U.S. EPA
OFFICE OF AIR QUALITY PLANNING AND STANDARDS
AIR QUALITY ASSESSMENT DIVISION

$PM_{2.5}$ Speciation Network Newsletter

Issue 6 Summer 2009

Special points of interest:

- **Modification of STN carbon sampler conversion**
- **Cyclone Cleaning**
- **New CSN vs IMPROVE Carbon data comparison**

Inside this issue:

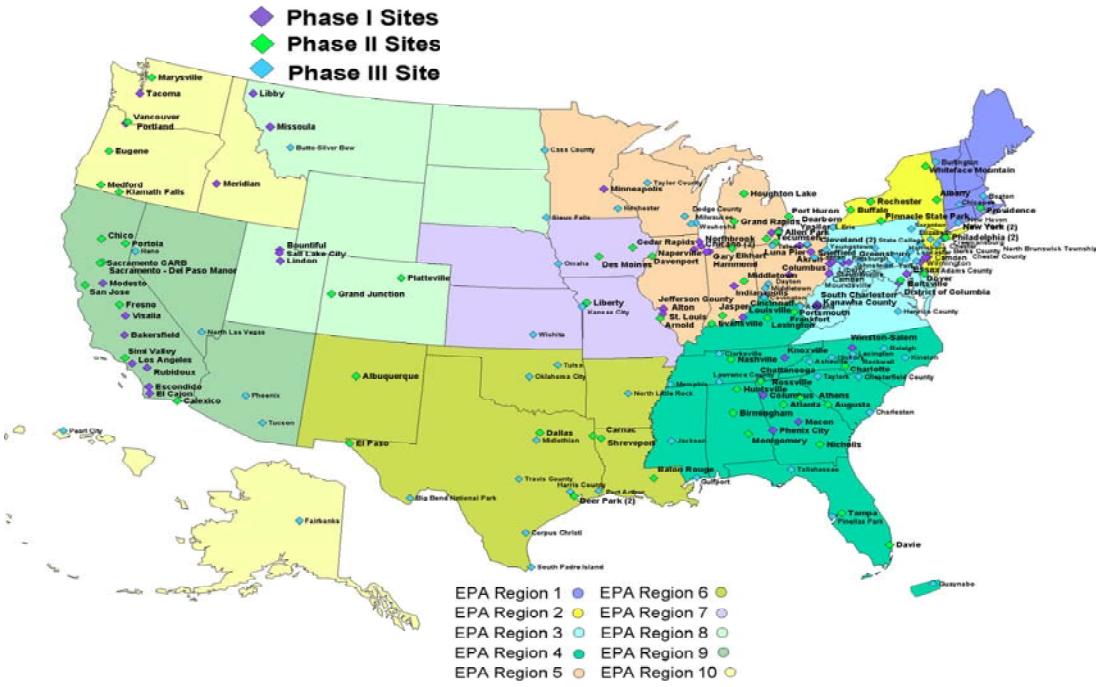
Carbon Channel Conversion Update

In April 2005, the Clean Air Scientific Advisory Committee, CASAC, provided recommendations to EPA for making changes to the Chemical Speciation Network, CSN, to improve data comparability with the rural Interagency Monitoring of Protected Visual Environments, IMPROVE, carbon concentration data. To accomplish this, EPA decided to replace the existing carbon channel sampling and analysis methods with a new modified IMPROVE version II Module C sampler, the URG3000N. The implementation process was broken into three phases:

- Phase I, which consisted in 56 sites, began in May 2007.
- Phase II, consisted of 63 sites, began in April 2009.
- Phase III, 78 sites, is currently being implemented and is scheduled to begin October 2009.

This change in sampler technology and the associated filter analysis technique will provide the national consistency of the CSN and IMPROVE networks of the carbon concentration data that both EPA and CASAC recommend.

More information or questions in regards to this conversion, contact David Shelow at Shelow.David@epa.gov or 919-541-3776.



CSN Lab Analysis Contract awarded to RTI

Research Triangle Institute, RTI, has been awarded the EPA speciation contract lab for 2009-2014. RTI handles the preparation, shipment, analysis of samples, and AQS reporting for all 52 STN sites and most of the supplemental SLAMS sites.

The notable changes with the new contract are:

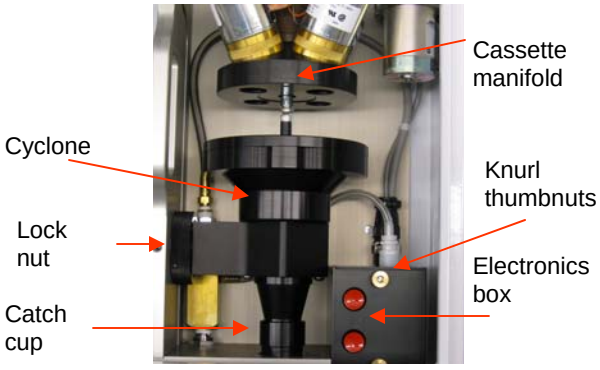
- Offer suite of analysis (gravimetric, XRF, ions/IC) as one line item.
- 33 elements analyze by XRF.
- 14 elements by ICP/MS.
- Supporting only MetOne SASS, MetOne SuperSASS, and URG3000N samplers.
- Optical Density Analysis.

RTI ships about 20,000 samples per year in support of the speciation network. In order to continue to reduce the program's shipping cost, RTI will maintain the new cold shipping boxes. All filter modules will be shipped to the sites overnight using Fed

URG 3000N Cyclone Removal/Cleaning Procedure

It is recommended to periodically clean the URG3000N cyclones to ensure optimum performance of your sampler. Depending on the quality of air at your site location, the frequency of cleaning may vary. We recommend cleaning at least once semi-annually. The following instructions provide guidance for cleaning.

Step 1: Raise top portion of CASSETTE MANIFOLD by pressing top red button on electronics box and Remove sampling cartridges.



Step 2: Loosen the ELECTRONICS BOX (knurl thumbnuts); although removal of the ELECTRONICS BOX is not necessary, it will make removal of the CYCLONE and bottom portion of CASSETTE MANIFOLD assembly easier.

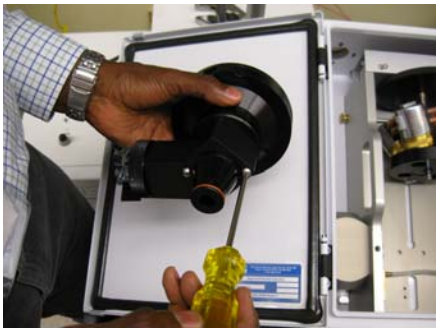
Step 3: Loosen the lock nut that connects the CYCLONE to the INLET TEE (turn towards the operator).

Step 4: Gently, but firmly, wiggle the CYCLONE and CASSETTE MANIFOLD assembly, angling the assembly such that the CATCH CUP swings from left to right and slowly remove the assembly.

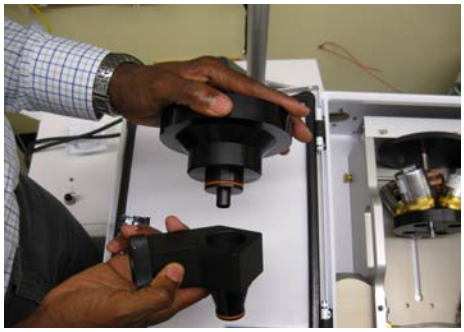
Step 5: Remove the CATCH CUP and inspect the interior. If the interior is not excessively dirty, clean with distilled water and a lint-free lab tissue. If heavy dirt is present, use isopropyl alcohol as your cleaning solution. If greasy/grimy residue is present, it will be necessary to clean the CATCH CUP with a sonicator. *(see picture on next page)*

Cleaning of URG3000N Cyclone procedure (cont'd)

Step 6: Remove the two screws holding the CYCLONE to the CASSETTE MANIFOLD.



Step 7: Gently separate the CYCLONE from the CASSETTE MANIFOLD and inspect the interior of the CYCLONE. Follow the same cleaning procedure provided for the CATCH CUP.



NOTE: If excessive greasy or grimy residue is evident in the CYCLONE, it will be necessary to not only clean the CYCLONE, but also clean the CASSETTE MANIFOLD. We recommend inspecting the CASSETTE MANIFOLD annually. This will necessitate removing the Allen bolts holding the CASSETTE MANIFOLD together.

Photo of dirty cyclone from field instrument.

Step 8: Clean CYCLONE by wiping with distilled water and lint free tissue If heavy dirt is pre sent use isopropyl alcohol as your cleaning solution. If greasy/grimy residue is present, it will be necessary to clean the CYCLONE with a sonicator.

Step 9: Once CYCLONE and CATCH CUP are cleaned, reassemble complete CYCLONE and CASSETTE MANIFOLD ASSEMBLY.

For more information or questions, contact Solomon Ricks at ricks.solomon@epa.gov or 919-541-5242.

Comparison of New CSN and IMPROVE Carbon Data in Birmingham

In May of 2007, OAQPS began Phase I of the carbon channel conversion project with the start of 56 sites (see page 1 of this newsletter). OAQPS worked with the regions and several monitoring agencies to successfully start Phase I. The primary objective of the conversion project was to obtain consistency between the carbon measurements made by both the CSN and IMPROVE monitoring networks. Now that Phase I sites have been operating for more than one year, it is a good time to begin to assess whether the overall goal of consistency in carbon measurements was met. There are 6 sites with continued collocation of CSN and IMPROVE carbon sampling and analysis methods. They are Atlanta, Birmingham, Detroit, Fresno, New York, and Pittsburgh. Of these 6 sites, only the Birmingham (site ID 01-073-0023) and New York (site ID 36-005-0110) CSN sites were converted in Phase I.

Changes were made to both the CSN sampling and analysis methods. The CSN sampler (for carbon only) was changed to the URG3000N which is very similar to the IMPROVE module C sampler. The URG3000N has active flow control and a flow rate of ~22 Lpm versus 6.7 Lpm for the most predominant CSN sampler (MetOne SASS). The CSN analysis method was changed from the NIOSH-like thermal optical transmittance (TOT) method to IMPROVE_A thermal optical reflectance (TOR). In addition to the sampling/analysis methods, the type and frequency of quartz blank filters was changed. For the URG3000N, the field blanks stay in the sampler for the duration of sampling (without flow) instead of being only momentarily exposed. Trip blanks, which are "travel" blanks used to assess any contamination during shipment, remained the same. A new backup quartz filter is collected using the URG3000N to help assess artifacts. The backup quartz filter is placed behind the routine quartz sampler filter. Five percent of the sampling events have field blanks, 3% trip blanks, and 30% backup filters.

Data from the Birmingham site were analyzed to assess comparability between CSN and IMPROVE carbon measurements before and after changes to the CSN sampling and analysis methods. Figure 1 shows the comparison between CSN and IMPROVE before the conversion in 2006. Data were adjusted for artifacts using the average field and trip blank value for the period. CSN (SASS) and IMPROVE OC and EC correlated well; however, IMPROVE EC was 30% higher than CSN EC and the OC was 28% lower than CSN. Figure 2 shows the comparison after the conversion. The average backup quartz filter was used for artifact adjustment in Figure 2. The new CSN (3000N) and IMPROVE correlations were very good and the slopes were very close to 1.00, indicating excellent agreement between CSN and IMPROVE after the conversion in Birmingham, AL. This shows that the goal of comparability was met in Birmingham. Data from New York, as well as the 4 other collocated CSN/IMPROVE sites should be evaluated when those data become available.

For more information, contact Joann Rice at rice.joann@epa.gov or 919-541-3372

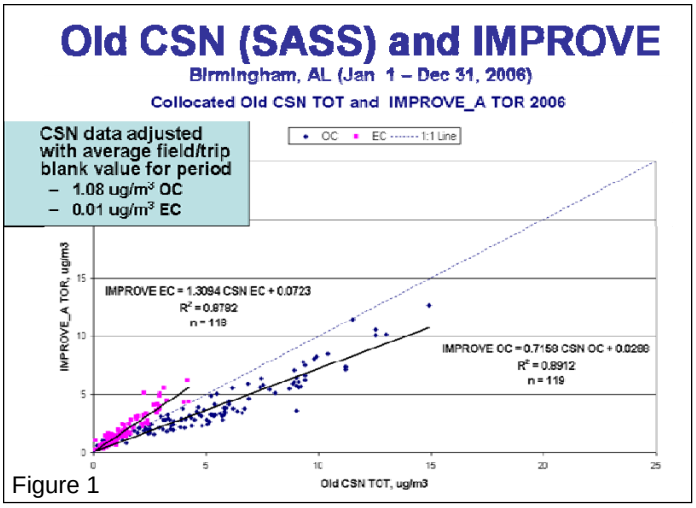


Figure 1

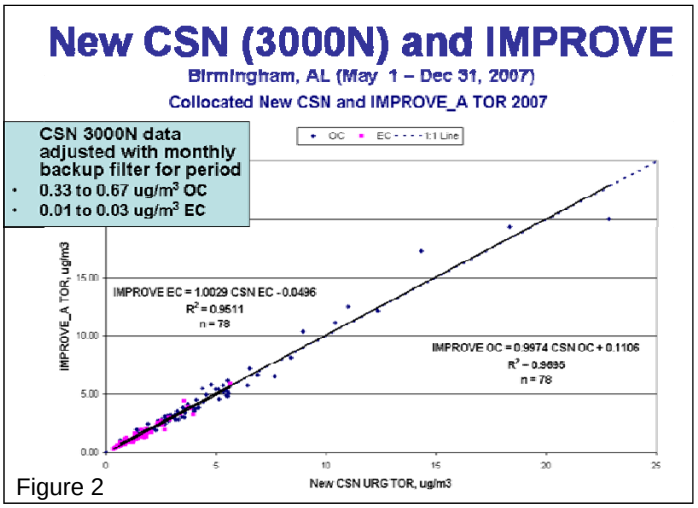


Figure 2

Upcoming Training and Conferences

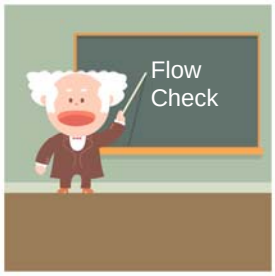
The Ambient Air Monitoring Group (AAMG) and ORIA are presenting **Speciation/IMPROVE Auditor's Training, August 24-27, 2009 in RTP, NC**.

The objectives are:

- Setup, calibration and programming of MetOne SuperSASS and URG3000N samplers
- Train Trainers for Auditing at SLT monitoring sites
- Technical Systems Audit (TSA) procedures

The workshop will be cover 3 and 1/2 days. To sign up, contact Solomon Ricks at *ricks.solomon@epa.gov* or 919-541-5242.
Or visit

http://www.epa.gov/ttn/amtic/qanews.html



• SAVE THE DATE •

2009 National Ambient Air Monitoring Conference

Gaylord Opryland Hotel
Nashville, Tennessee
November 2-5, 2009

EPA in conjunction with the National Association of Clean Air Agencies (NACAA) is pleased to announce the 2009 National Ambient Air Monitoring Conference.

GET ESSENTIAL TRAINING ON AIR MONITORING TOPICS!

Whether your previous air monitoring experience spans months, years, or decades, this conference can provide you with the skills to help prepare for the future challenges of air monitoring.
EPA's website (http://www.epa.gov/ttn/amtic/naamc.html)

Changes in the Audit Program

A reporting mechanism for CSN audit reports has been under construction for about two years and we are close to "launch." We have developed a site Technical Systems Audit (TSA) form, accompanied by a set of sampler performance verification or audit worksheets for the MetOne SASS/ SuperSASS and the URG 3000N. Copies of the newest version are available on AMTIC at http://www.epa.gov/ttn/amtic/specguid.html.

We expect SLTs to conduct TSAs of their CSN sites annually, and we are working toward semi annual sampler audits. (Quarterly audits will also be accepted). Monthly performance verifications by site operators should continue. We have incorporated a procedure to post monthly sampler performance verifications, so that if a critical flow failure is identified in a semi annual audit, the monitoring agency can identify the last date on which the sampler was known to be operating satisfactorily.

Upon completion, the TSA form and the worksheets will be sent electronically by the operators and auditors to a website managed by RTI. RTI will pull flow rate verifications and audit values out of the electronic reports and post that data as accuracy records into AQS. We are working on a data base to store all the TSA and sampler audit data. AAMG will conduct a series of conference calls to roll out the program in September and October of this year.

For more information or questions, contact Dennis Crumpler at crumpler.dennis@epa.gov or 919-541-0871.

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AIR QUALITY ASSESSMENT DIVISION

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The Newsletter is posted at www.epa.gov/ttn/amtic/speciepg.html

Surf AMTIC for Updates http://www.epa.gov/ttnamti1/speciepg.html

- The latest SOP for the URG3000N version 5.6
- Annual QA Data Summary reports from RTI
- Lab QAPP from RTI
- Coming soon...Field QAPP for Speciation
- Up-to-date Speciation list of Trend sites
- 2009 and 2010 Sampling schedules

$PM_{2.5}$ Speciation Program Contacts

OAQPS welcomes the new CSN Speciation Program Lead, Dave Shelow to the Ambient Air Monitoring Group. Dave comes to us from Pennsylvania State University and Restek Corporation. He is also Program lead for NCore Network and Ozone NAAQS.

Program Lead: David Shelow; 919-541-3776; *shelow.david@epa.gov*

QA Coordinator: Dennis Crumpler; 919-541-0871; *crumpler.dennis@epa.gov*

RTI Contract Manager: David Shelow; 919-541-3776; *shelow.david@epa.gov*

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Regions 5, 6, 7 — Patricia Schraufnagel; 312-886-5955; *schraufnagel.patricia@epa.gov*

Regions 8, 9, 10 — Michael Copeland; 303-312-6010; *copeland.michael@epa.gov*

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AAMG Group Leader: Lew Weinstock; 919-541-3661; *weinstock.lewis@epa.gov*

IMPROVE Steering Committee Chair: Marc Pitchford; 702-862-5432; *pitchford.marc@epa.gov*