

Processes Controlling the Stability LNAPL Pools in Porous Media

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Abstract. Through industrial processes petroleum liquids have been released into shallow subsurface environments. Petroleum liquids are considered light non-aqueous phase liquids (LNAPLs), because they are immiscible and their density is less than that of water, causing them to “float”. Their immiscible nature has caused significant problems with remediation.

This study examined the stability of the LNAPL pools. A LNAPL, methyl tert-butyl ethane (MTBE), was injected into a sand tank at a steady rate over 56 days. The MTBE progressed through the tank until the losses through volatilization and dissolution equaled the MTBE inflow rate into the tank. This resulted in an LNAPL pool that was stable as an overall body even though there was active flow within the pool.

Results to date have led to the hypothesis that volatilization and dissolution are critical factors that control the stability of LNAPL bodies. No other references to this have been found in the literature. Further studies will include more rigorous tank experiments, development of mathematical models, and field studies.

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