



Streets and parking lots

# Catch-Basin Maintenance

## Low-cost solutions

Develop a schedule to regularly clean catch basins at least once per year.

Prioritize cleaning schedule to regularly maintain basins that receive the most sediment.

Communities may consider joint purchasing and use of a vactor truck to reduce costs.

## What's the Problem?

Debris, chemicals, trash, sediment, leaves, and other pollutants that enter storm drains in streets travel to lakes, rivers, and streams. Storm drain catch basins should be cleaned and maintained in order to prevent this pollution from entering waterways. Storm drains can also be retrofitted with devices to filter out pollutants and protect water quality.

## Catch-Basin Design Considerations

Several varieties of catch basin inserts exist for filtering runoff. Inserts to remove oil, chemicals, debris, and sediment can improve the efficiency of catch basins. Some inserts are designed to drop directly into existing basins, while others may require retrofit construction.

One design option consists of a series of trays, with the top tray serving as an initial sediment trap; the underlying trays filter out pollutants. Another design option uses filter fabric to remove pollutants from runoff. These devices have a smaller volume capacity compared to the volume of the catch basin sump, and would typically require frequent sediment removal.

Retrofitting existing catch basins may help improve their performance substantially. One retrofit option of catch basins is to ensure that they have a hooded outlet, or 90-degree pipe elbow, to prevent floatable materials such as debris from exiting the sump.

## Catch-Basin Cleaning Schedule

It is generally recommended to develop and implement a program to evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment at least one time per year. Some communities clean once every two years.

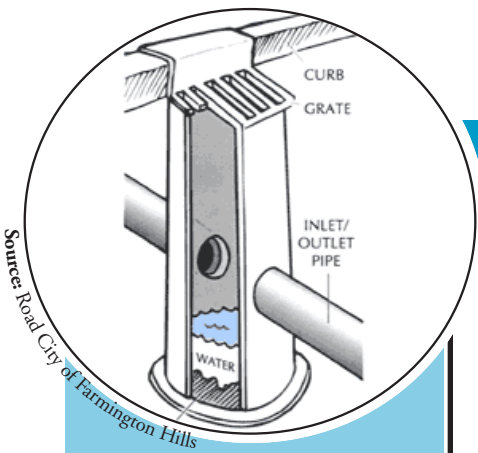
It is also recommended that cleaning be done before basins are half full to maintain the sump capacity. Structures that accumulate more debris may need more frequent cleaning. Fall is a good time to clean catch basins after leaves have fallen and before the first snowfall. Another good time to clean basins is in the spring to remove the buildup of leaves, dirt, and other debris that accumulated during the winter months. Areas that contribute to higher pollutant loadings or discharge to surface waters should be cleaned more frequently.

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## Cleaning Process

It is important to remove sediment and debris from stormwater structures, including the surface grates and the interior and sump of the structure. Routine cleaning reduces the amount of debris, chemicals, and sediment (including metals that bind to soil particles) that enter receiving waters. Debris left in catch basins can decompose; this reduces the amount of dissolved oxygen and may increase bacteria levels in a waterway. High levels of dissolved oxygen and low levels of bacteria are important to the health of aquatic ecosystems.

Catch basins can be cleaned manually or with specially designed equipment including tools and vehicles with vacuum pumps to remove pollutants. High-pressure water loosens compacted material and vacuums remove solids and liquids. These trucks are expensive to purchase, so many communities use contractors for catch-basin-cleaning services.

## Disposal Regulations

The combined liquid and solid waste removed from the catch basin when cleaning storm sewer systems is legally defined as “liquid industrial waste,” pursuant to Part 121, Liquid Industrial Wastes (Part 121), of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

When removing the material from a catch basin using a vactor truck, the liquid and solid waste is combined, resulting in liquid industrial waste. However, a sump pump, or any other pumping mechanism other than a vactor truck, can be utilized to remove the majority of water in the sump of the basin without disturbing the solid material below. This water can be properly discharged through the following recommended practices:

- Discharge to the sanitary system (with prior approval).
- Apply it to the ground adjacent to the catch basin (evenly distributed at a maximum rate of 250 gallons/acre/year).
- This discharge is only allowed if the water is not mixed with the solids at any point.

If the liquid and solids are mixed (such as when using a vactor truck), they are both considered liquid industrial waste and can be discharged using the following methods:

- Discharge into a wastewater treatment plant (must request permission from the sanitary system operator). Most treatment plants require pre-treatment. All applicable local ordinance provisions must be followed.
- Use drying beds to separate the liquid from the solids. This is usually performed at a publicly owned treatment plant where the liquid portion of the waste stream is drained and separated from the solids during the drying process and discharged to the treatment plant. The resulting solid waste is fully subject to Part 115, Solid Waste Management (Part 115) of NREPA, which requires proper disposal at a licensed landfill. Solid waste from a catch basin cannot be used as fill on local government or private property.
- Combined liquid and solid waste can also be disposed of at a privately owned company that is licensed by the Michigan Department of Environmental Quality to legally accept liquid industrial waste.

## Training

Maintenance staff must be properly trained to address emergency spills and illegal disposal activities to recognize signs of contamination during regular maintenance. It is important to be aware of sediment with obvious contamination such as unusual odor, staining, corrosion, unusual odor, fumes, and oily sheen. If a spill has occurred in a basin, contact the proper authority in your community. Once emergency conditions have been addressed, any remaining material in the catch basin should be segregated until further testing can be done. If disposal of spoil materials is delayed on site, proper containment must be ensured to prevent leaking or contamination.

## Cost Considerations

Effective methods of catch basin cleaning and disposal, and the appropriate frequency of cleaning are integral to an effective catch basin maintenance program. There are a variety of costs associated with catch basin replacement, retrofitting, and maintenance. A typical catch basin costs \$2,000-\$3,000. A vactor truck, a common method of cleaning, typically costs \$125,000-\$150,000. Communities may consider joint purchasing and use of a vactor truck with another community. Depending on the community, there may be disposal costs for the spoils and polluted material. Retrofit catch basin inserts range widely with regard to cost. A “drop in” type catch basin insert may cost from \$70-\$400, while more elaborate insert designs can cost \$2,000 and higher. Many communities find that hiring a private contractor to clean and maintain catch basins is the most cost-efficient approach.

## Storm-Drain Marking

Stenciling or applied decals that read “Dump No Waste-Drains to River” are good reminders that only water belongs down a storm drain. Consider marking catch basins in your community to inform individuals that storm drains lead directly to lakes, streams, and rivers. Storm-drain marking can be an effective community service activity appropriate for schools, scout troops, community groups, adults, and seniors. If feasible, encourage volunteers in your community to plan a storm-drain-marking activity by supplying instructions, supplies, maps, and possible staff support.

There are a variety of methods for marking storm drains, including paint stencil, vinyl curb marker, pre-glued curb marker, aluminum curb marker, pavement marker, and pre-cast inlet. A community should choose the marking method that best fits its needs and budget. Some methods require more maintenance than others, such as stenciling, because paint must be reapplied every couple of years. Vinyl curb markers are popular because they are attractive, easy to apply, and last for several years. Consider marking or re-marking storm drains during road construction or scheduled catch-basin cleaning.



**Cover photo:** Catch basins should be cleaned before basins are half full to maintain capacity. Photo courtesy of Bloomfield Township

**Top left photo:** A catch basin is an opening to the storm drain system that typically includes a grate or inlet and a sump to capture sediment, debris, and other pollutants.

**Top right photo:** Clean sediment from storm drain grates to prevent clogging of the system.

**Back page photo:** Catch basins can be cleaned manually or with specially designed equipment including tools and vehicles with vacuum pumps to remove pollutants.

