



The TTEP Quarterly

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The quarterly update of U.S. EPA's Homeland Security Technology Testing & Evaluation Program (TTEP)



Evaluation of Large-Scale Radiological Decontamination Processes

Welcome to TTEP

The U.S. Environmental Protection Agency (EPA) is actively participating in the national homeland security effort by ensuring the protection of the nation's drinking water systems and the safety of the public in buildings and other structures. The National Homeland Security Research Center (NHSRC) under EPA's Office of Research and Development has established the Technology Testing and Evaluation Program (TTEP) to assist this effort. TTEP is conducting third-party performance evaluations of commercially available homeland security technologies, incorporating stakeholder guidance and a high degree of quality assurance oversight. Completed TTEP documents may be found at www.epa.gov/nhsrc/ttep.html. Questions about TTEP should be directed to Mr. Eric Koglin (koglin.eric@epa.gov or 702-798-2332).

The EPA NHSRC is conducting technology evaluations for the decontamination of radiological contamination from urban construction materials through TTEP. The objective of these technology evaluations, conducted by Battelle and Idaho National Laboratory (INL), is to determine the efficacy of various decontamination approaches while minimizing destruction of urban surfaces.

During 2007, two strippable coatings were evaluated through TTEP using a bench-scale test stand of concrete coupons that measured 2 feet (ft) x 3 ft. During the summer of 2009, a second technology evaluation was conducted through TTEP using a larger-scale test stand (9 ft x 9 ft) to accommodate larger decontamination equipment. This testing involved five technologies. Three of these utilized a

handheld grinder equipped with either sanding, steel brush, or diamond wheel heads; all three were equipped with a vacuum shroud to minimize secondary contamination. The other two technologies tested included a rotating hot water blasting technology and a grit blasting technology, both of which were also equipped with a vacuum shroud for secondary waste collection. The five technologies that were evaluated are pictured below.

The experimental design included the use of 6 inch x 6 inch concrete coupons to simulate concrete building surfaces that might become contaminated with radioactive cesium (Cs)-137. The entire surface of these concrete coupons was contaminated with a fine mist of an aqueous solution of Cs-137. The

See *Radiological Decon* next page

Evaluated Radiological Decontamination Technologies



The five technologies that were evaluated are shown left to right: Dust Director (steel brush and diamond cutter heads), CS Unitec (sanding head), River Technologies (hot water blasting), and Empire Abrasive (grit blasting).

Radiological Decon (cont.)

radiological activity on each coupon was then measured using a gamma-spectrometer. For each technology evaluation, eight contaminated coupons were placed in the vertical test stand and fastened into place to mimic the wall surface of a building. One uncontaminated (blank) coupon was placed in the bottom center of the test stand to study the amount of cross contamination that may have occurred during the use of each technology. All of the testing was accomplished in a radiological work area at INL by

workers outfitted in anti-contamination personal protective equipment. Once the contaminated coupons were placed in the test stand, one of the decontamination technologies was applied to the coupons according to a predetermined procedure. Following the application of the technology to all nine coupons (eight contaminated coupons and one blank), the coupons were removed from the test stand and the activity measured again in order to determine the efficacy of the decontamination technology. This

process was repeated for each of the five technologies.

Following analysis of the data obtained from these evaluations, the results will be compiled into TTEP evaluation reports. These reports are expected to be available early in 2010. If you have questions about this TTEP evaluation, please contact Mr. John Drake (513-235-4273 or drake.john@epa.gov) or Dr. Ryan James (614-424-7954 or jamesr@battelle.org).

Drinking Water Pipe - Contaminant Persistence and Decontamination

NHSRC conducts research to protect, detect, respond to, and recover from terrorist attacks on the nation's water and wastewater infrastructure. Over the past several years, EPA and water utilities have identified and prioritized key research needs that pertain to the decontamination of water systems. NHSRC is taking the lead on addressing existing research gaps. Specifically, key areas of concern include the adsorption of contaminants introduced into drinking water distribution systems to pipe walls, or corrosion and biofilm on interior pipe surfaces, and the restoration of the water distribution system to normal use as quickly as possible should adsorption occur.

In support of this important research area, NHSRC has initiated a project under TTEP to develop and test a prototype experimental design to



quantitatively determine the adsorption propensity of individual priority contaminants to various drinking water pipe materials. In addition, this experimental design will include the testing of methods for decontaminating affected pipe surfaces, if indeed the contaminant is persistent on the pipe. The ultimate result of this project will be an experimental design that can be implemented in a reproducible fashion across laboratories and for various contaminants. This experimental

design will be used to gain additional experimental information about the adsorption of chemical, biological, and radiological contaminants to various drinking water pipe materials and test various methods to destroy, reduce, or remove adsorbed contaminants. Many priority contaminants have not yet been studied and use of the prototype design would permit increased confidence, continuity, and comparability of results across studies.

This new project will be conducted over the upcoming year. If you have questions about this work, please contact Mr. Scott Minamy (513-569-7175 or minamy.scott@epa.gov) or Dr. Ryan James (614-424-7954 or jamesr@battelle.org).

Non-Radioactive Alternatives to Sealed Source Radiography Cameras

EPA and Battelle are soliciting vendors and collaborators for verification testing of non-radioactive alternatives to sealed source radiography cameras for industrial applications, including monitoring the integrity of pipes and tanks. Tests evaluating the performance of alternative, non-nuclear source devices against standard sealed-source radiography

cameras will be conducted at an industrial facility. Potential collaborators willing to support the testing of these devices at their facility are also sought. Interested vendors and collaborators should contact Stephanie Buehler (614-424-3972 or buehlers@battelle.org).

Notice to TTEP Quarterly Recipients: If you would prefer to receive the TTEP Quarterly electronically, please inform Dr. Ryan James (614-424-7954 or jamesr@battelle.org).