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## ACCURACY OF TEMPERATURE LOGGING FOR CALCULATING GAS INVENTORIES IN STORAGE CAVERNS

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### Abstract

Fundamentally, measurements of the temperature and pressure within a cavern are required to estimate the gas inventory. To obtain these measurements, downhole wireline logging has been the conventional industry standard, and several calculation methods have been developed to estimate the gas inventory based on wireline measurements. However, wireline logs only measure the temperature at the centerline of the cavern, which requires an assumption that the temperature at the cavern centerline represents the entire gas temperature at that particular depth. If horizontal variations in temperature exist at that measurement depth, particularly near the cavern walls (which may be significantly warmer or cooler than the gas), the calculated inventory may be inaccurate. Therefore, this paper presents an initial computational fluid dynamics investigation into the appropriateness of wireline temperature logging for gas inventory calculations.

**Key words:** gas storage, mechanical integrity testing, computational fluid dynamics, thermodynamics

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