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What is the SITE MMT Program?

Performance verification of innovative field analytical technologies is an integral part of the regulatory and research mission of the U.S. Environmental Protection Agency (EPA). The Superfund Innovative Technology Evaluation (SITE) Program was established by the EPA to meet three primary objectives:

- identify and remove obstacles to the development and commercial use of innovative technologies;
- demonstrate promising innovative technologies and gather reliable performance and cost information to support site characterization and cleanup activities; and
- develop procedures and policies that encourage the use of innovative technologies at Superfund sites as well as other waste sites or commercial facilities.

The intent of a SITE demonstration is to

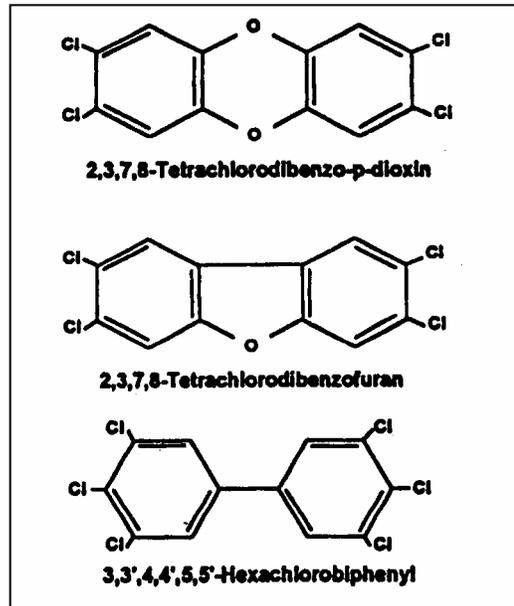


Figure 1. Structures of a representative dioxin, furan, and polychlorinated biphenyl

obtain representative, high-quality performance and cost data on innovative technologies so that potential users can assess a given technology's suitability for a specific application.



Figure 2. Environmental samples were collected from EPA Region 2 (Newark Bay, NJ; Raritan Bay, NJ), Region 3 (Nitro, WV), Region 4 (Warren County, NC; Brunswick, GA), Region 5 (Tittabawassee River, MI; Midland, MI; Saginaw Township, MI), and Region 7 (Winona, MO).

What are dioxins?

Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans, commonly referred to collectively as "dioxins," are of significant concern in site cleanup projects and human health assessments because dioxins are highly toxic. Dioxins and furans are halogenated aromatic hydrocarbons (shown in Figure 1) and have similar structural, chemical, and physical properties. Dioxins are extremely stable under most environmental

conditions making them persistent once released in the environment. The close toxicological and structural similarity of coplanar polychlorinated biphenyls (PCBs) to dioxins has led to the extension of risk assessments to include these dioxin-like compounds.

Why conduct this demonstration?

Conventional laboratory-based analytical methods for dioxins and PCBs are highly accurate and sensitive, but time-consuming and very costly. The use of simple, rapid, cost-effective measurement technologies enables field personnel to quickly assess the extent of contamination at a site and permit the development of a more focused sampling strategy for subsequent laboratory-based methods. However, users need to evaluate the performance of the technologies before adopting an alternative strategy to exclusive use of traditional laboratory-based methods. The participants in the demonstration are presented in Table 1.

Why conduct a test in Michigan?

The Michigan Department of Environmental Quality, EPA Region 5, and the U.S. Fish and Wildlife Service wanted to be on the leading edge of innovative analytical technology for the determination of dioxins and took advantage of this opportunity to share this information with their communities. The demonstration will begin on April 26 and interested observers are welcome to attend a Visitors Day on the morning of April 28 at the Green Point Environmental Learning Center in Saginaw, Michigan. The Visitors Day will allow observers to get a first-hand look at the technologies in

Table 1. Participants in Dioxin Demonstration

<i>Participant</i>	<i>Contact Information</i>	<i>Technology Name (analytical approach)</i>
Abraxis, L.L.C.	Fernando Rubio 215-357-3911	Coplanar PCB ELISA Kit (immunoassay)
Hybrizyme Corporation	Randy Allen 919-783-9595	AhRC PCR™ Kit (Ah-receptor/PCR)
Paracelsian, Inc.	Noriyoshi Inoue 914-472-5152	Ah-Immunoassay® (ELISA)
CAPE Technologies L.L.C.	Bob Harrison 207-741-2995	DF-1 Dioxin/Furan Immunoassay (immunoassay)
Xenobiotic Detection Systems, Inc.	John Gordon 919-688-4804	CALUX® (bioassay)
Wako Pure Chemicals Industries, LTD.	Emmy Leung 877-714-1920	Dioxin ELISA Kit (immunoassay)
AXYS Analytical Services, LTD.	Laurie Phillips 250-655-5800	High resolution mass spectrometry (commercial analytical lab)

operation.

Demonstration design

Soil and sediment samples were collected for use in this demonstration from a variety of dioxin-contaminated sites (see Figure 2). The samples represent unique environmental situations and vary greatly in concentration, interferences, and matrix composition. Each participant will be required to analyze over 200 samples, including quality control samples to ensure that a robust and scientifically defensible dataset is obtained.

Outcomes

Innovative Technology Verification Reports (ITVRs), which describe the performance of each technology, are planned for release in the fall of 2004. The reports will be posted on the Program's Web site (<http://www.epa.gov/ORD/SITE>).



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