

## QUARTERLY COMPOSITING OF AIRNET SAMPLES

### Purpose

This Meteorology and Air Quality Group (MAQ) procedure describes the preparation of composites of biweekly AIRNET samples for the purpose of determining alpha-emitting nuclides and selected inorganics on a quarterly basis.

### Scope

This procedure applies to the preparation and submittal of composited samples of filter papers used to collect airborne particulates as part of the AIRNET monitoring program.

### In this procedure

This procedure addresses the following major topics:

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### Signatures

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04/04/05

## CONTROLLED DOCUMENT

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## General information about this procedure

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**Attachments** This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Review	1

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**History of revision**

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	3/13/2001	New document created from a chapter of ESH-17-202, R12.
1	7/2/02	Updated details about station 90 handling, cutting filters, and changes to requested analytes.
2	4/15/04	Updated requirements for disposition and storage of analyzed filters. Discontinued the analysis of rejected biweekly filters not included in normal composite sample.
3	04/04/05	Quick-change revision to replace HCP with HR for annual review.

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**Who requires training to this procedure?**

The following personnel require training before implementing this procedure:

- MAQ personnel assigned to composite AIRNET samples

Annual retraining is required and will be by self-study (“reading”) training.

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**Training method**

The training method for this procedure is **on-the-job** training by a previously trained individual and is documented in accordance with the procedure for training (MAQ-024).

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**Prerequisites**

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- Appropriate Radiation Worker training (as required by the location where procedure is performed)

## General information, continued

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**Definitions  
specific to this  
procedure**

None.

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**References**

The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"
  - MAQ-202, "Environmental Sampling of Airborne Particulate Radionuclides"
  - MAQ-208, "Evaluation of Biweekly AIRNET Data and Calculated Air Concentrations"
  - MAQ-AIRNET, "Sampling and Analysis Plan for the Radiological Air Sampling Network (AIRNET)"
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**Note**

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

## Preparation for quarterly sample compositing

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### Overview

AIRNET filter samples are collected every two weeks according to procedure MAQ-202. The uncut biweekly samples are shipped to the analytical laboratory for instrumental analysis. Every quarter, the filters from the past calendar quarter are composited into one sample per each AIRNET site for analysis for additional radionuclides and elements. The compositing is done at the laboratory in conjunction with one of that laboratory's staff. Thus, two people commonly perform this process: one to prepare the paperwork and oversee the work, and the second person to handle the samples. See MAQ-AIRNET for more details.

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### Preparing for quarterly composite

Compositing of the quarterly samples is performed at the analytical laboratory at the end of the quarter after the final set of instrumental analyses is completed. Perform the following steps to prepare needed paperwork for compositing.

Step	Action
1	In the MS Access AIRNET database AIRNET_PeriodID table, there is a quarterly composite field, "QuartComp", that indicates which biweekly period IDs will be included in each specific composite. This field is populated during each calendar year's start-up activities. <b>NOTE:</b> Samples deployed before Christmas and collected in early January of the following year will be included in the first quarterly composite of the new year.
2	Ensure that the field data V&V for filters and that the biweekly analyses are complete. <b>NOTE:</b> We elect to take the risk that a few samples may be reclassified upon health physics review, and will NOT use the gross beta as an indicator for compositing decisions and may composite prior to completion of that review.

*Steps continued on next page.*

## Preparation for quarterly sample compositing, continued

Step	Action
3	<p>Using the MS Access AIRNET database (see the AIRNET Database User's Guide), produce the composite reports to ensure that no sample that has been rejected for field data reasons gets inadvertently included in a composite.</p> <ul style="list-style-type: none"><li>• Start on the AIRNET Database Form "MAIN Switchboard" and selecting the "Quarterly Composite" button. The subsequent forms show walk through the process of producing a complete checklist for assembling the composite, printing labels, editing the cover letter, producing a chain-of-custody document for returning samples, etc.</li><li>• Be sure to take a copy of all documents produced via this database form to the compositing site.</li></ul>
4	<p>Prepare pre-printed labels for the composited samples:</p> <ul style="list-style-type: none"><li>• Use the button for that purpose on the AIRNET Database "Quarterly Composite" Form.</li><li>• Be sure to take these to the compositing site.</li></ul>
5	<p>Prepare a letter to the analytical laboratory by editing the existing template (via the database form) that requests the analyses on the quarterly composite samples. The chemistry data coordinator maintains current analysis information and it is also documented in the Sites_MasterLocation table within the AIRNET database.</p>

## Compositing samples at the laboratory

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### Compositing the samples

After the filters have been collected, shipped, and analyzed for one quarter, they are ready to be “composited” and submitted for the analyses of various radionuclides by radiochemical alpha spectroscopy. This process will be performed at the analytical laboratory under the direction of MAQ personnel. Follow all safety and radiation protection requirements of the laboratory.

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### Supplies needed

Collect the materials and tools listed below.

- gloves (powderless)
  - scissors
  - metal sample cans
  - Kimwipes
  - 1 set of labels (e.g., “04Q1.nn”)
  - tweezers
  - Copy of MS Access reports or forms for “Quarterly Composites”
  - bench paper
  - permanent marker
  - scotch tape
  - cleaning solution
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### Steps to composite the samples for analysis

To composite the samples, perform the following steps:

Step	Action
1	Ensure all required training is complete and current for working in the analytical laboratory. The staff from the analytical laboratory may work with participating MAQ staff to perform the actual filter cutting operation, help track the filters, and record the samples composited on the Access report printout. Participating MAQ staff will take legal responsibility for the overall compositing process.
2	The analytical lab staff collect all filters (in individual containers) for the calendar quarter to be submitted. Refer to the Compositing Checklist generated in step three on previous page.
3	For each sample station, label one sample container with the station I.D., in the format yyQn.ss, where yy is the year, n is the quarter number, and ss is the station number, using the preprinted labels generated from the AIRNET database. These labels will be generated from the AIRNET database and supplied by the participating MAQ staff member.
4	Put all sample containers (each containing an individual filter) from each station in an individual stack.

*Steps continued on next page.*

## Compositing samples at the laboratory, continued

Step	Action
5	Refer to the Compositing Checklist generated above and remove all samples marked with an “R”. Rejected samples will no longer be analyzed individually, beginning with the 04Q1 composites. Return these rejected samples to LANL for disposition.
6	Refer to the Compositing Checklist and, with the assistance of the second person, ensure the stack contains all the period IDs listed on the checklist. For each sample that goes in a composite, mark on the Compositing Checklist that the samples are present and were included in this composite.
7	Cover the bench with bench paper and place a Kimwipe over the immediate work area. Put on the gloves. Select one stack (representing a single station).
8	Place a labeled sample composite container open, face-up in the covered work area. Remove samples one at a time from their original counting containers, and holding each over the composite container with the tweezers, cut it in half, letting the loose half drop gently into the composite container. Place the remaining half (held in the tweezers) gently back into its original counting container. Note that as a result of changes to the biweekly analysis requirements, that some of the stations will have only one-half filter remaining for use in the composite. In these cases, simply combine all the remaining half filters <b>WITHOUT</b> any further cutting.
9	If there is remaining loose particulate material in any of the vacated individual sample containers, manually apportion it uniformly between the new composite containers.
10	Discard any vacated individual sample containers. Repeat steps 7 through 9 for the remaining filters in this quarter for this site. Close the completed composite sample container and set aside for resubmission to the Sample Management organization at the analytical laboratory. If the filters have never left their custody, all chain-of-custody documentation is handled internal to the analytical laboratory.
11	Put a new Kimwipe on the work area. Wash both scissors and tweezers. Select the next stack (representing a single station). Repeat steps 8 through 10.
12	After the last composite is prepared, both the participating MAQ staff and the analytical laboratory staff must sign and date the Compositing Checklist. Make a copy, and leave one copy at the analytical laboratory. Ensure the original Quarterly Composite Checklist is returned and becomes part of the records retained at MAQ. Leave the original (or draft) of the cover letter requesting the specific analyses to be performed.

*Steps continued on next page.*

## Compositing samples at the laboratory, continued

Step	Action
13	Package all remaining sample half-filters for shipment back to Los Alamos. Initiate the C-of-C form that was prepared from the database and receive custody of the sample remains from the analytical laboratory for return to MAQ. Upon arrival in Los Alamos, relinquish custody to the field team at TA-54 site for sample archiving.



## Records resulting from this procedure

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### Records

The following records generated as a result of this procedure are to be submitted **within 1 week** as records to the records coordinator:

- Completed and signed Compositing Checklist. This will generally be a part of a larger internal memo that documents how the quarterly air volumes were calculated.



## HAZARD REVIEW FOR COMPOSITING AIRNET SAMPLES

Work tasks/Steps	Hazards, Concerns, and Potential accidents; Likelihood/ Severity	Controls, Preventive Measures (e.g., safety equipment, administrative controls, etc.)	Hazard Level from IMP 300-00-00 Hazard Grading Matrix
Task: perform compositing steps as described in chapter "Compositing samples at the laboratory" in this procedure.	Contamination from handling filters with potential particulate activity.  Improbable / Negligible = Minimal	Use appropriate PPE (gloves, lab coat), work in a controlled area. Appropriate radiological monitor available, RCT phone number posted by phone or other readily available location in case of contamination. Follow all requirements of the facility or laboratory where the work is being done.	Low

**Wastes or residual materials resulting from process**

Used filter media or analytical residue is disposed by the analytical laboratory.

**Emergency actions to take in event of control failure**

For all injuries, provide first aid and see that injured person is taken to Occupational Medicine (only if immediate medical attention is not required) or the hospital. Notify supervisor and group office as soon as possible. Follow all site-specific emergency plans for any radiation contamination.

