Sample Tracking and Storage UCD SOP #903, Version 1.1 July 31, 2021 Page **1** of **8** 

## **UCD CSN Standard Operating Procedure #903**

# **Sample Tracking and Storage**

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

> July 31, 2021 Version 1.1

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#### **DOCUMENT HISTORY**

Date Modified	Initials	Section/s Modified	Brief Description of Modifications
8/21/2020	JAG	All	New document.
5/26/2021	LMK	9	Update image.
6/18/2021	SRS	8	Previous sections 8 & 9 now subsections 8.1 & 8.2.

#### **TABLE OF CONTENTS**

1.	Pur	pose and Applicability	4
2.	Sun	nmary of the Method	4
3.	Def	finitions	4
4.	Hea	alth and Safety Warnings	4
5.	Cau	itions	4
6.	Inte	erferences	4
7.	Pers	sonnel Qualifications	4
8.	Pro	cedural Steps	4
8	8.1	Filter Tracking	4
8	3.2	Storage Conditions	6

#### LIST OF FIGURES

Figure 1. CSN Chain of Custody (COC) form.	5
Figure 2. AQRC laboratory refrigerator temperature log.	6
Figure 3. Flowchart of CSN sample movement at AQRC from receipt to archiving	8

Sample Tracking and Storage UCD SOP #903, Version 1.1 July 31, 2021 Page **4** of **8** 

## 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<sub>2.5</sub> 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

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

#### 8. PROCEDURAL STEPS

#### 8.1 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.

	CSN Labora	tory Chain of Cu	istody Form
Ship Date and Name	3/3/2020 Kno	II	
Receive Date and Name			
Analysis Request ID	Intended Sample Date	1/1/2020	
	Set #	7Q	
Barcode/Filter Analysis ID	Filter Type	Analysis Requested	Invalid?
Filter Analysis ID	Teflon	XRF	
III I IIIIII IIII IIII III III F185715	220812071		
Filter Analysis ID	Teflon	XRF	
III I IIIIII III III III III F185718	220812072		
Filter Analysis ID	Teflon	XRF	
IIIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	220812073		
Filter Analysis ID	Teflon	XRF	
F185724	220812074		
Filter Analysis ID	Teflon	XRF	
III II IIIII IIII IIII IIII F185727	220812075		
Filter Analysis ID	Teflon	XRF	
<b>I</b> IIIIII F185730	220812076		
Filter Analysis ID	Teflon	XRF	
III II IIIII IIII F185733	220812077		
Filter Analysis ID	Teflon	XRF	
III I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	220812078		
Filter Analysis ID	Teflon	XRF	
III I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	220812079		
Filter Analysis ID	Teflon	XRF	
III II IIIIIII III III III F185742	220812080		
Filter Analysis ID	Teflon	XRF	
III I IIIIII IIII IIII IIII IIII F185745	220812081		

Page 1 of 120

#### 8.2 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.

Temperature Log				
	Refrigerator Serial Number: WA91102886			
Date	Time	Temperature	Initials	

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.

