

# **Illicit Discharge Detection and Elimination Program**

**Village of Fox River Grove, Illinois**

**Village of Fox River Grove**  
**NPDES Phase II Stormwater Program**  
**Illicit Discharge Detection and Elimination Procedures**

This document outlines procedures to implement the Village of Fox River Grove's Illicit Discharge Detection and Elimination Program as authorized by village ordinance Chapter 23, Water and Sewers, Article X, "Discharges and Connections to Stormwater Drainage System" (attachment 1) and required under the NPDES Phase II Stormwater Program. The following procedures listed below are described in greater detail in the document titled *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, published by the Center for Watershed Protection, October 2004 ([www.cwp.org](http://www.cwp.org)).

Illicit discharges are any direct or indirect non-stormwater discharges to the storm drain system that is not composed entirely of storm water.

Common illicit discharges are:

- 1) Sewage flows from sanitary sewers connected to the storm sewer system,
- 2) Septage flows from septic systems,
- 3) Wash water flows from laundry water, commercial carwash water, fleet wash water, commercial laundry water, floor washing, and
- 4) Liquid wastes including, but not limited to oil, paint, process water, plating baths, radiator flushing, etc.

The following types of discharges do not constitute an illicit discharge unless the discharge contains a pollutant:

- 1) Water line flushing and other discharges from a potable water source,
- 2) Landscape irrigation or lawn or plant watering (except for wastewater irrigation),
- 3) Diverted stream flows,
- 4) Rising ground water,
- 5) Ground water infiltration into the storm water drainage system,
- 6) Pumped ground water,
- 7) Discharges from foundation or footing drains,
- 8) Discharges from crawl space pumps,
- 9) Discharges from potable water sources,
- 10) Discharges from air conditioning condensations,
- 11) Discharges from the non-commercial washing of vehicles,
- 12) Natural riparian habitat or wetland flows,
- 13) Discharges from swimming pools that contain less than one part per million of chlorine,
- 14) Storm sewer cleaning water,
- 15) Discharges resulting from firefighting activities,
- 16) Discharges from other sources of water such as springs, and
- 17) Rinse water from street cleaning or sweeping operations.

The Village of Fox River Grove's Illicit Discharge Detection and Elimination program includes four components. These components are:

- I. Education
- II. Identify / Detect Illicit Discharges
- III. Remove / Eliminate Illicit Discharges and
- IV. Documentation and Evaluation

### **I. Education**

Prevention is more effective and less expensive than removing and eliminating illegal discharges. Educating village residents and business about proper chemical use, storage, and disposal practices will minimize unintentional pollutant discharges into the Village of Fox River Grove's storm sewers, ponds, streams, and rivers. The village addresses illicit discharge topics through its Public Education and Outreach Program.

### **II. Identification / Detection of Illicit Discharges**

There are many strategies to identify illicit discharges. The strategy offered below involves two steps that include visual dry weather screening and water sampling. Visual dry weather screening is generally the simplest method and is effective identifying obvious illicit discharges. In some cases visual screening alone is insufficient to determine if observed flows are from illicit discharges. If the source of flowing water cannot be identified, water sampling should be conducted to determine if an illicit discharge is present.

#### **A. PRIORITIZE FIELD SCREENING AREAS**

1. Past discharge reports and or complaints. Review public records of suspected or identified illicit discharges (do not include discharges that occurred soon after a rain event). Inquire with Village field staff as to where they have seen suspected illicit discharges, or where they might be occurring.
2. Poor Dry Weather Quality. Review existing outfall and stream / ditch water quality data. Streams having poor water quality may be caused by illicit discharges.
3. Industrial / Commercial Development Density. Higher industrial and commercial development densities can signify a greater likelihood of illicit discharges, especially in older industrial areas.
4. Age of Developed Areas. The older an area was developed, the greater possibility of illicit discharges. A change in construction materials, building codes, and inspections means newer developments are less likely to have illicit discharges.
5. Aging or Failing Infrastructure. Older and aging sewer infrastructure experience more leaks, cross-connections and broken pipes that can contribute sewage to the storm drain system. An increased probability of illicit discharges occurs when the sewer age exceeds the design life of construction

materials or when increased pipe breaks or infiltration and inflow (I&I) are observed.

6. Sewer Conversion. Areas once served by septic systems but connected to sanitary sewers and former combined sewer systems can be susceptible to illicit discharges.
7. Density of Aging Septic Systems. Septic systems greater than thirty years old are more prone to failure.

## B. VISUAL DRY WEATHER SCREENING

Illicit discharges often, but not always, have characteristics that can help indicate when stormwater is polluted. Some characteristics include:

- 1) Odor,
- 2) Color,
- 3) High turbidity,
- 4) Suds / foam,
- 5) Synthetic oil sheen,
- 6) Bacteria or algae growth at the outfall or downstream that are present when there are high nutrients in a discharge,
- 7) Excessive vegetation at or just downstream of the outfall indicating excess nutrients in discharge,
- 8) Staining in pipe or at outfall may indicate intermittent illicit discharge,
- 9) Poor downstream pool quality,
- 10) Toilet paper at outfall, and
- 11) In cold weather:
  - a) An outfall with multiple pipes, with one pipe frozen with ice and the other not frozen may have had a recent illicit discharge.
  - b) Discolored ice around the outfall.
  - c) An unfrozen area in a ditch or stream with moving water in an otherwise frozen area can indicate a submerged outfall.

The dry weather field screening should be conducted during ideal seasonal weather conditions that include:

- 1) Low groundwater (e.g., few flowing outfalls), since high groundwater can confound results. Screening should not be done in early spring when the ground is saturated with snowmelt.
- 2) No runoff producing rainfall within the previous forty-eight (48) hours. Stormwater runoff can interfere with screening, both by masking illicit discharges through dilution from high flows, or by providing false indications of illicit discharges from pollutants contained in the stormwater runoff.
- 3) Leaf off. Dense vegetation makes locating outfalls more difficult. This criterion is recommended, but not required.

With the Storm Sewer System & Outfall Point Map (attachment 2) in hand, conduct an Outfall Reconnaissance Inventory (ORI).

- a. Walk receiving waters (streams & ditches) looking for outfalls. Look for additional outfalls not identified on the Storm Sewer System & Outfall Point map. The village's receiving waters are the Fox River and Spring Creek. It may also be helpful to identify outfalls to ditches that are tributary to receiving waters, as it is easier to identify illicit discharges at an outfall than it is at the confluence of a ditch with a larger stream.
- b. Survey almost all outfalls observed. Only skip an outfall if it cannot in any situation contribute to a transitory (brief) illicit discharge. See list below for guidance.

**Outfalls to Record**

Large and small diameter pipes that appear to be part of the storm drain infrastructure.

Outfalls that appear to be piped  
Headwater streams

Field connections to culverts

Submerged or partially submerged outfalls

Outfalls that are blocked with debris or sediment deposits

Pipes that appear to be outfalls from storm water treatment practices

Small diameter ductile iron pipes

Pipes that appear to only drain roof downspouts but are subsurface, preventing definitive conformation

**Outfalls to Skip**

Drop inlets from roads in culvert (unless evidence of illegal dumping, dumpster leaks etc.)

Cross-drainage culverts in Transportation right of way (can see daylight at other end)

Weep holes

Flexible plastic pipes known to serve as slope drains

Pipes that are clearly connected to roof downspouts via above ground connections

- Record outfall characteristics. Update Storm Sewer System & Outfall Point Map as necessary.
- Look for stains, smudges, odors, etc. that are unusual for storm water discharges and may indicate an illicit discharge.
- Record any previously unknown outfalls. Use Village of Fox River Grove Storm Sewer Outfall Inventory Inspection and Collection form (attachment 3). Also use Data Dictionary (attachment 4) to fill in required fields. Complete the same survey for the already identified outfalls.

- For obvious illicit discharges, stop survey and trace the source immediately.
- Record ownership or apparent ownership. Is the outfall maintained by the village or private owner?
- Digital photo of the outfall location. This is not required, but can save time in locating previously identified outfalls that may be submerged or obstructed.

### C. WATER SAMPLING

Water sampling may be necessary to help determine the type of illicit discharge. For outfalls with flowing water, an attempt should be made to identify the water source (see section D). The following sources of non-storm water discharges are not considered to be illicit, unless they are determined to be substantial contributors of pollutants.

- 1) Water line flushing and other discharges from a potable water source,
- 2) Landscape irrigation or lawn or plant watering (except for wastewater irrigation),
- 3) Diverted stream flows,
- 4) Rising ground water,
- 5) Ground water infiltration into the storm water drainage system,
- 6) Pumped ground water,
- 7) Discharges from foundation or footing drains,
- 8) Discharges from crawl space pumps,
- 9) Discharges from potable water sources,
- 10) Discharges from air conditioning condensations,
- 11) Discharges from the non-commercial washing of vehicles,
- 12) Natural riparian habitat or wetland flows,
- 13) Discharges from swimming pools that contain less than one part per million of chlorine,
- 14) Storm sewer cleaning water,
- 15) Discharges resulting from firefighting activities,
- 16) Discharges from other sources of water such as springs, and
- 17) Rinse water from street cleaning or sweeping operations.

If a water source is not listed above, is listed above but is suspected of being a significant contributor of pollutants, or cannot be identified then sampling is warranted. Prior to sampling, determine what parameters to sample for. See table of common indicator parameters below.

<b>Indicator Parameters Used to Detect Illicit Discharges</b>				
	<b>Discharge Types It Can Detect</b>			
<b>Parameter</b>	<b>Sewage</b>	<b>Wash Water</b>	<b>Tap Water</b>	<b>Industrial / Commercial Liquid Wastes</b>
Ammonia	*	**	***	**
Boron	**	**	***	N/A
Chlorine	***	***	***	**
Color	**	**	***	**
Conductivity	**	**	***	**
Detergents - Surfactants	*	*	***	**
E.coli				
Enterococci				
Total Coliform	**	***	***	***
Fluoride	***	***	*	**
Hardness	**	**	**	**
pH	***	**	***	**
Potassium	**	***	***	*
Turbidity	**	**	***	**

\* Can almost always (>80% of samples) distinguish this discharge from clean flow types (tap water or natural water). For tap water, can distinguish from natural water.

\*\* Can sometimes (> 50% of samples) distinguish this discharge from clean flow types depending upon regional characteristics, or can be helpful in combination with another parameter.

\*\*\* Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water.

Source: *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004

#### D. TRACING INDIVIDUAL ILLICIT DISCHARGES

For suspected illicit discharges, a combination of methods can be used to isolate the specific source. Methods to trace illicit discharges are summarized below and presented in detail in *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*.

1. Trunk Investigations. Three options used to narrow the source of a discharge problem to a single storm sewer system.

- Work upstream from the detected discharge. This can begin immediately after a discharge is detected.

- Work downstream from the more upstream pipes to the detected discharge. Requires preparation to decide where to sample. Use storm sewer and outfall map.
- Break the trunk sewer into segments and test manholes at strategic points of the storm sewer system. Requires decisions as to which strategic manholes to sample. Use storm sewer and outfall map.

2. On-Site Investigations. Performed when the illicit discharge has been narrowed to a single pipe segment.

- a. Dye testing
- b. Smoke testing
- c. Video surveillance
- d. Visual inspection at manholes
- e. Sandbagging or damming the trunk

3. Intermittent or transitory discharge monitoring:

- Suspected based on physical indicators (staining, etc.), poor instream dry weather water quality, or the density of generating sites in the contributing watershed.

- Monitoring methods:

- a. Odd hour monitoring
- b. Toxicity monitoring
- c. Optical brightener monitoring traps
- d. Caulk dams
- e. Pool sampling

4. In-stream water quality monitoring:

- Can help identify problem reaches or watersheds
- Can be done regularly (monthly or more often) to track changes
- Measure parameters that are being targeted in the watershed (such as bacteria, ammonia, etc.)
- Should be done in conjunction with outfall survey (one can often confirm / assist the other)

### **III. REMOVING / ELIMINATING ILLICIT DISCHARGES**

A. Determine who is responsible (Fox River Grove, property owner, both or transitory “dumper”), and required to eliminate the discharge. The table below indicates party responsible and action to be taken in each case.

<b>Discharge Type</b>	<b>Source</b>	<b>Removal Action(s)</b>
Sewage	Break in right-of-way	Repair by municipality
	Commercial or industrial direct connection	Enforcement
	Residential direct connection	Enforcement; Incentive or aid
	Infrequent discharge (RV dumping)	Enforcement; Spill response
	Septic	Enforcement; Incentive or aid
Wash water	Commercial or industrial direct connection	Enforcement; Incentive or aid
	Residential direct connection	Enforcement; Incentive or aid
	Commercial power wash / car wash	Enforcement
	Commercial wash down	Enforcement
	Residential car wash	Education
Liquid wastes	Professional oil change / vehicle maintenance	Enforcement; Spill response
	Heating oil / solvent dumping	Enforcement; Spill response
	Homeowner oil change	Warning; Education; Fines
	Trucking spill	Spill response
	Other industrial wastes	Enforcement; Spill response

- B. Determine methods to fix the problem. Solutions may include infrastructure repair or replacement, cross connection removal, infrastructure cleaning, pipe lining rehabilitation, etc. The preferred method depends on the type of problem, site accessibility, and depth of infrastructure.
- C. Establish compliance schedule. If an entity other than the Village is responsible for the work, the Village will determine a specific date that the work must be done. See Village ordinance Chapter 23, Water and Sewers, Article X, “Discharges and Connections to Stormwater Drainage System” (attachment 1).
- D. Confirm that the illicit discharge has been removed within the compliance schedule. It should be confirmed at the source of the illicit discharge and the

outfall or manhole where the discharge was first noted (to verify that it was the only illicit discharge present at the outfall).

- For discharges from internal plumbing and lateral connections, dye testing can confirm the correction. Sandbagging should also be done at the first downstream manhole to confirm that this was the only illicit connection present.
- For discharges resulting from infrastructure failure, dye testing or televising should be used along with sandbagging and sampling at a downstream manhole.

#### **IV. DOCUMENTATION AND EVALUATION**

Document actions taken. As a final step, all actions taken under this plan should be documented. This illustrates that progress is being made to eliminate illicit connections and discharges. Documented actions should be included in annual reports and contain information such as:

- a. The number of outfalls inspected / screened
- b. Any complaints received and corrected
- c. The number of illicit discharges eliminated
- d. The number of dye or smoke tests conducted

Annual program evaluation will determine the program strengths and deficiencies. As new technology is developed, these procedures may be incorporated to this plan for improved efficiency. The result of a successful IDDE program will be improved stream, lake, and river water quality within the Village of Fox River Grove and surrounding communities.

#### References

Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A Users Guide. USEPA. EPA 600-R-92-238 January 1993

Draft Manual of Practice: Identification of Illicit Connections. USEPA Permits Division EN-336. September 1990

USEPA. Office of Water. EPA 833-F-00-007 January 2000 (Revised December 2005) Fact Sheet 2.5

Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, and Dr. Robert Pitt, University of Alabama. October 2004

Storm Sewer Outfall Inventory, Recommended Collection Guidance and Data Dictionary: Lake County Stormwater Management Commission. 2004

Village of Fox River Grove  
Storm Sewer Outfall Inventory  
Inspection and Collection Form

1. Outfall ID	<input type="text"/>
2. Community	<input type="text"/>
3. Receiving Water	<input type="text"/>
4. Outfall Type	<input type="text"/>
5. Outfall Material	<input type="text"/>
6. Outfall Diameter	<input type="text"/>
7. Outfall Source	<input type="text"/>
8. Ownership	<input type="text"/>
9. Date	<input type="text"/>
10. Inspection	<input type="text"/>
	11. Collection <input type="text"/>
12. Collected By	<input type="text"/>

13. Location

14. Comments

15. Photo Numbers

Attachment 3

# Village of Fox River Grove Storm Sewer Outfall Inventory Data Dictionary

These are the recommended minimum pieces of information communities should collect during the storm sewer outfall inventory and correspond to the fields on the data form.

## 1. Outfall ID Number

This will be a unique number assigned to an outfall. It is recommended communities start at 00001 and work up in increments of 10 in the event others need to be added in between.

## 2. Community ID

- 001 Antioch, Village of
- 002 Bannockburn, Village of
- 003 Barrington, Village of
- 004 Barrington Hills, Village of
- 005 Beach Park, Village of
- 006 Buffalo Grove, Village of
- 007 Deer Park, Village of
- 008 Deerfield, Village of
- 009 Fox Lake, Village of
- 010 Fox River Grove, Village of
- 011 Grayslake, Village of
- 012 Green Oaks, Village of
- 013 Gurnee, Village of
- 014 Hainesville, Village of
- 015 Hawthorn Woods, Village of
- 016 Highland Park, City of
- 017 Highwood, City of
- 018 Indian Creek, Village of
- 019 Island Lake , Village of
- 020 Kildeer, Village of
- 021 Lake Barrington, Village of
- 022 Lake Bluff, Village of
- 023 Lake Forest, City of
- 024 Lake Villa, Village of
- 025 Lake Zurich, Village of
- 026 Lakemoor, Village of
- 027 Libertyville, Village of
- 028 Lincolnshire, Village of
- 029 Lindenhurst, Village of
- 030 Long Grove, Village of
- 031 Mettawa, Village of
- 032 Mundelein, Village of
- 033 North Barrington, Village of
- 034 North Chicago, City of
- 035 Old Mill Creek, Village of
- 036 Park City, City of

037 Port Barrington, Village of  
038 Riverwoods, Village of  
039 Round Lake, Village of  
040 Round Lake Beach, Village of  
041 Round Lake Heights, Village of  
042 Round Lake Park, Village of  
043 Third Lake, Village of  
044 Tower Lakes, Village of  
045 Vernon Hills, Village of  
046 Volo, Village of  
047 Wadsworth, Village of  
048 Wauconda, Village of  
049 Waukegan, City of  
050 Wheeling, Village of  
051 Winthrop Harbor, Village of  
052 Zion, City of  
053 Antioch, Township of  
054 Avon, Township of  
055 Benton, Township of  
056 Cuba, Township of  
057 Ela, Township of  
058 Fremont, Township of  
059 Grant, Township of  
060 Lake Villa, Township of  
061 Libertyville, Township of  
062 Moraine, Township of  
063 Newport, Township of  
064 Shields, Township of  
065 Vernon, Township of  
066 Warren, Township of  
067 Wauconda, Township of  
068 Waukegan, Township of  
069 West Deerfield, Township of  
070 Zion, Township of  
071 Lake, County of

**3. Receiving Water**

This will be the name of the receiving water body (i.e. Spring Creek, Fox River, etc.).  
If the name is unknown use UNK. For several UNK receiving waters, use UNK1,  
UNK2, etc.

**4. Outfall type**

01 Swale/Open Channel  
02 Pipe or Culvert

**5. Outfall material**

01 Corrugated Metal  
02 PVC  
03 Reinforced Concrete  
04 HDPE  
05 Vitrified Clay  
06 Ductile Iron  
07 Brick lined  
08 Asphalt (i.e. in the case of a paved open channel)  
09 Natural/Earthen  
20 Unknown

99 Not Applicable (i.e. in the case of a swale)

**6. Outlet diameter**

[value] this is the diameter of the pipe expressed in feet and decimal inches (i.e. 3ft 6in would be entered as 3.5, 3ft 9in as 3.75, etc),  
99 not applicable (i.e. swale)

**7. Outfall Source (Source of Data)**

- 01 As-builts
- 02 Field checks
- 03 Design plans
- 04 NPDES Permit
- 05 Other (fill in comments)

**8. Ownership (of outfall)**

- 01 Public
- 02 Private
- 03 Industrial

**9. Date (required)**

Inspection or collection date entered as MM-DD-YYYY (i.e. 08-24-2004)

**10. Inspection**

√ if inspection only

**11. Collection**

√ if water sample is collected

**12. Collected by (required)**

Initials of person collecting data – 2 or three characters

**13. Location** (up to 250 characters)

Descriptive information about the location of the outfall.

**14. Comments** (up to 250 characters)

General comments about the outfall. If no comments, enter None

**15. Photo Number**

Photo number if applicable otherwise 0