



PM_{2.5} Chemical Speciation Network (CSN)

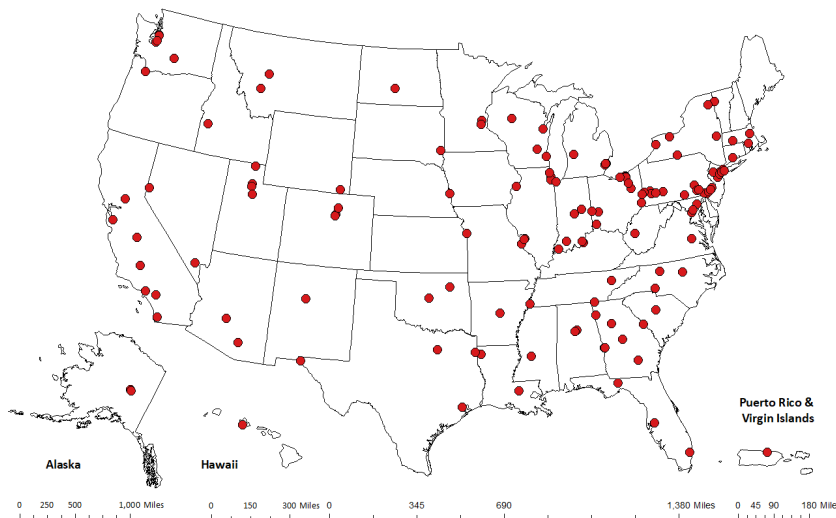
Bringing Back the CSN Newsletter

Believe it or not, the last CSN Newsletter was published in 2009! Over 10 years later and we think it is time to bring back the newsletter so that we can convey information on CSN that is useful to the State, Local, and Tribal (SLT) monitoring agencies and data validators, as well as users of CSN data. We plan to use the newsletter to let you know about all things CSN. We look forward to communicating with you.

If you have any questions regarding CSN, contact us using the CSNsupport@sonomatech.com email address. This email address puts you in touch with EPA, the sample handling/shipping and gravimetric laboratory (Wood PLC), the sample analysis laboratory (University of California at Davis), and the CSN Data Analysis and Reporting Tool (DART) support team (Sonoma Technology).

CSN Site Map

There are currently 140 CSN Trends and Supplemental sites supported by the centralized contract laboratories Wood PLC and UC Davis.



Met One Super SASS

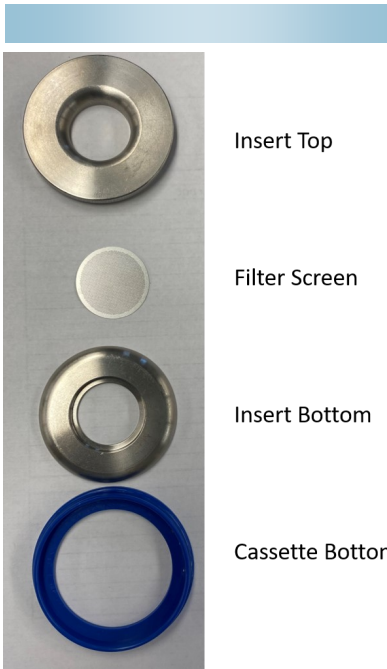
URG 3000N

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Special points of interest

- We are extending the 25-mm Teflon® filter study to evaluate an identified bias.
- We are issuing a data advisory to alert data users about intermittent contamination of Chromium and Nickel.
- Save the date for the National Ambient Air Monitoring Conference (NAAMC) in Pittsburgh, PA the week of August 10th, 2020.



Insert Top

Filter Screen

Insert Bottom

Cassette Bottom

Super SASS 25-mm Teflon® Filter Study

The CSN has been operating since 2000 with elements being analyzed by X-Ray Fluorescence (XRF). With decreasing PM_{2.5} concentrations over time, the percentage of non-detects for measured elements continues to increase. Some of the PM_{2.5} elements of most interest are not always being detected above the method detection limit (MDL).

A Teflon® filter sample module insert has been designed for the Met One SASS and Super SASS samplers to reduce the sampled filter size from 47-mm to 25-mm and increase the concentration of PM_{2.5} per cm² of filter area by a factor of about 3.

The EPA has been evaluating the 25-mm insert at six collocated CSN sampling sites on

the 1-in-6 day schedule: Bakersfield, CA; Riverside (Rubidoux), CA, G.T. Craig, OH; Rutgers, NJ; Roxbury, MA; and Deer Park, TX.

The study started in January 2019 and was planned for one year. Analysis of the data shows that results from the inserts are approximately 20% lower than expected. We continue to troubleshoot the situation and are continuing the evaluation into 2020.

Thanks to the state and local monitoring agency operators at the six collocated CSN sites for continuing to collect the extra modules for this special study.

We continue to look for ways to improve the detection limits for all of the constituents measured in the CSN.

Since the development of DART, data validation and review has increased and been maintained by SLT monitoring agency validators at around 80% for the last few years.

DART Data Review

CSN data review is an important part of helping to ensure that the data are of the best quality to support data uses. The State, Local, and Tribal (SLT) monitoring agencies play a significant role in reviewing and validating their data in DART.

EPA has invested in the development of DART for CSN to provide a consistent platform for SLT data review and validation. DART is hosted in AirNowTech. SLTs can request [access to DART by setting up an account](#) at and [requesting DART access](#).

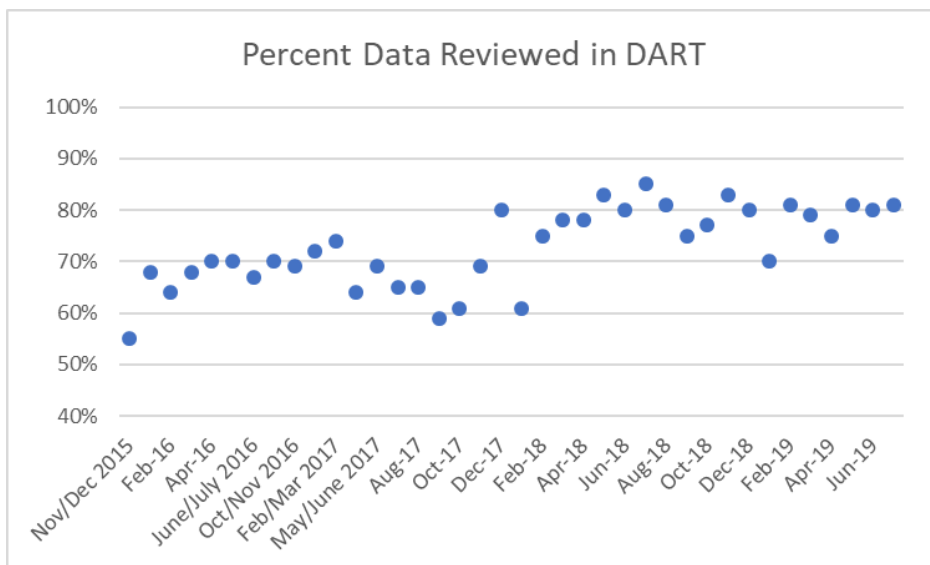
[The last DART webinar for CSN](#)

[The validation guide](#)

Data Analysis Reporting Tool (DART) Validation and Review

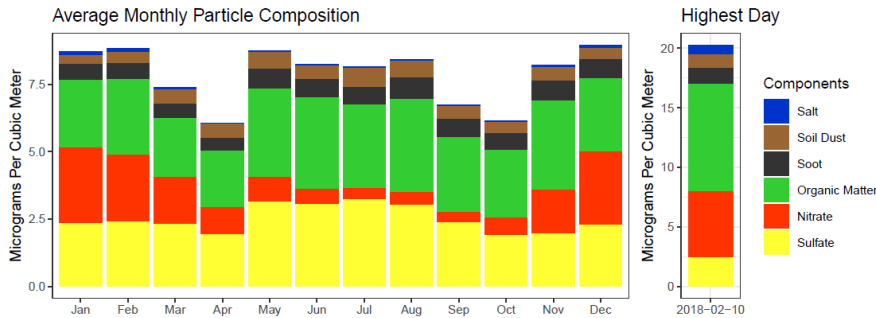
State, Local, and Tribal (SLT) monitoring agency validators review their site specific data in DART using their knowledge of sampling conditions, significant sources, special events, and historical information. SLT validators have 30 days to review their data in DART before it gets loaded into EPA's Air Quality System (AQS) data base.

Since the development of DART, data validation and review has increased and been maintained by SLT monitoring agency validators at around 80% for the last few years. Thanks to the all of the data validators and keep up the good work!



2018 Annual Site Summary Composition Information for Pittsburgh, AQS: ID 42-003-0008

The following plots summarize the chemical composition of particles collected at this site. The monthly averaged compositions calculated from 2014-2018 data are shown on the left while compositions for the day with the highest measured concentrations during 2018 are shown on the right.



Components	Calculation	Natural Sources	Anthropogenic Sources
Salt	1.8 · Chloride	Ocean spray, dry lakebeds	Chemical manufacturing, lake consumption
Soil Dust	2.2 · Al + 2.49 · Si + 1.63 · Ca + 2.42 · Fe + 1.94 · Ti	Soil resuspension, dust storms long-range transport	Construction, agriculture, deforestation, unpaved roads
Soot	Elemental Carbon	Wildfires	Motor vehicles, wood burning, smoking
Organic Matter	1.4 · Organic Carbon	Plants, animals, wildfires	Motor vehicles, cooking oils, household cleaners
Nitrate	1.29 · Nitrate	Plants, animals	Fertilizer, stock yards, chemical manufacturing
Sulfate	4.125 · Sulfur	Volcanism	Coal-fired power plants, chemical manufacturing

Chromium (Cr)/Nickel (Ni) Data Advisory

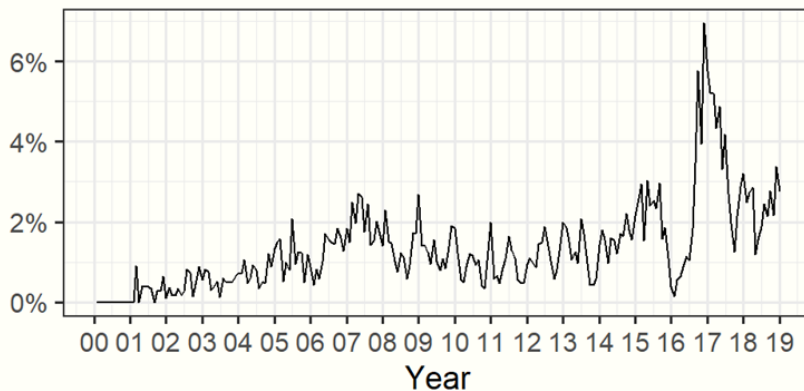
Intermittent contamination of chromium (Cr) and nickel (Ni) has been observed in some samples. The contamination is difficult to identify but became apparent in comparisons with collocated IMPROVE sites. High concentrations of Cr are often accompanied by high concentrations of both Ni and iron (Fe).

Consistent Cr/Ni and Fe/Cr ratios have been identified for high values. This suggests a single contaminant material from a common source, and the ratios are consistent with stainless steel; however, the specific source has not yet been identified. Cobalt (Co) and copper (Cu) may also be involved in the contamination.

Since 2001, the percentage of samples above detection for Cr and Ni that are identified as likely contaminated has hovered between 1 and 3%, with an unexplained spike from late 2016 through late 2017 (see figure below). Preliminary experiments to understand the specific source of contamination were not conclusive.

Three test can be used to identify contamination: $Cr \geq 0.01 \mu\text{g}/\text{m}^3$; ratios $1.5 < Cr/Ni < 6$ and $1.75 < Fe/Cr < 7$.

Contamination tests will be applied to all samples and if contamination is suspected, null codes will be applied prior to SLT validation and review in DART. For samples that have not been flagged, we suggest applying the test above to remove the most contaminated samples.



Annual Site Summaries

Starting in 2017, our analysis laboratory contractor, University of California at Davis (UC Davis) has compiled individual CSN site summaries.

These summaries include information on the site AQS ID, site latitude/longitude, completeness, daily reconstructed fine mass (RCFM), long-term trends in RCFM, chemical composition, and a map of RCFM as compared to both nearby CSN and Inter-agency Monitoring of PROTECTED Visual Environments (IMPROVE) monitoring sites.

[All CSN site summaries for 2017 and 2018.](#)

CSN Data Advisories

When issues are identified that affect CSN data, we have started to compile data advisories to let the CSN community and data users know about potential issues.

[The data advisory on Cr/Ni contamination and all other CSN data advisories.](#)

Mega Performance Evaluation Program (Mega PE)

The CSN Mega PE program is administered by EPA. EPA sends PE samples to laboratories that analyze samples for the CSN. The program was transitioned from the Office of Radiation and Indoor Air (ORIA) to OAQPS. OAQPS resumed the program in late 2017 and completed the first study in early 2018. Each participating laboratory analyzes a set of blind PE filter samples for the analyses they provide to support CSN (e.g., gravimetric mass, elements, ions, and carbon). Another Mega PE is planned for early 2020.

If you have questions about the Mega PE program, contact [Nealson Watkins](#)

Field blank Collection Procedure and Importance

Reminder: In 2018, EPA developed a new field blank procedure for the Met One sampler to allow both Teflon® and Nylon field blank filters to be handled like routine samples and remain in the sampler for the duration of sampling. The procedure was distributed to CSN site operators for implementation in 2018. This new procedure requires the disconnection and capping of sampling lines corresponding to the field blanks from the pump box. Disconnecting the sample lines ensures that no sample air flows through the field blank filters.

If a field blank is collected with sample air flow, the field blank data assigned the null code "AQ" for operator error.

Background: In the past, field blanks were not handled identically as routine sample filters and did not stay in the sampler for the duration of sampling. Field blanks were only mo-

mentarily exposed to the atmosphere and repackaged for shipment back to the sample handling and shipping lab. When URG3000N samplers were implemented in the network (2007-2009), quartz field blank filters were installed in the sampling cartridge and kept in the sampler for the duration of routine sampling. However, for the Met One samplers, field blanks continued to only be momentarily exposed.



Disconnected and capped lines at the pump box

Requesting Changes to CSN Data in AQS

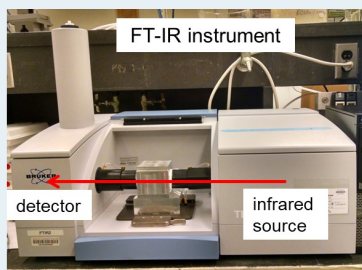
Changes to data already posted to AQS should be requested within 6 months of posting, otherwise it is the SLT agency responsibility to make the changes directly in AQS. Request [changes within 6 months, please email](#).

If a SLT monitoring agency needs to make changes to data in AQS, the SLT monitoring agency can make the changes directly in AQS. Here are the rules for updating raw data:

- * The user must have the security privilege "RAW_DATA_UPDATE" granted to the screening group that they are logged into;
- * If the user's screening group owns the monitor;
- * If the user belongs to the agency listed as the "Monitoring Agency" for the monitor;
- * If the user belongs to the REPORTING agency for the monitor; or
- * If the user belongs to the Primary Quality Assurance Organization or "PQAO" for the monitor.

FTIR on CSN Teflon® Filters

EPA and the National Park Service (NPS) have been working with researchers at UC Davis to explore the feasibility and capability of using FTIR (Fourier Transform Infrared Spectroscopy) to predict the amount of OC and EC on Teflon® filters. This analytical method is non-destructive, quick, relatively inexpensive, and has the potential to provide additional information about the composition of the particulate matter on the filter. The technique can also be applied to any Teflon® filter, including filters from the Federal Reference Method (FRM) network. The evaluation is ongoing and remains a possible future option for providing OC and EC, as well as composition information for the CSN and IMPROVE networks. For the latest presentations on FTIR and other topics from the [2019 IMPROVE Steering Committee Meeting](#).



National Air Monitoring Conference (NAAMC)

The Ambient Air Monitoring Group (AAMG), in cooperation with the National Association for Clean Air Agencies (NACAA) and the Association of Air Pollution Control Agencies (AAPCA) will host The National Ambient Air Monitoring Conference, **August 10-13, 2020 in Pittsburgh, Pennsylvania.**

The conference is intended to provide a national and international forum for EPA, State, local, tribal, international, and other agencies who are involved in implementing air monitoring programs. This conference will provide a forum for:

- * discussing the implementation of changes to the ambient air monitoring networks as a result of revisions to the National Ambient Air Quality Standards (NAAQS) and ambient air monitoring regulations;
- * a forum for data users to discuss and share information learned as a result of the data analysis; and

- * how data is managed in our Air Quality System (AQS) data base.

More details to follow. If you have agenda ideas or suggestions, please email [Laurie Trinca](mailto:Laurie.Trinca)



Ambient Air Monitoring Group (AAMG)

We plan, implement, and assess the nation's ambient air quality networks.

We collaborate with states, locals, tribes, instrument companies, researchers and colleagues at EPA and other Federal agencies to optimize the ambient air monitoring networks.

We provide oversight, guidance, and tools to ensure quality data for clean air decisions across the country.

EPA and Regional Contacts

Wondering who the right people are to contact regarding CSN? The current contacts are:

EPA Contacts

Program Lead: [Joann Rice](mailto:Joann.Rice); 919-541-3372

Technical Point of Contact: [Melinda Beaver](mailto:Melinda.Beaver); 919-541-1062

Quality Assurance: [Greg Noah](mailto:Greg.Noah); 919-541-2771

Mega Performance Evaluation Program: [Nealson Watkins](mailto:Nealson.Watkins); 919-541-5522

Regional Contacts

Region 1: [Catie Taylor](mailto:Catie.Taylor); 617-918-8607

Region 2: [Gavin Lau](mailto:Gavin.Lau); 212-637-3708

Region 3: [Lori Hyden](mailto:Lori.Hyden); 215-814-2113

Region 4: [Keith Harris](mailto:Keith.Harris); 706-355-8624

Region 5: [Chad McEvoy](mailto:Chad.McEvoy); 312-886-6084

Region 6: [Josh Madden](mailto:Josh.Madden); 214-665-7251 and [Fran Verhalen](mailto:Fran.Verhalen); 214-665-2172

Region 7: [Leland Grooms](mailto:Leland.Grooms); 913-551-5010

Region 8: [Josh Rickard](mailto:Josh.Rickard); 303-312-6460

Region 9: [Dena Vallano](mailto:Dena.Vallano); 415-972-3134

Region 10: [Chris Hall](mailto:Chris.Hall); 206-553-0521

