

Rapid Optical Screening Tool Detects Petrochemical Contaminants

North Dakota State University



Leaking petroleum-based compounds such as fuels, oils, and coal tar frequently contaminate the soils and groundwater near underground storage tanks (gas stations/truck stops), pipelines, refineries, fueling areas, fire-training facilities, automobile service locations, surface spills, lagoons, waste ponds, tank bottoms, and wood treatment sites. Historically the extent of contamination has been visually determined in the field, which is subject to error or outlined by tedious sampling at many depths and locations.

In 1993–1994 Greg Gillispie, Ph.D., and Randy St. Germain of North Dakota State University developed the Rapid Optical Screening Tool (ROST), the world's most advanced subsurface petroleum screening tool. ROST uses laser-induced fluorescence (LIF) to detect and characterize subsurface contaminants. The U.S. Air Force provided the original funding for both the prototype development and field testing.

Based on the successful field tests, a consortium consisting of the university spin-off company Dakota Technologies, Unisys (prime contractor), and Hogentogler & Company was formed to commercialize the technology. ROST became the

world's first commercially available LIF logging service in 1994.

“ ROST helps identify contamination using “machine vision,” which eliminates the geologist’s often-subjective results.

The device provides LIF system in operation on a frozen lake in Minnesota extremely high vertical resolution, enabling pinpoint detection of narrow “seams” of contamination. Numerical results can be easily transformed into 3-D models that can be readily merged with existing drawings or maps for the “big picture.” Because the better models or maps lead to a better understanding of the contamination, geologists can put together a much more effective remediation plan. Not only does ROST save time and money, it also makes contamination testing more reliable.

ROST has been used extensively throughout the U.S., Japan, and Europe and is standard equipment for nearly every major environmental consulting firm or agency.

This story was originally published in 2007.

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