**Evaluating Seal Potential of Top and Intraformational Seals**

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Any lithology may form a seal to a hydrocarbon column. Determining which seals have the potential to trap economically viable hydrocarbon accumulations, versus those that hold sub-economic volumes, has become an important aspect of evaluating both basinwide hydrocarbon systems and field scale prospects. The evaluation of seal potential comprises determining (1) seal capacity, (2) seal geometry, and (3) seal integrity. Seal capacity is the calculated amount of hydrocarbon column height a particular seal can support. This is a function of the relationship between the buoyancy pressure of the hydrocarbon column and the capillary properties of the updip seal. Seal capacity can be determined by mercury injection capillary pressure analyses. Seal geometry relates the structural position, thickness, and areal extent of the sealing lithology to that of the reservoir and/or structure. Where seal area is equal to or greater than the area of the reservoir or structure, the seal is more effective. Similarly, as seal thickness increases, the likelihood of seismically invisible through-going faults or fractures decreases. Seal geometry is determined by integrating seismic and core data, detailed well correlations, regional sedimentological/stratigraphic relationships and making comparisons to known depositional analogs. Seal integrity refers to geomechanical properties such as ductility, compressibility, and propensity for fracturing. Rocks with high seal integrity, such
as salts and anhydrites are generally better seals than brittle rocks such as dolomites or quartzites. Seal integrity can be measured in a laboratory or evaluated qualitatively by core examination, borehole imaging and petrographic studies. These three variables can be quantified to give comparative values of seal potential. This, in turn, can be incorporated with assessments of reservoir, source, and trap to provide overall exploration and development strategies. Examples of the use of these techniques are provided from offshore northwest Java, Indonesia, and the Cooper Basin, Australia.