EPA Environmental Technology Verification Program for Source Water Protection

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It is generally believed that objective, independently acquired, high quality performance data and operational information on new technologies will significantly facilitate the use, permitting, financing, export, purchase, and general marketplace acceptance of such technologies.• The USEPA Environmental Technology Verification (ETV) program was established to provide such data and information to the customer groups in order to accelerate the real world implementation of improved technology.• One of the pilot programs established by EPA includes Source Water Protection (SWP) technologies.• NSF International was selected from an open solicitation to act as the EPA partner for the pilot.

The goal of the ETV program, and the SWP pilot, is to verify the environmental performance characteristics of *commercial-ready technologies* through the evaluation of *objective and quality assured data*, so that potential purchasers and permitters are provided with an *independent and credible assessment* of what they are buying and permitting.•• There are five critical elements to achieve this goal:

- Fairness - consistent testing available to all vendors of commercial-ready technologies within defined categories being evaluated.
- Objectivity - all ETV testing conducted by objective, third-party testing organizations having no financial or other interests in the technology.
- Technical soundness - standardized protocols and test plans, which are publicly available and reproducible at different testing locations, will be used for ETV SWP pilot testing.
- Transparency - results of testing will be publicly available through published reports, and available on the ETV and NSF web sites.
- Quality - the ETV program and SWP pilot operate under quality management plans and through quality assurance/quality control procedures that assure reliable test results.

The Source Water Protection (SWP) pilot was established to provide verification of technologies that protect ground and surface waters from contamination that degrade the value of the water as a source for drinking water.• The pilot is actively developing test plans and protocols for several different technology areas, including urban infrastructure rehabilitation technologies.• Four specific infrastructure areas have been selected:

- Coating materials for corrosion control

- Grouts used for infiltration control
- Pipe liner materials
- Pipe bursting technologies

Protocols and test plans are developed to answer the questions users, purchasers or permitters of a technology would ask before making a decision on whether to use the technology. The protocols and test plans are developed by consultants contracted with the SWP pilot, with input from technical experts familiar with the technology. The documents are then made available for general stakeholder comment before being finalized. The efforts include:

Coatings for Corrosion Control

These are materials, primarily paints or sealers, that provide for corrosion control, and are not intended to provide structural support. The pilot is building on the work completed by Dr. Vipu at the University of Houston's CIGMAT group. A draft test plan has been prepared and is under review. The basic issues the plan address include the ability of the coatings to adhere to concrete or brick surfaces when applied under wet or dry conditions. Evaluation of these issues will be by three different evaluations - a hydrostatic test, bonding test and chemical test. The hydrostatic test will demonstrate the ability of the coating to adhere to saturated concrete pipe, while the bonding test will determine the bonding strength of the materials to concrete pipe and clay bricks using tensile tests. The chemical test is completed by immersing coated concrete and brick samples in acid, with holidays (holes in the coating) to evaluate the coating adherence with chemical attack of the base material. The test duration is from three months to a year. Testing is expected to begin later this spring or summer.

Grouts for Leak Control

These materials are generally non-structural in nature, being used to control the infiltration of water into a sewer pipe, or pump station or treatment plant wall. As with coating materials, the SWP pilot is working with Dr. Vipu and CIGMAT at the University of Houston. A draft test plan has been prepared and is under review. The grouts will be evaluated to determine the ability of the grout to be applied and to withstand a variety of environmental conditions. The grout materials will be characterized as part of the evaluation so the specific combination of additives, accelerants, etc. are known. The mechanical durability of the grouts and grouted soils will be evaluated, as will the performance of the grouts under both dry and wet conditions. The test duration is about six months, and testing is expected to begin later this spring or summer.

Pipe Liner Materials

These are mostly thermoset or thermoplastic materials used for repair of damaged sewers. The pilot is working with Dr. Barbero at West Virginia University on the test plan, which is in the final stages of review and should be completed soon. The verification will be completed in a laboratory evaluation to determine the short term modulus of the materials, which can be used to predict the long term performance in use. There will also be confirmation of the material to provide a user with information to know that a material in

field use is the same as the verified material.&#65533; The test duration is about three weeks, and testing is expected to begin this spring.

Pipe Bursting Technologies

These technologies allow for pipe replacement with a minimum of excavation and trench, providing for breaking of the existing pipe and expansion of the pieces to allow a new pipe material to be pulled or jacked into position behind the bursting head.&#65533; The test protocol is under development, and the first draft is expected to be completed in late February or early March.&#65533; Some of the factors to be verified include the scoring of the replacement pipe by the broken pipe, longitudinal strain on the replacement pipe during installation, onsite weld verification, grade alignment, the effect of the bursting operation on surrounding buried utilities, joint stabilization of rigid pipe during installation, and watertightness of the finished product.&#65533; The test duration is to be determined.&#65533; The draft protocol will be made available to any stakeholder to comment on following review by the tech panel.&#65533; Testing is expected to begin this summer.

Because the verification testing is completed with federal funds, any testing initiated under the pilot will be completed and the results of the testing will be reported.&#65533; The end products of the verification are a verification report and a verification statement.&#65533; The verification report contains all of the detail of the testing, including descriptions of the technology, the testing protocol and testing results.&#65533; The verification statement, which is signed by both USEPA and NSF International, is a summary of the verification report and can be used by the vendor in making contacts with potential purchasers and regulators.&#65533; These reports and statements are posted on the USEPA (and NSF (web sites.&#65533; Examples of technologies verified for other pilots are posted on each of the sites.

If you have any questions, please contact **Dr. C.Vipulanandan**