Map-Based Versus Grid-Based Calculation of NRV and OOIP: Methods, Comparisons, and Recommendations in Turbiditic Depositional Environments, Block 14, Angola

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When calculating NRV and OOIP, earth scientists have two choices of estimation methods: 2-D map-based and 3-D grid-based. Use of map-based NRV and OOIP estimations are considered historically reliable, verifiable by all stakeholders, and simple in concept. Volumetric grid-based modeling has enabled sophisticated development and use of grid-based objects for estimations of NRV and OOIP; grid-based methods have a shorter history of confidence checking, are usually time intensive to create, involve complex processes, and more difficult to independently verify.

While map-based solutions are convenient and standard approaches to estimating NRV and OOIP, they often do not adequately represent the subsurface and can result in overly-optimistic estimates of NRV and OOIP in turbidites. The most significant limitations of map-based estimations of NRV and OOIP include: inability to accurately identify the number of individual reservoir sub-units, layering configuration, and spatial location of reservoirs.

Grid-based calculation methods can be superior to map-based methods in that accurate spatial representation of NRV can be realized by using reservoir properties from 3-D seismic methods resulting in more accurate OOIP estimates. Grid-based calculation of NRV enables visual comparison of the spatial distribution of reservoir rock.

Qualitative and/or quantitative comparisons of map-based and grid-based NRV and OOIP estimates are difficult to achieve due to problems in evaluating data presented in different dimensional formats. Map-based and grid-based NRV and OOIP estimation results have been evaluated for turbiditic environment reservoirs in Block 14, offshore Angola. Comparison of results supports utilizing grid-based objects as soon as possible in development mapping efforts.