

# Annual Report #2

January 1, 2013 to December 31, 2013  
Civil Action No. 1:10cv4039 - WSD

## DeKalb County Department of Watershed Management



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## Acronyms

BMP	Best Management Practices
C&M	Construction and Maintenance
CD	Consent Decree
CERP	Contingency and Emergency Response Plan
CMMS	Computerized Maintenance Management System
CMOM	Capacity, Management, Operations, and Maintenance
CSARP	Continuing Sewer Assessment and Rehabilitation Program
DWM	Department of Watershed Management
FOG	Fats, Oil, and Grease
FSE	Food Service Establishments
EPA	U.S. Environmental Protection Agency
EPD	Georgia Environmental Protection Division
GIS	Geographical Information System
MMS	Maintenance Management System
O&M	Operation and Maintenance
OSARP	Ongoing Sewer Assessment and Rehabilitation Program
PASARP	Priority Area Sewer Assessment and Rehabilitation Program
SEP	Supplemental Environmental Project
SOP	Standard Operating Procedure
SSO	Sanitary Sewer Overflows
WCTS	Wastewater collection and transmission system

## **Annual Report 1 – January 1, 2013 to December 31, 2013**

### **Introduction**

The DeKalb County (the County) Department of Watershed Management (DWM) submits this second Annual Report in accordance with Section IX, Paragraph 58 of the Consent Decree (Civil Action 1:10cv4039-WSD):

- a) *“A narrative summary of progress made, including key accomplishments and significant activities, under the CMOM programs implemented or modified pursuant to this CD for the most recent twelve (12) month period.”*
- b) *“A trends analysis of the number, volume, average duration, and cause of the County’s SSOs for the previous twenty-four (24) month period.”*

### **Executive Summary**

During the period from January 1, 2013 to December 31, 2013, the following DWM Capacity, Management, Operations and Maintenance (CMOM) implementation programs or reports were approved by or submitted to the EPA/EPD as noted.

- Maintenance Management System submitted 12/19/2013.
- OSARP – On Going Sewer Assessment and Rehabilitation Program submitted 12/19/2013.
- FOG Program was approved 6/21/2013.
- PASARP – Priority Areas Sewer Assessment and Rehabilitation Program was approved 3/26/2013.
- Sewer Mapping Program was approved 1/16/2013.
- Collection and transmission System Training Program was approved 1/3/2013.
- Contingency Emergency Response Plan was approved 1/10/2013.
- System Wide Flow and Rainfall Monitoring Program was approved 2/14/2013.
- System-Wide Hydraulic Model was approved 2/14/2013.
- Financial Analysis Program was approved 1/10/2013.
- Infrastructure Acquisitions Program was approved 1/10/2013.
- Supplemental Environmental Project was approved 3/27/2013.

In overview, DWM submitted the following Consent Decree deliverables to EPA/EPD in 2013, the reporting period. All submittals were on, or ahead of schedule. Regardless of whether or not programs and plans have received formal approval from EPA/EPD, implementation was begun, or continued, on all programs and activities in anticipation of receiving EPA/EPD formal

approval. Program adjustments will be made accordingly to assure that the work will align with the formally approved Programs.

1/2013	4 <sup>th</sup> Quarterly Report	1/2013	2 <sup>nd</sup> Semi-Annual Report
2/2013	1 <sup>st</sup> Annual Report	4/2013	5 <sup>th</sup> Quarterly Report
7/2013	6 <sup>th</sup> Quarterly Report	7/2013	3 <sup>rd</sup> Semi-Annual Report
10/2013	7 <sup>th</sup> Quarterly Report		

There were no missed Program implementation deadlines associated with approved CMOM programs prepared under the CD within this reporting period. The remainder of this report presents implementation progress and activities associated with the programs required by the Consent Decree.

# Capacity, Management, Operations and Maintenance (CMOM) Programs' Implementation Activities Completed

## 1. Contingency and Emergency Response Plan – CERP (CD VI.B.i)

DWM has fully implemented the Sanitary Sewer Overflow (SSO) CERP in 2013. The County executed the strategy outlined in the CERP program document for mobilizing labor, materials, tools, and equipment to respond to and appropriately remedy conditions which may cause or contribute to a SSO.

Key accomplishments and significant activities realized in 2013 are listed below:

1. Received approval of the CERP program by EPA/EPD on 01/10/2013.
2. Performed CERP training for 32 personnel.
3. Conducted 29 self-evaluation meetings with field personnel.
4. Conducted 10 monthly meetings with all program area managers.
5. Conducted 8 monthly review meetings with the Director.
6. Properly responded to 127 reportable SSO events.
7. Properly published public notices for 13 major spill events.

In addition, as a result of SSO investigation, tracking, and trend analysis, the County has completed 1,165 follow-up service requests. The following maintenance activities related to SSOs were completed in 2013:

1. Cleaning (Total 186,339 Feet)
  - a. First Response 31,136 Feet
  - b. Additional Follow-up 52,702 Feet
  - c. Contractor Cleaning 102,501 Feet
2. Manhole Inspections 10,052
3. Point Repairs 40
4. CCTV 49,959 Feet

## 2. Fats, Oils, and Grease (FOG) Management Program (CD VI.B.ii)

During 2013, the County met all of the implementation goals within the FOG Program including maintaining a current and accurate Food Service Establishments (FSE) inventory, performing FOG inspections for FSEs, providing for consistent FOG Ordinance enforcement, and maintaining necessary resources and proper training to ensure the FOG Program's success. Moreover, the County has continued to promote Best Management Practices (BMPs) for FSE FOG management and has educated WCTS users, including FSE and residential customers, about FOG management.

Key accomplishments and significant activities realized in 2013 are listed below:

1. Received approval of the “*FOG Management Program*” from EPA/EPD on 6/21/2013.
2. Required all County FSEs to undergo a FOG evaluation or plan review prior to obtaining a building permit.
3. Hosted meetings to introduce grease recycling vendors to groups of DeKalb County apartment owners.
4. Delivered 577 Warning Notices and 33 Court Summons to non-compliant FSE customers.
5. Reviewed 5,586 pump-out manifests as part of the Hauler Company Assessment program to help identify haulers that may be improperly or illegally removing and disposing of wastewater.
6. Trained and presented the FOG inspectors with laptops with access to the FSE database to review and record data in the field to make inspections more efficient.
7. Communicated with County customers on a consistent basis concerning FOG using
  - a. Education materials distributed at multi-family apartment complexes that have been identified to be located near sewer spills
  - b. Community and School events
  - c. Homeowners Association and other group meetings
  - d. Office of Neighborhood Empowerment (ONE DeKalb) office
  - e. DCTV (DeKalb County Television - Comcast Channel 23)
  - f. Constant Contact, which is an email messaging system.
8. The County has initiated the FOG permit renewal fee invoicing to FSE water bills, which will further streamline administrative functions within the FOG Program. Currently, the County is in the pilot stage of FSEs data incorporation into the water billing software.

As a result of these efforts, the County has accomplished the following:

1. Total number of FOG inspections - 7,042
2. Total number of FOG evaluations - 759
3. Average inspections per day per inspector - 4.63
4. Average permitted active FSEs - 2,273

### **3. Sewer Mapping Program (CD VI.B.iii)**

A sewer system mapping and inventory survey project is currently being completed by County contractors. The project includes gathering information regarding mapping, inventory, and recording of geographical location of sanitary sewer manholes (by identifying numbers), sewer mains, force mains and air valves, service line cleanouts, and lift stations in the wastewater collection system. Mapping and inventory tasks are conducted by sewer drainage sewershed. The County has made tremendous progress and has already mapped five (Barbashela, Upper Snapfinger Creek, Lower Snapfinger Creek, Nancy Creek, South Fork Peachtree Creek) instead of the scheduled three sewersheds during the 2013 reporting

period. Thus, with 27 sewersheds in the County service area currently completed, the remaining six sewersheds are scheduled to be completed by December 2014.

The County has also realized the following key accomplishments and significant activities:

1. Received approval of the *Sewer Mapping Program* by EPA/EPD on 1/16/2013.
2. As a result of the mapping of the five sewersheds, the County received from its contractors the results of 14,295 surveys and inspections.
3. An ESRI ArcOnline account was purchased to help facilitate and develop a mobile mapping solution for GIS maps.
4. The InfoNet database was created and populated with data from three sewersheds that were previously modeled.
5. The integration of the CMMS system and the GIS system was studied.

#### **4. Maintenance Management System (MMS) Program (CD VI.B.iv)**

The MMS Program was submitted to EPA/EPD for approval on 12/19/2013. Therefore, during the reporting period, the program was not approved by EPA/EPD and therefore is not implementable “pursuant to the consent decree.” Nonetheless, in anticipation of agency approval, the County – at its own risk – began implementing some activities under the proposed MMS program. Specifically, the County initiated two types of sewer cleaning projects. First, the County contracted sewer cleaning with two general contractors, targeting areas surrounding SSOs. Second, the County contracted for the specific cleaning of 63 miles of line where, in 2013, the County accomplished 59 miles of contracted cleaning. In addition, the County accomplished 713 Aerial Creek Crossing Checks.

#### **5. Collection and Transmission Systems Training Program (CD VI.B.v)**

In 2013, the County identified and delivered necessary training and provided personnel with the proper technical knowledge and skills to complete job requirements and responsibilities in compliance with regulatory requirements. The long-term three-year training cycle described in the Collection and Transmission Systems Training Program document began in 2013 and initiates the rotation of DWM’s employees through several training courses. Those training courses cover a wide spectrum of target areas including general training (for new employees), wastewater collection system training, wastewater transmission system training, safety training, and other certification training.

Key Accomplishments and Significant Activities for 2013 include:

1. Received approval of the *Collection and Transmission Systems Training Program* by EPA/EPD on 01/03/2013.
2. 203 training classes were held for a total of 5,648 hours of training.

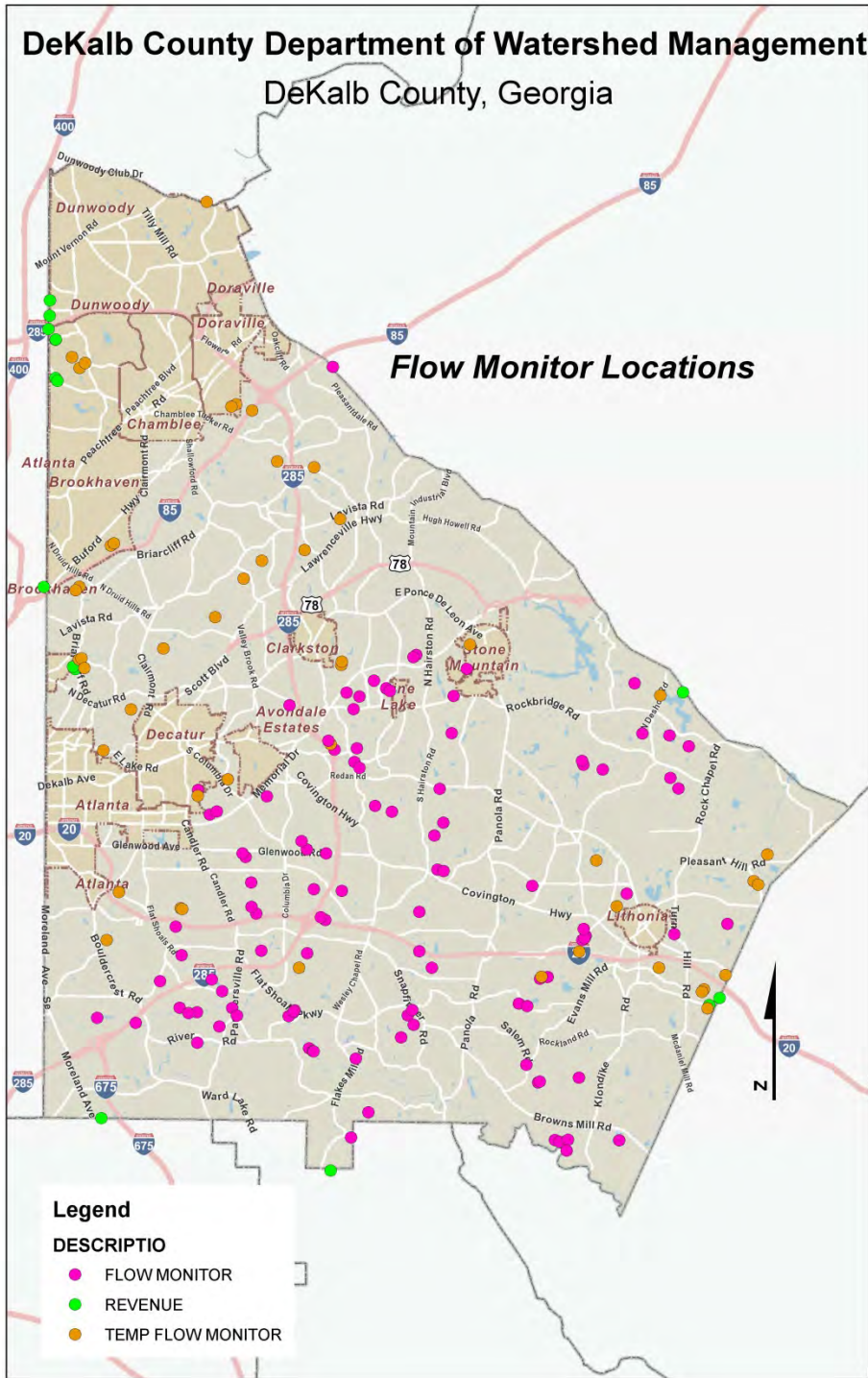


## 6. System-Wide Flow and Rainfall Monitoring Program (CD VI.B.vi)

The System-Wide Flow and Rainfall Monitoring Program's goal is to provide efficient and effective data to assess capacity and infiltration/inflow (I/I) issues within the wastewater collection and transmission systems. The Program is integral to the development and maintenance of the Wastewater System Hydraulic Model relative to making capacity decisions or confirming the capacity status of portions of the conveyance system. As such, in 2013, the County focused on completing the WCTS flow monitoring networks, improving the data management system, and improving overall program performance and management, to provide systematic and reliable data. These accomplishments are detailed below:

1. Received approval of the *System-Wide Flow and Rainfall Monitoring Program* by EPA/EPD on 2/14/2013.
2. The County installed 3 additional rain gauges to the northern portion of the County.
3. Data from Weatherbug stations in DeKalb County was downloaded and is ready for use in the model for 2013 rain calculations.
4. The historical flow and rainfall data that were previously stored at a remote server were transferred to the County's server in the 4<sup>th</sup> quarter 2013.
5. The installation of modems at each permanent monitoring site is being studied to determine if this would enhance the reliability of data collection.

**DeKalb County Department of Watershed Management**  
DeKalb County, Georgia



Map 1. Flow Monitor Locations

## 7. System-Wide Hydraulic Model (CD VI.B.vii)

The Hydraulic Model will be used to determine the system capacity under dry weather and wet weather conditions and to enable the County to identify, characterize, and address hydraulic deficiencies. Currently, three sewersheds have been modeled. However, the framework for the other models was being developed as scheduled in 2013 as noted below:

1. Received approval of the *System-Wide Hydraulic Flow Model Program* by EPA/EPD 2/14/2013.
2. Created and began the integration between the InfoNet software and GIS.
3. Populated the InfoNet software with three sewersheds that were previously modeled.

Even though a basin wide model is still in the development stage, the County created small project specific models that were used in SSO analysis and capacity related analysis in 2013.

## 8. Financial Analysis Program (CD VI.B.viii)

In 2013, the County's Financial Analysis Program was implemented to identify projects and budgets in the Capital Improvement Plan (CIP), operations and maintenance (O&M) cost analysis and budget and to allocate operation and maintenance budget funds to achieve the goal of sufficient funding and efficient funds management.

The County's key accomplishments and significant activities are summarized below:

1. Received approval of the *Financial Analysis Program* by EPA/EPD on 1/10/2013.
2. Implemented the 2013 Water and Sewer Rates Adjustment (11%) on 01/01/2013.
3. Provided analysis to the Finance Department regarding recommended revenue projections and recommended budgeted expenditures based on prior years' history and recent trends. Completed 2014 O&M and capital budget planning at the end of July. Completed the 2014 projected revenues and budgeted expenditure which were submitted to the Finance Department in August 2013.
4. Continued to work on the integration of the CMMS, GIS and InfoNet™ system.
5. Continued to monitor, analyze and report on the Department's overall financial performance.
6. Serve on the Outcome Base Budgeting Team (OBBT) for the implementation of a new County wide budgeting methodology.

## 9. Infrastructure Acquisitions Program (CD VI.B.ix)

The County received approval of the Infrastructure Acquisitions Program by EPA/EPD on 01/10/2013 and promptly began to implement and follow the procedures in the program. These procedures included (i) procedures for conducting the evaluation of prospective

infrastructure acquisitions to ensure that all proposed infrastructure acquisitions comply with all DWM design and construction standards; (ii) procedures for approving or denying the prospective acquisitions; (iii) procedures and specifications for performing the physical tests the County requires as part of its evaluations; and (iv) procedures for contractors, developers, property owners and other governments to follow. The implementation of the program in 2013 ensured that the County only acquired infrastructure that meets County standards for design, construction, capacity, and efficiency. The County was able to properly monitor the acquisition process such that 28 projects were reviewed and 11,706 feet of gravity sewer lines accepted.

## **10. Priority Areas Sewer Assessment and Rehab Program (PASARP) (CD VI.B.x)**

In implementing the PASARP in 2013, the County completed several assessments within the Priority Areas, and identified, prioritized, and completed the appropriate rehabilitation measures within those areas. The key accomplishments and significant activities are listed below:

1. Received approval of the *Priority Areas Sewer Assessment and Rehabilitation Program* by EPA/EPD 03/26/2013.
2. Completed 21,652 LF of gravity sewer cleaning and CCTV.
3. Completed 1,890 LF of gravity sewer relining (CIPP).
4. Completed 1,700 LF of gravity sewer replacement and relocation.
5. Completed 1,512 LF of gravity sewer installation.
6. Completed 170 LF and 1 manhole for sewer extension for new home construction.
7. Completed 2,343 sewer manhole assessments.
8. Completed 60 sewer manhole rehabilitation.
9. Completed 422,704 LF of engineering study.
10. Completed 3 gravity sewer point repairs.
11. Began designing 1,400 LF of gravity sewer replacement and relocation.
12. Began construction on a pump station and pipeline improvement project where 6,600 LF of the force main is within the priority area.
13. Received the notice to proceed on 12/23/2013 for the Sanitary Sewer Evaluation Survey for Northfork Peachtree Creek basin (approximately 156,517 LF resides inside the priority areas).

## **11. On Going Sewer Assessment and Rehabilitation Program (OSARP) (CD X 38.)**

As with the MMS Program in 4. above, the OSARP was submitted to EPA on 12/19/2013 but has not yet been approved. Even so, the County has completed several activities in 2013 relative to the OSARP as follows:

1. Completed 56,404.2 LF of gravity sewer cleaning and CCTV.

2. Completed 1,216 LF of gravity sewer replacement and relocation including creek crossing replacement.
3. Completed 6,042 sewer manhole assessments.
4. Completed 1,121,676 LF of engineering study.
5. Completed 3 gravity sewer point repairs.
6. Completed the design for 2,900 LF of force main installation.
7. Began design for 770 LF of gravity sewer replacement.
8. Began construction of 2 lift stations
9. Received the notice to proceed on 12/23/2013 for the Sanitary Sewer Evaluation Survey for Northfork Peachtree Creek basin (approximately 147,083 LF are outside the priority area).

## **Supplemental Environmental Project (CD VIII.)**

The Supplemental Environmental Project (SEP) proposes three Stream Cleanup Projects within the County – one for each of the following streams: the South River, the South Fork Peachtree Creek, and Snapfinger Creek. Each proposed project involves a one-time cleanup of trash and debris from the banks and beds of the selected stream segments. After the SEP was approved by EPA/EPD on 03/27/2013, the County in 2013 accomplished laying the ground work for these three Stream Cleanup Projects as required under the Consent Decree. The following are some significant activities relative to the SEP:

1. Published a notice of intent to accept public bids for the SEP projects.
2. Developed bid materials, including contract specifications, scopes of work, along with field maps illustrating logistical information.
3. Published and distributed invitations to bid (concluded the bidding process).
4. Evaluated the bid responses and selected a potential vendor for award. This recommendation was forwarded to the Purchasing/Contracting Department for presentation to the Board of Commissioners at the scheduled January 2014 meeting. Construction activities are anticipated to commence in 2014.

In addition, the County has already conducted a volunteer public stream cleanup for each of the 3 streams. A total of 26 volunteers participated in the cleanups, and 1500 cubic yards/tons of debris was collected.

## Sanitary Sewer Overflow Trend Analysis For the Period 2012 and 2013

As required by the Consent Decree, IX. Reporting Requirements 58(b), the following trend analysis is submitted for the 24 month period that includes calendar year 2012 and 2013. This report addresses the three specific Sanitary Sewer Overflow (SSO) types (Spills, Building Back-ups and Overflows) as they apply to the various data and trends.

Consent Decree Totals		2011	2012	2013
CD Spills to date	273	5	141	127
CD Major #	29	1	15	13
CD Major Volume gallons, to date	1,259,059	116,080	308,772	834,207
CD Minor #	244	4	126	114
CD Minor Volume gallons, to date	910,663	18,700	444,330	447,633
CD Volume Total gallons, to date	2,169,722	134,780	753,102	1,281,840
Average Volume per Major Spill	43,416	116,080	20,585	64,170
Average Volume per Minor Spill	3,732	4,675	3,526	3,927
Average Volume per Total Spills	7,948	26,956	5,341	10,093

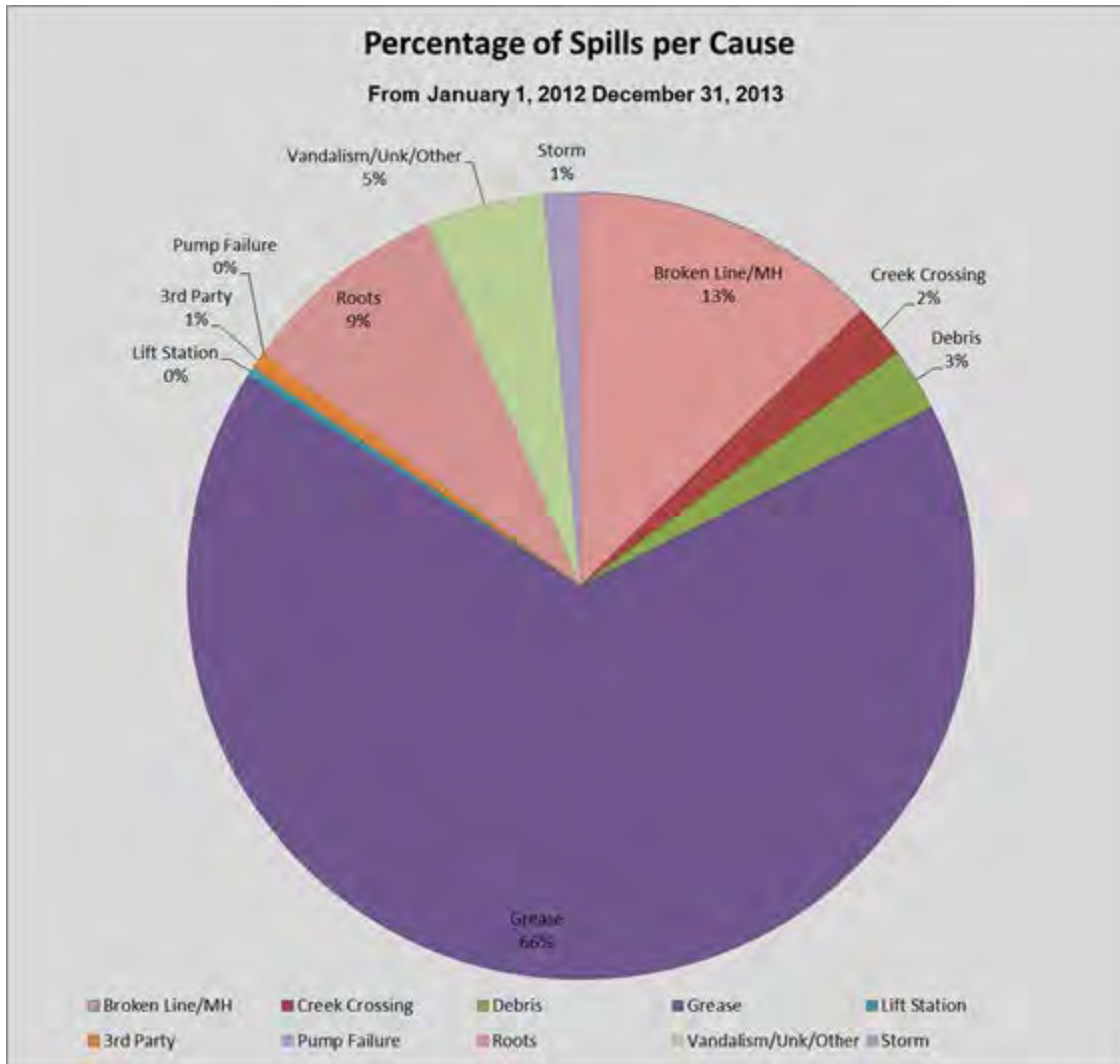
Figure 1. Consent Decree Spill Data Summary Table  
2011 only includes data from the start of the Consent Decree Period.

As noted in Figure 1, the detailed number and volumes by category for reportable spills is presented for review. The two year period has shown a slight reduction in spills in the Total, Major and Minor areas. In the review of the spill volumes it also begins to highlight the annual variability in the volume per spill especially in the major spill category. The primary driver on this appears to be the line size in the Major category with a 30 inch line being the high volume spill in 2013 with 337,000 gallons. The median volume for the 24 month period Major category is 18,440 gallons.



Figure 2. Spills per 100 Miles of Sewer Line

In Figure 2, the reportable spills per 100 miles of line indicate a decreasing linear trend from 2011 to the present.



**Figure 3. Spill Cause Breakdown**

Figure 3 notes that the majority (66%) of reportable spills are still grease related. The number is the same percentage from 2012 (66%) and 2013 (67%). The next highest areas of reportable spills are broken lines and structures at 13% and roots at 9% which remains consistent from 2012 to 2013.

Grease related spills are still the prevalent type of spill. What is interesting to note is that spill locations are still variable as noted in Maps 2, 3, 4, and 5 (discussed later on in the document). To address the grease driven spills, the County has contracted with the two on call contractors doing follow-up cleanings after spills and a specific area cleaning contractor in addition to County employees that have cleaned 35 miles of line. The cleaning efforts show that there are no findings of large contiguous areas of grease, large amounts of debris or major issues with the system in the spill area or specifically identified areas. What has been observed, however, is

localized concentrations of grease. Moreover, the FOG program is not finding FSEs that are contributing to spills in either the follow-ups to the spill investigations or via routine inspections or evaluations.

Investigative efforts by the County into the status of the sewer system are finding instances of human interference with the system in the form of large amounts of clothing, 100 plus spray paint cans deposited in a manhole, large rocks that were placed in a manhole to fill the 8 foot deep manhole to the top, a garbage can lid folded into an 8 inch line and other items as noted on our spill tabulation sheets.

Reviewing the mapping of the spills and description of the actions taken to control the spill has yielded a growing amount of data that has influenced a change in our response protocol. The distance of the blockage from the spilling manhole is less than twenty feet in many cases and easily removed by the gooseneck or minimal rodding. Where the crew is able to access the spilling manhole they have been instructed to insert the gooseneck and rods to see if that corrects the spill. If not, then the standard practice of rodding/pressure washing from a dry manhole upstream is initiated.

A review of the debris found in the blockage is also showing the effects of water conservation and the rapidly increasing use of wipes. These are occurring in many areas that require some additional educational efforts. Day cares are particularly problematic with the high number of wipes and low volume from the flow of water saving devices. Our public information group will be developing an educational brochure for this and some other common problems encountered in the spill evaluation.

It has also been noted on some occasions that the larger medical wipes are being flushed from both medical and dental facilities. In these cases the County is contacting the health department for assistance in enforcement from the medical waste aspects.

On several occasions the evaluation has shown items such as mop heads and similar cleaning items being the cause of or contributing to spills. If this is related to a FSE, our FOG group is asked to enforce and educate the FSE relative to floor drains and best practices. The County has noted some schools (public and private) have had the same issue and are working with the school to advise them of the issue and what best practices to follow.

Technology changes have been developed and are being researched by the County to resolve the stolen manhole cover problem. Through the partnership with Oldcastle Cement, a specially designed insert has been developed that has a plug type bottom that fits in the ring and a larger top that can fit over the cone of the manhole to secure the manhole. The device has inserts for lifting eyes that are removed when it is installed. The weight is such that it cannot be lifted



without a back-hoe so that the manhole is protected from vandalism. The County has also been reviewing non-metallic lids for those areas that are capable of accepting such a device.

The County has used specific maps within a quarter mile radius of any spill to determine whether there is a spill pattern, particularly between Memorial Drive and I-20. The County determined that a major trunk line warranted modeling and further field investigation. The spill patterns initially did not make sense based on line sizes and flow patterns. This project was called the Shoal Creek Spill Capacity Model. The model showed issues with the feeder lines connecting to the main trunk line. These issues include reverse slopes, elevation differences, hydraulic grade issues and other minor concerns. The results of this model are being translated into a rehabilitation program by our Engineering staff.

In Decatur, an issue is under review on Greene Street. There is a recurring spill at 101 Greene Street during higher levels of rain. The limited smoke testing completed so far has revealed various issues related to roof drains, storm drain cross connections, a street drain, and vented manhole issues. These have been corrected. An investigation has also been conducted via CCTV, the results of which have revealed improperly abandoned lines near the creek, in addition to locating some structures that were not on the system map, and identifying a manhole that was in a narrow part of the creek that become inundated when the creek level rose. This investigation is continuing onto 2014. As a result of the efforts to date, the spill frequency has decreased and the rainfall level at which spills occur has risen by more than an inch.

	2012	2013	Total
Plant*	21,034.950	24,287.100	45,322.050
SSO*	0.753	1.282	2.035
Percent	0.0036%	0.0053%	0.0045%

\*Million Gallons

Figure 4. Volume as Percent of Total Flow

The County has begun to trend the volume of SSO as a percentage of total flow reaching the treatment plants. As noted in Figure 4, the spill volume is a very minor percentage of the total flow. As a tool, this type of comparison may be further broken down by the Program Manager to determine SSO flows to each of the three plants as a percentage of the total flow to further determine SSES and related activities.

Type	Spills 2013	Spills 2012	Percentage	Building Backups 2013	Building Backups 2012	Percentage	Overflows 2013	Overflows 2012	Percentage	Total	Percentage
Broken Line	11	21	12%	0	1	2%	5	11	10%	49	10%
Creek Crossing	4	2	2%	0	0	0%	0	1	1%	7	1%
Debris	2	5	3%	5	1	9%	4	0	2%	17	3%
Grease	63	59	46%	14	7	32%	28	32	36%	202	40%
Manhole Issue	2	0	1%	0	0	0%	1	2	2%	5	1%
Grease-Debris	15	21	13%	2	2	6%	7	5	7%	52	10%
Grease-Roots	6	11	6%	3	3	9%	8	4	7%	35	7%
Lift Station	1	0	0%	0	0	0%	0	3	2%	4	1%
Outside Contractor	1	1	1%	0	0	0%	4	3	4%	9	2%
Pump Failure	0	0	0%	0	0	0%	0	0	0%	0	0%
Roots	8	6	5%	7	10	26%	14	4	11%	49	10%
Roots-Debris	4	5	3%	0	1	2%	3	0	2%	13	3%
Vandalism	2	3	2%	0	0	0%	1	1	1%	7	1%
Storm	2	2	1%	2	0	3%	4	0	2%	10	2%
Grease-Roots-Debris	1	2	1%	1	0	2%	0	0	0%	4	1%
Other	3	3	2%	4	1	8%	0	2	1%	13	3%
Unknown	2	0	1%	1	1	3%	2	18	12%	24	5%
<b>Total</b>	<b>127</b>	<b>141</b>		<b>39</b>	<b>27</b>		<b>81</b>	<b>86</b>		<b>500</b>	

Figure 5. SSO Breakdown by Type

Figure 5 shows the SSO type category, number of SSOs of that category by year and a total. This total is then calculated as a percentage of all SSO types by category and then overall for the period.

In the spill category, grease is predominant and was discussed above. There is no significant difference in the number of spills in this category per year. There is, however, a minor trend where (second to grease) in 2012 there was more broken lines than in 2013.

The building back-up category in 2012 has more root caused events than in 2013. In 2013 the causes went to grease with fewer root related issues. When the years are combined the two predominant causes of the building back-ups are grease and roots accounting for more than 60% of the issues.

Overflows show more grease related spills by percentage than other causes. The next three types of broken line, roots and unknown have not yielded enough information to improve the spill response program.

Grease Related	Roots	Mechanical	Outside	Debris	Type
		10%			Broken Line
		1%			Creek Crossing
				3%	Debris
40%					Grease
		1%			Manhole Issue
10%				10%	Grease-Debris
7%	7%				Grease-Roots
		1%			Lift Station
		2%	2%		Outside Contractor
		0%			Pump Failure
	10%				Roots
	3%			3%	Roots-Debris
			1%		Vandalism
			2%		Storm
1%	1%			1%	Grease-Roots-Debris
			3%		Other
			5%		Unknown
58%	21%	15%	13%	17%	

Figure 6. Overall Summary of Causes

The data derived from the total spill percentages in Figure 5 is combined in such a manner as to group the spill types in categories of similar characteristics (shown in Figure 6). For example, if grease was involved in the spill the percentage was totaled. From the totals in the table, it is shown that grease is still the predominant cause of SSOs.

Roots are the second highest percentage of SSO cause/type. A review of the mapping data of the spill locations will determine the areas needing root treatment in 2014.

Mechanical issues are the next highest cause of SSOs. It should be noted that creek crossings are not appearing to be a significant issue as indicated in the Consent Decree. In review of the empirical data it appears that the major issues are the smaller lines connecting just a few homes to the sewer mains. These lines have tended to be older lines. With just seven total incidents the data is not conclusive and will continue to be monitored.

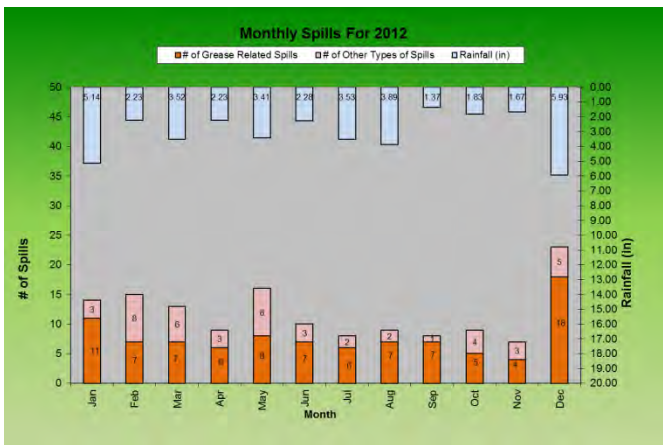


Figure 7 2012 Rain versus Spills

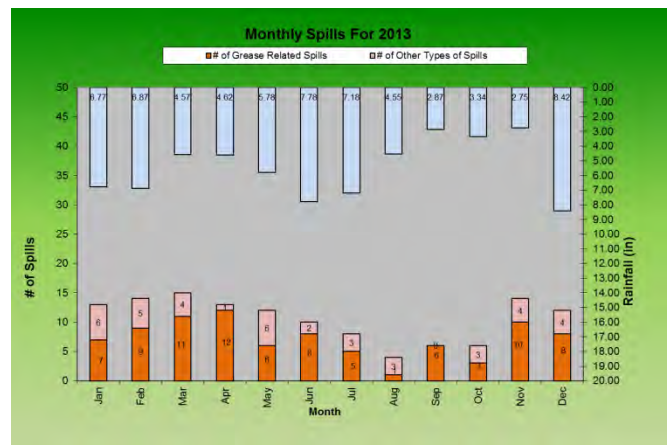


Figure 8 2013 Rain versus Spills

In Figures 7 and 8 the comparison of rain to spill numbers is reviewed. As noted in the figures, there is no strong correlation between spills and rainfall amounts.

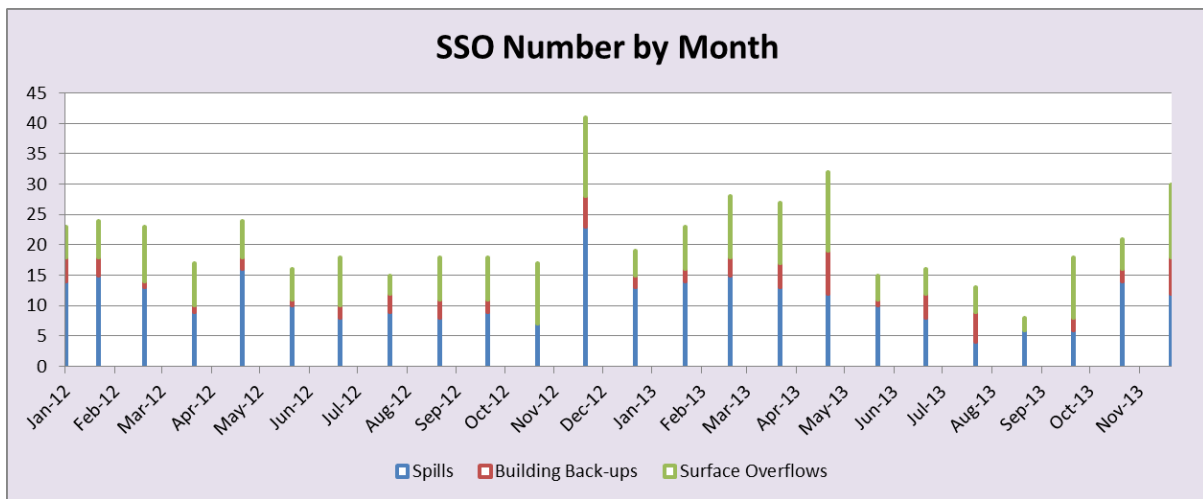


Figure 9. SSO by Month

In review of the SSO numbers by month, a spike occurred in December 2012. It is not clear why the number grew so much other than the combination of events that have been considered causes in the past. These events include some localized extremely heavy rain events, cold temperatures, and input of extra grease from holiday cooking. Further statistical evidence is needed to draw conclusions.

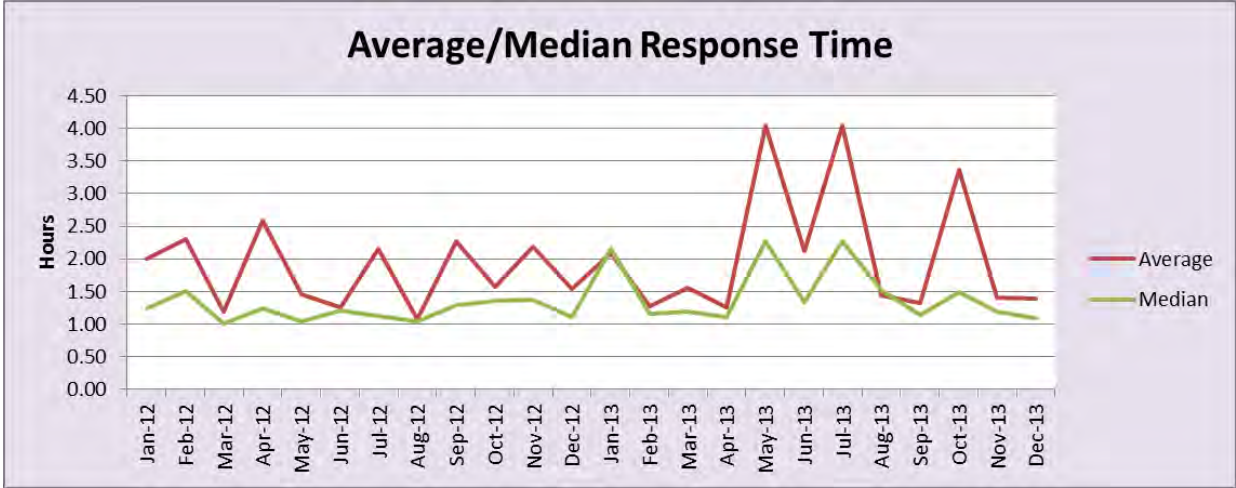


Figure 10. Response Time Call to Flow Restoration

The response time from the initial notification to the County and the restoration of flow is shown in Figure 10. In 2012 the average was 1 hour 58 minutes with a median of 1 hour and 20 minutes. For 2013 the average was 2 hours and 20 minutes with a median of 1 hour and 30 minutes. In 2013 the County encountered some large line spill events that required extra time to correct. The overall trend remains good.

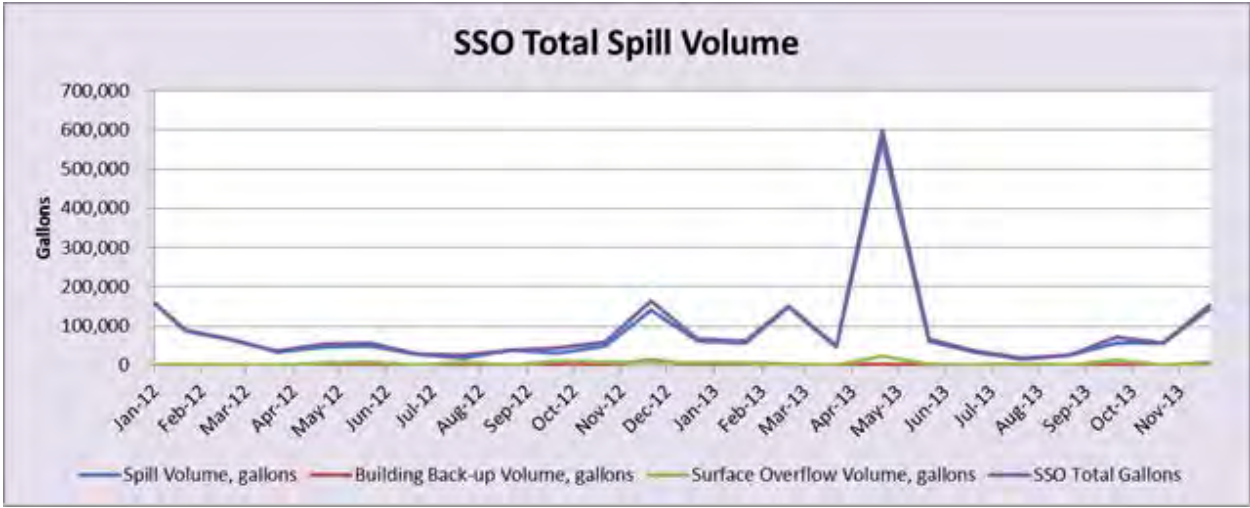


Figure 11. SSO Volumes by Month

In Figure 11, the monthly volume is indicated above for spills, building backups, and overflows. The amount remained relatively stable with the exception of the large volume spills in 2013 as seen by the spikes. The building backups and overflows remain relatively flat.

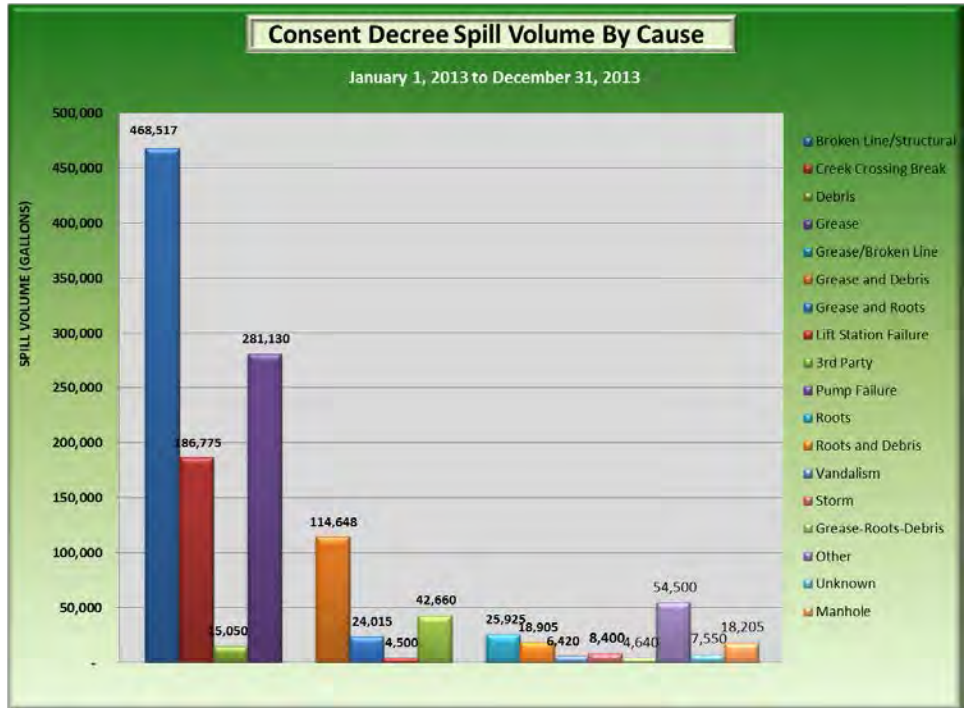
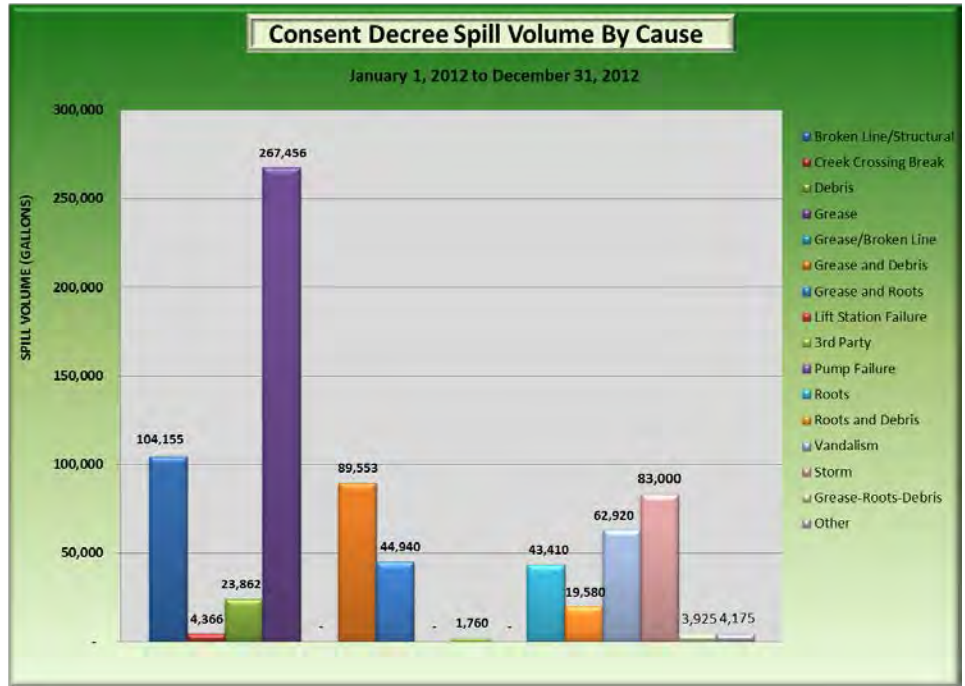
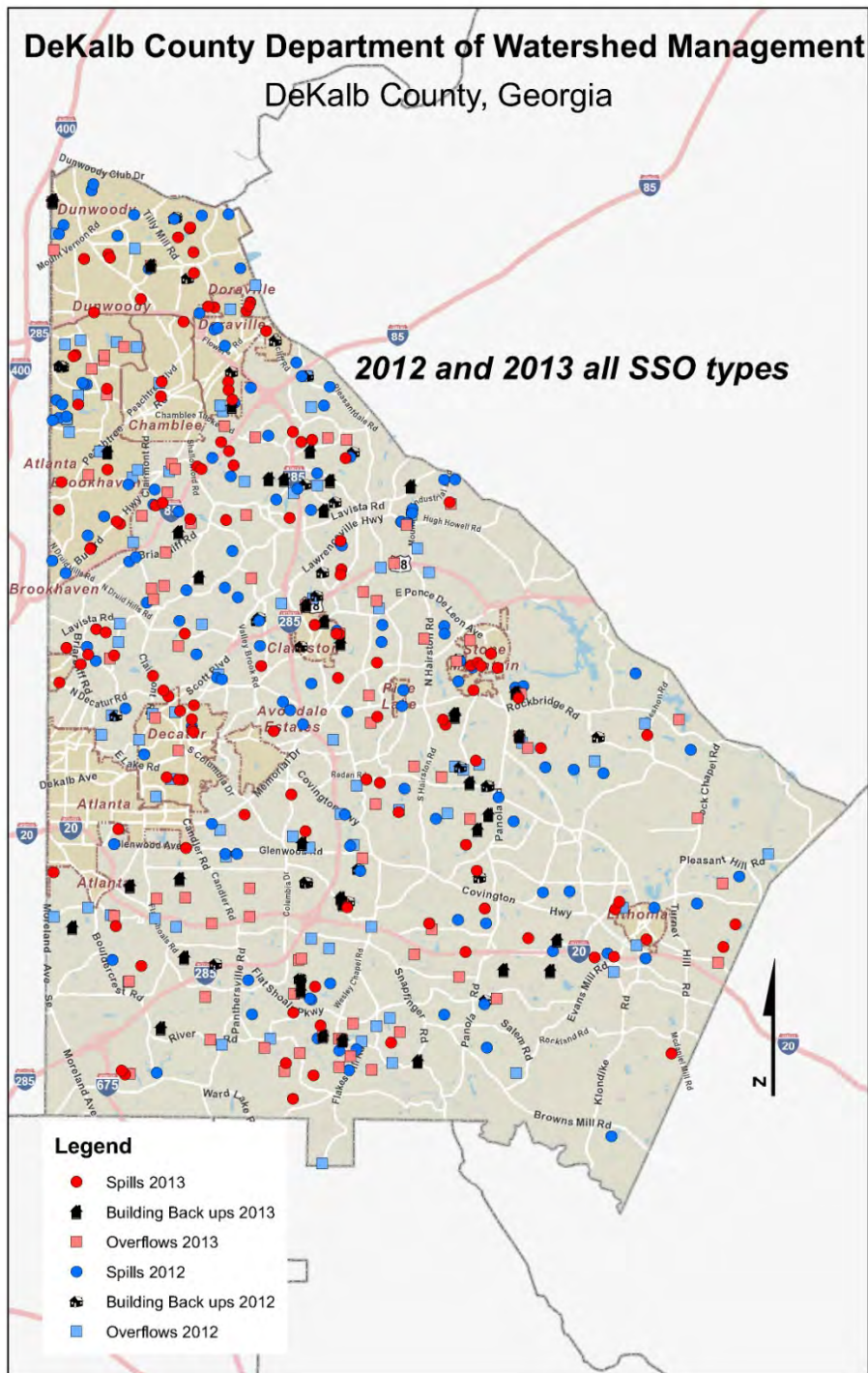


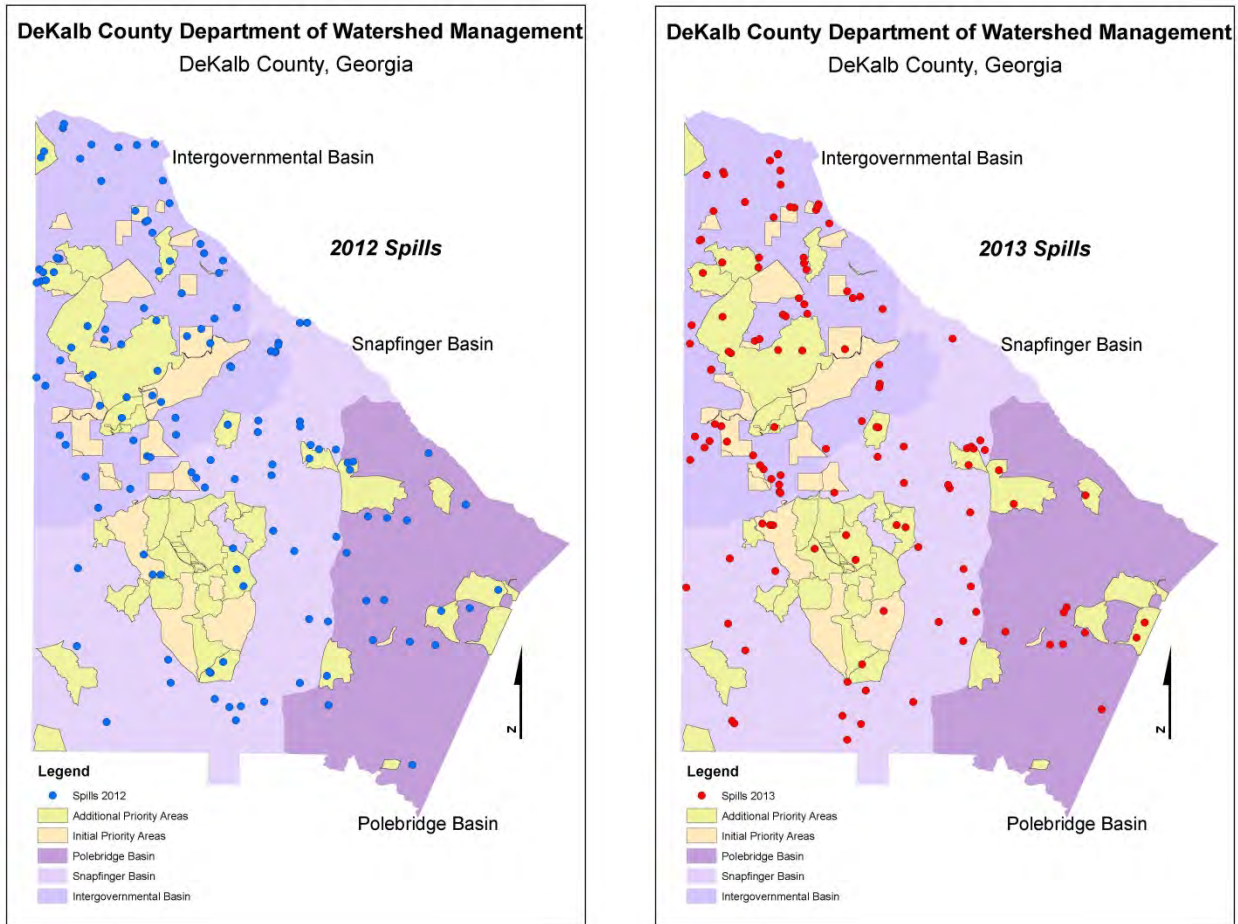
Figure 12 Spill Volumes by Cause

Figure 12 is indicative of the volumes by cause for each 12 month period. The grease volume remained stable during the period while the large spills from mechanical issues drove the volume in 2013.

# MAP SECTION



Map 2. All SSO Locations



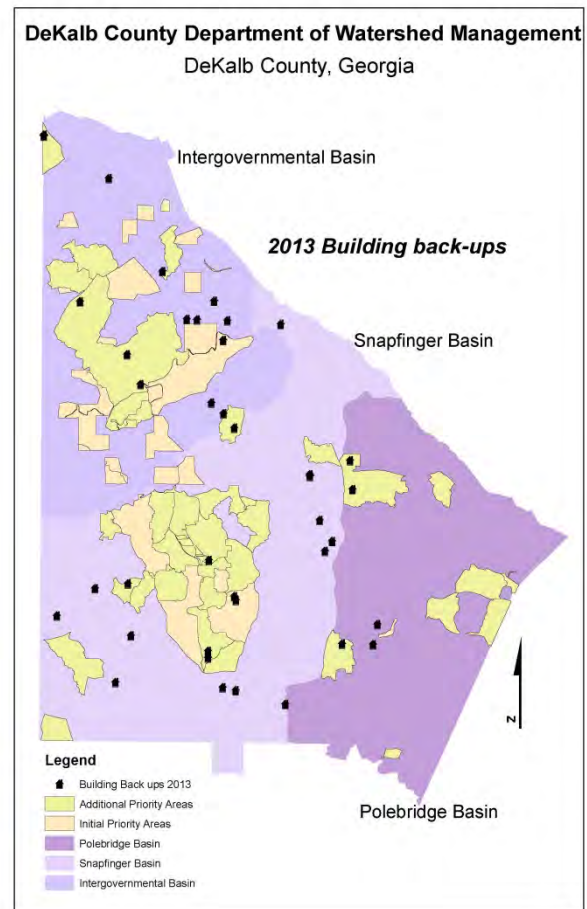
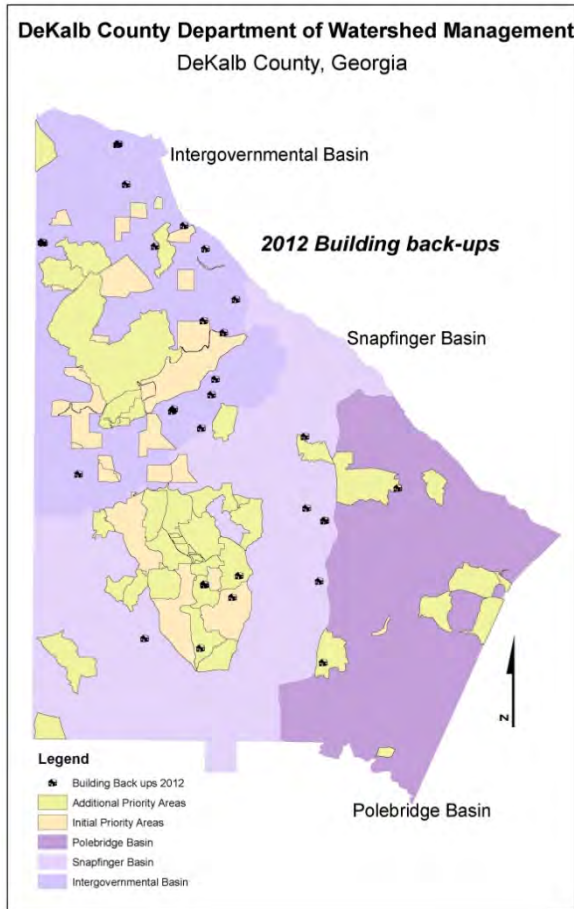
**Map 3. Annual Spills Overlaid on Basins and Priority Areas**

Map 3 shows a comparison of the spill plots over the initial and additional priority areas. The distribution is more indicative of a random nature than that of defined area problems. In the PASARP a more detailed analysis is outlined where spills were one of the criteria in determining the priority areas. The PASARP is more of a predictive tool taking into account factors that can affect the system overall.

In review of the spill spreadsheets there are minimal locations that are indicative of repeat spills. Those that were repeat spills were driven by a factor such as a weakened force main with construction activity in the area that cause continual breaks. There has been an initial response which stopped the spilled. In addition, there has been an engineering process to upgrade the force main.

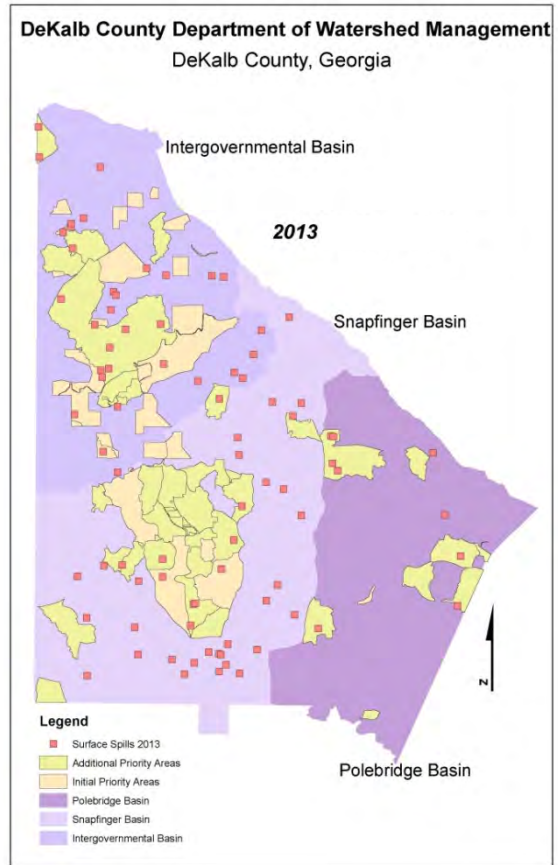
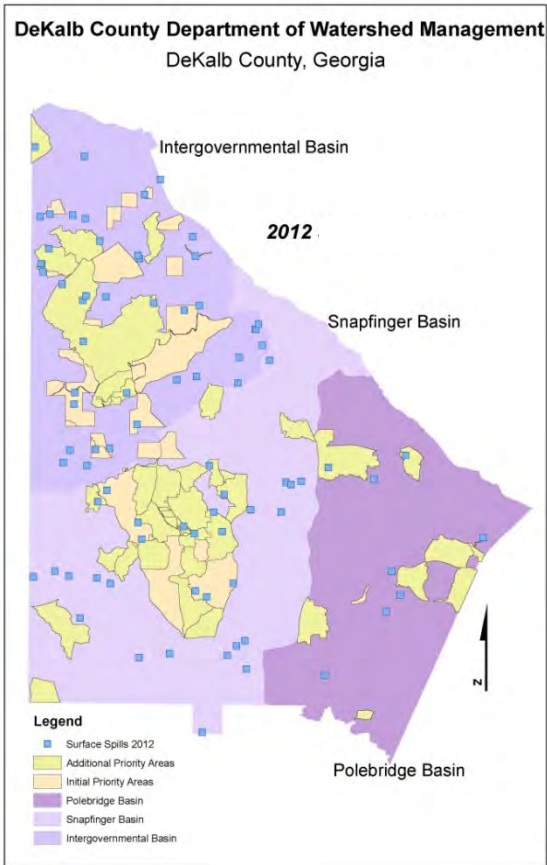
With the incorporation of a third and subsequent years of data, the Program Manager will be able to do a more significant review to determine if there are indeed any significant relationships or repetitive spills in the system.





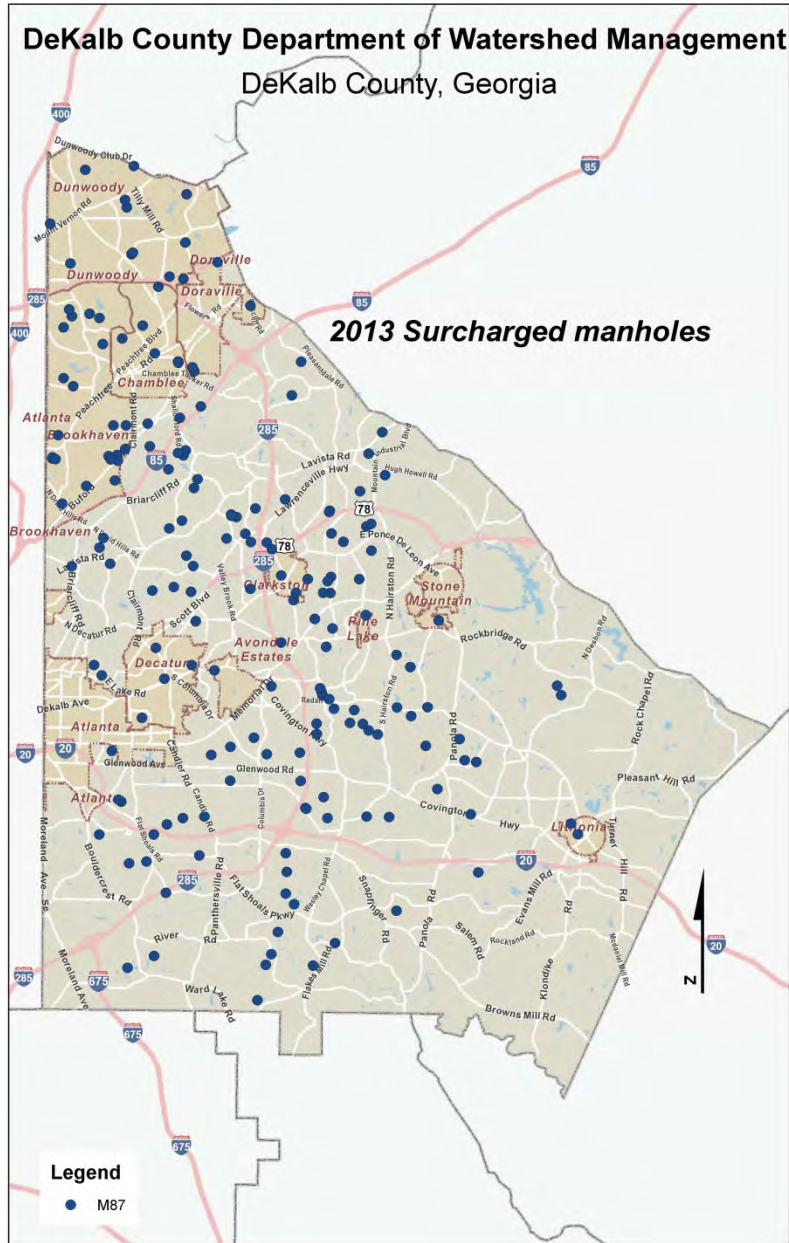
Map 4. Building Back-up Distribution

In review of the building back-ups for the period the distribution appears to be somewhat random in nature. Investigative results indicated that additional building back-ups resulted because of plumbing code violations. The owners were notified of such deficiencies and their effect on future claims. It was also noted that some of the building back-ups were caused by the County cleaning equipment in some cases doing their follow-up work to either a SSO or some type of system surcharge.



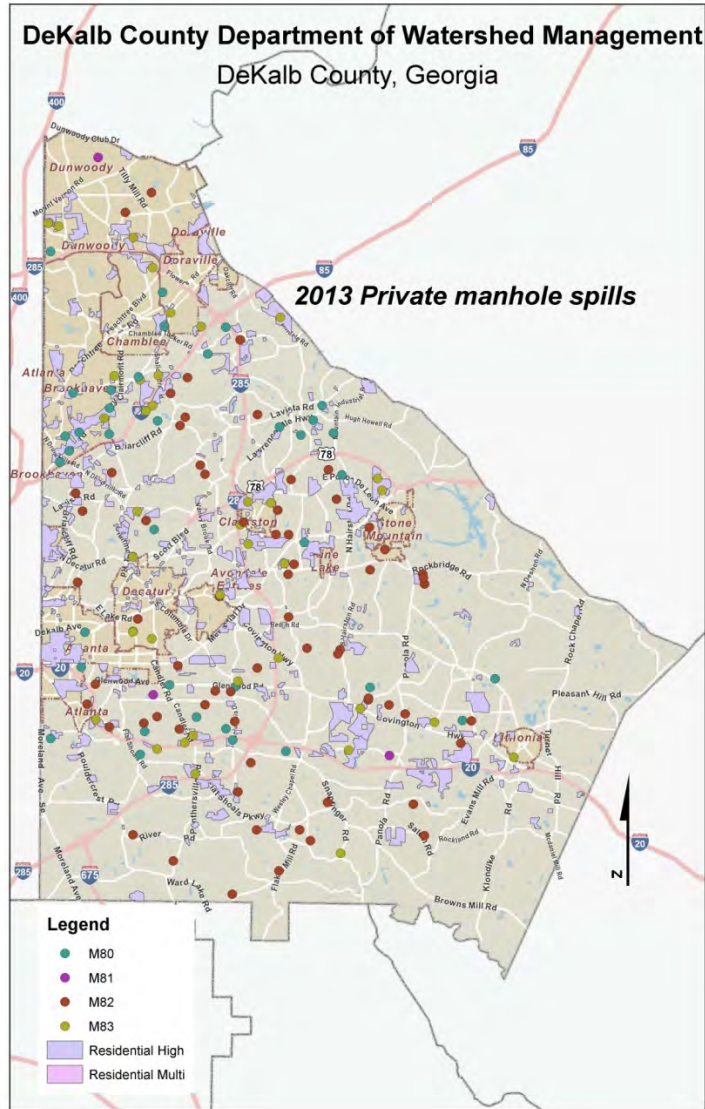
Map 5. Overflow Distribution

Map 5 demonstrates the distribution of overflows throughout the County. As with spills, overflows are not correlated with any type of priority area and are random in nature. Further study is underway on a comparison of SSO locations to those locations that have surcharged manholes.



**Map 6. Surcharged Manholes**

Map 6 shows the initial collection of data related to surcharged manholes in the County system. The initial review shows some linearity to the locations and this relationship will be further verified in 2014 by the Program Manager. Currently any surcharged manholes are addressed by a thorough cleaning of the connected lines and inspection to see if there is a reason for the issue that can be corrected.



**Map 7. Private Manhole Spills**

As part of the continuous review process the County expanded the data collection of private issues in 2013 to further enable better predictions of sites that could potentially spill. Map 6 shows the data related to private spills. The map includes the multi-family and high density populations in the County which are strongly associated with various SSO events. The initial data does not justify nor disprove this theory and will be further reviewed. When these maps are overlapped with the grease related spills there are the beginnings of a residential grease issue in some neighborhoods. It is not clear yet if this is related to system age, cleaning frequency or other factors.