



NTN Sample Change-out, Aerochem Metrics Bucket Collector

Items needed:

- Field Observer Report Form (FORF), as started the previous week
- FORF, for next week's sample
- new bucket in protective plastic bag
- new lid in protective plastic bag
- fresh (< 6 months old) deionized or distilled water in a plastic squeeze bottle
- paper towels or lab wipes (e.g., Kimwipes^{*})
- carrier (if used) for supplies, lid, and new bucket
- log book, if used



New bucket and lid in carrier



Aerochem Metrics bucket collector

Precautions:

Use care when handling the sample bucket and lid to avoid contaminating the sample. NTN samples are analyzed for sodium, chloride, and potassium all of which are present in sweat.

Instructions:

1. Approach the collector from the downwind side (i.e., facing the wind). This will reduce the chance that the sample is contaminated inadvertently. If there is snow or ice on the collector lid, brush it off before proceeding.

^{*} **Disclaimer:** Use of a trade or manufacturer's name does not constitute an endorsement by the University of Wisconsin, the Wisconsin State Laboratory of Hygiene, the National Atmospheric Deposition Program, or project sponsors.

2. Make observations as to the conditions of the collection site and equipment. Record observations in Block 10 (**Remarks**) on the Field Observer Report Form (FORF). See the Appendix to this document for a sample FORF.

<p>10. REMARKS <i>For example: equipment malfunction, contamination, farming, burning, logging, leakage before weighing, etc.</i></p> 
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Retrieving the deployed sample bucket.

3. Verify operation of the sensor by placing your finger along the sensor grid. If the ambient temperature is less than 40°F (4°C) the grid should feel warm.



4. Activate the collector lid by placing several drops of water (DI, or tap), or a small amount of snow on the sensor. The collector should remain open for several minutes allowing change-out of the sample.



- Inspect the contents of the bucket for contaminants. Do not lean over the open bucket. Doing so may lead to contamination of the sample (e.g., human hair, clothing fibers). Note any contaminants in Block 5 (**Sample Conditions**) of the FORF.

5. SAMPLE CONDITION <i>Check type of contamination for all field buckets before and after decanting. Describe all contamination in Block 10, including any not listed here.</i>	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	1. Bird droppings	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	3. Soot/ash/dirt particles	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	5. Leaves/twigs/pollen/plant matter
	YES	NO																
	2	1																
	YES	NO																
2	1																	
YES	NO																	
2	1																	
<table border="1"> <tr><td>2</td><td>1</td></tr> </table>	2	1	2. Cloudy or discolored	<table border="1"> <tr><td>2</td><td>1</td></tr> </table>	2	1	4. Insects/animal matter	<table border="1"> <tr><td>2</td><td>1</td></tr> </table>	2	1	6. Handling contamination							
2	1																	
2	1																	
2	1																	
<i>After decanting into sample bottle, look closely at sample and field bucket and double-check your entry.</i>																		

- Grasp the bagged lid from the side opposite the zip. Fold the bag back over your wrist, exposing the lid with the seal side down. Use the bag as a “glove” and place the lid on the bucket.



- Using your bagged hand, push the leading edge of the lid down firmly on the bucket rim. Avoid touching the lip of the bucket and the underside of the lid with bare hands. Doing so may lead to sample contamination when the sample is decanted.



8. Lift the sealed bucket from the collector holder and place it in the carrier or on a clean surface. ***Do not set the bucket on bare ground as dirt and dust are difficult to remove when the bucket is washed.*** Verify that the lid is sealed firmly on the bucket.



9. Complete Block 3 (**Field Bucket**) of the FORF for the previous week to include the OFF Date and Time for the sample bucket that was collected. The Date is expressed in the form MMDDYY. Time is expressed based on a 24-hr clock.

3. FIELD BUCKET						
		Date			Time	
		MO	DAY	YR	0001-2400	
ON						
OFF						

Cleaning the collector.

The previous week’s bucket should be removed, sealed, and secured. The new bucket should be bagged and protected prior to deployment.

10. Moisten a lab wipe (e.g. Kimwipes) or paper towels (non-print/colored) with deionized (or distilled) water. Wipe down the:
 - underside of the lid seal pad,
 - top and sides of the collector lid,
 - lid arms,
 - collector tabletop,
 - clean any debris from the sensor.

11. Note the condition of the lid seal pad and record any problems in Block 10 (**Remarks**). If the seal pad is torn, punctured or looks discolored, call the CAL for a replacement and circle *lid seal pad* in Block 9 (**Supplies**) of the FORF. A damaged lid seal or one that fits poorly can lead to sample contamination.

9. SUPPLIES <i>Request early.</i>	
<i>Circle if needed, until received.</i>	
CAL address labels	lid seal pad
dashpot fluid	packing tape
dry sample env.	raingage charts
field forms	raingage ink
gloves (S, M, L)	

12. Verify correct operation of the equipment (motorbox, sensor, and raingage). Complete Block 4 (**Site Operations**) of the FORF.

4. SITE OPERATIONS <i>Check YES, NO, or U (Unable to determine) for each field bucket. If NO or U for Item 1 or 2, describe in Block 10 and call CAL.</i>		
YES	NO	U
2	1	0
2	1	0
2	1	0
YES	NO	

- The **collector sensor heater** and **motor box** operated properly.
Lid is in correct position
- Raingage operated properly during the week.
- Collector opened and closed at least once during the week, **other than for testing.**
- Raingage in winterized state during sampling period (antifreeze in bucket & funnel out).

Deploying new sample bucket.

13. Switch to the FORF for the current week's sample. Complete blocks 1 and 2 (**Site** and **Observer**, respectively) for the sample bucket to be deployed. This includes:

- the name of the Site
- the 4 character ID of the Site (e.g., IL11)
- your name as the Observer, and
- your initials

1. SITE Name _____ ID <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	2. OBSERVER Print name _____ Initials <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
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14. Grasp the new clean bucket by its handle and remove the twist-tie that holds the bag closed. Pull the bag back over your arm so that the bag acts as a “glove”. Turn the bucket upside down and shake it to ensure that no rinse water remains in the bucket. Place the bucket on the collector so its handle is located on the side of the collector with the tie-down spring (as illustrated below). Fasten the tie-down spring to the handle of the bucket to secure the bucket.



15. While face away from the sample bucket, blow across the surface of the grid sensor to remove excess water. This should help the collector close sooner. The collector lid should move smoothly. Verify that the lid seal fits snugly over the bucket.
16. Enter the Date and Time that the sample bucket was placed “ON” the collector in Block 3 (**Field Bucket**) of the FORF for the current week.

3. FIELD BUCKET						
		Date			Time	
		MO	DAY	YR	0001-2400	
ON						
OFF						

17. Place the sealed bucket containing last week’s sample in the plastic bag that the new bucket came in. Seal the bag, and return it to the carrier for transport to the field laboratory.
18. Verify that the collector lid is resting on the wet side bucket before leaving the site.

Incorporating data from raingage.

19. Complete Block 7 (**Precipitation Record**) of the previous week's FORF to include the daily precipitation values, and the type of precipitation (i.e., rain, snow, mixed, unknown) for each data with precipitation. Refer to the appropriate SOP for interpreting a Belfort raingage chart, or for downloading data from the electronic raingage.

7. PRECIPITATION RECORD		All sites must circle Precipitation Type							
		← Bucket On R – Rain Only (Includes Hail) S – Snow Only M – Mixture U – Unknown Bucket Off →							
		TUES	WED	THURS	FRI	SAT	SUN	MON	TUES
Type circle one →		R S M U	R S M U	R S M U	R S M U	R S M U	R S M U	R S M U	R S M U
Amount Inches or circle one →		Z T MM	Z T MM	Z T MM	Z T MM	Z T MM	Z T MM	Z T MM	Z T MM
		Z – Zero		T – Trace (Circle Type)		MM – Missing			
Sample Weight (grams)		X 0.00058 inches/gram =		Sample Depth (inches)		Do these values agree within ±5%?		Total Raingage Depth (inches)	
		[][] . [][]		[][] . [][]		YES <input type="checkbox"/> NO <input type="checkbox"/> (If no, reweigh)		[][] . [][]	
E-gage sites: Please submit your electronic raingage data promptly after shipping this sample.									

20. Take the bagged and sealed bucket containing last week's sample to the field lab for processing. This includes weighing the bucket and sample. The sample is then decanted to a bottle for shipment to the CAL for analysis. Refer to the SOP titled *Decanting the Sample for Shipment to the CAL*. Block 6 (**Bucket Sample Weight**) and Block 8 (**Sample Bottle Use**) of the FORF will be completed.

6. BUCKET SAMPLE WEIGHT	
Weigh ALL sample buckets.	
[][][][][][] . []	Bucket + Lid + Sample
- [][][][][][] . []	CAL Bucket
- [][][][][][] . []	CAL Lid
= [][][][][][] . [] →	Sample Weight (grams)

8. SAMPLE BOTTLE USE	
Pour ANY and ALL liquid up to 1-liter into the sample bottle.	
Did you pour sample into the bottle?	
YES <input type="checkbox"/>	NO <input type="checkbox"/>

21. Indicate any supplies that are needed in Block 9 (Supplies) of the FORF.

Contact Information

Please contact the NADP Site Liaison at 800-952-7353 or via email at ntn@slh.wisc.edu if you have any questions, or if any problems are encountered. The site liaison can:

- help troubleshoot equipment problems,
- order replacement parts,
- explain the FORF, and
- explain the steps in this manual in greater detail.

Appendix A – Sample Field Observer Report Form (FORF)

