



Measurement of Non-Aqueous Phase Liquid Flow in Porous Media by Tracer Dilution

Non-aqueous phase liquids (NAPLs) are liquids which are immiscible with water and include a range of industrial chemicals that are basic building blocks of modern society. Common examples of NAPLs include fuels, solvents, lubricants, wood preservatives, and chemical feedstock. Unfortunately, large quantities of NAPLs have been released into the subsurface, forming contiguous bodies of separate phase liquids. The selection of suitable remediation strategies for handling NAPL releases is influenced by the rate at which the NAPL is moving in these bodies. Although a number of techniques have been developed to measure the flow rate of NAPLs, these methods may be time consuming, costly and potentially inaccurate.

Researchers in the Department of Civil Engineering at Colorado State University have developed a novel technique for measuring the velocities of groundwater, NAPLs, and other fluids through an aquifer or other porous media. Utilizing fluorescent tracers and in-well calibration standards, this technique results in calibrated, normalized values for each data point collected, thereby eliminating errors associated with drift (e.g. signal, calibration, background fluorescence, temperature-induced, humidity-induced). Furthermore, the technique is insensitive to the viscosity and thickness of the fluid layer being measured.

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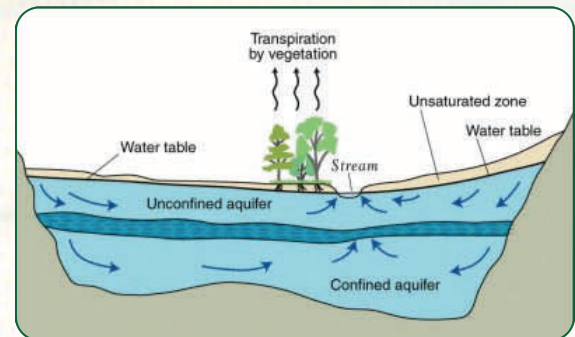
Patent Information

Patent pending.

Related Technologies

04-008

05-023



Features and Benefits

- Simple apparatus—does not require continuous mixing, pumping, or multiple wells.
- Broad application. Already proven for non-aqueous phase liquids (e.g. fuels, solvents, lubricants).
- Insensitive to equipment drift, environmental conditions, viscosity, and changes in water table (ideal for tidal areas).
- Field-tested, ready for immediate application.

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