ILLICIT DISCHARGE DETECTION AND ELIMINATION

A QUICK-REFERENCE FIELD GUIDE FOR MUNICIPAL EMPLOYEES

2013

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Illicit Discharges: What they are and Why they Matter

Illicit discharges are defined by the State of Indiana as "any discharge to a municipal separate storm sewer system conveyance (or natural water body) that is not composed entirely of stormwater, except naturally occurring floatables, such as leaves or tree limbs". Illicit discharges can generally be found in the form of spills, illegal connections (sanitary cross-connections), illegal dumping, or excessive soil and sediment. Other examples of prohibited discharges are listed on the following pages.

Illicit discharges can contaminate water supplies, disrupt recreational activities on our rivers and lakes, and harm the environment and aquatic species. It's important to find illicit discharges and eliminate them in order to protect our natural resources and preserve them for future generations.

Illicit discharge example – Sediment laden runoff

Illicit discharges are illegal, and, if not corrected, can be enforced through various means, such as notices of violations, fines, and corrective measures. Keep in mind that illicit connections may be unintentional or unknown to the business owner or homeowner who is causing the illicit discharge. If you think you've discovered an illicit discharge, contact your supervisor about what you've seen. Your supervisor will inform your local Stormwater Coordinator about the potential problem.

Illicit discharges are any foreign materials in the drainage collection system other than pure, clean water.

Where to Look for Illicit Discharges

The following pages contain information about locations where illicit discharges are most often found and what sorts of activities may produce illegal discharges. (Note: Bolded items are areas especially prone to illicit discharge.)

Residential

Locations:	What To Look For:
• ***Apartments***	• ***Dumpster Areas***
• Multi-family homes	• Failing septic systems
• Single-family homes	• Lawn/landscape watering
	• Swimming pool discharges
	• ***Vehicle maintenance spills/leaks***
	• ***Yard waste dumping***

Commercial

Locations:	What To Look For:
• Campgrounds/RV parks	• Dumping/spills
• ***Car washes***	• ***Dumpster Areas***
• Commercial laundry/dry cleaning	• Grease traps
• Gas stations/auto repair centers	• ***Landscaping/grounds care***
• Marinas	• Oil / grease containers/ outdoor material storage
• Nurseries/garden centers	• Vehicle fueling/washing
• ***Restaurants***	• Vehicle maintenance/repair
• Swimming pools (commercial)	
• Vehicle service stations	

Construction Sites

Locations:	What To Look For:
• ***Active Construction Sites***	• Sediment from outlet pipes
• *Residential*	• Sediment tracked on roadways
• *Commercial*	• Equipment and materials staging/storage areas
• *Industrial*	• Vehicle fueling areas

Institutional

Locations:	What To Look For:
• Cemeteries • Churches • Corporate campuses • Hospitals • Schools/universities	• Building/parking lot power washing • Dumping/spills • ***Dumpster Areas*** • Equipment /vehicle washing • Lawn/landscape watering • ***Litter from parking areas***

Industrial

Locations:	What To Look For:
• **Auto recylers/scrap yards** • Beverage makers/breweries • Distribution centers • Food processing • Paper and wood product manufacturing • Petroleum storage • Vehicle wash areas	• All commercial activities • ***Dumpster Areas*** • Loading/unloading rinse areas • Material storage • Process water or rinse water

Municipal

Locations:	What To Look For:
• Airports • Animal shelters • Construction activities • Landfills • Maintenance depots • Municipal fleet storage areas • Public works yards • Streets/highways	• Building/parking lot power washing • Dumping/spills • Dumpster areas • Equipment /vehicle washing • Fueling areas • Lawn/landscape watering • Material storage • Road maintenance • Vehicle maintenance/repair

How Do We Find Illicit Discharges and Safety in the Field

Often, illicit discharges are reported from members of the public, but this is not the only way illicit discharges are identified. Because municipal employees are in the field every day, it is their responsibility to help identify these problems while completing their day-to-day duties.

The simplest way to identify illicit discharges is through the use of dry weather screening. Dry weather screening occurs after more than 72 hours without precipitation. If flow exists in the drainage system long after a rain event, this is a potential indicator of unnatural discharges to the system.

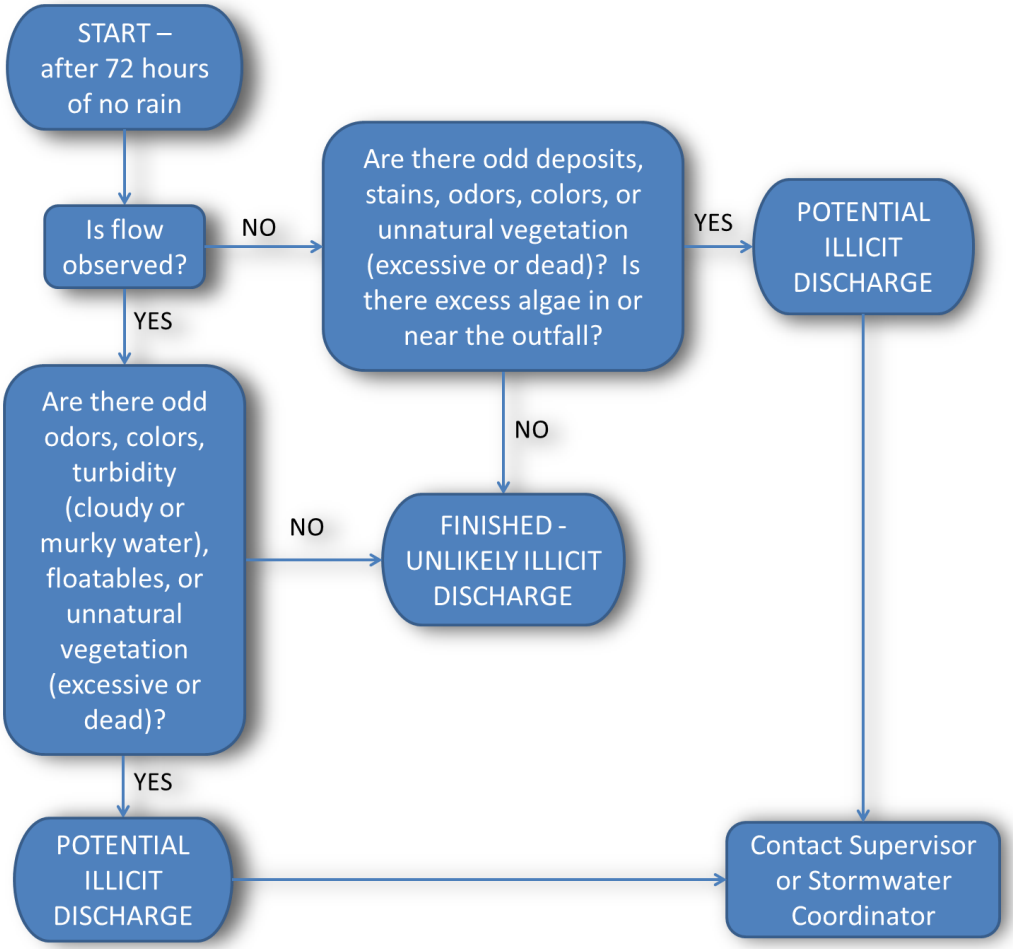
If you identify an illicit discharge or suspect an illicit discharge, contact your supervisor or your community's stormwater coordinator immediately. If you have the opportunity, it is best to document what you observe as soon as possible through the use of pictures, field notes, or other methods.

Field safety is an essential part of every worker's responsibility. Never compromise personal safety or the safety of others if you observe or are reporting to an illicit discharge. General safety precautions are as follows:

- *Always utilize safe, prudent practices while in the field.*
- *Rely on the buddy system.*
- *Wear appropriate personal protective equipment (PPE) at all times.*
- *Never enter a confined area without proper training and equipment.*
- *If you perceive a threat to yourself or others, move to a safe location.*
- *Notify others in the area immediately if you think a hazard exists.*
- *Be aware of pets and other animals that could be present or near the area.*
- *If a property owner becomes threatening, do not escalate the situation; leave the site and notify your supervisor.*
- *Only use spill cleanup and countermeasures if you have had adequate training for the spilled material and cleanup / countermeasures you are using.*

We rely on you to be the eyes in the field.
Please help us protect our communities and water sources from being contaminated.

General Procedures for Dry Weather Screening of Illicit Discharges



If you observe dumping or evidence of dumping, or you think you have found an illicit discharge, notify your supervisor or stormwater coordinator immediately.

Physical Indicators

Physical indicators observed during dry-weather screenings or routine inspections include: presence of unusual flow, odor, color, turbidity (mudiness), and floatables other than those that are naturally occurring.

Flow

The presence of flow at a site can indicate an illicit discharge, particularly during dry-weather periods. Sometimes, flow during dry weather periods is associated with groundwater and is completely natural. However, there are times when flows through the drainage system during dry weather can indicate cross-connections (sanitary discharges to the drainage system), or other prohibited activities. If there is no flow, evidence of stains/deposits, odors, and abnormal vegetation can still indicate an illicit discharge is taking place.

**NOTE: Though not recommended, discharges from residential car washing activities are allowed to flow into the drainage system. If observed, residents should be encouraged to wash their vehicles in a grassy area to minimize the release of grit, oils, and soaps. Lawn watering is also allowed for residential properties.*

Turbidity

Indicator: Turbidity.

Turbidity is water "cloudiness" or "murkiness" that can be the result of soil erosion, algae blooms, sediment-laden runoff, and dredging, among other causes. High turbidity is often a good indicator of illicit discharge. Often turbidity is associated with building and construction activities. Construction sites are required by law to manage soil erosion.

Odor

Excessive or unnatural odors can indicate different types of illegal discharge. Never inhale directly over the suspected area as it may contain vapors that could be harmful. Look around for other potential sources of the offensive smell. See the table below for common odors and their causes.

Odor	General Causes
Musty	▪ Raw or partially treated sewage ▪ Livestock waste
Sewage	▪ Sanitary wastewater from cross-connection with the drainage system ▪ Septic tank/ failing septic system
Rotten Eggs (sulfide)	▪ Stale sanitary wastewater ▪ Meat processing plants/ canneries/ dairies ▪ Decomposing organic matter
Gas or Oil	▪ Gas stations ▪ Vehicle maintenance operations ▪ Illegal disposal ▪ Industrial operations: refineries/ manufacturing
Sharp, pungent	▪ Chemicals ▪ Pesticides
Rancid, sour	▪ Food processing facilities ▪ Dairies
Chlorine	▪ Wastewater treatment plant discharges ▪ Swimming pool discharges ▪ Local manufacturing / industrial sites
Sweet, fruity	▪ Commercial wash water

Color

Excessive or unnatural colors in a water system can indicate different types of illegal discharge. See the table below for common colors and their possible causes. Be aware that water depth, sediment, aquatic plants, and other conditions can influence your perception of water color.

Color	Possible Sources
Yellow	▪ Chemical, textile, tanning plants
Brown	▪ Construction activities ▪ Meat packing facilities ▪ Printing facilities ▪ Concrete, metal, stone operations ▪ Agricultural land
Tan to light brown	▪ Construction activities ▪ Suspended sediments ▪ Agricultural land
Light to dark brown	▪ Decaying organic matter from soil, leaves, or other vegetation
Green (pea green, bright green, blue-green, brown-green)	▪ Chemical plants, textiles ▪ Algae or plankton bloom ▪ Antifreeze ▪ Fertilizer
Gray (milky/dirty dishwater, gray-black)	▪ Dairies/ food processing ▪ Sewage discharge ▪ Concrete wash-outs
Milky white	▪ Paint, lime, grease, concrete ▪ Swimming pool filter backwash ▪ Concrete wash-outs
Clear black	▪ Sulfuric acid spill ▪ Turnover of oxygen-depleted water
Red, purple, blue, black	▪ Fabric dyes, inks from paper and cardboard manufacturers
Red	▪ Meat packing/processing
White, crusty deposits	▪ Salt; commonly left behind after evaporation ▪ Brine water from oil production areas – petroleum odor and oily sheen may be present

Field Investigation Example

A red discharge was observed flowing into a creek. It was traced back to a soap and dye manufacturer. The night crew had washed down the work area and discharged the water into the storm drain.

Indicator: Color.

Floatables

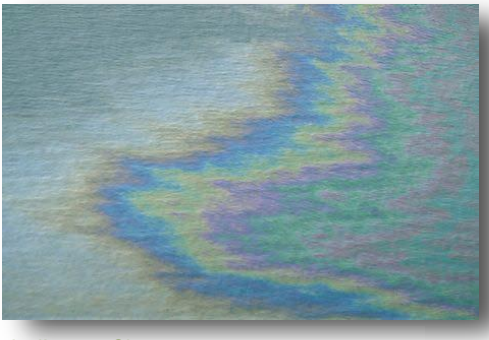
Floatables are anything unnatural that is floating on the surface of the water and an easy-to-spot indicator of illicit discharge. Illicit floatables include: solids or liquids from industrial or sanitary wastewater, garbage, trash, litter, toilet paper, oily sheen (described in detail below), or foam/suds. Natural floatables, such as branches or leaves, are not considered illicit discharge.

Indicator: Floatables; toilet paper and other trash in tree; indicates sanitary discharges to drainage system.

Illicit discharges cause harm to our environment and waterbodies. If you notice anything unnatural or abnormal, please tell your supervisor.

Sheen

Surface sheen indicates that oil and hydrocarbon wastes have been added to the water from surrounding areas or through illegal dumping. Sheen can also indicate presence of other toxins and pollutants. Oil sheens can be mistaken for naturally-produced sheen.



Indicator: Sheen.

Surface Floatables

A large grease spill from a food production operation was not properly contained, resulting in an illicit discharge to the creek. The waste produced a musty odor, gray water, and a thick buildup on the water surface.

Indicator: Floatables from food processing

Stains or Deposits

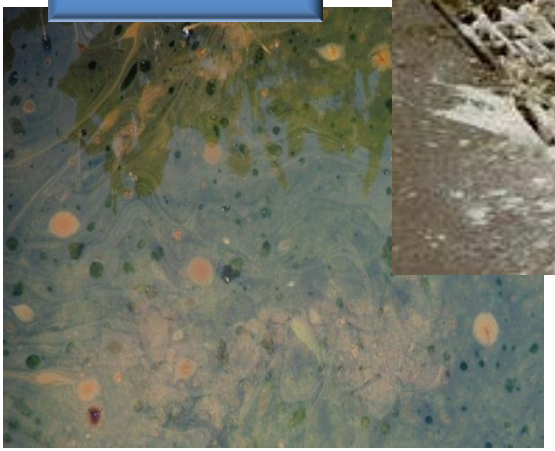
Stains or deposits can be any color, but it will be different than the outfall. Sediment is a common deposit. Gray-white deposits (see photo) can be from illegal concrete washouts or construction sites. Crystalline powder can be from salt spills or storage areas, as well as from fertilizer discharges.

Indicator: Deposits from concrete washout

Examples

The following are common examples of illicit discharges. Remember, if it doesn't look natural, it probably isn't.

Large oil droplets on water surface



Unknown material dumped on inlet

Soapy, sudsy discharge

Concrete Washout

Examples

Grass Clippings
- Improper disposal

Automotive Fluids

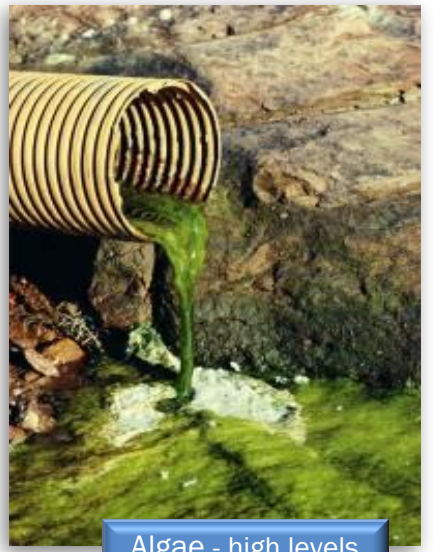
Illicit dumping of cleaning supplies

Inside a catch basin below a poorly maintained dumpster area located 50 ft from the recreational area of a lake.

Biological Indicators

Any abnormalities in a natural system can display evidence that an illicit discharge is taking place, including the following indicators:

Vegetation - abnormal increase or decrease of plant growth at outfall



Algae - high levels of fertilizer

Bacteria - sewage, sanitary sewer overflows, livestock, wildlife, others

Fish Kills - caused by decreased oxygen levels from algae blooms, infectious disease, rise in water temperature, other

Follow-Up Investigations

If you suspect that you've found an illicit discharge, please contact your supervisor or your local Stormwater Coordinator. The contact information for your local Stormwater Coordinator can be found on the back page of this manual. The Stormwater Coordinator will be responsible for follow-up investigations.

More detailed information about Illicit Discharge Detection and Elimination can be obtained from your supervisor and local Stormwater Coordinator.

This field guide manual was developed by Stantec Consulting Services, Inc. through the Southern Indiana Stormwater Advisory Committee partnership. It was adapted from a compilation of local, state, and national resources and is intended to serve as a guide for municipal employees working in the field to help them identify illicit discharges. Depending on the field activities of certain crews, additional training and instructional materials may be beneficial. As with all reference materials, periodic updates to this field guide may be necessary to maintain current procedures, examples, and contact information.

Contact Information

Morgan County Surveyor's Office:
Bill Dials (765) 342-1082
bdials@morgancounty.in.gov
www.morgancounty.in.gov

Morgan County Soil & Water Conservation District
Carla Allen (765) 349-2060
callen@morgancounty.in.gov
www.morgancountyswcd.org

Town of Mooresville:
Dennis Nail (317) 831-9545
dnail@mooresville.in.gov
www.mooresville.org/stormwater

City of Martinsville:
Ross Holloway (317) 831-7918
ross@hollowayengineering.com
www.martinsville.in.gov

Tri County Conservancy District:
Amy Moore (317) 293-3542
amoore@vsengineering.com

Town of Brooklyn:
Tonce Eggers (317) 831-3343
tbrooklyn@scican.net