NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

KENT COUNTY MS4
Permit No. DE 0051144

submitted by
DELAWARE DEPARTMENT OF TRANSPORTATION

ANNUAL REPORT FOR CALENDAR YEAR 2008

Volume 1 of 1
DelDOT Report and Appendices

DelDOT
Department of Transportation

Submitted July 1, 2009

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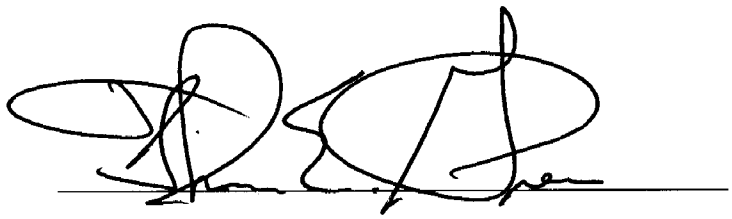
CERTIFICATION

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.



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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 to date through year 2008 and provide a projection of work for calendar year 2009. Table A summarizes the Minimum Control Measures, BMPs, Measurable Goals, and Status of Implementation for the entire permit term. Work projections for 2009 are provided at the end of this section in Table B.

Public Education and Outreach

DelDOT hired the Partnership for the Delaware Estuary to provide services for development of education and outreach activities statewide. The NPDES section also engaged in public education and outreach activities. A summary of these activities is described as follows:

- Held the fifth annual statewide K-12 *Clean Water Begins and Ends with You!* drawing contest in April 2008.
- Partnered with the Appoquinimink River Association.
- Participated in public events and distributed educational materials including bookmarks, brochures, calendars and promotional giveaways that carry a water quality.
- Distributed tip cards, "Bag-on-Board" pet waste dispensers to all pet owners in the St. Jones River watershed.
- Developed a new stormwater website (www.deldot.gov/stormwater).

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.
- Participation in citizen Tributary Action Teams to develop pollution control strategies for impaired watersheds.
- Participation in the Nonpoint Education for Municipal Officials (NEMO) Network, a network of education programs teaching local land use decision makers about the relationship between land use and natural resource protection.
- Development of stormwater presentations for community groups with follow-up survey to solicit public comments, concerns or program improvements.

- DelDOT held its fourth annual "Imagine a Litter Free Delaware" cleanup day along roads, highways and community areas.
- DelDOT is continuing with its door hanger campaign to solicit public participation to report illegal dumping and "neighborhood watch."

Illicit Discharge Detection and Elimination (IDDE)

DelDOT completed inventory, inspection and dry-weather screening of all parts of the DelDOT 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.

DelDOT 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." This has been a very effective part of our program.

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 DelDOT. Satisfactory performance of the delegated responsibilities will be considered compliance with this component of the SWMP. DelDOT made improvements to Section 110, Erosion, Sediment Control and Water Pollution, of the Delaware Department of Transportation Standard Specifications.

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 DelDOT. Satisfactory performance of the delegated responsibilities will be considered compliance with this component of the SWMP.

Pollution Prevention and Good Housekeeping

DelDOT has developed and implemented an operation and maintenance program with a goal or 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.
- 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.
- Implemented new programs to reduce use of pesticides and fertilizers during roadside vegetation management. These include development of an IRVM Manual, initiation of a guardrail inventory and pilot study on alternative vegetation management strategies for guardrails, changes in contract language, and improvements in staff training and record keeping.
- Conducted employee training through:
    - Training videos on the SWPPP's
    - Training videos on SPCC Plans
    - Attendance at stormwater quality and roadside vegetation conferences, Certified Construction Reviewer workshop and webcasts.

Table A. Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DelDOT 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, continuing 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, tipcard and follow-up survey to vet clinics, dog groomer, dog trainer, animal rescue	Completed 2006
B. Watershed Training Workshop	Present four 2 ½-hour watershed training course on basic watershed education and good-housekeeping measures to DelDOT 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, continuing through permit
D. Storm Drain Marking	Install water quality message markers on the estimated 4,500 storm drains	Completed June 2007

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DelDOT 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 since 2004; 1,500 participants in 2008, continuing as budget permits
Technology Students Asso.	Judge TSA competition for middle and high school students statewide; students develop restaurant placemat and coloring book cover	Annually since 2003, continuing through permit
F. Public Event Participation/Display	Develop display and interactive stormwater game for use at public events	Completed 2002, continuing through permit
G. Promotional giveaways	Purchase items that display a water quality message for prizes and giveaways at public events	Annually since 2002, continuing 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, continuing through permit
I. Stormwater Video	Reprint "Protecing 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

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

MCM #2: Public Participation/Involvement		
BMP	**Measurable Goal**	**Status of Implementation**
A. Litter control programs		
Adopt-a-Highway	DelDOT will continue the Adopt-a-Highway program and document all participants and solicit new volunteers through newspaper ads and DelDOT 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	Annually since 2005
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 DelDOT projects.	Continuous program since 2002
F. National Nonpoint Education for Municipal Officials (NEMO)	Serve on the Delaware NEMO steering committee and co-author a chapter on stormwater management.	Continuous program since 2004

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

MCM #3: Illicit Discharge Detection and Elimination		
BMP	**Measurable Goal**	**Status of Implementation**
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 - target date for completion, 2011	Ongoing, begun in 2007
B. Dry Weather Outfall Screening	Screen 20% of known DelDOT outfalls in the permitted area per year	Completed 2007
	Conduct screening on new outfalls added to the system since the original inventory.	Ongoing, annually
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
D. MOA with DNREC	Develop a new Memorandum of Agreement with DNREC to provide for enforcement actions in Kent and Sussex Counties.	Not complete; Target completion 2009

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

MCM #4 & #5: Construction Site Runoff Control/Post Construction Stormwater Management		
BMP	**Measurable Goal**	**Status of Implementation**
A. Delegated Agency	DelDOT 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 as budget allows.

Table A (cont.). Minimum Control Measures , BMPs, Measurable Goals, and Status of Implementation for DelDOT 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	DelDOT will continue the Adopt-a-Highway program and document all participants and solicit new volunteers through newspaper ads and DelDOT website.	Continuous program since 2003
"Imagine a Litter Free Delaware"	DelDOT will continue the program and solicit new volunteers through newspaper ads and DelDOT website	Annually since 2005
Inmate Crew	DelDOT 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	DelDOT developed SWPPPs at all maintenance facilities.	Completed 2004
Quarterly Inspections	DelDOT staff will complete a Dry and Wet Weather inspection each quarter.	Quarterly since 2004
Purchase spill kits	The NPDES Section purchased wall mount spill kits for placement in vehicle shop buildings.	Completed 2003
Security Fence	As part of the SWPPPs, DelDOT enclosed all maintenance facilities with security fences and gates.	Completed 2005
C. Statewide Vehicle Wash Water Practices for DelDOT Maintenance Yards	Treat all wash water through a treatment train prior to leaving the site.	Report completed July 2005
Central District Headquarters	Catch basin inserts were installed and water is treated through a oil/water separator.	Completed 2005
Magnolia Yard	A detention pond was designed and constructed, and catch basin inserts were installed.	Completed 2006
D. Statewide Salt Best Management Practices for DelDOT Maintenance Yards	DelDOT developed a report that documents operational practices and strategies for salt delivery, stockpiling, and mixing.	Completed 2004
Construct salt barns	DelDOT constructed 3 salt barns	Completed 2005
E. Spill Prevention and Response		
Spill Kits for Vehicles	DelDOT to purchase 450 vehicle spill kits for use on the roadway	Completed 2007

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

Spill Prevention, Control and Countermeasures Plans (SPCC)	DelDOT developed a SPCC plan for each maintenance facility. These plans include proper procedures for spill response	Completed 2007
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	DelDOT, 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 inpsections
G. Stormwater Conveyance System	DelDOT will manage a program to ensure the stormwater conveyance system is properly maintained and operating.	
Drainage Maintenance	DelDOT will maintain the system when notified of an issue.	Continuous Program since 2001
Storm System Inventory and Inspection	DelDOT will perform a detailed inventory and inspection of the MS4 system.	Completed 2007
Inspection and Preventative Maintenance Program	DelDOT will determine the appropriate re-inspection schedule for the stormwater system	Completed 2007
	DelDOT will begin the re-inspection program	To begin in 2009
H. Sweeping Program	DelDOT 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 DelDOT 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	DelDOT 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 2009.

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.

Public Involvement and Participation

- Continue to be a member of the St. Jones River and Broadkill River Tributary Action Team.
- Continue to partner with University of Delaware on project NEMO (Nonpoint Education for Municipal Officials).
- 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.

Illicit Discharge Detection and Elimination

- Continue inventory and inspection of outfalls and drainage structures in Kent and Sussex Counties.
- Inspect all stormwater ponds and BMPs in Kent and Sussex Counties; add collected data to the existing inventory database.
- Identify, track to source and eliminate any illicit connections/pollutants entering the MS4.
- Continue door hanger campaign to residents where illegal dumping has occurred.

Construction Site Stormwater Runoff Control

- Delegation of the sediment and stormwater program is granted through the year 2009.

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

- Delegation of the sediment and stormwater program is granted through the year 2009.

Pollution Prevention and Good Housekeeping

- 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.
- Continue implementation of the "Statewide Vehicle Wash Water Practices for DelDOT Maintenance Yards" retrofits.
- Complete the IRVM manual and guardrail inventory, as measures to reduce pesticide use. Continue the guardrail vegetation management study initiated in 2008.

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. Discussion in this section includes substantive program improvements and successful programs.

Public Education

Partnerships

The NPDES Section contracts with several non-profit organizations to assist with development of education and outreach programs. The Partnership for the Delaware Estuary, the Appoquinimink River Association and the Delaware Nature Society have specialties in watershed and water quality education. Partnering with these organizations has proven to an effective means of expanding our limited staff resources in a cost effective manner. One of our more popular programs is the annual "Clean Water Begins and Ends with You!" drawing contest. Participation has grown from less than 300 in 2003 to over 1,500 in 2008.

Web Site

Our NPDES web site, once a joint effort with New Castle County, is now managed by DelDOT's IT section. This provides us more direct management for upgrading and providing up-to-date information to the public on recent events and locations where our consultants will be conducting the storm system inventory. This information can be found in our "Hot Topics" section and is continually updated as necessary.

We have made a greater effort to advertise the website URL in our presentations and printed and promotional materials. We began tracking the number of visits to the website to help assess the effectiveness of our additional effort. A review of the data revealed no additional visits. We therefore determined we need to modify our approach to advertising, and focus our efforts and budget in other ways that may include additional newspaper ads, PSA's, or offer our current game on CD that links to our website thereby reducing our expenditures on promotional items.

Teacher's Packet

A popular free service we provide to educators is "Teacher's Packets" containing stormwater and watershed education information. The packets contain stormwater/watershed videos, kid's activity booklet, brochures, book mark, our "Delaware Nonpoint Source Educational Materials Survey" and "Delaware Nonpoint Source Public Events and Programs Survey" booklets and CD. The free packets were mailed to 35 teachers who registered at our public events.

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. This typically generates phone calls to our office where we explain the program and direct them to our web site. After submitting a press release to local newspapers, the Delaware State News did a front-page story on the door hanger campaign. In 2008, we distributed 20 door hangers in Kent and Sussex Counties.

Report a Problem

The "Report a Problem" tool bar on our web site provides users with contact information to report illegal discharges or dumping and report a drainage problems or other stormwater maintenance concerns. In 2007, DNREC implemented a new "Drainage and Stormwater Assistance" Hotline – a central telephone number and email address for Delaware residents to report drainage and stormwater related concerns. DNREC staff members then determine which jurisdiction is responsible for following up on the report and transfer the information to the appropriate agency. We have been trying to work with DNREC staff to ensure that DelDOT-related calls and issues get transferred to the correct sections of the Department, with a minimum of frustration and delay for the citizens who call the hotline.

Illicit Discharge Detection and Elimination

Map Viewer

We have gone through two iterations of the NPDES map viewer. Issues with non-supported software and database incompatibility that causes malfunctions, have provided less than stellar functionality. We are working with our consultant to develop a more functional viewer. When the application is complete, we will conduct staff training on its use to increase the number of maintenance staff who take advantage of this valuable tool.

Pesticide, Herbicide, Fertilizer

The NPDES Section began discussions in January 2007 with the Roadside Environmental Section seeking ways to develop additional PHF reduction strategies. As a result of these discussions, the following programs have been initiated:

1. Guardrail Projects: Review of DelDOT's assets that are treated with herbicide showed that guardrails comprise a significant amount of chemicals applied over an estimated 250 guardrail miles on an annual basis. Often retreatment is necessary. We believe this was a way to effect a significant overall reduction, as well as eliminating treatment altogether at sections that met certain environmental qualifiers. Therefore, we concluded that our program required a statewide inventory and a pilot study to investigate various methods of ground treatment under guardrail.

a. Guardrail inventory – This is a statewide inventory. Attributes collected will include material under guardrail and surrounding landscape and environmental features. With this information we can determine a course of action to apply the treatment methods, in lieu of or to reduce herbicide, as described in the guardrail pilot study and identify "no-spray" zones.
b. Guardrail pilot study – This study will investigate methods to reduce the use rates of pesticides and carriers used to treat guardrail vegetation without compromising safety and aesthetics. We will select and apply treatments to compare the effectiveness, ease of implementation, aesthetics, cost and longevity. Treatments will include weed control barriers, low-growing vegetation and cutting existing vegetation. Herbicide will be used on treatment plots as a measure against non-chemical treatments.

2. IRVM manual – DelDOT 's NPDES and Roadside Environmental Sections determined DelDOT's Division of Maintenance and Operations needed a manual that outlined consistent protocols and policies for maintenance staff and crews to manage roadside vegetation optimizing efficiency and provide pesticide reducing strategies. To that end, DelDOT hired the University of Delaware to develop an Establishment and Maintenance Manual incorporating Integrated Roadside Vegetation Management principles.
3. Herbicide SOP – The Roadside Environmental Section is preparing a herbicide standard operating procedure to be used by DelDOT and contractor staff that includes the following objectives:
    - To ensure the appropriate and effective application of herbicides as a management tool
    - To ensure the safety of all individuals participating in the use of herbicides
    - To use herbicides only when they contribute to the perpetuation of species, communities, and ecosystems targeted for preservation or when they provide the most efficient and/or environmentally compatible method in the following situations: (1) maintain traffic line of sight, (2) treat noxious species legally requiring control and (3) protection and maintenance of assets.
    - Minimize the detrimental effects to the environment
4. Contract language – New language was added to all contracts that specify using EPA-approved drift control agents and only using formulations of glyphosate with a full aquatic label.
5. Mowing Standard Operating Procedure – The NPDES Section conducted a study to determine the impact that grass length has on stormwater runoff quality. Overall, the study showed a water quality improvement in reducing the amount of sediment released and associated metals and that the higher grass releases road salt more slowly. To that end, the Roadside Environmental Section has begun revising the mowing policy last written in 1984. Improvements will include:
    - Maintain utility turf at a height of 6 inches. Utility turf constitutes the majority of mowed areas.
    - Mow one mower width on either edge when median is greater than 40-feet wide, leaving a "beauty strip" along the edge. The unmowed portion will act as a filter to improve water quality.

- Maintain a 10-foot buffer around stormwater ponds; mow biofiltration swales to a 6" height minimum.

6. Training – DelDOT staff held a "Basic Herbicide Application" training workshop for 25 DelDOT employees.

Construction Site Runoff

Standard Specification 110 - Erosion, Sediment Control and Water Pollution

A committee consisting of DelDOT construction engineers, supervisors and NPDES staff was formed in early 2007. Several meetings were held to discuss the EPA audit results of the NPDES program, specifically compliance with erosion and sediment control regulations on DelDOT construction sites. The NPDES section led a discussion focusing on three objectives: (1) Ensure weekly E & S site inspections are conducted, (2) Ensure compliance, and (3) Training/education for on-site staff. It was decided that members would review and rewrite Standard Specification 110, Erosion, Sediment Control and Water Pollution to include:

- Contractor required to provide Certified Construction Reviewer (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.
- Required pre-construction meeting specifically designed to address E & S compliance.
- Better defined division of responsibilities among site reviewers, contractor engineer, project engineer, stormwater engineer
- Strengthening of actions to gain compliance
- Environmental Compliance Supervisor – new position at DelDOT to regularly track and review the construction site reviews submitted on a weekly basis from NOI to NOT and annually assess CCR's performance. The addition of this position has resulted in better reporting in terms of compliance, record keeping and timely submittals.

Augmentation in these three areas would considerably improve the current way DelDOT manages its construction sites and put E & S controls in the forefront. DelDOT provided training for the inspection staff on March 6 and 12, 2007 on the Clean Water Act, pollution prevention using common sense tactics, reporting, communication, and posting NOI & Permits. A CCR training course was held in the fall of 2008 for 59 DelDOT staff who conduct E & S inspections, design stormwater systems, review stormwater plans, public utility staff and others involved in earth disturbing activities.

Best Management Practice inspections

DelDOT and KCI Technologies reviewed the current protocol for inspection, maintenance work orders and vegetation control of its BMPs. KCI drafted a manual (Best Management Practices Field Inspection Manual) that improves upon the existing method of inspecting, collecting data and ranking and issuing work orders. We have already used the manual to identify stormwater ponds in need of vegetative maintenance and have advertised a contract for herbicide treatment. We also plan to meet with the Districts to achieve better consistency with work order rankings. This will result in more accurate, efficient and credible work order submittals than in the past.

Pollution Prevention and Good Housekeeping for Municipal Operations

Street Sweeping Program

We have continued to add new regenerative street sweepers to the DelDOT fleet, as the Department budget allows. This has allowed DelDOT to comply with the 4:2:1 sweeping frequency in the permitted areas that is called for by the SWPP&MP. In the future we intend to evaluate whether concentrating the sweeping on roadways with closed drainage systems might provide better overall protection of water quality. If so, then the SWPP&MP will be revised accordingly.

Stormwater Conveyance Systems

DelDOT recently hired KCI Technologies and Century Engineering to take over the tasks of inventorying and inspecting the stormwater conveyance system statewide. One of KCI's initial tasks was to redesign the inventory and inspection database so that it functions better for DelDOT's maintenance needs. With the database redesign, we are also working to improve the system of issuing maintenance work orders based upon these inspections. By focusing the work orders on problems and conditions that have greatest potential impact on water quality and/or public safety, we hope to improve the overall work order completion rate and maximize the water quality benefit gained using limited funding for these tasks.

Vehicle Wash Plan

The use of the *Statewide Vehicle Wash Water Practices for DelDOT 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 have completed most of the retrofits and operational changes called for in the plan for yards in the Phase II area and believe that these changes have improved the ability of maintenance staff to wash vehicles with minimal impact on water quality.

Pollution Prevention Plans

Major programmatic and operational changes that occurred as a result of the PPP's for area maintenance yards are listed below:

- Security fence for all maintenance yards: prohibits illegal entry and possible illegal dumping;
- Purchased spill decks for fluid storage and spill kits for vehicles;
- More knowledgeable staff as a result of training resulting cleaner yards complying with state regulations;
- Quarterly inspections: Obtaining compliance with wet and dry inspections was an issue when the PPP's were first implemented. While the NPDES project manager sent periodic reminders prior to the end of the quarter, some PPP teams were delinquent in submitting reports. If a team's reports were not submitted, the NPDES Program Manager sent emails to the team and the District supervisors/engineers. This proved to be an effective means of assuring future submittals. We now routinely receive all reports.

Salt Plan

DelDOT's *Statewide Salt Best Management Practices for DelDOT'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.

Stormwater Retrofits

Now that the maintenance yard retrofits called for in the Vehicle Wash Water Plan are being completed, we will be looking for new retrofit opportunities in the Phase II permitted area. Our program has been partnering with DNREC's Watershed Assessment Section to conduct a comprehensive assessment of the St. Jones watershed. Duffield Associates and the Center for Watershed Protection are doing the assessment. A major goal of the watershed assessment is to identify sites where stormwater retrofits would greatly benefit water quality in the St. Jones. The consultants have been asked to look particularly at DelDOT-owned or DelDOT-impacted sites during their watershed walks and stream condition assessments. Thus we anticipate that this work will identify at least a few new retrofit opportunities for us to consider in the near future.

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:

- DelDOT hired the Partnership for the Delaware Estuary under a one-year agreement to provide services for education and outreach activities. They were charged with administering DelDOT's 5th annual "Clean Water Begins and Ends With You" drawing contest and calendar. Sixteen winners were selected from over 1,500 participants. Participation increased again this year due to aggressive advertising and a $500 cash award offering to the school with the most entries. The drawings were developed into a 16-month calendar (Figure 1-1). Also, the drawings of the four first-place winners were made into bus-back cards for display on the outside of DART buses (Figure 1-2a-2d). An awards ceremony and dinner were held in April. The winners were recognized and awarded gift cards and art supplies. 2,500 calendars were printed and distributed at educational events.
- DelDOT also worked with the Partnership for the Delaware Estuary to distribute tip cards and "Bags-on-Board" pet waste dispensers to 2,400 pet owners living in the St. Jones River watershed.
- DelDOT partnered with the Appoquinimink River Association (ARA) to lead and execute an education and outreach program to provide information to the public on ways to reduce nonpoint source pollution. As part of their scope of work, the ARA is assisting DelDOT in developing a watershed presentation for schools and community groups. A follow-up survey will be given to participants to measure the effectiveness of the presentation. Additional work accomplished is documented in their 2008 annual progress report (Appendix A).
- The NPDES Program submitted anti-litter quarter-page newspaper advertisements to the Delaware State News (Figure 1-3).
- We designed and distributed 40,400 water quality tip cards in state employee paychecks statewide (Figure 1-4).
- DelDOT distributed several hundred book covers to schools and the general public that highlight stormwater pollution, the water cycle and watersheds (see Annual Report 2006, Figure 1- 3).
- 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.
- To assist teachers with stormwater and watershed education, we developed a "Teachers Packet" that consisted of stormwater/watershed videos, kid's activity booklet, brochures, book mark, our "Delaware Nonpoint Source Educational Materials Survey" and "Delaware Nonpoint Source Public Events and Programs Survey"

booklets and CD. The free packets were mailed to 35 teachers who registered at our public events.

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 2008. NPDES staff participated for 10 days and evenings;
- The Delaware Rural Water Association Annual Conference, held in Harrington on February 26 – February 28, 2008.

Other education/outreach efforts in 2008 include:

- DelDOT teamed with Technology Students Association (TSA) and served as judges in the April 2008 State Conference;
- DelDOT developed a new stormwater website (www.deldot.gov/stormwater); we continually update the "Hot Topics" section. We began tracking "visits" to the website in March 2008. The number of visits ranged from about 7,400 to over 10,000 per month (Table 1-1).

Table 1-1. Number of visits to DelDOT's stormwater website per by month.

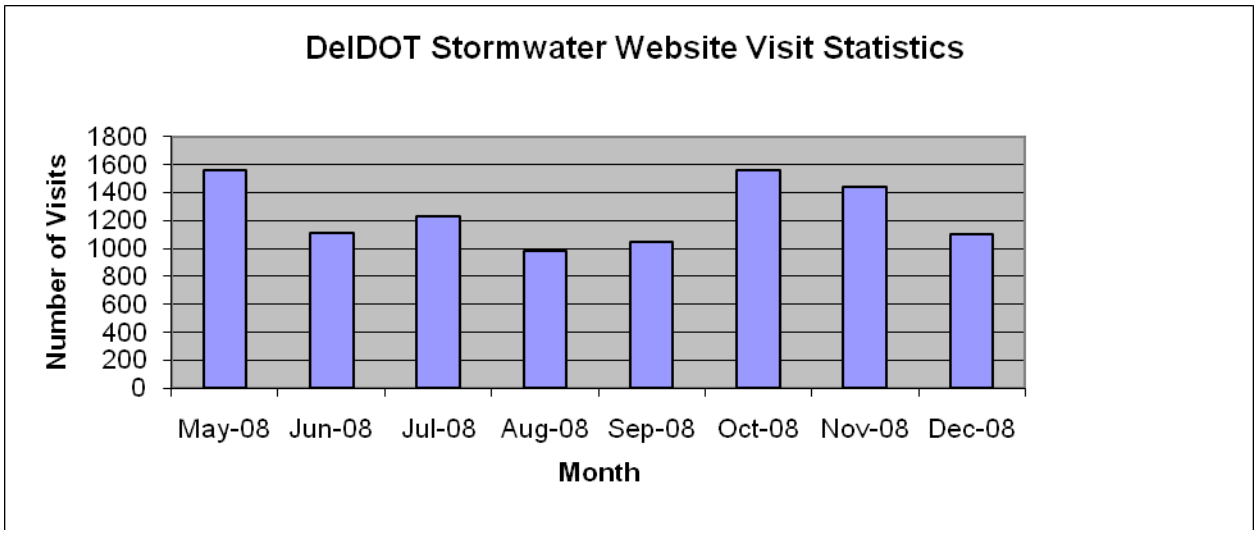

Figure 1-1. 2008 "Clean Water Begins and Ends with You!" drawing contest calendar winners.

Figure 1-1 (cont.). 2008 "Clean Water Begins and Ends with You!" drawing contest calendar winners.

Figure 1-2a. 2007 K – 2nd grade first place winner appearing on DART bus.

Figure 1-2b. 2007 3rd – 5th grade first place winner appearing on DART bus.

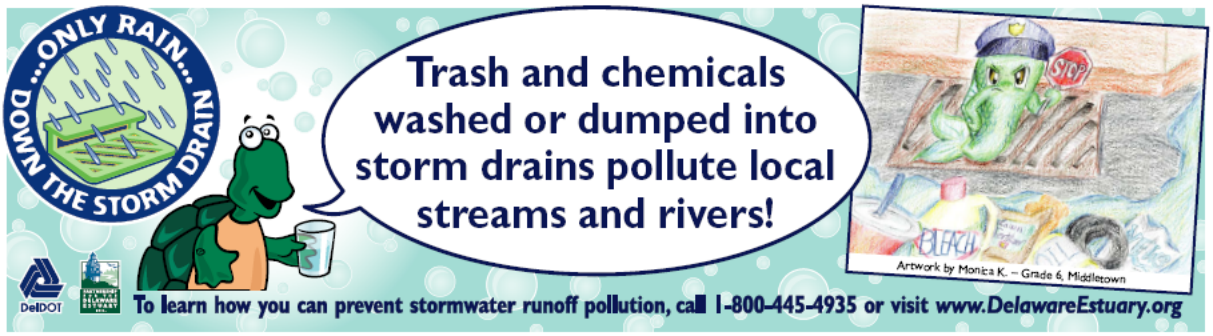

Figure 1-2c. 2007 6th – 8th grade first place winner appearing on DART bus.

Figure 1-2d. 2007 9th – 12th grade first place winner appearing on DART bus.

Figure 1-3. Anti-litter newspaper advertisement.

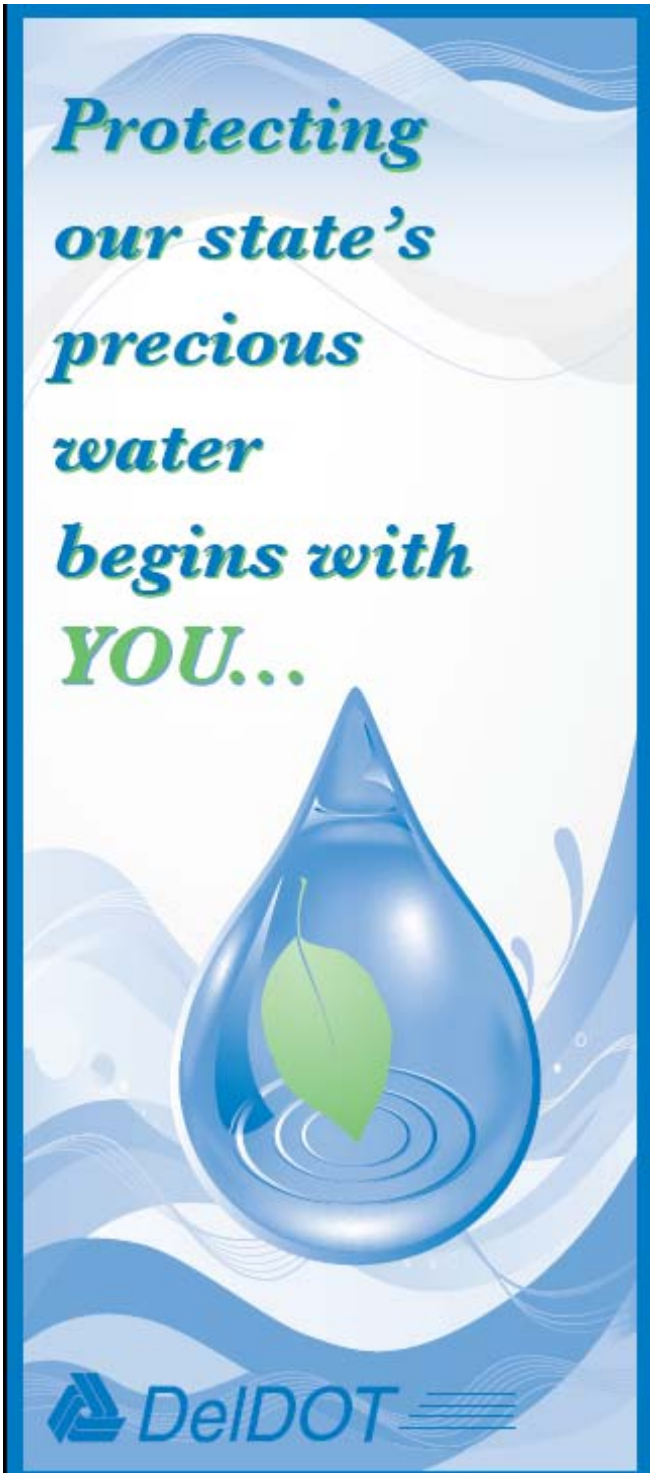

Figure 1-4. Pay check insert sent to all state employees.

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.net) and submits press releases to solicit volunteers. In 2008 there were 224 volunteer groups in Kent County and 310 in Sussex County maintaining approximately 1,068 lane miles.

C. Litter Control Programs

DelDOT held its fourth annual "Imagine a Litter Free Delaware" cleanup day along roads, highways and community areas in September 2008. 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 2008, we distributed 20 door hangers in Kent and Sussex Counties.

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. DelDOT staff participates 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 for those watersheds and to determine the effect of TMDL implementation on DelDOT projects.

The Department of Natural Resources and Environmental Control (DNREC) conducted a watershed study of the St. Jones River basin. This study was initiated to develop a plan to reduce pollutants in the St. Jones River Watershed to the Total Maximum Daily Loads (TMDLs) established by the DNREC in December 2006. The study is comprised of three (3) steps. The first step, the "St. Jones River Baseline Assessment Technical Memorandum," dated October 2008, was prepared by Duffield Associates, Inc. to identify and describe the Watershed, sources and types of impairment, and locations of water quality degradation. Step two is an inventory of potential pollution control opportunities targeted at the identified impairments. The third and final step is an implementation strategy, which will combine the data from the first two steps and present prioritization and watershed management methods to ultimately reduce pollution entering the Watershed. These reports are available from DNREC's Watershed Assessment Section.

DelDOT, as a partner/stakeholder, will utilize this study to identify retrofit projects. We may perform pre and post water quality monitoring as part of our assessment of selected BMP retrofits. DelDOT staff will continue to attend these meetings and interact with the citizen groups until Pollution Control Strategies (PCS) are developed.

G. Development of stormwater presentations for community groups

DelDOT has developed several presentations of varying length on watershed management, stormwater runoff pollution control, and good housekeeping measures for various audiences such as civic associations, school groups, elected officials, business owners, builders and developers, etc. (See Annual Report 2003, Appendices B and D). These presentations can be given by volunteer educators, NPDES staff, and/or other educators. They can be used as an educational tool to facilitate stewardship and increase awareness of stormwater pollution

prevention. A follow-up survey form is developed to assess knowledge resulting from the presentation as well as the opportunity for the public to submit comments, concerns or improvements to DelDOT's Stormwater Quality Program. The presentations will also be made available to the public through our web site (www.deldot.gov/stormwater).

H. NEMO

The National Nonpoint Education for Municipal Officials (NEMO) Network is a network of education programs teaching local land use decision makers about the relationship between land use and natural resource protection. NEMO groups provide assistance through research-based, non-advocacy professional outreach education programs that emphasize natural resource-based land use planning and better site design. A Delaware NEMO Program was begun in 2003. DelDOT NPDES staff serves on the Delaware NEMO steering committee and co-authored a chapter entitled "Managing Stormwater" for the Delaware NEMO BMP Manual.

I. Website

DelDOT developed a new 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.

J. Silver Lake Park Revitalization Project Public Workshop

A public workshop was held on March 4, 2008 to give the general public an opportunity to provide input and take an active role in the development of a project to improve water quality in the St. Jones River. The main purpose of the project is to improve the water quality in the St. Jones River by decreasing nutrient runoff in Silver Lake Park. This is done by planting vegetative buffers along the stream banks. DelDOT has assisted DNREC with this project by determining connectivity of the closed storm sewer system through video-logging inlets and outfalls that empty into the River.

3. Illicit Discharge Detection and Elimination

Requirement:

- 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 2008, KCI Technologies, Inc., and their subconsultant Century Engineering, Inc. (CEI), performed MS4 inventory and inspection tasks for DelDOT to ensure our compliance with the NPDES Phase II requirements for illicit discharge detection and elimination. This work was conducted under Agreement No. 1354. This work includes expanding the MS4 inventory and inspection program to parts of the state beyond the permitted areas, as well as performing reinspections and screening of the MS4 in the Phase II area. KCI and Century also perform annual BMP inspections for DelDOT and conduct dry-weather screening of outfalls.

Specific progress during calendar year 2008 includes the following:

A. Inventory and Mapping

DelDOT completed inventory and inspection of all parts of the DelDOT owned stormwater conveyance system in the Phase II urbanized area in 2007. This work included: all outfalls, drainage inlets, manholes, associated piping, stream channels, ditches, pipes and storm drains, and identifying which drainage inlets function as catch basins. Stormwater ponds and other BMPs also have been inventoried and receive annual inspections. These data are incorporated into the existing comprehensive GIS database that enables users to view the entire stormwater system, corresponding inspection data and photographs.

During the inspection process, each structure was opened and evaluated for material construction and condition. Physical measurements were also made. Digital photographs of the structure and each associate pipe were taken and connectivity between structures verified. At the completion of the inspection process a marker was placed on

each structure to encourage residents to not dispose of waste down the inlet. If a structure had a material deficiency, a Maintenance Work Order (MWO) was generated and forwarded to DelDOT.

Following completion of the inventory and inspection in the Phase II area, KCI Technologies and Century Engineering were hired under Agreements 1351 and 1354 to complete the inventory and inspection of the DelDOT-owned storm system in all other areas of the state, including the rest of Kent and Sussex Counties and new subdivisions statewide. During calendar year 2008, CEI inventoried and inspected 6,325 structures in 48 subdivisions and 53.8 miles of non-subdivision roadways. In Kent County, the work was concentrated in the St. Jones watershed. We expect to complete the St. Jones watershed in early 2009 and then move to the Murderkill River Watershed. A complete summary of work performed by KCI and CEI through the end of calendar year 2008 is included in this report as Appendix B.

The mapping requirements of the Phase II Permit are met through an existing GIS viewer developed for the storm system inventory in New Castle County. 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 2008, KCI's Technology Services developed a Web-based Map Viewer to replace and upgrade DelDOT's existing Map Viewer. The new version leverages newer web technologies based on ESRI's ArcGIS Server platform, and also provides access to the re-designed and more robust geodatabase model that KCI developed in 2007.

B. Outfall Screening in Urbanized Areas of Kent County

Dry weather outfall screening in the Phase II permitted area of the state began in 2004 and was completed in 2007 (see the 2007 Annual Report). Thus we have fulfilled the permit requirements. No additional dry weather screening was performed in 2008.

C. Prevention of 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, DelDOT conducts 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 (see Annual Report 2006, Figure 2-1).

In 2008, two incidents of illegal dumping into storm drains were reported to DelDOT in Kent County (Table 3-1). In response to these reports, we distributed 20 door hangers in the Irish Hill subdivision. Following the distribution, calls were received from residents requesting additional information. We feel, based on experience in all three counties, that this door hanger campaign has been very effective in both raising citizen awareness and discouraging further dumping incidents. Additional details are provided in KCI's 2008 Outfall Inspection and Monitoring Report (Appendix C).

Table 3-1. Potential illicit discharge/dumping incidents investigated in Kent County in 2008.

Date	County	Address	Type Waste	Determination
04-08-08	Kent	91 Limerick Lare Rd	Unidentified sludge dumped into catch basin	Distributed Door Hangers
09-22-08	Kent	4662 Forest Avenue	Discharge tested high for ammonia, detergents and phenols	Pipe from washing machine re-routed to septic tank

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. DNREC renewed DelDOT's delegation for a period of three years, until June 30, 2009. Satisfactory performance of the delegated responsibilities will be considered compliance with this component of the SWMP (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 – new position at DelDOT 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.

Additional/improved training on Clean Water Act, pollution prevention using common sense tactics, reporting, communication, posting NOI & Permits, etc. is being provided. A 3-day Certified Construction Reviewer (CCR) course was held in October 2008 for DelDOT staff involved with erosion and sediment issues, E & S inspections, designing stormwater systems or review of stormwater plans will be required to attend. 59 DelDOT staff attended the training.

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.

KCI upgraded our existing data collection methodologies for all BMP types. A field inspection manual and new form were developed to effectively perform field inspections to evaluate BMP performance and to identify maintenance requirements. The procedures outlined in this manual will assist DelDOT with decisions on inspection, maintenance, repair, and retrofit of BMP facilities. KCI inspected 298 BMPs in 2008.

BMP Maintenance

Maintenance functions are performed by the Districts or through contractors specializing in noxious and invasive species control or maintenance of specific BMP types. We executed a 3-year statewide agreement with JCM Environmental to control noxious and invasive species. We are also developing a maintenance contract for select BMPs that need more major maintenance.

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 DelDOT. 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:

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).

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 will also decrease 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.

DelDOT has a Standard Operating Procedure developed for responding 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; employees have been trained on spill response and protection of water quality.

All road projects are required to follow the Delaware Sediment and Stormwater Regulations. Projects designated as minor, medium or major shall 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).

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 31 sweepers in its fleet statewide. Table 6-1 provides a summary of the types of sweepers owned by the Department and the areas to which they are assigned. 11 of the vehicles operate in Kent and Sussex Counties. No new sweepers were added to the fleet in 2008.

C. Litter Program

DelDOT's Litter Program reduces the discharge of floatables to the MS4. 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 and 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. Additional litter control programs are described below.

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. In 2008 there were 224 volunteer groups in Kent County and 310 in Sussex County maintaining approximately 1,068 lane miles.

Anti-Litter Campaign

The Division of Motor Vehicle offices offered free car litter bags to all motorists. DelDOT is also bringing the anti-litter message to young people by partnering with school districts. Another partnership with the Department of Natural Resources and Environmental Control resulted in the fines to at least four persons who littered along a DelDOT roadway. The NPDES Program also submitted anti-litter quarter-page newspaper advertisements to the Delaware State News (See Section 1, Figure 1-3).

Roadside Clean-up

DelDOT held its fourth annual "Imagine a Litter Free Delaware" cleanup day along roads, highways and community areas in September 2008.

D. Snow and Ice Program

DelDOT continues to follow the salt management practices established by the "Statewide Salt Best Management Practices for DelDOT Maintenance Yards" plan developed two years ago (see Annual Report 2004, Appendix I). All salt stored at the maintenance facilities is stored under roof. Only during loading and unloading does the potential exist for salt to enter the stormwater system. Standard procedures call for DelDOT maintenance staff to clean up loading areas as soon as practicable after a storm event.

Salt application rates can vary depending on storm conditions, but the goal is 100 to 400 pounds of salt per lane mile, as recommended by AASHTO. The rate is achieved by calibrating the equipment annually and sending maintenance personnel to a one-day seminar provided by The Salt Institute. The seminar instructs on proper salt application procedures and quantities, balanced with safety and environmental considerations.

DelDOT has developed and instituted advanced snow fighting practices that began during the 2004-2005 winter season. These 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. This also helps meet the goals of the NPDES Program by reducing the impact on the environment in the following ways:

- Ground speed spreader controls provide accurate control of material application.
- 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 presently has eleven brine units of 1300-gallon capacity and six units of 1800-gallon capacity that slide into the bed of a dump truck. We have also acquired four 5000-gallon tanker trailers equipped with spraying capabilities to be pulled by the Departments current fleet of truck tractors.
- 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 decrease the amount of weight that the plow cutting edge bears on the road surface, decreasing damage to the road surface.

DelDOT's long-term plan is to have all trucks fully equipped with the aforementioned equipment by 2009.

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.

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, 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 herbicides that are applied to DelDOT rights-of-way by contract applicators are reviewed prior to contract award to ensure that selected herbicides are labeled for the intended use and that, when feasible, chemicals are selcted that can be used at a low application rate. This review frequently reduces the total load of herbicide applied to DelDOT's rights-of-way.

DelDOT does not routinely fertilize its roadsides. Grass clippings are left on the ground after mowing, and their degradation results in slow release of nutrients to turfgrasses. This practice minimizes leaching and runoff of nutrients.

Fertilizers are used only in establishing turfgrasses from seed on freshly prepared bareground. This generally is done by contractors using hydroseeders. DelDOT 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 31 kg/ha of water soluble potash. In all cases seeded areas are covered with a recommended mulch.

Pesticide applications on DelDOT's rights-of-way are done according to product label recommendations. Pesticides are applied only by contractors that are certified Delaware pesticide applicators. DelDOT employees who apply pesticides to DelDOT's rights-of-way are certified Delaware pesticide applicators or work directly under the supervision of a certified Delaware pesticide applicator. Typically, herbicides are the only pesticides used by DelDOT. Insecticides may occasionally be applied 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. Sessions attended by these specialists often include topics such as opportunities to use reduce pesticide applications by using new low rate pesticides, or using adjuvants or surfactants that enhance efficacy of pesticides and thus reduce rate.

Following an audit and assessment of our program in 2006, DelDOT began in 2007 to implement several new programmatic initiatives as part of the NPDES pesticide reduction strategy:

1. Guardrail Inventory – The guardrail inventory is a field inventory and database project. The inventory and attributes collected will be used in development of a pesticide reduction strategy. Each DelDOT-owned guardrail section will be GPS'd and attributes collected. Attributes include material under guardrail, guardrail type, surrounding environmental features and identification of sensitive/no spray zones. The field work for the inventory was largely completed in 2008 under Agreement 1438 with Wallace, Montgomery and Associates. All data from the inventory should be available to DelDOT by early 2009.

2. Guardrail Vegetation Management pilot study – The University of Delaware and DelDOT's NPDES Program began a controlled research study in 2008 to test the effectiveness of vegetation control alternatives for under guardrails. Treatments being evaluated include weed control barriers, chemicals, low-growing vegetation, and hand cutting of existing vegetation. They will be compared based on effectiveness, ease of implementation, aesthetics, cost and longevity. Test locations were selected to represent typical roadway settings in which guardrails are utilized. Test sites will be monitored and data will be taken monthly for two years. 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 environmentally sensitive areas and drinking water supply reservoirs.

3. "Establishment and Maintenance" manual – DelDOT has contracted with The University of Delaware to develop an "Establishment and Management" manual to manage vegetation along Delaware's highways. One goal of the manual is developing pesticide reductions strategies that follow Integrated Roadside Vegetation Management (IRVM) objectives. A draft of the manual was substantially complete by December 2008. DelDOT intends to provide training to DelDOT maintenance staff on the manual's contents and principles in early 2009.

4. Contract language – Because DelDOT outsources most of its 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.
5. Training – In addition to the required training for pesticide license renewal, DelDOT holds additional periodic training to further educate staff. 25 DelDOT staff attended a "Basic Herbicide Training" workshop in August 2008, which focused on proper equipment calibration.
6. Record keeping – Contractors and DelDOT applicators are required to submit records of spraying activities to DelDOT's Environmental Roadside Section. We are working with staff in development of a database that will allow us to track pesticide usage.

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

1. 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.

2. Facility Inspections

   Team members of the Pollution Prevention Plans for each maintenance yard are required to conduct quarterly inspections during dry and wet weather events to look for evidence of stormwater contamination. The inspection reports are submitted to the DelDOT NPDES Program and also filed with the SWPPP binders at each facility. Quarterly inspections continued during the 2008 calendar year. At least once per year, a member of the DelDOT NPDES Program staff also conducts a full inspection of each yard.

3. Spill Prevention Control and Countermeasures (SPCC)

   DelDOT hired BrightFields, Inc. to assist the Department in complying 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. BrightFields, completed a full investigation and developed site-specific plans for maintenance facilities that met the above ground storage minimums requiring a SPCC plan. All plans were completed and distributed in 2007. Because of the addition of new above ground storage tanks at Harrington and Cheswold maintenance facilities, Brightfields recently also prepared SPCC plans for these areas, and they were implemented in 2008.

4. Training

In 2007, the NPDES Program executed an agreement with the Center for Safety & Emergency Response Training (CSERT) to develop three training videos for our maintenance staff. Videos were completed and delivered to each maintenance facility. The videos are used to train DelDOT personnel annually on:

- The regulatory requirements of the Spill Prevention Control and Countermeasures (SPCC) plans developed for each maintenance yard
- Spill response and emergency procedures
- The proper procedures for responding to facility and non-facility (roadway) based emergency events.

The training videos on Facility and Vehicle Maintenance, Stormwater Contamination and Spill Prevention, and Vegetation Control and Pollution Prevention on Public Roads and Highways, developed by CSERT in 2003, also continue to be used to train DelDOT personnel and new hires.

5. Monitoring

The Pollution Prevention Plans require wet weather stormwater monitoring at five maintenance facilities. These facilities were chosen as representative of the 16 facilities located throughout the state. The five yards are: Kiamensi, Bear, Cheswold, Harrington and Georgetown. In October 2008, DelDOT submitted a request to DNREC that the Georgetown Yard pond be exempted from the monitoring requirement. Reconstruction of the BMP earlier in the year significantly increased its storage capacity. Repeated attempts to sample there were unsuccessful, because the pond did not discharge, even during heavy rainfall events. On November 18, 2008, DNREC approved this exemption.

Monitoring was conducted during 2008 at each of the other four 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 6-2 displays the first flush concentrations measured during 2008 for all parameters at each of the four sites. The total suspended solids (TSS) level of 717 mg/L measured at Cheswold yard in January exceeded the benchmark value of 100 mg/L. This was attributed to construction activities that were occurring at the yard during that time period. This construction included retrofit of the stormwater pond, installation of grassed swales and a vehicle wash pad. TSS levels measured at that site later in the year were well below the benchmark. A relatively high level of diesel-range petroleum hydrocarbons (106 mg/L) also was observed in the January sample taken at Bear yard. This exceeded the benchmark value of 15 mg/L for oils and grease. No explanation

could be found for this one-time exceedance of the benchmark. The Area Supervisor reported that no leaks, spills or dumping incidents had occurred at the yard on or before the monitoring date. TPH values were found to be normal at the next sample date in the fall.

When monitoring at the maintenance facilities first began in 2004, suspended solids concentrations routinely were found to be high at certain of the yards, including Harrington and Bear. These yards handle and store large quantities of dirt, sand and other construction materials, and wash vehicles on site. We have also noted higher chloride concentrations in winter samples at yards that have salt storage and deicing operations.

In response to these findings, DelDOT implemented operational changes (including stricter enforcement of materials storage and housekeeping rules) and retrofitted certain yards with new BMPs (e.g., see "Wash Water Plan" section below). Subsequent monitoring has demonstrated that the BMPs have largely been effective in reducing TSS discharges from the maintenance facility sites, with the exception of temporary spikes during retrofit construction at Bear and Cheswold yards.

6. Vehicle Wash Water Plan

In July of 2005, DelDOT submitted a report entitled *Statewide Vehicle Wash Water Practices for DelDOT Maintenance* 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.

Retrofits have been completed at several yards over the past few years, including Magnolia, Bear and Cheswold. Currently we are working on BMP retrofits at Middletown and Harrington yards.

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 2008:

- All maintenance staff is 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 is 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.
- Winter Workshop – February 2008; attended by DelDOT staff and contractors. Mary Hamilton gave presentation on her role as Environmental Compliance Supervisor; training on erosion and sediment control, NPDES, seeding, soil retention blanket mulches and bonded fiber matrix.
- Public Workshop, February 13 and 20, 2008: Managing stormwater and properly maintaining stormwater systems. Participating organizations: DNREC, Sussex Conservation District, Center for Inland Bays.
- 25 DelDOT staff attended a "Basic Herbicide Training" workshop in August 2008.
- A Certified Construction Reviewer (CCR) course was held in October 2008, where 59 DelDOT staff involved with erosion and sediment issues, E & S inspections, utility work, designing stormwater systems or review of stormwater plans attended.
- Webcasts viewed by NPDES staff:
  - EPA webcast: BMP Performance
  - EPA webcast: The Art and Science of Stormwater Retrofits
  - EPA webcast: Assessing the Effectiveness of you Municipal Stormwater Program
  - EPA webcast: Using rain gardens to reduce runoff-slow it down, spread it out, soak it in!
- The DelDOT Stormwater Engineer and the NPDES Environmental Scientist attended the 2008 AASHTO/SCOE National Stormwater Conference
- The NPDES Environmental Scientist attended the EPA workshop, Water Quality Modeling to Support Management Actions, held in Baltimore, Maryland, September 9–10, 2008.
- The Roadside Environmental Section staff attended various courses and workshops for re-certification, pesticide credits, and ISA (International Society of Arboriculture) credits including:
  1. 2008 Delaware Nursery & Landscape Association Summer Expo
  2. 2008 Delaware Nursery & Landscape Association Winter Expo
  3. 2008 Delaware Ornamental & Turf Workshop
  4. Threats to Forest Health workshop
  5. 2008 Delaware Horticulture Industry Expo
  6. Ornamental Short Course Turf workshop
  7. 2008 National Roadside Vegetation Management Association conference
  8. DelDOT pesticide training workshop
  9. 2008 Invasive Species Workshop
  10. 2008 Mid-Atlantic Horticulture Short Course held in Virginia Beach, VA

Table 6-1. Current statewide sweeper fleet.

Unit No	Vehicle Type	County	District and Area Assignment
2678	2002 STERLING SEWER CLEANR	New Castle	CANAL - AREA 10, BEAR
3776	2007 SCHWARZE SWEEPER-VAC	New Castle	CANAL - AREA 10, BEAR
3963	2002 SCHWARZE TRK SWEEPER VAC A7000	New Castle	CANAL - AREA 10, BEAR
3962	2002 SCHWARZE TRK SWEEPER VAC A7000	New Castle	CANAL - AREA 10, BEAR
3961	2002 SCHWARZE SWEEPER-VAC	New Castle	CANAL - AREA 22, FLOAT CREW
3974	2002 SCHWARZE SWEEPER-VAC	New Castle	CANAL - AREA 22, FLOAT CREW
3956	2002 SCHWARZE SWEEPER-VAC	New Castle	CANAL - AREA 9, MIDDLETOWN
2798	2001 STERLING SEWER CLEANR	Kent	CENTRAL - AREA 6, HARRINGTON
3960	2002 SCHWARZE TRK SWEEPER VAC A7000	Kent	CENTRAL - AREA 6, HARRINGTON
3970	2002 GMC TRK SWEEPER	Kent	CENTRAL - AREA 7, MAGNOLIA
3968	2002 GMC TRK SWEEPER	Kent	CENTRAL - AREA 8, CHESWOLD
3971	2002 GMC TRK SWEEPER	Kent	CENTRAL - AREA 8, CHESWOLD
3775	2007 SCHWARZE SWEEPER-VAC	Kent	CENTRAL - DISTRICT TRUCK SHOP
3957	2002 SCHWARZE SWEEPER-VAC	New Castle	NORTH - AREA 11, KIAMENSI
2688	2002 STERLING SEWER CLEANR	New Castle	NORTH - AREA 12, TALLEY
3958	2002 STERLING TRK SWEEPER	New Castle	NORTH - AREA 12, TALLEY
3973	2002 GMC TRK SWEEPER	New Castle	NORTH - AREA 14, INTERSTATE CREW
3952	2001 STERLING TRK SWEEPER	New Castle	NORTH - AREA 14, INTERSTATE CREW
3951	2001 STERLING TRK SWEEPER	New Castle	NORTH - AREA 14, INTERSTATE CREW
3964	2002 SCHWARZE TRK SWEEPER VAC A7000	New Castle	NORTH - AREA 14, INTERSTATE CREW
3773	2007 SCHWARZE SWEEPER-VAC	New Castle	NORTH - AREA 14, INTERSTATE CREW
3774	2007 SCHWARZE SWEEPER-VAC	New Castle	NORTH - AREA 14, INTERSTATE CREW
3965	2002 SCHWARZE TRK SWEEPER VAC A7000	New Castle	NORTH - AREA 14, INTERSTATE CREW
2963	2001 STERLING SEWER CLEANR	New Castle	NORTH - AREA 14, INTERSTATE CREW
3183	2001 STERLING TOLLB CLNR6W	New Castle	NORTH - AREA 14, INTERSTATE CREW
3969	2002 GMC TRK SWEEPER	Sussex	SOUTH - AREA 20, FLOAT CREW
3959	2001 ELGIN SWEEPER-MECH	Sussex	SOUTH - AREA 20, FLOAT CREW
3953	2001 STERLING TRK SWEEPER	Sussex	SOUTH - AREA 20, FLOAT CREW
3967	2002 GMC TRK SWEEPER	Sussex	SOUTH - AREA 3, ELLENDALE
3966	2002 GMC TRK SWEEPER	Sussex	SOUTH - AREA 5, DAGSBORO
3181	1992 FORD TRK SWEEPER	Kent	TOLL OPS-SMYRN RST AREA (OLD 7314)

Table 6-2. 2008 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.

PARAMETER	KIAMENSI		BEAR		CHESWOLD		HARRINGTON	
	01/11/08	09/06/08	01/18/08	09/06/08	01/11/05	09/06/08	02/01/08	09/06/08
Total Suspended Solids	53	26	18	107	717	51	60	48
Surfactants, MBAs	0.17	0.26	0.18	0.27	0.28	1.6	0.16	0.69
Chloride	530	1190	737	39.3	471	107	1870	331
TPH-Gasoline Range Organics	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH-Diesel Range Organics	0.45	0.28	106	0.14	0.1	3.62	<0.13	0.24
pH	7.3	7.35	ND[1]	7.31	8.11	7.13	6.97	7.26

[1]No pH measurement due to laboratory error.