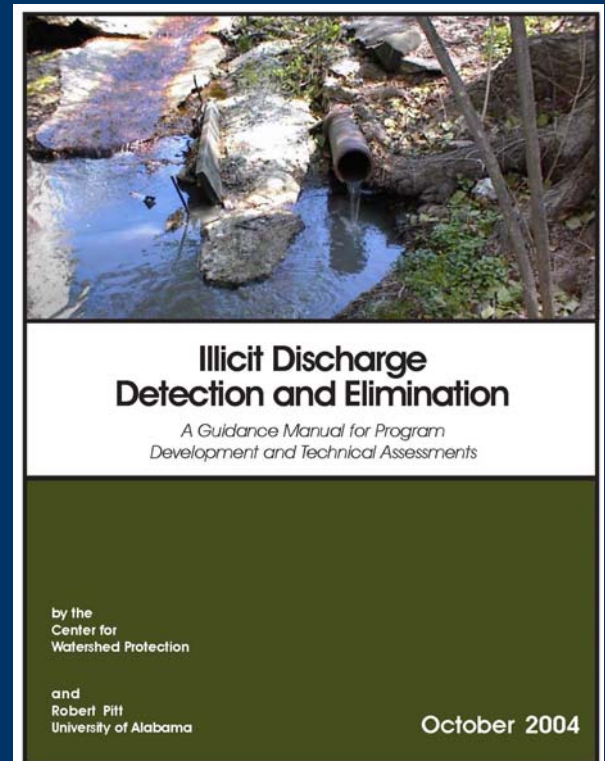# Illicit Discharge Detection and Elimination: Building Up Your Local Program

IDDE Guidance Manual
8 Program Components

1. Audit Existing Resources & Programs
2. Establish Responsibility / Authority
3. Complete a Desktop Assessment of Illicit Discharge Potential
4. Develop Program Goals & Implementation Strategies
5. Search for Illicit Discharge Problems in the Field
6. Isolate & Fix Individual Discharges
7. Prevent Illicit Discharges
8. Evaluate the Program

Illicit Discharge Detection and Elimination

A Guidance Manual for Program Development and Technical Assessments

by the
Center for
Watershed Protection

and
Robert Pitt
University of Alabama

October 2004

Audit Existing Resources & Programs

▶ Purpose:
- ■ Determine the most capable local agency to run program
- ■ Identify available staffing, resources and gaps
- ■ Understand local resources, expertise that can be applied

Audit Elements

- Infrastructure profile
- Legal authority
- Available mapping
- Field staff
- Access to lab services

- Education & outreach resources
- Discharge removal capability
- Program budget & financing

Potential Infrastructure Profile Questions:
How many miles of streams and storm drains exist in the MS4?
What is the area served by storm drains, sewers, and septics?
What is the general age and condition of the infrastructure?

Audit Existing Resources & Programs

▸ Desired Outcome:
- ■ Initial five year IDDE program development plan over the current permit cycle

▸ Budget Resources Required:
- ■ Less than one staff month for smaller communities
- ■ Up to three staff months for larger communities

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Establish Responsibility & Authority

▶ Purpose:
- ■ Establish authority to regulate, respond to & enforce discharges
- ■ Identify & prohibit inappropriate connections through plumbing code updates
- ■ Develop reporting & tracking system

Fundamental units to track are individual outfalls...

- Geospatial coordinates
- Contributing land use
- Diameter & physical characteristics
- Field assessment data
- Digital photos
- Follow-up monitoring at outfall or further up pipe
- Hotline complaints, along with response
- Status & disposition of enforcement actions
- Maintenance & inspection data

Desktop Assessment of Illicit Discharge Potential

▸ Purpose:
  - ■ Determine the potential severity for illicit discharges
  - ■ Identify which subwatersheds or generating land use merit priority investigation

▸ Elements:
  - ■ Define drainage areas
  - ■ Compile data
  - ■ Screen drainage areas for IDP factors
  - ■ Characterize IDP across subwatersheds

Develop Program Goals & Strategies

▸ Purpose:
  ◾ Define milestones to measure progress during 1st permit cycle
  ◾ Make sure resources allocated to address real problems
  ◾ Choose most appropriate & cost-effective methods to find discharges

▸ Desired Outcomes:
  ◾ Program goals & measurable indicators for:
    ● overall program administration
    ● outfall assessment
    ● finding & fixing illicit discharges
    ● prevention of illicit discharges
  ◾ Detailed yet flexible field investigation strategy

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Measurable Goals Related to Outfall Assessment

Example Measurable Goals	Timeframe
Define & characterize drainage areas or sewer sheds	Year 1
Walk all stream miles	Begin Year 1, complete 1st screening end permit cycle Repeat once per permit cycle
Develop digital map of all outfalls, land use, & other relevant infrastructure	Year 1 Continuously & regularly after that
Secure analytical laboratory services	Initiate in conjunction with field screening
Sample & trace source of % of flowing outfalls each year of permit cycle	Initiate during 1st permit cycle Expand & enhance where problems are observed
Conduct regular in-stream assessments	
Conduct investigations at % of non-flowing outfalls with poor in-stream water quality to look for intermittent flows	
Integrate all collected stream data & citizen complaints into GIS system	Initiate during 1st year Expand & enhance with time

Refining Strategies to Address Unique Conditions... Aging Septic Infrastructure

▸ Develop targeted education program for septic system maintenance

▸ Institute a point of sale inspection and verification process

▸ Develop cost share capabilities to assist property owners with upgrade of system

What could you do if......

▸ There are minimal illicit discharge problems anticipated throughout the MS4.

What could you do if...

▶ The anticipated problems are confined to a few subwatersheds or reaches, where a history of suspect discharges exist or in-stream dry weather water quality is consistently poor.

What could you do if......

▸ The community has chronic dumping areas.

What could you do if......

▸ Community used to be on combined sewer system or existing sanitary sewer infrastructure is old & has history of problems .

What could you do if……

▸ Significant illicit discharges are suspected throughout jurisdiction & across all land uses.

Search for Illicit Discharge Problems in the Field

▶ Purpose:
  ■ Conduct rapid field screening to identify & track suspected outfalls & stream segments
  ■ Conduct investigatory sampling & analysis to establish flow types & likely sources

▶ Desired Outcome:
  ■ Locations & characterizations of all outfalls
  ■ Strategy for future chemical analysis
  ■ Local "fingerprint" library

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Isolate & Fix Illicit Discharges

▸ Desired Product or Outcome(s):
  ◾ Finding & fixing illicit discharges is the core goal
  ◾ Ancillary outcomes:
    ● Reduced incidences of illicit discharges = improved water quality
    ● Increased homeowner & business awareness
    ● Tracking system to document problems & repairs & identify repeat offenders
▸ Budget and/or Staff Resources Required:
  ◾ Budget & staff resources needed to find sources variable
  ◾ Fixing problem more predictable & can often involve qualified contractors
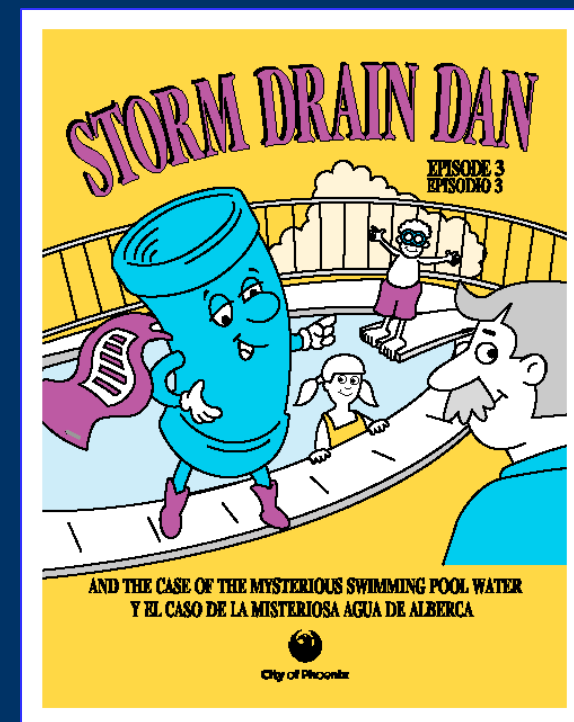 ◾ Repair costs can be incurred fully by offender or shared

Discharge Complaint Hotline

- Leads to early detection & correction
- Encourages active public stewardship
- Can "piggyback" on other call response needs
- Identifies suspected facilities for further investigation & education
- Increases municipal accountability

- Good tool to pick up intermittent and transitory discharges
- Time & money to provide 24/7 service
- Marketing the hotline number
- Establishing inter- & intra-departmental response process

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Preventing Illicit Discharges

- ▸ Desired Product or Outcome(s):
  - ■ Local prevention programs targeting common intermittent and transitory discharges
  - ■ Target: neighborhoods, generating sites, and municipal housekeeping

- ▸ Budget and/or Staff Resources Required:
  - ■ Costs can be considerable - coordinate with other 6 minimum measure work
  - ■ Economies realized when community staffs are cross-trained, partnerships are developed with watershed organizations, and regional efforts take advantage of pooled resources

IDDE Education Target Audiences

- ▶ Resident Education
  - ■ Storm drain stenciling, outfall signage, hotline promotion, school presentations
- ▶ Commercial and Industrial Hotspots
- ▶ Public Employees
  - ■ Field crew & inspector cross-training

Source: City of Phoenix, AZ

Example PSA...

Program Tracking & Evaluation

▶ Purpose:
  ■ Revise the program to prevent or eliminate the most serious illicit discharges in the most cost-effective manner in response to monitoring and hotline information gathered in the first few years of the permit cycle.

Program Tracking Systems

▸ Updated mapping to reflect locations of illicit discharges and problems

▸ Water quality results associated with specific outfall and in-stream sampling

▸ Frequency of hotline use

▸ Number of "hits" or confirmed illicit discharges

▸ Program costs by line item

▸ Number of corrections and associated cost

IDDE Program Component		Start Up Cost	Annual Cost
1: Audit	Perform Audit	$3K - $9K	--
	Initial Program Plan	$1K - $3K	--
2: Authority	Adopt Ordinance	$1K - $17K	--
	Tracking System	$2K - $15K	$2K
3: Desktop Assessment	Desktop Analysis	$1K - $4K	--
	Field Mapping	$500 - $1K	--
4: Goals & Strategies	Develop Goals	$1K - $3K	--
	Field Monitoring Strategy	$1K - $3K	--
5: Search for Discharges	ORI	--	$5.7K - $12.8K
	Establish Hotline	$1.3K - $7.7K	$1.5K - $11.4K
	Sample Analysis	$500 - $15.5K	$9K - $21.2K
	Outfall Map	--	$500 - $1K
6: Isolate & Fix Discharges	Isolate	--	$2K - $5.2K
	Fix	--	$10K - $30K
7: Prevent Discharges	Education	$1K - $8.1K	$1.3K - $13.9K
	Enforcement	--	$1K - $14K
8: Tracking & Evaluation	Program Administration	$10K - $15K	$10K - $15K
TOTAL		**$23,300 - $101,300**	**$43,000 - $126,500**

Additional Resources

All these documents can be accessed from www.cwp.org

- *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments* (CWP and Robert Pitt, 2004)
- ORI Field Sheet & Database
- Illicit Discharge Hotline Incident Tracking Sheet
- Chemical Mass Balance Model (CMBM) Setup & Input File
- *Inappropriate Discharge Detection and Elimination: What Phase I Communities Are Doing to Address the Problem* (Zielinski and Brown, 2003)

Q/A