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Long-Term Archiving of Filters
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UCD CSN Standard Operating Procedure #901

Long-Term Archiving of Filters

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

*October 31, 2022
Version 1.4*

Prepared By: _____	<small>DocuSigned by:</small> <i>Lindsay Kline</i> <small>B7A73C50DF23499...</small>	Date: <u>11/17/2022</u>
Reviewed By: _____	<small>DocuSigned by:</small> <i>Jason Giacomo</i> <small>B62B01F81613421...</small>	Date: <u>11/18/2022</u>
Approved By: _____	<small>DocuSigned by:</small> <i>Marcus Langston</i> <small>0A10CFCF79B0452...</small>	Date: <u>11/18/2022</u>



DOCUMENT HISTORY

Revision	Release Date	Initials	Section/s Modified	Brief Description of Modifications
	11/30/18	NJS	All	Rewording for clarity and reformatting to be consistent with all other SOPs.
	06/20/19	MGN	All	Update archiving procedures for Quartz filters.
	4/28/20	LMK	8, 9, 10	Rewording for clarity of archive conditions for Quartz and Teflon, information on CSN archive form used for retrieving/returning samples, updated figures.
1.3	7/29/2021	LMK	8	Updated locations.
1.4	10/31/22	LMK	8, 9, 10	Small editing changes. Added new permanent cold storage location and information on generating archive. Add box location to CSN archive form.

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1. PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes the procedure for long-term archiving of samples (Teflon and quartz filters, and extracts of nylon filters) analyzed under the EPA Chemical Speciation Network (CSN) contract.

2. SUMMARY OF THE METHOD

Filter samples collected for the CSN network are archived under specific conditions for potential reanalysis. 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. ARCHIVING CONDITIONS

Quartz and Teflon filters are stored for the life of the contract in Petri slide holders within Petri slide trays. Petri slide trays of filters are placed in zippered plastic bags and stored in refrigerators or cold storage rooms maintained between 0 °C and 4 °C. Quartz and Teflon filters for the current CSN contract are stored in the following locations: refrigerators housed in Drew Ave, UC Davis Buckeye Cottage, UC Davis Sprocket Building, and UC Davis Surge building. The temperature of refrigerators within Drew Ave used for storing CSN filters are monitored daily by laboratory staff. The temperature of cold storage rooms located at UC Davis Buckeye Cottage and Sprocket Building are monitored at all hours via a remote alarm system.

8.1 Quartz Filters

Quartz filters for the current CSN contract are stored at Drew Ave and UC Davis Buckeye Cottage. Quartz filters from previous CSN contracts are stored by UC Davis off-campus at a cold storage facility in Modesto, California. Trays are placed in plastic zippered bags and plastic bins for storage in a refrigerated room. Individual filters are located by box number, batch number, tray number and *ContractorFilterAnalysisID*.

8.2 Teflon Filters

Teflon filters are archived for the life of the contract, sorted by *ContractorBatchNumber*, *IntendedUseDate*, *ContractorSetNumber*, and *ContractorFilterAnalysisID* into Petri slide trays. Individual filters are located by box number, batch number, tray number, and *ContractorFilterAnalysisID*.

Teflon filters from the current and previous CSN contracts are stored on-campus at UC Davis. For the first five years (current contract), Teflon filters are housed in Drew Ave, UC Davis Sprocket Building and UC Davis Buckeye Cottage. After that time, samples are stored by UC Davis off-campus at a cold storage facility in Modesto, California or at room temperature in the UC Davis storage facility (Surge Building).

8.3 Nylon Filter Extracts

Nylon filter extracts are archived for six months in extraction vials. They are grouped in laboratory batches, and placed in heavy-duty plastic zippered bags and plastic bins for refrigerated storage maintained at or below 4 °C (but not below freezing).

Filter extracts are stored by the ions analysis laboratory subcontractor (RTI; Research Triangle Park, North Carolina).

9. PROCEDURES FOR ARCHIVING FILTERS

9.1 Sample Shipping and Receiving

Refer to RTI SOP and UCD SOP for shipping and receiving:

UCD CSN SOP #904: Receiving and Inventorying of CSN Samples

RTI SOP: Determination of Anions and Cations Extracted from Nylon Filters by Ion Chromatography (IC)

9.2 Generating Archive

The CSN Archive list is an electronic list of Petri trays assigned to a box. The Archive list is filter type specific and includes the following information for each sample; the position number, FilterID, BarcodeID, Intended Use Date, Set, Batch, type, Purpose, Null code, and Manufacturer number (for Teflon filters only). Petri trays of samples are assigned a box number during the inventory process, refer to UCD SOP #904 for additional information. Number of trays assigned to each box number can vary, and an

electronic list of trays is generated for each box (Figure 4). Once boxes are ready for archive, the status of the box is changed in the CSN web app from inventory to archive. The following information is added in the CSN web app for each archive box, archive date, user initials and archive location. Filters remain in trays in the archive boxes until they are logged out or removed (e.g. returned to a state, turned over to EPA, etc.). Refer to *UCD CSN TI #901A: Long-Term Archiving of Filters* for more information

9.3 Teflon/Carbon Filters – Labels

Petri Slide Labels

Petri slide labels are generated by Wood PLC and correspond to the Barcode ID. Labels have a barcode and text (Figure 1), and may be located on the front or back of the Petri slide.

Figure 1. Petri slide label.



Petri Tray Labels are unique labels the lab technician places on the petri tray during the inventory process. The labels include the Batch Number, tray number, and QR barcode for each Petri tray (Figure 2). Only the last two digits of the Batch number are used for the label (e.g. A000019 is Batch 19). To differentiate between Teflon and Quartz trays add “Quartz” to the tray label (e.g. Quartz- B19T1).

Figure 2. Petri tray label.



Archive Box Labels

Archive box labels include the box name, the range of trays, and QR barcode (Figure 3 is one possible version of archive box labels). The box range is indicated as *Batch XX Tray XX – Batch XX Tray XX*. To differentiate between Teflon and Quartz boxes, add “Quartz” to the box label (e.g. Quartz - CSN Box 6).

samples have been retrieved from archive the CSN Archive form is updated with the date removed and initials.

10.3 Return Samples to Archive

Samples are returned to archive by placing the samples in the correct position, tray and box. The CSN filter archive form used for retrieving samples from archive is utilized for returning filters. Once samples are returned to archive the CSN Archive form is updated with the date returned and initials.

11. EQUIPMENT AND SUPPLIES

Archival of samples makes use of Petri slides, slide trays, and archive bins. These holders are available commercially from multiple scientific product vendors.

12. QUALITY ASSURANCE AND QUALITY CONTROL

Not Applicable.

13. REFERENCES

UCD CSN SOP #904: Receiving and Inventorying of CSN Samples

UCD CSN TI #904A: Long-Term Archiving of Filters

RTI SOP: Determination of Anions and Cations Extracted from Nylon Filters by Ion Chromatography (IC)