

## Ribbon NAPL Sampler (TechID 2238)

The Ribbon NAPL Sampler (RNS, also known as the FLUTE™ Hydrophobic Membrane) is a sampling device that provides detailed delineation of Nonaqueous Phase Liquids (NAPLs) in a borehole such as that created by the Cone Penetrometer. The RNS is a dye-impregnated hydrophobic ribbon that is deployed via a reusable nylon liner. When everted into the borehole the ribbon comes into tight contact with the soils, absorbing NAPLs that are in contact with the membrane causing a color change in the dye. Upon removal, the membrane is turned inside out and the ribbon is retrieved into the membrane. The ribbon is then removed and examined. The presence of NAPL is indicated by brilliant red marks on the ribbon. Laboratory analysis of ribbon sections can identify the specific NAPL compounds present.



### Developers:

- US DOE, Savannah River Tech Center, Aiken, SC and Westinghouse Savannah River Company, Aiken, SC
- FLUTE™, Ltd.

### Applications:

- Can be deployed in small diameter cone penetrometer boreholes
- Used for depth-discrete detection of NAPLs
- Numerous deployments at both DOE and non-DOE sites

### Benefits:

- Eliminates need for drilling and collection and laboratory analysis of soil samples to determine DNAPL locations
- RNS is relatively inexpensive and reusable
- Minimal time needed to deploy and retrieve membrane; lightweight and easily transported with no need for special vehicles or equipment
- RNS results from initial characterization phase can be used to optimize subsequent drilling and sampling, resulting in significant time and cost savings.

### Status:

- Commercially available from FLUTE™, Ltd. ([www.flut.com](http://www.flut.com)), Applied Research Associates, Inc. ([www.vertek.ara.com](http://www.vertek.ara.com)), and Fugro Geosciences, Inc. ([www.fugro.com](http://www.fugro.com))
- Development co-funded by DOE EM-50 and EM-40
- Innovative Technology Summary Report Available ([www.cmst.org](http://www.cmst.org))