UCD CSN Standard Operating Procedure #903

Sample Tracking and Storage

Chemical Speciation Network  
Air Quality Research Center  
University of California, Davis

August 21, 2020  
Version 1.0

Prepared By: ___________________________  Date: ________________

Reviewed By: ___________________________  Date: ________________

Approved By: ___________________________  Date: ________________
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1. PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes the procedure for tracking and storage of samples (PTFE and quartz filters) analyzed as part of the EPA Chemical Speciation Network (CSN) contract.

2. SUMMARY OF THE METHOD

Filter samples collected for the CSN are stored under specific conditions. This method describes the documentation and sample handling practices necessary to maintain sample integrity.

3. DEFINITIONS

- **Chemical Speciation Network (CSN):** EPA’s PM$_{2.5}$ sampling network, with sites located primarily in urban areas.

4. HEALTH AND SAFETY WARNINGS

Not applicable.

5. CAUTIONS

Not applicable.

6. INTERFERENCES

Not applicable.

7. PERSONNEL QUALIFICATIONS, DUTIES, AND TRAINING

The Air Quality Research Center (AQRC) laboratory staff assigned to this project have been trained on this SOP.

8. FILTER TRACKING

CSN filters are shipped to UC Davis from the CSN Sample Handling Laboratory (Wood PLC) with a Chain of Custody (COC; Figure 1). There are separate COC documents for each filter type; UC Davis currently receives PTFE and quartz sampled filters. An electronic copy of each COC is also available. This document lists an itemized inventory including number of samples, filter type, analysis requested, and status (invalid or valid). The COC is utilized to perform filter inventory upon receipt by UC Davis. Following inventory, the COC stays with the filters as they move to different laboratories for analysis. For further information regarding COCs refer to **CSN TI 302B: Receiving and Inventorying**, **CSN TI 302C: Sample Change**, and **CSN TI 277A: Optical Analysis**. Following completion of analyses, COC forms are archived.
Figure 1. CSN Chain of Custody (COC) form.

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CSN Laboratory Chain of Custody Form

- **Ship Date and Name:** 3/3/2020 Knoll
- **Receive Date and Name:**
- **Analysis Request ID:**
- **Intended Sample Date:** 1/1/2020
- **Set #:** 7Q
9. STORAGE CONDITIONS

CSN filters must be kept at a temperature below 4 °C with exceptions allowed during preparation prior to analysis and during analysis. Time spent outside refrigerated conditions is minimized, and a temperature log is used for each laboratory refrigerator where CSN filters are stored. The refrigerator temperature is recorded daily, excluding weekends and holidays, by a laboratory technician (Figure 2).

Filters initially arrive at the AQRC in coolers containing ice packs and are moved to the laboratory for inventory. If the shipment is delayed and/or the ice packs appear to be melted, the Data & Reporting Group is notified for flagging of filters with the TT qualifier flag (TT – Transport Temperature is Out of Specs). Petri trays containing filters are stored in zippered plastic bags. Samples remain in zippered plastic bags unless undergoing analysis. The filters are unpacked from coolers and placed in refrigerators maintained at temperatures below 4 °C.

Figure 2. AQRC laboratory refrigerator temperature log.
When samples are removed from refrigeration and transported between AQRC laboratories, the filters are placed back into cold storage upon receipt. Prior to analysis, filters are removed from refrigeration and allowed to reach room temperature. Following analysis, filters are returned to refrigeration. Filters remain refrigerated until prepared for cold storage archive; see Figure 3 for a flowchart of CSN sample movement at AQRC from receipt to archiving.

When preparing filters for archive, zippered bags containing Petri trays with filters are placed in plastic bins. Icepacks are temporarily placed inside the archive bins during transportation to archive storage at the UC Davis Buckeye Cottage or UC Davis Sprocket facilities. The temperature at UC Davis Buckeye Cottage and UC Davis Sprocket cold storage facilities is maintained between 0-4 °C and monitored via a remote alarm system. If the archive cold storage exceeds the specified temperature range, an email alert is sent to the Laboratory Group Manager, Program Manager, and designated Laboratory Technician, and a maintenance technician is dispatched to investigate and resolve the event that triggered the alarm.

For further details regarding filter archive storage refer to CSN SOP 901: Long-Term Archiving of Filters.
Figure 3. Flowchart of CSN sample movement at AQRC from receipt to archiving.