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WHAT IS AN ILLICIT DISCHARGE?

The storm sewer system including ditches, storm drains, and pipes, collects stormwater and empties into a waterbody. An illicit discharge is any material besides stormwater that drains or falls into the storm sewer system.

PROHIBITED NON-STORMWATER DISCHARGES INCLUDE:

- Chlorinated swimming pool water
- Concrete waste
- Construction discharges
- Facility discharges
- Fats, oils, and grease (FOG)
- Fertilizers
- Lawn clippings
- Leaves
- Non-biodegradable soaps/detergents
- Paint
- Pesticides/herbicides and other hazardous chemicals
- Petroleum products (vehicle fluids/oils, fuels)
- Pet waste
- Sediment
- Sewage
WHAT IS NOT AN ILLICIT DISCHARGE?

Not all discharges are illicit.

ALLOWABLE NON-STORMWATER DISCHARGES INCLUDE:

- Air-conditioning condensate
- Dechlorinated swimming pool discharges
- Discharges from firefighting activities
- Groundwater/springs
- Landscape irrigation and lawn watering
- Water from residential car washing
- Water line flushing
OUTFALL FIELD INSPECTION
WORK FLOW DIAGRAM AND CLASSIFICATION SCHEME

START

Make physical observations.

Does the outfall have flow?

YES

Measure flow and measure field water chemistry if necessary.

NO

Are laboratory water samples necessary for collection?

YES

Collect water samples for laboratory analysis.

NO

Do observations suggest an illicit discharge?

DOES THE OUTFALL HAVE FLOW?

NO

UNLIKELY ILLICIT DISCHARGE

Do observations suggest an illicit discharge?

YES

POTENTIAL ILLICIT DISCHARGE

NO

UNLIKELY ILLICIT DISCHARGE

SUSPECT ILLICIT DISCHARGE

NO

Are laboratory water samples necessary for collection?

YES

Collect water samples for laboratory analysis.

NO

Does laboratory sample results, field water chemistry, and physical observations collectively suggest an obvious discharge?

YES

OBVIOUS ILLICIT DISCHARGE

NO

see table 1

see table 2
## Logic Scheme to Affirmatively Answer “Do Observations Suggest an Illicit Discharge?” Leading to a Classification of “Potential Illicit Discharge.”

<table>
<thead>
<tr>
<th>Observation</th>
<th>For Dry Weather</th>
<th>For Wet Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Foam</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Color Stain</td>
<td>Yellow, Red, Orange, Blue, Purple, or White</td>
<td>Yellow, Red, Orange, Blue, Purple, or White</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Cloudy or Opaque</td>
<td>Opaque</td>
</tr>
<tr>
<td>Presence of Floatables</td>
<td>Sewage, Petroleum Sheen, Paint, or Suds</td>
<td>Sewage, Petroleum Sheen, Paint, or Suds</td>
</tr>
<tr>
<td>Vegetative Conditions</td>
<td>Poor Growth or Overgrowth</td>
<td>Poor Growth or Overgrowth</td>
</tr>
<tr>
<td>Presence of Deposits</td>
<td>Oil, Paint, or Others</td>
<td>Oil, Paint, or Others</td>
</tr>
<tr>
<td>Odor</td>
<td>Sewage, Sulfide, Rancid, or Petroleum</td>
<td>Sewage, Sulfide, Rancid, or Petroleum</td>
</tr>
</tbody>
</table>

### Physical Parameters

### Field Water Chemistry

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results</th>
<th>Units</th>
<th>Results</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia Nitrogen</td>
<td>&gt; 2.0</td>
<td>ppm</td>
<td>&gt; 2.0</td>
<td>ppm</td>
</tr>
<tr>
<td>Chloride, Total</td>
<td>&gt; 2.0</td>
<td>ppm</td>
<td>&gt; 2.0</td>
<td>ppm</td>
</tr>
<tr>
<td>Detergent (Surfactant)</td>
<td>&gt; 5.0</td>
<td>ppm</td>
<td>&gt; 5.0</td>
<td>ppm</td>
</tr>
<tr>
<td>pH</td>
<td>&lt; 6.0 or &gt; 9.0</td>
<td>Standard Units</td>
<td>&lt; 6.0 or &gt; 9.0</td>
<td>Standard Units</td>
</tr>
<tr>
<td>Copper, Total</td>
<td>&gt; 0.5</td>
<td>ppm</td>
<td>&gt; 1.0</td>
<td>ppm</td>
</tr>
<tr>
<td>Phenols</td>
<td>&gt; 0.3</td>
<td>ppm</td>
<td>&gt; 0.6</td>
<td>ppm</td>
</tr>
</tbody>
</table>

## Logic Scheme to Affirmatively Answer “Does Field Water Chemistry and Observations Suggest an Illicit Discharge?” Leading to a Classification of “Suspect Illicit Discharge.”

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<td>Oil, Paint, or Other</td>
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### Physical Parameters

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<td>ppm</td>
</tr>
<tr>
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<td>&gt; 5.0</td>
<td>ppm</td>
<td>&gt; 5.0</td>
<td>ppm</td>
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<tr>
<td>pH</td>
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<td>Copper, Total</td>
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<td>ppm</td>
<td>&gt; 0.6</td>
<td>ppm</td>
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</table>
WHAT TO LOOK FOR WHEN IDENTIFYING AN ILLECIT DISCHARGE

PHYSICAL INDICATORS

Is there a color?
Is there an odor?
What is the appearance?
  • Flow - Is the water moving?
  • Turbidity - Is the water cloudy?
  • Sheens and surface scum - Is there an iridescence or film on the water surface?
  • Outfall condition - Does the outfall have any deposits?
BIOLOGICAL INDICATORS

Vegetation
• Are the plants located near the stream dead?
• Do the plants near the stream look unhealthy?

Algae
• Are there any pea-green colored algae blooms?

Fish kills
• Do you see any dead fish?
CONSTRUCTION DISCHARGE

WHAT IS IT?
Any illicit discharges associated with construction site activities. Sediment is the primary stormwater pollutant on a construction site.

PHYSICAL INDICATORS

Color - Varies; synthetic colors, neutral colors, or colorless
Odor - Varies; sulfur, waste, chemical, or odorless
Appearance - Varies; increased turbidity, sheens, surface scum, and floating solids all common

BIOLOGICAL INDICATORS

• Changes in vegetation/aquatic life

POTENTIAL DISCHARGES

• Sediment
• Concrete waste
• Petroleum products
• Paint
• Lawn clippings
Construction Discharge
SEDIMENT

WHAT IS IT?
Sediment is a stormwater pollutant that is made up of soil particles that have been detached from the land by erosion. The primary source of stormwater pollution is sediment.

PHYSICAL INDICATORS

Color – Yellow, red, or orange  
Odor – None  
Appearance – Water appears turbid, dirty

POSSIBLE SOURCES

• Construction sites  
• Suspended sediment after rainfall  
• Surface runoff from construction sites, roadways, and/or agricultural/range land  
• Streambank erosion  
• Agricultural erosion  
• Breakdown of roads, parking lots, and other paved surfaces  
• Unpaved roads  
• Soil erosion following vegetation/landscaping removal
Facility Discharge

What Is It?

Any illicit discharges produced from facilities including, but not limited to, industrial manufacturing plants, commercial businesses, transportation centers, and treatment plants.

Physical Indicators

- **Color** - Varies; synthetic colors, neutral colors, or colorless
- **Odor** - Varies; sulfur, waste, chemical, or odorless
- **Appearance** - Varies; increased turbidity, presence of sheens and surface scum, and outfall staining all common

Biological Indicators

- Changes in vegetation/aquatic life

Potential Discharges

- Concrete waste
- Petroleum products
- Soaps and detergents
- Chlorine
- Paint
- Sewage
- Industrial cooling water
- Sanitary wastewater
PETROLEUM PRODUCTS

WHAT IS IT?
Petroleum products include vehicle fluids/oils and fuel.

PHYSICAL INDICATORS

Color – Rainbow sheen
Odor – Possible petroleum/gasoline smell
Appearance – Iridescent sheen on water surface

POSSIBLE SOURCES

• Dumping/spills
• Vehicle fueling/washing
• Vehicle maintenance/repair
• Poorly maintained vehicles
• Vehicle accidents
• Pressure washing gas station pavement
• Outdoor material storage
• Industrial discharge
CONCRETE WASTE

WHAT IS IT?
Rubble from demolished concrete structures, concrete and liquid produced when the chutes of concrete mixers are rinsed out after delivery, and slurry used to create new concrete structures.

PHYSICAL INDICATORS

Color – White or gray
Odor – None
Appearance – Water appears turbid, dirty; light-colored plume

POSSIBLE SOURCES

• Demolition of existing concrete structures at a construction site
• Testing of concrete samples
• Concrete mixer truck washouts
• Uncured concrete dumped or rinsed off concrete equipment and delivery trucks
PAINT

WHAT IS IT?
Any pigmented liquid, liquefiable, or solid mastic composition that, after application, converts to a solid film. Paint is typically oil-based or water-based.

COLOR
Varies; can be colorful or neutral

ODOR
Possible volatile odor

APPEARANCE
Opaque, coalescing film on water

PHYSICAL INDICATORS

POSSIBLE SOURCES

- Interior and exterior building design projects where paint and paint equipment are used in large quantities
- Residential painting
- Wastewater from paint manufacturing facility
- Empty raw material packages from paint manufacturing facility
SEWAGE

WHAT IS IT?
Wastewater and excrement conveyed in a sewer system that is produced from residences and commercial, institutional, and public facilities.

PHYSICAL INDICATORS

Color - Gray or brown
Odor - Sulfur, fecal matter
Appearance - Foam, bubbles, food or other waste

BIOLOGICAL INDICATORS

• Sewage fungus
• Bacteria growth in outfalls

POSSIBLE SOURCES

• Overflowing and leaking sanitary sewer lines; sewer lines become clogged, causing sewage to back up and flow out through a manhole or another path
• Failing septic systems
• Inadequately treated sewage
SOAPS AND
DETERGENTS

WHAT IS IT?
Substances that, when dissolved in water, possess the ability to remove dirt from surfaces such as human skin, textiles, vehicles, and other solids.

PHYSICAL INDICATORS

Color – White or gray
Odor – May be fragranced
Appearance – Bubbles, foam

POSSIBLE SOURCES

• Commercial laundry water
• Commercial wash water
• Wastewater
• Commercial vehicle and boat washing
• Illegal dumping of mop water and carpet cleaning wastewater
PESTICIDES AND FERTILIZERS

WHAT IS IT?
Pesticides (including herbicides) are natural or synthetic chemical substances meant to control pests and improve crop yields. Fertilizers are materials applied to soil or plants to provide nutrients. When used in excess, these products can become illicit discharges.

PHYSICAL INDICATORS

Color – May be colorless or blue
Odor – Varies; volatile odor, ammonia odor, or no odor
Appearance – (Fertilizers) algal blooms may form a pea-green mat on the water’s surface; increased turbidity

BIOLOGICAL INDICATORS

• Algal blooms
• Fish kills
• Absence of aquatic life
• Changes in vegetation growth

POSSIBLE SOURCES

• Residential and commercial landscaping
• Agricultural production
FATS, OILS, AND GREASE (FOG)

WHAT IS IT?

Substances that are ingredients for, or by-products of, food preparation. Blockages from coagulated grease are the leading cause of sanitary sewer overflows (SSOs).

PHYSICAL INDICATORS

Color - Milky white

Odor - Varies; frying oil odor, sulfur, rotten food

Appearance - FOG can either be liquid or solid and may turn viscous or solid as it cools in a sewer system

POSSIBLE SOURCES

• Cleaning wastewaters from commercial businesses
• Improper kitchen maintenance in restaurants
• Grease trap/equipment cleaning in restaurants
• Illegal dumping of FOG
LAWN CLIPPINGS, LEAVES, AND PET WASTE

WHAT IS IT?
Lawn clippings and leaves are organic waste generated from landscaping and landscaping maintenance. Pet waste, when improperly disposed of, can run off into a sewer system and become an illicit discharge.

PHYSICAL INDICATORS

Color - Colorless or tea/coffee colored
Odor - Varies; can have a sulfuric smell from organic matter decaying
Appearance - Lawn clipping and leaves typically visible on the water’s surface or as clumps often clogging storm drains

POSSIBLE SOURCES

- Residential and commercial landscaping
- Improper lawn maintenance
- Improper disposal of pet waste by pet owners
- Construction activities
Lawn Clippings, Leaves, and Pet Waste
I FOUND AN ILLICIT DISCHARGE! WHAT DO I DO NEXT?

1. Record the location and type of illicit discharge.

2. Take photos.

3. Report the discharge.

MS4 Coordinator: _____________________________

Email: ENV_MS4-Illcit-Discharge@TxDOT.gov
Help TxDOT Improve Texas Water Quality!

TxDOT Stormwater Management Program