

Quantification of LNAPL Transmissivity in Fractured Porous Media

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Background/Objectives. Light non-aqueous phase liquid (LNAPL) transmissivity is a metric to quantify the hydraulic recoverability of LNAPL. Existing methods developed to date have been used to measure LNAPL transmissivity within granular porous media, and their use has often failed to reliably quantify LNAPL transmissivity in fractured porous media.

Approach/Activities. These failures in LNAPL transmissivity calculations in fractured porous media neglected key measurements of the geometry and discharge rate for individual fractures containing mobile LNAPL. A modification of LNAPL transmissivity measurement and calculation methods designed for granular porous media has been developed to provide improved measurement of LNAPL transmissivity in fractured porous media at the individual fracture and aggregate well scales. Thus, this process will afford the use of LNAPL transmissivity as a metric to define if LNAPL hydraulic recovery is necessary for a given fracture or well.

Results/Lessons Learned. The methodology has been applied at a site impacted with LNAPL in fractured basalt of varying permeability including areas of extremely weathered “rubble zones” to successfully identify impacted fractures within the well screen interval. The results have been utilized to support optimization of remedial actions at the facility.