UCD CSN Technical Information #901

Long-Term Archiving of Filters

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

July 31, 2020
Version 1.0

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DOCUMENT HISTORY

Date Modified	Initials	Section/s Modified	Brief Description of Modifications

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1. PURPOSE AND APPLICABILITY

The subject of this technical information (TI) document is the long-term archiving of samples collected for the Chemical Speciation Network (CSN). The scope is to ensure good laboratory practice of long-term archiving of samples in the CSN Data Management Site and storing filters under specific conditions.

2. SUMMARY OF THE METHOD

The operator will archive CSN samples electronically and physically move filters to designated storage locations on the UC Davis campus. The CSN Data Management Site is used for archiving filters electronically and serves as an electronic catalog for locating filters.

3. DEFINITIONS

- **Chemical Speciation Network (CSN):** EPA's $PM_{2.5}$ sampling network, with sites located principally in urban areas.
- **Chain-of-custody (COC) form:** The form received with the samples including the list, amount, sample type etc.
- **CSN Data Management Site:** User interface web application for the CSN database (*csn.aqrc.ucdavis.edu*).
- **Laboratory Technician:** Authorized personnel responsible for processing CSN samples; must receive prior approval from the Lab Manager. The laboratory technician shall have access to Jungerman Hall room 116 where the XRF instruments and refrigerators are located.

4. HEALTH AND SAFETY WARNINGS

Not applicable.

5. CAUTIONS

Not applicable.

6. INTERFERENCES

Not applicable.

7. PERSONNEL QUALIFICATIONS, DUTIES AND TRAINING

Only trained lab personnel designated by the laboratory manager may archive CSN samples.

8. EQUIPMENT AND SUPPLIES

Archive Bins

9. PROCEDURAL STEPS

9.1 Sample Shipping and Receiving

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

UCD TI #302B: 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 List

The CSN Archive list is an electronic list of the samples in a Petri tray. The Archive list is filter type specific that 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).

9.2.1   Filter Archive Boxes

1.   Write down the Batch and Tray numbers for which an archive list needs to be generated. Typically archive trays are generated as soon as a CSN batch is received and the chain of custody is utilized for this process.
2.   Log-in to the CSN webapp at *https://csn.crocker.ucdavis.edu*. Request permissions from Data Management group and/or IT support, if necessary.
3.   From the CSN Webapp main menu select "Archive." This will open the list of all previously generated archive boxes for Teflon filters.
4.   Select the **Quartz** tab to generate trays for quartz filters.

9.2.2   Create a New Archive Box

1.   From the open window, Filter Archive Box, click on **Add Box**. Select the Year, and Box Label. Select the Year the samples are collected. If boxes include samples from multiple years then select the Year of the oldest sampling date.
2.   Type the box number: the box number is one number higher than the preceding box. Note the box number does not restart with a sampling year.
3.   Next, The Box Label is in format CSN Box #.
4.   Click **create** when done, then continue to "Add Trays" until there are 36 trays in the box. Once 36 trays are assigned to a given box, create a new archive box.

9.2.3   Add a New Tray

1.   Select **Add Tray**.
2.   Type the FilterID for the first filter in the tray from the chain of custody (COC). Then click **Select**.
3.   Preview the samples in the tray, if this looks good, then type the "Tray Label" in format CSN Batch ## Tray ##, e.g. CSN Batch 18 Tray 7.
4.   Select **Create**.
5.   Review the Tray list and verify the samples are in the correct order.

9.2.4   Edit Tray list

In general, the majority of the electronic tray lists will agree with the physical order of the trays and no additional action will be required. Exceptions include double filters, delayed samples, samples missing from shipment by Wood PLC (formerly Amec) or special studies.

1. To insert a sample, select **Insert Above** the sample will be inserted in the position above the selected record.
2. To remove a sample, select **remove** that will remove the selected record and leave the position empty
3. To add a filter to empty position, select **Add filter** that will open "Add Filter to Tray" window in the space available type the BarcodeID. Add the filter by clicking **select**.
4. To shift sample up click the ⌃ Up button, moving the record up one position. Clicking ⌃ Up will also work to fill an empty position and leave position "50" empty.
5. To shift sample down, click the ⌄ Down button. Each click will move the record down one position.

9.2.5   Archive date

Update the archive date and operator initials for each tray within the Archive Box.

1. Select the **Archive** submenu in the CSN Webapp.
2. Select details for the box. This will populate a complete list of trays within the box.
3. Select details for the tray. This will populate a complete list of the samples within the tray.
4. From the upper right hand corner select **Edit**, then update the Date and operator initials.
5. Continue with the procedure until all trays have been updated.

9.3   Teflon/Carbon Filters – Archive Labels

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

Figure 1. Filter label (same as *ContractorFilterAnalysisID and BarcodeID*).

Petri Tray Labels: The operator prints unique Petri tray labels after inventory. The labels include the *ContractorBatchID*, tray number, and QR barcode for each petri tray (Figure 2). Only the last two digits of the *ContractorBatchID* are used for the label (e.g. A0000019 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: The archive box label includes the box name, the range of trays, and QR barcode (Figure 3). 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.

Figure 3. CSN Teflon and Quartz box labels.

9.4 Full Trays

Once a tray is full, the *TrayID* is associated with the box number. Thirty-six trays are assigned to each box number, and a list of trays (including archive date and operator initials) is generated for each box (Figure 4).

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.).

Figure 4. Partial Tray list for CSN Box 5.

Box Details

SetYear	2016	Created	3/13/2017 1:42:13 PM	Edit	Delete
Box Number	5	CreatedBy			
BoxLabel	CSN Box 5				

Trays

Tray number	Tray label	Filters	
1	Batch 11 Tray 15	50	Details
2	Batch 11 Tray 16	50	Details
3	Batch 11 Tray 17	50	Details
4	Batch 11 Tray 18	50	Details
5	Batch 11 Tray 19	50	Details
6	Batch 11 Tray 20	50	Details
7	Batch 11 Tray 21	49	Details
8	Batch 11 Tray 22	50	Details
9	Batch 11 Tray 23	50	Details
10	Batch 11 Tray 24	50	Details
11	Batch 11 Tray 25	50	Details
12	Batch 11 Tray 26	50	Details
13	Batch 11 Tray 27	50	Details
14	Batch 11 Tray 28/ Batch 12 Tray 1	50	Details
15	Batch 12 Tray 2	50	Details
16	Batch 12 Tray 3	50	Details
17	Batch 12 Tray 4	50	Details

9.5 Transportation Conditions

Cold storage temperatures must be maintained during shipment and transportation of filter. When transporting archive boxes short distances to archival storage, pack the archive box with ice packs to keep the temperature between 0-4 °C. Remove the ice packs after placing the box in the archival refrigerator. When shipping filters using a carrier service, filters will be placed into appropriate sized ice-chests with sufficient ice packs to maintain cold temperature for the duration of the shipment (overnight shipping is highly recommended).

10.   PROCEDURE FOR REMOVING FILTERS FROM ARCHIVING

10.1 Identify Samples

1. Open the CSN Archive Form and save a copy with today's date, "U:\IMPROVE_Lab\XRF_Epsilon5\CSN\Filter Archive\CSN_Archive_YYYYMMDD_Template.xlsx"
2. Navigate to the CSN Data Management Site (CSN web app) *https://csn.aqrc.ucdavis.edu/* and search the database to identify the *ContractorFiltersAnalysisIDs* (Barcode ID) of the filters.
3. In the records, find the box number, batch number, tray number, position number, Filter ID and manufacturer number for the specific sample (Figure 5 CSN Archive Form). Record this information in the CSN Archive form. Save and print the form.

Figure 5. CSN Archive form.

Box	Batch	Tray	Position	BarcodeID	Filter ID	Manufacturer #	Date Removed from Archive	Initials	Date Returned to Archive	Initials
32	60	1	8	F173869	177456	220807782				
32	60	1	50	F174898	179571	220809051				

10.2 Locate Samples

1. Using the printed CSN Archive form, locate the archive bin(s) containing the sample(s).
2. Within the archive bin, locate the tray containing the sample(s).
3. Within the tray, locate and retrieve the individual samples.
4. Update the following fields on the printed copy of the CSN archive form, "Date Removed from Archive" and "Initials". Also update the same fields on the electronic copy of the CSN Archive form, save and close the form.

10.3 Return Samples to Archive

1. Using the printed CSN Archive form, return the samples to archive by placing the samples in the correct box, tray, and position.
2. Update the following fields on the printed copy of the CSN archive form, "Date Returned to Archive" and "Initials". Also update the same fields on the electronic

copy of the CSN Archive form, save and close the form. Once the electronic copy has been updated the paper copy does not need to be retained.

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 TI #302B: Receiving and Inventorying of CSN Samples

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