Desiccation Assessment in Puddle Clay Cores

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SYNOPSIS.The embankment dams to Banbury Reservoir and Lockwood have a history of high level leakage, clay core repairs and TWL restrictions. Current TWL restrictions posed a risk of damage to the kneeler beam of Banbury Reservoir during storms, whilst on Lockwood Reservoir undermining of the kneeler beam and associated slabing due to exposure to wave action was actively occurring. In seeking relaxation of the restrictions to mitigate damage, and to recover potential storage capacity, Thames Water were requested by the AR Panel Engineer to complete a desiccation assessment. This paper describes the principles and techniques adopted for the desiccation assessment of the clay cores, including laboratory testing of high quality samples and the installation and monitoring of two arrays of GeO flushable piezometers. Visual inspection did not identify desiccation cracks within the cores, although there is evidence that the cores have previously been desiccated to greater depth. The potential of desiccation processes is highlighted, with the monitoring of pore pressures within the clay cores demonstrating the seasonal activity and depth within the clays cores to which suctions can be experienced.

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