

Mining Drill Stem Tests for Fluid Data

John R Forster¹ (1) The Wetterhorn Company, Centennial, CO

DSTs are short term open hole production tests, run while drilling, to evaluate potential producing zones. The one day test, usually a few hours in extent, produces fluids and creates a short term pressure draw down for reservoir evaluation. While transient analysis and Horner analysis of the pressure data are commonly used to determine reservoir pressure and extent, the fluids recovered are often overlooked in mining DST data.

Fluids and gases are reported in three ways from a drill stem test; Pipe recoveries, Sample Chamber recoveries and Flowing fluids. These fluids cannot be mapped as reported. The units are mixed and the descriptions of the fluids are not standardized and can be quite complex, e.g. MW & GCO (15% M, 10% W, 10% G, 65% OIL). These problems can be solved with database standardization methods. Unit conversions can be applied. The makeup of each fluid and the modifiers used to indicate the relative quantity of each fluid can be standardized. With this standardization, the percentage fluid makeup can be estimated. This process produces consistent mappable information from the recovered DST fluids.

Regional mapping of fluid ratios like Oil and Gas to Water ratios produce excellent exploration and exploitation maps. Additionally, DSTs are key to the recognition of basin centered gas accumulations. They provide a unique data set for defining the extent of the hydrocarbon plumes associated gas generation windows.