

Managing Stormwater: Sheet Flow

A stormwater pollution control plan should include drainage areas and patterns for all discharge points. In some cases, stormwater leaves the site in the form of “sheet flow,” as it runs off paved or vegetated areas. Sheet flow must be evaluated like all other stormwater leaving an industrial facility, but it can present a number of unique challenges when making visual observations or collecting stormwater samples for characterization.

What is sheet flow?

Sheet flow is the overland transport of stormwater in a shallow concentrated flow. When sheet flow is exposed to industrial activities or significant materials and discharges to a water of the state, the U.S. Environmental Protection Agency requires that these discharges also be regulated under DEQ’s National Pollutant Discharge Elimination System 1200-Z permit.

How to address sheet flow

First, evaluate whether your facility discharges sheet flow from areas exposed to industrial activities. DEQ recommends that facilities eliminate sheet flow leaving that site rather than managing it as a separate discharge. Options for eliminating sheet flow include:

- Divert sheet flow to established conveyances that drain to monitoring or treatment locations.
- Contain and infiltrate sheet flow using berms or vegetative cover, depending on the volume of flow.
- Eliminate stormwater exposure to industrial activities in those areas that form sheet flow discharges.

If sheet flow cannot be eliminated, it must be managed as a discharge point in accordance with permit requirements. Permit holders must:

- Install and maintain appropriate control measures to minimize pollutants in sheet flow runoff.
- Delineate drainage areas and identify discharge locations, and include these determinations in the permit’s stormwater pollution control plan.
- Perform stormwater sampling of sheet flow per monitoring requirements for your facility. This can be challenging as the flow may be too shallow for collection bottles to be filled. Recommended approaches to sampling sheet flow are referenced below.

Evaluate which sheet flow management approach is most appropriate for your facility. DEQ expects permit holders to update stormwater pollution control plans with evaluation findings and include any changes to site infrastructure or monitoring locations.

Recommended guidance for collecting sheet flow samples:

EPA Industrial Stormwater Monitoring and Sampling Guide (March 2009):

https://www.epa.gov/sites/production/files/2015-11/documents/msgp_monitoring_guide.pdf

State of Washington Department of Ecology’s Stormwater Sampling Manual (December 2015):

<https://fortress.wa.gov/ecy/publications/documents/1503044.pdf>

Industrial Stormwater: How to Collect a Sheet Flow Sample

<https://www.youtube.com/watch?v=AmEJUNp44aU>



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