

**MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE)
WATER MANAGEMENT ADMINISTRATION**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT
MD00683625**

MDE AUDIT: CHARLES COUNTY 2011 ANNUAL REPORT

Charles County was reissued a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system discharge permit (MD0068322) on July 31, 2002. This permit lasts for 5 years and requires the County to prohibit non-stormwater discharges and reduce the discharge of stormwater pollutants to the maximum extent practicable. While Maryland Department of the Environment (MDE) is in the process of reissuing this permit, the existing permit is administratively continued. Each year Charles County produces an annual report to document progress related to its NPDES stormwater management programs. The following is an audit of the 2011 annual report submitted to MDE on October 21, 2011.

Permit Administration

Charles County is required to identify key administrative and technical personnel responsible for NPDES permit compliance. Updated information with names, addresses, and phone numbers of personnel responsible for the NPDES program was submitted in this annual report. MDE considers this information complete.

Legal Authority

Charles County is required to maintain adequate legal authority in accordance with NPDES regulations 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) throughout the permit term. On June 19, 2003, the Office of the County Attorney provided recertification that adequate legal authority exists to control the quality and quantity of discharges through the County storm drain system. As a result, adequate legal authority continues to be maintained by Charles County.

Source Identification

Charles County is required in its NPDES permit to compile and submit any new source identification information. Data include the identification and mapping of storm drain outfalls, land use activities, population estimates, runoff coefficients, major structural controls, landfills and controls, publicly owned lands, State and federal properties, NPDES industrial discharges, and industries organized by watershed and Standard Industrial Classification (SIC) codes. Furthermore, the County is required to describe progress made toward geographic information system (GIS) implementation.

Charles County continues to update and maintain its source identification data. GIS coverages with metadata were provided and included storm drain pipes, outfalls, drainage areas, and best management practices (BMP) located within the Development District. Additionally, the county-wide Light Detection and Ranging (LIDAR) data with 2' contours became available at the

end of 2005. Since that time, higher resolution orthophotography has become available for County employees. Due to the higher resolution aerial photos, additional impervious surface was captured by the Feature Analyst software. This software provides capabilities for feature extraction within the ArcGIS environment requiring access to current, high quality aerial orthophotography. Since 2007, KCI Technologies has been using Feature Analyst to estimate impervious surface coverage in the County.

In February, 2006 Charles County began requiring digital submittals of as-built drawings by surveyors and engineers. Development plans and their associated BMPs are also identified and updated each year. In the reporting year 2011 a total of 25 development plans were added to the database. At this time major outfalls associated with these developments were also identified. This included outfall numbers 231 and 232 from the Sheffield and Acton Lane projects. In addition, a total of 65 new BMPs were added in this reporting period. The updated database shows a total of 689 BMPs in the Development District and 1183 BMPs county-wide.

Charles County continues to maintain adequate source identification data and the County's urban BMP database is well-maintained. MDE commends Charles County's effort in taking advantage of new technology to meet these permit requirements. Substantial progress has been made to resolve the discrepancy between the County database and the number of mapped BMPs in the Development District.

In the future, the County needs to work on developing GIS data for the remainder of the County outside of the Development District. In addition, MDE has recently updated the database structure outlined in "Attachment A" and this database has been distributed for the County's use. The next annual report should include a complete "Attachment A" submittal. This will allow MDE to maintain a consistent State-wide database for all NPDES jurisdictions.

Discharge Characterization

Chemical Monitoring

Charles County is required to perform storm event monitoring and estimate annual and seasonal pollutant loads. In December of 2005, the chemical monitoring station was relocated to Arthur Middleton Elementary School to develop baseline pollutant inflow data to the receiving channel prior to construction of a wetland restoration project. Baseline sampling began in 2006 through 2007 and the wetland construction began in April of 2007. Baseline monitoring is shown in the 2007 and 2008 reports and post wetland construction data are provided in the 2011 report.

Overall, 8 storm events were observed and 8 wet weather samples were taken in 2010. Chemical data show that the average event mean concentrations (EMCs) for each pollutant are below literature values from the Nationwide Urban Runoff Project (NURP) at both the inflow and downstream locations. While the inflow concentrations for most contaminants have not varied at the inflow location, reductions have been observed for every contaminant (except oil and grease), when comparing the inflow to the wetland outflow. The largest reductions can be found in TKN, nitrate and nitrite, TSS, and fecal coliform.

The County provided calculations to show observed pollutant removal efficiencies over the entire monitoring period. This analysis shows that pollutant removal has been increasing each year since the wetland was constructed, indicating that the wetland is improving water quality in the downstream channel. A comparison of wetland performance was also made with removal efficiencies recently published in the document, Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated (MDE, 2011). This analysis showed that between 2008 and 2010 observed removal rates for nitrogen and phosphorus have consistently been greater than MDE published values. For TSS the removal efficiencies exceeded published values in 2010 only. This trend may not necessarily be a function of improved wetland performance as much as a function of higher TSS inputs in 2010. For example, in 2008 and 2009, very low TSS values were observed at the inflow (11 mg/L and 17 mg/L respectively). The outflow TSS values in 2008 and 2009 were 7 mg/L and 9 mg/L, which were actually lower than the 2010 value of 13 mg/L. Therefore, higher removal rates in 2010 (80.9%), versus 2008 (36.4%) and 2009 (47.1%) do not necessarily mean that greater load reductions were achieved. This analysis is very useful for evaluating BMP performance over time, and MDE encourages the County to continue in future years.

Biological and Physical Stream Assessment Monitoring

In the Fall of 2005 a new site was chosen for the biological and physical monitoring on a tributary to Mattawoman Creek located between Berry Road and Acton Lane. The site was chosen because it was identified within the Acton-Hamilton area in the Charles County Watershed Restoration plan. The site was monitored in the Fall of 2005 to establish baseline conditions. Monitoring continued in 2007 through present to include geomorphic and biological assessments. The complete history of the monitoring is provided in the 2011 report.

Physical monitoring included an analysis of channel substrate, stream cross-sections, and a stream habitat assessment. An annual comparison of the stream profile was not done and should be provided in future years. Channel cross-section data show both aggradation and erosion observed over the monitoring period and very small differences in bankfull elevation between the 2005 through 2011 surveys. The substrate is highly mobile and extensive point bar formations, channel aggradation, and some finer sedimentation in the pools have been noted. The channel geometry remains consistent with previous years and appears to experience overbank flow in the floodprone zone regularly.

The physical habitat assessment rated the habitat for both fish and benthic macroinvertebrates at the midrange to suboptimal. From the baseline observations to 2009, conditions appear to have generally degraded in the study reach. Extensive bar formations and excessive algae have been consistently observed. Benthic scores have returned to the "Poor" range from 2009 through 2011 after receiving a score of "Fair" in 2008. A general trend has been observed showing a decrease in water quality from 2008 levels with lower dissolved oxygen levels and higher conductivity and turbidity. However, dissolved oxygen did increase significantly in 2010 to 13.5 mg/l and then decreased again to 8.8 mg/l in 2011. These deteriorating conditions are very likely due to the lack of stormwater management in this watershed.

Charles County continues to perform comprehensive chemical, biological, and physical monitoring. The information is detailed and complete. MDE commends the County for moving

the monitoring locations to areas designated for watershed restoration. The chemical data at Arthur Middleton Elementary School is already providing useful information with respect to the performance of the constructed wetland.

The biological and physical data at the Acton-Hamilton site provide baseline conditions from 2005 to present. This information will be very useful in evaluating the effectiveness of future restoration projects at this site. These projects are currently under design and are planned for construction in the fall of 2012 and propose to treat 18 acres of impervious area. Future annual reports should consider how the biological and physical data are integrated to show trends and relate to a change in watershed conditions.

2000 Maryland Stormwater Design Manual Effectiveness Study

In 2003, the County began monitoring the effectiveness of the *2000 Maryland Stormwater Design Manual* (Design Manual). Monitoring occurs along a tributary to Piney Branch draining 294 acres of agricultural and forested land use. Development in the watershed over the course of the study period includes the addition of North Point High School, William A. Diggs Elementary School, and the residential developments of Windsor Mill and Avalon. Eleven stormwater management ponds are located in the study area.

Stream profiles, cross-sections, and a stream gauge have been established and discharges continue to be analyzed and reported annually since 2003. Results show that the presence of wetlands, a broad floodplain, and beaver activity all contribute to the stability of the channel. In addition, vast forested areas were protected in the floodplain and the developed areas did not encroach on existing steep slopes.

The purpose of the study is to evaluate the effectiveness of the stormwater ponds in protecting stream channels. As noted above, a number of factors contribute to the stability of the system as a whole. Therefore, in the 2009 MDE audit of Charles County's annual report, a more detailed field evaluation of the ponds and tributary channels that convey runoff to the main stream was recommended. As a result, the County performed detailed pond inspections for each of the 11 ponds in the study area and these were documented in the 2010 annual report. The inspections showed that each pond was functioning properly and the conveyance channels were stable with the exception of the outfall channel below pond 9 at North Point High School. As a result, a more detailed analysis of this channel was performed and the results were documented in the 2011 annual report. The section of channel that is eroding is on an 8% slope with sandy alluvial erodible soils. Therefore, it is anticipated that the headcut could be more severe without stabilization. The recommendation to stabilize the area with a step-pool system needs to be evaluated further and any resource impacts (forested area and potential disturbance on the slope) as a result of this construction activity should be considered. MDE commends the County for following up on the recommendations made during the 2009 audit. Due to the recent development activity in the subwatersheds, the inspections should continue so that pond performance may be assessed and any impacts associated with the change in land use may be identified. MDE suggests that the County provide a rotating schedule for pond inspections and conveyance channels in future years.

In the 2009 audit MDE also requested more information related to the change in land use over the study period and the original design of the ponds. As a result, the 2009 annual report provides a tabulation of land use information from 2002 to 2009. Overall the total watershed imperviousness increased from 1.1% in 2004 to 8.6% in 2009. The forested area decreased from 82% in 2002 to 51% in 2009, and the residential area increased from 6% to 35 % over the same time period. The total imperviousness is expected to increase as the homes in the Avalon community are completed. The information provided is very useful in documenting the change in land use during this time period and should be updated as needed in future annual reports.

MDE also recommended in the 2009 audit that further information on the original design of the ponds should be provided. This included the drainage area, and proposed impervious areas draining to each pond along with the dates of construction completion for further analysis. All stormwater structures should be identified in the aerial photos for further clarity. This information will provide a more complete evaluation of the performance of the ponds within the context of the ongoing development activities.

The information gathered in the Piney Branch study area provides a useful starting point for evaluating the effectiveness of the Design Manual. The 2010 and 2011 annual reports address MDE's recommendations to incorporate pond design and performance into observations made from the stream channel stability analysis. MDE will continue to work with Charles County to modify the direction of the study as necessary so that the information gained will provide further insight into the effectiveness of the Design Manual. As an alternative approach, the County may consider evaluating the performance of environmental site design (ESD) practices. Investigating ESD implementation can contribute further information on the effectiveness the Design Manual.

Management Programs

Stormwater Management Program

Charles County is required to submit detailed information addressing a wide variety of NPDES management programs. The County is required to maintain an acceptable stormwater management program and document all maintenance inspections, necessary corrective actions, and enforcement actions. The County continues to conduct preventative maintenance inspections of all stormwater management facilities on a triennial basis. These are reported per calendar year. Between 2005 and 2011, the County performed a total of 331, 365, 761, 501, 378, and 427 inspections in each respective year. Clearly the inspection effort has been improved over the entire permit term. In addition, 59 facilities were brought into compliance in 2010.

Overall, facilities typically require only routine maintenance as no major structural defects have been reported. However, the number of unacceptable facilities remains high each year (48% and 56% in 2009 and 2010). The number of unacceptable facilities is comparable to prior years' annual reports. It will be helpful to provide more detail regarding the type of maintenance that is needed and how these maintenance activities are affecting pond performance. The County needs to show further progress in bringing unacceptable facilities into compliance.

On July 13, 2010, Charles County adopted new stormwater regulations to reflect new requirements in the Maryland Stormwater Management Act of 2007. The regulations went into

effect on August 1, 2010, and the County has provided educational seminars and public notices to the involved stakeholders to allow for successful transition to the new regulatory requirements. The County has also published guidance materials to assist developers through the plan review process. The County is commended for these efforts as they will be integral to successful implementation of the new stormwater management regulatory requirements. Future annual reports should list projects that received Administrative Waivers and were reviewed under prior stormwater regulatory requirements.

The 2011 annual report tabulates the stormwater management credits applied to single family lots on an annual basis. As observed in previous annual reports, the data show that stormwater credits were provided for the great majority of projects, sometimes eliminating the need for structural practices. In addition, rooftop runoff disconnections continue to be the most prevalently used credit in each year by a wide margin. Dry wells are also very widely used in residential applications. Future annual reports should continue to list stormwater credits when Administrative Waivers are granted. In addition, the submission and review of ESD projects should also be specified. This will reflect successful progress in implementing the recent revisions to the Design Manual.

Illicit Connection Detection Elimination Program

Improvement also has been made with Charles County's illicit connection detection and elimination program. Field screening for illicit discharges was performed for 99 outfalls in 2010. Of the 99 sites, 24 had observed flow, two of which had chlorine present and one had detergents. However, the chlorine and detergent concentrations were below the threshold limits identified in the MDE document, *Dry Weather Flow and Illicit Discharges in Maryland Storm Drain Systems* (1997).

As observed in prior annual reports, progress continues to be made toward correcting the problems identified in the field. For example, Appendix G provides a summary table of illicit discharge detection and elimination inspections between 2006 and 2011 where problems were found and action taken to correct the problem. In addition, Table 11 of the annual report provides a list of projects where repair work has been performed as a result of problems observed in the field. The 2011 report identified three areas of concern at outfalls 106, 56, and 159.

Outfall number 106 was observed to be undergoing severe erosion in the 2006 annual report. The 2011 report shows that the erosion problem continues to worsen. Engineering plans to address this issue are currently underway. The repair work has been planned for FY 2011 as part of the Pinfield Community retrofit projects, however, the work has not been completed to date.

Excessive algae growth and white residue was observed in the storm drain at Outfall 56. Outfall 159 had a high amount of ammonium observed during 2 field visits. The County is continuing to investigate both of these problems.

Major outfall 203 located at Mr. Tire automotive garage was found to be in non-compliance in past annual reports. MDE recommended further investigation of this problem. The County should follow up on this recommendation and provide an update on the status and resolution of this problem.

It is clear that the illicit connection detection and elimination program is doing a good job of identifying problems and following up with proper action to address the issues. Charles County should continue to follow up with action to address the problems noted in previous annual reports. MDE commends Charles County for combining efforts to meet restoration requirements with opportunities to fix problems observed under the illicit detection program.

Public Reporting and Citizen Complainants

The County is also required to maintain a program to respond to illegal dumping and spills and include procedures for reporting and citizen complaints. Reports of suspected pollutant discharges and citizen complaints have been outlined in Appendix H of the annual report. Of the list of complaints it appears that there have been numerous reports regarding excessive algae and a white residue at outfall number 56. As discussed above, this outfall has been inspected numerous times since 2008 and chemical tests have not found any parameters to be above the threshold limits. The County is continuing to investigate this issue.

Public Education and Outreach to General Public and Regulated NPDES Community

Charles County continues to maintain comprehensive public education and outreach programs. These efforts have been excellent and include the Potomac River Watershed Cleanup, and partnerships with University of Maryland Cooperative Extension and Master Gardeners to educate the public on water quality issues. The Charles County Government website provides various information related to environmental issues as well as detailed services available to the public. These include links to the NPDES annual reports, environmental planning initiatives in the Mattawoman and Port Tobacco River watersheds, numbers to call for suspected pollutant discharges, public transportation and recycling services, and information on proper disposal of household hazardous waste. Charles County also incorporates various permit requirements into opportunities for public outreach and education.

Charles County is also required to identify all County-owned facilities requiring an NPDES discharge permit and submit documentation that a permit has been obtained for each. The County has identified six facilities that have NPDES Discharge permits. Of these, only one, the Mattawoman Waste Water Treatment Plant has a completed pollution prevention plan. Pollution prevention plans are the fundamental component of the industrial general permit, and the County needs to ensure that these plans are developed presently to remain in compliance with the NPDES stormwater permit.

Erosion and Sediment Control Program

At the beginning of the permit term, Charles County was encouraged to apply to MDE for delegation of erosion and sediment control enforcement authority. Charles County formally submitted an application for delegation in September of 2005, and was granted authority for erosion and sediment control in the Fall of 2006. At that time, personnel from both MDE and Charles County met in the field to provide a smooth transition for the new program. In October and November of 2007, MDE performed field reviews of active construction sites to evaluate the program. Significant improvements and the progress made toward addressing violations were

noted at that time. In September through November of 2009, MDE performed another evaluation of Charles County's erosion and sediment control program. MDE's review of the program included recommendations related to proper installation of controls and on-site stabilization. Overall, the review showed continued progress by Charles County and its erosion and sediment control program was found to be acceptable.

In September and December of 2011, MDE performed another field review of active construction sites to further evaluate Charles County's program. Recurring maintenance items found during the field review included erosion repairs for swales and inflow protection, and the lack of stabilization of inactive areas. Where problems were found, the County was able to take appropriate corrective action to bring the sites into compliance. As a result of the site inspections, MDE has found the program to be acceptable and granted the County continued delegation in a February 22, 2012 letter.

Additional elements of an acceptable erosion and sediment control program include education and documentation of construction activity in the County. Charles County should consider performing their own responsible personnel certification classes to educate field personnel on erosion and sediment control compliance. At this time, these classes are conducted by MDE. Information regarding earth disturbances exceeding one acre is consistently provided in the annual reports. This information has been submitted to MDE on a quarterly basis.

Overall, Charles County has improved its management programs and outreach efforts. The stormwater management, illicit detection and elimination program, and erosion and sediment control program have made considerable progress. The County is commended for its efforts to address these programs.

Watershed Restoration

Charles County is required to systematically assess water quality within all of its watersheds. This includes prioritizing watersheds, selecting restoration areas that comprise 10% of the County's impervious area, performing detailed water quality analyses, identifying water quality improvement opportunities, and implementing plans to control stormwater discharges to the maximum extent practicable. This work establishes long-term water quality improvement programs.

In order to meet the 10% restoration goal, a total of 286.3 acres of impervious area is required for water quality treatment in the Development District. The County completed watershed restoration studies in 2004, 2007, and 2010 to identify potential water quality improvement projects.

As a result of the 2004 and 2007 studies, an action plan for implementation has been scheduled. Two shallow marsh wetlands were constructed at Gustavus Brown and Arthur Middleton Elementary Schools in 2008 and a total of 45 acres of impervious area has been restored. However, implementation efforts have been slow in recent years as noted in the action plan shown on Table 15 of the 2011 annual report. The plan does indicate progress should accelerate over the next 12 to 18 months as several projects will be ready for construction. Engineering and design work has been completed for the Bryans Road and

Pinefield restoration projects and these should be constructed over the next six to nine months. Six other projects are currently contracted out for design work and should be ready for construction by the end of 2012. Charles County needs to stay committed to this action plan and continue to show further progress in future years.

The 2004 Watershed Restoration Study identified seven study areas for implementing water quality BMPs to treat a total of 488 acres of impervious area. The 2007 Watershed Study identified 10 study areas that could provide an additional 276 acres of impervious area. After implementation of projects identified in the 2004 and 2007 Watershed Studies, over 20% of untreated impervious areas within the Development District will be restored.

The 2010 Watershed Restoration Study identified 17 projects within 9 study areas to treat approximately 37 acres. The study does call for one stream restoration project. This project should be credited according to the MDE document Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, June 2011 (MDE, 2011). If however, the credit allowed in the MDE document is greater than the actual impervious area draining to the stream restoration project, then the lesser of the two numbers should be used.

The 17 restoration projects identified in the 2010 study provide different opportunities for water quality improvement in residential, commercial, and public properties. Several of the commercial properties are located along the MD Route 301 corridor in highly urbanized locations. MDE commends the County for seeking opportunities to utilize the green space available in these urban areas for stormwater retrofit projects as these projects will provide significant water quality improvement.

As part of the 2010 Watershed Restoration Study, the County also plans to use the Jenifer Elementary School project for educational opportunities by using signs to identify plants and incorporating educational information into the school's science curriculum. The project at the Potomac Library may be another opportunity for public education and community outreach. MDE commends the County for coordinating activities for other NPDES permit requirements into the restoration efforts.

The 2011 annual report provides cost estimates for watershed restoration efforts identified in each of the three studies mentioned above. Of particular interest is the disparate costs identified in Table 14 as a result of the 2004 study versus the estimates shown in the 2011 study. For example, in some cases the costs differ by two orders of magnitude for the same BMP type. The differences noted in these studies reflect the numerous issues and hurdles that impact project costs from conceptual planning through actual construction. The County may want to briefly discuss these differences in future annual reports to provide further insight into the actual cost of BMP implementation and numerous factors that affect the process.

Charles County continues to make progress toward meeting its watershed restoration goals. MDE will continue to provide suggestions and recommendations on the specific restoration plans and the credits applied to each project as more detail becomes available. It should be noted that future permit requirements will be more stringent. The new permit will expand coverage outside of the Development District to the entire County. This will mean that

future restoration plans need to address water quality problems and implementation of restoration projects County-wide. In the meantime, Charles County needs to stay committed to the implementation schedule outlined in the action plan, while also planning ahead and recognizing that the restoration requirements in the future will be even greater.

Program Funding

Charles County is required to maintain adequate program funding to comply with the conditions of its NPDES permit. The County continues to use a portion of its annual Environmental Service Fee and Recordation Fees for NPDES-related programs. A budget of \$184,000 is projected for FY2011.

The permit requires that Charles County submit a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of the NPDES permit. Discussions between MDE and Charles County have indicated that the program expenditures provided in the 2011 annual report do not include money spent on stormwater management program staffing and maintenance activities. The total operating budget may be closer to \$1.7 million. Future annual reports should provide program funding information on all NPDES related activities, programs, and expenditures.

The Capital Improvement Project budget funding is approved for five year increments. This funding increased from \$7.69 million in the 2006 through 2011 budget cycle to \$12 million in the 2010 through 2014 budget cycle to accommodate watershed restoration projects for the permit term. This funding appears adequate to meet existing NPDES permit requirements, as \$2.9 million dollars have been spent in the current budget term. However, future permit requirements will be more stringent. Charles County is encouraged to seek additional funding mechanisms in order to meet future permit requirements.

Assessment of Controls

Charles County is required annually to submit estimates of expected pollutant load reductions as a result of its management programs. The County continues to use PLOAD to estimate annual pollutant loads for total nitrogen, total phosphorus, total suspended solids (TSS), copper, zinc, and lead. The pollutant load computations use event mean concentrations (EMCs) developed by Charles County as part of the monitoring component of its permit, as well as from MDE's statewide NPDES monitoring averages. These numbers are used to estimate pollutant concentrations for each parameter listed above county-wide. The loading estimates are tabulated for each year between 2004 and 2011 and the results show that loading inputs stayed nearly the same for each year until 2011. In 2011 the pollutant loads increased substantially from the 2010 results. This is a result of the updated loading rates that were used in the model despite the fact that the land use had not changed significantly since 2004.

Pollutant removal efficiencies for each category of BMP was taken from MDE (2011) for total nitrogen, total phosphorus, and total suspended solids. Pollutant removal efficiencies for other contaminants were compiled from the Center for Watershed Protection, National Pollutant Removal Database, 2nd Edition (2000) or the International Stormwater BMP Database (2008). This information was used to calculate pollutant loading reductions for BMPs implemented

county-wide from 2004 to 2010. The data over this time period show general increases in pollutant removal efficiencies with data from 2011 showing a substantial decrease in pollutant reductions (Table 25). This is largely due to a substantial increase in nutrient loading estimates accounted for in the Chesapeake Bay model as discussed above. It is not clear however, why the reductions associated with BMP implementation have decreased in 2011 relative to other years. The County should provide some explanation for the trends observed in Table 25 in future annual reports.

The County's work with assessment of controls continues to be excellent. The use of PLOAD helps judge management program effectiveness and the County is commended for its efforts. It should be noted however, that because the pollutant removal data assume that BMPs are functioning properly, it is imperative that the County vigorously pursue efforts to bring unacceptable stormwater management facilities into compliance. Otherwise, the condition of existing BMPs could bring into question the results for the pollutant reduction analysis.

Summary

Charles County is commended for its continued efforts toward NPDES stormwater program implementation. Legal authority continues to be maintained, GIS data are complete, chemical monitoring and reporting are acceptable, and educational programs are excellent. The County has developed very useful information in assessing the effectiveness of the Design Manual. In the future, the scope of the study needs to consider how information gained will provide insight into the effectiveness of the Design Manual. The County has also addressed previous shortcomings by substantially improving its County's stormwater management and illicit connection detection and elimination programs over the current permit term. In future years, the County needs to focus on bringing unacceptable BMPs into compliance. This is going to be critical for the Chesapeake Bay restoration efforts because the pollutant removal data assume that BMPs are functioning properly. Commitment put forth toward the County's watershed restoration work has been consistent, however, the pace of implementation needs to be improved. Future consideration toward more vigorous restoration requirements in Charles County's new permit need to be incorporated in County plans.