14.13: Laboratory measurements of Skempton's B Coefficient on Wolfcamp A Core, Delaware Basin, USA

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ABSTRACT

I present my current experimental work on measuring Skempton's pore pressure buildup coefficient (B) values on Wolfcamp A mudrock. This is a material coefficient that defines the undrained change in pore pressure due to a change in isotropic load. I measure a B value of 0.12 (Fig. 1) at my sample's present-day effective stress of 3,716 psi. Using this preliminary B measurement, I demonstrate that the pressure of my sample before erosion (unloading) was 7,839 psi (Fig. 2).

The use of a pore pressure buildup coefficient is a key input into my pressure prediction model, which I present in *UT GeoFluids Talk 14.03;* currently, I assume a C value (which is termed the 'uniaxial loading efficiency,' and can be mathematically transformed to B) of 0.8. The aim of my experimental work is to obtain reliable B values for my material and use these to replace my current assumed value.

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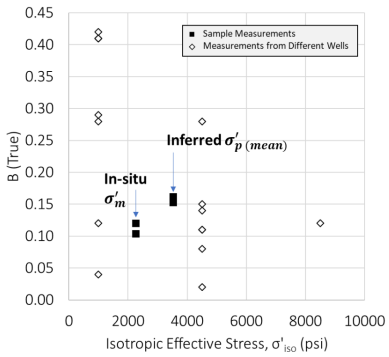


Fig 1: Preliminary measurements of B coefficient (black squares) during two load-unload stress cycles between the sample's inferred preconsolidation pressure of 3,535 psi, and its in-situ effective stress of 2,254 psi. Back pressure is held constant at 1,000 psi. Open diamonds illustrate previous measurements from neighboring wells.

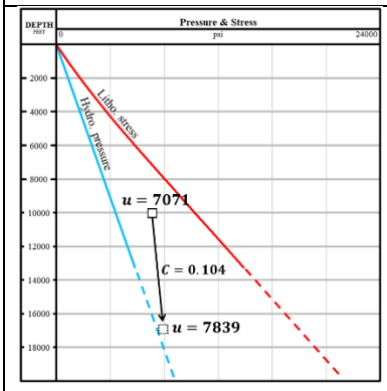
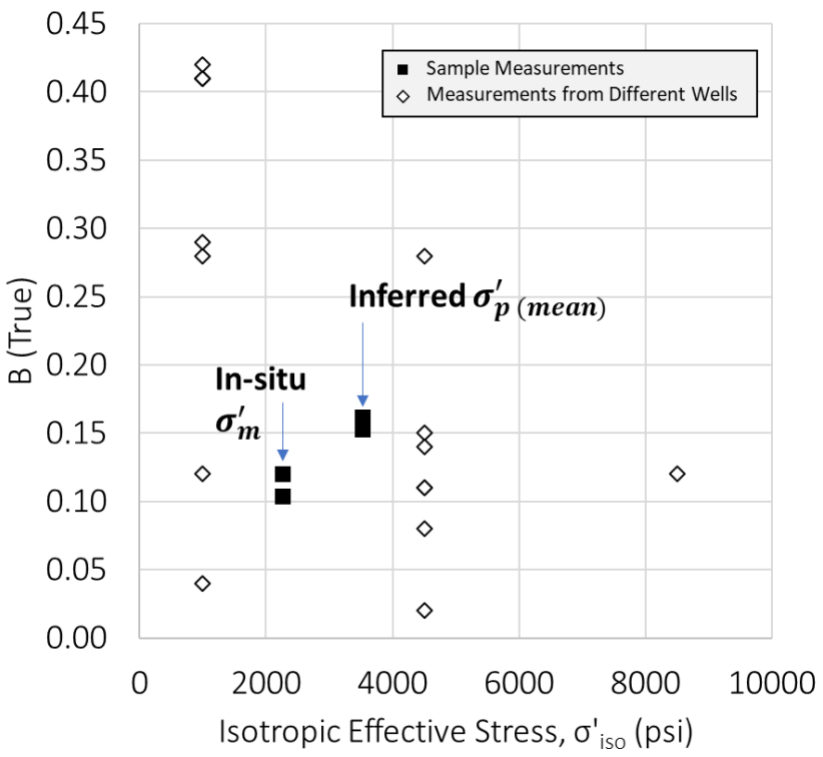


Fig 2: Estimation of my sample's pre-erosion pore pressure based on my preliminary Skempton's $\boldsymbol{B}$ value (Fig. 1) which I experimentally measured in the lab, assuming an in-situ pore pressure of 7,071 psi and an erosional value of 6,890 ft. In this figure, $\boldsymbol{B}$ is mathematically transformed into a uniaxial loading efficiency, $\boldsymbol{C}$.



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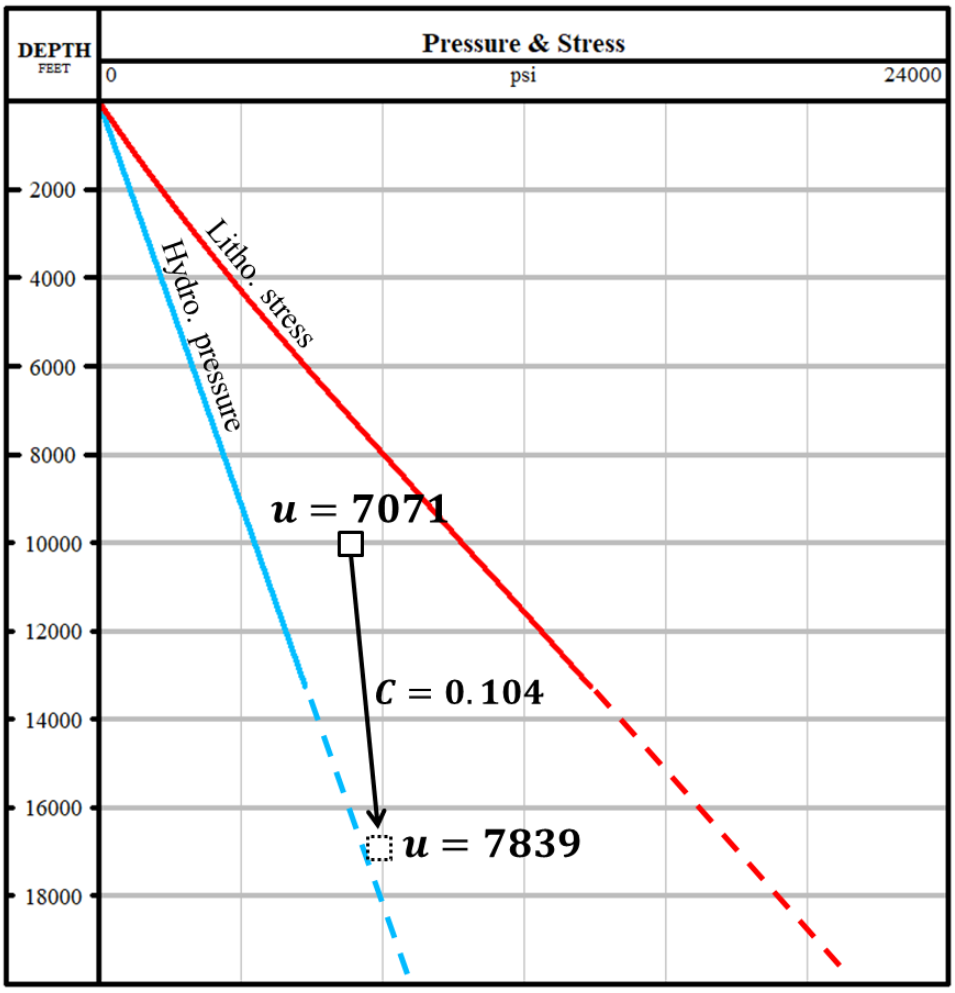

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