

Sheet flow sampling guidance document

Accompanies the MPCA's "How to Collect a Sheet Flow Sample" video

Industrial stormwater

The Industrial Stormwater Multi-Sector General Permit requires all permittees to conduct stormwater monitoring. This fact sheet, and its companion video (<https://www.youtube.com/watch?v=AmEJUNp44aU>), offer helpful guidance and tips about how to correctly collect a sheet flow sample. For alternative sampling methods and for comprehensive guidance about the permit's sampling and monitoring requirements, please visit the Industrial Stormwater Program webpage, Step 7: Sampling - <https://www.pca.state.mn.us/business-with-us/step-7-sampling>

This sheet flow sampling uses six basic steps:

1. preparing for sampling
2. assembling the proper equipment
3. selecting the best sampling location
4. collecting the sample
5. sending the samples to a laboratory
6. submitting the results to the Minnesota Pollution Control Agency (MPCA)

Sheet flow sampling is an invaluable tool, especially on impervious surfaces. However, as you will see, the surface material of the sheet flow sampling location results in unique collection methods and equipment.

Step 1. Preparing for sampling

Be prepared to collect your sample **within 30 minutes of the start of a runoff event** when the stormwater/snowmelt is flowing (not standing still or ponding), so you will get a more representative sample of your facility's conditions.

Step 2. Assembling the proper equipment

For each monitoring location, you may need:

- one new, 2-gallon plastic storage bag
- two, 2-gallon re-sealable plastic bags
- one new, 1-gallon re-sealable plastic bag
- one pair powder-free, disposable nitrile or latex gloves
- one straight piece of metal or wood, examples include a 2" x 2" x 18" piece of lumber, a similar sized pipe, a shovel handle, or similar item
- one small quantity of wet or dry sand material
- one pair of scissors

- one clean bottle for collecting the sample (provided by your lab)
- one container of preservative (if provided by your lab)
- chain-of-custody (COC), provided by your lab
- one cooler for shipping the sample
- ice, enough to fill the cooler

Suggested:

Before you go outside, be familiar with the lab instructions for sample collection to ensure the correct bottle, volume, and preservative (if required) are used. Have a camera for a visual record of sampling conditions, a field notebook, and waterproof pens.



Step 3. Selecting the best sampling location

If possible, familiarize yourself with the site terrain prior to a rain or snowmelt event. Sampling location should be updated in the Stormwater Pollution Prevention Plan (SWPPP), located at the facility. In any case, choose locations that are most representative of the runoff and best allows for obtaining a sample.



Step 4. Collecting the sample

Because a sheet flow discharge may be too shallow to collect easily with a sample bottle, one approach is to install a temporary barrier device, trough, or gutter to intercept stormwater flow. Industrial Stormwater Program staff strongly recommends that these devices be lined to prevent inadvertent sample contamination. Straight edged metal, wood, or berms, such as speed bumps or funnels, can be employed as temporary barriers to achieve collection success. Take care to not walk or stand upstream of the sample location as this disturbance could contaminate your sample.

- Cut off the top of the clean, plastic storage bag.



- Next, slit both sides of the bag so if it was unfolded you would have an oblong piece of plastic. Leave it folded together for now.
- Fill the two, re-sealable 2-gallon bags about one-quarter full with wet or dry sand from a location that will not disturb your sample site.



- Squeeze out the air in each bag and seal.
- Take your collection materials to your monitoring location.
- Put on the clean gloves. This prevents the possibility of your fingers or hands accidentally contaminating the sample.
- Unfold the plastic bag that you cut into an oblong sheet and lay it lengthwise in the flowing stormwater in the direction the water is flowing.



- Place the bags of sand on top of the plastic bag you cut into an oblong sheet, as shown, to help direct the stormwater flow into a narrow “channel”.



- Place the straight piece of wood or metal (or the shovel handle) underneath the plastic bag you cut into an oblong sheet on the downstream side of the bags. This should make it easier to guide the stormwater from the sandbag channel straight into your collection bag.



- Unscrew the cap from the clean stormwater sample collection bottle you received from your lab. Place the cap in your pocket or on a clean, uncontaminated surface. Be sure you do not place the cap on the ground! Place the clean bottle in a location where surface flow will not tip it over while you work.
- Hold the 1-gallon collection bag so the opening is facing upstream.



- You will probably have to fill the bags several times in order to fill the bottle to within one half inch of the opening (unless your lab has instructed you otherwise).



- Add the sample preservative if your lab has provided one. Be sure to handle the preservative carefully; most are acids or bases and can cause skin or eye irritation if not handled correctly.



- Once filled, cap the sample bottle, ensure your name and the sample collection date, location, and time are on the label, and place it inside a re-sealable plastic bag.
- Place the bag into a cooler and prepare the cooler for pickup or shipment to the lab. This includes packing the sample with ice. (Do not use ice packs. They cannot uniformly surround the sample bottle).



- A photo of the sealed container is not required but may provide a useful record.



For more information on the best sampling method for your facility, the monitoring guidance manual, to view other training videos, and to sign up for the program's electronic newsletter, visit the Minnesota Pollution Control Agency's website at <https://www.pca.state.mn.us/business-with-us/industrial-stormwater>.