MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT
MD0068284

REVIEW OF PRINCE GEORGE'S COUNTY'S 2008 ANNUAL REPORT

Prince George's County was reissued a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system discharge permit (MD0068284) on October 13, 2004. NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of pollutants to the "maximum extent practicable." For each year of the County's permit, an annual report is required to help assess the County's stormwater program. In order to provide continuity of reporting between permit terms, the County submits its annual reports by mid-January each year. The following is a review of Prince George's County's annual report that was submitted to the Maryland Department of the Environment (MDE) on April 14, 2000.

Permit Administration

Prince George's County is required to identify key administrative and technical personnel responsible for permit compliance. The County submitted an updated contact list and organizational charts with its annual report. No major changes were reported. Any additional or future changes should be immediately reported to MDE.

Legal Authority

Prince George's County is required to maintain legal authority to perform the activities described in 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) and permit MD0068284. In May 1999, the County submitted certification by its attorney that adequate legal authority exists to control the quality as well as quantity of water discharged through the County storm sewer system. In the event that any provision of its legal authority is found to be invalid, the County will need to make the necessary changes to maintain adequate legal authority.

Source Identification

Prince George's County is required to identify sources of pollutants in stormwater runoff and link these sources to specific water quality impacts on a watershed-by-watershed basis. To demonstrate this capability, the County is required to submit information regarding its storm drain system, urban best management practices (BMPs), impervious surfaces, monitoring locations, and watershed restoration locations in geographic information system (GIS) format with associated tables as required in Part IV of the permit. This information is to be updated annually and submitted on databases in a format consistent with Attachment A of the permit.

Traditionally, Prince George's County has had difficulty reporting NPDES data. In order to

address data reporting problems, the County's Office of Information Technology and Communications in partnership with PowerSolv, Inc., has developed an automated data tracking and management system that integrates permit and license application, NPDES, and GIS information. This new system is designed to automatically extract data from the County's Permit and License Application Tracking System (PLATS) on a continuous basis. This allows stormwater project status to be linked with property coverage. Additionally, the new system is supposed to allow staff to enter data across programmatic boundaries and should rectify any data inaccuracies between departments. For the third consecutive year, the County reported that the system is currently being tested by the Department of Environmental Resources (DER) to ensure that it operates effectively.

The County reported that it maintains a storm drain inventory in GIS format and that location features (e.g., outfalls, inlets) are routinely updated. A review of the submitted storm drain inventory data indicates digitization of features has occurred recently. However, the status of associated drainage areas is unclear.

The County is required to submit stormwater management facility construction completion data on MDE's Urban BMP Database. The County reported that work continues on the data input program and that it has been unable to update information since June 2007. A list of sites and associated permit number (not BMPs) to be added to the database was submitted.

The County is also required to delineate impervious areas and reported that it has requested funding to develop a GIS data layer in its proposed FY2010 budget. Under the current proposal, DER will partner with the Maryland-National Capital Park and Planning Commission (M-NCPPC) to develop the data layer. The anticipated completion date is March 2010.

The County is required to submit the locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the *2000 Maryland Stormwater Design Manual*. The data were not submitted on a database in a format consistent with Appendix A of the permit. This should be done annually and consistent with the fields established in the required database.

Lastly, basic information regarding Capital Improvement Program project (watershed restoration projects) status was submitted. The information submitted indicates that no projects were constructed during the reporting period. As submitted, the County's annual report is not complete. This and the other reporting deficiencies discussed need to be addressed to achieve permit compliance.

Management Program

Prince George's County is required to conduct preventative maintenance inspections of all stormwater management facilities at least on a triennial basis. Additionally, documentation identifying the facilities inspected, the number of maintenance inspections, follow-up inspections, and the enforcement action(s) used to ensure compliance are to be submitted in the County's annual report.

There are more than 10,000 stormwater management facilities in Prince George's County. The County reported that the DPW&T is responsible for inspecting and maintaining 431 publicly

owned stormwater management ponds within Prince George's County. In Prince George's County, "public" stormwater management facilities include those conveying or treating runoff from more than one property or sites that are zoned residential. The County reported that 122 public facilities were inspected in 2009. A review of the maintenance inspection schedule found 87 facilities without any record of inspection.

Regarding private facilities, the County has established administrative procedures for the inspection of private facilities. These procedures require any owner of a private facility constructed after 2001 to submit an inspection report certified by a Maryland licensed professional engineer that the facility is properly maintained and operates as designed and approved. Private facilities constructed prior to 2001 will be inspected by DER.

The County has contracted Greenhorn and O'Mara to develop a standard methodology for BMP inspection and to provide training to County staff. Although training is scheduled for early 2009, the County reported that it had inspected 51 private facilities during 2008. Information regarding private inspections was submitted but should be formatted according to MDE's Urban BMP Database to provide consistency with source identification and management program requirements. The "last change" field in the database can be used to indicate when the facility was last inspected. Similarly, a field could be added to indicate the next scheduled inspection.

It should be noted that preventative maintenance inspections are not exclusive to ponds only and the County needs to ensure that all types of stormwater facilities (e.g., underground storage, infiltration trenches, oil/grit separators, sand filters, etc.) are inspected. Preventative maintenance inspection has long been a program shortcoming in Prince George's County. Efforts put forth during the last year indicate that the County is moving toward permit compliance. This effort needs to continue to ensure that all facilities, public and private, are routinely inspected at least once every three years.

The County is also required to implement the stormwater management design policies, principles, methods, and practices found in the *2000 Maryland Stormwater Design Manual* (Design Manual). The County has modified its existing ordinances, regulations, and administrative procedures to meet State stormwater requirements. Since July 2002, any new development proposal in Prince George's County has been required to meet or exceed the Design Manual criteria.

The County is required to maintain an acceptable erosion and sediment control program and address any needed program improvements identified during MDE's evaluation of the County's application for the delegation of erosion and sediment control enforcement authority. In April 2008, delegation to Prince George's County was limited to one year due to concerns that included poor initial installation of sediment controls, premature removal of controls, and a lack of timely stabilization. This delegation was contingent upon the County making needed program improvements. During 2008, MDE conducted numerous field visits to monitor progress toward implementing solutions to address program deficiencies and to insure that outstanding violations are addressed. While some progress had been made, it was determined that shortcomings persist in Prince George's County's erosion and sediment control program. Failure to address the erosion and sediment control program deficiencies is a violation of the County's permit.
The County is also required to conduct responsible personnel certification classes to educate construction site personnel regarding erosion and sediment control compliance. Program activity is to be recorded on MDE's "green card" database and submitted with annual reports. The

County reported that 80 individuals received certification during this reporting period. However, information regarding individuals that were certified was not submitted. The last recorded data submittal was in 2005. This information needs to be submitted to verify that individual training has occurred.

Additionally, information regarding earth disturbances exceeding one acre or more is to be reported quarterly and should be specific to the permitting activity for the three months preceding submittal. This has been a long-standing problem and the County had made significant progress regarding the routine submittal of this information during 2006. However, grading permit information was not submitted for any quarter in 2007 or 2008.

The County is required to implement an illicit discharge detection and elimination program. At a minimum, the County is to field screen at least 150 outfalls annually, survey commercial and industrial areas for discovering and eliminating pollutant sources, and maintain a program to address illegal dumping and spills. Inspection and enforcement efforts are to ensure that all discharges to and from the municipal storm drain system that are not composed entirely of stormwater are either permitted by MDE or eliminated. Significant discharges are to be reported to MDE for enforcement and/or permitting.

The investigation and enforcement of non-stormwater discharges occurs as a result of complaints and, more proactively, as part of the County's Comprehensive Community Cleanup Program (CCCP). During the reporting period, 200 outfalls within 21 communities were screened as part of the CCCP efforts. Nine of the 200 outfalls were tested for chemical constituents with none testing positive for pollutants. Field screening efforts are to be documented on MDE's Illicit Discharge Detection and Elimination Database. Information was submitted for 180 and 200 of the screened outfalls during 2007 and 2008, respectively.

The County also responded to 48 water quality complaints. Twenty-two were found to be without merit while 21 were referred to other agencies [e.g., Washington Suburban Sanitary Commission (WSSC)]. The remaining five complaints were reported to be resolved voluntarily. Additionally, the County's Health Department's Office of Engineering investigated 200 water quality concerns during the reporting period. Ninety-two investigations occurred due to sewer manhole overflows or line breaks that were reported to the Health Department by the WSSC. Fifty-four investigations involved private septic system failures or improper disposal of hazardous waste. Lastly, the County Fire/Emergency Medical Services Department's Hazardous Materials Division responded to 328 calls during 2008. The majority of responses were to address combustible liquids, flammable gases, and poison gases.

The County is required to identify all County-owned and municipal facilities requiring NPDES stormwater general permit coverage and submit Notices of Intent (NOI) to MDE for each. Additionally, the status of pollution prevention plan development and implementation is to be reported annually. The County has identified seven of its 242 owned and operated facilities, as requiring discharge permits. These seven facilities have been permitted under MDE's *General Discharge Permit for Storm Water Associated with Industrial Activities*. Coverage under MDE's general permit is predicated upon developing and implementing a pollution prevention plan. The County reported that it has developed a Countywide Pollution Prevention Strategy to reduce stormwater impacts from County facilities. The status of pollution prevention activities at each facility was reported and, while many achievements were made in 2008 (e.g., purchasing spill kits, reducing exposure, etc.) there remains an overriding need for training, record-keeping, and

actual plan development. Final draft pollution prevention plans were developed for Brandywine Road and Glen Dale facilities. These plans were not included with the annual report and should be submitted to MDE presently. Plan development needs to be completed for the remaining facilities and these plans should be submitted to MDE when finalized.

There are 22 Phase II municipalities within Prince George's County. In 2006, the County surveyed these municipalities regarding their pollution prevention and good house-keeping efforts. Results of the surveys indicated that the majority of municipalities conducted activities that would require NPDES stormwater general permit coverage. The County reported that it conducted detailed walkthroughs for six of the 22 facilities that fall under the General Permit guidelines for Phase II communities. Self-assessment forms were used to identify immediate and long-term planning needs. The results of the work completed in 2008 will be used to develop a stormwater pollution prevention plan template for all 22 municipalities. Activity toward plan development is an improvement over a compliance issue that has languished for a considerable amount of time. However, the report was silent regarding the permitting of these facilities. As indicated during the previous review, the County needs to submit the status of all municipal facilities (except for the City of Bowie) requiring coverage under MDE's industrial general stormwater permit and pollution plan development.

The County also reported that it has identified maintenance issues at County and municipal sites for used oil and antifreeze collection. These issues (e.g., leaks and spills) pose significant risk to local water quality. The County has questioned the responsibility for site maintenance and the proper storage and handling of recyclables. MDE believes that each facility is responsible for daily house-keeping. In some cases, Maryland Environmental Service (MES) provides limited assistance to educate the site operators regarding proper house-keeping protocols. However, at the end of the day, the owner is responsible for proper site maintenance. Maintenance issues at these sites need to be rectified with due diligence.

The County is required to develop and implement a plan to reduce pollutants associated with its road maintenance activities. At a minimum, annual progress reports are to be submitted that document street sweeping, inlet cleaning, roadside vegetation management, and winter weather deicing activities. The County reported that all residential subdivision streets are swept annually and that selected arterial and collector roadways are swept twice each year. During 2008, 1,559 tons of debris were removed from County roadways as a result of this effort.

The County also operates a residential leaf collection program but the amount of material collected during the reporting period was not reported. Storm drain inlets within subdivisions are inspected and cleaned as part of the County's CCCP. Residential subdivision and municipal inlets are cleaned an average of once every two years as well. As a result of these efforts, 7,453 storm drain inlets were cleaned during the reporting period.

Roadside vegetation maintenance is done mostly by mowing with herbicide use restricted to guardrail areas only. In addition to roadway litter collection, the County has installed automatic bar screen cleaners at four of the five Anacostia Flood Control pumping stations. Approximately 280 tons of debris were collected by the bar cleaners in 2008. The County plans to install a bar screen cleaner on the remaining station within the next year. The County also reported that the Office of Highway Maintenance (OHM) of its DPW&T routinely calibrates deicing equipment to
prevent excessive application of materials. Pavement temperature sensors have also been

installed on roadways throughout the County. These sensors allow for better timing of material application.

The County is required to implement a public education and outreach program to reduce stormwater pollutants. Outreach efforts are to be integrated with all aspects of the County's NPDES activities. These efforts are to be documented and summarized in each annual report. At a minimum, the County is to establish and publicize a compliance hotline for the public reporting of suspected illicit discharges, illegal dumping, and spills.

The County reported that it continues to operate a water pollution hotline (95-CLEAN) and email service (DERCares) for public reporting of water pollution problems. The email service resulted in the investigation of 74 water related inquiries during 2008. The County is also required to provide information regarding various water quality issues to the general public and regulated community. The County continues to implement a diverse public outreach program that focuses on pollution prevention. Recent activities include participating in numerous public and community events and disseminating information regarding pollution prevention, water conservation, household hazardous waste, lawn care, recycling, car care, and private well and septic management. The County continues to do an excellent job with its public outreach efforts. Additional public outreach effort should be directed toward private stormwater management facility maintenance and pet waste management.

Prince George's County has successfully implemented many of the stormwater management program elements required by its NPDES permit. While certain program components are considered to be strong (e.g., public outreach), continued problems regarding facility permitting and pollution prevention plan development, data management, and reporting continue. Most notably, erosion and sediment control program deficiencies have been identified and implementation of needed changes has lagged.

Watershed Assessment and Planning

Prince George's County is required to conduct a systematic assessment of water quality within its 41 identified watersheds. The overall goal is to have all land area in Prince George's County covered by a specific action plan to address the water quality problems identified. At a minimum, the County is to perform a detailed watershed assessment for one County watershed during each year of the permit term.

Prince George's County completed a five-year (1999-2003) jurisdiction-wide biological monitoring and assessment program. The monitoring program included the collection and analyses of the benthic macroinvertebrate data, the assessment of physical habitat quality, and an analysis of selected water chemistry parameters. A total of 257 sites were sampled. The 2004 annual report included results from the 2003 sampling period as well as integrated results from all five years (1999-2003). Generally, biological conditions were found to be "poor" to "very poor." The program was discontinued in 2003 to allow for additional data evaluation and subsequently decide how best to address biological conditions. Additional monitoring occurred

in 2004 and 2005 to support site specific activities and the Anacostia River Watershed Restoration Action Strategy (WRAS). Results of the 2004 and 2005 monitoring activities were submitted with the 2007 annual report. The narrative site ratings for physical habitat were "non-supporting" and the benthic index of biological integrity was "fair" to "very poor." The County

reported that it is proposing to resume countywide random sampling in 2010.

Presently, stream corridor assessments (SCAs) have been completed for 10 of the County's 41 watersheds. Through SCAs, the County is able to assess the present environmental condition of stream networks, identify problems such as pipe outfalls, erosion sites, lack of buffers, fish passage blockages, sewer outfalls, or unusual conditions, and rank watershed restoration opportunities. WRASs have also been completed for the Upper Patuxent River (2003) and Western Branch (2004) watersheds. WRASs are the end product of Maryland's Unified Watershed Assessment process that was developed by the Maryland Department of Natural Resources (MDNR) in 1998 as a result of the federal Clean Water Action Plan (CWAP) initiative. The information from MDNR's technical watershed assessment, local knowledge from stakeholder involvement, and leadership from local government are combined to provide a consensus-based strategy to steer watershed restoration. The strategy identifies priorities, opportunities, concerns, and challenges as well as potential mitigation, restoration, and protection sites.

The County reported that WRAS development is ongoing for the Anacostia River watershed. Previous assessment efforts resulted in 76 of the 197 total stream miles within the Anacostia River watershed being assessed with additional work being needed to complete the remaining 121 stream miles. The initial assessment identified 756 problem sites including 378 associated with pipe outfalls, 85 inadequately forested stream buffers, 69 erosion sites, 68 fish barriers, 62 channel alterations, 58 exposed pipes, 18 trash and dumping sites, 15 unusual conditions, and 3 in or near-stream construction sites. Results from a nutrient synoptic survey of 37 sites indicated that nutrients do not appear to be a significant problem. However, in its 2005 annual report, road salts were identified as negatively impacting water quality in a major portion of the watershed. The County has yet to identify a corrective action strategy as a component of its road maintenance program to address this problem.

From a planning perspective, the WRASs developed in Prince George's County focus on implementing Low Impact Development (LID) techniques within developed areas. The County reported that it is looking into ways to improve watershed plans and ensure that planning efforts are directed toward meeting the existing impervious treatment goals. The County reported that there is a need for an appropriate data management, retrieval, and reporting system to address permit requirements and total maximum daily load (TMDL) implementation tracking. As a result, the County is currently upgrading existing GIS based tools to support analysis and decision making for stormwater planning and design at the watershed scale.

Specifically, the watershed planning currently conducted through the WRAS will be enhanced through the creation of Watershed Restoration Plans (WRP) that will set goals, identify steps to achieve those goals, and provide an implementation schedule and monitoring plan. The WRP decision-making process will be supported by use of the Center for Watershed Protection's (CWP) Watershed Treatment Model (WTM) to calculate pollutant loads under existing and proposed land use management scenarios. The County is also converting its assessment, planning, and management activities for the 41 watersheds to Maryland's 12-digit watershed

scale. This change in scale will result in 72 sub-watershed management units instead of 41 and correspond with TMDL and State water quality planning efforts. The reduction in unit area should also allow the County to better gage the effectiveness of BMP restoration success.

The Anacostia Watershed Restoration Partnership is a consortium of local, State, federal partners including the District of Columbia, Prince George's and Montgomery Counties, MDE, MDNR, Metropolitan Washington Council of Governments (MWCOG), and Environmental Protection Agency (EPA) that are developing a restoration strategy under the leadership of the United States Army Corp of Engineers (USACE). The *Anacostia River Watershed Restoration Plan Interim Report Framework* was presented to the United States Congress on November 21, 2008 and represents the first product of a two-year planning effort to produce a systematic 10-year restoration plan for the entire Anacostia Watershed. The plan is titled the Anacostia River Watershed Restoration Plan (ARP). The methodology described in the Interim Report Framework will be applied to the 13 sub-watersheds and the tidal river reach in the Anacostia watershed. The plan is to quantify restoration goals, specify an implementation timeline, and provide explicit measurement of progress.

Sligo Creek is one of 14 primary tributaries to the Anacostia River and serves as a case study to demonstrate the framework for the ARP. MWCOG staff have compiled a project inventory by using detailed GIS investigations coupled with field verification. Approximately 170 candidate restoration projects have been identified. Additionally, the County began a trash monitoring project to establish baseline conditions for the Maryland portion of the Anacostia River in 2008. This was a cooperative effort with MDE, MWCOG, M-NCPPC, Montgomery County, and the Beltsville Agricultural Research Center (BARC). The results will be used by MDE to develop a trash TMDL for the Anacostia watershed. Twenty-two sites were monitored representing four site types (i.e., streams, storm drain outfalls, roadways, and a trash netting system.) Information was submitted regarding site location, land use, and the number and weight of various categories of trash.

Data collection to address water quality problems in Laurel Lakes was completed in 2007. In 2008, a SCA was completed on a 4.3 mile reach of Bear Branch to identify potential restoration projects designed to reduce the sediment load to Laurel Lakes. In addition to the identification of environmental problems, a BMP retrofit assessment was also completed. Twenty-one ponds were evaluated during the process. The Bear Branch WRP is expected to be completed in 2009. The County reported that watershed assessment is currently underway for the Piscataway Creek watershed and that Henson Creek will be assessed in 2009. WRAS development is expected to be completed in 2009 and 2010, respectively.

The County has made a substantial effort to document watershed conditions. Similarly, progress is being made regarding development of restoration plans. Ultimately, the success of the County's assessment and planning efforts will be gauged by implementation of projects and improved water quality.

Watershed Restoration

Prince George's County is required to implement the practices identified in its watershed plans (e.g., WRAS, WRP, etc.). The goal is to maximize the water quality in a single watershed, or combination of watersheds, using efforts that are definable and the effects of which are

measurable. At a minimum, the County is to complete the implementation of those restoration efforts that were identified and initiated during the previous permit term to restore ten percent of the County's impervious surface area. The watershed or combinations of watersheds where the restoration efforts are implemented are to be monitored to determine effectiveness toward improving water quality. Additionally, the County is required to implement restoration for an additional ten percent of the County's impervious surface area. The impervious surface treatment goal for both permits totals 7,140 acres. Annual reports are to include the estimated cost and the actual expenditures for program implementation and the monitoring data and surrogate parameter analyses used to determine water quality improvements.

The County reported that "[it] utilizes four main approaches to watershed restoration including the construction of capital improvement projects, removal of pollutants achieved through public participation projects, initiation of new or revised policies, and promotion of emerging technologies as supported by grant funding." As described in the assessment and planning section above, the County's restoration efforts have focused primarily on LID projects. The County reported that its watershed restoration efforts are heavily contingent upon securing grant funding for design and construction. The annual report noted that a significant time lag is expected before any new watershed restoration planning goals and objectives are reflected as watershed restoration project achievements.

The status of 26 proposed watershed restoration projects approved under the County's Capital Improvement Program (CIP) was submitted. The projects involved stream restoration, bioretention, stormwater pond water quality retrofit, a trash net, and flood control or storm drainage improvements. Most projects are at the 70 percent design phase or better. When completed, these projects will provide treatment for approximately 2,170 impervious acres with an estimated cost of $12.9 million. During the reporting period, no capital improvement projects were reported to be completed or under construction. However, the County did report on a myriad number of projects that support the Anacostia Trash Reduction initiative. For example, trash nets at Ray Road and Flagstaff Street and a mechanical trash screen at the Edmonston pumping station have been installed. Trash screens already exist at the Colmar Manor, Bladensburg, and Brentwood pumping stations. It is unclear when these were installed and whether or not they were installed as part of the NPDES restoration effort. Generally, implementation and performance status is not presented in a manner that facilitates a compliance determination. For example, how these projects relate to the County's WRAS/WRP and cumulative restoration goal for the permit term is unclear. Similarly, the water quality benefits specific to each project should be quantified. The County should identify all proposed projects by 12-digit watershed code, establish an implementation schedule, and report on project status, cost, impervious surface treated, and water quality benefits for these projects.

The County's Livable Communities Initiative and CCCP set the framework for a long-term countywide effort to ensure cleaner, more beautiful communities and support activities that improve water quality. To date, the County is unable to quantify the accomplishments of this program relative to impervious area treated and funds expended. However, it is evident that this program has prevented adverse water quality impacts through the removal of potential pollutants. For example, efforts have resulted in the collection of 53,078 tons of solid waste, 245 tires, and 130,000 gallons of hazardous wastes. Additionally, 91 vehicles have been towed and 204 electronic devices recycled in 2008.

Given the pace of CIP implementation, compliance with NPDES watershed restoration goals is unlikely. Recognizing that the time and cost required getting from initial design through construction are great, it is imperative to account for other nonstructural activities associated with water quality improvement and impervious surface treatment. Accounting for pollutant load reduction and associated impervious area treatment for structural and nonstructural practice implementation deserves further discussion between MDE and Maryland's entire NPDES stormwater community.

Assessment of Controls

Prince George's County is required to use chemical, biological, and physical monitoring to document work toward meeting the watershed restoration goal. In April 2007, the County requested to move its watershed restoration assessment monitoring activities from the Beaverdam Creek watershed to the Bear Branch watershed. As part of this change, two in-stream monitoring stations were established instead of the traditional outfall and associated in-stream station. Because dedicated funding has been established and local support for water quality improvement exists in the Bear Branch watershed, MDE supported this request. MDE's approval was contingent upon restoration projects being implemented within the drainage area to the monitoring locations. A detailed restoration implementation schedule and cost estimates were to be submitted. MDE also requested that the relationship between restoration efforts, impervious surface treatment, and water quality improvement be quantified and detailed monitoring site data and drainage area information submitted.

All remaining monitoring requirements remain unchanged (e.g., chemical, biological, and physical protocols). Continuous flow monitoring is required at the in-stream station to develop stage and discharge relationships and pollutant load estimates. For chemical monitoring, at least three discrete samples determined to be representative of each storm event sampled are to be collected and analyzed for 12 specified parameters. The samples collected at the outfall are flow-weighted to better characterize the flashy response of the runoff associated with the highly urbanized drainage area. Twelve storm events are to be monitored each year and baseflow samples are to be taken once per month during periods of extended dry weather.

Bear Branch is a second-order stream with a total drainage area of approximately 1,056 acres at its confluence with Laurel Lake (Station 005). Station 003 is 2,400 feet upstream of station 005. The land use (as of 2000) of the watershed consists of approximately 54 percent forest, 14 percent industrial, 14 percent open space, 7 percent bare land, 5 percent commercial land, and 6 percent residential. Since 2000, there have been many development projects, both residential and commercial, taking place in this watershed. Current impervious cover is 30.5% and is anticipated to be at 37.5% at build out. The stations were set up and chemical monitoring started in June 2007. However, the County reported that storm samples were not collected from the time of the installation of the station to the end of September 2007 because of the lack of measurable storm events. Four baseflow samples were collected manually during this period.

Nine storm event and six baseflow samples were collected from October 2007 through February 2008 (a.k.a. 2008 hydrologic year) at the in-stream stations (003 and 005). The storm event sampling is fairly represented for each quarter with at least one in each quarter. Sampled storm events ranged in rainfall depths from 0.33 to 2.8 inches. Samples collected were representative

of the rising, peak, and falling limbs of each storm's hydrograph. Event mean concentrations (EMCs) were calculated and reported on MDE's Chemical Monitoring Storm Event Database as required. Annual and seasonal pollutant loads were also provided.

Baseline data indicates poor water quality in Bear Branch due to excessive nutrients and suspended sediments. Similarly, total phosphorus, total nitrogen, and copper exceed EPA water quality criteria. Maximum concentrations of copper in storm samples also exceeded MDE acute criteria. Total Kejedahl Nitrogen (TKN) concentrations were found to be higher than nitrate. The County reported that elevated TKN is typically associated with animal feedlots and sewage. Monitoring results were noticeably absent for phenols, total petroleum hydrocarbons, and bacteria. The County needs to do a much better job obtaining samples for these pollutants.

In addition to chemical monitoring, the County is required to conduct biological and physical assessments between the in-stream stations. Macroinvertebrate sampling occurs between the two in-stream stations in the Bear Branch mainstem. The County uses a 20-jab multi-habitat method to collect benthic macroinvertebrate samples along a 100-meter channel reach at each site. Concurrent with the biological sample collection, a qualitative assessment of habitat quality is performed at each site. Ten parameters are evaluated, compared to reference conditions, and assigned a narrative description. Biological monitoring and physical habitat assessment was conducted in the Spring of 2008. Sampling results indicate that the habitat is "partially supporting." The site has a wide vegetated riparian zone on each side but marginal vegetative protection on both banks. The benthic community was described as being "poor."

For physical assessment, a stream profile and five monumented cross-sections representing 6,312 feet of channel were established in 2007. Measurements and a comparative analysis are to occur annually. The County's geomorphologic characterization includes a Wolman pebble count, a determination of frequent flood and bankfull elevations, a Rosgen Level II classification, and an estimation of bank erosion potential. The physical monitoring data for 2008 indicate moderate to high bank erosion potential and erosion rates ranging from 0.13 to 0.28 feet per year. While the report indicates that a Hydrologic Simulation Program-Fortran (HSPF) model has been developed and calibrated for the watershed, results were not reported.

Finally, Prince George's County was required to select a watershed to monitor in order to evaluate the effectiveness of stormwater management system implementation for stream channel protection. The County has identified a 1,920 acre drainage area of Black Branch as the watershed for assessment. This watershed was approved for monitoring by MDE in April 2000. The "pre-development" (as of 2000) land use consists of approximately 59 percent agriculture, 35 percent forest, 2 percent commercial land, 1 percent residential, and 1 percent open space. Ongoing development involves a conversion of 40 percent of the watershed (27 percent agriculture and 13 percent forest) to residential land use. The County also conducts chemical and biological monitoring in addition to the required physical monitoring. More intensive monitoring occurs in Tributary 1 (272 acres) where LID practices are to be installed. Development in Tributary 1 will result in approximately 171 agricultural acres being converted to residential land.

During previous reporting periods, approximately 2 miles of stream were surveyed, nine monumented cross-sections were established, and baseline data were obtained for the purposes of evaluating the stream bank protection. Baseline data exhibited high levels of existing problems (e.g., bank instability, disturbed vegetation, extensive sediment deposition, etc.).

Current profile and cross-section comparisons are similar to those in 2007 and indicate that both stream segments appear to be in transition, with some sites aggrading one year and degrading the next and vice versa. Rosgen Level III data show that the cross-sections are more susceptible to bank erosion and are experiencing greater near-bank shear stresses than they were during the previous evaluations. This indicates that the streams are still in the process of adjusting to the land use alterations resulting from agricultural activities and recent development. Additional measurements in the future will determine whether channel alteration continues or stability is obtained.

The biological condition is described as moderately stressed with a narrative rating of "poor." There have been no significant changes (positive or negative) in the composition of the collected samples. The scores for this site are hurt by a lack of pollution and urban-sensitive organisms (e.g., mayflies). Overall, Black Branch habitat rating is "non-supporting." This site is a naturally wooded channel but suffers from bank instability and a lack of bank vegetation.

Comparisons of the data collected during the 2007 sampling year to water quality criteria indicated severe impairment with EPA chronic and acute criteria being equaled or exceeded during wet-weather samples, particularly for copper and zinc. However, the 2008 results do not indicate impairment in the watershed. Additionally, total suspended solids exceeded water quality criteria in 2007. The comparison of EMCs of previous years shows that suspended solids have increased every year. This trend has reversed in 2008, which may be due to a decrease in construction activity. The County submitted tabular results of a HEC-RAS hydraulic model used to analyze stream reach characteristics during 2008. The surveyed cross-sections were incorporated into the model and the results indicate a drop in the water surface elevation for the 1.5 year frequency storm event on the mainstem while the tributary water surface elevations have remained relatively stable. At this point, it is unclear why instability has occurred in the mainstem but not the tributary.

The County continues to monitor land use change in the watershed. While development was planned to minimize the effects of land use changes on Black Branch, especially to the Tributary 1, previous water quality results showed that the concentrations of total suspended solids and zinc are higher than those of an average urban stream. The County reported that there has been little to no land use change from 2007 to 2008. As indicated above, pollutant concentrations have decreased concurrent with reduced construction activity.

Program Funding

Prince George's County is required to maintain adequate funding to comply with all conditions of its NPDES stormwater permit. Funding for the County's NPDES program is provided through an ad valorem tax, fee-in-lieu payments, State grants for flood control, contributions from a stormwater enterprise fund, and the sale of stormwater revenue bonds. Prince George's County submitted budget information for its stormwater management enterprise fund and capital improvement program for fiscal years 2002-2009. The budget included current revenue sources ($421,840,500), operating expenses ($24,415,000), and capital project expenses ($17,816,000). Fiscal data specific to permit conditions as described in Attachment A (Database J) of the permit were not submitted.

Summary

Prince George's County has implemented many of the program components required by its NPDES permit. Through its watershed assessment efforts, the County should have the ability to link potential sources of pollution with activities within its watersheds. However, the County has not addressed basic reporting elements (e.g., storm drain system updates, impervious cover and treatment, grading permit information, outfall screening, fiscal data, etc.) As a result, a quantitative performance status has not been provided for the County's efforts. Additionally erosion and sediment control program deficiencies have not been corrected. Continued noncompliance in this regard violates both State and federal requirements. Permitting and pollution prevention plan development requirements for municipal facilities and developing a restoration strategy to meet the impervious surface treatment goals continue to need to be addressed.