

Stormwater Management Training  
for  
**ILLICIT DISCHARGE  
DETECTION  
AND ELIMINATION**



**City of Cottonwood**

**2024**

# Agenda

## PART 1

### Stormwater Overview

- What is stormwater?
- What is an illicit discharge?
- Permit compliance
- Identifying and reporting illicit discharges
- How you can help

## PART 2

### IDDE PROGRAM

- IDDE Program elements
- IDDE investigation
- Dry weather screening
- Wet weather monitoring
- General information

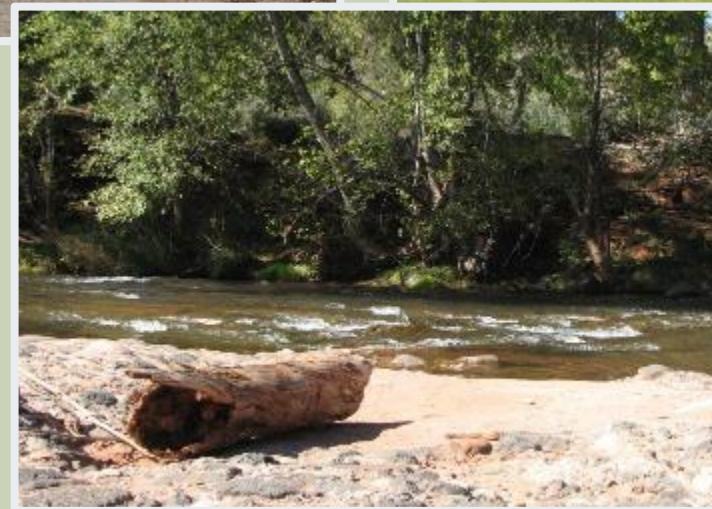
# What is Stormwater?



- Runoff due to rain or snow melt
- Stormwater is collected by natural channels, storm drains, ditches, and gutters
- Along the way, stormwater picks up sediment, pathogens, oil, fertilizer, pesticides, and other **pollutants**
- Stormwater enters streams and rivers **without treatment**

# Where does stormwater go?

Retention basins, washes, rivers, lakes...



# Where does YOUR stormwater go?

Ultimately, to the Verde River



# How does stormwater get there?

Through the Municipal Separate Storm Sewer System (MS4)



And exits through outfalls.

The MS4 consists of:

- Curbs and gutters
- Storm drains
- Catch basins
- Ditches
- Pipes



# Why is stormwater quality important?



Polluted stormwater harms:

- Human health and safety
- Wildlife and habitat
- Recreation and tourism
- Land preservation

# Stormwater Regulations

- Clean Water Act, Section 402
  - EPA delegated authority to ADEQ in 2002
  - Arizona Pollutant Discharge Elimination System (AZPDES)
    - AZPDES permits allow the discharge of stormwater to Protected Surface Waters
    - MS4 Permit, Construction General Permit (CGP), Industrial Permit (MSGP)
- Cottonwood City Code chapters 13.24 & 15.40
  - Regulates discharge of stormwater pollutants
  - Authorizes Cottonwood to take enforcement actions
- Cottonwood Engineering Design Standards Manual
  - Sets City requirements for stormwater management in construction and post-construction

# MS4 Permit Requirements

- Develop and implement a Stormwater Management Plan (SWMP)
- Minimize discharge of pollutants “to the maximum extent practicable”
- Education & Outreach
- Visual and analytical monitoring of stormwater
- Inspect construction sites
- Submit annual reports
- **Illicit Discharge Detection and Elimination (IDDE)**
- **Provide employee training**



ARIZONA DEPARTMENT  
OF  
ENVIRONMENTAL QUALITY



## Arizona Pollutant Discharge Elimination System General Permit for Stormwater Discharges From Small Municipal Separate Sewer Systems to Protected Surface Waters

This permit provides authorization to discharge under the Arizona Pollutant Discharge Elimination System (AZPDES) program, in compliance with the provisions of the Arizona Revised Statutes (A.R.S.), Title 49, Chapter 2, Article 3.1, the Arizona Administrative Code (A.C.C.), Title 18, Chapter 9, Article 9, and Chapter 11, Article 1; and the Clean Water Act as amended (33 U.S.C. 1251 et seq.). This general permit authorizes stormwater discharges of pollutants from small municipal separate storm sewer systems (MS4s) in Arizona to Protected Surface Waters, pursuant to federal conditions in 40 CFR § 122.31 and A.R.S. Title 49 Chapter 2, Article 3.1 et seq. State requirements for discharges to non-WOTUS protected surface waters are enforceable solely by the Arizona Department of Environmental Quality (ADEQ). All discharges authorized by this general permit shall be consistent with the terms and conditions of this general permit.

This general permit is effective on September 30, 2021.

This general permit and the authorization to discharge expires at midnight on September 29, 2026.

This general permit was modified on Sep 16, 2022

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



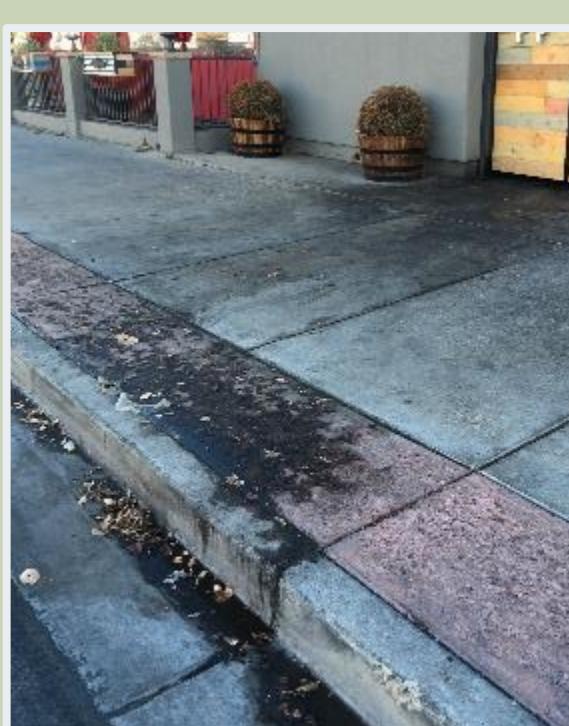
Trevor Bagglo, Director  
Water Quality Division

# What is an Illicit Discharge?

Any discharge to the MS4 not composed entirely of stormwater, except:

- Certain allowable non-stormwater (*we'll get to this*)
- Discharges covered under their own AZPDES permit

Illicit Discharges may be intentional or accidental



# Common Examples of Illicit Discharges



Improper Disposal



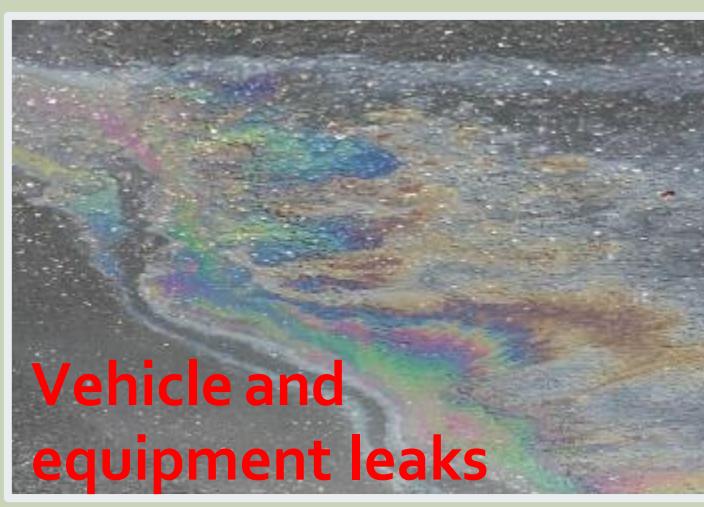
Improper disposal



Pool / spa discharges



Leaking / damaged dumpsters



Vehicle and equipment leaks



Sewer/septic overflow or leaks

# Other Types of Illicit Discharges

## Littering and illegal dumping



## Illicit Connections

A physical connection of a non-stormwater source to the storm drain system.



# Some non-stormwater discharges are “allowable”

*... BUT they **must** be pollutant free!*

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Discharge from potable sources
- Fountain drains
- Air conditioning condensate
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Non-commercial, charity car washes
- Discharge from riparian habitats and wetlands
- Street wash water
- Discharges of flows from fire-fighting activates
- Building washing without added cleaning products

# Recognizing Potential Illicit Discharges

- Flow in a gutter or outfall without a rain event
- Unusual water characteristics (color, odor, bubbles, solids, etc.)
- Visual observation of discharge/disposal
- Pavement staining



# Illicit Discharges: What to Report?

- Chemical dumping
- Malfunctioning septic systems
- Leaking or blocked stormwater systems
- Dry weather discharges that may contain any pollutant
- Silt and sediment runoff from poorly controlled construction sites



*Anything that doesn't look like  
normal rain runoff!*

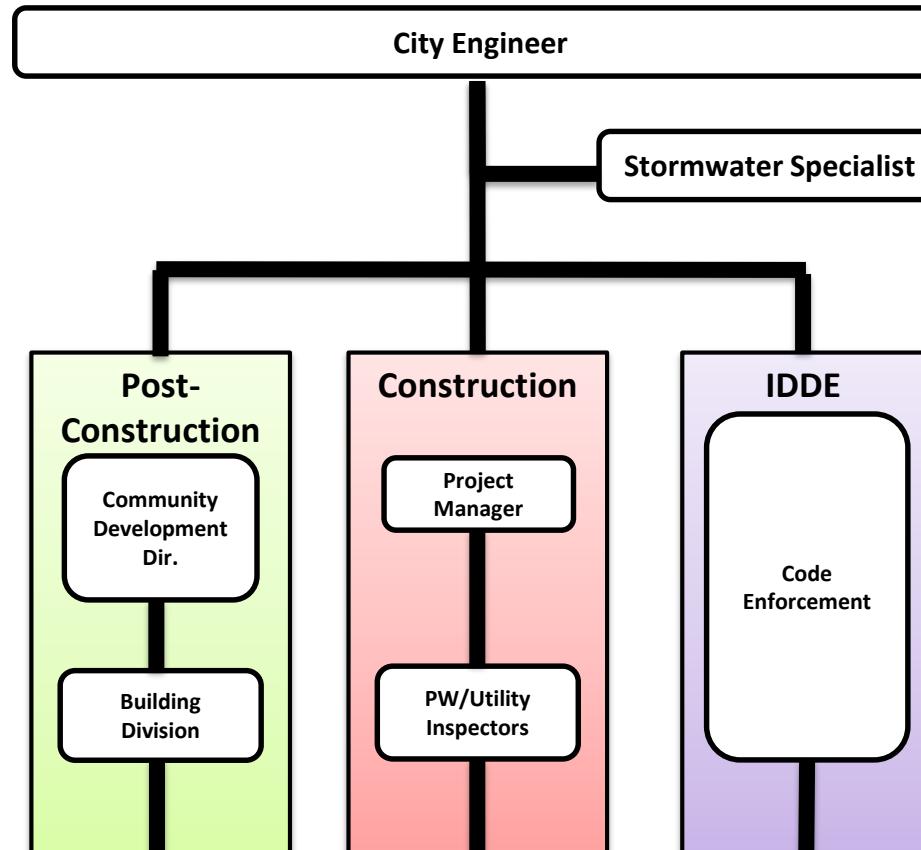
# How to report Illicit Discharges

- If you see a potential illicit discharge:
  - Identify location, discharge characteristics, obvious sources
  - Take a picture or video (if it is safe to do so)
  - Notify Stormwater Staff:
    - Email: [stormwater@cottonwoodaz.gov](mailto:stormwater@cottonwoodaz.gov)
    - Call: (928) 340-2772
- If the discharge might be hazardous material/waste:
  - DO NOT touch it!
  - Call the Fire Department at 911
  - Then contact stormwater staff



# Organizational Chart for Stormwater Program

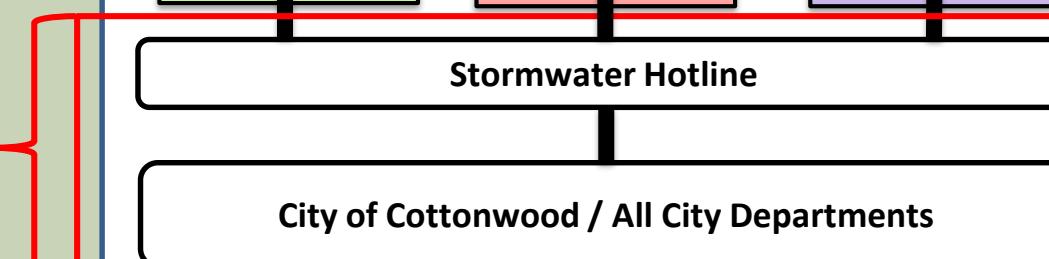
## City of Cottonwood Stormwater Protection Additional Duty Organizational Chart



Administration of the Stormwater Protection Program is executed by senior City staff.

Stormwater inspections and enforcement are executed by the appropriate section: Post-Construction, Construction, or IDDE.

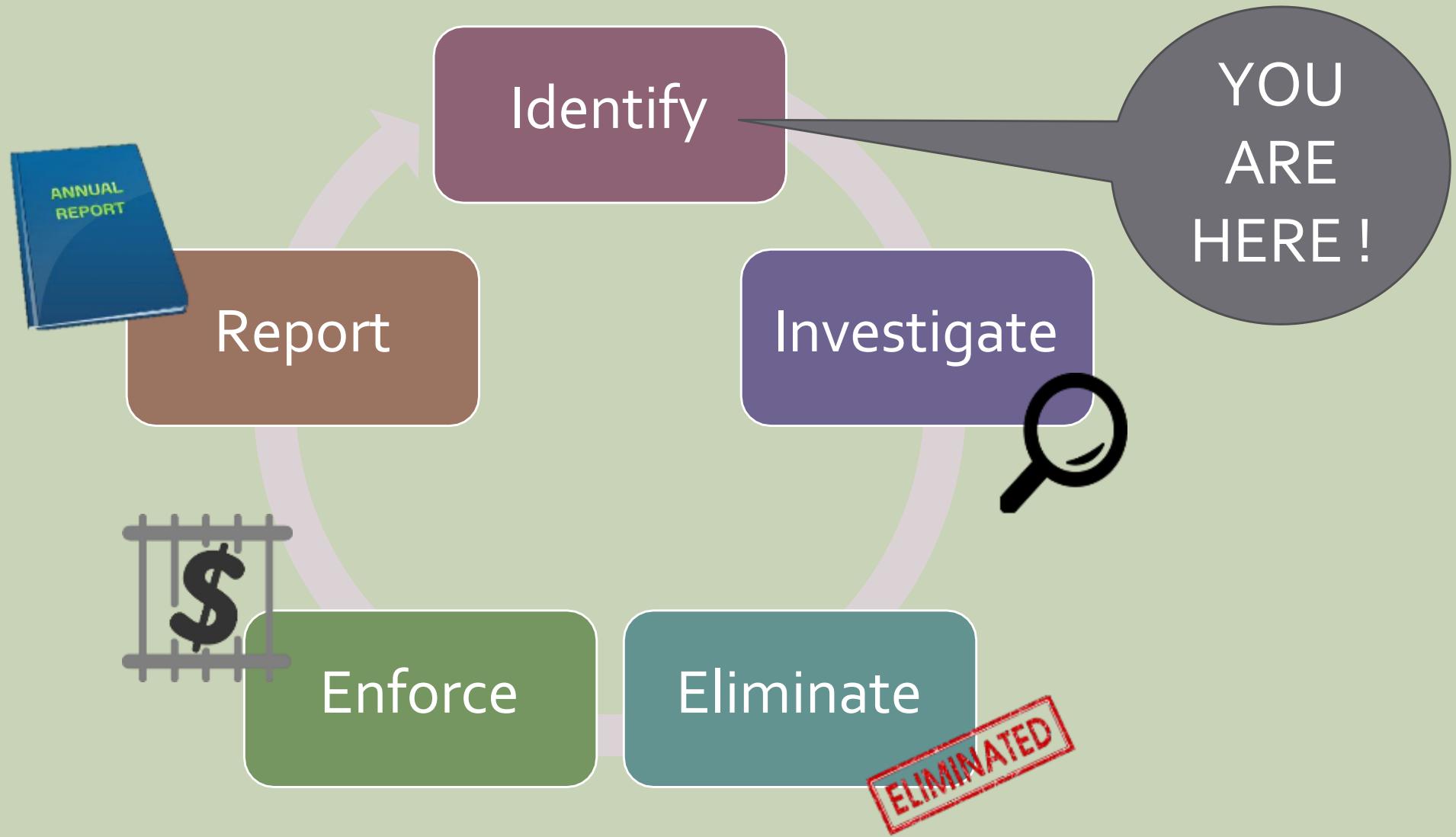
Illicit  
Discharge  
Reporting



Calls to the Stormwater Hotline are fielded to the appropriate department based on the reported observation.

Observation and verbal reporting are conducted by the public and City employees. All reports are made to the Stormwater Hotline.

# City IDDE Program Responsibilities



# How can you help keep our water clean?



## As a Citizen...

- Maintain your vehicles
- Wash your vehicles at car washes
- Don't over-fertilize plants and lawns
- Pick up pet waste
- Maintain septic systems

## As an Employee...

- Put vehicles in for service as needed
- Clean vehicles and equipment in designated areas
- Maintain vehicles and equipment in designated areas
- Report illicit discharges

# Agenda

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## PART 2

### IDDE PROGRAM

- IDDE Program elements
- IDDE investigation
- Dry weather screening
- Wet weather monitoring
- General information

# What is the IDDE program?

- IDDE is one program element described in the SWMP
- **Illicit Discharge Detection and Elimination** is a comprehensive program of detecting, identifying, isolating, regulating, and eliminating illicit discharges.



# IDDE Program Elements

Eliminating  
Illicit  
Discharges

Report  
Permit  
Non-filers

Analytical  
Monitoring

Visual  
Outfall  
Monitoring

Recordkeeping  
& Reporting

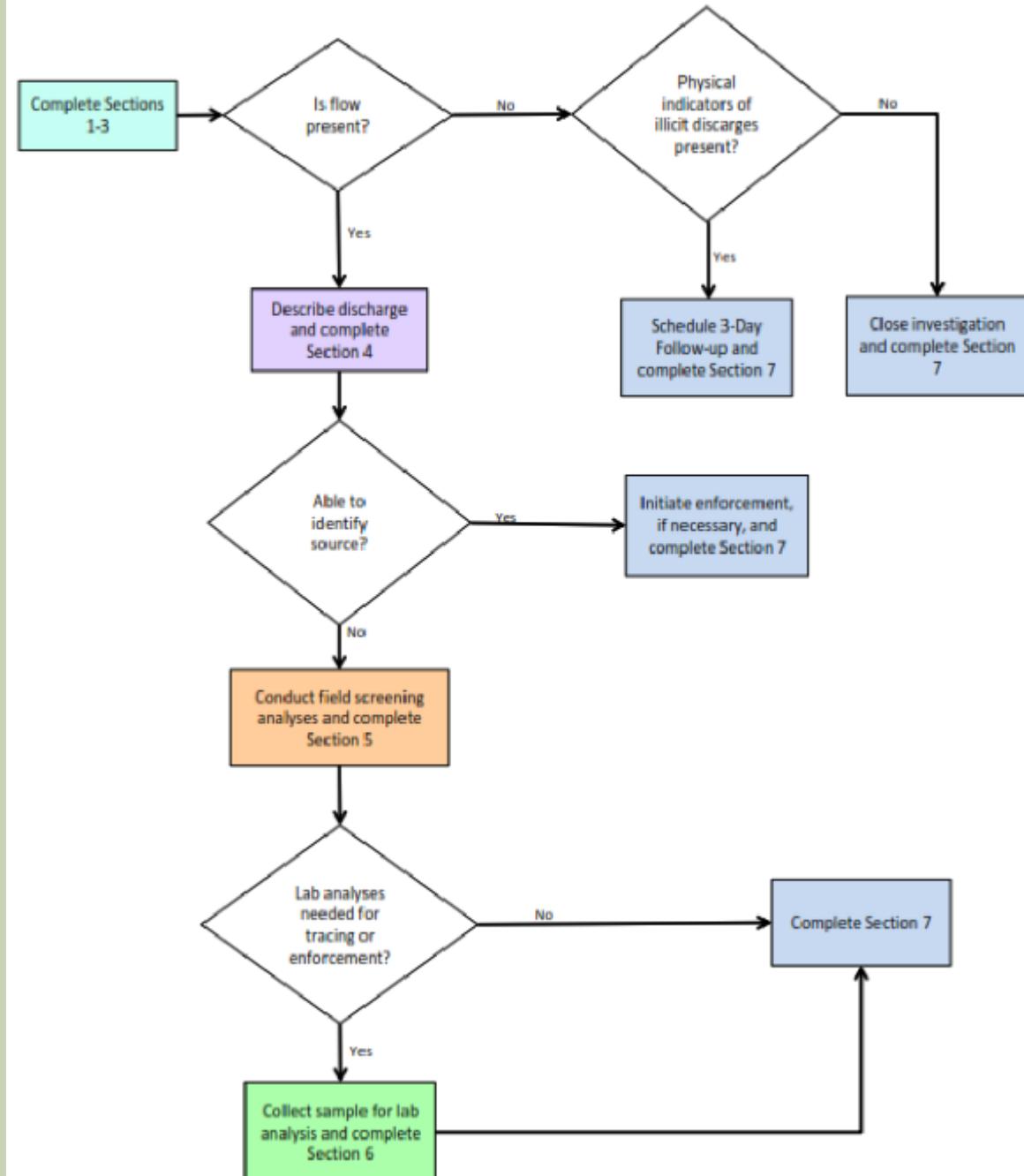
Follow-up  
Screening  
Procedures



# Illicit Discharge Detection

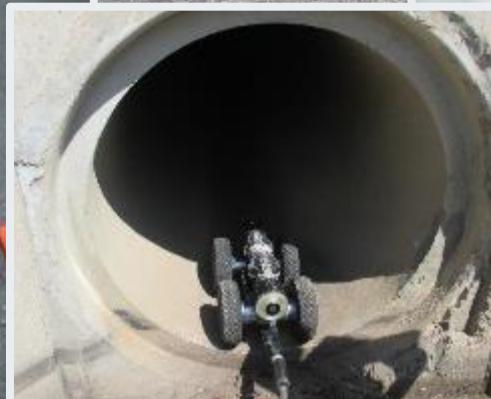
- Dry and wet weather outfall screenings
- Analytical monitoring (stormwater discharge sampling)
- Construction and post-construction inspections
- Community & staff reporting

FLOW CHART FOR DRY WEATHER INSPECTION/IDDE INVESTIGATION FORM  
CITY OF COTTONWOOD



# Illicit Discharge Investigation Methods

- Above-ground tracking – track discharge upstream until you locate the source
- Below-ground tracking – review maps, gis, as-builts, etc.
  - Manhole inspection
  - Dye testing
  - Smoke testing
  - CCTV



# Illicit Discharge Investigation



- Initiate source tracking
- Indicate the potential source
- Use information from field analysis to help identify the suspected source

**WHO DONE IT?**

# IDDE Investigation Form

- Thorough investigation information helps determine the source
- ADEQ requires documentation of all illicit discharges

## DRY WEATHER INSPECTION/ IDDE INVESTIGATION FORM CITY OF COTTONWOOD

### Section 1: Background Data

Outfall ID:	Date:	Time:
Inspector/Investigator:		
<input type="checkbox"/> Dry Weather Inspection <input type="checkbox"/> IDDE Investigation <input type="checkbox"/> 3-Day Follow-up Inspection		
Photos? <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, append photos to this report.	
Precipitation w/in last 48 hours? <input type="checkbox"/> Yes <input type="checkbox"/> No	Weather (approx. temp, etc.):	
Land Use in Drainage Area (check all that apply):		
<input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Open Space Other: _____ Known Industries: _____		

### Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSIONS (IN.)	SUBMERGED
Storm Sewer (Closed Pipe)	<input type="checkbox"/> RCP <input type="checkbox"/> PVC <input type="checkbox"/> Steel <input type="checkbox"/> CMP <input type="checkbox"/> HDPE <input type="checkbox"/> Clay/drain tile <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Elliptical <input type="checkbox"/> Box <input type="checkbox"/> Other: _____	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter / Dimensions: _____ X _____
Open drainage (swale / ditch)	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth: _____ Top Width: _____ Bottom Width: _____	

### Section 3: Physical Indicators

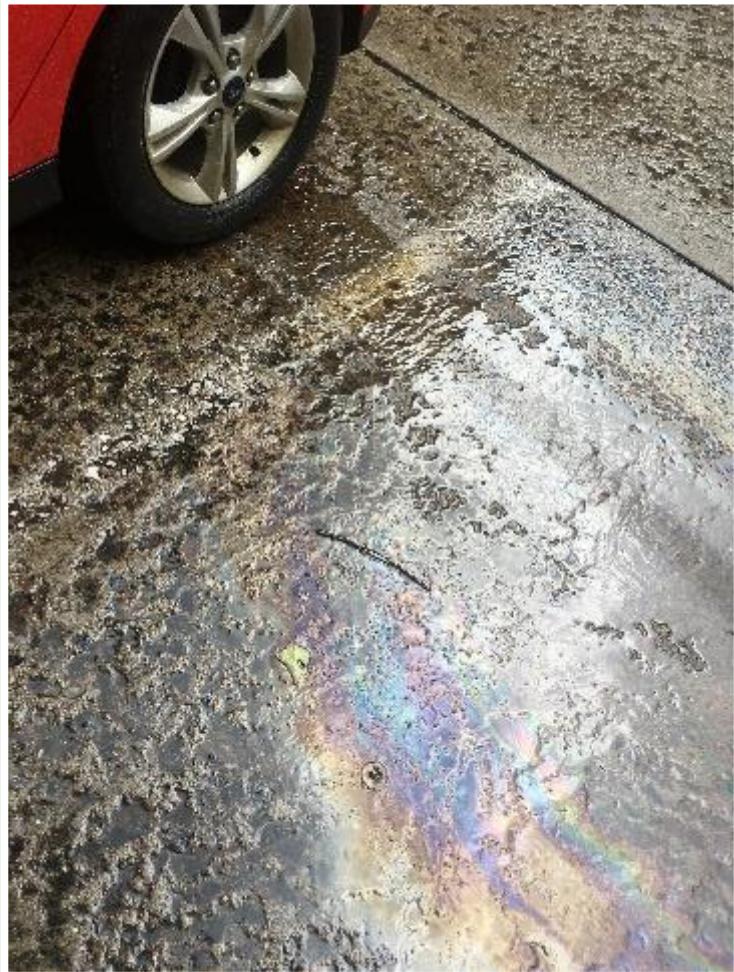
INDICATOR	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/> None <input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion <input type="checkbox"/> Other: _____	
Deposits / Stains	<input type="checkbox"/> None <input type="checkbox"/> oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other: _____	
Abnormal Vegetation	<input type="checkbox"/> None <input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor Water Quality	<input type="checkbox"/> None <input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds <input type="checkbox"/> Excessive Algae <input type="checkbox"/> Other: _____	
Pipe Algae Growth	<input type="checkbox"/> None <input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other: _____	
Do physical indicators suggest an illicit discharge has occurred? <input type="checkbox"/> No <input type="checkbox"/> Yes		
Flow Present?	<input type="checkbox"/> Yes    If yes, describe: <input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial    And go to Section 4. <input type="checkbox"/> No    If no flow and no physical indicators, skip to Section 7 and close investigation. If no flow but physical indicators are present, skip to Section 7 and schedule 3-Day Follow-up.	

# Visual Monitoring – Dry Weather

- Look for signs of illicit discharges:
  - Dry weather flows
  - Stains in gutter, storm drain
  - Sediment deposition
- Follow IDDE Investigation SOP
- Trace any illicit discharges identified upstream ASAP
- Investigate potential facility discharge
- Re-inspect to ensure no additional discharge is present



# Visual Monitoring – Wet Weather



- Look for signs of illicit discharges:
  - Unusual color or odor in water
  - Oily sheen or murky runoff
- Follow IDDE Investigation SOP
- Trace any illicit discharges identified upstream ASAP
- Investigate potential facility discharge
- Re-inspect to ensure no additional discharge is present

DRY WEATHER INSPECTION/ IDDE INVESTIGATION FORM  
CITY OF COTTONWOOD

Section 4: Discharge Description (flowing outfalls only)

INDICATOR	CHECK if Absent	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/> (No odor)	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/Sour <input type="checkbox"/> Sulfide <input type="checkbox"/> Laundry <input type="checkbox"/> Petro/gas <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1-Faint	<input type="checkbox"/> 2-Easily detected	<input type="checkbox"/> 3-noticeable from a distance
Color	<input type="checkbox"/> (Colorless)	<input type="checkbox"/> Gray <input type="checkbox"/> Brown <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Red/Orange <input type="checkbox"/> Multicolor <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1-Faint color visible in sample bottle	<input type="checkbox"/> 2-Color clearly visible in sample bottle	<input type="checkbox"/> 3-Clearly visible in outfall flow
Turbidity	<input type="checkbox"/> (Clear)	See severity	<input type="checkbox"/> 1-Slightly cloudy	<input type="checkbox"/> 2-Cloudy	<input type="checkbox"/> 3-Opaque
Floatables – does not include trash!	<input type="checkbox"/> (Clean)	<input type="checkbox"/> Sewage <input type="checkbox"/> Suds/Foam <input type="checkbox"/> Oil sheen <input type="checkbox"/> Plant Debris <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1-Few/slight; origin not obvious	<input type="checkbox"/> 2-Some indications of origin	<input type="checkbox"/> 3-Some; origin obvious
Do physical indicators suggest an illicit discharge is present? (Y/N)					
Able to trace flow to source? <input type="checkbox"/> Yes If yes, proceed to Section 7. <input type="checkbox"/> No If no, proceed to Section 5.					

Section 5: Field Screening Analyses (flowing outfalls only)

Parameter	Results	Comments	Equipment
Temperature			
pH			
Total Residual Chlorine			
Phenols			
Detergents			
Total Copper			

Section 6: Sample Collected for Lab Testing (see flow chart) (flowing outfalls only)

1. Sample for the lab?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, explain (source identified, or other): _____
2. Chain of Custody (COC) completed:	<input type="checkbox"/> Yes <input type="checkbox"/> No	COC Information (Date, Time, Lab Name): _____
3. Analyses requested:	<input type="checkbox"/> E. coli <input type="checkbox"/> Metals <input type="checkbox"/> Oil & Grease <input type="checkbox"/> Total Petroleum Hydrocarbons <input type="checkbox"/> VOCs <input type="checkbox"/> SVOCs <input type="checkbox"/> Pesticides <input type="checkbox"/> PCBs <input type="checkbox"/> Other _____	

Section 7: Enforcement and Resolution

<input type="checkbox"/> Source Identified (describe below)	<input type="checkbox"/> 3-Day Follow-up Inspection required (describe reason why below)
<input type="checkbox"/> No flow and no sign of illicit discharge, investigation closed.	
Enforcement action taken? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:	
Source/Resolution:	

Record all background data associated with the sampling event

Document known details

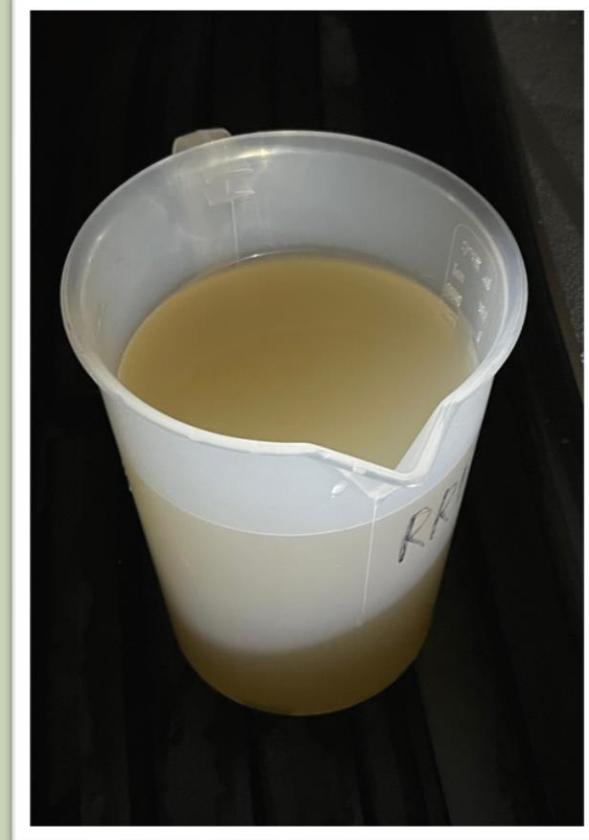
Document samples collected

Describe any actions taken to enforce ID

# Qualitative Screening

Qualitative data - *non-numerical*; describes qualities or characteristics.

Collect samples in a clear, clean container.



Characteristics to look for in the sample:

- Color
- Odor
- Turbidity (aka Clarity)
- Floatables (i.e. materials floating at or near the top of the sample bottle)
- Sediment
- Oil sheen



# Quantitative Screening

- Quantitative data – *numerical*; can be counted or measured.
- Measure flow rate and conduct field screening analysis (when appropriate)
- Analytes to record:
  - Temperature
  - pH
  - Phenols
  - Copper
  - Chlorine
  - Detergents
  - Organic Compounds (alcohols, benzene, methane, petroleum products, etc.)



# Permit Non-Filers

- Identify:
  - Construction sites without CGP coverage
  - Industrial sites without MSGP coverage
  - Other discharges without AZPDES Permits



# Recordkeeping

Keep any records pertaining to the MS4 Permit for a minimum of 3 years

- This includes:
  - Reports
  - Inspection Records
  - Enforcement Actions
  - Follow-up Documentation



# Why Document?

Each year, an Annual Report must be prepared.

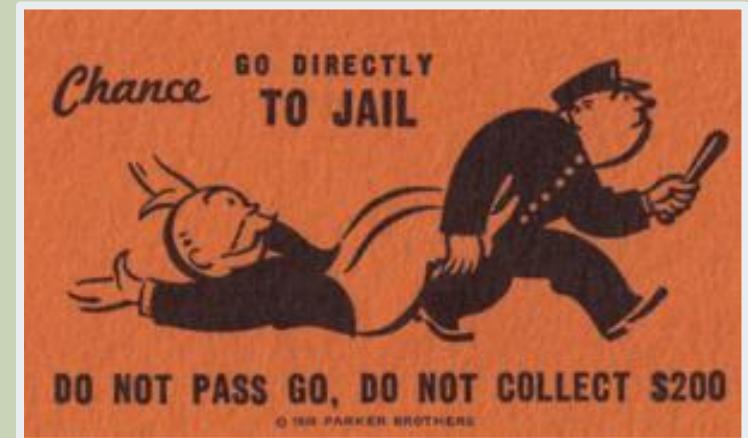
The Annual Report contains a summary of IDDE program activities:

- Number of dry/wet weather inspections
- Details on each incident:
  - Date incident discovered
  - Date City response began
  - Date City response ended
  - Did discharge reach a protected surface water?
  - Incident location
  - Pollutants involved
  - Source
  - Correction methods



# Illicit Discharge Enforcement

- The City has legal authority to prohibit illicit discharges to the MS4, conduct inspections, and carry out enforcement procedures
- The City applies the following enforcement measures:
  1. A verbal warning
  2. Written warning
  3. Notice of Violation (NOV)
  4. Civil or criminal penalties  
(if compliance is not met)



# SAMPLE FIELD EQUIPMENT AND PPE LIST

- Camera
- Clipboards
- Field Sheets
- First Aid Kit
- Flashlight or spotlight
- Gas monitor or probe
- Two-way radios
- Storm drain and street maps
- Waterproof marker/pen
- Sledgehammer
- Spray paint
- Rubber/latex gloves
- Manhole
- Handheld GPS
- Measuring Tape

- Hook/Crowbar
- Mirror
- Reflective safety vests



# HEALTH AND SAFETY CONCERN

- If evidence of a health or safety issue exists....STOP the inspection.
- Notify the fire department, hazmat team, and then your supervisor.



# Questions / Comments?

For any questions or concerns, contact:

## Stormwater Hotline

[stormwater@cottonwoodaz.gov](mailto:stormwater@cottonwoodaz.gov)

(928) 340-2772

## City Engineer

(928) 340-2770



**City of Cottonwood**