

A Novel Deep Vadose Zone Sampling Port - VSP (BGN)

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There is a continues need for a reliable tool for monitoring soil pollution and providing accurate information about the chemical composition properties within the vadose zone pore-water, as well as to monitor the resulting chemical properties of the flowing water and their contaminants. Currently most monitoring of subsurface pollution processes is focused on groundwater. However, contamination of groundwater is usually caused by pollution events at the surface, which traverse the vadose zone into the groundwater. As a result, monitoring pollution in groundwater is already too late for an efficient corrective and cost effective action. Therefore the vadose zone, recognized as the domain which connects land surface pollution with the groundwater below needs a reliable and accurate monitoring tool.

Water flow and contaminant transport within the vadose zone are an extremely complex, coupling complex hydrodynamic and chemical processes. At present, a cumbersome technology of tensiometers and suction cups are the most common tools used to measure the soil water potential and sample soil pore-water.

Although tensiometers and suction cups are available and widely used for soil science and agricultural practice, their use is relatively limited to very shallow soil depths. This limitation has led to the development of a new Vadose zone Sampling Port (VSP) apparatus that is based on structural modification of tensiometers and a special installation technique that allows installation of multiple probes all along the deep vadose zone cross-section from land surface to groundwater. Using this VSP system enables easy, continues monitoring of a pollution process.

Advantages:

An efficient, cost effective tool for the monitoring of soil polluting processes.

A novel system designed to monitor soil hydraulic properties, such as soil water potential, and collect soil pore-water, in relatively undisturbed soil conditions.

Designed especially to allow monitoring of soil pore-water in the deep vadose zone.

Applicable for both the deep vadose zones and shallow soil horizons.

Potential Commercial Uses and Strategic Partners

Monitoring the hydraulic properties across the vadose zone in various susceptible polluting locations such as gas stations etc.

Development Stage and Development Status Summary

To date several prototype systems have been installed in the field and successfully tested.


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Patent Status

Patent Pending

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