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MEETING PAPER

A SIMPLE METHOD FOR MODELING THE PRESSURE BUILDUP OR FLOW OF AN ABANDONED SOLUTION WELL

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ABSTRACT

Solution wells in salt are used for either mineral production or space to store gases, liquid hydrocarbons, or wastes. During the well's operational lifetime, the pressure or flow at the wellhead is controlled. Abandonment of a solution well, however, introduces many questions. What will be the time-dependent pressure in a plugged solution well? Will the plug hold? Will the salt hydrofrac? If the well is left open, what will the flow be from the wellhead?

In this paper, a simple analytical method is described for computing either the pressure buildup in a plugged well or the flow from an open well. Pressurization and flow predictions for a typical storage well are presented and compared to the results from a sophisticated finite element model. The analytical model is also used to predict the pressure buildup for two shut-in wells on the Warren Petroleum property at Mont Belvieu, Texas. The agreement between the measured wellhead pressures and the predicted pressures is quite good.