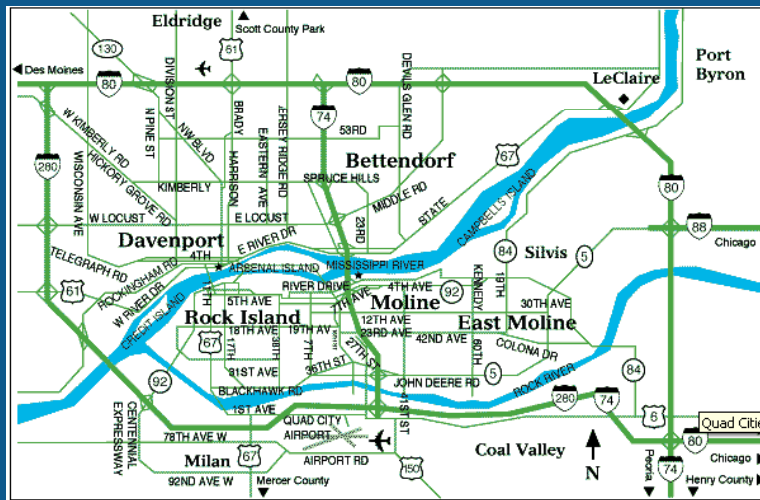


Key Components of an Illicit Discharge Detection & Elimination Program



Quad City Area NPDES Permit Holder Workshop

May 25, 2010



Presentation Overview

PART 1

*Illicit Discharge Detection &
Elimination (IDDE) Program Overview*

PART 2

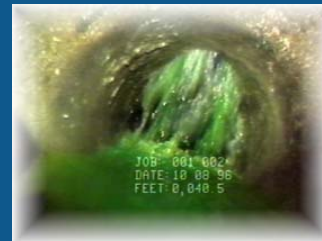
Field Procedures

NPDES Phase II Minimum Controls

Construction Erosion Control



IDDE



Post Construction Controls



Housekeeping Practices



Public Participation



Public Education

Drain Goes to Stream



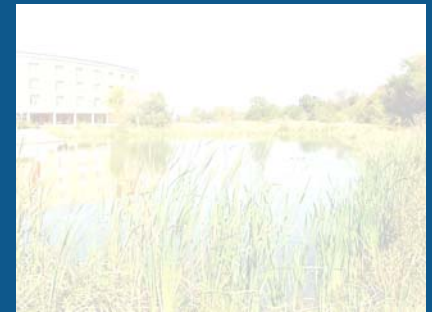
NPDES Phase II Minimum Controls

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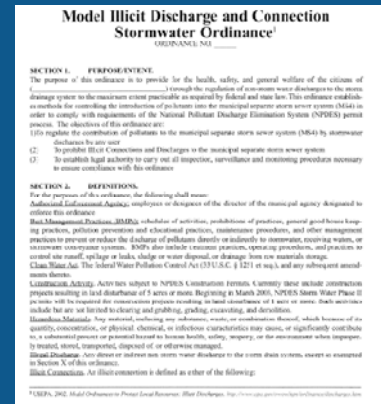
KEY POINT #1

IDDE is a dry weather program

IDDE Program Components

PLAN

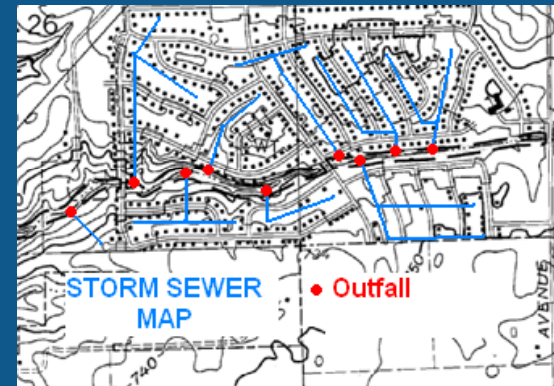
1. Develop Program Goals and an Implementation Strategy - *Administrative*
2. Research Existing Programs and Resources - *Administrative*
3. Assign Responsibilities, Establish Authority (IDDE Ordinance),
Develop Outfall Map, Secure Funding - *Administrative*



4. Develop Monitoring Approach (scheduled outfall visits & hotline) - *Technical*
5. Develop Investigative Tracing Approach - *Technical*

FIELD WORK

6. Perform Monitoring (Detect)
7. Locate and Eliminate Sources of Illicit Discharges (Eliminate)



What is an illicit discharge?

Any discharge to a Municipal Separate Storm Sewer System (MS4) that is not composed entirely of stormwater.

Except for certain non-stormwater discharges listed in Part 1.B.2 of the ILR40 permit such as:

- Water line and fire hydrant flushing
- Landscape irrigation water
- etc.

(21 listed in ILR40 permit)

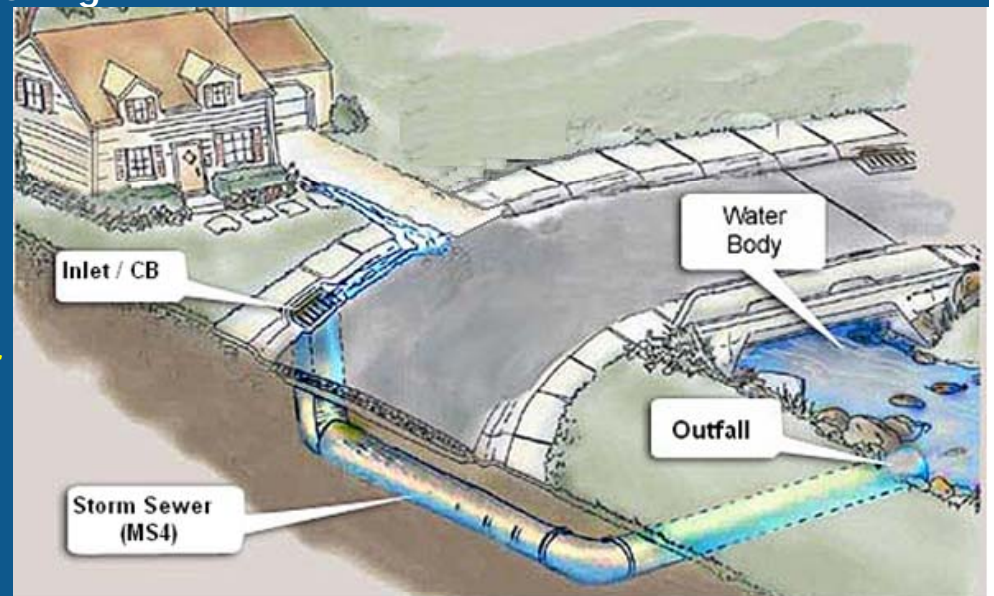
KEY POINT #2

Stormwater infrastructure is for stormwater

KEY POINT #3

IDDE is not a water quality standard-based program

(i.e., not establishing "allowable" limits)



Why do we have illicit discharges?



- Ignorance. Many people don't realize that what enters catch basins and inlets ends up in our oceans, lakes, streams, and rivers.
- Accidents.
- Neglect.
- Just don't care.

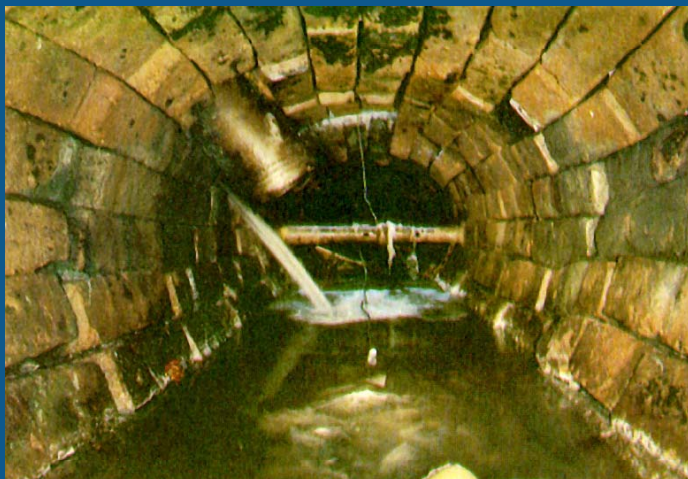


from "The Unforeseen" 2007

Violation Sources: Occasional Spills - Discharges



Violation Sources: Direct Connections



Violation Sources: Pipe Defects



What is an “outfall” ?

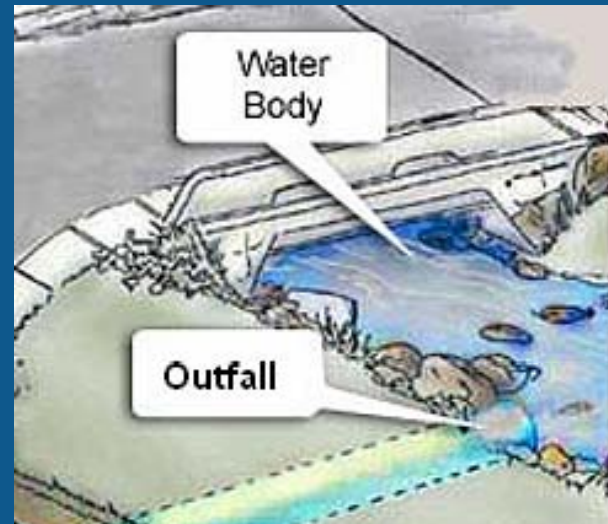
DEFINITION:

40 CFR 122.26 (b) (9)

OUTFALL means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to Waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

KEY POINT #4

IDDE is an outfall-based program



NOTE: The definition above is also the definition provided in the General NPDES Permit No. ILR40 for an "OUTFALL"

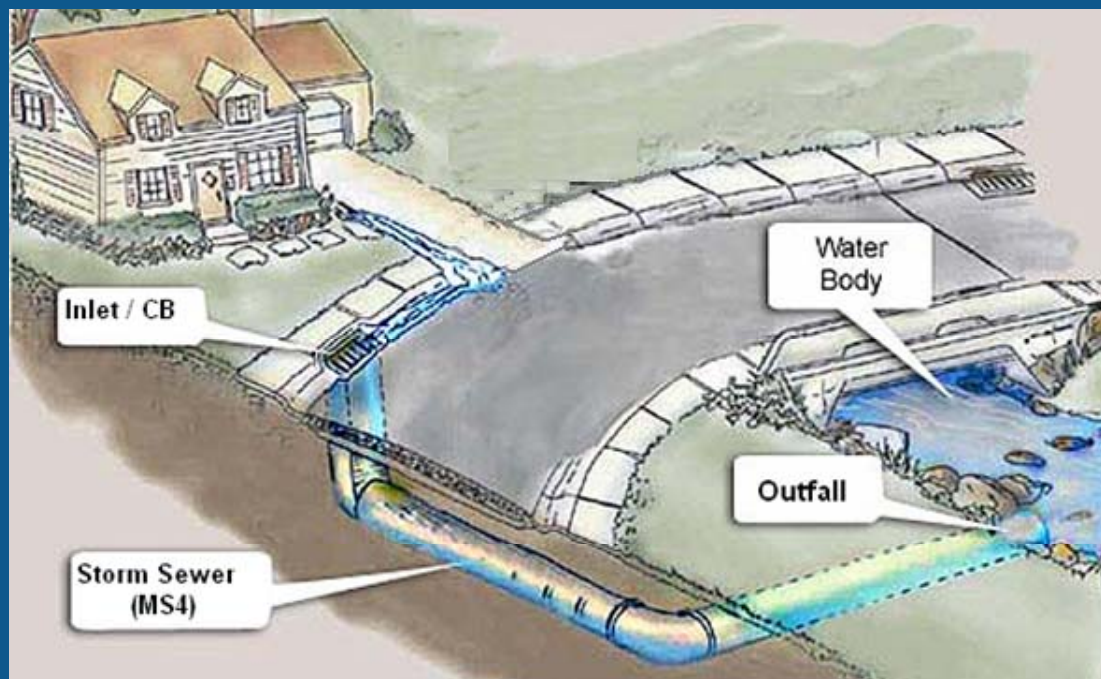
What is an “outfall” ?

- Outfalls of any size (not limited to “major outfalls”)
- Ditches / swales (at point where discharge to a Waters of the US)



The Big Picture

- Search for dry-weather flows (period where precip < 0.1 " in last 72 hrs)
- Storm sewers and stormwater ditches are for stormwater (not trying to meet some water quality standard/concentration)
- Outfall-based program (no in-stream sampling necessary)
- Perform Outfall Monitoring (Detection) as frequently as possible
- Perform Investigative Tracing (Elimination) when find a potential illicit flow



Detection Methods

Resident IDDE Hotline Telephone Number



Outfall Monitoring

- Perform as frequently as possible
- May need to prioritize!



Outfall Monitoring Planning

Precipitation Data:

- NOAA website data
- Local gage network
- Local news channels for their weather information/data



Outfall mapping and Outfall ID's:

- Create and print field maps
- ID outfalls either by sequential numbering, by basin names or other naming (GPS location)



Vehicle:

- Ability to haul all field equipment and field crew



Outfall Monitoring Office Preparation

Field Equipment:

- Calibrate Instruments
- Decon sampling equipment
- Notify laboratory
- Get coolers, ice, sample bottles
- Safety gear, waders, gloves, etc.
- Use equipment checklist



Outfall Monitoring Water Quality Standards vs Indicators

Water Quality Standards (not applicable to IDDE):

- Apply to receiving water bodies
- Set to protect “Beneficial Uses” of water body
- Pollutant concentrations above/below threshold (standard)

Water Quality Indicators:

- Used to detect if dry weather flow is an “Allowable Non-stormwater Discharge” or an “Illicit Discharge”
- WQ parameters indicate nature of discharge

Outfall Monitoring

Outfall Structural Characteristics

Type:

- Pipe vs Swale

Material:

- Pipe material
- Type of swale vegetation

Shape:

- Use technical guidance examples

Size/Dimension:

- Measure inside to inside



Outfall Monitoring Presence/Absence of Flow

If flow is not present, log data and move on to next outfall

If flow is present:

- Measure depth and velocity of flow in pipe or swale



Miscellaneous:

- Submerged and partially submerged outfalls
- Hard to reach outfalls
- Unknown outfalls



Outfall Monitoring Physical/Observational Indicators

Qualitatively Assess:

- Water color
- Clarity/cloudiness
- Staining
- Floatables
- Odor
- Pool characterization
- Vegetation



Outfall Monitoring

Physical/Observational Indicators

Quantitatively Assess:

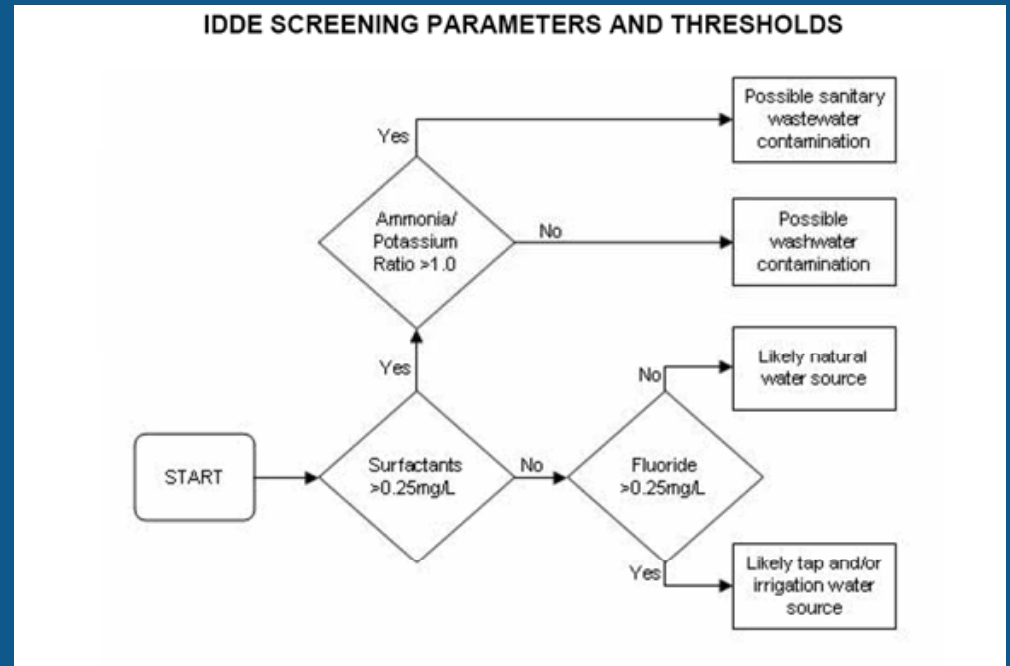
- Temperature – can indicate non storm water sources
- pH – can indicate washwater, industrial or commercial wastes are present
- Specific Conductivity – can indicate sewage, washwater, industrial or commercial is present



Outfall Monitoring Chemical Indicators

Quantitatively Assess:

- Detergents/Surfactants – can indicate sewage and/or washwater is present
- Ammonia – can indicate sewage is present
- Fluoride – can indicate if tap water is present
- Potassium – can indicate if industrial or commercial liquid wastes are present



SOURCE: Center for Watershed Protection and Robert Pitt 2004



Outfall Monitoring Data Collection

Field Test Kits & Handheld Meters/Probes



Spectrophotometer



Labs



ILLICIT DISCHARGE INSPECTION FORM OUTFALL

Pipe / Outfall Location & Description: _____ Main St _____
 _____ 12-inch Pipe _____

Inspector's Names: _____

Date of Inspection: _____

Date & amount of last rainfall: 7/26/05 0.19 in.

Is pipe/outfall active? Yes

Ambient Temperature: 80 °F

Water Temperature: _____ °F



OUTFALL SCREENING RESULTS

FIRST SAMPLE

Date/Time: _____

OBSERVATION

Color: Milky

Odor: Unknown

Turbidity: None

Floatables: Cereal or chips

Surface Sheen: None

SAMPLE RESULTS (Expected Range)

pH: 7.7 (6.0-sample-9.0)

Chlorine: 0.0 mg/l (sample<0.2)

Detergent: > 3.0 mg/l (sample<0.1)

Copper: 0.3 mg/l (sample<0.0)

Phenols: 0.0 mg/l (sample<0.5)

FLOW/DISCHARGE ESTIMATE

Velocity: slow (<2 ft/s) Moderate (2-5 ft/s) Fast (> 5 ft/s) INTERMITTENT FLOW

Water Level in Pipe/Channel: < 0.5 to 1 inches.

Additional Comments/Observations: Approximately 9am - no flow apparent from across river. When arrived at outfall, a milky flow is present. Flow became greater as we watched (~ 5 mins) and then tapered off. Floatables (cereal or potato chips?) present.

OUTFALL SCREENING RESULTS

SECOND SAMPLE (if necessary)

Date/Time: 8/2/05 (7/26/05, 0.19", 80°F)

OBSERVATION

Color: Milky/clear

Odor: Unknown

Turbidity: None

Floatables: None

Surface Sheen: None

SAMPLE RESULTS

pH: _____

Chlorine: _____ mg/l

Detergent: _____ mg/l

Copper: _____ mg/l

Phenols: _____ mg/l

FLOW/DISCHARGE ESTIMATE

Velocity: slow (<2 ft/s) Moderate (2-5 ft/s) Fast (> 5 ft/s)

Water Level in Pipe/Channel: < 0.5 to 1 inches.

Additional Comments/Observations: Visual inspection only. Milky flow was observed w/intermittent flow (slow to moderate) w/no floatables present, but milky plume in river around outfall discharge. Sanitary (illicit) connection was detected and removed.

Outfall Monitoring Final Step - Data Analysis

WQ Data Indicates Allowable Non-Stormwater Discharge

- Decontaminate and repack equipment
- Move to next outfall

WQ Data Indicates an Illicit Discharge

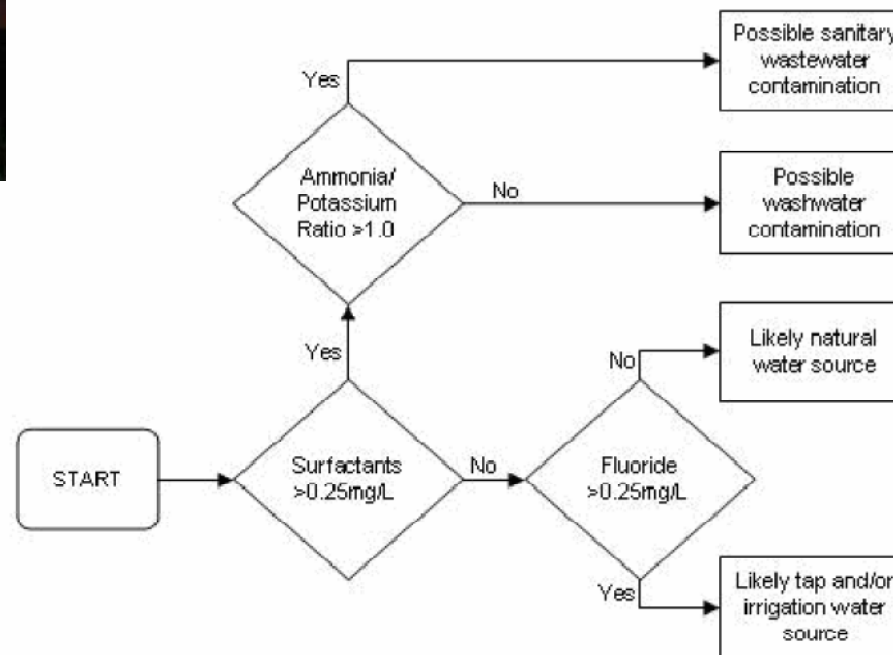
- Document illicit discharge; or
- Begin tracing/investigation; or
- Notify tracing/elimination team (recommended)



Investigative Tracking of Illicit Discharges (Eliminate)



IDDE SCREENING PARAMETERS AND THRESHOLDS



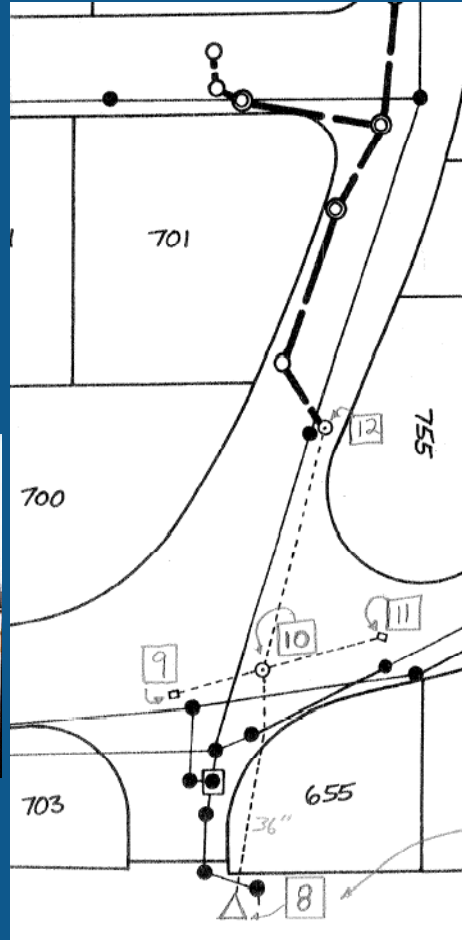
SOURCE: Center for Watershed Protection and Robert Pitt 2004

Locate and Eliminate Sources of Illicit Discharges

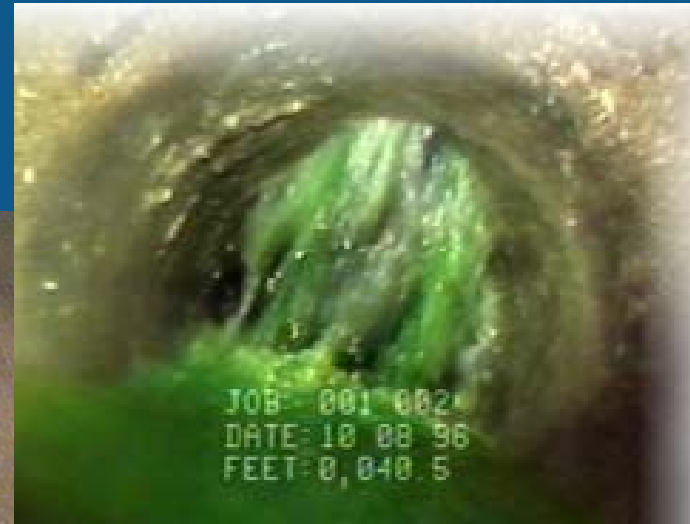
- Trace illicit discharge to its source / isolate (“hit” detected)
- Is a “hit” a Violation? (existing permit holders)
- Take Corrective Action



Windshield Survey and/or System Walk



Televising



Smoke Testing



Dye Water Testing



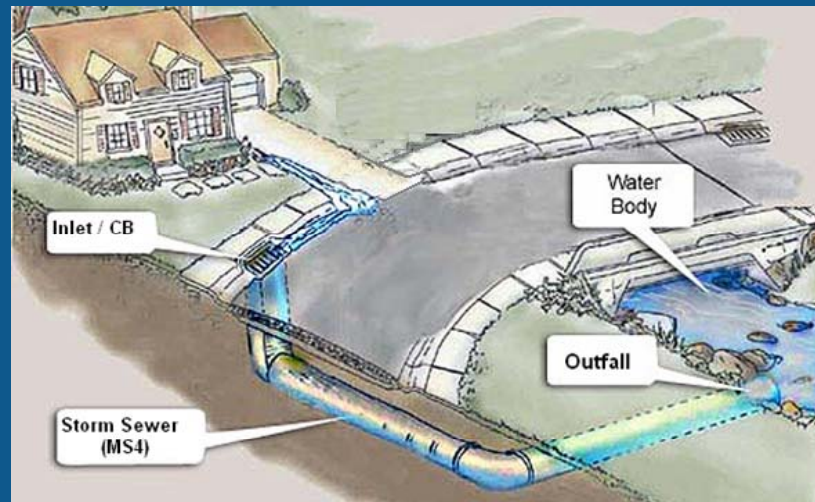
Contact Property Owner

- Provide notice to property owner
- Disconnect as soon as practicable (24 hours? 48 hours? Days? Weeks?)
- Track and document



IDDE Program Summary

- KEY POINT #1: This is a dry-weather program
- KEY POINT #2: Stormwater infrastructure is for stormwater
- KEY POINT #3: We are not attempting to meet a water quality standard
- KEY POINT #4: This is an outfall-based program (no in-stream sampling req'd)
- Process:
 - Search for dry-weather flows at MS4 outfalls through outfall monitoring and respond to resident hotline calls (Detection)
 - Perform Investigative Tracing (Elimination)



Questions / Discussion

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ILR40 – IDDE Requirements

The permittee must:

- a. develop, implement and enforce a program to detect and eliminate illicit discharges into your small MS4;
- b. develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters that receive discharges from those outfalls;
- c. to the extent allowable under state or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions, including enforceable requirements for the prompt reporting to the MS4 of all releases, spills and other unpermitted discharges to the separate storm sewer system, and a program to respond to such reports in a timely manner.
- d. develop, implement, and adequately fund a plan to detect and address non-storm water discharges, including illegal dumping, to your system;
- e. inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste and the requirement and mechanism for reporting such discharges;
- f. address the categories of non-storm water discharges listed in Section LB.2 only if you identify them as significant contributor of pollutants to your small MS4 (discharges or flows from the fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States); and
- g. define appropriate BMPs for this minimum control measure and measurable goals for each BMP. These measurable goals must ensure the reduction of all of the pollutants of concern in your storm water discharges to the maximum extent practicable.
- h. conduct periodic (annual is recommended) inspections of the storm sewer outfalls for detection of non-storm water discharges and illegal dumping.