
**NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM**

**KENT COUNTY MS4
Permit No. DE 0051144**

**submitted by
DELAWARE DEPARTMENT OF TRANSPORTATION**

ANNUAL REPORT FOR CALENDAR YEAR 2011

**Volume 1 of 1
DeIDOT Report and Appendices**



Submitted July 1, 2012

TABLE OF CONTENTS

Page Number

Certification

Program Summary and Projection *i to xii*

SWPP&MP Assessment *xiii to xvii*

Section

1.	Public Education and Outreach	1-1
2.	Public Participation/Involvement	
	A. Budget Process.....	2-1
	B. Adopt-a-Highway	2-1
	C. Litter control programs	2-1
	D. Door Hanger Campaign	2-1
	E. Stream Watch	2-2
	F. Tributary Action Teams.....	2-2
	G. Website	2-2
3.	Illicit Discharge Detection and Elimination	
	A. Inventory and Mapping.....	3-1
	B. Outfall Screening in Urbanized Areas of Kent County	3-4
	C. Prevention of Illegal Dumping.....	3-4
4.	Construction Site Stormwater Runoff Control	
	A. Delegated Agency.....	4-1
	B. Inspection and Operation of BMPs.....	4-2
	C. BMP Maintenance	4-3
5.	Post-Construction Stormwater Management in New Development/Redevelopment	5-1
6.	Pollution Prevention and Good Housekeeping	
	A. Road Repair and Maintenance	6-1
	B. Sweeping Program	6-1
	C. Litter Program	6-2
	D. Snow and Ice Program	6-3
	E. Stormwater Conveyance Systems	6-3
	F. Roadside Vegetation Management	6-4
	G. Spill Prevention	6-6
	H. Pollution Prevention at Maintenance Facilities	6-6
	I. Employee Training Program	6-9

LIST OF APPENDICES

Appendix A. 2011 Appoquinimink River Association annual summary report.

Appendix B. KCI Technologies, Inc., 2011 Stormwater System Inventory and Summary Report.

Appendix C. KCI Technologies, Inc., 2011 Outfall Inspection and Monitoring Report.

LIST OF TABLES

Table A. Minimum Control Measures summary.

Table B. Projection of Work to be performed during Calendar Year 2012.

Table 1-1. Monthly visit statistics for DelDOT's Stormwater website.

Table 3-1. 2011 inventory and inspection totals for the MS4 in Kent and Sussex Counties.

Table 4-1. DelDOT's stormwater BMP rating system.

Table 4-2. 2011 BMP inspection ratings summary.

Table 6-1. 2011 outfall monitoring results from DelDOT maintenance facilities.

LIST OF FIGURES

Figure 3-1. Screen shot of Dover roadways from the most recent version of DelDOT's NPDES MS4 Map Viewer application.

Figure 3-2. Educational door hanger distributed in communities with suspected or reported illicit discharges or dumping into storm drains.

CERTIFICATION

I certify under penalty of perjury that this document and all attachments are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. As to the identified portions of this document for which I cannot personally verify their truth and accuracy, I certify as Delaware Department of Transportation's official having responsibility for the persons who, acting under my direct instruction, made the verification that this information is true, accurate, and complete.



6/27/12

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Program Summary and Projection

The objective of the Delaware Department of Transportation NPDES Program is to reduce stormwater pollutants from the MS4 (municipal separate storm sewer system) to the maximum extent practicable. This is accomplished through the implementation of a comprehensive stormwater pollution prevention and management program as contained in the NPDES Permit No. DE 0051144, effective July 1, 2003.

The purpose of this review and update is to summarize activities for 2011 and provide a projection of work for calendar year 2012. Table A summarizes the Minimum Control Measures, BMPs, Measurable Goals, and Status of Implementation for the entire permit term. Work projections for 2012 are provided at the end of this section in Table B.

2011 Program Summary

Public Education and Outreach

DelDOT's public education program includes the following accomplishments for calendar year 2011:

- Partnered with the Appoquinimink River Association for public education and outreach that included continuation of the Delaware Livable Lawns campaign.
- Development of an education/outreach management plan through an agreement with the University of Delaware, Water Resource Agency, to investigate cost effective social marketing options.
- DelDOT is continuing the "Door hanger campaign," begun in 2006, as an educational tool to neighborhoods where illicit disposal are reported.
- DelDOT staff participated in the following public outreach events and distributed educational materials including bookmarks, brochures, calendars and promotional giveaways that carry a water quality message:
 - Delaware Rural Water Association – we exhibited our display board and graphics and touch screen stormwater slide show;
 - Delaware State Fair – we exhibited our display board and graphics and touch screen stormwater quiz.
- Served on the board of directors with the Delaware Association for Environmental Education (DAEE) and helped organize the annual statewide environmental education conference.

Public Involvement and Participation

DelDOT makes opportunities for members of the public to participate in program development and implementation through:

- Public participation in the DelDOT budget process.

- The Adopt-a-Highway program, a volunteer program to reduce litter along state roadways.
- DeIDOT held its seventh annual “Imagine a Litter Free Delaware” cleanup day along roads, highways and community areas.
- DeIDOT is continuing with its door hanger campaign to solicit public participation to report illegal dumping and “neighborhood watch.”

Illicit Discharge Detection and Elimination (IDDE)

DeIDOT completed inventory, inspection and dry-weather screening of all parts of the DeIDOT owned stormwater conveyance system in the Phase II urbanized area in 2007. These data are incorporated into the existing comprehensive GIS database that enables users to view the entire stormwater system, corresponding inspection data and photographs. KCI Technologies and Century Engineering continue to expand the inventory and inspection program to the rest of Kent and Sussex Counties and to update new structures that are added to the system. New outfalls are screened for dry weather flow or evidence of illicit discharges as they are inventoried and inspected.

Inventory and inspection of Kent County was essentially complete by the end of 2011. Emphasis during the next three years will be on completion of Sussex County.

DeIDOT also continued its door hanger campaign to residents in subdivisions where an illicit discharge or illegal dumping activity was discovered or reported. It solicits public participation to anonymously report illegal dumping and serves as a “neighborhood watch.”

Construction Site Stormwater Runoff Control

The Department of Natural Resources and Environmental Control has delegated the authority to administer a sediment and stormwater program to DeIDOT. Satisfactory performance of the delegated responsibilities will be considered compliance with this component of the SWMP. This delegation was renewed for another three years through June 30, 2015.

Post-Construction Stormwater Management in Newly Developed Areas and in Redeveloped Areas

The Department of Natural Resources and Environmental Control has delegated the authority to administer a sediment and stormwater program to DeIDOT. Satisfactory performance of the delegated responsibilities will be considered compliance with this component of the SWMP. This delegation was renewed for another three years through June 30, 2015.

Pollution Prevention and Good Housekeeping

DeIDOT has developed and implemented an operation and maintenance program with a goal of preventing and/or reducing discharges of pollutants associated with our operations through implementation of the following:

- Maintenance of the roadways and stormwater conveyance system.
- Maintaining a 4:2:1 street sweeping frequency.
- Continued to upgrade the existing snow removal fleet with ground speed spreader controls, plow balance valves and apply the techniques of anti-icing and pre-wetting in an effort to reduce overall salt usage during the winter season. New trucks will be fully equipped with ground speed spreader controls and plow balance valves. To date, all DelDOT trucks are equipped with the latest snow fighting equipment.
- Litter pickup by Department maintenance staff, prison crews, and the Adopt-a-Highway Program, and an annual “Imagine a Litter Free Delaware” cleanup day.
- Monitoring of stormwater outfalls at our maintenance yards per Pollution Prevention Plans.
- Implemented a Stormwater Pollution Prevention Program (SWPPP) at all DelDOT maintenance facilities. Quarterly wet and dry weather inspections are conducted at each yard.
- Continue to implement Spill Prevention Control and Countermeasures (SPCC) plans for all maintenance yards.
- Continuation of a pilot study on alternative vegetation management strategies for guardrails to reduce pesticide usage.
- Conducted employee training through:
 - Training videos on the SWPPP’s
 - Training videos on SPCC Plans
 - Maintenance bulletins posted at each maintenance facility.

2012 Work Projection and Plan:

Work projections for 2012 are provided at the end of this section in Table B (page xi).

Table A. Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

MCM #1: Public Education and Outreach Program		
BMP	Measurable Goal	Status of Implementation
A. Citizen Outreach / Educational Materials	Conduct citizen outreach using media and materials:	
Educational bookmark	Distribute 11,000 to 7th graders in public and private schools	Completed 2005
Stormwater brochures	Distribute at public events	Annually since 2002
Kid's activity booklet	Distribute 9,000 booklets to 4th graders in public and private schools statewide	Annually since 2004, continuous through permit
Book cover	Distribute 4,000 at public events and per teacher request	Completed 2006
Restaurant placemat	Distribute 7,500 placemats to 11 restaurants statewide	Completed 2005
Public Service Announcement	Air twenty 60-second PSA spots in spring on WSTW, 93.7 FM	Completed Spring 2005
Bags-on-Board	Distribute 4,000 units (2006), 7,200 units (2010), tipcards and follow-up surveys to vet clinics, dog groomer, dog trainer, animal rescue	2006 and 2010
B. Watershed Training Workshop	Present four 2 ½-hour watershed training course on basic watershed education and good-housekeeping measures to DeIDOT and NCCo. employees	Completed 2002
C. Stormwater Web Page	Develop a website to educate the public on stormwater issues and good housekeeping measures; update as needed; track web-site visits	Completed 2003, continuous through permit
D. Storm Drain Marking	Install water quality message markers on the estimated 4,500 storm drains	Completed June 2007; continuous with newly accepted subdivisions

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

E. School Participation	Engage public and private schools statewide in stormwater education	
Statewide drawing contest	Coordinate "Clean Water Begins and Ends with You!" drawing contest for K-12 graders	Annually from 2004 - 2008; 1,500 participants in 2008, canceled due to budget cuts
Technology Students Asso.	Judge TSA competition for middle and high school students statewide; students develop restaurant placemat and coloring book cover	Annually since 2003, continuous through permit
F. Public Event Participation/Display	Develop display and interactive stormwater game for use at public events	Completed 2002, continuous through permit
G. Promotional giveaways	Purchase items that display a water quality message for prizes and giveaways at public events	Annually since 2002, continuous through permit
H. Local Group Interaction	Partner with local non-profit groups in the development of education materials and outreach manuals, pet waste campaign and user surveys	Completed 2005, continuous through permit
I. Stormwater Video	Reprint "Protecting Our Water: Who's Got the Power" video. We will reprint the video into a DVD format and offer it as a teacher package at public events and watershed training for Tributary Action Team participants.	Completed September 2007
J. Newspaper Advertisements	Submit newspaper advertisements to increase public awareness on the importance water quality related to stormwater.	Completed October 2008
K. Storm System Inventory Brochure	Revise and distribute existing brochure for all residents in Phase II area	Completed February 2008
L. Delaware Livable Lawns	Promote program, launch website, develop brochures, certify qualified companies	Continuous since 2010

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

MCM #2: Public Participation/Involvement		
BMP	Measurable Goal	Status of Implementation
A. Litter control programs		
Adopt-a-Highway	DeIDOT will continue the Adopt-a-Highway program and document all participants and solicit new volunteers through newspaper ads and DeIDOT website.	Continuous program since 2003
"Imagine a Litter Free Delaware" cleanup day.	Statewide public event for clean up along roads, highways and community areas.	Annually since 2005
Anti-litter education program	Education program for elementary students all across Delaware to educate kids about the harmful effects of littering and encourage participation in the Adopt-a-Highway program	2005-2006
B. Public workshop – maintenance organizations	Hold two public workshops for Kent and Sussex County maintenance organizations on stormwater pond maintenance and the NPDES program and solicit public comment through a survey and comment form.	Completed May 2007
C. Development of stormwater and watershed presentation/survey for community groups	Review and revise current watershed presentation.	Completed May 2008
D. Door hanger campaign	Distribute door hangers to all subdivision residents where illegal dumping was reported or discovered. Solicit public participation for future reporting.	Annually since 2005
E. Tributary Action Teams	Participate in TAT meetings of the Murderkill and St. Jones River watersheds to assist in the development of Pollution Control Strategies and to determine the effect of TMDL implementation on DeIDOT projects.	2002-2007; participate as new TATs are formed
F. National Nonpoint Education for Municipal Officials (NEMO)	Serve on the Delaware NEMO steering committee and co-author a chapter on stormwater management.	2003-2006

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

MCM #3: Illicit Discharge Detection and Elimination		
<u>BMP</u>	<u>Measurable Goal</u>	<u>Status of Implementation</u>
A. Storm Sewer System Map	Develop map showing location of all outfalls & names and location of all waters of the US receiving discharges from them	
Database and viewer application	Develop storm sewer system system inventory and inspection database application and GIS mapping viewer application for Kent County.	Completed 2003
Inventory and inspection	Complete initial inventory and inspection of all storm sewer system components in the permitted area, at a rate of 20% each year,	Completed 2007
Database update	Update database at least annually to include inventory and initial inspection of all new system components in the permitted area	Ongoing, annually
Expand to rest of Kent & Sussex Counties	Expand inspection database and mapping to include all of Kent and Sussex Counties	Ongoing, begun in 2007; Kent Co. completed 2011
<hr style="border-top: 1px dashed black;"/>		
B. Dry Weather Outfall Screening	Screen 20% of known DeIDOT outfalls in the permitted area per year	Completed 2007
	Conduct screening on new outfalls added to the system since the original inventory.	Ongoing, annually
<hr style="border-top: 1px dashed black;"/>		
C. Public Reporting and Education	Publicize phone number for reporting illicit discharges or dumping into the storm sewer system through all education and outreach materials and in public workshops.	Ongoing
	Distribute educational door hangers to homes in all neighborhoods in which illicit dumping activities have been reported, found or suspected.	Completed 2006, and ongoing

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

MCM #4 & #5: Construction Site Runoff Control/Post Construction Stormwater Management		
<u>BMP</u>	<u>Measurable Goal</u>	<u>Status of Implementation</u>
A. Delegated Agency	DeIDOT is a delegated agency to administer its own Sediment and Storm Water Management Program per Delaware's Sediment and Stormwater Regulations. Review delegation every 3-years.	Annually since 1991
B. Operations and Maintenance of BMPs	Annually inspect stormwater BMPs statewide.	Annually since 2001
C. BMP maintenance contract	Maintain stormwater ponds in need of major repairs that are functioning below design standard for quantity and quality.	Annually or as required
D. Third party CCR inspectors	Use third party consultant services to conduct erosion and sediment control inspections on DeIDOT projects	Annually since 2011

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

MCM #6: Pollution Prevention/Good Housekeeping for Municipal Operations		
BMP	Measurable Goal	Status of Implementation
A. Litter Control Programs		
Adopt-a-Highway	DeIDOT will continue the Adopt-a-Highway program and document all participants and solicit new volunteers through newspaper ads and DeIDOT website.	Continuous program since 2003
“Imagine a Litter Free Delaware”	DeIDOT will continue the program and solicit new volunteers through newspaper ads and DeIDOT website	Annually since 2005
Inmate Crew	DeIDOT will continue to utilize the inmate crew to assist current staff levels to reduce the floatables entering the storm sewer system.	Continuous program since 2002
B. Storm Water Pollution Prevention Plans		
Quarterly Inspections	DeIDOT developed SWPPPs at all maintenance facilities.	Completed 2004
Annual Inspections	DeIDOT maintenance facility staff will complete a Dry and Wet Weather inspection each quarter.	Quarterly since 2004
Purchase spill kits	DeIDOT NPDES staff will conduct annual compliance inspections at each maintenance facility	Annually since 2004
Security Fence	The NPDES Section purchased wall mount spill kits for placement in vehicle shop buildings.	Completed 2003
	As part of the SWPPPs, DeIDOT enclosed all maintenance facilities with security fences and gates.	Completed 2005
C. Statewide Vehicle Wash Water Practices for DeIDOT Maintenance Yards		
Dover, Magnolia, Cheswold maintenance facilities	Treat all wash water through a treatment train prior to leaving the site.	Vehicle wash plan report completed July 2005
	Fully implement vehicle wash plan for three facilities within the Phase II permit area	Completed 2007
D. Statewide Salt Best Management Practices for DeIDOT Maintenance Yards		
Construct salt barns	DeIDOT developed a report that documents operational practices and strategies for salt delivery, stockpiling, and mixing.	Completed 2004
	DeIDOT constructed 3 salt barns	Completed 2005
E. Spill Prevention and Response		
Spill Kits for Vehicles	DeIDOT to purchase 450 vehicle spill kits for use on the roadway	Completed 2007
Spill Prevention, Control and Countermeasures Plans (SPCC)	DeIDOT developed a SPCC plan for each maintenance facility. These plans include proper procedures for spill response	Completed 2007

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DeIDOT Phase II NPDES.

F. Retrofits		
St. Jones Watershed Assessment	Partner with DNREC and their consultant to complete a comprehensive watershed assessment of the St. Jones. This assessment will give the Department locations for retrofits of the stormwater system.	Completed 2008
BMP Analysis	DeIDOT, through our consultant, will perform a detailed inspection of our BMPs to determine any that are in need of a retrofit.	Completed 2007, ongoing annual inspections
G. Stormwater Conveyance System	DeIDOT will manage a program to ensure the stormwater conveyance system is properly maintained and operating.	
Drainage Maintenance	DeIDOT will maintain the system when notified of an issue.	Continuous Program since 2001
Storm System Inventory and Inspection	DeIDOT will perform a detailed inventory and inspection of the MS4 system.	Completed 2007
Inspection and Preventative Maintenance Program	DeIDOT will determine the appropriate re-inspection schedule for the stormwater system DeIDOT will begin the re-inspection program	Completed 2007 Began 2009, ongoing
H. Sweeping Program	DeIDOT upgraded the sweeping program to a full time operation with the addition of new sweepers.	Completed 2002, continuing through permit
I. Training	Develop a training program for DeIDOT staff to educate staff on ways to prevent and reduce storm water pollution from their daily activities.	
PPP training videos	Develop 3 videos entitled (1) Facility and Vehicle Maintenance, (2) Stormwater Contamination and Spill Prevention, (3) Vegetative Control and Pollution Prevention on Public Roads.	Completed 2003, continuing training through permit
Maintenance Bulletins	Develop informative bulletins for District staff to educate them on stormwater management and pollution prevention BMPs	Continuous Program since 2003
Spill Prevention and Response Videos	DeIDOT to develop and use three training videos on Spill Prevention and response.	Completed 2007, continuing training through permit

Table B. Projection of Work to be performed during Calendar Year 2012.

Public Education and Outreach

- Participate and distribute education materials at outreach events: Delaware Rural Water Association Conference and the Delaware State Fair.
- Place storm drain markers, carrying a water quality message, on DelDOT owned inlets.
- Update web site as necessary and make available all outreach material and training presentations.
- Network and coordinate educational efforts with other state and local organizations through participation in the newly formed Delaware Association for Environmental Education.
- Continue Phase I of the Delaware Livable Lawns project to commercial lawn care companies.

Public Involvement and Participation

- Recruit new volunteers for Adopt-a-Highway.
- Solicit public participation for reporting illegal dumping through DelDOT's door hanger campaign.
- "Imagine a Litter Free Delaware" cleanup day.
- Begin development of Phase II of Delaware Livable Lawns, an educational/outreach campaign to reduce fertilizer application for home owners.

Illicit Discharge Detection and Elimination

- Continue inventory and inspection of outfalls and drainage structures in Kent and Sussex Counties. Since Kent County was mostly completed by the end of 2011, inspections will be focused in Sussex County during 2012.
- Inspect all stormwater ponds and BMPs in Kent and Sussex Counties; add collected data to the existing inventory database.
- Screen outfalls as they are inventoried. Identify, track to source and eliminate any illicit connections/pollutants entering the MS4.
- Continue door hanger campaign to residents where illegal discharges/dumping has occurred.

Construction Site Stormwater Runoff Control

- Delegation of the sediment and stormwater program is granted through the year 2015. DelDOT will comply with all state requirements.
- Use third party consultant services to conduct erosion and sediment control inspections on DelDOT projects.
- Plan for future implementation of effluent turbidity monitoring and other effluent limit guidelines that may be incorporated into the update of the NPDES General Permit.

Post-Construction Stormwater Management in Newly Developed Areas and in Redeveloped Areas

- Delegation of the sediment and stormwater program is granted through the year 2015. DelDOT will comply with all state requirements.

Pollution Prevention and Good Housekeeping

- Update the Pollution Prevention Plans for DelDOT maintenance facilities.
- Continue requiring maintenance staff to view pollution prevention and spill prevention training videos annually.
- Continue to develop and distribute Stormwater Pollution Prevention Bulletins to each maintenance yard statewide on a quarterly basis.
- Continue 4:2:1 sweeping frequency. Finalize installation of GPS units in sweepers to conduct a pilot test of sweepers as a means of tracking and confirming compliance and development of a sweeper management plan.
- Continue implementation of the “Statewide Vehicle Wash Water Practices for DelDOT Maintenance Yards” retrofits.
- Continue implementation of the Integrated Roadside Vegetation Management (IRVM) manual developed in 2009.
- Continue to update the statewide guardrail inventory, as needed.
- Use data from the guardrail inventory to develop a strategy for continued reduction of pesticide use.
- Continue the guardrail vegetation management study initiated in 2008 through the growing season of 2012.

SWPP&MP Assessment

This section is an annual review of the current SWPP&MP. Revised in June 2007, we conclude that no modification to the SWPP&MP is required at this time.

Public Education

Partnerships

The NPDES Section contracts with several non-profit organizations to assist with development of education and outreach programs. During the permit term, we have partnered with The Partnership for the Delaware Estuary, the Appoquinimink River Association (ARA) and the Delaware Nature Society. They have specialties in watershed and water quality education. Partnering with these organizations has proven to be an effective means of expanding our limited staff resources in a cost effective manner.

With many watersheds facing TMDLs for nutrients and bacteria, we decided to pilot an outreach effort in a two-phased approach to commercial lawn care companies and property owners. We therefore executed an agreement with the ARA to (1) develop a program called “Delaware Livable Lawns” that certifies commercial lawn care companies for their efforts that reduce fertilizer runoff through educating their clients on best practices, soil testing, and reporting fertilizer quantities while meeting homeowners needs. (2) In Phase II of the program, we will be targeting individuals in housing developments to be demonstration lawns for various types of fertilizer applications and organic products. We have an advisory committee consisting of 9 stakeholder groups from government and state agencies, University staff, private non-profit, plus a member of a commercial lawn care company. This diversity with varying perspectives has proven to be an effective combination to move this program forward quickly capturing a multitude of ideas without the idea of the government trying to regulate the commercial lawn care industry.

Our draft Phase I NPDES permit requires DelDOT to meet a minimum 250,000 “impressions” about stormwater quality to the general public. We are under agreement with the University of Delaware to assist the co-permittees in achieving the education requirements of the permit and making these efforts more effective and meaningful for New Castle County, DelDOT and the six municipalities regulated under the permit. This project will also strive to get the public and businesses involved in NPDES stormwater quality education. We will therefore use the results of this effort in modifying our Phase II SWMP.

Public Events

Part of our public outreach effort is participating in public events. Because we have limited budget and staff, we focus on large, multi-day events where there is substantial foot traffic. The biggest event each year is the Delaware State Fair, where we participate for 10 days serving over 30,000 visitors through our building. Our theme this year will focus on the “Delaware Livable Lawns” project to reduce fertilizer runoff. Since the landscape display was so popular we will again use the University of Delaware horticulture staff to design a landscape display in 2012.

Public Participation/Involvement

Door Hanger

Our door hanger campaign has brought awareness to the public and allows them to be proactive in reporting illicit discharges in their neighborhood. When illegal substances are found in storm inlets or are reported by the public, we distribute door hangers to the surrounding neighborhood. We have found this to be a very effective program for generating public awareness and public involvement. This typically generates phone calls to our office where we explain the program and direct them to our web site. In 2011, we distributed 60 door hangers New Castle County, but none were required in Kent and Sussex County Phase II areas.

Illicit Discharge Detection and Elimination

Outfall Screening

Very few illicit connections have been found over the years through dry weather screening. The majority of the illicit discharges or connections that actually have been confirmed as such either were discovered either through routine MS4 maintenance inspections or were reported to the NPDES Section by maintenance staff or the public. That pattern continued through this year.

Map Viewer

We completed the map viewer and provided training to DelDOT employees. Based on comments received during the training workshops, we continue to modify the viewer functionality and querying capabilities. The map viewer and database have proven to be very useful tools for maintenance staff. In 2011 we offered training on use of the map viewer to engineering, design and planning staff to extend its use within the department. We anticipate offering additional trainings in the near future.

Pesticide, Herbicide, Fertilizer

DelDOT's Roadside Environmental section manages PHF applications applied by contractors and DelDOT staff. The NPDES Program has the responsibility to develop programs and implement controls through training, policy changes resulting from research, development of SOPs, education, etc. to reduce the pollutants associated with their application and to track trends that can document anomalous spikes in usage or declines in usage due to implementation of programs.

We have implemented several pesticide reduction programs as described below:

1. Guardrail pilot study – DelDOT currently treats approximately 310 miles of guardrail with herbicide. We developed a program in conjunction with the University of Delaware to investigate methods to reduce the use rates of pesticides and carriers used to treat guardrail vegetation without compromising safety and aesthetics. We selected and applied several treatment methods along several guardrail sections to compare the effectiveness, ease of implementation, aesthetics, cost and longevity. Treatments included weed control barriers, low-

growing vegetation and hand-cutting existing vegetation. Herbicides will be used on treatment plots as a measure against non-chemical treatments. Based on preliminary results, one commercial weed control barrier treatment type will be eliminated from testing and two new seed mixes will be added in 2012.

2. Guardrail inventory – Treating guardrail accounts for a significant percentage of DelDOT’s herbicide treatment program. The NPDES Program saw guardrails as a relatively simple way to reduce herbicide usage. Our consultant inventoried all guardrails statewide and collected attribute data that included material under guardrail and surrounding landscape and environmental features. We are looking for areas where alternative treatment measures (e.g. hand control, weed barrier, low-grow fescues) can be used in lieu of herbicides.

We have an agreement with a consultant to maintain and update this statewide guardrail inventory. As we receive notification of new projects and review as-built plans for the addition of new guardrail, a list is compiled and sent to our guardrail consultant on a quarterly basis. This continuous process saves the department money by not having to repeat the entire statewide inventory every several years.

3. Record keeping –We are continuing to keep records of herbicide quantities to establish baseline herbicide usage. By tracking herbicide quantities we hope to be able to identify the cause of spikes or declines in usage and use the data to assess pesticide reduction programs we have implemented.

Construction Site Runoff

E & S Plan Compliance and BMP Performance

Erosion and sediment control at DelDOT construction sites falls under the purview of the Division of Transportation Solutions (DOTS). However, the NPDES Program, through its permit and consent decree, is responsible for ensuring E & S control compliance.

1. Currently, the contractor provides the CCR for major construction jobs. This has proven to be, on occasion, ineffective. Reports are not completed weekly or after storm events and often contractors do not provide a daily crew to maintain and/or correct deficiencies for E & S. We therefore executed two agreements with consultants to conduct the daily CCR construction duties in lieu of the contractor.
2. Changes to the DelDOT Standard Specifications, as well as new E & S control requirements and BMP standard details, have made the current version of the *DelDOT Erosion and Sediment Control Field Guide* somewhat obsolete. Therefore, the NPDES Program executed an Agreement with Whitman, Requardt and Associates to completely rewrite the *Field Guide* and put it into a more user-friendly format. Final review, printing and distribution are expected in early spring 2012 and will be available for viewing at http://www.deldot.gov/stormwater/ES_fieldguide.shtml.
3. Sediment and Stormwater Regulations: The Governor's Surface Water Task Force recommended revision of the Sediment and Stormwater Regulations to address

volume management, flooding, and plan review process improvement. Federal requirements for water quality improvement (e.g. TMDL) are being addressed as well. As a delegated agency, DeIDOT is required to follow these regulations.

Pollution Prevention and Good Housekeeping for Municipal Operations

Street Sweeping Program

Under the current NPDES permit, DeIDOT sweeps an annual 4:2:1 frequency on primary, secondary and tertiary roads. The draft Phase I permit requires DeIDOT to quantify the expected pollutant load reductions from all controls (e.g. sweeping) to meet the TMDL (Total Maximum Daily Load) and Waste Load Allocation goals. In order to obtain the required information this past year DeIDOT equipped all sweepers with automatic vehicle location (AVL) devices. The AVLs will hopefully enable us to verify that the required sweeping frequency has been met, as well as obtain better estimates of pollutant load reductions resulting from sweeping activities.

DeIDOT also tasked KCI Technologies to assist with developing a more optimum, science-based sweeping strategy for pollutant removal. That plan is expected to be completed sometime late in 2012 and will be implemented first in the Phase I area once the Phase I SWPP&MP has been approved. If successful, we anticipate implementation in Kent County as well.

Vehicle Wash Plan

The use of the *Statewide Vehicle Wash Water Practices for DeIDOT Maintenance Yards* manual, developed in July 2005, has resulted in designated locations for vehicle washing that are treated via a stormwater treatment train series of BMPs. We completed the last retrofit at the Harrington maintenance facility in summer 2010.

Pollution Prevention Plans

In assessing the PPP's, we determined that many of the plans need to be updated to include new maps of facilities and drainage systems, new BMPs, and new staff responsible for PPP implementation. We will update the PPPs as facility use changes.

Salt Plan

DeIDOT's *Statewide Salt Best Management Practices for DeIDOT's Maintenance Yards* has resulted in the purchase of salt structures to comply with storing salt under roof. Quarterly inspections and increased training through SWPP&MP videos and maintenance bulletin posters have also resulted in greater awareness of and compliance with the provisions of the salt plan by maintenance staff.

NPDES staff is part of a road salt working committee with DNREC and drinking water suppliers in New Castle County. Although DeIDOT has implemented many salt reducing strategies into its snow/ice program, intake water often has high chloride levels due to salt runoff into surface waters that supply their customers following snow/ice events.

Other

Storm sewer system inventory and inspection

Although not a permit requirement, we extended the storm sewer system inventory and inspection program to Kent and Sussex Counties. This program assists the Districts with maintenance and pollutant tracking statewide through the map viewer database.

We made a programmatic change to the inspection schedule. We will add additional inspection teams in Sussex County in an effort to complete the entire state on an accelerated schedule.

Stormwater Retrofits: Partnering on stormwater retrofits provides a cost saving benefit and increases the ability to leverage grant money.

- **Agriculture Museum:** DelDOT is partnering with DNREC on a stormwater retrofit in the Phase II area in Dover adjacent to the Agriculture Museum. The retrofit would treat currently untreated road runoff and reduce ponding along State Street before it enters Silver Lake/St. Jones River.
- **Inland Bays:** Although not in the Phase II permit area, we took advantage of a grant opportunity through DNREC's Nonpoint Source Program to partner with the Center for the Inland Bays to construct 18 bioretention areas in the median of Delaware Highway One located within portions of unincorporated Sussex County, Middlesex Beach, and the Town of South Bethany in Sussex County, Delaware. The bioretention areas are designed to achieve calculated reductions of surface water runoff and nitrogen and phosphorus loads entering stormdrains that flow to residential canals on Little Assawoman Bay.

1. Public Education and Outreach

Requirement:

DelDOT shall implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on local water bodies and the steps that can be taken to reduce stormwater pollution. In addition, DelDOT shall determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Performance/Measurable Goals:

- We continued our door hanger campaign to residents in subdivisions where an illicit discharge or illegal dumping activity was discovered or reported as part of our outreach program to residents. The front side of the door hanger lists the date and type of pollutant found and what water body affected. On the back, the door hanger describes stormwater pollution and guidelines to reduce pollution at the home or workplace (see Annual Report 2007, Volume 2 of 2, Figure 11- 3). We distributed 60 door hangers statewide in 2011. This program also helps meet the public education requirements of Part II.A.6. *Illicit Discharges and Improper Disposal* of the NPDES Permit.
- DelDOT distributed several hundred activity booklets to schools and the general public that highlight stormwater pollution, the water cycle and watersheds.
- DelDOT developed a stormwater website (www.deldot.gov/stormwater). We continually update the “Hot Topics” section on the home page. A “Report a Problem” link allows the public to email or call to report illegal discharges or dumping and stormwater maintenance problems. In 2011, Google Analytics reported an average of about 340 visits per month (range 227-432) (Table 1-1).
- Appoquinimink River Association
“Delaware Livable Lawns” Project:

DelDOT is in the third year of a three year agreement with the ARA to lead an education and outreach program to provide information to the public on ways to reduce nonpoint source pollution. We have developed an educational/outreach campaign to reduce fertilizer application by changing watershed residents’ lawn care practices. The “Delaware Livable Lawns Program” certifies lawn care companies that follow environmentally-friendly best practices in fertilizer application while educating homeowners on these best practices. The goal of the program is to reduce fertilizer runoff from residential lawns. Phase I of the program targets commercial lawn care companies recognizing them for environmentally friendly lawn care plans (e.g. soil tests, organic products, low or no nitrogen fertilizers, only fall applications, annual reporting, distribution of educational materials, etc.) while also meeting homeowners’ needs and educating them on best practices.

A measurable goal that may indicate an increased awareness of the Delaware Livable Lawns goal of proper/reduced fertilizer application is to monitor homeowner soil test kit usage. Beginning in 2012, using the University of Delaware’s database, we will

track homeowner soil test kit usage looking for increased use as the program becomes fully implemented.

In Phase II of the program, we will be targeting individuals in housing developments to be demonstration lawns for various types of fertilizer applications and organic products.

Updates for 2011:

- 20 companies have shown interest in applying for certification, 17 fit within the parameters, six companies have applied for certification and two have been accepted.
- The website is now available to the public at www.DelawareLivableLawns.org. Our web designer is making modifications to make the website more “mobile ready.”
- Developing a brochure that will be available to the certified companies to supply their customers and to residential DIY applicators describing the benefits and the parameters of the program.
- Development of a monthly newsletter as an opportunity to capture the residential customer.
- Development of a video on how to make soil testing and interpreting more understandable.

Additional work accomplished by the ARA is documented in their 2011 annual progress report (Appendix A).

- As part of the storm drain inventory and inspection in the Dover and Camden/Wyoming area of Kent County, KCI Technologies is continuing to label each inlet with a storm drain marker that carries a water quality message.
- We participated in and/or distributed educational materials including bookmarks, brochures, calendars and promotional give-a-ways, that carry a water quality message, at the following public events and conferences:
 - Delaware State Fair held in July 2011. NPDES staff participated for 10 days and evenings;
 - The Delaware Rural Water Association Annual Conference, held in Harrington on February 28 – March 1, 2011.
- We have begun development of an education/outreach management plan for both Phase I and Phase II NPDES permits. We executed an agreement with the University of Delaware, Water Resource Agency, to investigate cost effective social marketing options that are feasible in Delaware to achieve the education requirements of the permits while making these efforts more effective and meaningful. The University of Delaware will prepare a final recommendations report in early 2012 detailing a stormwater education plan that address major pollutant problems.

- DeIDOT staff has been active participants in the founding and development of the Delaware Association for Environmental Education (DAEE). The DeIDOT NPDES Environmental Scientist serves on the Board of Directors, assists the group with its communications and outreach, and serves on the planning committee for DAEE's annual statewide conference.
- DeIDOT teamed with Technology Students Association (TSA), and our staff served as judges in the April 2011 State Conference.

Table 1-1. Monthly visit statistics in 2011 for DelDOT's Stormwater Quality website (www.deldot.gov/stormwater).

Month	Visits (Google Analytics)	Pageviews	Unique Visitors
January	303	518	269
February	298	469	264
March	363	705	294
April	379	623	348
May	335	579	288
June	432	715	383
July	227	337	205
August	350	438	198
September	277	570	218
October	404	667	330
November	391	649	332
December	322	524	229

2. Public Participation/Involvement

Requirement:

DelDOT shall include the public in developing, implementing and reviewing the stormwater program. DelDOT shall make opportunities for members of the public to participate in program development and implementation and will comply with all applicable State, Tribal, and local public notice requirements. DelDOT shall determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Performance/Measurable Goals:

A. Budget Process

As part of the DelDOT budget process the community has the opportunity to suggest projects for the following year.

B. Adopt-a Highway

Adopt-a-Highway is a cooperative program between DelDOT's Division of Public Relations and volunteers to reduce litter along State roadways and subsequent discharge to waters of the State. This program supplements efforts by DelDOT's maintenance forces to control litter. This has a water quality benefit because it reduces floatable debris entering streams. The volunteer groups are required to collect litter a minimum of twice per year and submit activity reports following each cleanup for inclusion in the program. Each group maintains approximately two miles of roadway. DelDOT maintains an Adopt-a-Highway website (www.deldot.gov/information/community_programs_and_services/) and submits press releases to solicit volunteers. There are currently 849 volunteer groups (577 in Kent and Sussex Counties) statewide maintaining 1,698 lane miles.

C. Litter Control Programs

DelDOT held its seventh annual "Imagine a Litter Free Delaware" cleanup day along roads, highways and community areas in October 2011. Public participation was solicited via newspaper ads and DelDOT's website.

D. Door Hanger Campaign

Since it is often difficult or impossible to catch someone in the act of improperly disposing of yard waste, oil, paint, etc. into the storm drain, DelDOT began a door hanger campaign to residents in subdivisions where an illicit discharge or illegal dumping activity was discovered or reported as part of our outreach program to residents. This effort solicits public participation to anonymously report illegal dumping and serves as a "neighborhood watch."

The front side of the door hanger lists the date and type of pollutant found and what water body affected. On the back, the door hanger describes stormwater pollution and guidelines to reduce pollution at the home or workplace (See Annual Report 2006, Figure 2-1). In 2011, we distributed 60 door hangers statewide, but none were required in Kent and Sussex County Phase II areas.

E. Stream Watch

Delaware Stream Watch is a grassroots volunteer waterway protection program focusing on citizen involvement through monitoring, education, and advocacy. Stream Watch is co-sponsored by the Delaware Nature Society and DNREC, representing a unique partnership of government, environmental interests, and industry.

The Stream Adoption program allows people and groups of all ages to adopt and monitor a local water body of their own choosing. Typical assessments include visual, macroinvertebrate and chemical surveys. Interested participants can download a form from the Delaware Nature Society website.

F. Tributary Action Teams

The Delaware Department of Natural Resources and Environmental Control coordinate teams of citizens known as Tributary Action Teams (TAT), who develop strategies for reducing water pollution in impaired watersheds. DeIDOT staff participated in TAT meetings of the Christina River and Appoquinimink River in New Castle County, St. Jones River and Murderkill River in Kent County, and the Nanticoke River, Broadkill River, and Inland Bays in Sussex County to assist in the development of Pollution Control Strategies (PCS) for those watersheds and to determine the effect of TMDL implementation on DeIDOT projects.

G. Website

DeIDOT developed a stormwater website (www.deldot.gov/stormwater). A “Report a Problem” link allows the public to email or call to report illegal discharges or dumping and stormwater maintenance problems.

3. Illicit Discharge Detection and Elimination

Requirements:

- A storm sewer system map, showing the location of all outfalls and the names and locations of all waters of the United States that receive discharge from those outfalls.
- Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State, Tribal or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions.
- A plan to detect and address non-storm water discharges, including illegal dumping into the MS4.
- The education of public employees, businesses and the general public about the hazards associated with illegal discharges and improper disposal of waste.
- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Performance/Measurable Goals:

During 2011, KCI Technologies, Inc., and their subconsultant Century Engineering, Inc. (CEI), performed MS4 inventory and inspection tasks for DeIDOT throughout the state to ensure compliance with the NPDES Phase II requirements for illicit discharge detection and elimination. This work was conducted under Agreements 1354 and 1591. The work includes expanding the MS4 inventory and inspection program to parts of Kent and Sussex Counties beyond the permitted areas, as well as performing inspections of new structures, reinspections and screening of the MS4 in the Phase I and Phase II permitted areas. These consultants also perform annual BMP inspections for DeIDOT and conduct dry-weather screening of outfalls. The dry-weather outfall monitoring is conducted under Agreement 1495 with KCI Technologies.

Specific progress during calendar year 2011 included the following:

A. Inventory and Mapping

As reported in previous years, we completed the initial inventory and inspection of all parts of the DeIDOT-owned stormwater conveyance system in the Phase II urbanized area in 2007. Stormwater ponds and other BMPs also have been inventoried and receive annual inspections. During the inspection process, each structure was opened and evaluated for material construction and condition, and physical measurements were made. Digital photographs of the structure and each associate pipe were taken and connectivity between structures verified. At the completion of the inspection process an “Only Rain Down the Storm Drain” marker was placed on each structure to encourage residents to not dispose of waste down the inlet. If a structure is found to have a material deficiency, a Maintenance Work Order (MWO) is generated and forwarded to DeIDOT. All of these data are incorporated into a comprehensive GIS database, designed for DeIDOT by KCI

Technologies, that enables users to view the entire stormwater system, corresponding inspection data and photographs.

In this last year of Agreement 1354, DelDOT focused on completing Kent County's inventory and inspection work by the end of 2011. Kent County was 99% complete by year's end. The KCI/CEI Team inventoried and inspected 11 subdivisions and 376.5 miles of non-subdivision roadways in 2011, for a total of 20,149 structures in Kent and Sussex Counties (Table 3-1). The team also completed annual inspections of 224 BMPS and submitted 742 MS4 work orders (269 of them in Kent and Sussex Counties). (*Note:* BMPs with outstanding work orders were not reinspected. They will be reinspected when the repair orders are completed.) By the end of the calendar year, district maintenance yards had completed 170 of these work orders (13 in Kent and Sussex). A total of 411 work orders (54 in Kent and Sussex) were deemed low priority, with no impact on safety or the environment, and were placed on a watch list.

Table 3-1. 2011 inventory and inspection totals for the MS4 in Kent and Sussex Counties.

Month (2011)	Subdivisions	Non-Subdivision Roadway Miles	Structures
January	0	25.0	1,509
February	0	33.9	1,969
March	0	35.0	1,822
April	0	31.6	1,462
May	0	21.5	1,405
June	0	38.1	1,819
July	0	30.2	1,740
August	0	23.1	1,680
September	0	29.7	1,439
October	0	30.2	2,044
November	5	57.8	1,739
December	6	19.5	1,521
TOTAL	11	375.6	20,149

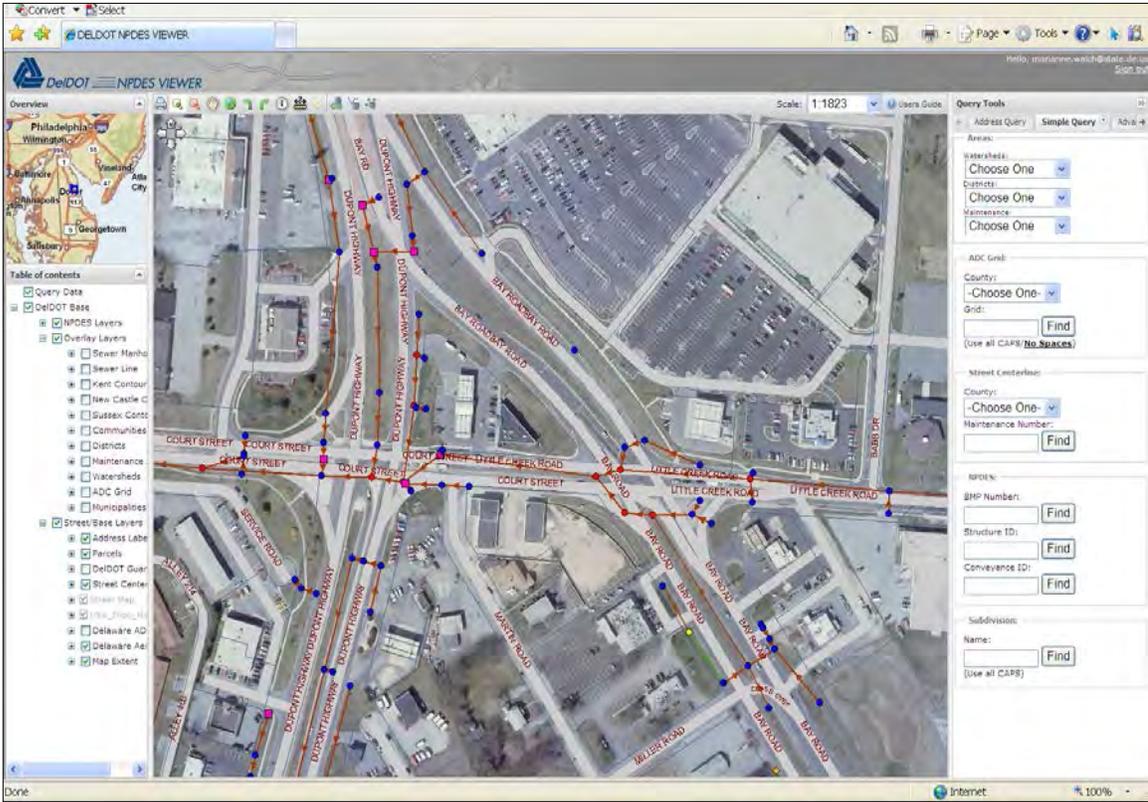
DelDOT executed a new Agreement #1591 with KCI Technologies on November 29, 2011, to continue the inventory and inspection program. We will be focusing this three-year agreement's efforts on completing Sussex County, while also adding a crew in New Castle County to inventory new storm drain systems associated with recently constructed roadway improvement projects in the Phase I area. A complete summary of work performed by KCI and CEI through the end of calendar year 2011 is included in this report as Appendix B.

KCI will be implementing a new process for inventorying and inspecting newly accepted subdivision streets and storm drain systems throughout the state. Once subdivision streets (and storm drain systems) are accepted by DelDOT, there is a three-year warranty period, during which the developer is responsible for maintenance of the street and storm drain systems. KCI will aim to inventory and inspect these storm drain systems during the third year of the warranty to help ensure that these systems are in good condition when the warranty period ends.

The mapping requirements of the Phase II Permit are met through an existing GIS viewer developed for the storm sewer system inventory statewide (Figure 3-1). The viewer is available to all DelDOT employees with access to the intranet. This satisfies the requirements of 40 CFR Part 122.21(f)(7) or Part 12.34.(b)(3)(i). This statewide map shows the location of all outfalls, the names and location of all waters of the United States that receive discharges from those outfalls, condition assessment data, and photographs.

In 2011, KCI continued to add some refinements to the Map Viewer and assisted DelDOT in formal training sessions to educate DelDOT design and maintenance staff on the use of the Map Viewer. 67 DelDOT maintenance, design and survey staff received the training.

Figure 3-1. Screen shot of Dover roadways from the most recent version of DelDOT’s NPDES MS4 Map Viewer application.



B. Outfall Screening in Urbanized Areas of Kent County

Dry weather screening of all outfalls in the Phase II permitted area of the state was completed in 2007 (see the 2007 Annual Report). Thus we have fulfilled the permit requirements.

Each new outfall that is inventoried and inspected is screened for dry weather flow. In calendar year 2011, a total of 2800 DeIDOT-owned outfalls were inventoried and screened. The majority of these were in Kent and Sussex Counties, all outside of the permitted urbanized area.

C. Prevention of Illicit Discharges and Illegal Dumping

Since it is often difficult or impossible to catch someone in the act of improperly disposing of yard waste, oil, paint, etc. into the storm drain, DeIDOT has for several years conducted a door hanger campaign to residents in subdivisions where an illicit discharge or illegal dumping activity was discovered or reported. This campaign is part of our outreach program to residents. It solicits public participation to anonymously report illegal dumping and serves as a “neighborhood watch.”

The front side of the door hanger lists the date and type of pollutant found and what water body affected. On the back, the door hanger describes stormwater pollution and guidelines to reduce pollution at the home or workplace (Figure 3-2).

Statewide during 2011, 10 potential illicit discharges (PIDs) were either reported to the DeIDOT NPDES Program or discovered during KCI’s MS4 inspection activities. Only one of these (at 2777 Andrews Road in Greenwood) was located outside of New Castle County. In March 2011, an inspection crew observed what appeared to be clumps of toilet paper and cloudy water at the bottom of an inlet at this location. A strong sewage odor also was detected. Chemical testing showed high levels of ammonia, detergents, turbidity and phenols. Further investigation, including inspection using a push camera, revealed a direct connection to the inlet from an apparent septic tank overflow. DNREC enforcement assisted with the investigation, and the homeowner was notified of DeIDOT’s intention to plug the connecting pipe. Additional information regarding all of the PIDs investigated in 2011 is provided in KCI’s 2011 Outfall Screening Report (Appendix C).

In an effort to encourage Delaware citizens to dispose of hazardous household materials properly, the DeIDOT NPDES Section helped publicize Delaware Solid Waste Authority (DSWA)’s Household Hazardous Waste Collection Program. This included distribution of DSWA brochures that announced the dates and locations of collections in each county.

Another public outreach program aimed at eliminating illegal dumping of trash, debris and hazardous wastes along the state’s highways, is DNREC’s “TrashStopper” Program. The public is asked to notify DNREC about any roadways or streets used for illegal dumping so the sites can be put under surveillance by digital cameras now effectively used for identifying trash dumpers. The public is also asked to identify the trash dumpers who are caught in the act in photos posted on the DNREC web site as part of the TrashStoppers campaign (<http://www.awm.delaware.gov/Enforcement/Pages/TrashStoppers.aspx>).

Figure 3-2. Educational door hanger distributed in communities with suspected or reported illicit discharges or dumping into storm drains.



Stormwater Pollution Found in Your Area!

This is not a citation.

Date: _____

This is to inform you that our staff found the following illegal pollutants in the storm sewer system in your neighborhood.

It is illegal to put any of these items in the storm drain, punishable by a minimum \$1000 fine:

- Motor oil/filters
- Antifreeze/transmission fluid
- Paint
- Solvent/degreaser
- Cooking grease
- Detergent
- Home improvement waste (concrete, mortar)
- Pet waste
- Yard waste (leaves, grass, mulch)
- Excessive dirt and gravel
- Trash
- Pesticides and fertilizers
- Other _____

The pollutants were found at: _____

This storm sewer leads directly to: _____



If you have any information regarding this or any other illegal discharge of pollutants, please call:
1-800-652-5600
dotpr@state.de.us





Stormwater runoff is water from rain or snow-melt that flows over the ground. As it flows, it can pick up debris, chemicals, dirt, and other pollutants and deposit them into a storm sewer system or waterbody.

Anything that enters a storm sewer system is discharged **untreated** into the waterbodies we use for swimming, fishing, and drinking water.

**Remember:
Only Rain Down the Storm Drain!**

To keep the stormwater that leaves your home or workplace clean, follow these simple guidelines:

- ☞ Use pesticides and fertilizers sparingly.
- ☞ Repair auto leaks.
- ☞ Dispose of household hazardous wastes, used auto fluids (antifreeze, oil, etc.), and batteries at designated collection or recycling locations.
- ☞ Clean up after your pet.
- ☞ Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- ☞ Sweep up yard debris rather than hosing down areas. Compost or recycle yard waste when possible.
- ☞ Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- ☞ Sweep up and properly dispose of construction debris such as concrete and mortar.

4. Construction Site Stormwater Runoff Control

Requirement:

The permittee shall continue to implement and enforce a program to reduce, to the maximum extent practicable, the discharge of pollutants from construction sites.

Performance/Measurable Goals:

A. Delegated Agency

The Department of Natural Resources and Environmental Control has delegated the authority to administer a sediment and stormwater program to DelDOT. The delegation is reviewed every three years. In 2009, DelDOT received delegation extension from DNREC through June 30, 2012. The components of the Delaware Sediment and Stormwater Regulations delegated to DelDOT are: review and approval of construction plans, review of construction sites, and inspection and maintenance of completed stormwater management facilities. Satisfactory performance of the delegated responsibilities will be considered compliance with this component of the SWPP&MP (see Annual Report 2003, Appendix F).

Enforcement of construction site erosion and sediment controls is accomplished through each construction contract. Section 110, Erosion, Sediment Control and Water Pollution, of the Delaware Department of Transportation Standard Specifications lays out a progressive step-wise approach to gaining compliance with approved plans, regulations, and laws. This section was significantly rewritten to demonstrate positive movement toward improving the Erosion & Sediment Program (See Annual Report 2007, Appendix F). The following items summarize the major changes:

1. Contractor required to provide CCR and must submit name at the time of bid and must conduct E&S reviews jointly with a member of DelDOT's construction staff.
2. Required pre-construction meeting specifically designed to address E&S compliance.
3. Better defined division of responsibilities among site reviewers, contractor engineer, project engineer, stormwater engineer
4. Strengthening of actions to gain compliance
5. Environmental Compliance Supervisor – This position at DelDOT has the responsibility to regularly track and review the construction site reviews submitted on a weekly basis from Notice of Intent (NOI) to Notice of Termination (NOT) and annually assess CCR's performance (Appendix D). The purpose of the Contractor Performance Evaluation Program is to better assure that CCRs considered for contract either possess, or will likely possess at the time contract performance is set to begin, all qualifications necessary to successfully complete the project on time. Getting the contractor CCRs to submit timely reports to DelDOT has been

inconsistent. We therefore determined that annual reviews may increase reporting compliance. The implementation of a mandatory, standardized system of evaluating CCR's performance is expected to yield consistency, objectivity, fairness, and accountability.

We executed an agreement with two consulting firms to perform the weekly CCR inspections in lieu of contractor provided CCRs as described in number 1 above. This will improve compliance with the required weekly and rain event reporting. The consultant will also have the authority to hire a third party contractor to correct E&S deficiencies if the prime contractor refuses.

The CCR reporting form was changed as a result of our delegation review with DNREC. Added were slots for the plan expiration date, rain event box, and a page dedicated to Pollution Prevention. All uncorrected deficiencies must show a reason for remaining incomplete.

DelDOT staff involved with erosion and sediment issues (E & S inspections, designing stormwater systems or review of stormwater plans) is required to complete DNREC's 3-day Certified Construction Reviewer (CCR) course.

DelDOT completed publishing a new, upgraded and updated version of its Erosion and Sediment Control Field Guide, which is made available to all DelDOT and contractor staff who install, inspect, and/or maintain construction BMPs.

The Environmental Protection Agency (EPA) has proposed new turbidity effluent guidelines. Construction sites that have greater than 10 acres of disturbed area would be required to maintain turbidity levels at, or below, 280 NTU for all storms events up to the 2-yr frequency. Owners/operators would be required to monitor the discharge from their sites to ensure compliance. However, the ruling was challenged and EPA was sued. The EPA discovered after promulgation that the data used to calculate the numeric limit was misinterpreted. The Agency initiated a stay for the numeric limit for turbidity until the limit can be recalculated. However, we purchased hand-held turbidity monitoring equipment for use during wet weather monitoring events and we plan to install an automated sampler at active a construction site in an effort to monitor our construction sites ahead of the new regulation.

B. Inspection and Operation of BMPs

DelDOT has an annual obligation to inspect its constructed best management practice (BMP) devices, structures and stormwater management facilities. The purpose of this statewide program is to: (1) inventory, inspect, measure water quality performance, identify noxious and/or invasive species and maintain functionality of DelDOT's stormwater BMPs such as stormwater ponds, sand filters, bioswales, bioinfiltration trenches, etc., (2) maintain a comprehensive database, (3) coordinate with the Districts on the submittal of work orders as needed, and (4) provide technical assistance and guidance to the Department regarding appropriate maintenance strategies for stormwater BMPs.

A field inspection manual and forms were developed to effectively perform field inspections to evaluate BMP performance and identify maintenance requirements. The procedures outlined in this manual assist DelDOT with decisions on inspection, maintenance, repair, and retrofit of BMP facilities. Overall performance and functionality are graded A-D. Table 4-1 describes the BMP rating system used by DelDOT.

Annual BMP inspections are conducted throughout the state by KCI Technologies, under Agreement 1354. KCI inspected 224 BMPs in 2011. Table 4-2 shows the 2011 rating summary by each maintenance district.

C. BMP Maintenance

BMPs are evaluated and placed on contract for maintenance as necessary and as money permits. Maintenance functions are performed by the Districts or through contractors specializing in noxious and invasive species control, or maintenance of specific BMP types.

In 2011, 22 BMPs were inspected in the Phase II permitted area. None of these BMPs warranted major maintenance. Invasive species control, where it affects BMP performance, occurs in the spring and fall by specialized contractors. In 2011, 8 BMPs were treated for Canada thistle and 18 for cattail/Phragmites.

Table 4-1. DelDOT’s stormwater BMP rating system.

Rating	Description
A	No Performance Issues BMP with no issues affecting performance.
B	Minor Maintenance BMP with minor maintenance required; repaired by DelDOT Maintenance District or third-party invasives spray contractor.
C	Major Maintenance BMP with major maintenance required; repaired by third-party contractor, with oversight by DelDOT NPDES Engineer.
D	Retrofit BMP with retrofit requirements; BMP is failing; needs to be redesigned or rebuilt with input from DelDOT Stormwater Quality Program.

Table 4-2. 2011 BMP Inspection Ratings Summary.

DISTRICT	# INSPECTED	A	B	C	D
North District	68	29	36	3	0
Canal District	84	22	61	1	0
Central District	22	8	14	0	0
South District	50	35	15	0	0
TOTAL NO.	224	94	126	4	0

5. Post-Construction Stormwater Management in Newly Developed Areas and in Redeveloped Areas

Requirement:

The permittee shall continue to implement and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb areas greater than or equal to one acre, including projects that disturb less than one acre that are part of a larger common plan of development, and that discharge to the storm sewer system.

Performance/Measurable Goals:

The Department of Natural Resources and Environmental Control has delegated the authority to administer a sediment and stormwater program to DeIDOT. Satisfactory performance of the delegated responsibilities, through triennial reviews, will be considered compliance with this component of the SWMP.

6. Pollution Prevention and Good Housekeeping

Requirement:

DelDOT shall develop and implement an operation and maintenance program with a goal of preventing and/or reducing discharges of pollutants associated with our operations as described in the Application page 13, Permit page 10, Part II.A.6.

Performance:

The following sections describe ways the Department practices source control at its facilities and manages and minimizes transport of pollutants associated with road repair and maintenance activities.

A. *Road Repair and Maintenance*

There are various ways in which the Department maintains the roadways that help reduce the discharge of pollutants. Routine maintenance and improvements reduce the pollutants coming from the roadway in several ways. The patching of potholes and sealing of cracks reduces the amount of pavement that will break away and be transported into the nearest waterway. Repairing potholes also decreases the wear and tear on vehicles, thus reducing the fluids, miscellaneous sediments, and tire particles that could be dislodged from vehicles. Money for roadway maintenance activities is programmed into the District's Maintenance funds.

All road projects are required to follow the Delaware Sediment and Stormwater Regulations. Projects designated as minor, medium or major must have an approved sediment and stormwater management plan. Medium and major projects must also have a site reviewer who is a Certified Construction Reviewer (CCR).

DelDOT staff and contractors continue to implement the practices set forth in Section 110 of the Standard Specifications for Erosion, Sediment Control and Water Pollution, modified in 2007. This Section addresses practices to control stormwater runoff from soil disturbance activities, spill prevention, material management and good housekeeping practices. Details may be found in Section 4 of this report (Construction Site Stormwater Runoff Control).

DelDOT follows the manual of Standard Operating Procedures developed for responding to and managing spills on the roadways classified as **Category E, Type E-1** incidents (Traffic Hazards, Fuel, Oil or other HAZMAT spills on or near the roadway). Most DelDOT vehicles have been equipped with spill kits in the event of an accidental spill or as a first responder to a vehicle accident, and maintenance employee are trained annually on spill response and protection of water quality.

B. *Sweeping Program*

DelDOT's sweeping program reduces pollutants by maintaining the cleanliness of the roadway. The street sweeping program includes the roadways, shoulder, intersections, and toll plaza lanes on primary, secondary and tertiary roads. The roadways are swept on the following cycle: roads with ADT (Average Daily Traffic) greater than 20,000 are swept 4 times a year, roads with ADT between 5,000 and 20,000 are swept 2 times a year and roads with ADT less than 5,000 are swept once a year.

DelDOT currently has 36 sweepers in its fleet statewide. Seven of the vehicles are assigned in Kent County and nine in Sussex County.

DelDOT's NPDES Section is trying to quantify the expected pollutant load reductions from controls such as sweeping. In 2011, DelDOT's Equipment Management Section installed automatic vehicle location (AVL) devices on all sweeper vehicles. This will assist the Department in verifying that the required sweeping frequency has been met, as well as obtain better estimates of pollutant load reductions resulting from sweeping activities.

In an effort to meet the draft Phase I (New Castle County) permit requirements for street sweeping, DelDOT tasked KCI Technologies to assist with developing an optimum science-based sweeping strategy for pollutant removal. This plan will accomplish the following:

- Prioritize roads to be swept, based on optimum water quality benefits with consideration of curbed roads (closed drainage), Average Daily Traffic, Industrial/Commercial or other hotspots, tree canopy
- Develop a roadway sweeping frequency plan for use by the Districts
- Provide analyses of cost and equipment requirements

The first step in this process has been completed which resulted in a literature search concentrating on questions formulated by DelDOT and KCI. A draft plan is due in Spring 2012. It is anticipated that this new sweeping strategy eventually will be implemented in the Phase II permitted area as well.

C. Litter Program

DelDOT's Litter Program reduces the discharge of floatables to the MS4.

DelDOT maintenance staff and prison crews

DelDOT's maintenance staff and prison crews help reduce the discharge of floatables to the MS4 through routine pick up of trash and debris from the roadways, medians and right-of-way. DelDOT staff is also responsible for removal of dead animals and clean up of illegal dump sites from the roadside.

Adopt-a-Highway

Adopt-a-Highway is a cooperative program between DelDOT's Division of Public Relations and volunteers to reduce litter along State roadways and subsequent discharge to waters of the State. This program supplements effort by DelDOT's maintenance forces to control litter. The volunteer groups are required to collect litter a minimum of twice per year and submit activity reports following each cleanup for inclusion in the program. Each group maintains approximately two miles of roadway. DelDOT maintains an Adopt-a-Highway website (www.deldot.gov) and submits press releases to solicit volunteers. There are currently 849 volunteer groups statewide (75 added in 2011) maintaining 1,698 lane miles. There are 272 groups in New Castle County who collected 1,971 bags of trash.

Roadside Clean-up

DelDOT held its seventh annual "Imagine a Litter Free Delaware" cleanup day along roads, highways and community areas in October 2011.

TrashStoppers

DNREC's campaign is an outward appeal to the public for help in stopping illegal trash dumping along Delaware roadways to stop illegal dumping of garbage, debris, and hazardous wastes. The "TrashStoppers" program relies upon the placement of numerous surveillance cameras.

D. Snow and Ice Program

Effective salt management practices can help reduce the amount of road salt that enters the environment. This translates into savings for DelDOT, protection against liability, and minimization of impacts of salt on our environment. DelDOT has many practices in place, both for the roadway and all maintenance facilities.

DelDOT has developed and instituted advanced snow fighting practices that began during the 2004-2005 winter season to include ground speed spreader controls, anti-icing, pre-wetting, and plow balance valves. These advanced techniques in snow and ice removal help DelDOT meet its goal of improved service to customers, reduce the impact to the infrastructure, and conserve salt which helps meet the goals of the NPDES Program by reducing the impact on the environment:

- Ground speed spreader controls provide accurate control of material usage.
- Anti-icing is the application of liquid deicers (Salt Brine) to road surfaces prior to a precipitation event to prevent the formation or development of bonded snow and ice. The Department uses 6000 gallon tanker trucks and 1300- and 1800-gallon capacity units that slide into the bed of a dump truck.
- Pre-wetting adds moisture to salt to "jump start" the melting action of the salt and causes the salt to stick to the road and prevent scatter or bouncing.
- Plow balance valves decreases the amount of weight that the plow cutting edge bears on the road surface decreasing damage to the road surface.

Salt application rates can vary depending on storm conditions, but the goal is 100 - 400 pounds of salt per lane mile as recommended by AASHTO. The rate is achieved by calibrating the equipment annually. Maintenance staff received training by Certified Power on proper use of the ground speed spreader equipment.

All salt stored at the maintenance facilities is under roof. Only during loading and unloading does the potential exist for salt to enter the stormwater system. DelDOT is following the salt management practices established by the "Statewide Salt Best Management Practices for DelDOT Maintenance Yards" plan developed for area maintenance facilities (see Annual Report 2004, Appendix U).

E. Stormwater Conveyance Systems

Maintenance of the stormwater conveyance system ensures proper functioning of the stormwater system and BMPs and thereby reduces the pollutants that are carried to nearby waterways. Money for this is programmed into the Districts' Maintenance funds. The MS4 and BMP inspections performed for DelDOT by KCI Technologies and Century Engineering continually generate and prioritize maintenance work orders.

This maintenance work includes three components:

- *Open system drainage* – General work to control erosion, as well as cleaning and reshaping of ditches. Stabilization of ditches reduces the amount of sediment that enters the local stream and waterways.
- *Closed system drainage* - Work performed on the components themselves, including general maintenance or replacement. This includes tasks such as drainage pipe repair and cleaning, catch basin/manhole repair and maintenance, and general maintenance on stormwater detention ponds.
- *Ponding problems* - Draining water off the roadways. This is usually the result of calls from citizens after a rain event.

F. Roadside Vegetation Management

All herbicide applications that are applied to DelDOT rights-of-way by contract applicators are reviewed prior to the award to the lowest bidder to insure that selected herbicides are labeled for the intended use, and that when feasible, a herbicide is selected that can be applied at a low-use rate. This review frequently reduces the total load of herbicide applied to DelDOT's rights-of-way.

DelDOT does not routinely fertilize its roadsides. The only nutrients applied to DelDOT's rights-of-way come as a result of leaving grass clippings on the ground after mowing. Degradation of this vegetative material results in the slow release of organic constituents, which are mineralized to plant nutrients by microorganisms and made available to turf grasses. This natural process results in minimal leaching of nutrients. Also this practice results in minimal surface runoff of nutrients from ground with a slope of 3 horizontal to 1 vertical or less.

Fertilizers are used in establishing turf grasses from seed on freshly prepared bare ground. This is generally done under contract with a firm using a hydroseeder. DelDOT's specifications require that 50% of the nitrogen product be a slow release form of ureaformaldehyde. The amount of nitrogen applied is 78 kg/ha. Phosphorous pentoxide is applied at 47 kg/ha of available P that is the sum of water soluble and citrate-soluble phosphate. Potassium oxide is applied at 31kg/ha of water soluble potash. In all cases areas that are seeded are covered with a recommended mulch.

Pesticides applied on DelDOT's rights-of-way are done according to label recommendations that are on the product and filed with EPA at the time of product registration. Pesticides applied on DelDOT's rights-of-way are done by contractors that are certified Delaware pesticide applicators. DelDOT employees that apply pesticides to DelDOT's rights-of-way are certified Delaware pesticide applicators or work under the supervision of a DelDOT employee that is a certified Delaware pesticide applicator. Typically, the only pesticides applied by DelDOT fall under the category of herbicides. DelDOT, however, may use other pesticides such as insecticides under certain circumstances.

DelDOT employees take required training courses that serve as credit toward renewal of their Delaware pesticide applicators license. Roadside Environmental Specialists attend conferences and working sessions on pest control technologies that are open to all DOT employees. Opportunities to use reduced amount of pesticides by using new low rate pesticides, adjuvants or surfactants that can enhance efficacy of pesticides and thus reduce rate, or alternatives to chemicals that are cost effective and efficacious are often topics of various sessions these specialists attend.

The following are active programs being initiated as part of the NPDES pesticide reduction strategy:

- *Guardrail Inventory* – DelDOT has the responsibility of maintaining a 4' clear zone around the guardrail for both public safety and structural integrity via mowing, hand trimming and herbicides. We executed an agreement with Wallace Montgomery & Associates, LLP in May 2008 to inventory all guardrails statewide. The project was completed in June 2009 and inventoried 310 guardrail miles. Attributes collected included material under guardrail, guardrail type, surrounding environmental features and identification of sensitive/no spray zones. The inventory and attributes collected will be used in development of a pesticide reduction strategy to limit the use of herbicides, particularly around environmental sensitive areas (e.g. streams, wetlands, drinking supply, etc.). Since DelDOT is continually upgrading, replacing, or adding new guardrail, we executed a new three-year agreement in 2011 with Wallace Montgomery to update and maintain DelDOT's existing guardrail inventory database. At least twice per year, DelDOT's NPDES Section provides information to the consultant on the locations of new guardrail installations. These will be integrated into the existing guardrail inventory database.
- *Guardrail Vegetation Management study* – DelDOT and the University of Delaware are conducting a controlled research study to test the effectiveness of treatment types under guardrail for weed control. Several types of weed block material, asphalt, low-grow fescue and natural growth with periodic hand-trimming are being monitored against a control. The results of this study will determine if these materials are effective at reducing herbicide application and can be used in specific locations such as environmental sensitive areas and drinking water supply reservoirs. We have extended this study through at least the next growing season to collect additional data on weed block materials and to test new plots of zoysia grass and other low-growth turf types.
- *Training* – In addition to the required training for pesticide license renewal, DelDOT holds or attends periodic training to further educate staff. In 2011, DelDOT Roadside Environmental staff attended two workshops.
- *Contract language* – Since DelDOT outsources most of the herbicide spraying, DelDOT has strengthened its herbicide contract language to reduce the environmental impact of herbicide treatment. We now require contractors to:
 - a. Use an EPA-approved drift control agent as part of the mix
 - b. Use only formulations of glyphosate with a full aquatic label.
 - c. Be aware of the locations of "Sensitive" or "No spray" zones and avoid applications within the limits of these areas. These zones will be identified through the guardrail inventory and made available to the contractor.
- *Record keeping and pesticide usage* – Contractors and DelDOT applicators are required to submit records of spraying activities to DelDOT's Environmental Roadside Section. The NPDES Program has begun tracking and reporting herbicide quantities to establish baseline herbicide usage. By tracking herbicide

quantities we will be able to identify the cause of spikes or declines in usage and use the data to assess pesticide reduction programs we have implemented.

G. Spill Prevention and Response on Roadways

DelDOT's Transportation Management Center (TMC) coordinates operations and shares information among its own personnel as well as various other transportation and public safety-related agencies, serving as the transportation interface among all such agencies in the state. They operate 24-hours per day/7 days per week. The TMC serves as the central communication point for DelDOT during major incidents, special events, and emergencies, and coordinates transportation management activities with other agencies. The TMC has special instrumentation that has been used to develop incident management capability.

The type of incident detected or called in has a direct effect on the notification process and steps that must be taken in order to be able to respond, assist, and document the incident in an expeditious manner. Incidents have been classified into one of seven categories, and then into sub-categories that further specify the type of incident that has occurred. These categories are listed below:

- Category A: Accidents (Emergency)
- Category B: Vehicle Fire (Emergency)
- Category C: Disable Vehicles (Emergency)
- Category D: Police Activity (Emergency)
- Category E: Traffic Hazards (Emergency)
- Category F: Roadway and Signal Operations (Traffic)
- Category G: Delay or Congestion (Traffic)

In June 2001, the TMC developed a manual of Standard Operating Procedures (SOP) that acts as a guideline for handling incidents and systems problems; as a training tool/resource for new employees and as a reference guide for the operations staff. *Category E: Traffic Hazards (Emergency)*, of the SOP describes the notification and documentation procedure involving fuel, oil or other HAZMAT spills on or near the roadway.

In the event of a spill such as fuel, oil, or HAZ-MAT, the TMC is required to notify the respective police agency since they are responsible for arranging for the particular traffic hazard to be removed. Generally, the police will contact the following agencies: Fire Board, DNREC (Department of Natural Resources and Environmental Control), tow company, and all other agencies that are required to attend such incidents.

In the event of a non-hazardous materials spill DelDOT mobilizes, responds and directs the clean up effort to prevent the material from entering the storm drain system or receiving waters. If the spill is of questionable material, DelDOT uses procedures as describe for HAZ-MAT spills. Most DelDOT maintenance vehicles have been supplied with spill kits, and maintenance staff are regularly trained on their use.

In addition to the TMC's Standard Operating Procedures, the NPDES Program has completed the Spill Prevention Control and Countermeasures Plans for DelDOT facilities that met the above ground storage tank minimums. These are described in section H below.

H. Pollution Prevention at the Maintenance Facilities

Pollution Prevention Plans

DelDOT's NPDES Program continues to manage a Stormwater Pollution Prevention Program (SWPPP) at each of the 16 DelDOT maintenance facilities. Development, implementation, and maintenance of the SWPPP provides the maintenance yards with tools to reduce pollutants contained in stormwater discharges and comply with the requirements of Delaware's "Regulations Governing Storm Water Discharges Associated with Industrial Activity." The program includes a written plan, timeline for plan implementation, inspection schedules, training and monitoring requirements, and proper storage and housekeeping measures. Each SWPPP has a pollution prevention team with designated responsibilities to carry out the plan.

Facility Inspections

Pollution Prevention Plan Team members are required to conduct quarterly inspections during dry and wet weather events to look for evidence of stormwater contamination. These inspections continued through the 2011 calendar year.

In addition, DelDOT NPDES Program staff annually conducts thorough SWPPP compliance inspections of each facility. Annual inspections were completed for all DelDOT maintenance facilities on October 25-27, 2011. A "Summary of Action Items," if any, is noted on the inspection form and gives specific instructions to the facility team and supervisors for corrective action. Follow-up correspondence with District managers will be conducted to ensure the action items were corrected.

Spill Prevention Control and Countermeasures (SPCC)

Maintenance facilities that met the above ground storage minimums requiring a SPCC plan were developed in order to comply with EPA's Oil Pollution Prevention regulations (40 CFR 112) contained within the Clean Water Act. An SPCC Plan discusses how the maintenance facility conforms to oil spill prevention and containment procedures. Each SPCC Plan is unique to the facility. As reported previously, the initial plans were completed and distributed in 2007. Because of the addition of new above ground storage tanks at Harrington and Cheswold maintenance facilities, SPCC plans were also prepared for these areas in 2008.

Training

Training videos were developed for maintenance staff. The videos provide training on protection of stormwater quality in the following areas:

1. Facility and vehicle maintenance
2. Stormwater contamination and spill prevention
3. Vegetation control and pollution prevention on public roads and highways
4. The regulatory requirements of the Spill Prevention Control and Countermeasures (SPCC) plans developed for each maintenance yard
5. Spill response and emergency procedures
6. The proper procedures for responding to facility and non-facility (roadway) based emergency events.

Each maintenance facility has copies of the videos, and current DelDOT personnel and new hires are required to view them. In addition, the NPDES Program also prepares training posters on elements of the PPP and SPCC Plans and distributes them to the yards several times per year.

Monitoring

The Pollution Prevention Plans currently require wet weather stormwater monitoring at four maintenance facilities. These facilities were chosen as representative of the 16 facilities located throughout the state. The four yards are: Kiamensi, Bear, Cheswold, and Harrington.

Monitoring was conducted during 2011 at each of the pond outfalls. Sampling techniques were performed in accordance with the Environmental Protection Agency (EPA) *Stormwater Sampling Guidance Document*, EPA 833-B-92-001 (July 1992). Semi-annual samples were collected once in each of the following six-month periods: January through June, and July through December.

The wet weather monitoring protocol includes 72 hours of antecedently dry conditions, minimum predicted rainfall depth of 0.10 inches, and two full days of standard maintenance yard operations since the last rainfall event. A first flush sample was collected within 30 minutes from the first noticeable flow, and delivered to the laboratory for analysis of total suspended solids, surfactants, chloride, pH, and total petroleum hydrocarbons: gasoline and diesel range organics. Measurements of flow, air temperature, water temperature, pH and turbidity were recorded on-site at the time of sample collection.

Table 6-1 displays the first flush concentrations measured during 2011 for all parameters at each of the four sites.

The total suspended solids (TSS) levels measured in the January 2011 sample collected at the Cheswold yard outfall (372 mg/L) exceeded the benchmark value of 100 mg/L. Operations at the yard were investigated shortly after the test results were received in order to determine the source(s) of the excess sediment discharge. No specific source was found. NPDES staff will continue to inspect the yard periodically to determine if any additional BMPs are needed at this site.

As in the previous year, chloride levels at pond outfalls were somewhat higher than usual in the winter samples. The winters of both 2010 and 2011 saw abnormally severe winter storms, with several feet of snowfall and continual emergency operations. Once the storm periods passed, chloride levels returned to normal background levels.

Vehicle Wash Water Plan

In July of 2005, DelDOT submitted a report entitled *Statewide Vehicle Wash Water Practices for DelDOT Maintenance Yards* (see Annual Report 2005, Volume 2 of 2, Appendix Z) to DNREC. This report outlined the Department's proposal for treating vehicle wash water on-site at our sixteen (16) maintenance facilities. Our goal was to develop options to treat vehicle wash water and stormwater to acceptable levels before it exits our site and enters receiving waters. To meet this objective we developed a stormwater "treatment train" at each maintenance facility. This method incorporates multiple Best Management Practices (BMPs) to treat wash water to the maximum extent practicable. In several cases, existing practices, together with proposed policy changes and employee training, were sufficient to treat the vehicle wash water. In other cases, there is a need to design and construct retrofits at the facilities.

In the 2010 Annual Report we detailed the Harrington Maintenance Yard stormwater retrofit that had been completed. In 2011 we began and completed the design for a Vehicle Wash Area Retrofit at the Chapman Maintenance Yard in New Castle County.

I. Employee Training Program

The following is a list of training workshops and conferences attended by DelDOT staff and training material produced in calendar year 2011:

- All statewide district maintenance staff are required to view the following videos as part of Pollution Prevention Plans: Stormwater Contamination & Spill Prevention, Vegetative Control & Pollution Prevention, and Facility & Vehicle Maintenance.
- All maintenance staff are required to view videos as part of the Spill Prevention Control and Countermeasures Plans. The three topics include: SPCC regulatory requirements, spill response and emergency procedures and roadside events.
- NPDES staff are members of the Nonpoint Source Advisory Committee and attend the annual workshop.
- As part of the NPDES industrial permit, the NPDES Section issues training bulletins to each maintenance facility statewide. These bulletins support DelDOT maintenance staff in its efforts to achieve and maintain compliance with the stormwater pollution prevention regulatory requirements. The bulletins are placed in a visible location at each yard. During the 2011 calendar year, one issue describing stream and culvert work was distributed.
- The following training/workshops were attended by NPDES or DOTS stormwater staff:

Workshops

- Applicator Certification Core Test: 29 DelDOT staff
- NPDES Map Viewer: Three training workshops were held: March 29 & April 28: 31 DelDOT maintenance staff; November 29: 36 design, construction and survey staff.
- May 10-11, 2011: NHI Course on Water Quality Management of Highway Runoff; Identify and Characterize the quantity and quality of highway runoff; develop conceptual designs for various BMPs considering treatment targets, design requirements, BMP performance goals, and maintenance considerations, etc.
- June 20-21, 2011: Bioretention/Bioinfiltration Summit at Villanova University
- September 28, 2011: Water Words that Work workshop; DelDOT, NCCo., municipalities
- November 17, 2011: Discussions with DNREC: A One-Day Symposium on Water-Related Topics; discussion of new DNREC reorganization and water-related topics

Web casts

- March 30, 2011: Managing Engineering and Operations Information for Improved Transportation Asset Management

- September 8, 2011: AssetWise for Transportation; discuss the benefits of an asset life cycle information management platform and associated applications
- September 21, 2011: EPA's Watershed Academy Nitrogen and Phosphorus Pollution Series webcast titled: State and Local Policies to Restrict the Use of Phosphorus Lawn Fertilizer
- October 4, 2011: NHI course – Maintenance of Drainage
- October 5, 2011: How gross can it get? Illicit discharge and sweeping webinar
- October 26, 2011: Using Social Media for Stormwater Education webinar
- October 27, 2011: Conducting Effective Stormwater Outreach
- The Roadside Environmental Section staff attended various courses and workshops for re-certification, pesticide credits, and International Society of Arboriculture credits including:
 1. Ornamental and Turf Workshop, November, 2011
 2. Horticulture Industry and Expo, January 26-27, 2011
 3. National Roadside Vegetation Management Assn. Annual Conference, Little Rock, AR, September, 2011
 4. First Annual Arborist Workshop, March, 2011

Table 6-1. 2011 wet weather monitoring results from DelDOT maintenance facility BMP outfalls. The samples were collected once in each of the following six-month periods: January through June, and July through December. All results are reported in mg/L.

PARAMETER	KIAMENSI		BEAR		CHESWOLD		HARRINGTON	
	01/18/11	08/09/11	01/18/11	08/09/11	01/18/11	09/06/11	01/18/11	09/06/11
Total Suspended Solids	35	78	8	261*	372*	36	6	5
Surfactants, MBAs	0.18	0.20	0.11	0.16	0.16	0.19	0.07	0.08
Chloride	15700	1580	1620	107	9170	258	143	68.2
TPH-Gasoline Range Organics	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH-Diesel Range Organics	0.95	0.28	0.23	0.48	0.66	0.39	0.11	0.16
pH	7.58	7.34	9.51	7.23	7.42	7.52	7.50	8.93

*Exceeds benchmark value.

Benchmark Values:

TSS – 100 mg/L

Surfactants – 1.0 mg/L

Chlorides – no benchmark exists

Oil and Grease – 15 mg/L

pH – 6 to 9 s.u.

Appendix A. Appoquinimink River Association summary report for 2011.

Appoquinimink River Association 2012 Report

Livable Lawns Campaign – Improper fertilization of lawns and open spaces is a huge problem in the entire state. The Appoquinimink River Association, Department of Natural Resources and Environmental Control, Department of Transportation NPDES Program, Delaware Nursery and Landscape Association, Delaware Grounds Management Association, University of Delaware, USDA-Natural Resource Conservation Service, Nutrient Management Commission and New Castle Conservation District continued meeting and creating a system to recognize those commercial applicators that are being environmentally friendly. Alongside the finalization of the commercial applicator program, 2011 brought the following accomplishments:



Livable Lawns Presentations (5):

1/27/2011	DE Horticulture Industry Expo
2/8/2011	DE Nutrient Management Commission
3/1/2011	DE Grounds Management Association Annual Meeting
3/3/2011	DE State Golf Association
7/22-7/31/2011	DE State Fair

Promotional Materials:

Commercial Brochure

- 250 Original printing of commercial brochures
- 350 Livable Lawns brochures reprinted 2/2011

Brochures were distributed at 1/27/11, 2/8/11, 3/1/11 and 3/3/11 presentations. Sign-up sheets were made available at all presentations. Brochures (208) were bulk mailed to all DNLA members on 2/7/11.

Website

Website Designed and Launched – 8/2011
Website/Smartphone enhancements completed 10/2011

Handouts

Magnets & Rulers were developed and produced 6/2011

Companies:

- 20 companies expressed interest; 17 viable companies that fit w/in the parameters; 2 completed the certification

Pet Waste Education – Alongside the Departments of Natural Resources and Environmental Control and Transportation, the Appoquinimink River Association continued an intensive pet waste education campaign throughout southern New Castle County. Over 500 portable pet waste collection bag holders were distributed to training facilities (350) and at outreach events (165) including the Blackbird Fall Festival.



“No Pile Left Behind” Waste Bags

On Saturday, October 22, 2011, PAWS for People (Pet-Assisted Visitation Volunteer Services) held their 3rd Annual “Wag-n-Walk & 5K Run” event at Glasgow Park in Bear, Delaware. Luke Williams with Boy Scout Troop 283 made arrangements with PAWS for People to have a display set up at the event which provided information about how the surface water quality in Delaware is impaired by different pollutants including bacteria from pet waste. Luke, along with some helpers, distributed over 115 pet waste bags to attendees at the event. PAWS staff even made an announcement over their public address system that free pet waste bags were available and encouraged people to stop by and visit the display. Following the event PAWS contacted Luke and requested additional bags. Luke has emailed the group several times asking for a delivery location for the bags but they have failed to respond to his requests.



Boy Scout Luke Williams standing beside his “No Pile Left Behind” display at the PAWS 3rd Annual “Wag-n-Walk & 5K Run” event at Glasgow Park.



Luke Williams (left) meeting with PAWS Director. Photo the right shows helpers passing out pet waste bags to event participants.



Luke Williams displaying pet waste bag with crowd of event attendees in background.

Luke also provided approximately 350 pet waste bags to the American Canine Doggie Daycare in Middletown, Delaware.

Appendix B. KCI Technologies 2011 Storm Drain Inventory and Inspection Project
Summary Report.



DELDOT AGREEMENT 1591
STATEWIDE MS4 / BMP INVENTORY & INSPECTION
2011 ANNUAL REPORT



The following is a summary of work performed by KCI Technologies, Inc. (KCI) and Century Engineering, Inc. (CEI) from January 1 to December 31, 2011 on the Delaware Department of Transportation's (DelDOT) Agreements 1354 and 1591. The 5-year Agreement 1354 ended in December 2011. The KCI/CEI Team was awarded Agreement 1591 in November 2011, and Notice to Proceed for Task 1 of this 3-year open-end contract was granted on December 8, 2011.

A. PROJECT MANAGEMENT

in 2011, KCI submitted a *2010 Agreement 1354 Annual Report* and a *2010 Annual BMP Inventory & Inspection Report*, as well as several Memorandums. In addition, KCI conducted six project status meetings and four internal field staff meetings (**Table 1**).

TABLE 1
PROJECT STATUS AND
INTERNAL FIELD STAFF MEETINGS

Project Status	Internal Field Staff
03/10/11 (#36)	04/04/11
05/05/11 (#37)	06/09/11
06/23/11 (#38)	09/14/11
09/01/11 (#39)	10/27/11
10/20/11 (#40)	
12/08/11 (#41)	

The project status meetings were held with DelDOT, KCI, and CEI to discuss work completed and outstanding issues. KCI distributed an agenda at least two days prior to each meeting and prepared meeting minutes for each meeting within 48 hours, including an Action Item List highlighting necessary actions, responsible parties, and target completion dates. These meetings have been highly effective in coordinating with DelDOT, identifying priority work, and resolving issues in a timely manner.

KCI conducted internal field staff meetings to discuss scheduling and to identify any data collection issues. The purpose of the internal meetings was to provide an opportunity for field crews to share their experiences with other field crews, and to develop the most efficient and consistent inspection methodology. Additional internal meetings were held with KCI's GeoSpatial Solutions staff to discuss and schedule refinements to the NPDES Map Viewer according to DelDOT's comments.

In 2011, KCI conducted four DelDOT NPDES Map Viewer Training Sessions (**Table 2**). These training sessions were held in March 2011 for DelDOT maintenance staff and in November 2011 for DelDOT design staff. The purpose of the training sessions was to introduce the non-NPDES DelDOT staff to the Map Viewer, provide instruction on its use, and offer example-specific exercises that illustrated how the viewer could aid DelDOT staff.

**TABLE 2
DELDOT NPDES MAP VIEWER TRAINING SESSIONS**

Map Viewer Training	
NPDES Map Viewer Training - Dry Run	03/22/11
NPDES Map Viewer Training - South Maintenance	03/29/11
NPDES Map Viewer Training - North Maintenance	04/28/11
NPDES Map Viewer Training - Design Staff (2 sessions)	11/29/11

Table 3 lists the deliverables transmitted to DelDOT in 2011. A majority of these deliverables related to BMP inspections and reports. Other deliverables pertinent to Agreement 1591 are included in the *Agreement 1495 Environmental Water Quality Monitoring 2011 Annual Report*, which includes outfall screening and illicit discharge investigations, some of which originated from Agreement 1591 inventory and inspection.

**TABLE 3
DELIVERABLES**

Date	Deliverable
02/23/11	Asset Management Project to University of Delaware
02/23/11	Agreement 1354 2010 Annual Report
03/10/11	Draft 2010 Annual BMP Report
03/30/11	Agreement 1354 NPDES GIS Database to USEPA
05/11/11	Final 2010 Annual BMP Report – PDF Files
06/22/11	BMPs 6, 84, 90, 166 Sediment Analysis – ACL Results
07/22/11	2011 Cattail/Phragmite Spray Map
07/22/11	2011 BMP Inspection Updates
08/05/11	Map Viewer User List 08-05-11
08/09/11	Interim Status Meeting Update
08/29/11	MWOs minus Completed MWOs to date
08/29/11	Added fields for Problem Code and Failure Class
09/06/11	DelDOT NPDES Geodatabase to Doug Rambo (DNREC)
09/08/11	Revised Maintenance Work Orders to DelDOT
09/12/11	Map Viewer User List 09-12-11
09/14/11	Notification that BMP Plan sheets were fixed in Map Viewer Supplemental Files
10/11/11	10/11/11 BMP 126 Inspection Memorandum: Sediment Depth Measurements
12/20/11	Map Viewer User List 12-20-11

B. DATABASE MANAGEMENT

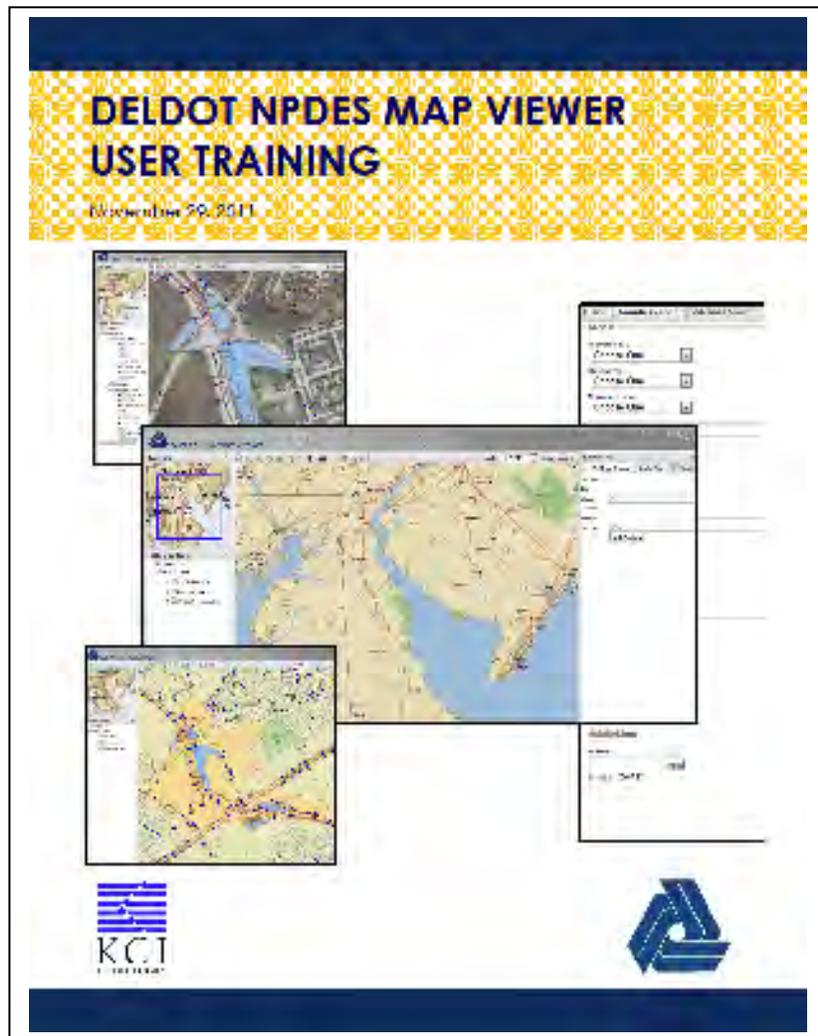
In 2007, KCI's Technology Services division developed a field application using advanced hardware, redesigned the existing Database structure to allow for re-inspections, migrated all existing data into the new Database design, and began development of a new field application to fit the new Database design.

In 2008, KCI's Technology Services division completed the development of the Field Application, Version 2 and developed a Web-based Map Viewer to replace and upgrade DelDOT's existing Map Viewer. In 2009, DelDOT expressed a desire for KCI to simplify the Map Viewer, especially the querying capabilities.

In 2010, KCI completed the refinements to the Map Viewer including simplifying querying and report creation for BMPs, conveyances and structures, and adding a drainage area layer for BMPs and Major Outfalls. In addition, KCI developed a *Map Viewer User's Guide* to assist with the use of the viewer.

In 2011, KCI assisted DelDOT in formal training sessions to educate DelDOT design and maintenance staff on the use of the Map Viewer.

The current ArcGIS Server 9.3.1 webADF codebase was migrated to ESRI's ArcGIS Server 10.0 SP2 Javascript API at the end of 2011 in preparation for the ESRI's webADF deprecation at ArcGIS Server 10.1. The Javascript API version of the DelDOT NPDES web viewer will be put into production in early 2012.



C. BEST MANAGEMENT PRACTICE (BMP) INVENTORY AND INSPECTION

In early 2012 under separate cover, KCI will submit the *2011 Annual BMP Inventory & Inspection Report*. The 2011 Annual Report will summarize the inspections for each BMP and provide recommended actions for BMPs in four categories:

- BMPs requiring **MAINTENANCE** by DelDOT maintenance staff (Maintenance Work Orders),
- BMPs requiring **INVASIVE SPECIES** to be eradicated by third party contractor,
- BMPs requiring **CONTRACTED WORK** by a third party contractor, and
- BMPs requiring **RETROFIT** evaluations by DelDOT’s Stormwater Quality Program staff.

BMPs are assigned a summary rating based on the recommended actions identified during the inspections. These ratings are defined in **Table 4**. In 2011, KCI inspected only those BMPs that were rated A and B in 2010. BMPs rated C and D are being scheduled for maintenance as part of a separate DelDOT maintenance contract. **Table 5** summarizes the BMP inspections conducted in 2011 by KCI and CEI. The ratings shown in **Table 5** are preliminary at this stage, and will be reviewed and finalized during DelDOT’s review and completion of the *2011 Annual BMP Inventory & Inspection Report*.

**TABLE 4
OVERALL BMP RATING SYSTEM**

Rating	Description
A	No Performance Issues BMP with No Issues affecting performance.
B	Minor Maintenance BMP with Minor Maintenance required; repaired by DelDOT maintenance district or third party invasive spray contractor.
C	Major Maintenance BMP with Major Maintenance required; repaired by third party contractor.
D	Retrofit BMP with Retrofit requirements; BMP is failing; needs to be redesigned or re-built with input from DelDOT Stormwater Quality Program.

**TABLE 5
2011 BMP INSPECTIONS AND RATINGS**

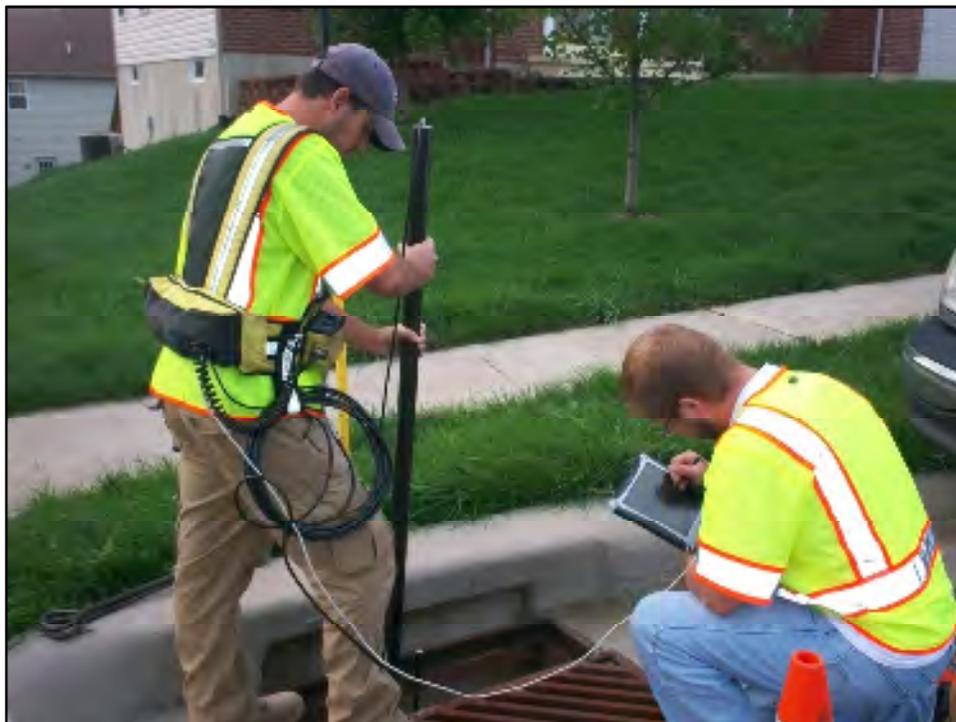
District	Total BMPs Inspected	BMP Performance Rating			
		A	B	C	D
North	68	29	36	3	0
Canal	84	22	61	1	0
Central	22	8	14	0	0
South	50	35	15	0	0
TOTAL	224	94	126	4	0

D. NEW CASTLE COUNTY RE-INSPECTION

KCI began re-inspection of DelDOT’s MS4 in New Castle County subdivisions in February 2008, based on KCI’s Subdivision Re-inspection Schedule (**Table 6**). The re-inspection schedule is based on a 5- and 10-year re-inspection cycle for subdivisions according to the acceptance date of the subdivisions. The subdivisions planned for re-inspection in 2009 (subdivisions accepted from 1951-1965) were completed in March 2010. In October 2010, DelDOT requested that KCI dedicate both KCI field crews to Kent County Initial Inventory and Inspection work. In 2012, KCI will be assigning a field crew to New Castle County to continue re-inspecting the 1951-1965 subdivisions.

**TABLE 6
 SUBDIVISION RE-INSPECTION SCHEDULE**

Year	Subdivisions	Cycle	Re-inspect?	Date Completed
1	Database Re-design	--	--	December 2007
2	1935-1950	5	Yes	December 2008
3	1951-1965	5	Yes	May 2010
4	1966-1980	5	Yes	25% Complete
5	1981-1995	10	Yes	--
5	1996-2005	10	No	--



New Castle County Inventory and Inspection – Subdivision Re-inspection

E. NEW CASTLE COUNTY INITIAL INVENTORY AND INSPECTION

KCI suspended Initial Inventory and Inspection work in New Castle County in October 2010 in order to focus on completing Kent County Initial Inventory and Inspection work by the end of 2011. In 2012, KCI will be assigning a field crew to New Castle County. This field crew will focus on inventory of new storm drain systems associated with recently constructed roadway improvement projects such as, I-95 from the City of Wilmington and the Maryland State line. KCI will be utilizing a Desktop approach to this inventory for new roadways, by using construction plans and electronic files. This will save time and money by eliminating Maintenance of Traffic.

In addition to new storm drain systems associated with new roadway construction, KCI will be implementing a new process for inventory and inspection of recently accepted subdivision streets and storm drain systems. Once subdivision streets (and storm drain systems) are accepted by DelDOT, there is a three-year warranty period, whereby the developer is responsible for maintenance of the street and storm drains system. KCI will aim to inventory and inspect these storm drain system in these newly accepted subdivisions during the 3rd year of the warranty to help ensure that these systems are in good condition when the warranty period ends.

F. KENT / SUSSEX COUNTIES INITIAL INVENTORY AND INSPECTION

KCI and CEI focused on completing the Initial Inventory and Inspection work in Kent County in 2011. Kent County was 99% complete as of December 2011. The KCI/CEI Team inventoried and inspected 11 subdivisions and 376.5 miles of non-subdivision roadways, for a total of 20,149 structures in Kent and Sussex Counties (**Table 7**). Starting in 2012, KCI and CEI will focus on completing the inventory & inspection of Sussex County within three years.



Kent County Initial Inventory and Inspection – Open Drainage

TABLE 7
2011 INITIAL INVENTORY / INSPECTION TOTALS
KENT / SUSSEX COUNTIES

Month (2011)	Subdivisions	Non-Subdivision Roadway Miles	Structures
January	0	25.0	1,509
February	0	33.9	1,969
March	0	35.0	1,822
April	0	31.6	1,462
May	0	21.5	1,405
June	0	38.1	1,819
July	0	30.2	1,740
August	0	23.1	1,680
September	0	29.7	1,439
October	0	30.2	2,044
November	5	57.8	1,739
December	6	19.5	1,521
TOTAL	11	375.6	20,149



+

Kent County Initial Inventory and Inspection – Closed Drainage

G. 2011 MAINTENANCE WORK ORDERS

During the MS4 inventory and inspection process, storm drain system deficiencies identified by KCI are submitted to DelDOT for upload to their maintenance work order system, MAXIMO. MAXIMO delivers the work order to the appropriate maintenance district, lists the concern, identifies a remedial action, and rates the concern (minor to severe). **Table 8** lists the maintenance work orders submitted to DelDOT and completed by DelDOT in 2011. Some issues related to safety (i.e., missing or broken catch basin grate) are considered Immediate Action concerns, and the appropriate maintenance district staff is notified as soon as these safety issues are identified.

**TABLE 8
 2011 MAINTENANCE WORK ORDERS (NO.)**

Type	North District	Canal District	Central District	South District
Submitted to DelDOT	321	152	63	36
Completed by DelDOT	117	40	13	0



Maintenance Work Order - Broken Grate

H. STATEWIDE INVENTORY SUMMARY

Tables 9, 10, and 11 summarize the number of BMPs, Structures and Conveyances contained in the DeIDOT NPDES Database.

**TABLE 9
STATEWIDE STRUCTURES (NO.)**

Category	NCC	Kent	Sussex
Inlet	43,207	19,391	2,786
Outfall	8,040	11,395	1,888
Manhole	5,164	776	25
Swale End	4,656	2,729	202
TOTAL	61,067	34,291	4,901

**TABLE 10
STATEWIDE CONVEYANCES (LF.)**

Type	NCC	Kent	Sussex
Open	2,226,208	8,311,273	563,975
Closed	4,661,498	1,542,543	180,646
TOTAL	6,887,706	9,853,816	744,621

**TABLE 11
STATEWIDE BMP (NO.)**

Type	NCC	Kent	Sussex
Check Dam	6	0	0
Bioswale	70	7	51
Bioretention	19	0	1
Dry Pond	44	6	2
Filter Strip	4	2	0
Infiltration Basin / Trench	9	1	0
Sand Filter	66	1	1
Sediment Forebay	4	0	3
Wet Pond	85	23	8
Wet Pond / Wetland	3	0	0
TOTAL	310	40	66

Appendix C. KCI Technologies 2011 Outfall Screening Summary Report.

Note: The report's appendix contains only the details of illicit discharge investigations in Kent and Sussex Counties. For the full report that includes New Castle County, see DelDOT's Phase I Permit report for 2011.



**DELDOT AGREEMENT 1495
WATER QUALITY MONITORING
OUTFALL SCREENING
2011 ANNUAL REPORT
TABLE OF CONTENTS**



A. OUTFALL SCREENING & POTENTIAL ILLICIT DISCHARGES

Table 1 2011 Potential Illicit Discharge Investigations

B. NPDES FLYER AWARENESS DISTRIBUTION

C. BEST MANAGEMENT PRACTICES DRAINAGE AREAS

D. NEXT STEPS

APPENDIX A - Potential Illicit Discharge Investigations:

Correspondence, Field Information and Documentation - Tab Dividers 1-10

(See **Table 1** for PID Corresponding Tab Divider No.)



**DELDOT AGREEMENT 1495
WATER QUALITY MONITORING
OUTFALL SCREENING
2011 ANNUAL REPORT**



As part of the Delaware Department of Transportation's (DelDOT) National Pollutant Discharge Elimination System (NPDES) General Permit Program Regulations Governing Stormwater Discharge, KCI Technologies, Inc. was contracted to conduct dry weather outfall inspection and monitoring of DelDOT-owned storm drain outfalls. Other activities conducted under this task included: Investigation of Potential Illicit Discharges (PIDs), NPDES Flyer Awareness Distribution, and Best Management Practices Drainage Area Delineation/Comparison.

A. OUTFALL SCREENING & POTENTIAL ILLICIT DISCHARGES

In 2011, 2800 outfalls were screened as part of the inventory, inspection and re-inspection tasks under Agreement 1354/1591.

In 2011, ten Potential Illicit Discharges (PIDs) were investigated. **Table 1** lists those PIDs that had dry weather flow discharge and the testing results, as well as PIDs that were investigated and determined to have no follow-up requirements. Detailed correspondence, field investigation information and documentation regarding PIDs are provided in **Appendix A**. **Table 1** indicates the corresponding **Appendix A** tab divider number (1-10) for each PID listed.



Outfall Screening



*PID: 23 Garrett Road
Leaf Dumping in Catch Basin*



*PID: 223 Sioux Court
Dry Weather Flow
from 4" Pipe in Manhole*

B. NPDES FLYER AWARENESS DISTRIBUTION

The purpose of the NPDES flyer awareness distribution (doorhangers) is to inform the public and increase awareness of illegal dumping of pollutants into the surrounding storm sewer systems. Doorhangers were distributed to those areas where suspected illegal discharge/dumping had occurred, as observed by the general public and/or field crews performing storm drain inventories. In 2011, 18 doorhangers were distributed in Kirkwood Gardens in New Castle County.

C. BEST MANAGEMENT PRACTICES DRAINAGE AREAS

KCI completed drainage area delineations for DelDOT-owned Best Management Practices (BMPs) in the Chesapeake Bay Watershed. BMP drainage areas were evaluated using Stormwater Management Reports. A total of 52 BMP drainage areas in the CBW were submitted in 2011.



*Chesapeake Bay Watershed
DelDOT-Owned BMP 415
South District*



*Chesapeake Bay Watershed
DelDOT-Owned BMP 180
South District*

In addition, KCI completed a comparison of the BMP Types and Drainage Areas, as listed in the DelDOT Master Inventory; the Map Viewer; and the Construction Plans/Stormwater Reports (via Map Viewer Link). Refinements to the drainage areas will occur in Winter 2012.

D. NEXT STEPS

KCI's goal for 2012 is to complete the delineation of drainage areas for all major outfalls in Kent and Sussex Counties, and the delineation of drainage areas for all DelDOT-owned BMPs throughout the state. In addition, KCI will continue to provide as-needed outfall screening activities in 2012. This includes investigating dry weather flow and potential illicit discharges at outfalls and storm drain structures discovered by KCI field crews, DelDOT maintenance staff or the public.

**TABLE 1
DELAWARE DEPARTMENT OF TRANSPORTATION
POTENTIAL ILLICIT DISCHARGE INVESTIGATIONS
Agreement No. 1495 FY12**

2010 INITIATED / 2011 SITE VISITS									
Structure No.	Date	Neighborhood	Address	Reported By	Issue Reported	Investigation Results	Determination	Action	2011 Annual Report Binder Tab #
NEW CASTLE COUNTY									
32008040 71311737	01/18/10	N/A	Outfall to BMP 241 / Route 7	Agr 1354 Field Crew	Dark green stain on outfall pipe leading to BMP 241; outfall discharge clear; dead fish directly in front outfall pipe.	Sampled tested within acceptable parameter levels.	Re-visit site.	Re-visit site.	1
	03/02/10				No dead fish; foam in front outfall pipe.	Sample tested high for detergents.	Re-visit site.	Re-visit site.	
	06/25/10				Follow-up visit.	Sample tested high for detergents.	Re-visit site.	Re-visit site.	
	12/22/11				Follow-up visit.	Sampled tested within acceptable parameter levels.	No further action.	No further action.	
71506	03/02/10	Todd Estates	42 Lynchfarm Drive	Agr 1354 Field Crew	Pet waste in catch basin.	Pet waste on grate and in catch basin.	Distributed 25 doorhangers.	Re-visit site.	2
	11/02/11				Follow-up visit.	No pet waste observed in or around catch basin.	No further action.	No further action.	
74839	03/02/11	Todd Estates	23 Garrett Road	Resident	Resident reported neighbor dumping leaves in catch basin.	Catch basin 75% full organic debris.	Re-visit site.	Re-visit site.	3
	03/08/10				Follow-up visit.	Catch basin 75% full organic debris.	Distributed 16 doorhangers.	Re-visit site.	
	11/02/11				Follow-up visit.	No signs of fresh leaf dumping. Catch basin 30% full organic debris. 25 Garrett Rd. resident said 23 Garrett Rd. resident still dumping leaves in catch basin.	No signs of ongoing leaf dumping.	No further action.	
5143	08/31/10	Lambeth Riding	504 Lambeth Place	Agr 1354 Field Crew	PVC pipe in side wall of concrete pipe connecting to catch basin; flow observed from PVC pipe collecting in catch basin.	Sample tested within acceptable parameter levels; could not find flow source.	Re-visit site.	Re-visit site.	4
	12/22/11				Follow-up visit.	Sample tested within acceptable parameter levels; could not find flow source.	No further action.	No further action.	
11712-11721	11/01/10	Mendenhall Village	Lampfighter Way	DelDOT	Report of grass clipping dumping in catch basin.	No evidence of grass clippings in any catch basins on Lampfighter Way.	Re-visit site.	Re-visit site.	5
	11/02/11				Follow-up visit.	No signs of grass clippings dumped in or around catch basins.	No further action.	No further action.	
620110622105245	11/01/10	N/A	316 Pigeon Point Road	DelDOT	Greenish substance in/around area of new inlet pipe.	No evidence of greenish substance. Observed dry white crystallized substance.	Re-visit site.	Re-visit site.	6
	06/14/11					No evidence of greenish substance. Observed dry white crystallized substance and large salt mounds covered with tarps.	Appears salt washing from salt mounds leaving stains on asphalt draining from 316 Pigeon Pt Rd into DelDOT's ROW. Salt runoff to Loddell Canal which leads straight to Delaware River.	Forwarded to DelDOT 06/28/11 for transmittal to DNREC to confirm NPDES industrial permit for this area.	

**TABLE 1
DELAWARE DEPARTMENT OF TRANSPORTATION
POTENTIAL ILLICIT DISCHARGE INVESTIGATIONS
Agreement No. 1495 FY12**

Structure No.	Date	Neighborhood	Address	Reported By	Issue Reported	Investigation Results	Determination	Action	2011 Annual Report Binder Tab #
NEW CASTLE COUNTY (Continued)									
20257-20258	03/25/11	Kirkwood Gardens	2410 Owen Drive Wilmington, DE 19808	Neighbor via DelDOT	Resident dumping yard waste into catch basin	Large amount sediment, leaves, organic debris on surface of catch basins; minimal yard waste inside catch basins.	Distributed 18 doorhangers.	No further action.	8
Charcoal Pit	05/31/11	None	2800 Concord Pike	DelDOT	Grease dumping.	Grease leaking from Charcoal Pit grease trap through a gap in stormwater pipe joint.	NCC to contact DNREC.	NCCo will contact DNREC. No Further Action by DelDOT.	9
12000907 & 12000910	11/15/11	The Woods	223 Sioux Court	Agr 1354 Field Crew	Dry weather flow from 4" pipe inside manhole.	Sampled tested within acceptable parameter levels.	Re-visit site.	Re-visit site.	10
	Sampled tested within acceptable parameter levels.					No further action.	No further action.		
KENT COUNTY									
520110114081352	03/24/11	N/A	2777 Andrewsville Road Greenwood, DE	Agr 1354 Field Crew	Possible sewage connection into stormdrain system	Clumps toilet paper in bottom of catch basin with strong sewage odor. Sample tested high for ammonia, detergents and turbidity.	Possible septic tank overflow.	Forwarded to DelDOT. DNREC investigated- recommend having pipe closed by DelDOT. 05/20/11: Attempted to send DelDOT Illicit Discharge notice by US Certified Mail-Returned by Post Office "No Mail Receptacle-Unable to Forward" 06/14/11. Sent regular US Mail.	7
	04/07/11					Strong sewage odor. Sample tested high for ammonia, detergents, turbidity and phenols.			
	04/13/11					DNREC investigated/spoke w/resident; recommended to have pipe closed.	DNREC recommends pipe closure.	Schedule push camera inspection.	
	06/29/11					Tri State Grouting push camera inspection.	Junction box discovered connecting to what appears to be an additional sewage pipe.	Will continue to try to notify homeowner of the requirement to correct within 30 days.	
	11/22/11					DNREC contacted homeowner (Tim Carrington 302-382-9649) and recommended he call DelDOT. DelDOT confirmed with Mr. Carrington that DelDOT intends to plug pipe; and any potential problems that may occur from back-ups would be homeowner's responsibility. Mr. Carrington acknowledged that he understood this and is OK with DelDOT plugging pipe.	DelDOT to plug pipe.		
SUSSEX COUNTY									
N/A									

OUTFALL SCREENING

2011 ANNUAL REPORT

APPENDIX A

POTENTIAL ILLICIT DISCHARGE INVESTIGATIONS

CORRESPONDENCE, FIELD INFORMATION AND DOCUMENTATION

Structure 520110114081352

2777 Andrewsville Road

Structure 520110114081352



Illicit Discharge Incident Tracking Sheet

Date: 04/08/11 & 03/24/2011 **Logged by:** Matt Ortynsky **Contact #:** 302-731-9176 **Incident ID:**

Caller contact information:

Subdivision: N/A
 County: Kent
 ADC Map No./Grid: 41-K7

Incident Location

Primary Location Description

- | | | |
|---|-------------------------------------|--------------------------------------|
| <input checked="" type="checkbox"/> Storm drain | <input type="checkbox"/> Outfall | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> In stream | <input type="checkbox"/> Along bank | |
| <input type="checkbox"/> Stormwater pond | <input type="checkbox"/> Upland | |

Outfall / inlet ID# : 520110114081352

Closest street address: 2777 Andrewsville Road

City: Greenwood, DE 19950

Watershed name: Marshyhope Creek Impacted Stream name: Tomahawk Branch

Nearby landmark: In front of residence (2777 Andrewsville Road)

Narrative description of location

In catch basin in front yard of residence at 2777 Andrewsville Road

Description of problem

Visual

- | | |
|--|---|
| <input type="checkbox"/> Oil / Oil sheen | <input type="checkbox"/> Soap |
| <input type="checkbox"/> Paint | <input checked="" type="checkbox"/> Floatables (toilet paper, etc.) |
| <input type="checkbox"/> Algae | <input type="checkbox"/> Dead fish |
| <input checked="" type="checkbox"/> Cloudy | <input checked="" type="checkbox"/> Flow -----> Precipitation in last 48-hours? Yes / No |
| <input type="checkbox"/> Anti-freeze | |
| <input type="checkbox"/> Yard waste | <input type="checkbox"/> Other _____ |

Odor

- | | | |
|--|---|----------------------------------|
| <input checked="" type="checkbox"/> Sewage | <input type="checkbox"/> Sulfide ("rotten egg") | <input type="checkbox"/> Gas/oil |
| <input type="checkbox"/> None | <input type="checkbox"/> Other (describe) _____ | |

Narrative description/comments of problem

02/11/11: CEI observed 4" clay pipe coming from residence at 2777 Andrewsville Rd tying into catch basin 520110114081352. Strong sewage smell observed along with cloudy water/toilet paper in bottom of basin.
03/24/11: KCI visited location and confirmed apparent sewage discharge into catch basin 520110114081352. Discharge tested high for ammonia, detergents, and turbidity.
04/07/11: KCI observed strong sewage odor/toilet paper. Discharge tested high for ammonia, detergents, turbidity, and phenols.

Plan of Action (check all that apply)

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Sample | <input type="checkbox"/> Contact DNREC | <input checked="" type="checkbox"/> Contact NPDES Manager |
| <input checked="" type="checkbox"/> Photos | <input type="checkbox"/> Door hangers | <input type="checkbox"/> GPS Coordinates |
| <input type="checkbox"/> Other (describe) | | |

Follow-up Action

04/08/11: KCI contacted DeIDOT via telephone to relay field investigation results. Submitted information to DeIDOT in 04/08/11 email. DeIDOT will evaluate issue and determine future action.
04/13/11: DNREC investigated area and spoke with owner of 2777 Andrewsville Rd, who did not know about pipe in catch basin. DNREC informed resident of their recommendation to have pipe closed by DeIDOT. If resident has problems with septic-will confirm origination from his system. If anyone else contacts either DNREC or DeIDOT once it's closed off, then DNREC will consider enforcement action at that time, because this would show someone knew pipe was there.
05/20/11: KCI attempted to send DeIDOT Illicit Discharge notice by Certified Mail. Letter returned by Post Office "No Mail Receptacle-Unable to Forward". **06/14/11:** Sent regular mail.
11/22/11: DNREC contacted homeowner (Tim Carrington 302-382-9649) and recommended he call DeIDOT. DeIDOT confirmed with Mr. Carrington that DeIDOT intends to plug the pipe and any potential problems that may occur from back-ups would be homeowner's responsibility. Mr. Carrington acknowledged that he understood this and is OK with DeIDOT plugging pipe. DeIDOT to plug pipe.



DELDOT AGREEMENT 1495
 POTENTIAL ILLICIT DISCHARGE FIELD DATA SHEET

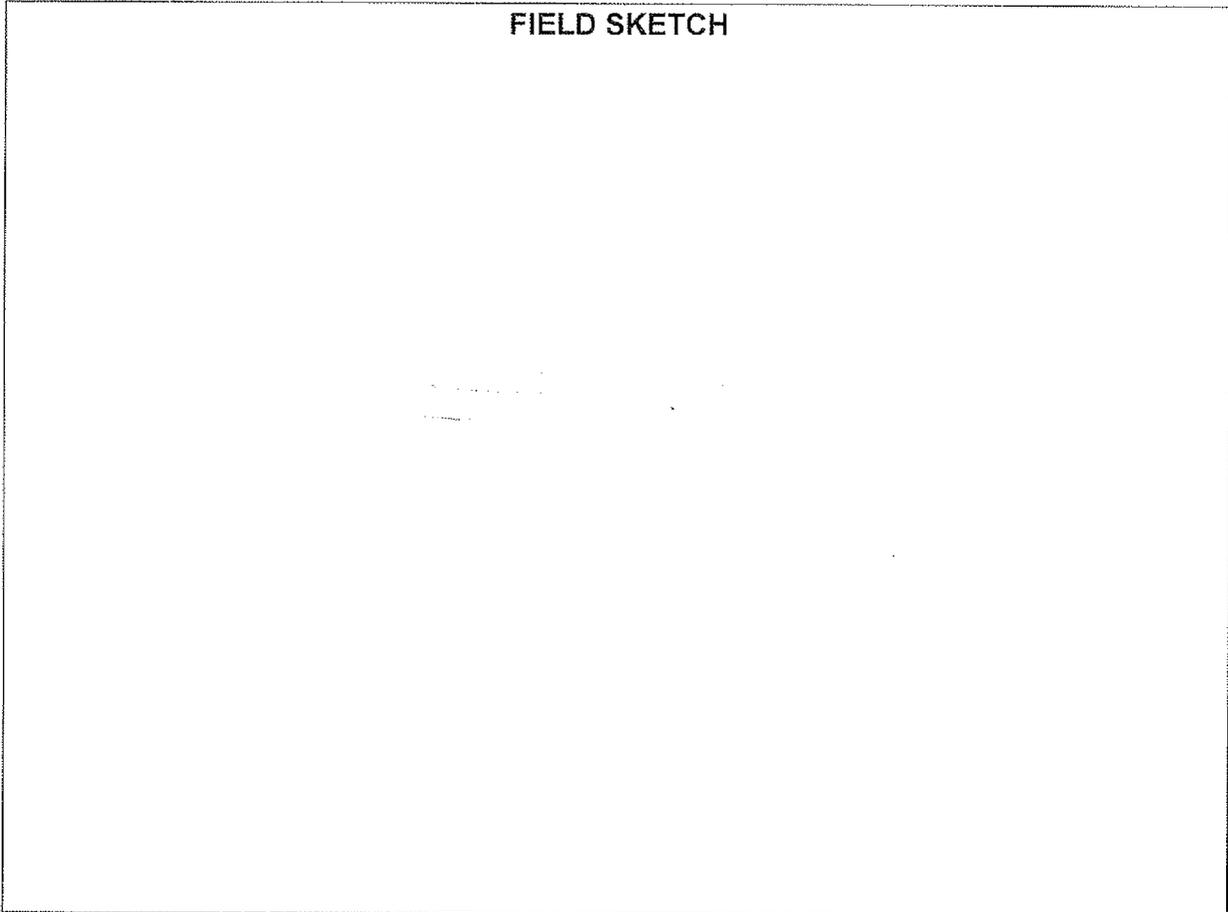
Structure/Outfall ID Number: 520110114081352

Address/Location Description: 2777 Andrewsville Rd.

Outfall Data	
Digital picture? (Y/N):	Y
Camera Number:	
Picture Number:	
Personnel:	CB/mo
Date (MM/DD/YY):	3/24/11
Time:	10:35am
Date of Last Rain >0.10" (MM/DD/YY):	
Follow Up Screen Date (MM/DD/YY):	4/7/11
Follow Up Field Screen Time:	11:00am
Outfall Dimensions (in):	4"
Outfall Shape: Round (R), Oval (O), Box (B), V-Ditch (VD), Trap Ditch (TD), Other Ditch (OD)	Round
Outfall Type (CMP, RCP, PVC, Other):	Clay
Flow Observed? (Y/N):	Y
Follow Up Flow Observed? (Y/N):	Y
Flow Source	Possible septic system
Structural Condition: Normal (N), Concrete Spauling (SP), Peeling Paint (PP), Concrete Cracking (CC), Outfall Damaged (OD), Submerged (S), Metal Corrosion (MC), Other (O-explain)	
Erosion (Outfall Area): None (N), Moderate (M), Severe (S)	N
Odor: None (N)=0, Rancid-Sour (RS)=4, Gas (G)=4, Sewage (S)=4, Oil (O)=4, Sulfur (S)=4, Other (Other-explain)	Sewage
Deposits / Stains: None (N)=0, Sediment (S)=2, Oil (OY)=3, Other (O-explain)	White Cloudy discharge/Staining in pipe
Algae Growth? (Y/N):	N
Vegetative Condition (Outfall Area): Normal (N), Inhibited Growth (IG), Excessive Growth (EG), Other (O-explain)	N
Land Use: Industrial (I), Commercial (C), Residential (R), Other (O-explain)	Res.
Specific Land Use:	Along roadside from residential area

		Result 1	Val.	Result 2	Val. 2
Flow Rate (cfs):	<0.022 cfs=0; ≥0.022 cfs=4	<.000	0	<.000	0
Water Temperature (Fahrenheit):		44.5°	-	69°	-
pH:	<4.5=4; >8.5=4; change ≥ 2 units=1	7.40	0	7.50	0
Phenol (mg/L):	<0.3 mg/L=0; ≥0.3 mg/L=4	0	0	.5 mg/L	4
Chlorine (mg/L):	<0.3 mg/L=0; ≥0.3 mg/L=4	0	0	0	0
Detergents (mg/L):	<0.2=0; 0.2 - 0.4=1; ≥0.5 mg/L=4	>1.3	4	>1.3	4
Copper (mg/L):	<0.01 mg/L=0; ≥0.01 mg/L=4	0	0	0	0
Ammonia (mg/L):	<0.05-0.1 mg/L=0; 0.1-1.0 mg/L=1; 1.0-2.99 mg/L=2; ≥3.0 mg/L=4	>3.0	4	>3.0	4
Turbidity:	0-10 ntu=0; 11-40=1; 41-150=3; >150=4	89.10	3	141.3	3
Color:	Clear (C)=0, Gray (G)=1, Red (R)=1, Yellow (Y)=1, Brown (B)=1, Green (GR)=1, Other (O-explain)	G/white G/cloudy	1	G/white G/cloudy	1
Floatables:	None (N)=0, Oil Sheen (OS)=4, Sewage (S)=4, Trash (T)=2, Other (O-explain)	N	0	N	0

FIELD SKETCH





MEMORANDUM

TO: Randy Cole
Marianne Walch
DelDOT Stormwater Quality Program

FROM: Matthew Ortynsky
Environmental Scientist

DATE: June 29, 2011 through November 22, 2011

SUBJECT: **2777 Andrewsville Road PID Summary**
Structure No. 520110114081352
Agreement 1495 / KCI Project 0203019H/0203019I

The purpose of this Memo is to summarize the investigation of a Potential Illicit Discharge (PID) at 2777 Andrewsville Road (Figures 1-2).

March 15, 2011: CEI identified a PID at 2777 Andrewsville Road. Field crew observed what appeared to be clumps of toilet paper and cloudy water in the bottom of Structure No. 520110114081352. A strong sewage odor was detected.

March 24, 2011: KCI inspected the catch basin and noticed a 4" clay pipe with a small amount of cloudy discharge (Figure 3). There appeared to be clumps of toilet paper in the bottom of the catch basin and a strong sewage odor was detected. The sample collected tested high for levels of ammonia, detergents, and turbidity. The source of the discharge could not be determined, but was suspected to be from septic tank overflow.

April 7, 2011: KCI detected a strong sewage odor. The sample collected tested high for levels of ammonia, detergents, turbidity and phenol (the latter of which was undetected 03/24/11 but high on 04/07/11).

April 8, 2011: KCI contacted DelDOT to relay the field investigation observations.

April 13, 2011: DNREC investigated area and spoke with owner of 2777 Andrewsville Rd, who did not know about pipe in catch basin. DNREC informed resident of their recommendation to have pipe closed by DelDOT. If resident has problems with septic-will confirm origination from his system. If anyone else contacts either DNREC or DelDOT once it's closed off, then DNREC will consider enforcement action at that time, because this would show someone knew pipe was there.

May 20, 2011: KCI attempted to send via certified mail a DeIDOT Illicit Discharge Notice, which was returned to sender with message “No mail receptacle-unable to forward”.

June 14, 2011: KCI attempted to send via regular mail a DeIDOT Illicit Discharge Notice.

June 29, 2011: KCI and Tri State Grouting conducted a push camera inspection. At approximately 83’ 6” a junction box was discovered that connects to what appears to be an additional sewage pipe (Figure 4). Upon further investigation, a metal cover was found at the area where the junction box should be located. There is a septic tank at the rear of the house (Figure 5).

November 22, 2011: DNREC contacted homeowner (Tim Carrington 302-382-9649) and recommended he call DeIDOT. DeIDOT confirmed with Mr. Carrington that DeIDOT intends to plug the pipe and any potential problems that may occur from back-ups would be the homeowner's responsibility. Mr. Carrington acknowledged that he understood this and is OK with DeIDOT plugging pipe.



Figure 1. Aerial View



Figure 2. Landscape



Figure 3. Structure View



Figure 4. Junction Box

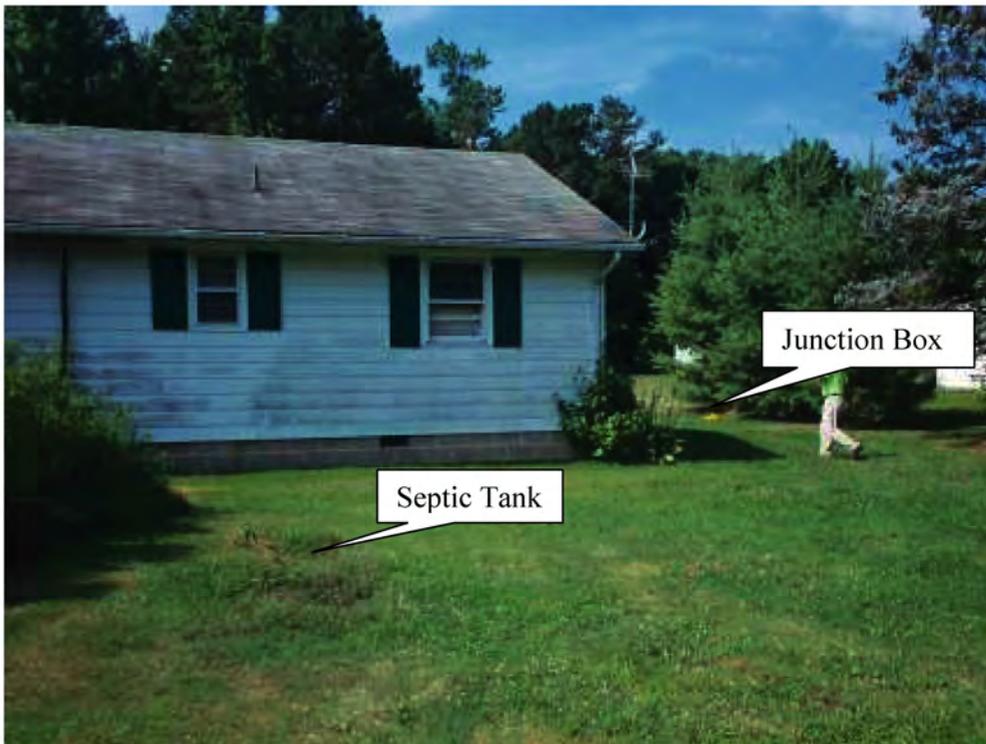


Figure 5. Septic Tank / Junction Box

2777 Andrewsville Road PID



● INLET	■ CULVERT	◆ SWALE VERTEX	■ Bay Saver	■ Filter Strip
● MANHOLE	◆ SWALE END	— Ditch	■ Biofiltration	■ Infiltration Basin / Trench
● OUTFALL	■ JUNCTION BOX	— Pipe	■ Biofiltration & Bioretention	■ Sand Filter
■ RISER	× DUMMY NODE	— Hydraulic Connection	■ Bioretention	■ Sediment Forebay
			■ Dry Pond	■ Storm Filter
				■ Wet Pond
				■ Wet Pond / Wetland



**NPDES
Inventory Map**
1 in. = 104 ft.





STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

CAROLANN WICKS, P.E.
SECRETARY

June 14, 2011

NOTICE OF POTENTIAL ILLEGAL DISCHARGE

Timothy O. & Angela F. Carrington
2777 Andrewsville Road
Harrington, Delaware 19952

The Delaware Department of Transportation (DelDOT) is responsible for maintaining not only roadways, but also the extensive storm drain and pipe networks located within State rights-of-way. The Federal National Pollutant Discharge Elimination System (NPDES) Program, which is a component of the Clean Water Act of 1972, requires DelDOT to control the amount of pollutants entering the drainage system. Part of this charge is the detection and elimination of *illegal discharges* or connections to the system that may contain pollutants or are otherwise not allowed. Left uncorrected, any pollutants entering the system will ultimately impact nearby streams, as storm drainage is not treated at any sort of treatment facility.

DelDOT has contracted with the engineering firm KCI Technologies, Inc. to survey and inspect the drainage system and to check for illegal discharges or connections. Upon inspection, KCI Technologies, Inc. found a 4 inch pipe with what appears to have a sewage discharge and odor. KCI Technologies, Inc. along with Tri State Utilities will be conducting an inspection with a camera to determine the origin of this 4 inch pipe leading into a catch basin in front of 2777 Andrewsville Road. If you have any questions regarding this matter please contact:

Bruce Thompson
KCI Technologies, Inc.
1352 Marrows Road, Suite 100
Newark, DE 19711
(302) 731-9176 (voice); (302) 731-7807 (fax)
bruce.thompson@kci.com

Thank you for helping us preserve Delaware's environment.





STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

CAROLANN WICKS, P.E.
SECRETARY

NOTICE OF POTENTIAL ILLEGAL DISCHARGE

The Delaware Department of Transportation (DelDOT) is responsible for maintaining not only roadways, but also the extensive storm drain and pipe networks located within State rights-of-way. The Federal National Pollutant Discharge Elimination System (NPDES) Program, which is a component of the Clean Water Act of 1972, requires DelDOT to control the amount of pollutants entering the drainage system. Part of this charge is the detection and elimination of *illegal discharges* or connections to the system that may contain pollutants or are otherwise not allowed. Left uncorrected, any pollutants entering the system will ultimately impact nearby streams, as storm drainage is not treated at any sort of treatment facility.

DelDOT has contracted with the engineering firm KCI Technologies, Inc. to survey and inspect the drainage system and to check for illegal discharges or connections. Upon inspection, KCI Technologies, Inc. found a 4" pipe with what appears to have a sewage discharge and odor. KCI Technologies, Inc. along with Tri State Utilities will be conducting an inspection with a camera to determine the origin of this 4" pipe leading into a catch basin in front of 2777 Andrewsville Road. If you have any questions regarding this matter please contact:

Bruce Thompson
KCI Technologies, Inc.
1352 Marrows Road, Suite 100
Newark, DE 19711
(302) 731-9176 (voice); (302) 731-7807 (fax)
bruce.thompson@kci.com

Thank you for helping us preserve Delaware's environment.





MEMORANDUM

TO: Randy Cole
Environmental Program Manager
DelDOT Stormwater Quality Program

FROM: Matthew Ortynsky
Environmental Scientist

DATE: April 8, 2011

SUBJECT: 2777 Andrews ville Road PID
Structure No. 520110114081352
Agreement 1495 / KCI Project 0203019H

The purpose of this Memo is to summarize the investigation of a potential illicit discharge at 2777 Andrews ville Road.

While performing Agreement 1354 Re-inspections, a Century field crew identified a potential illicit discharge (PID) located at 2777 Andrews ville Road. Century field crews observed what appeared to be clumps of toilet paper and cloudy water in the bottom of Structure ID No. 520110114081352. A strong sewage odor was also observed. Alex Schmidt from Century notified Bruce Thompson of KCI on Tuesday March 15, 2011 of this PID.

On Thursday March 24, 2011, KCI field crews inspected the catch basin and noticed a 4" clay pipe with a small amount of cloudy discharge. There appeared to be clumps of toilet paper in the bottom of the catch basin and a strong sewage odor was observed. KCI collected a sample to be tested. The sample tested high for levels of ammonia, detergents, and turbidity. KCI was unable to pin point the source of the discharge, but it is suspected that the discharge is coming from a septic tank overflow. KCI will retest the discharge in the future.

On Thursday April 7, 2011, KCI field crews conducted a follow up visit on the catch basin. KCI observed a strong sewage odor and collected another sample to be tested. The sample tested high for levels of ammonia, detergents, turbidity and phenols. Phenols were undetected on Thursday March 24, 2011, but tested high during the follow up visit.

KCI contacted Randy Cole on April 8, 2011 to relay the field investigation observations. Randy stated that DelDOT will evaluate this issue and determine the appropriate action.



Figure 1. Landscape



Figure 2. Structure View