

SC-10 Non-Stormwater Discharges

Description

Non-Stormwater discharges (NSWDs) are flows that do not consist entirely of stormwater. Some NSWDs do not include pollutants and may be discharged to the storm drain if local regulations allow. These include uncontaminated groundwater and natural springs. There are also some NSWDs that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include potable water sources, fire hydrant flushing, air conditioner condensate, landscape irrigation drainage and landscape watering, and emergency firefighting, as discussed in section 2 of the Handbook.

However, there are certain NSWDs that pose environmental concerns. These discharges may originate from illegal dumping of industrial material or wastes or from internal floor drains, appliances, industrial processes, sinks, and toilets that are illegally connected to the nearby storm drainage system through on-site drainage and piping. These unauthorized discharges (e.g., process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals, and other pollutants into storm drains.

NSWDs must be addressed through a combination of detection and elimination. The ultimate goal is to effectively eliminate unauthorized NSWDs to the stormwater drainage system by implementing measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants onto streets and into the storm drain system and downstream water bodies.

Approach

Initially a discharger must make an assessment of NSWDs to determine which types must be eliminated or addressed through best management practices (BMPs). The focus of the following approach is eliminating unauthorized NSWDs. See

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Substitute Products

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered

 Good Housekeeping	✓
 Preventative Maintenance	
 Spill and Leak Prevention and Response	✓
 Material Handling & Waste Management	
 Erosion and Sediment Controls	
 Employee Training Program	✓
 Quality Assurance and Record Keeping	✓



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other BMP fact sheets in this series for activity-specific pollution prevention procedures.

General Pollution Prevention Protocols

- Implement waste management controls described in SC-34 Waste Handling and Disposal.
- Develop clear protocols and lines of communication for effectively prohibiting NSWDs, especially those that are not classified as hazardous. These are often not responded to as effectively as they should be.
- Clearly identify storm drains by stenciling or otherwise demarcating them, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste - Drains to Stream” or similar wording on or next to them to warn against ignorant or unintentional dumping of pollutants into the storm drainage system.
- Manage and control sources of water such as hose bibs, faucets, wash racks, and irrigation heads. Identify hoses and faucets in the stormwater pollution prevention plan (SWPPP), and post signage for appropriate use.

NSWD Investigation Protocols

Identifying the sources of NSWDs requires the discharger to conduct an investigation of the facility at regular intervals. There are several categories of NSWDs, including the following:

- Visible, easily identifiable discharges typically generated as surface runoff such as uncontained surface runoff from vehicle or equipment washing.
- Nonvisible (e.g., subsurface) discharges into the site drainage system through a variety of pathways that are not obvious.

The approach to detecting and eliminating NSWDs will vary considerably, as discussed below:

Visible and Identifiable Discharges

- Conduct routine inspections of the facilities and of each major activity area, and identify visible evidence of unauthorized NSWDs. This may include the following:
 - ✓ Visual observations of actual discharges occurring
 - ✓ Evidence of surface staining or discoloring, which indicates that discharges have occurred
 - ✓ Pools of water in low-lying areas when a rain event has not occurred
 - ✓ Discussions with operations personnel to understand practices that might lead to unauthorized discharges
- If evidence of NSWDs is discovered:

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- ✓ Document the location and circumstances using worksheets 5 and 6 (in section 2 of the Handbook), including digital photos.
 - ✓ Identify and implement any quick remedy or corrective action (e.g., moving uncovered containers inside or to a proper location).
 - ✓ Develop a plan to eliminate the discharge. Consult the appropriate activity-specific BMP fact sheet for alternative approaches to manage and eliminate the discharge.
- Make sure the facility SWPPP is up-to-date and includes applicable BMPs to address the NSWD.

Other Illegal Discharges (Nonvisible)

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of as-built piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate discharges to the storm drain system.
- Perform a visual inspection and inventory:
 - ✓ Inventory and inspect each discharge point during dry weather.
 - ✓ Keep in mind that drainage from a storm event can continue for 1 or 2 days following the end of a storm and groundwater might infiltrate the underground stormwater collection system.
 - ✓ NSWDs are often intermittent and might require periodic inspections.

Infield Piping

- A review of the as-built piping schematics is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of loading/unloading area drain inlets and floor drains in older buildings.
- Never assume that storm drains are connected to the sanitary sewer system.

Monitor Investigation/Detection of Illegal Discharges

- If a suspected illegal or unknown discharge is detected, monitoring the discharge might help identify the content and/or the source. This may be done with a field screening analysis or flow meter measurements, or by collecting a sample for laboratory analysis. Section 5 and appendix D in the Handbook describe the necessary field equipment and procedures for field investigations.

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- Investigative monitoring can be conducted over time. For example, if a discharge is intermittent, monitoring might be conducted to determine the timing of the discharge to determine the source.
- Investigative monitoring may be conducted over a spatial area. For example, if a discharge is observed in a pipe, monitoring might be conducted at accessible upstream locations to pinpoint the source of the discharge.
- Generally, investigative monitoring requiring collection of samples and submittal for laboratory analysis requires proper planning and specially trained staff.

Smoke Testing

Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two piping systems. Smoke testing is generally performed at a downstream location, and the smoke is forced upstream using blowers to create positive pressure. The advantage to smoke testing is that it can potentially identify multiple potential discharge sources at once.

- Smoke testing uses a harmless, nontoxic smoke cartridges developed specifically for this purpose.
- Smoke testing requires specialized equipment (e.g., cartridges, blowers) and generally should be conducted only by specially trained staff.
- A standard operating procedure (SOP) for smoke testing is highly desirable. The SOP should address the following elements:
 - ✓ Proper planning and notification of nearby residents and emergency services since introducing smoke into the system could result in false alarms.
 - ✓ During dry weather, filling the stormwater collection system with smoke and then tracing the smoke back to sources.
 - ✓ Temporary isolation of segments of pipe using sand bags to force the smoke into leaking pipes.
 - ✓ The appearance of smoke in a waste vent pipe, at a sewer manhole, or even the base of a toilet, indicating that there might be a connection between the sanitary and storm water systems.
- Most municipal wastewater agencies having necessary staff and equipment to conduct smoke testing that should be contacted if cross-connections with the sanitary sewer are suspected. See SC-44 Drainage System Maintenance for more information.

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Dye Testing

- Dye testing is typically performed when there is a suspected specific pollutant source and location (i.e., leaking sanitary sewer) and evidence of dry weather flows in the stormwater collection system.
- Dye is released at a probable upstream source location, either the facility's sanitary or process wastewater system. The dye must be released with a sufficient volume of water to flush the system.
- Operators then visually examine the downstream discharge points from the stormwater collection system for the presence of the dye.
- Dye testing can be performed informally using commercially available products to conduct an initial investigation for fairly obvious cross-connections.
- More detailed dye testing should be performed by properly trained staff following SOPs. Specialized equipment such as fluorometers might be necessary to detect low concentrations of dye.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct dye testing, and they should be contacted if cross-connections with the sanitary sewer are suspected.

TV Inspection of Drainage System

- Closed circuit television (CCTV) can be employed to visually identify illicit connections to the industrial storm drainage system. Two types of CCTV systems are available: (1) a small specially designed camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, and (2) a larger remotely operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe.
- CCTV systems often include a high-pressure water jet and camera on a flexible cable. The water jet cleans debris and biofilm off the inside of the pipes so the camera can take video images of the pipes' condition.
- CCTV units can detect large cracks and other defects such as offsets in pipe ends caused by root intrusions or shifting substrate.
- CCTV can also be used to detect dye introduced into the sanitary sewer.
- CCTV inspections require specialized equipment and properly trained staff and are generally best left to specialized contractors or municipal public works staff.

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks may include paints, used oil and other automotive fluids, construction debris, chemicals, fresh

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concrete, leaves, grass clippings, and pet wastes. These substances can cause quality problems in stormwater and receiving waters as well as clog the storm drain system itself.

- Establish a system for tracking incidents. The system should be designed to identify the following:
 - ✓ Illegal dumping hot spots
 - ✓ Types and quantities (in some cases) of wastes
 - ✓ Patterns in time of occurrence (time of day/night, month, or year)
 - ✓ Mode of dumping (e.g., abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, and accidents/spills)
 - ✓ An anonymous tip/reporting mechanism
 - ✓ Evidence of responsible parties (e.g., tagging or encampments)
- One of the keys to successful reduction or elimination of illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

Once a site has been cleaned:

- Post “No Dumping” signs with a phone number for reporting dumping and disposal.
- Add some landscaping and beautification to hot spots to discourage future dumping as well as to provide open space and increase property values.
- Lighting or barriers might also be needed to discourage future dumping.
- See fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of NSWDS.
- Proactively conduct investigations of high-priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for proactive investigations.



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Spill and Leak Prevention and Response

- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or hazmat team may be necessary.
- See SC-11 Spill Prevention, Control, and Cleanup.



Employee Training Program

- Training of technical staff in identifying and documenting illegal dumping incidents is required. The frequency of training must be specified in the SWPPP and depends on site-specific industrial materials and activities.
- Consider posting a quick reference table near storm drains to reinforce training.
- Train employees to identify NSWDS and report discharges to the appropriate department.
- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the spill prevention control and countermeasure plan. Employees should be able to identify work/jobs with high potential for spills and suggest methods to reduce the potential.
- Determine and implement appropriate outreach efforts to reduce non-permissible NSWDS.
- Conduct spill response drills annually (if no events occurred) to evaluate the effectiveness of the plan.
- When a responsible party is identified, educate the party on the impacts of his or her actions.
- Document training activities.



Quality Assurance and Record Keeping

Performance Evaluation

- Annually review internal investigation results; assess whether goals were met and what changes or improvements are necessary.

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- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- Develop document and data management procedures.
- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited NSWDS observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that NSWDS have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Annually document and report the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.
- Document training activities.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing, and time limitations that can preclude implementation of BMPs. Following are some typical limitations and recommended “work-arounds:”

- Many facilities do not have accurate, up-to-date as-built plans or drawings that might be necessary to conduct NSWDS assessments.
 - ✓ Online tools such as Google Earth can provide an aerial view of the facility and may be useful in understanding drainage patterns and potential sources of NSWDS.
 - ✓ Local municipal jurisdictions may have useful drainage systems maps.
- Video surveillance cameras are commonly used to secure the perimeter of industrial facilities against break-ins and theft. These surveillance systems may also be useful for capturing illegal dumping activities. Minor, temporary adjustments to the field of view of existing surveillance camera systems to target known or suspected problem areas may be a cost-effective way of capturing illegal dumping activities and identifying the perpetrators.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital facility cost requirements may be minimal unless cross-connections to storm drains are detected.

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- Indoor floor drains may require replumbing if cross-connections are detected.
- Leaky sanitary sewers will require repair or replacement, which can have significant costs depending on the size and industrial activity at the facility.

Maintenance (including administrative and staffing)

- The primary effort is for staff time and depends on how aggressively a program is implemented.
- Costs for containment and disposal of any leak or discharge is borne by the discharger.
- Illicit connections can be difficult to locate, especially if there is groundwater infiltration.
- Illegal dumping and illicit connection violations require technical staff to detect and investigate them.

Supplemental Information Permit Requirements

The IGP authorizes certain NSWs, provided BMPs are included in the SWPPP and implemented to:

- Reduce or prevent the contact of authorized NSWs with materials or equipment that are potential sources of pollutants;
- Reduce, to the extent practicable, the flow or volume of authorized NSWs;
- Ensure that authorized NSWs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards; and
- Reduce or prevent discharges of pollutants in authorized NSWs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.

References and Resources

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