

Environmental Technology Verification Program

JULY 2002

QUARTERLY REPORT

ETV Takes Important Role in Homeland Security Technology Verifications

As everyone is aware, the events of September 11 have catapulted homeland security needs to the forefront of our Nation's priorities. The U.S. Environmental Protection Agency (EPA) is now engaged in identifying and filling data and informational gaps with our sister agencies, departments, and the Office of Homeland Security. As part of EPA's effort, the Environmental Technology Verification (ETV) Program has been tapped to verify the performance of technologies that can be used to monitor and ensure the quality of the Nation's drinking water supplies, technologies for use in monitoring indoor environments in buildings, and technologies for cleaning up contamination from intentional acts.

Under a funding agreement with EPA's Office of Water, three ETV centers are being enlisted for developing protocols and testing technologies related to insuring the security of the Nation's water supplies. The Advanced Monitoring Systems Center, in cooperation with Battelle, will develop protocols and test technologies for detection of chemical and biological warfare agents in drinking water. The ETV Drinking Water Systems Center, operated by NSF International, will develop protocols and test technologies for point of use treatment of biological and chemical contaminants. Finally, the new ETV Water Quality Protection Center, also operated by NSF International, will develop protocols and test technologies for treating wastewater resulting from

decontamination of buildings that have been intentionally contaminated. New or expanded stakeholder groups and technical panels will be forming in early Fall 2002. Developers and vendors of technologies that can be enlisted to support these efforts are encouraged to contact these ETV centers.

A new EPA Safe Buildings Program calls for ETV testing of technologies that can be used to monitor, measure, and detect chemical and biological warfare agents in commercial and public buildings. Due to the continuing threat of additional sudden and unexpected chemical and biological terrorist attacks, federal, state, and local first responders must be prepared to rapidly assess the presence and levels of contaminants to mitigate harm to the public and the environment. Further, public and private-sector buildings that house the Nation's workforce may be targets of future terrorist attacks, as they represent locations where many hundreds or thousands of people congregate during their work days. EPA has responsibility for protecting human health and the environment from accidental and intentional releases of hazardous and toxic materials. In the interest of expanding our national readiness against future attacks, the Agency must identify and evaluate the tools for measuring contaminants in and on a variety of matrices including soil, dust, air, and on surfaces. In 2002, the EPA Office of Research and Development plans to fund initial efforts, including two ETV centers for evaluating technologies that safeguard building air systems and provide effective cleanup of air systems in the event of contamination. The two centers are the ETV Air Pollution Control Technology Center, managed by Research Triangle Institute, and the Advanced Monitoring Systems Center, operated by Battelle. In early Fall 2002, ETV anticipates forming new or extending existing

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Center Stage

ETV Advanced Monitoring Systems Center

Advanced Monitoring Systems

- Solicited vendors of technologies that detect ammonia "slip" emissions.
- Solicited vendors for Phase II testing of mercury continuous emissions monitors.
- Solicited vendors of monitoring technologies applicable to homeland security needs including those that can detect biological and chemical agents such as anthrax, explosives, or cyanide.
- Held a meeting of the Water Stakeholder Committee on May 21 in Madison, WI, during the National Water Quality Monitoring Council meeting.
- Presented at the 95th Annual Conference and Exhibition of the Air and Waste Management Association in June.
- Completed verification testing of a portable multi-gas emission analyzer at the College of Engineering - Center for Environmental Research and Technology, University of California, Riverside, CA.
- Completed verification testing of four portable arsenic water analyzers in three Ohio counties.
- Began verification testing of multi-parameter water probes in fresh and brackish waters on June 24 in Charleston, SC.

Site Characterization and Monitoring Technologies

- Held a vendor meeting with Geoprobe Systems in May.

ETV Air Pollution Control Technology Center

- Held technical panel meetings for selective catalytic reduction and fuels/fuel additives/lubricants on June 4 and 5.
- Solicited vendors of mobile source, NOX, and volatile organic compound emission controls and dust suppressants for unpaved roads.
- Presented at the 2002 International Conference on Incineration and Thermal Treatment Technologies in May.
- Participated in an expert panel on "Potential Environmental Impacts of Dust Suppressants" sponsored by EPA Region 9 and University of Nevada at Las Vegas, Department of Civil and Environmental Engineering in May.
- Presented at the Fluid Bed XIV Conference, Council of Industrial Boiler Owners in May.
- Presented at the 95th Annual Conference and Exhibition of the Air and Waste Management Association in June and the Emissions Control 2002 Conference in July.

ETV Greenhouse Gas Technology Center

- Exhibited at the 2002 Southeast Green Power Summit in May.
- Presented at the Working Session to Develop the Technical Framework for a DOE/USDA Joint Initiative and GHG and Soil Carbon Measurement and Monitoring Systems in June.
- Completed verification testing of COMM Engineering's EVRU Vapor Recovery System.
- Held a vendor meeting with Conoco, Inc. in July.

ETV Drinking Water Systems Center

- Solicited vendors of technologies related to arsenic reduction using sorptive media, ion exchange, and activated alumina.

- Revised Vendor and Field Testing Organization Guidance Manuals to reflect recent policy and procedural changes.
- Presented at the Association of State Drinking Water Administrators Advanced Technologies Conference in April/May and at the American Water Works Association Annual Conference and Exhibition in June.
- Completed field testing for verification of the Polymem UF 120 S2 Ultrafiltration Membrane Module in Green Bay, WI.
- Held a teleconference of the stakeholder workgroup to discuss a draft of new procedures for conducting low-pressure membrane microbial challenge tests using cryptosporidium and/or surrogates.
- Completed revisions of a number of Test Plans and Protocols for removal of microbial contaminants, disinfection by-product precursors, arsenic, nitrate, volatile organic compounds, synthetic organic chemicals, radioactive chemicals, and inorganic constituents.

ETV Water Quality Protection Center

Source Water Protection Technologies

- Began verification testing of high-rate UV disinfection technologies at a wastewater treatment plant in Parsippany-Troy Hills, NJ.
- Completed the test plan for solids separation technologies for flushed swine wastes.
- Began verification testing of a swine waste solids separator at North Carolina State University.
- Held a Ballast Water Stakeholder Advisory Group Meeting on June 18 in Alexandria, VA.
- Presented at the National Environmental Health Association 67th Annual Educational Conference in June.

Wet Weather Flow Technologies

- Began verification testing of high-rate UV disinfection technologies at a wastewater treatment plant in Parsippany-Troy Hills, NJ.
- Completed verification testing of two flow meters under laboratory conditions at the Utah Water Research Laboratory, Utah State University and under field conditions in a sewer line in Quebec City, Canada.
- Began testing of a pressurized filtration technology for treatment of stormwater runoff in Green Bay, WI.
- Presented at the Oregon Association of Clean Water Agencies Stormwater Symposium in May.
- Completed verification testing of a wet weather flow computer model.

ETV Pollution Prevention, Recycling, and Waste Treatment Systems Center

P2 Innovative Coatings and Coating Equipment

- Presented at the Painting Technology Workshop 2002 sponsored by the University of Kentucky Painting Consortium in June.
- Presented at the 95th Annual Conference and Exhibition of the Air and Waste Management Association in June.

P2 Metal Finishing Technologies

- Presented at the American Electroplaters and Surface Finishers Society SUR/FIN 2002 Conference in June.

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stakeholder groups and technical panels to accomplish safe buildings protocol development and technology verification. Technology vendors and developers are also being solicited. President Bush's proposed 2003 budget calls for expanded funding for EPA's safe buildings effort.

Verifying Arsenic Treatment and Detection Technologies

ETV is responding to the need for credible performance data on arsenic treatment and detection technologies in light

of the new federal standard for arsenic in drinking water of 10 ppb (parts-per-billion = µg/L), to be met by 2006. The previous maximum acceptable level - 50 ppb - was in effect for nearly half a century. Moreover, these technologies are critically needed in countries such as India and Bangladesh, where well-intentioned development of shallow drinking water wells has exposed millions of people to arsenic poisoning from naturally contaminated groundwater.

ETV Drinking Water Systems Center (DWS) begins cooperative studies with Pennsylvania and Alaska

In 2001, NSF International, EPA's partner for the ETV DWS Center, successfully verified four technologies for arsenic reduction. Building on this work, the ETV DWS Center plans to test and report on additional arsenic technologies that will help small communities comply with the new arsenic maximum contaminant level (MCL). The ETV DWS Center and the Pennsylvania Department of Environmental Protection have announced a cooperative arsenic treatment technology study. The proposed ETV testing is expected to involve three Pennsylvania community water systems that have arsenic in their source water exceeding the new MCL, and that appear to be representative of other small communities. An initial meeting of Pennsylvania state regulators, the communities, and representatives of NSF, for the arsenic small systems project was held on July 16, 2002 in Harrisburg, PA. Current plans call for ETV testing to commence in Fall 2002. Vendors committed to participating include ADI International, Inc., Tetra Process Technologies, Subsidiary of Severn Trent Services, Water Remediation Technology LLC (WRT), and Kinetico Incorporated with Alcan Chemicals.

The ETV DWS Center and the University of Alaska at Anchorage, an EPA Technology Technical Assistance Center, have also been working together in a small-system arsenic ETV test. Three sites were identified for possible ETV testing of arsenic small systems technologies. Current plans call for the testing to commence in late 2002. A request for arsenic treatment technologies remains open for sites in Alaska.

The four technologies verified by the DWS Center in 2001 are: Watermark Technologies LLC's eVOX® Model 5 Coagulation/Filtration System; TFC®-ULP4 Reverse Osmosis Membrane Module by Koch Membrane Systems; CPS100CPT Coagulation and Filtration System by Kinetico, Inc.; and ESPA2-4040 Reverse Osmosis Membrane Element Module by Hydranautics. During the ETV field-testing in Park City, UT, these products produced water with arsenic levels at less than 5 micrograms per liter.

ETV Advanced Monitoring Systems Center (AMS)

ETV's AMS partner, Battelle, has completed verification tests of four portable devices for determining total arsenic in water. Three of the devices are test kits that determine arsenic semi-quantitatively, by producing a color change that is visually or electronically compared to a standard reagent color chart. The fourth device is a portable analyzer that determines arsenic quantitatively, using an electrochemical technique called anodic stripping voltammetry. The tests were conducted with fresh water, treated and untreated well water, and public drinking water systems in three central Ohio counties.

The arsenic analyzers were tested at arsenic concentrations ranging from 1 to 100 ppb. All samples were also analyzed for arsenic by a laboratory reference method (ICP/MS) for comparison to the results from the portable devices. Performance parameters included accuracy, precision, linearity, method detection limit, matrix interferences, operator bias, and the rate of false positives/negatives relative to a 10 ppb decision level. Among the samples used for testing were treated and untreated well water from a rural elementary school where Battelle is conducting tests for EPA of an arsenic removal system. All four devices were operated during testing by both a skilled and an unskilled operator, to assess whether technical expertise was necessary to obtain valid data.

Verification reports on the four arsenic monitoring devices are in the final approval stage with EPA. Planning for a second round of arsenic verification tests is in progress. Technologies capable of separately determining different oxidation states of arsenic in a sample such as As(III) vs. As(V) are of particular interest for further tests.

Web Watch

- ET✓ The ETV Web Site has been updated to meet EPA requirements. Visit the *New ETV Web Site* at <http://www.epa.gov/etv/>.**
- ET✓ The June 2002 issue of *The Monitor* from the ETV Advanced Monitoring Systems Center has been posted at http://www.epa.gov/etv/pdfs/newletters/monitor/01_mon_jun02.pdf.**
- ET✓ The first edition of the quarterly ETV water newsletter *ETV Update* featuring activities of the Drinking Water Systems Center and the Water Quality Protection Center is available at <http://www.epa.gov/etv/pdfs/newletters/nsf/win2002.pdf>.**

ETV Calendar

Date	Location	Event
August 19-22	San Antonio, TX	ETV Program - ETV exhibit at the 7th Annual Joint Services Pollution Prevention and Hazardous Waste Management Conference and Exhibition
Sept 8-13	Portland, OR	ETV Water Quality Protection Center - Source Water Protection technologies presentation at the 9th International Conference on Urban Drainage
Sept 11	Orlando, FL	ETV Water Quality Protection Center - Source Water Protection Technology Pilot's Watershed Protection Technologies Stakeholder Advisory Group Meeting
Sept 18	Research Triangle Park, NC	ETV Air Pollution Control Technology Center - Stakeholder Advisory Committee Meeting
Sept 28-Oct 2	Chicago, IL	ETV Water Quality Protection Center - Wet Weather Flow technologies presentation at the Water Environment Federation 75th Annual Technical Exhibition and Conference.
Sept 30-Oct 3	Salt Lake City, UT	ETV Drinking Water Systems Center - Exhibit at the Association of State Drinking Water Administrators Annual Conference

For more details on ETV events, check out our online calendar at <http://www.epa.gov/etv/calendar/02-07.html>.

Four ETV Centers Verify Seven Technologies

Four ETV centers recently completed seven verifications, increasing the total number of verified technologies to 177.

The ETV P2, Recycling, and Waste Treatment pilot verified the performance of two insulating dielectric fluids. Cooper Power Systems' Envirotemp® FR3™ Insulating Dielectric Fluid is used in electrical apparatus requiring a liquid dielectric coolant. The Envirotemp® FR3™ is currently used in pole, padmount, network, and small and medium power transformers with a voltage rating of 35kV and a maximum rating of 10 MVA. ABB's BIOTEMP Vegetable Oil-Based Insulating Dielectric Fluid is used in liquid-filled electrical transformers to act as an electrical insulating medium, and to transport heat generated in the transformer around the windings, core and connected circuits to cooling surfaces.

The ETV Drinking Water Systems Center verified the performance of two ultraviolet radiation disinfection technologies. Trojan Technologies' UVSwift 4L12 System is a medium-pressure ultraviolet radiation system used for inactivation of MS2 virus in drinking water. Atlantic Ultraviolet Corporation's Megatron Unit Model M250 is a reactor with low-pressure UV lamps and is also used for the inactivation of MS2 virus. Both technologies are

designed specifically for municipal drinking water applications.

The ETV Greenhouse Gas Technology Center verified the Phase II performance of MIRATECH Corporation's GECO 3001 Air/Fuel Ratio Controller. The GECO Controller is designed to improve performance of natural-gas-fired, four-cycle, lean-burning reciprocating engines by optimizing and stabilizing the air/fuel ratio over a range of engine operations and conditions. The Phase II verification of the GECO Controller evaluated oil degradation over an 8-month period.

The ETV Air Pollution Control Technology Verification Center verified the performance of two baghouse filtration products. BWF America's Grade 700 MPS Polyester Felt is a micro-pore-size high efficiency scrim supported felt, singed cake side, and is used primarily to control PM2.5 emissions. W.L. Gore and Associates' LYSB3 Filter Sample was also verified.

The Verification Reports and Verification Statements for these technologies are available on the ETV Web Site at <http://www.epa.gov/etv/verifications/verification-index.html>.

July 2002

EPA/600/R-02/061