When It's Not Raining…

Prioritizing Stormwater Outfall Screening During Dry Weather Periods for MS4 Requirements

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BAXTER & WOODMAN Consulting Engineers

Overview

Prioritizing Stormwater Outfall Screening

- MS4 Permit requirement / purpose
- Assessing the stormwater system / watershed
- Selecting high priority outfalls
- Prioritization approaches
- Implementation
- Documentation / tools

Minimum Control Measures (Program Areas)

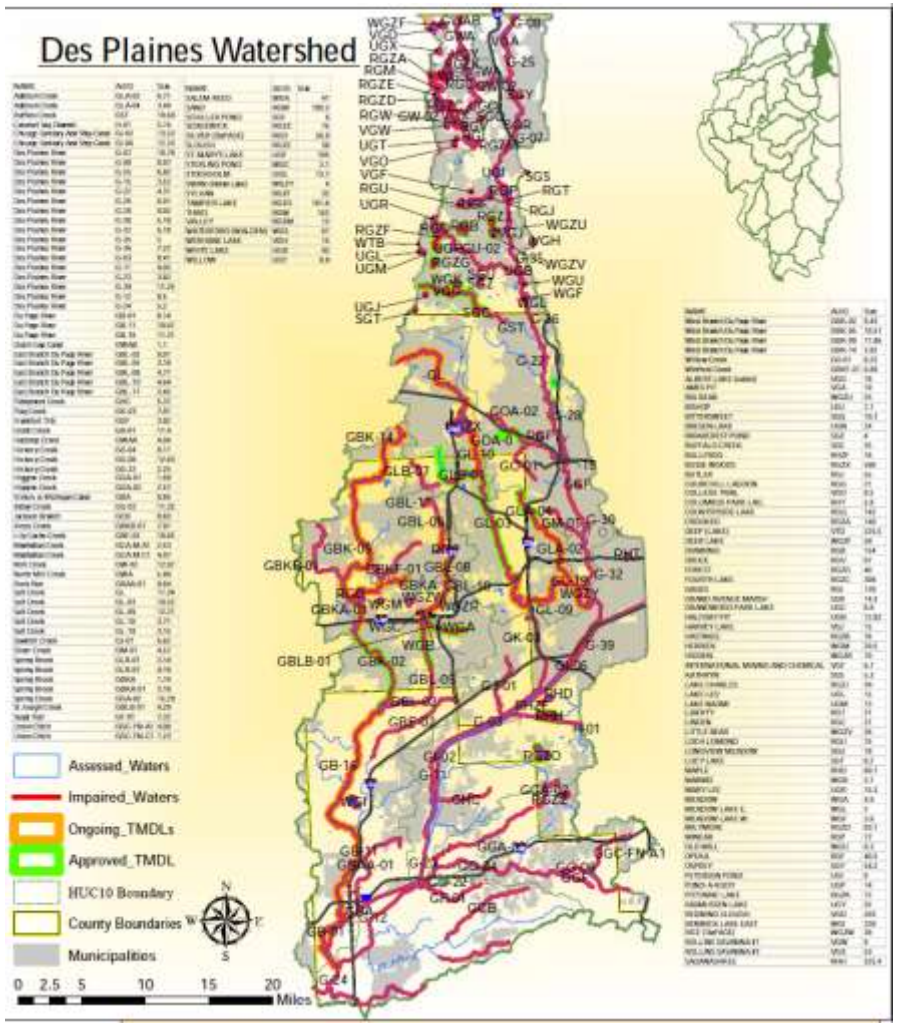
- Six Minimum Control Measures have been established
  - Public Education and Outreach on Storm Water Impacts
  - Public Involvement / Participation
  - Illicit Discharge Detection and Elimination
  - Construction Site Storm Water Runoff Control
  - Post-Construction Storm Water Management in New Development and Redevelopment
  - Pollution Prevention/Good Housekeeping for Municipal Operations
- BMPs with measurable goals must be developed for each minimum control

Permit Requirement

- Develop, implement, and enforce a program to detect and eliminate illicit connections or discharges into the permittee's small MS4
- Conduct periodic inspections of the storm sewer outfalls in dry weather conditions for detection of non-storm water discharges and illegal dumping
- Establish a prioritization plan for inspection of outfalls, placing priority on outfalls with the greatest potential for non-storm water discharges. Major/high priority outfalls shall be inspected at least annually

Assessing the System / Watershed

- Local water quality impairments
  - IEPA 303d list
- Pollutants of Concern
  - Sediment
  - Nutrients
  - Metals
  - Other pollutants / toxins
- TMDLs
- Local water quality goals
  - Water supply
  - Recreational areas
  - Tourist areas

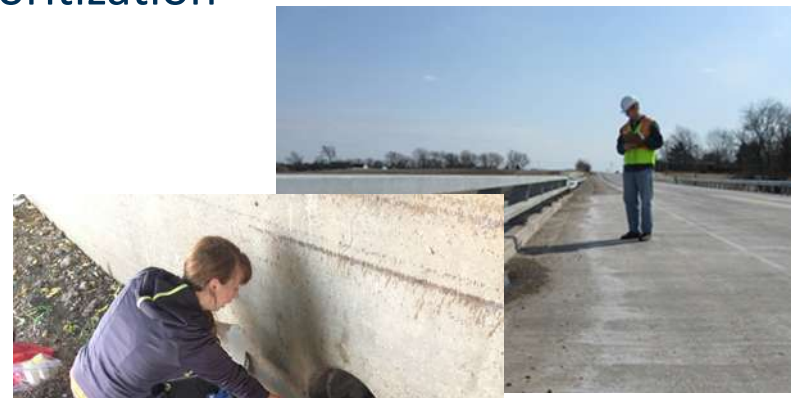


Selecting High Priority Outfalls

- Location, location, location
  - Impaired / TMDL waterbodies
  - Recreation / tourist areas
  - Industrial / commercial land use
  - Complaint areas
  - History of illicit discharges
  - Local priorities
- Safety considerations
  - Accessibility

Prioritization Approaches

- Evaluate your program resources
- How many inspections can you do in a year?
- One or two people?
- Staff time available, or contractor
    - Summer intern?
- What would your MS4 inspector say is your MEP?
- Must document your inspection prioritization



Implementation

- Example 1:
  - Community has twelve stormwater outfalls
    - Two in industrial areas
    - Ten in residential areas
    - Five tributary to impaired river reach listed for sediment, nutrients
- How many high priority outfalls?

Implementation

- Example 1:
  - Community has twelve stormwater outfalls
    - Two in industrial areas
    - Ten in residential areas
    - Five tributary to impaired river reach listed for sediment, nutrients
- How many high priority outfalls?

- Answer: 12
  - Would be considered easily implementable for most MS4 communities

Implementation

- Example 2:
  - Community has 200 stormwater outfalls
    - 12 to impaired waters
    - 8 in the downtown area
    - 10 near public recreation areas
    - 20 in heavy industrial areas
    - 150 in commercial / residential area
- How many high priority outfalls?

Implementation

- Example 2:
  - Community has 200 stormwater outfalls
    - 12 to impaired waters
    - 8 in the downtown area
    - 10 near public recreation areas
    - 20 in heavy industrial areas
    - 150 in commercial / residential area
- How many high priority outfalls?

- Answer: Depends on local resources, goals
  - Possibly 12, 22, 50, 200?
  - 200 would be beyond what the typical community would be expected to do annually

Implementation

- Example 3:
  - Community has no stormwater outfalls
    - Storm sewer system drains to other communities' systems
    - Nothing daylights
- How many high priority outfalls?

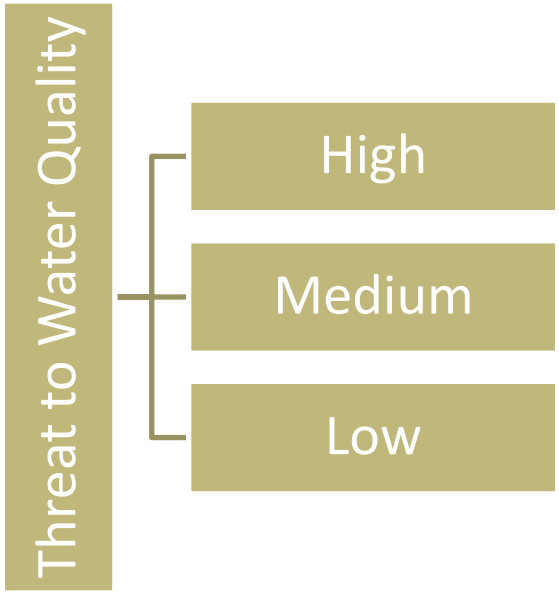
Implementation

- Example 3:
  - Community has no stormwater outfalls
    - Storm sewer system drains to other communities' systems
    - Nothing daylights
- How many high priority outfalls?

- Answer: 0, no outfalls, but…
  - Could pop manholes in high priority areas and inspect
  - Could inspect runoff during storm events in areas of concern
  - Do something

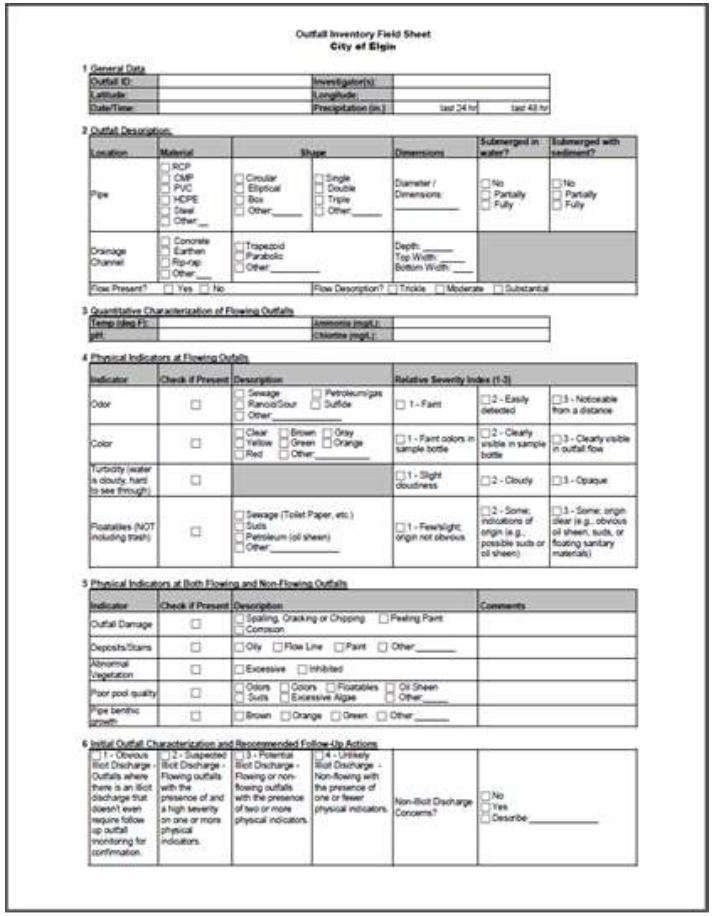
Implementation

- But what about all the non-high priority outfalls?
- Permit is silent, implies you can't ignore them completely
- Local program decision
  - Again, what resources do you have?
  - Every other year?
  - Once per permit term, 5 year schedule is generally accepted



Documentation / Tools

- Paper forms
- Pros
  - Straight forward
  - Field notes
  - Batteries don’t go dead
- Limitations
  - Retrieving information
  - Determining past issues
  - Photos cumbersome to link / manage



Outfall Inventory Field Sheet
City of Elgin

1 General Data

Outfall ID:		Investigator(s):			
Latitude:		Longitude:			
Date/Time:		Precipitation (in.):		last 24 hr	last 48 hr

2 Outfall Description

Location	Material	Shape		Dimensions	Submerged in water?	Submerged with sediment?
Pipe	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other__	☐ Circular ☐ Elliptical ☐ Box ☐ Other_____	☐ Single ☐ Double ☐ Triple ☐ Other_____	Diameter / Dimensions: _____	☐ No ☐ Partially ☐ Fully	☐ No ☐ Partially ☐ Fully
Drainage Channel	☐ Concrete ☐ Earthen ☐ Rip-rap ☐ Other___	☐ Trapezoid ☐ Parabolic ☐ Other_____		Depth: _____ Top Width: _____ Bottom Width: ___		
Flow Present? ☐ Yes ☐ No				Flow Description? ☐ Trickle ☐ Moderate ☐ Substantial		

3 Quantitative Characterization of Flowing Outfalls

Temp (deg F):		Ammonia (mg/L):	
pH:		Chlorine (mg/L):	

4 Physical Indicators at Flowing Outfalls

Indicator	Check if Present	Description	Relative Severity Index (1-3)		
Odor	☐	☐ Sewage ☐ Petroleum/gas ☐ Rancid/Sour ☐ Sulfide ☐ Other:_____	☐ 1 - Faint	☐ 2 - Easily detected	☐ 3 - Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:_____	☐ 1 - Faint colors in sample bottle	☐ 2 - Clearly visible in sample bottle	☐ 3 - Clearly visible in outfall flow
Turbidity (water is cloudy, hard to see through)	☐		☐ 1 - Slight cloudiness	☐ 2 - Cloudy	☐ 3 - Opaque
Floatables (NOT including trash)	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:_____	☐ 1 - Few/slight; origin not obvious	☐ 2 - Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

5 Physical Indicators at Both Flowing and Non-Flowing Outfalls

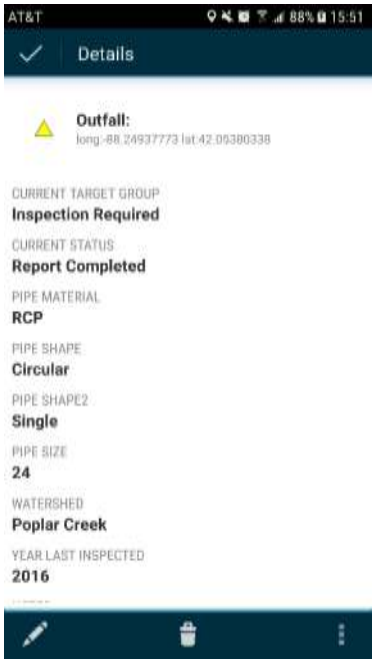
Indicator	Check if Present	Description	Comments
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other_____	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other_____	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other_____	

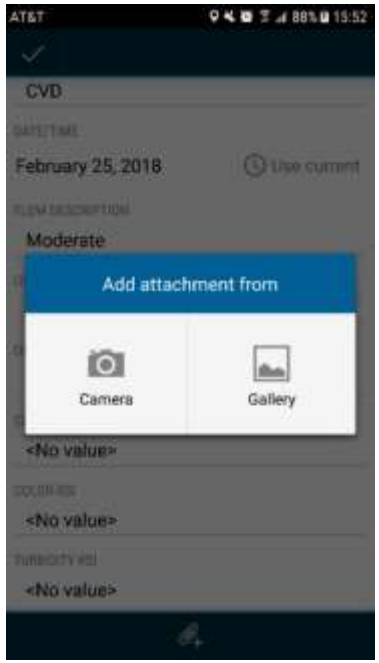
6 Initial Outfall Characterization and Recommended Follow-Up Actions

☐ 1 - Obvious Illicit Discharge - Outfalls where there is an illicit discharge that doesn't even require follow up outfall monitoring for confirmation.	☐ 2 - Suspected Illicit Discharge - Flowing outfalls with the presence of and a high severity on one or more physical indicators.	☐ 3 - Potential Illicit Discharge - Flowing or non-flowing outfalls with the presence of two or more physical indicators.	☐ 4 - Unlikely Illicit Discharge - Non-flowing with the presence of one or fewer physical indicators.	Non-Illicit Discharge Concerns?	☐ No ☐ Yes ☐ Describe:_____

Documentation / Tools

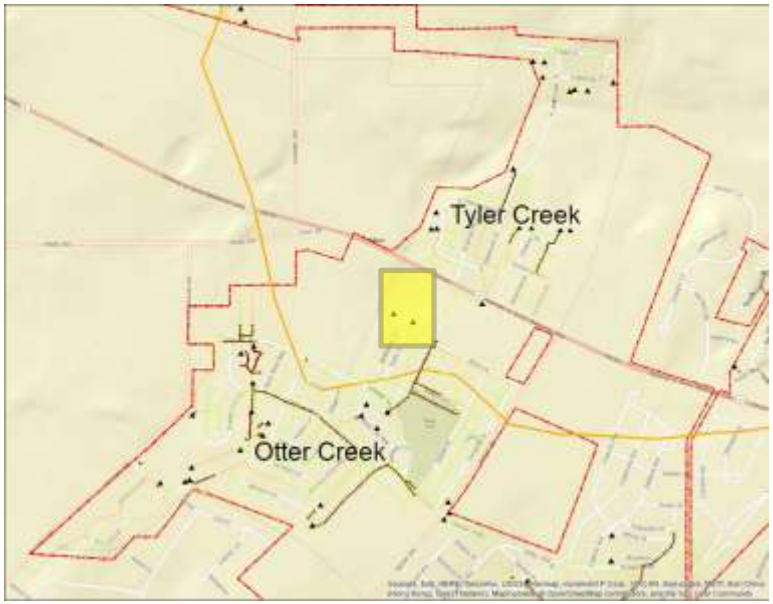
- Collector for ArcGIS





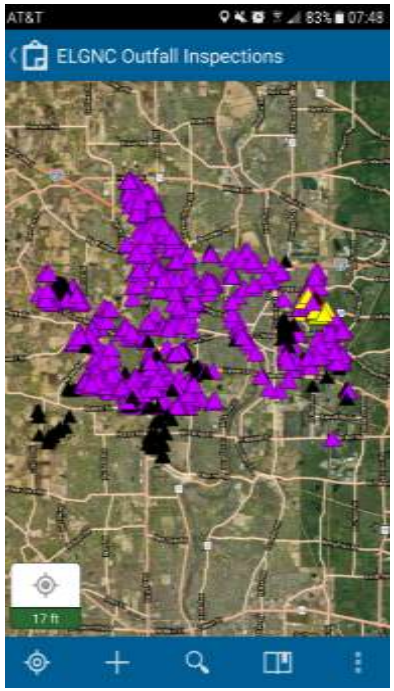
Documentation / Tools

- Easier to find outfalls
  - Zooms



Collector for ArcGIS – Benefits

- Pros:
  - Easier to find outfalls
  - Improved efficiency with record keeping
  - Instant history
  - Easily link photographs
  - Up-to-date mapping
- Limitations
  - Licenses and costs
  - Staff technical capabilities
  - Batteries…



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Questions & Discussion

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