



Department of Defense Aberdeen Proving Ground & Picatinny Arsenal  
Regenerated-cellulose Dialysis Membrane (RCDM)

Summary

<b>Media:</b>	Groundwater
<b>Study Type:</b>	Side-by-side
<b>Technology:</b>	Equilibration
<b>Peer Reviewed:</b>	No
<b>Publication Date:</b>	September 2010

Study Description

- Results are provided for the Department of Defense Aberdeen Proving Ground (Maryland) and Picatinny Arsenal (New Jersey) field sites from samples collected in 2008 and 2010.
- Regenerated-cellulose dialysis membrane (RCDM) samplers were used to collect samples for analysis of perchlorate and explosives compounds (for example, RDX, HMX, tetryl, pentaerythritol tetranitrate (PETN), and nitrobenzene/nitrotoluene compounds)
- Groundwater samples collected from RCDM methods were compared to low-flow samples collected side-by-side
- Low-flow and RCDM side-by-side results were compared graphically and statistically to evaluate the significance of differences.

Remedial Phase

The overall objectives of the study were to assess validity of RCDM samplers for perchlorate and explosives parameters, test the equilibration period for these compounds, compare sampling efficiency to low-flow sampling, and gain regulatory acceptance and transfer sampler use to end users. Both sites are well characterized and used extensively for ongoing research purposes.

Outcome

Concentrations of perchlorate and most explosives parameters showed “excellent” agreement between results. Results for 2-amino-4,6-dinitrotulene and 4-amino-2,6-dinitrotoluene showed significantly higher concentrations in RCDM results compared to low-flow samples. Sampling costs were estimated to be 71% less for each sample collected with an RCDM sampler compared with low-flow sampling methods.

Case Study Reference

Imbriotta, Thomas E., Joseph S. Trotsky, and M. C. Place. “Demonstration and Validation of a Regenerated Cellulose Dialysis Membrane Diffusion Sampler for Monitoring Ground-Water Quality and Remediation Progress at DoD Sites (ER-0313).” Technical Report. Naval Facilities Engineering Service, 2007.  
<https://pubs.usgs.gov/publication/70206138>.

*Also documented in an October 2011 ESTCP Cost and Performance Report (ER-200313) titled: Demonstration and Validation of a Regenerated Cellulose Dialysis Membrane Diffusion Sampler for Monitoring Ground-Water Quality and Remediation Progress at DoD Site: Perchlorate and Ordnance Compounds.*