



Title: Procedures for Preparing and Receiving PAH Canisters and Filters		Copy No: 2
SOP No.: 3.19/1.3/S	Effective Date: September 11, 2013	Location: 139

QSM Approval: _____

Procedures for Preparing and Receiving PUF Canisters and Filters

1. Introduction

This Standard Operating Procedure provides instructions for preparing PUF canisters and filters for shipment to field sampling sites, and for processing incoming samples.

2. Procedure

2.1 Preparation of Canister and Filter for sampling

2.1.1 Washing Aluminum Foil

- Clean aluminum foil is used to wrapped filter after it has been sampled. It is to be included in every shipment to the field.
- When washing aluminum foil, gloves and safety glasses must be worn and washing must be done in the fumehood.
- Wash one side of the aluminum foil (~ 12" X 12") with acetone followed by hexane. Repeat on the other side. Allow to air dry then fold clean foil in four and place in a polyethylene bag. Collect all acetone/hexane waste in a beaker.
- Empty the solvent waste into the waste receptacle. Refer to SOP 4.11/*.*S – Waste for proper waste disposal.
- Refill Teflon solvent squirt bottles after use.

2.1.2 Pre-Weighing Filters

- Wear gloves at all times when handling balance or filters.
- Filters and its envelope are stamped with a discrete number and weighed before deployment into the field.
- The stamp was designed to print the same discrete number 3 times:
 - Stamp the filter twice on the opposite edges. Do not stamp on surface where particles will be collected.
 - Stamp the envelop once.
- Condition all filters to be weighed in the balance room approximately 48 hours prior to weighing.
- The initial filter weights are recorded in the site specific binder and the filter is placed in its envelope until deployment.

2.1.3 Washing /Assembling/Shipping PUF Canisters

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- After the PUFs (i.e. samples) have been removed from the canister, disassemble the canister for cleaning. The stainless steel liners are to be cleaned in the dishwasher in room 167. All other pieces are washed in hot, soapy (Sparkleen) water, rinsed with tap water, followed by de-ionized water, then set to dry on a clean surface lined with toweling.
- Wear gloves when handling clean canisters or pieces.
- Fresh PUFs, stored in glass jars, will be placed in liners, and then into canisters as close to actual shipment time as possible.
- Place stickers on the top and bottom of each canister to indicate to the operators which side should be out when the canister is reassembled after sampling.
- PUF canisters must be shipped for the sampling date indicated on the sampling schedule.
- Coordinate PUF canisters shipping with VOC shipping.
- Ship PUF canisters in coolers when possible. Some sites have their own coolers which should not be used to ship to any other site. Verify with supervisor for these specific sites.
- Include one piece of washed foil in a plastic bag for each canister being sent.
- On the return address label, mark the sender as 'AAQS'.

2.2 Canister and Filter Receiving

Samples arrive at the 335 River Road Shipping & Receiving loading dock. Personnel are informed of their arrival either verbally or via telephone by the Shipper/Receiver. They may have been shipped in a cooler, cardboard box or case normally used for 6L VOC canisters; therefore, regardless of when VOC canisters are processed, all received containers must be checked for the presence of PUF canisters and filters as quickly as possible. If there will be a delay in the processing of these samples, they must be placed immediately into the freezer in Lab 164. The **date and time of receipt as well as the initials of the analyst receiving the sample, must be recorded on the data sheet** (Form 7.11S/F1). Most samples will be received within two to four weeks of their sampling date; however, AAQS cannot control the rate of return from the site operators. During this time and while in transit, the samples are at ambient temperature. Thus, any loss of analytes resulting from samples sitting on the loading dock while awaiting processing would be negligible.



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2.2.1 Processing PUF Canisters

Note: If PAH samples have been placed in the freezer until time permits proper handling, they should be thawed for approximately one hour before being processed.

- Locate the data sheet. Record on it the date and time received and the initials of the person doing the receiving.
- Check to ensure that the data sheet and sample canister match. (If they do not match, try to locate the correct data sheet in the 'PAH Data Sheet' binder. If this fails, store the canister in the freezer and contact the site operator to obtain the correct data sheet.)
 - * Check sampling time. Sampling time is calculated by subtracting the initial timer reading from the final timer reading. Record sampling time on the data sheet. **Samples must have been run for 24 hours ± 1 hour (1440 minutes). Any sample not run for this time is invalid.**
 - * Check sample volume. Sample volume is calculated by subtracting the initial gas meter volume from the final gas meter volume. Record sample volume on the data sheet.
 - * In an optimal condition, samples would have a volume of 720 m³. There are two samples acceptance limits:
 - * **Level 1 - Any sample with a volume out of (720 m³ ± 10%) 648 and 792 m³ range is flagged but not invalid.** If several samples from a site arrive in succession with volume out of this range, notify lab supervisor and NAPS Operation unit manager. The field operators will have to repair/make adjustment to the meters.
 - * **Level 2 - Any sample with a volume out of the 500 and 1200 m³ range is invalid.** Notify lab supervisor and NAPS Operation unit manager. The field operators would have to repair/make adjustment to the meters.
- If a sample is invalid, mark it as such on the data sheet and discard the PUF's and the corresponding filters. Locate the filter # in the "PAH Filter Weights" binder, enter the sample date, put the word "VOID" in the column for the final weight and initial under "Analyst Initials." Any questionable samples should be kept in the freezer until the site operator can be contacted to verify the information on the data sheet.
- If the sample is valid, record the following information on a new plastic bag:

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- * Location
- * Canister ID
- * Sample Date
- * Filter Number

- Remove the plastic bag containing the filter from the brown envelope. Record the above information on this bag as well. Store this bag in the freezer.
- All valid samples are ‘bagged’ and the filters are weighed within a week of reception. See procedures 2.2.2 and 2.2.3 below.
- Inventory each canister in Excel on the computer “atslab” in Rm 1701. START-MS EXCEL-C:\EXCEL\PAH.
- File all data sheets in the ‘PAH Data Sheet’ binder according to site.
- The information from the data sheet is then entered onto the spreadsheet to determine the volume and total suspended particulates (TSP) of the sample corrected to standard temperature and pressure. The spreadsheet for each site is located on the share drive at Ncr.int.ec.gc.ca\Lab\Riv\Samplepreplabs .
- Each sample is then logged into the LIMS system, which will generate a unique lab code. The sample is then labeled with this lab code.

2.2.2 Bagging PUF’s

- Loosen the top of the PUF canister.
- Lay down a large Kimwipe or piece of WYPALL toweling on the bench top in the fumehood. Do all work on this clean surface, inside the fumehood.
- Wearing nitrile or Chloroprene gloves, wash a piece of foil (~12” x 14”) on both sides with acetone followed by hexane and clean a pair of tongs using the same procedure.
- Remove the top of the canister. Using the tongs, remove both PUFs from the canister, wrap them in cleaned foil making as small a package as possible and place this in the corresponding plastic bag.
- Seal the plastic bag and place bagged PUFs in the site specific bags in the freezer.
- Wash the tongs in-between each sample with acetone, followed by hexane.

2.2.3 Weighing Filters

- When the filter is returned from the field, remove the filter from plastic bags. Unfold the foil covering and allow filter to equilibrate to the controlled room temperature and humidity for a minimum of 4 hours.

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- Take the binder (“PAH Filter Weights”) containing the filter weight sheets and a pen to the balance room.
- Calibrate the balance according to the steps outlined in the instrument manual.
- Remove each filter from its foil wrapping, unfold it and weigh it with the side containing the particulate up. **Take care to handle each filter only on its edges, so as not to disturb any particulate on the filter.** Record the filter weight on the sheet. Allow the balance to re-zero between each weighing. Tare as necessary.
- Re-fold and replace filter into its foil wrapper and its corresponding plastic bag. **If sub-sampling is required, follow section 2.2.3.1.**
- Re-weigh one filter in duplicate every 10 weighings to ensure the precision of the balance.
- Seal each plastic bag and store weighed filters in the freezer until they can be submitted for analysis.
- Calculate the change in mass of the filters by subtracting its initial weight from its final weight. Record this difference on the filter weight sheets and transfer this information to the data sheets.

Note: The freezer is equipped with a digital thermometer, and a daily log of temperatures is maintained as per SOP 2.06/*.*S. The freezer may require servicing if a daily minimum reading is not consistent with historical values.

2.2.3.1 Sub-sampling from filter for special studies

Sub-sampling is carried out by punching out two 47 mm diameter discs from the (8 x10 inches, 20.32 x 25.4 cm; sampling area 18 x 23 cm) filter.

- Before use and in between punching out filters, rinsed the punch with acetone then hexane.
- Fold the filter half with the side containing the particulate inside.
- Punch once on the half folded filter using the rinsed 47 mm diameter punch (gives 2 discs).
 - Each disc has an area of 17.35 cm² which correspond to 4% of the sampling area of the filter.
- Wrap the discs individually in foil wrapper and place them in plastic bag. Label them with the following information:
 - Site Name
 - Sampling Date
 - Filter ID



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- Field Sample No.
- Total suspended particulate (TSP) mass on the whole filter
- Log in all the information for these discs in an archived samples inventory list.
- Seal the plastic bag and store these discs in the freezer until they can be submitted for analysis.

3. Revisions

Sep. 1999: Author: Ron Halman; New Document

May 2011: Lead Reviewer: Michael Lister May 26 2011

Renumbered to 3.19/1.0/S.

Section 2.12-Change to procedures to reflect unit change.

November, 2011: Lead Reviewer: Gary Poole

Removed references to Air Toxics and replaced with AAQS throughout

Section 2.3: added that the time, date and analyst receiving the sample is recorded onto the datasheet accompanying the sample.

Added that the information from the data sheet is entered onto the spreadsheet to determine the STP corrected volumes and TSP values and where the spreadsheet is located.

Added to log the sample into the LIMS.

Section 2.5: Added a statement on stamping the filters and envelopes with a discrete number and determine the initial weight before deployment to the field.

Deleted “with heat sealer” from Sections 2.4 and 2.5

Section 2.5 Added “for a minimum of 4 hours”

July 2013 Leader Reviewer: May Siu/Jennifer Verner

Deleted revision history 2009 and older

Text and numbering revised for clarity

Section 2.1.2: Added filter stamping procedure

Section 2.2.1: Added samples volume acceptance limit

Sept 2013 Added Section 2.2.3.1 Sub-Sampling from filter for special studies



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