

Webinar Training Series



**Illicit Discharge Detection and Elimination
*Requirements and Best Practices***

January 19, 2017 /// 10:30 a.m. – 11:30 a.m. (Eastern)



Questions?

Please Type Your Questions in the
“Questions Pane” in the Webinar Toolbar



Annual Southeast Regional Stormwater Seminar

Emerging Trends in Stormwater BMPs

March 31, 2017

Atlanta, GA

www.seswa.org/seminars

For More Information..... seswa@ksanet.net or 866-367-7379

www.SESWA.org

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Today's Presenters



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Agenda

- IDDE Requirements
- Case Study – Charlotte/Mecklenberg County
- Additional IDDE Approaches/Techniques
- Takeaways



Typical IDDE Requirements

- Develop a map of the MS4 that locates all major MS4 outfalls and names of receiving waters
- Effectively prohibit discharges of non-stormwater to the MS4 through the use of an ordinance or other regulatory mechanism, and provide for enforcement procedures and actions
- Develop and implement a plan to detect and address non-stormwater discharges
- Inform public employees, businesses, and the general public of the hazards associated with illegal discharges and improper disposal of waste
- Annual reporting requirements with metrics and corrective actions



General Differences Among State General Permits

- Outfall mapping specifics
- Enforcement Response Plans vs developing/implementing enforcement procedures
- Rationale statements
- Requirements for the development of formal procedures for various program aspects
- Development of a mechanism for reporting by the public
- Training/education requirements for municipal staff and others



Unique IDDE Requirements

- Ordinance must prohibit contamination of stormwater runoff from “hotspots” - TN
- Requirement for evaluation of the success of the program and whether meeting measurable goals – MS
- Dry weather screening program requiring % of outfalls screened per year - AL
- Identification of priority areas for more frequent screening – SC
- Foster interagency coordination of hazardous waste or material spills response and cleanup – TN
- Address non-stormwater discharges that are defined as significant contributors (non-commercial/charity car washes, water line flushing, etc.) – AL/MS

Focus is to detect and eliminate illicit discharges,
no prescriptive or “one size fits all” solution



Charlotte-Mecklenburg Storm Water Services

IDDE PROGRAM



It All Began With Smelly Creeks



THE CHARLOTTE NEWS

PINK FINAL

Vol. 82, No. 220

Largest Evening Newspaper in The Carolinas
Charlotte, North Carolina, Monday, September 15, 1969

5 5 38 Pages—Price Ten Cents

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372-3333
THE ACTION LINE

Call Quest solves problems, gets answers, cuts red tape and provides a voice for the public. Dial 372-3333 or write Quest, Box 369, Charlotte, where you need interesting or action or want to find out.

Q. I've just about been through the mill. For a year and a half now, I've been trying to get my Social Security disability, but I've been turned down every step of the way. Everyone knows I'm sick, but nobody can seem to agree on just what my illness is. In the meantime, I can't get my bills or my car as my car is coming in. Because I don't myself with about \$250 left on a furniture bill that originally was many times that, I'm about to lose almost everything in my house. The furniture people have been patient, but they're like everyone else—you just can't expect them to wait forever. I think that there is, but is there any way you can help?—Strapped.

A. Because of exceptional circumstances in your case, we decided we could at least try. It turned out that the people at the furniture company were extremely understanding. Since repossessed furniture is often about as much trouble as it's worth to pick it up—sometimes more—they were willing to cut your outstanding balance almost in half. An anonymous donor took care of that bill, and you're out of the woods. In addition, a utility company is willing to make good on that payment you'll be able to make Oct. 1. And by the way, we've found that companies of all kinds are much more understanding about such things than most people think. The only people they're really hard-hearted with normally are the credit bureaus who never actually try to meet their obligations.

Q. A friend of mine told me that Charles Percy, senator from Illinois, was catapulted into his almost-legendary rapid ascent here by family connections. My friend is also the world's most astute Democrat, and since Percy is a Republican, I thought I'd ask you if this was true. Also, I recall stories of his business ventures while he was still in office, and if there are any I wish you'd remind them for my friend's benefit.—Stanley.

A. Your friend must be the world's most dedicated practicing Democrat. Percy was the son of Edward H. Percy, a Bell & Howell executive who managed his money well and certainly was not a "billionaire" when he first entered the University of Chicago. But while young Charles was a student, he established a business selling food, coats, furniture and linen to fraternity houses and university residences. University President Robert M. Hutchins said of his efforts, which grossed \$150,000 a year, that he was "the richest kid who ever worked his way through college." Later, Percy got a summer job that included answering complaints about Bell & Howell's cameras and projectors. He worked up a standard complaint, and by the time summer was over there was no need to employ anyone in field complaints. Having worked himself out of a job, Percy later returned to R&H and became head of the company at 20. He'll be 30 on Oct. 27.

Q. Charles Percy is going to appear here Saturday with a Cherokee Indian? Is he a Negro or, as I've heard from some, a Chinese Indian?—Sam.

A. It's no longer necessary, as it was in the days of almost-commodore-carrier Carl Fisher, to be a "Cherokee Indian" for purposes of touring the South. Charles' black as he can be, but he's the first black country singer to make it big, with his old-timey reminiscences of the late Hank Williams. He was born in Oxford, Miss., later moved to Grand Falls, Miss., came out with a record called "Shades of a Yule at Night," was named most promising male artist of 1962 and appeared on Cash's television show. He's on his way, as the lucky ones who managed to get tickets to his show with Percy show will observe.

call Quest

Q. I've got a problem. This young man is in the hospital and needs blood for an operation, but the blood can't be released until I've got 2000-odd dollars lined up—and what a number of them have already given me. Can you help?—B.C.

A. As we thought when we first talked with you, your problem was magnified in your mind. While donors have to replace the blood used in an operation, it's hardly true that the Red Cross will stand by the red ink in life to preserve the local blood supply. In this case, the physician requested the blood, it was released, the operation was performed, and you've made arrangements for the blood he donated. It's easier.

Q. I would like to know who sets the rules for school buses for handicapped children. My child has been told that he must be at outside when the bus arrives, yet he never only knows when that will be, sometimes it's earlier, sometimes as much as half an hour late. With winter coming, this is terrible, and a real problem, and I'd like something to

Another 40,000 Troops To Leave Vietnam In Fall

WCTU-TV Declared Insolvent

By JOE FLANDERS
News Staff Writer

Television station WCTU-TV (Channel 36) today was declared insolvent and placed in receivership by a consent order signed by Superior Court Judge F. W. Layton Jr.

The order, in effect, takes all control away from the present management and puts it into the hands of lawyer Emil F. Kratz, who was named receiver.

The Howard W. Twidale, president of the firm "Twidale Telecasts Inc.," did not contest the order.

Twidale said at his press conference that WCTU will stay on the air. He said he will ask federal authorities to investigate what he termed "suspicious" claims by other broadcast executives in Charlotte to put his operation in the present bind.

At the first hearing last month, Twidale said his lawyers asked for a continuance of the case before Judge Fred H. Hart.

At that time, Twidale told the News there was a possibility that the firm may be sold. He indicated that he had "been talking" with several prospective buyers.

"The receivable action was brought by National Television Associates, Inc., of Beverly Hills, Calif., which claimed WCTU-TV owed it some \$700,000 in film rental fees."

In July, James Corp., which supplied the firm with most of its telecasting equipment, was given a judgment of more than \$1 million against WCTU-TV in United States District Court.

The judgment was not contested on Page 8A, Col. 7.

Evening Prayer

Parson says neglect and indifference have brought on a disaster. He says our hearts to those, that in times we may think in the world.

Continued on Page 8A, Col. 7.

Continued on Page 8A, Col. 7.



Wayne R. Chapman, fishery biologist with the N.C. Wildlife Resources Commission (left) and Dr. Edward F. Menhick, assistant professor of biology at the University of North Carolina at Charlotte, examine Little Sugar Creek behind Piedmont Courts while Reporter Pat Smith watches. They found blue crabs in fish.

A Tip: Don't Go Near The Water

With great six weeks investigating pollution in Little Sugar Creek. This is the first of his reports.

A Sewer Named Sugar

Hidden Valley and heads south, through industrial North Charlotte, by the baseball diamond at Carolina College, by Central Piedmont Community College and crowded Freedom Park and then south into residential neighborhoods.

And it's not an open sewer all the way. Under state law that crick isn't supposed to be a pipe 7 1/2 with freest, but fish should be able to survive in it.

It isn't supposed to be clean enough to swim in, and neither is it supposed to be a dumping ground for untreated industrial wastes or a carrier of raw domestic sewage.

It flows through a pipe in northeast Charlotte. It leaves with a mile to three something in the creek.

Sewers of pipes led from its banks. Some of them are rusted, like the ones we've seen carrying the runoff from city streets. But some are industrial latrine flushing tanks and poison into the creek.

The News had Charles Labadie, Jr., analyze some of those pollutants to determine what chemicals they contained. Those analyses will be discussed later in this series.

Dr. William T. Lammer, a professor at Davidson College who is engaged in pollution research, told The News he wouldn't get in Little Sugar Creek without wearing rubber boots and gloves like those used by surgeons.

When a News reporter mentioned his waiting trip, Lammer asked: "Have you had a typhoid shot?"

Dr. Maurice Kemp, director of the Mecklenburg County Health Department, strongly recommends that parents keep their children out of the creek. "There is no way of telling what could be picked up," he said.

Approval Follows Meeting

SARON — Vice President Nguyen Cao Ky said tonight that another 40,000 American troops will be withdrawn from Vietnam between now and November.

Ky made the announcement through an aide shortly after an emergency meeting of the South Vietnamese National Security Council.

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ABRAMS AND BERGER had conferred with Thieu at the presidential palace in an extraordinary meeting at 8 a.m. Monday. It was the first meeting, less than two hours after North Vietnamese forces had installed an overflow valve and piped sewage into Blue Creek, a tributary of Little Sugar.

The U.S. Naval Command would be deactivated with the withdrawal, it is believed.

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A spokesman said, however, that this was not the usual fluctuation caused by rotation of personnel, not a permanent reduction in strength.

Continued on Page 8A, Col. 1.

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You Can Learn To Avoid A Wreck

By NEK TAYLOR
News Staff Writer

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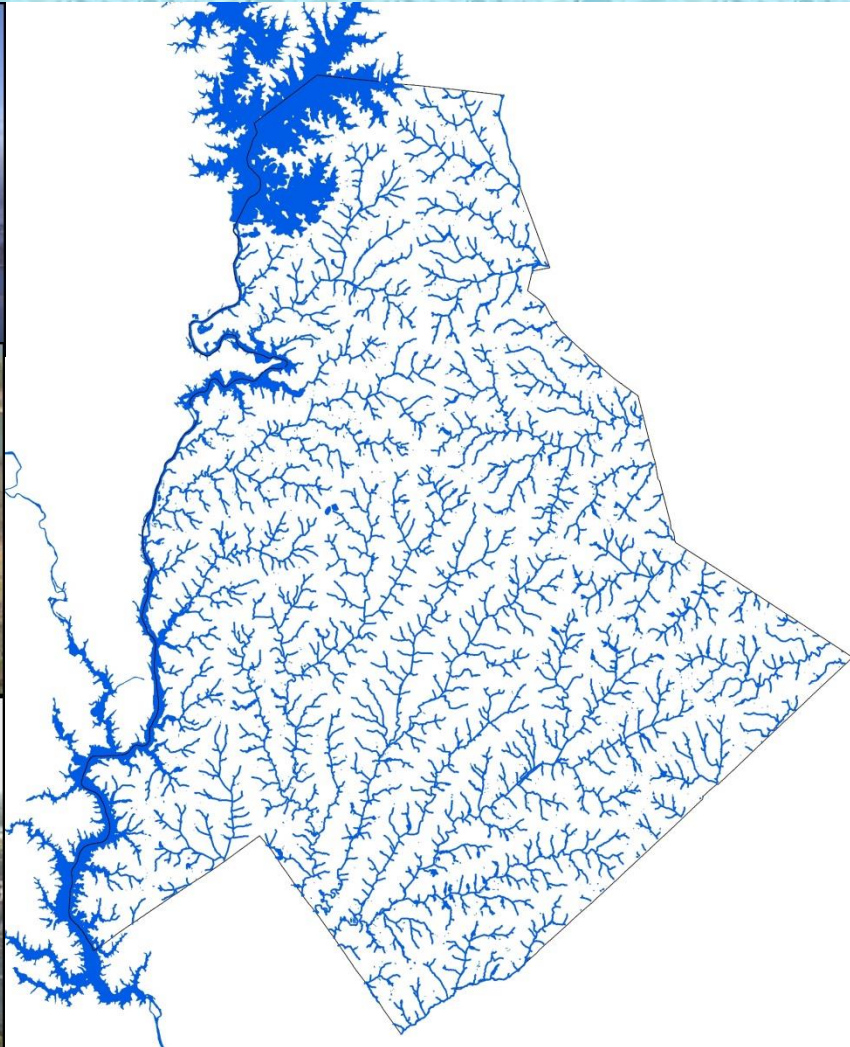
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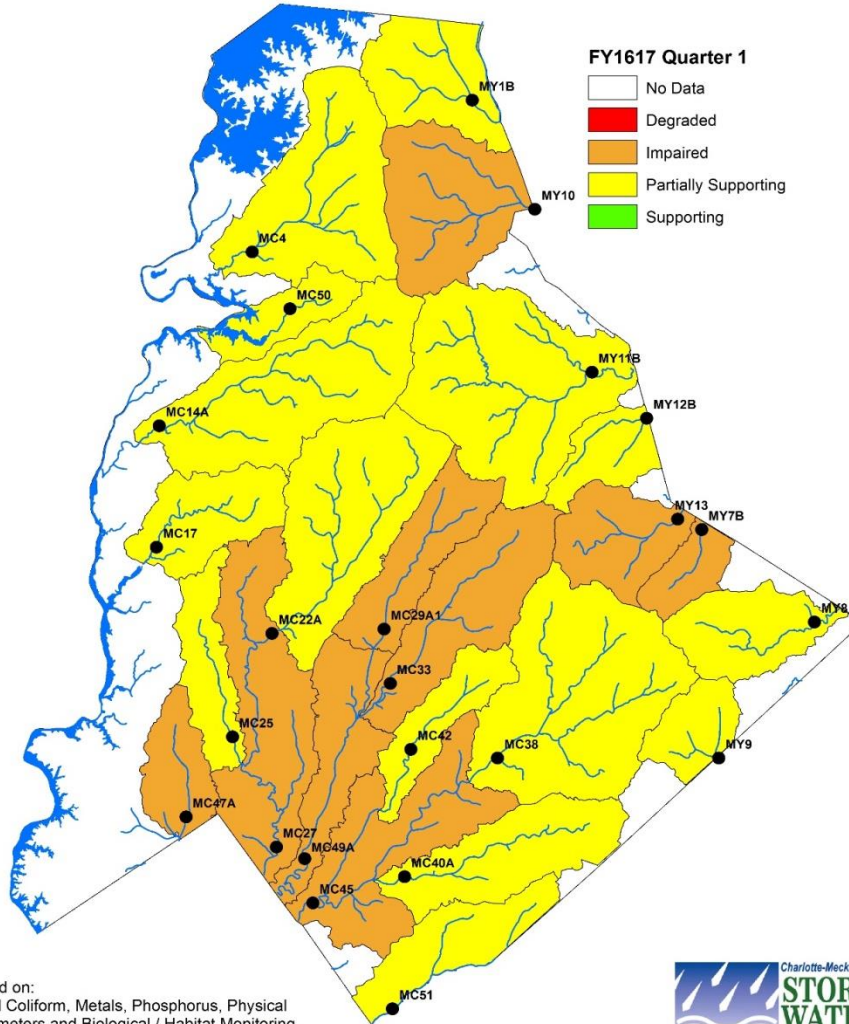
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Continued on Page 8A, Col. 1.

3,000 stream miles
200 miles of lakeshore
529 sq. miles of land area



Water Quality Stream Use-Support Index



Based on:
Fecal Coliform, Metals, Phosphorus, Physical
Parameters and Biological / Habitat Monitoring
in Charlotte-Mecklenburg



Stream Use-Support Index (SUSI)

■ Sub-Indices

■ Fecal Coliform

■ Total Phosphorus

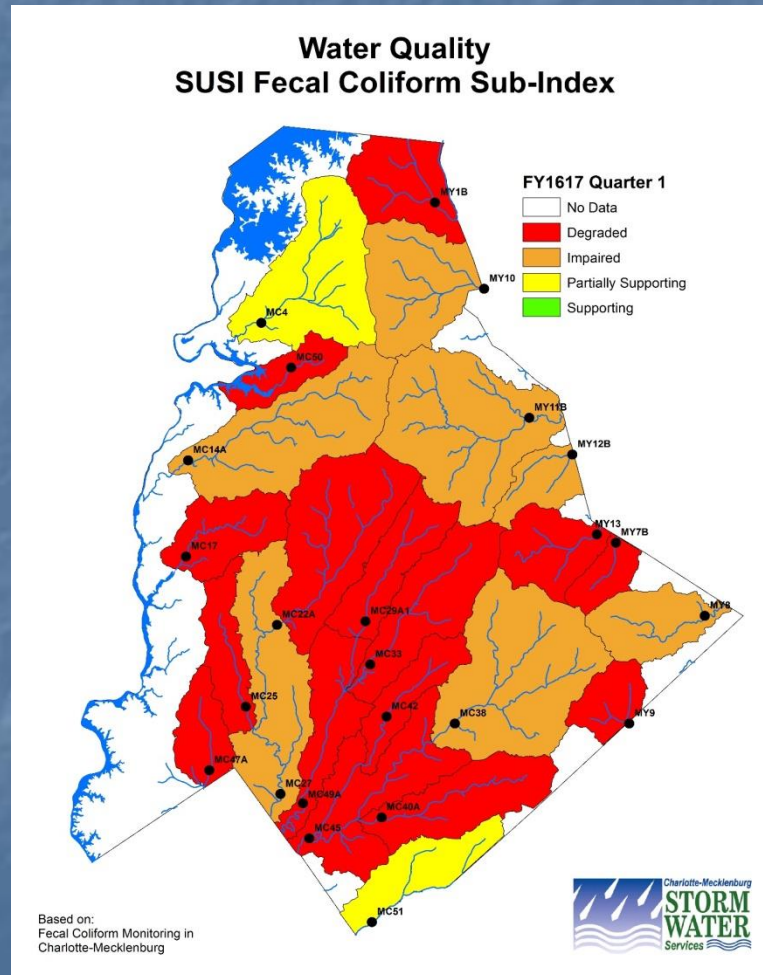
■ CMANN

■ Metals

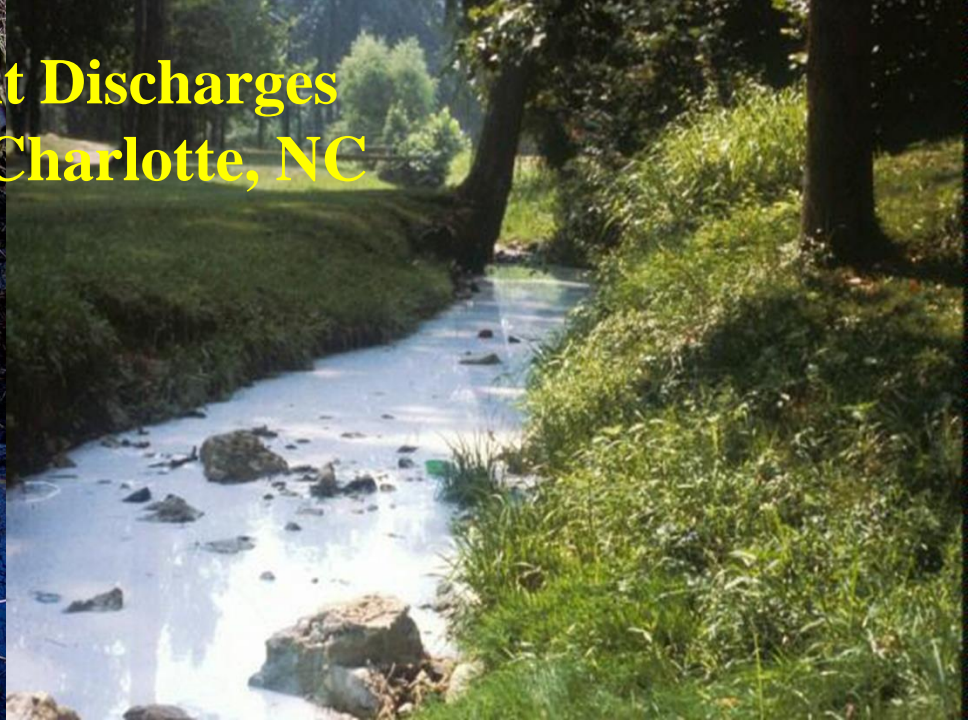
■ Biological/Habitat

■ 24 Monitoring Sites

Fecal Coliform Sub-Index



Typical Illicit Discharges Observed in Charlotte, NC



Typical Illicit Discharges Observed in Charlotte, NC

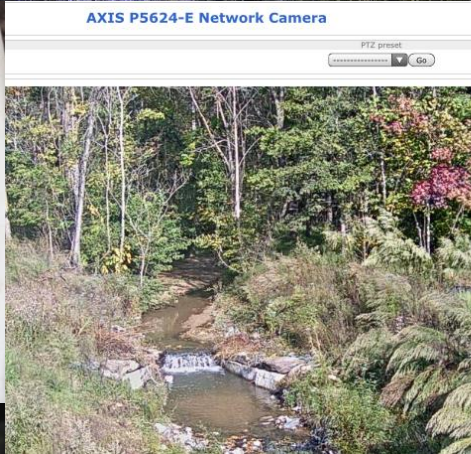


Typical Illicit Discharges Observed in Charlotte, NC

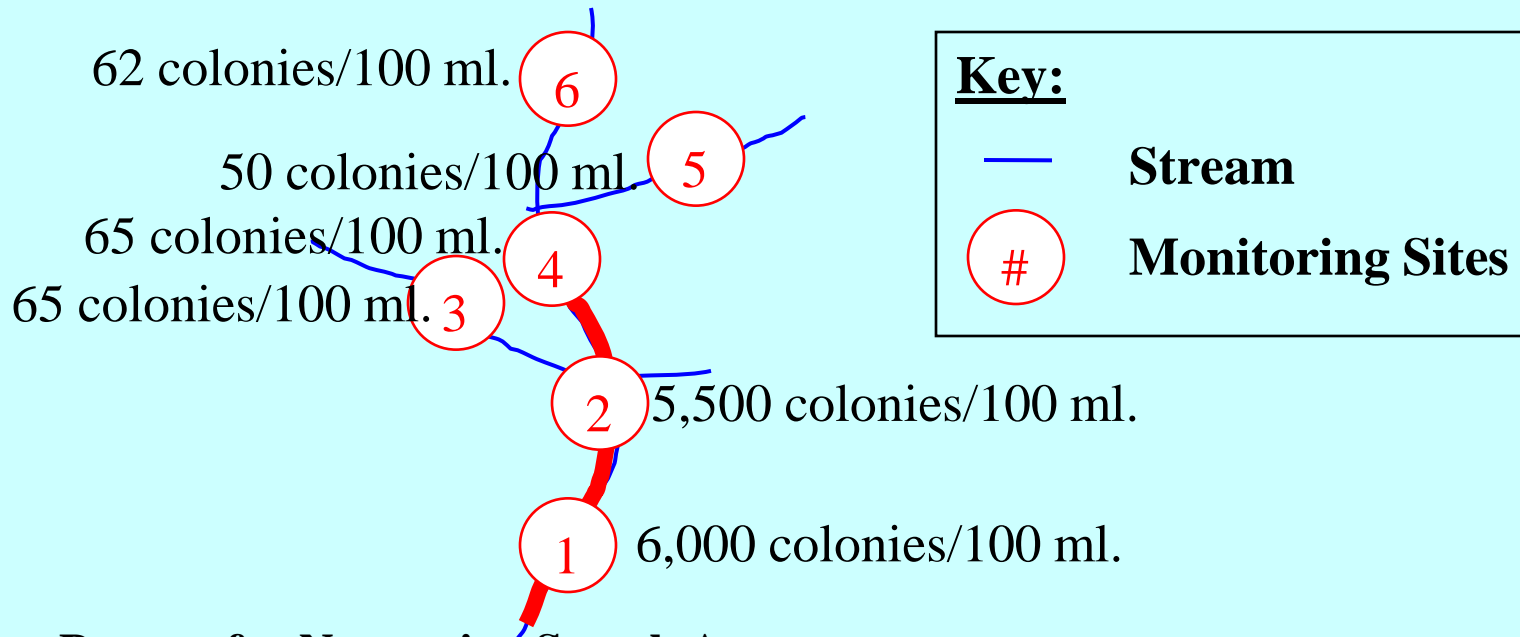


IDDE Tool Box

- **MONTHLY MONITORING**
- **CITIZENS REQUEST FOR SERVICE**
- **IDEP**
- **CMANN**
- **HOTSPOTS**
- **DYE TESTS**
- **TV INSPECTIONS**
- **STREAM WALKS**
- **SEPTIC SYSTEM EVALUATIONS**
- **MST**
- **AERIAL INFRARED SURVEYS**
- **OPTICAL BRIGHTNERS**
- **HUMAN SOURCED CHEMICALS** (CAFFEINE, COTININE)



Tracking Illicit Discharges and Connections to a Source Through Bacteria Sampling



Process for Narrowing Search Area:

- Fixed interval monitoring reveals an exceedance of the Action Level for fecal coliform bacteria at monitoring site #1.
- Short term monitoring is performed at monitoring sites 1 through 6 to verify the pollution problem (results are shown above).
- Short term monitoring data reveals that the Action Level was not exceeded in two tributaries (#3 and #5) and two other monitoring points upstream (#4 and #6), thus allowing the search to be narrowed to the area shown in red



14 10:20 PM



AUG 11 2003

Why We Walk.....

Purpose of Stream Walking

1. Conduct Outfall Inventory and Reinspection

A screenshot of a mobile application form titled "Cancel" at the top. The form contains several fields, each with a blue arrow icon to its right, indicating a dropdown menu. The fields are: Feature Type, Time and Date, Outfall Type, Outfall Material, Outfall Shape, Endwall Material, Outfall Location, Is structure functioning?, depth, diameter, rise, span, length, and width.

2. Illicit Discharge Detection and Elimination (IDDE)

A screenshot of a mobile application form titled "Dry Weather Flow?". The form contains several fields, each with a blue arrow icon to its right, indicating a dropdown menu. The fields are: Sample ID, Flow Rate, Temperature, Dissolved Oxygen, pH, and conductivity.

3. To Collect other Useful Data

A screenshot of a mobile application map titled "Streamwalks FY1617". The map shows a list of streamwalk features, each with a colored icon and a label. The features are: Curb Cut (yellow circle), Dry Channel (pink square), Canal California Sample (purple square), Follow-up Sample (blue square), Private Aerial (red circle), Problem (blue triangle), Reference Reach (pink triangle), Severe Bank Erosion (pink triangle), Storm Water Outfall (blue circle), Stream Blockage (yellow square), and Wetland (yellow triangle). The labels "Curb Cut", "Private Aerial", and "Stream Blockage" are circled in red.



 **Collect**
Add new features to the map

Verizon 11:32 AM 100%

Map **Map Tools**

 **Measure Distance**
Measure distances between points

 **Measure Area**
Measure areas of polygons

 **Collect**
Add new features to the map

Verizon 4:09 PM 95%

Cancel **Feature Type** Done

- Reference Reach
- Storm Water Outfall** ✓
- Fecal Coliform Sample
- Problem
- Stream Blockage
- Wetland
- Severe Bank Erosion
- Private Aerial

Verizon 4:46 PM 100%



Cancel

City Streamwalks FY1617

- Feature Type**
Storm Water Outfall
- Time and Date**
- Outfall Type**
- Outfall Material**
- Outfall Shape**
- Endwall Material**
- Outfall Location**
- diameter**

- rise**
- span**
- length**
- width**
- Is structure functioning?**
- Dry Weather Flow?**
- Flow Rate**
- Temperature**

- Dissolved Oxygen**
- ph**
- conductivity**
- Pollution Indicators**
- Sample ID**
- Channelization Through Buffer**
- comments**

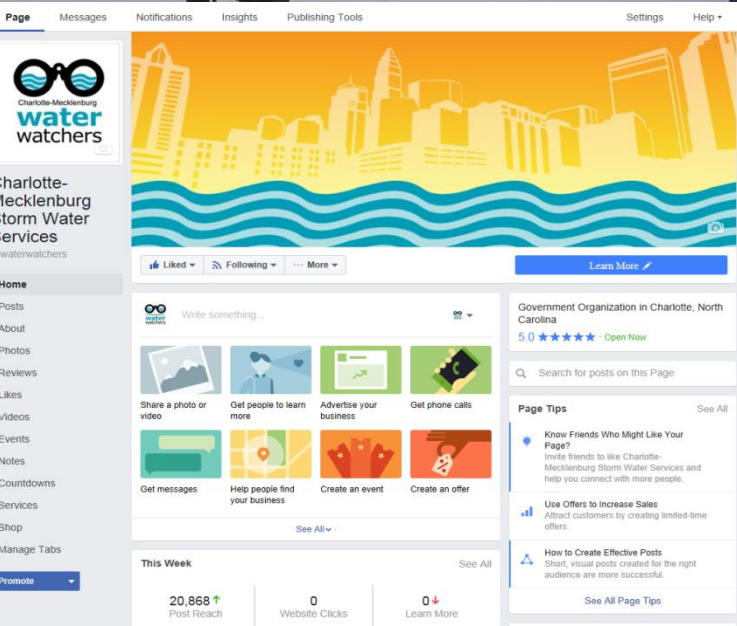
FY16 Stream Walk Stats

Description	Number
Number of streams assessed	687
Number of steam miles assessed	229.32
Number of six square mile sub-basins assessed	21
Total Number of GPS ^d locations	766
Number of inspections conducted (outfalls)	702
Number of new outfalls inventoried	260
Number of previously-identified outfalls field QC'd	506
Number of samples collected (Fecal and TPhos)	360 Fecal, 15 TPhos.
Number of dry weather flows detected	87
Number of dry weather flows sampled	15
Number of problems detected	31
Number of Stream blockages	16
Number of areas of SEVERE erosion	11
Number of reference reaches identified	5
Number of wetlands identified	13
Number of NOVs or Notice of Deficiencies issued	2 NOVs
Number of illicit discharges and/or connections detected under this program	5
GIS map of inspection sites	See attached appendices.
Findings and recommendations	<ol style="list-style-type: none"> 1. Averaged 0.156 problems per stream mile 2. Recommend that future staff training focus on standardization of data collection.

Illicit **D**ischarge **E**limination **P**rogram

- Business Corridor Inspections
- Minor Outfall Inspections (<36")
- Multi-Family Community Inspections
- Basin Scale Investigations
- TMDL Watershed Basins
- Watershed Recovery Plan Support

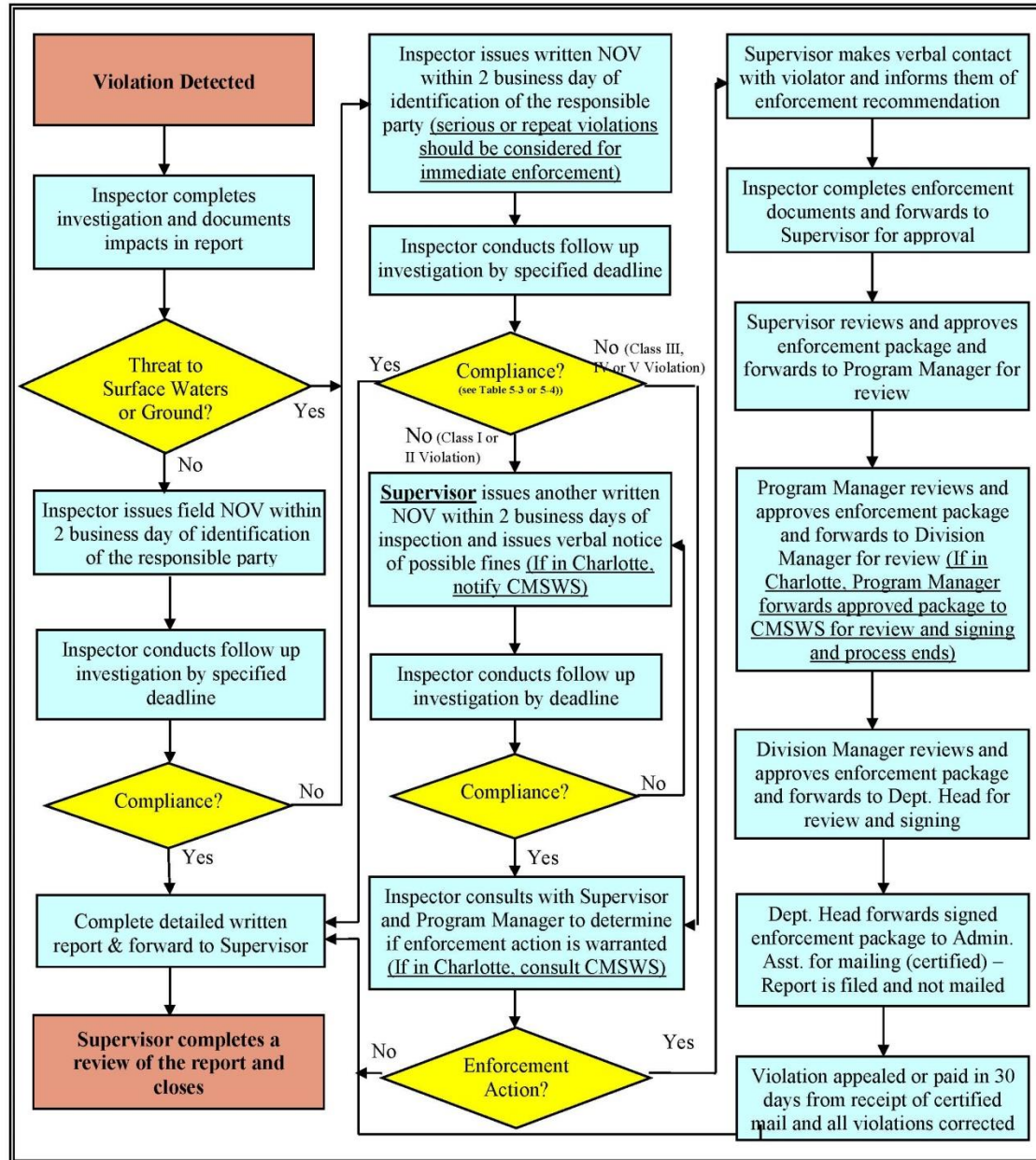
Service Requests/Citizen Reports



FY2016 Summary

Charlotte NPDES MS4 Program Service Requests, and Emergency Response FY2016 Program Summary	
Number of Service Requests 1994 - 2016	10,537
Number of Service Requests FY2016	476
Service Request Type	Accidental Spill – 49 Algae Bloom – 5 Fish Kill – 4 Discharge/Dumping – 237 Buffer Disturbance – 20 Erosion – 12 Illicit Connection – 3 No Incident Identified - 87 Unspecified/Other – 25 Natural Occurrence – 10 Unknown - 15
Service Request – Material Type	Chemical – 13 Concrete – 10 Cooking Oil – 15 Automotive Fluids – 61 Paint – 16 Sediment – 20 Sewage – 80 Solid Waste – 29 Wastewater/Wash Water - 28 Buffer – 18 Other/Unknown – 68 None/Natural Conditions – 99 Allowable Discharge - 10
Number of Follow-up Field Inspections	201
Emergency Responses during FY2016	43
No. of SSOs found through service requests	80
NOVs Issued	107

NOV/Penalty Flowchart



Documentation of Activities

Cityworks

Inbox Request **Activity** Work Order GIS Search Reports Calendar Favorites Help

✓ Inspection View Save Close Clear

Location

Template Type: General Inspection

Activity ID(s): 5153

Location Name: Sugar Creek Charter School

Address/Location: 4101 N TRYON ST

Basin No: 1 District: South Catawba

Municipality: Charlotte Resp. P Name: A&K Painting

Resp. P Contact: Mike - 704-521-8003 Resp. P Address: 9929 John Price Road, Charl

X: 1,463,236 Y: 554,081

Summary

Comments 1: Spidel investigated Sugar Creek Charter School for the dumping of paint and washing materials. A paint crew from A&K Painting working as a contractor at Sugar Creek Charter School was observed by the general contractor cleaning their paint supplies

Comments 2: and buckets out in the parking lot behind the school. No storm drain was effected. The general contractor that observed the spill occur was Mr. James Dwy from Edison Foard Inc (mobile - 704-363-0349). Mr. Dwy informed Spidel that 2-5 gal. buckets

Comments 3: of water, 4 paint brushes and 4 rollers were cleaned and then improperly dumped on the parking lot.

Cond. Score: 0

Status

Initiated Date: 8/27/2012 4:39 PM Initiated By: SPIDEL, RYAN

Priority: Medium Completed By: SPIDEL, RYAN

Status: To Close Submit To: John McCulloch

Activity Type: Service Request Activity Stage: Initial

Sample ID(s): Customer: Phase 1

Actual Start: 8/16/2012 3:00 PM Actual Finish: 8/16/2012 3:20 PM

Next Activity:

Probl. Found: 1 Prob. Resolved: 1

Activity(s): NOV(s):

Request: 532

Closed By: Date Closed:

Assets

Highlight Get from Map History Remove Asset Costs

COUNTYBOUNDARY

Id 0

General

Incident type: Discharge/dump

Media impacted: Road/parking lot/driveway

Material released: Paint

Investigation methods used: Physical

Amount spilled: Gallons

10

Land use type: School for activity location

Aquatic Life Impacts

Start
Inbox - Microsoft Outlook
G:\WQ_xfer\MCCULLR\...
Microsoft PowerPoint - [...]
IN #5153 General Ins...



Original Approach

- Portable spectrophotometer/dip strips
- 72 hours or greater with $< 0.1''$ of precipitation
- Grab sample tested for chemical attributes
- Between 4 hours and 24 hours later run second grab for the same analytes

Physical Attributes

- Color
- Odor
- Deposits and stains
- Floatable matter
- Temperature
- Turbidity
- Grease/Oil

Chemical Attributes

- pH
- Chlorine
- Copper
- Phenols
- Surfactants



Original Approach

- Identify typical allowable ranges
- Interpret screening data
- Indicative of sanitary sewage

Chemical Parameter	Allowable Range/Limit
pH	6.0 – 9.0
Chlorine	0.0 – 0.5 mg/L
Copper	0.0 – 0.5 mg/L
Phenol	0.0 – 0.399 mg/L
Surfactant	0.0 – 0.6 mg/L

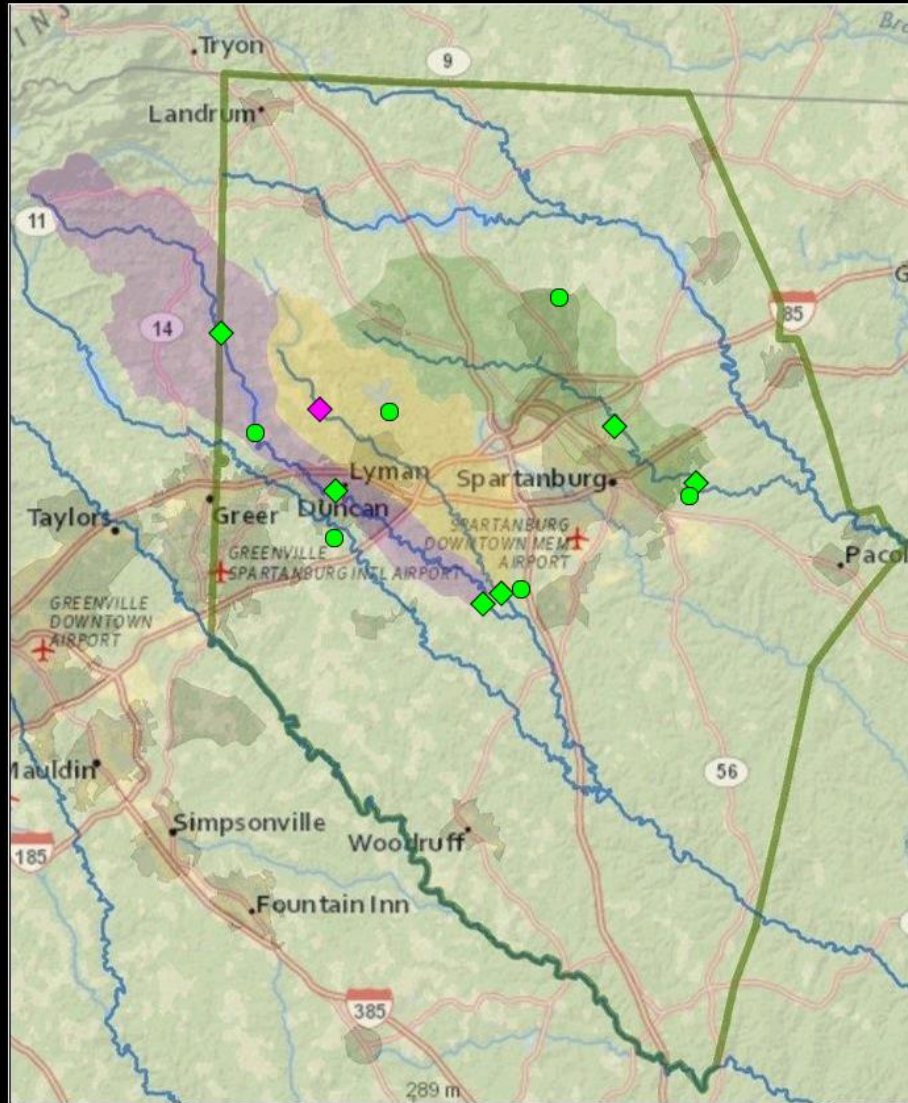
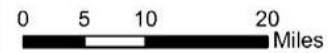
WATER QUALITY INFORMATION:					
SAMPLE 1		SAMPLE 2		ILLICIT INVESTIGATION SAMPLE	
SAMPLE DATE:	7/14/2004	SAMPLE DATE:	7/14/2004	SAMPLE DATE:	7/16/2004
<u>Chemical Properties</u>		<u>Chemical Properties</u>		<u>Chemical Properties</u>	
pH:	6.2	pH:	6.13	pH:	6.9
CHLORINE:	0.71 mg/L	CHLORINE:	0.76 mg/L	CHLORINE:	0.72 mg/L
COPPER:	0.03 mg/L	COPPER:	0.05 mg/L	COPPER:	0.13 mg/L
PHENOLS:	0.11 mg/L	PHENOLS:	0.09 mg/L	PHENOLS:	0.13 mg/L
SURFACTANTS:	0.11 mg/L	SURFACTANTS:	0.12 mg/L	SURFACTANTS:	0.09 mg/L
FLUORIDE:	0.16 mg/L	FLUORIDE:	0.18 mg/L	FLUORIDE:	0.14 mg/L
AMMONIA/POTASSIUM RATIO:	0.89 mg/L	AMMONIA/POTASSIUM RATIO:	0.81 mg/L	AMMONIA/POTASSIUM RATIO:	0.79 mg/L
<u>Physical Properties</u>		<u>Physical Properties</u>		<u>Physical Properties</u>	
TEMPERATURE:	22.2 DEG. C	TEMPERATURE:	19.00 DEG. C	TEMPERATURE:	21.30 DEG. C
TURBIDITY:	Yes	TURBIDITY:	Yes	TURBIDITY:	Yes
OIL SHEEN:	No	OIL SHEEN:	No	OIL SHEEN:	No
SCUM:	No	SCUM:	No	SCUM:	No
FLOW ODOR:	Yes	FLOW ODOR:	Yes	FLOW ODOR:	Yes
FLOW COLOR:	Cloudy	FLOW COLOR:	Cloudy	FLOW COLOR:	Cloudy
FLOW RATE:	Stream	FLOW RATE:	Stream	FLOW RATE:	Stream

Fixed Station Illicit Detection



Spartanburg County Water Quality Monitoring Network

The real-time data contained herein may be affected by variable conditions such as drought, unusually heavy rains, shifting river bottoms, equipment failures, or other factors that can impact monitoring stations and the real-time reported data. Users should be aware that this website presents raw data that has not been analyzed and should be considered provisional in nature. Although Woolpert and the contributors below work hard to keep the information and data on this site accurate, reliable, and timely, we provide no warranties, expressed or implied.



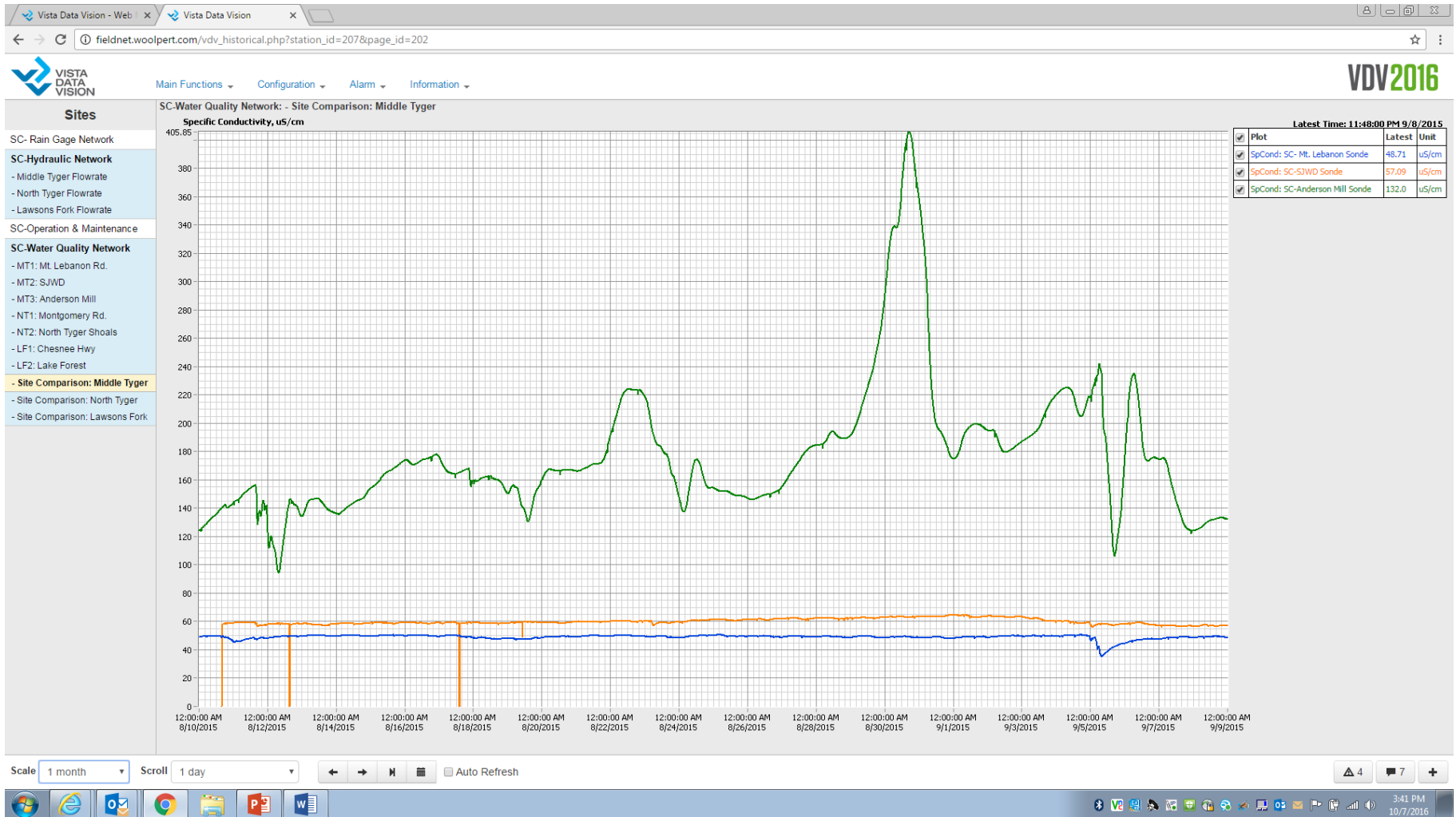
- ◆ Water Quality Monitoring Station
- Rain Gauge
- ▭ Middle Tyger River Watershed
- ▭ North Tyger River Watershed
- ▭ Lawsons Fork Creek Watershed
- Spartanburg County
- Rivers
- + Municipalities



Fixed Station Illicit Detection

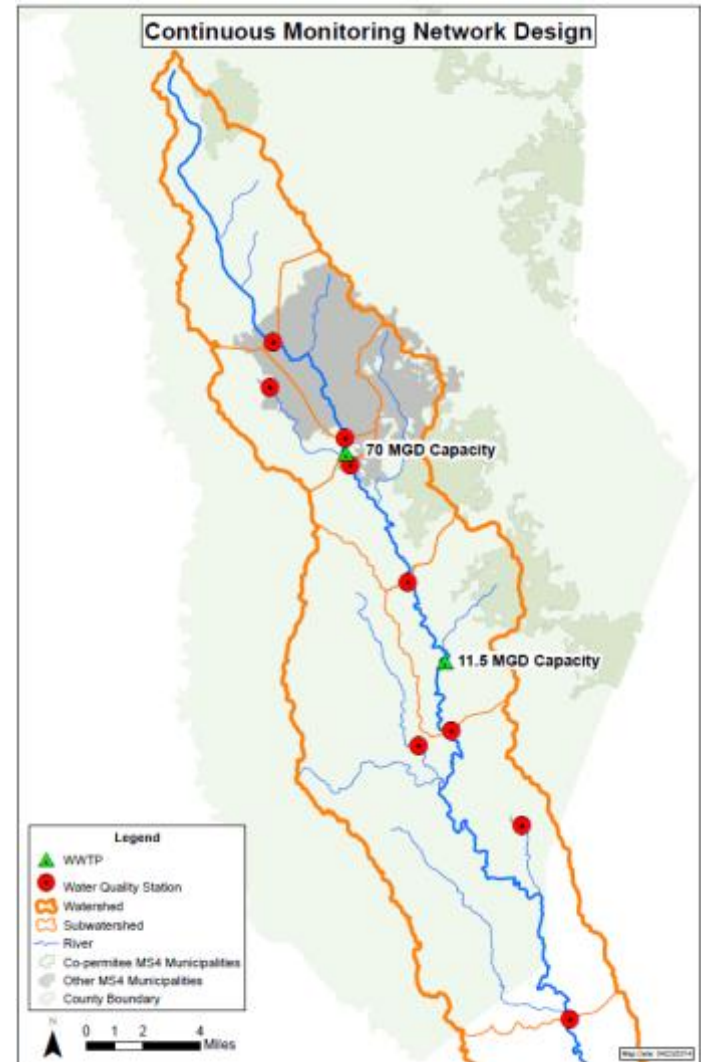


Fixed Station Illicit Detection



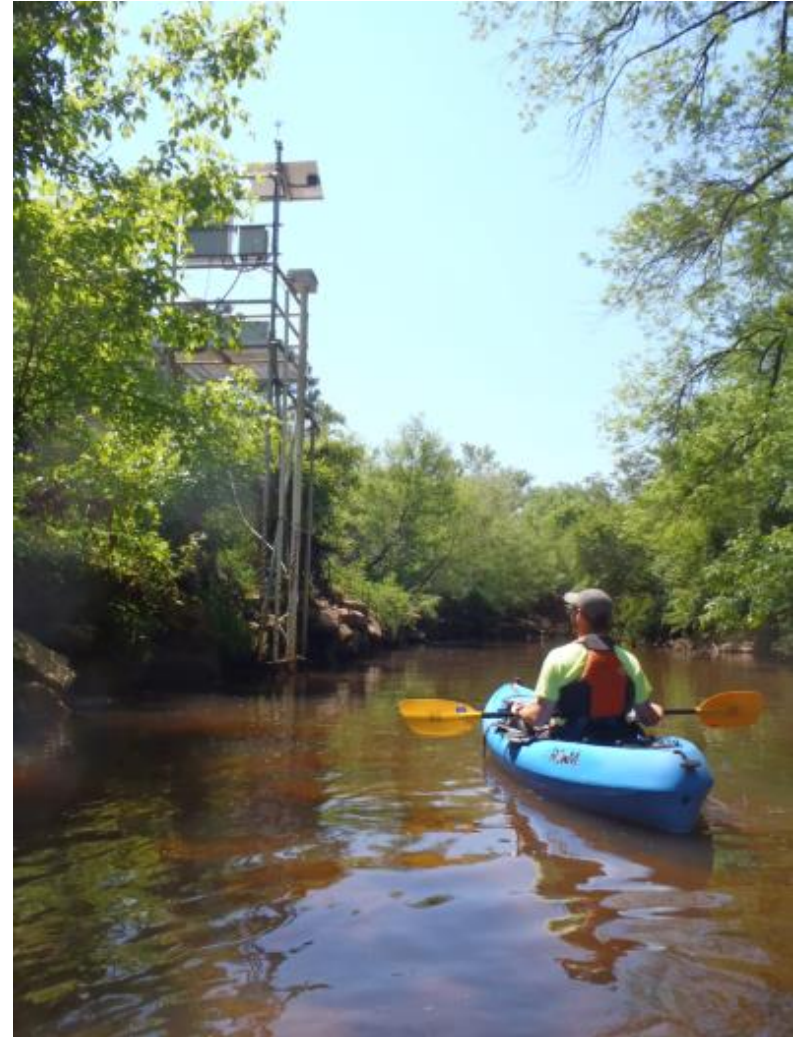
Float Mapping

- Reedy River Watershed
 - 240 square miles
 - 40 stream miles
- Evaluate tributaries and point sources
- Prioritize watersheds or outfalls of concern
- Mobile real-time (20 seconds) surrogate and grab sample assessment

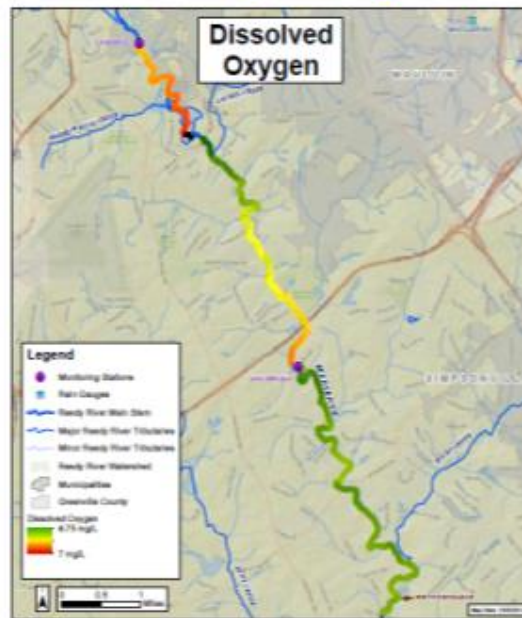
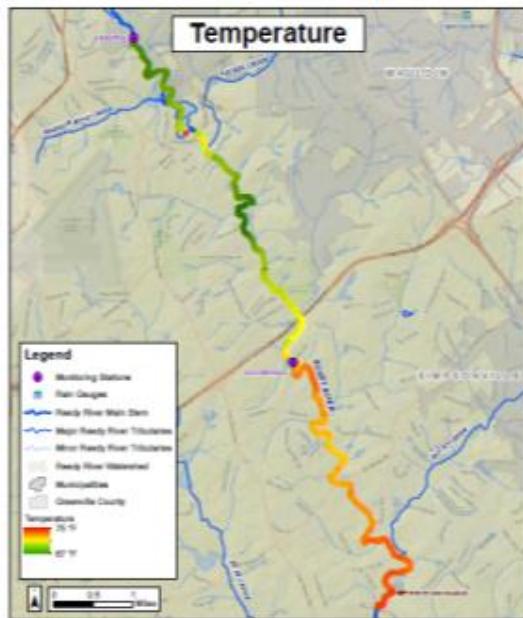
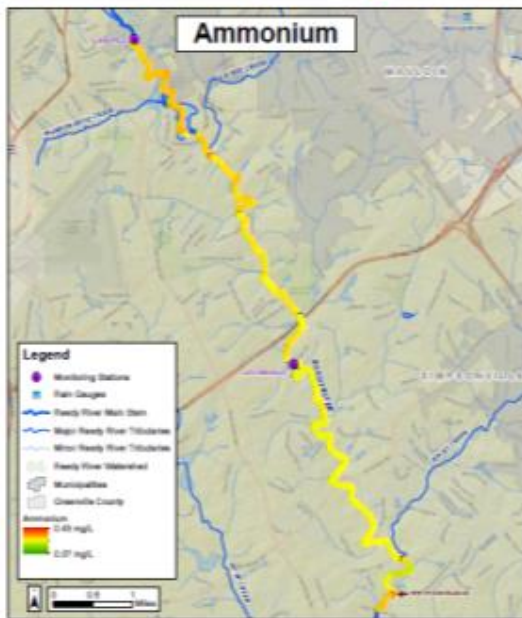
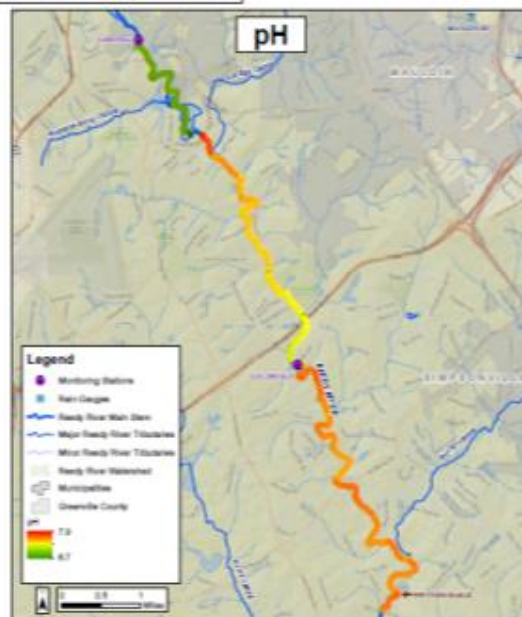
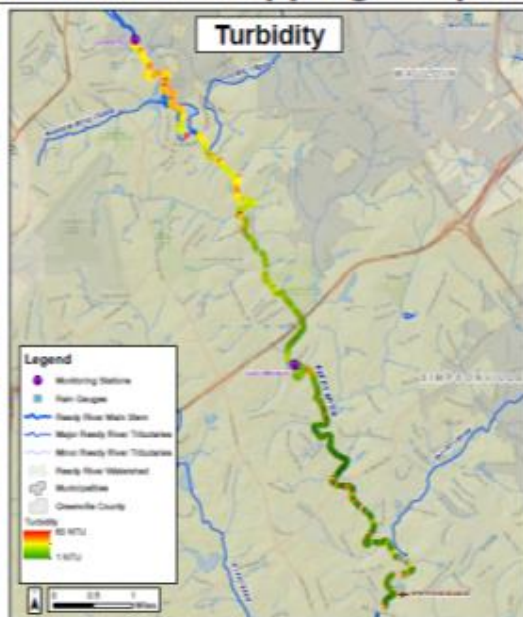
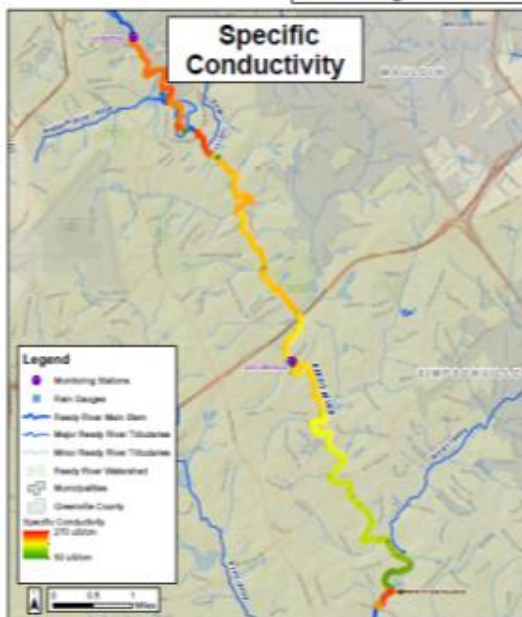


Float Mapping

- Paddle main-stem of the Reedy River
 - 40 miles
 - 5 days
- Sonde Parameters:
 - Turbidity
 - Specific Conductivity
 - pH
 - Dissolved Oxygen
 - Temperature
- Used Garmin GPS to spatially identify location
- Floated during dry weather periods



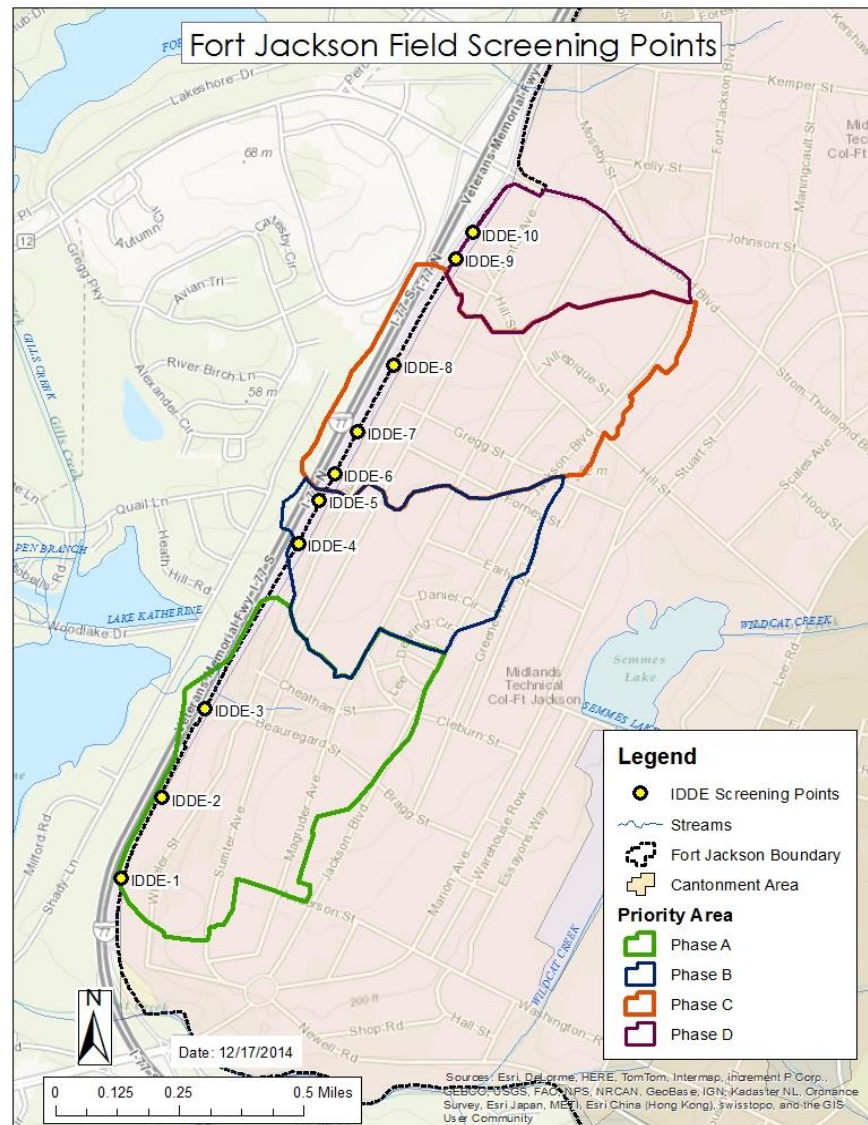
Reedy River IDDE Float Mapping - September 22, 2014



IDDE Prioritization

- Second Permit Term
- Prioritize Areas of Risk

Phase	Screening Point(s)	Timeframe *
A	IDDE-1 IDDE-2 IDDE-3	2015
B	IDDE-4 IDDE-5	2016
C	IDDE-6 IDDE-7 IDDE-8	2017
D	IDDE-9 IDDE-10	2018



IDDE Tracking



Smoke Testing



Dye Testing



Robotic Crawler

Reference

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Review

Contamination of stormwater by wastewater: A review of detection methods



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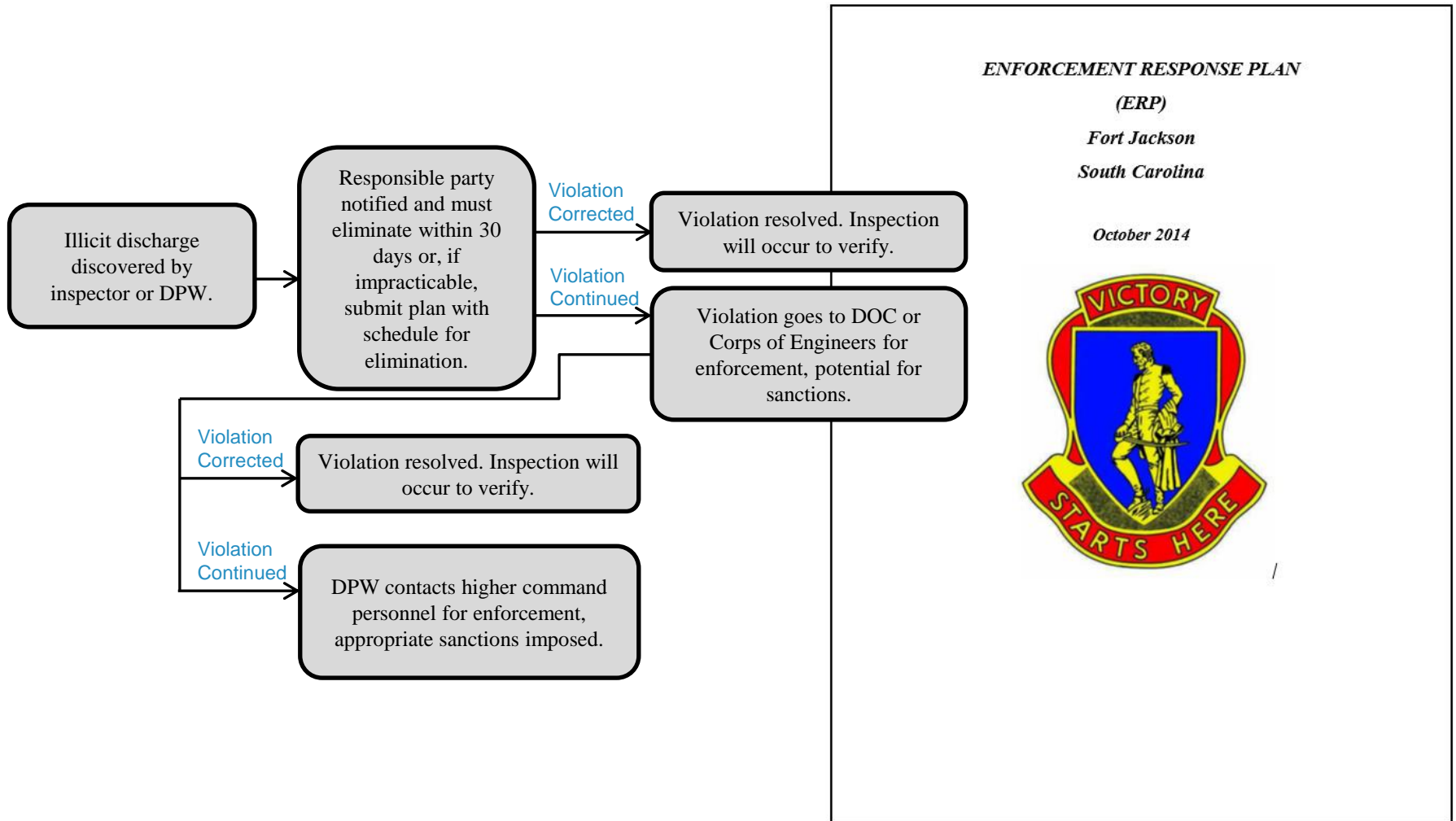
ABSTRACT

Even in separate sewer systems, wastewater may find its way into the receiving waters through stormwater sewers. The main reasons for this are cross-connections, illicit connections, overflows and leakages through broken sewers. Such discharges may affect receiving water quality and increase risks to public health and aquatic organisms. Detecting wastewater contamination and locating its points of ingress into storm sewer systems can be a challenging task, which should be addressed using proper methods and indicator parameters. A number of detection methods have already been proposed in this area, yet there is a lack of a general overview of such methods. This literature review summarizes and evaluates the methods used for detecting wastewater in stormwater, including those recently developed. The advantages, weaknesses and limitations of individual methods are discussed. It is concluded that while no single method can as yet produce results in a precise, fast and inexpensive way, the use of human waste specific chemical and microbiological markers, and their innovative sampling, offer the way forward. Guidance for selecting the most effective combinations of detection methods, under specific conditions, is also provided.

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IDDE Enforcement



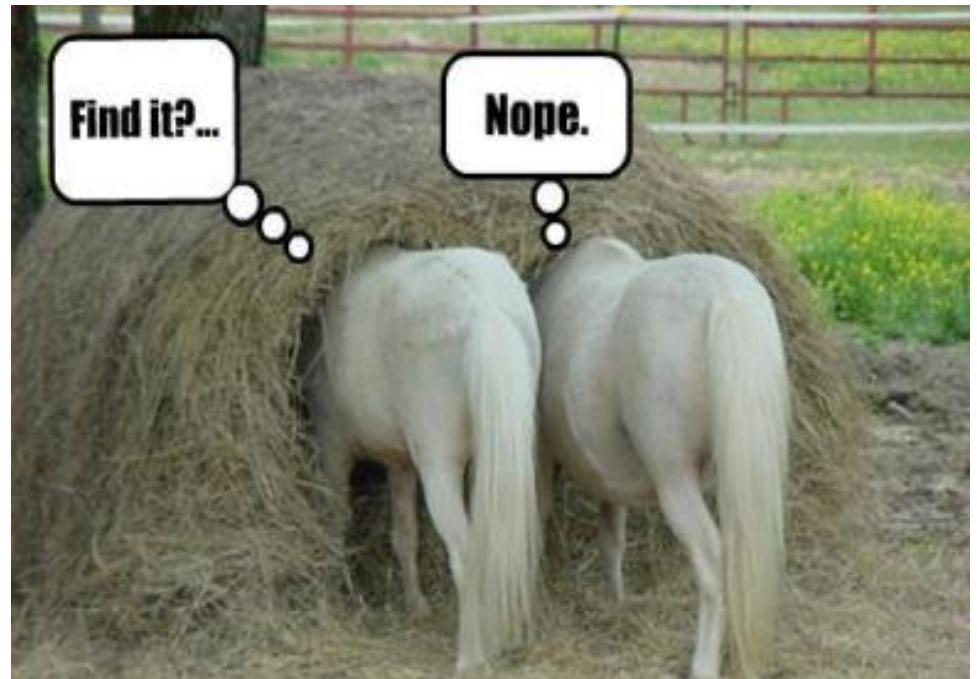
MS4 Reporting

- Illicit Detection
- Illicit Documentation/
Metrics
- Illicit Tracking
- Enforcement

Table 4. Summary of 2007 Permit, Year 8 SWMP Activities			
Annual Report Section	Activity Description	Number of Activities Accomplished	Comments
3.4.2	Illicit Discharge Detection and Elimination	37 reports of illicit discharges logged; 22 NOVs issued.	Investigation details can be found in Appendix 4, Section 2
3.4.3	Illegal Dumping and Roadside Litter	2,248 dumping and litter complaints; 1,402,990 lbs of litter and debris collected and recycled.	Details of complaints can be found in Table 8
3.4.4	Welcome Creek IDDE Investigation	118 Outfalls investigated, 76 Manholes investigated, 30 aerial and in-stream sewer crossings investigated.	1 illicit found and repaired
3.4.5	Float Mapping	Close to 50 miles of streams floated; 19 POIs, 1 potential illicit discharge.	Details can be found in Appendix 4, Sections 4 and 5
3.4.6	Septic Tank Analysis	302 septic tanks added to database.	--

IDDE Takeaways

- Don't overcomplicate.... technology not always needed
- Training/Hotline
 - Staff
 - Public
- River/creek illicit = significant
- Stream walks/float mapping
- Sanitary sewer #1 culprit
- Be proactive, not just reactive





Questions?

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March 31, 2017

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