Pore-Water Sample for Long-Term Monitoring Beneath Lakes and Streams

APPLICATION

Pore-water samplers provide long-term sampling points for contaminated ground water immediately prior to discharging to surface water. Because much of the contaminant degradation along the ground-water flow path can take place in the microbiologically robust zone near the ground-water/surface-water interface, pore-water samplers near this zone have the potential to produce more realistic values for discharging contaminant concentrations than values obtained from an on-shore monitoring well.

ADVANTAGES

1. Can provide repeated samples from the same location.
2. Easy to use.
3. The sampler is self-filling with ambient formation water and does not need to be recharged manually.
4. Does not require a surface expression in the surface-water body, such as a standpipe that may be subject to disturbance by floating objects or current.
5. Samples from the middle of the surface-water body can be collected from the shoreline.

CONSTRUCTION


A 2.5-inch diameter pore-water sampler with scale.

Lengthwise exploded view.

Exploded endview of sampler

Exploded 1.4-inch diameter sampler

SUMMARY

The pore-water samplers were capable of collecting water from the sand and organic-rich mud beneath the ditch and in surface water in September 2005, and ground-water chlorobenzene was detected in water collected from all of the pore-water samplers. In August 2006, one sampler failed to provide water, probably because the tubing connecting the sampler to the shoreline was crushed by people and equipment walking in the ditch. This problem is easily solved by using a small-diameter PVC pipe as a protective shield for the tubing.

The constituent concentration data collected during this study show that the samplers can function as adequate long-term sampling devices for monitoring concentrations of ground-water contamination discharging to surface water.

<table>
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<th>Location</th>
<th>Sample number</th>
<th>Date</th>
<th>CB</th>
<th>1,2-DCE</th>
<th>1,4-DCE</th>
<th>Chlorobenzene</th>
<th>Methane</th>
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Table: Concentrations of selected volatile organic compounds in water samples, Installation Restoration Site 4, Naval Air Station Corpus Christi, Corpus Christi, Texas, 2005-06

[CB, chlorobenzene; 1,2-DCE, 1,2-dichloroethane; 1,4-DCE, 1,4dichloroethane; < lower limit of detection; all concentrations are in micrograms per liter; suffix R represents a duplicate sample]