water saturation. To match pay calculations with production data, extremely high water saturation cutoffs would be required using conventional methods. A review of special core analysis (SCAL) formation electrical properties data indicated lower values of Archie "m" cementation factors, and "n" saturation exponents. Applying special core analyses parameter results along with the high-resolution measurements yielded more reasonable water saturation and net reserve estimates.