



U.S. EPA Environmental Technology Verification (ETV) Program
Advanced Monitoring Systems (AMS) Center
Air Stakeholder Committee Teleconference
Thursday, May 28, 2009

Attendees

John Bosch, Environmental Consultant
Ernest Bouffard, Connecticut Department of Environmental Protection
Chuck Dene, EPRI
Raul Dominguez, South Coast Air Quality Management District (SCAQMD)
Rudy Eden, SCAQMD
Philip Galvin, New York State Dept. of Environmental Conservation
Doug Grosse, EPA
Scott Hamilton, EPA Region 5
Tess Hammons, EPA
Loretta Lehrman, EPA Region 5
Dennis Mikel, EPA
Will Ollison, American Petroleum Institute (API)
Roy Owens, Owens Corning
Joann Rice, EPA
Don Stedman, University of Denver
Eben Thoma, EPA

ETV AMS Center Staff:

Ken Cowen, Battelle
Amy Dindal, Battelle
Teresa Harten, EPA
Michelle Henderson, EPA
Tom Kelly, Battelle
John McKernan, EPA
Rachel Sell, Battelle
Abby Waits, EPA

Welcome

Rachel Sell, Battelle AMS Center Stakeholder Coordinator, welcomed committee stakeholders and AMS Center staff, took roll call of the participants in the teleconference, and provided an overview of the agenda.

ETV Updates and AMS Center News

Recent EPA funding awards

Dr. John McKernan, AMS Center EPA Project Officer, announced that the ETV AMS Center has received support from the EPA Environmental Technology Council (ETC) to fund four proposals for verification of water monitoring technologies:

- Evaluation of Nitrate Sensors for Groundwater Remediation Monitoring
- Pathogen Monitors for *E. coli* and Total Coliforms in Water
- Testing Toxic Blue-Green Algae for Microcystins in Freshwater Sources
- Monitoring Technologies for Measuring Stored Carbon Dioxide from Sequestration Applications.

These technology categories have been priorities for the AMS Center stakeholders. All four projects will involve AMS testing of novel and potentially cost-effective monitoring technologies to provide results in short time frames. The four proposals were selected from more than 20 monitoring technology proposals submitted to the ETC for consideration.

There already are some vendors interested in testing. Oklahoma Department of Agriculture has sites for the nitrate sensor evaluation, Nebraska Department of Environmental Quality (NDEQ) for microcystins, and EPA Region 7 for carbon sequestration.

Climate change technology verification ideas

Dr. McKernan also presented several ideas for consideration:

- Continuous emission monitors at manufacturing facilities to support the proposed greenhouse gas (GHG) reporting rule. This would leverage existing ETV test/quality assurance plans (TQAPs) for stack emission devices and ambient monitoring.
- Particulate monitors (PMs) to monitor carbon black emissions are being proposed. These efforts will leverage existing ETV TQAPs for particulate monitoring.
- Continuous monitors for coastal water quality (including dissolved oxygen, pH, and other water quality parameters) deployed and evaluated in marine settings. This would leverage existing ETV TQAPs for continuous water quality monitoring in coastal environments developed with NOAA.

A stakeholder asked what specific technology was being considered for particulate monitors for black carbon emissions. Dr. Tom Kelly (Battelle) mentioned laser incandescent technology (heat particles to a glowing state). Will Ollison (API) noted a laser photoacoustic technique and will provide the name of a vendor of black carbon aerosol monitors. Don Stedman (University of Denver) noted the Houston Atlas carbon monitor that has been used for many years. Joann Rice (EPA) also knows of 4-5 vendors who have technology that could possibly be evaluated.

Verification Test for Field Monitoring for Aerosols and Gases

Dr. Ken Cowen, Battelle, discussed the results of the 30-day field test of duplicate MARGA systems completed in the fall of 2008 at the EPA site in RTP, NC. Applikon's Monitor for Aerosols and Gases in Air (MARGA[®]) was the only identified field deployable ion chromatograph fully capable of meeting the analysis and data transfer needs of EPA's Clean Air Markets Division (CAMD). The stakeholders were able to follow the presentation on slides received before the teleconference. He presented some general information on the results of the

verification test, since the report is at EPA in the final approval stage. The final verification report and statement is expected to be released soon on the ETV web site.

Discussion:

Don Stedman suggested that scatter plots of the results from the duplicate MARGA units would be helpful. Dr. Cowen indicated that, in the report, comparison of the time series plots for the duplicate MARGAs will illustrate the agreement between the two, and that different metrics are used to quantify precision of the MARGAs.

Airborne Remote Sensing for Methane/Ethane Leaks

Dr. Cowen discussed the progress being made on the joint U.S./Canada ETV verification testing of airborne remote sensing technologies: Synodon realSens (Canada), a passive ethane detector, has committed to participating in the joint verification test. At least one other vendor, ITT Airborne Natural Gas Emission Lidar (U.S.), an active methane detector, has expressed interest in participating. The stakeholders were able to follow the presentation on slides received before the teleconference. He presented:

- A proposed outline of the test design;
- A tentative schedule, including plans to conduct a technical panel conference call to discuss testing parameters on June 1, 2009. No vendors will be invited to participate in the technical panel conference call; however, a follow-up meeting to outline the test design derived from input received from the technical panel will be presented to prospective vendors during a vendor teleconference which will follow soon after the technical panel call.

John Bosch (Environmental Consultant) was concerned about funding coming from a Canadian research foundation that has been funded in part by the Canadian government. In his opinion, it gives the perception of an unfair advantage to one vendor, as the Canadian groups are providing funding to verify a technology from one Edmonton-based company. Mr. Bosch said that any and all funds coming into ETV should support a common set of testing to support as many commercial entities as possible rather than one vendor. Dr. McKernan replied that this was not different from a U.S. company getting funding from the EPA Small Business Innovative Research (SBIR) or DoD's ESTCP program and using it to verify their technology through ETV. Teresa Harten (EPA) joined the discussion, commenting that ETV is looking for more opportunities to collaboratively fund verifications. This is different from the way ETV operated in the mid-1990s where EPA was providing funding support for testing; now we need collaborators and partners to support testing. However, this is consistent with the original design of the ETV program --- to become self-sufficient (or close to) over time. Ms. Harten noted that there is concern that if no testing funds come from the EPA, it will result in only large companies being verified, with smaller companies that cannot afford verification being left out. Additionally, Mr. Bosch indicated that his main objective in raising his concern (see above) was to alert ETV and stakeholders that there might appear to be a potential appearance of locking out small U.S. vendors due to high marginal costs of participating and therefore to take precautionary steps as needed. As such, ETV is currently tracking the size of vendors entering the program.

Will Ollison (API) asked whether both Canadian and U.S. ETV programs approve the final report. Can either group "censor" the documents by taking out information? Amy Dindal replied that both the U.S. and Canadian ETV programs will review and approve the report in order for it to be a jointly verified technology.

Update on Current and Developing Verification Tests

Dr. Tom Kelly, Battelle, presented a comprehensive review of the following technologies. The stakeholders were able to follow the presentation on slides received before the teleconference.

- **Leak Detection and Repair (LDAR) Devices at Petroleum Refineries and Chemical Plants**
These are infrared cameras that allow simultaneous visualization of leaks from multiple valves, flanges, seals, etc. in industrial facilities, instead of sending humans out to test thousands of such individual components in a facility with an organic vapor analyzer, an expensive and dangerous operation. Vendors participating in the verification include: GasFindIR by FLIR and Sherlock VOC by Pacific Advanced Technology.

Discussion:

Don Stedman asked if the testing will answer the question, if a company has 2000 fittings, did an individual going around to check all of them find a different number of leaks than the infrared cameras would? Dr. Kelly replied that ETV checked pipes that the company thought might be leaking. These were targets that the cameras should have seen. Dr. Stedman pointed out that the method is supposed to help the plant/refinery operator, so the test should show whether the method is more efficient than a guy walking around the plant, i.e., preferable to Method 21. He'd like to see the percentage detected out of all the fittings in the plant. Eben Thoma (EPA) commented that manual sniffing is time consuming and expensive. There are also safety issues from climbing high fixtures. And there are the sheer numbers to be tested. Dr. Stedman reiterated that the technology is potentially useful to the refinery/petrochemical operator, but how many leaks are you missing? Under what conditions are they difficult to detect? Dr. Kelly said that the report will evaluate the time and labor needed for use of the cameras so that these determinations can be made. In the laboratory portion, ETV tried to determine the smallest leak detectable.

- **Radio Frequency Identification (RFID) for Hazardous Waste Package Tracking**
A verification test was conducted near El Paso, TX, in March 2009 with two vendors participating: Private Pallet Security Systems (P2S2) and Avante International Technology. Reports will be published by the end of the fiscal year.
- **Alternative Nonradioactive Technologies to Devices with Radioactive Sources**
A potential technology would provide a non-radioactive source of energy for radiography cameras: e.g., pulsed x-ray, ultrasound, portable x-ray, and computer-assisted tomography devices. This area is of interest to EPA's Office of Air and Radiation.
- **Odor Management System**
Potential field test sites for OdoWatch System (OdoTech, Montreal, Canada): Dayton, OH municipal WWTP, and Columbus, OH. The AMS Center has completed discussions with OdoTech with regards to experimental design, in collaboration with SCAQMD, and we are awaiting OdoTech's decision about providing financial support for testing. Concurrence was received on this technology category during the last call.
- **Ozone Detector Card**
Potential lab and field testing of Enviroscan's color-indicating ozone cards is being pursued with Breathe California. Concurrence was received on this technology category during a previous call.

Discussion:

Will Ollison commented that exposure to direct sunlight is something to consider as an interferent; it affects other passive ozone monitors. This factor will be included in the testing of the cards to the extent possible. Dr. Ollison also noted that when used as a personal exposure monitor, the card should stand away from the body by a couple inches to avoid efficient ozone scavenging by skin, hair, and clothing surfaces (e.g., on the bill of a cap).

- Cavity Ringdown Spectroscopy (CRDS) Instruments
 - Power plant NH₃ applications (Picarro, Inc.)
 - Carbon sequestration (collaboration with EPA Region 7)
 - Gas intrusion
 - Confined Animal Feeding Operations (CAFO) monitoring

Concurrence was received on this technology category during a previous call.

Discussion:

Will Ollison commented on the reference method for ammonia in the CAFO test and questioned why the EPA Office of Research and Development (ORD) method, and not the SCAQMD method already being used in the ongoing CRDS power plant test, is being proposed. Chuck Dene (EPRI) commented that they use the SCAQMD method and have no experience with the ORD method, which is why EPRI suggested the SCAQMD method. After the call, Dr. Cowen clarified that the primary difference is that the SCAQMD method uses an ion selective electrode for analysis, providing results rapidly on-site, whereas the ORD method uses ion chromatography. Further consideration of these methods will be conducted before finalizing the CAFO test plan.

USEPA Region 5 Proposed Air Monitoring ETV(s)

Scott Hamilton, EPA, presented Region 5's interests in air monitoring. The stakeholders were able to follow the presentation on slides received before the teleconference. Together with Loretta Lehrman, he addressed:

- Continuous monitoring and data input
- Increased air monitoring around CAFOs, oil/gas production sectors, and landfills
- Pulsed fluorescence for hydrogen sulfide monitoring: CRDS, colorimetric, UV-DOAS.
- Both open path and point monitoring are of interest.

Discussion:

Eben Thoma said EPA was very interested in CRDS and was conducting a pilot test in Danville, IN using a mobile tracer dilution method. Dr. Thoma further commented that CRDS does appear very promising for a handful of compounds, based on ruggedness and sensitivity, but requires method development work.

Stakeholder Input – Monitoring Technologies on the Horizon?

No additional input was received.

Recap of Priorities, Action Items, and Next Meeting by Rachel Sell

- The next teleconference will take place some time in September/October.
- The AMS Center will be looking for stakeholder reviewers for the TQAP for alternative technologies to devices with radioactive sources, should testing proceed in this area.
- Will Ollison and Joann Rice will provide the names of vendors for black carbon aerosol monitoring technologies.

Adjourn