

## **EXECUTIVE SUMMARY**

The submission of this annual progress report to the Maryland Department of the Environment (MDE) fulfills requirements specified under the Frederick County National Pollutant Discharge Elimination System (NPDES) Permit No. MD0068357. This second-generation Phase I permit is effective from March 11, 2002 through March 11, 2007 and covers stormwater discharges from the municipal separate storm sewer system (MS4) in Frederick County. Continuing progress has been made in the County's NPDES programs since the 2005 Annual Report was submitted in March 2006. The sections in this annual report follow specific sections presented under Part III, Standard Permit Conditions, of the County's NPDES Permit to document how required elements of the County's stormwater program are being implemented.

### **Permit Administration/Legal Authority**

The report identifies contact information for key Frederick County personnel responsible for the various program components that support compliance with the County's NPDES permit. This report also documents certification from the County Attorney that Frederick County possesses the authority to perform the activities described in 40 CFR 122.26(d)(2)(i) and the County's NPDES permit.

### **Source Identification**

County staff continued to make extensive improvements to the County's geographic information system (GIS) in 2006. Frederick County has collected source identification data on all permit-required topics. The report details GIS data layers that are currently complete with countywide data, as well as GIS layers that are in the process of being created or updated from CADD, photoimagery, or other original data. In 2005, Frederick County awarded a major contract to collect spatial data at a mapping scale of 1:1200, including orthophotographic images containing half-foot pixel ground resolution, two-foot contour data, planimetric features and a digital elevation model. Most data were complete as of December 2006. A project was conducted in 2005-2006 to collect roadway asset information (signs, guardrails, roadway striping, and legends); as of December 2006, all highway districts were imaged for asset data collection with two districts remaining for asset feature collections. A sinkhole tracking database is used by Highway Operations, allowing users to review the history of each sinkhole site and to track repair or inspections. Developable areas and comprehensive planning analyses for the New Market Region to accompany the regional plan update continued. Staff continued to maintain agricultural preservation property and district data. The pilot parcel project for Frederick County was in progress. Frederick County road centerlines are now complete and undergo periodic updates when new plans arrive.

The ArcReader map application is installed on staff laptop computers, allowing field and desktop use of GIS information. Spatial data include: stormwater system structures and pipes, aerial photography, soils groups, fire station locations, Maryland state watershed delineations, hydrography, County roadways, and other GIS data. Frederick County continues to share its

storm drain system data structure with Phase II municipalities within Frederick County to assist in their NPDES stormwater system data collections.

Beginning January 2006, the Watershed Management Section (WMS) Community Restoration Coordinator used grant funds from the National Fish and Wildlife Foundation to develop a GIS-based "House Calls" program to make site visits to interested landowners to discuss specific property conditions and possible voluntary restoration, enhancement, and protection options.

At present, all stormwater management (SWM) facilities have been entered into Frederick County's urban best management practices (BMP) database. There are 576 entries in the database, including 15 new facilities completed on or after January 1, 2006. New facilities are entered into the database upon approval of the as-built survey. During the past year, the County continued to improve the entire database by updating and editing where necessary to ensure database integrity.

### **Discharge Characterization**

Long-term chemical monitoring has continued at the Peter Pan Run instream monitoring station in the Villages of Urbana Planned Unit Development (PUD) since May 1999. Since December 2002, the outfall at Pond R has been monitored as a land use-specific stormwater management structure. Monthly baseflow and storm samples are analyzed for 13 constituents. Physical and biological data are collected from four permanent stream monitoring stations on Peter Pan Run and its tributaries. Quality assurance project plans have been completed for the County's water chemistry and biological and physical monitoring.

Between October 1, 2005 and September 30, 2006 (Water Year [WY] 2006), 11 of the targeted 12 storm events were monitored at both the Peter Pan Run instream and Pond R outfall stations. The missing storm event was from the winter season (January to March). During the target month of March 2006, just 0.43 inches of rain fell and no storm events were forecasted to be above the minimum rainfall quantity criterion of 0.10 inches. The October 7, 2005 and September 1, 2006 storm events were associated with the remnants of Tropical Storm Tammy and Tropical Storm Ernesto, respectively.

At the instream station, annual average storm event mean concentrations (EMCs) of all pollutants decreased during WY 2006 from the prior year except for metals. Zinc increased by 132%, copper increased by 39%, and lead increased by 9.5%. Elevated concentrations of fecal coliform included a result of over 24,000 organisms/100 mL at the instream station during the April 3, 2006 storm event. High levels of fecal coliform may be the result of applications of fertilizer, wildlife excrement, and failing septic systems.

At the outfall station, annual average storm EMCs were lower than in WY 2005 except for zinc (increased 145%), total phosphorus (increased 120%), and nitrate and nitrite (increased 149%). Phosphorus EMCs were on average 71% higher than at instream. Storm biochemical oxygen demand (BOD) and total Kjeldahl nitrogen (TKN) EMCs were 4.8% and 55% higher, respectively, than at instream. Other pollutants were lower at Pond R than at the instream station. Elevated fecal coliform concentrations were found in several samples.

Annual pollutant loading estimates at Peter Pan Run were similar to EMC results. Copper loading increased 63%, zinc loading increased 130%, and lead loading increased 69% in comparison to WY2005. Cadmium and TPH loads were within the same range as WY2005. Loads of all other parameters were lower in WY 2006 or were not detected in any samples (phenols). Load reductions were between 15% (phosphorus) and 72% (TKN). Much of the decrease can be attributed to slightly lower total discharge from Peter Pan Run in WY 2006 as well as generally lower EMCs. The increase in metal loadings can be assumed to be the result of development within the PUD. Anthropogenic sources are primarily automobile tire wear (zinc and cadmium), brake wear (copper), and emissions (lead).

In 2006, all benthic index of biotic integrity (IBI) scores for Peter Pan Run sites were Poor, consistent with or slightly below previous results. The score for PPAN-03 dropped into the Very Poor category in 2003 after a record-breaking drought caused the stream to completely dry up in 2002, but slightly improved between 2003 and 2005, indicating some recovery. Fish IBI scores have remained consistent since sampling began in 1999, with each site usually scoring in the same category each year. The number of taxa at each site has fluctuated.

*In situ* water quality values for temperature, pH, and conductivity were consistent with those of previous years, and all were within a normal range. Physical stream conditions within Peter Pan Run were generally similar to those in years past, though certain stream parameters are beginning to show a pattern of slow change over time. PPAN-04 showed an increase in embeddedness in previous years (from 25% in 2002 to 75% in 2005) and a corresponding decrease in epifaunal substrate quality. In 2006, embeddedness decreased and epifaunal substrate quality improved at PPAN-04.

The cross sectional survey at PPAN-01 shows that the channel has continued to widen (by 1.8 feet to the right between 2003 and 2005, and by an additional 1 foot since 2005) as a large gravel bar has filled in the center and the left half of the channel. At PPAN-02, the cross sectional profile shows that material scoured downward during 2004 was partially replaced in 2005, possibly because of slumping of the right bank; the channel remained relatively stable between 2005 and 2006. Changes in the cross sectional profiles of PPAN-03 and PPAN-04 suggested only minor alterations within their channels.

Wolman pebble count data indicate that, in 2001, much finer sediments began to appear at the four stations, a shift in substrate size that coincided with increased land clearing and development upstream. In 2003, substrate particle size was notably larger than in previous years, likely the result of substrate sorting by higher flows in the first half of WY 2003 and the completion of construction in some areas of the development. Results for 2006 showed a slight increase in the D50 for all sites, with coarse gravel being the median particle size.

The fourth annual field survey to assess the effectiveness of the *2000 Maryland Stormwater Design Manual* for stream channel protection was conducted during October to December 2006. Cross-section profiles indicate that for the most part, differences between the 2003-2006 surveys were minimal. Change in 2006 was most evident at OB-01, OB-02, and XS-04A. Erosional forces were concentrated at the outside bends of stream channels, and a moderate rate of lateral channel erosion was evident in the outside bend profiles, particularly at OB-2. From 2003 to

2006, cumulative bank loss as measured at bank pins was greater than one foot at XS-04, XS-08, and OB-1. Longitudinal profile segments showed minor changes, namely the downstream migration of bed features resulting from localized scour and deposition processes. These adjustments should continue to be monitored to assess the rate and magnitude of change over several years. Wolman pebble count data showed that, since 2003, the distribution of bed particle sizes at some sites has shifted towards smaller diameters, suggesting a slight increase in the fraction of bottom sediments composed of finer sizes each year, most likely a result of increased in-channel bank erosion.

Hydrologic and hydraulic models (TR-20 and HEC-RAS) are being used to evaluate the capacity of the pre-development channel system of Peter Pan Run Tributary 1 to handle runoff from the residential development constructed following the MD2000 stormwater design manual. Models were constructed to represent the level of development/construction present in fall 2005 and to provide a comparison with a predevelopment, agricultural runoff scenario. Flow events for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year rainfall recurrence intervals, as simulated with TR-20, were used as input to HEC-RAS. Flow data from County's stream gauge on Tributary 1 were used for calibration. The calibrated model peak flows for the 2005 development/construction scenario fall below those from an agricultural scenario and above those from a pristine, forested scenario for all recurrence intervals. For the development scenario, HEC-RAS design storm flow levels for XS-01 and XS-08 show the 1- to 5-year events confined to the channel with the larger events rising above the channel banks. Modeled agricultural flows are considerably larger (as per TR-20 results), yielding correspondingly higher flows in HEC-RAS, with the 1- to 2-year design storm flow levels within or near bankfull levels at these sites. HEC-RAS results indicated that larger storm flows are constrained by the size of the Carriage Hill Drive culverts. Further refinements to the models are proposed, incorporating a final build-out scenario, additional cross-section data, and larger storm events for calibration.

## **Management Programs**

Frederick County maintains its current Stormwater Management Program in compliance with Environmental Article, Title 4, Subtitle 2, Annotated Code of Maryland. The County will continue to do so through plan review and inspection of all developer projects and through implementation of the *2000 Maryland Stormwater Design Manual*.

The Environmental Compliance Section (ECS) of the Frederick County Division of Permitting and Development Review continues to conduct a regular program of preventative maintenance inspections of all stormwater management facilities built, approved, and operating within the County. Required triennial inspections of all facilities Countywide are completed on a rotating basis. The County continues to maintain an acceptable stormwater management program in accordance with State stormwater management laws, including implementation of appropriate County ordinances. County inspections in 2006 met the requirements for triennial inspections in its inspection of more than 150 facilities. During the period from January 1, 2006, to December 31, 2006, County SWM maintenance inspections included wet/dry screenings of 158 facilities with visual inspections for illicit connections.

Frederick County has been implementing the stormwater management design policies, principles, methods, and practices of the *2000 Maryland Stormwater Design Manual* and subsequent changes to the Code of Maryland Regulations through the County's Stormwater Management Ordinance and its Design Manual, both of which were revised in 2001.

The County's Development Review staff has made great strides over the past year with the interpretation of the stormwater management designs outlined in the Manual. For example, single-family home projects on large lots with less than 15% overall impervious area are now using the County's version of the MDE-provided standard plan. Frederick County has made great progress over the past year with the use of non-structural methods and credits identified in the MD2000 design guidelines. One example is the use of grass buffer shoulders along driveways and other linear projects in combination with "diversion swales" to provide for stormwater management in areas that would be difficult to treat with structural methods.

Frederick County continues to improve its Illicit Connection Detection and Enforcement Program. Over the past three years, all SWM structures were inspected for illicit connections or discharges through the County's ongoing maintenance inspection program. During the period from January 1, 2006 to December 31, 2006, the County conducted inspections at 158 sites. Field screening results are recorded in the County's facilities database to ensure proper tracking and to follow up when potential problems are detected. Chemical results from wet/dry screenings did not indicate any illicit discharges.

The County has worked with the Center for Watershed Protection (CWP) to provide a training program using CWP's national guidance, *Illicit Discharge Detection and Elimination – Guidance Manual for Program Development and Technical Assessments*, for responsible personnel. The County intends to implement the reconnaissance inventory protocol detailed in CWP's manual in conjunction with the upcoming Countywide stream monitoring program.

Under the permit, the County is required to ensure that all non-stormwater discharges to the municipal storm sewer system are permitted or eliminated. All County-owned properties requiring an NPDES industrial discharge permit must be identified. With guidance from the County's DPW staff, all required permits and No Exposure Certifications have been issued, and all permitted County facilities have completed a Stormwater Pollution Prevention Plan (SWPPP).

Frederick County continued to implement a successful program to respond to illegal dumping and spills including procedures for public reporting and citizen complaints. As of January 2006, all ECS field staff were trained and certified as "First Response" personnel for HAZ-MAT spill response. This HAZ-MAT training enhances the County's current capabilities and improves protections to staff and citizens. The County maintained reporting information for illicit discharges and spills on its website and provided a hotline number for citizen inquiries. There were no spills in 2006 that required County action.

Frederick County's Erosion and Sediment Control program is well established and the County's delegation was under review at the end of the reporting period. Frederick County works to maintain an acceptable Erosion and Sediment Control Program in accordance with Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. Site compliance and minimum

inspection guidelines were identified by MDE as needing improvement. Frederick County anticipates a successful review of its program and subsequent renewal of its delegation of authority for the inspection and enforcement of sediment control.

Frederick County continues to implement a successful and effective series of Responsible Personnel Certification classes to educate construction site operators regarding erosion and sediment control requirements. Over the past year, 49 individuals successfully completed the certification during the three classes held by the County. Frederick County plans to continue to implement this successful training program in the coming years. In addition, the County has met requirements for reporting of earth disturbances in 2006 despite database incompatibilities. Staff is seeking ways to improve efficiency and timeliness of quarterly reporting.

In 2006, Watershed Management Section (WMS) staff made diverse and far-reaching impacts through the County's public outreach and education program. Frederick County addressed permit-suggested outreach topics and met its own goals and objectives of its 2003 *Strategic Plan to Improve Water Quality Through Public Outreach in Frederick County, Maryland*. County staff supported the Monocacy & Catoctin Watershed Alliance (known as MCWA or the Alliance), a group born of the two Watershed Restoration Action Strategy (WRAS) Steering Committees. The MCWA set up regular bimonthly meetings to discuss educational outreach opportunities and to develop restoration and protection projects to support water quality and habitat initiatives. WMS staff coordinated internally with various County Divisions to enhance and track their outreach products. Outreach activities were used to educate citizens, to direct the course of watershed plans, and to identify landowners for potential restoration activities. Public outreach efforts implemented by the Alliance during 2006 included the development of a MCWA brochure, the Watershed Steward Program, quarterly E-newsletters, participation in the 2006 Frederick County Fair, and the continued expansion of the Alliance website.

The County continued to use its Landowner Tracking Database that was developed to track landowner permission responses for Stream Corridor Assessments (SCA). Staff used mailing lists to contact landowners who requested specific property information (*i.e.*, want results of the SCA on their property) or expressed a specific restoration and outreach program interest (*e.g.*, want to install cattle fencing). Staff also tracked responses to County-sponsored initiatives like the Backyard Buffers program, which distributed free trees to landowners with stream frontage.

Through a grant obtained from the National Fish and Wildlife Foundation, the WMS Community Restoration Coordinator met with a variety of agricultural and urban property owners using the "House Calls" GIS tool, which shows stream conditions and restoration opportunities.

In February 2006, WMS staff and its consultant Versar, Inc., held a public meeting to share data collected about the Linganore Creek watershed and to collect feedback regarding potential stormwater retrofit and stream restoration opportunities.

Other County programs successfully implemented public outreach related to NPDES. Both the Frederick County Recycling Program and the TransIT Services of Frederick County continued to expand their services in 2006. The Frederick County Recycling Program was able to divert a growing proportion of solid waste from the landfill by promoting recycling among county

residents. In fiscal year 2006, 37,619 tons of waste were collected and recycled from the County's residential curbside and satellite drop off programs. In 2006, Frederick County reported a recycling rate of 34.3% and a source reduction of 2% for a combined waste reduction of 36.3%. TransIT promotes alternatives to driving as well as providing assistance with initiatives like commuter trip planning, vanpools, employer services, Air Quality Action Days, and Bike to Work Day.

The Frederick County Health Department provides citizen education and outreach materials on proper septic system maintenance and well testing and protection. The Frederick County Health Department, in partnership with Canaan Valley Institute (CVI), a Monocacy & Catoctin Watershed Alliance partner, has been awarded over \$700,000 through the Maryland Bay Restoration Fund (BRF) in order to address nutrient impacts by failing and underperforming On-site Disposal Systems (OSDS) in the Monocacy Watershed and in Frederick County's proposed source water protection areas. An estimated 65 OSDS will be upgraded over a two-year period.

During 2006, Frederick County's Office of Highways and Transportation continued to implement recommendations from the County's 2002 assessment of road maintenance practices, including experimenting with new technology to reduce impacts to water quality. Improvements were made in street sweeping; litter control; deicing materials; inlet cleaning; data collection; and reducing the use of pesticides, herbicides, fertilizers and other pollutants. The County approved funds to purchase a vacuum-assisted street sweeper in 2006 and has swept 191.99 miles (242.8 acres) of streets and bridges. Significant improvements were made in reporting practices in 2006.

Frederick County continues to implement responsible use of herbicides, pesticides, and fertilizers. Agencies strive to minimize use of these materials to the lowest rate required for effectiveness. Applicators have proper certification. Integrated Pest Management programs are in place at County schools. Earlier evaluations of herbicide use along roadsides led to a shift away from one potentially harmful herbicide to a more environmentally friendly alternative.

Frederick County continues to build upon and strengthen the various components of its NPDES stormwater management programs. The past year brought progress in many areas. Frederick County government has been particularly effective in leading well-coordinated efforts involving multiple agencies and organizations working toward common goals for water quality improvements and better management of the County's watersheds. The County has capitalized on opportunities to leverage substantial funding for outreach and restoration. Frederick County has supported NPDES Phase II municipalities with execution of their permits.

### **Watershed Restoration**

Frederick County continued to build upon its previous efforts to identify and evaluate water quality problems in its priority watersheds by conducting biological and physical stream monitoring. Currently, monitoring is being conducted approximately every two to three years in the County's three highest priority watersheds: Lower Bush Creek, Ballenger Creek, and Lower Linganore Creek. In 2006, the County continued its annual stream monitoring program in Peter Pan Run and six additional sites in Lower Bush Creek, plus 14 locations in Ballenger Creek,

Bennett Creek, and Linganore Creek in support of on-going and potential future restoration and community outreach efforts.

Water quality sampling conducted in March-April and June-July of 2006 generally showed good results. Substantial embeddedness (>60%) is an issue at several sites in Ballenger and Linganore Creeks. Aquatic biota, particularly benthic macroinvertebrates, need the spaces between and beneath gravel and cobble substrate for attachment sites, feeding areas, and as shelter from predation. In contrast, every site scored in the optimal or suboptimal range for instream habitat quality, indicating good habitat availability for fish. Several sites in Bush and Linganore Creeks had insufficient riparian buffers on one or both banks. The IBI ratings for benthic macroinvertebrates were generally Poor to Very Poor. Fish IBI scores spanned a wider range, from Very Poor to Good.

A number of agencies and organizations are involved in monitoring waterways in Frederick County. To aid in watershed planning and management, in 2005-2006 the County's Watershed Management Section worked with Versar to compile information on these existing programs and to evaluate their utility in assessing stream conditions. In all, survey information was gathered on monitoring data from 27 programs. Frederick County is considering potential future ways to use and integrate data from the various sources, including possible development of ecological indicators and presentation of results in a "report card" or "watershed health report" format.

Frederick County is currently developing a three-pronged Stream Assessment and Monitoring program that will include (1) the Frederick County Stream Survey, a Countywide probability-based survey of wadeable streams using rapid benthic macroinvertebrate and physical habitat assessment methods, (2) targeted monitoring to evaluate restoration success and address management questions at specific locations, and (3) special studies that will support the County's planning and management decisions.

To provide a comprehensive assessment of County streams, the County is working with Versar to design and implement a Countywide stream survey using a probability-based design. Over four years, the County's survey will include the random selection and sampling of 200 sites spread across the County's 20 watersheds. This four-year assessment cycle will provide a snapshot of stream condition in Frederick County that will be repeated on a regular schedule into the future. A pilot survey in the high priority Bennett and Catoctin Creek watersheds will be conducted in 2007. The first countywide assessment cycle will begin in 2008 and continue through 2011.

Frederick County Government has focused its restoration tracking reductions in nutrients, sediments, and impervious area and in tracking BMP statistics (*e.g.*, area treated or linear feet of stream restored). Frederick County Government has taken a role in a wide variety of watershed restoration efforts. Projects are sorted according to funding source (County Capital Improvement Program (CIP), Community Restoration, and MCWA Partnership Projects). Based on BMP pollutant efficiency figures from the Bay Program and other sources, it is estimated that upon completion of NPDES-related projects, nitrogen will be reduced by 2,078.64 lbs/yr, phosphorus by 197.85 lbs/yr, sediment by 81,468.44 lbs/yr, and the total treated impervious area will equal 887.02 acres. The projects are all, at a minimum, planned and funded

with many completed. Combined, these projects provide for the treatment of 672 untreated urban impervious acres.

Frederick County completed a baseline watershed assessment for Lower Bush Creek in 2001. The report made a number of recommendations to improve water quality, which the County continues to implement along with other initiatives to improve watershed conditions in Lower Bush Creek. DPW is using CIP funds for the Lower Bush Creek watershed to design and install a Low-Impact Development (LID) retrofit project at the Urbana High School. The goals of the project are to reduce untreated impervious area and to improve water quality. Project design has been completed by Tetra Tech, Inc., and installation is planned for summer of 2007. The effectiveness of the retrofit will be assessed by comparing pre- and post-retrofit pollutant data. Additional projects active in Lower Bush Creek include the Backyard Buffers program, which provides landowners with free trees to plant in riparian regions; a tree planting at the Old National Pike District Park; and street sweeping. An assessment of stormwater retrofit and stream restoration opportunities in the Lower Bush Creek watershed, completed in 2003, provides guidance for restoration measures.

Frederick County continues to implement recommendations from the 2001 watershed assessment of Ballenger Creek. An assessment of retrofit and restoration opportunities was completed in 2005. Using CIP funds, DPW is currently working on a stream restoration project at Ballenger Creek Elementary School. The goal of the project is to improve the condition of approximately 605 linear feet of stream to improve watershed water quality, in-stream and riparian habitat, and aesthetic conditions. The project design has been completed by Brightwater/Ecosite/CCJM Joint Venture; construction is planned for summer 2007.

Frederick County is also implementing recommendations from the 2002 watershed assessment of Lower Linganore Creek. A stormwater retrofit/stream restoration assessment was completed in July 2006 for the entire Linganore Creek watershed. Elements of this study included a review of existing watershed information (including recent SCA stream walk data), map review to target solutions to the most promising areas, field investigations to refine proposed concepts for solutions, a February 2006 public workshop to solicit input from local stakeholders, estimating pollutant loads and potential reductions using the Stormwater Management Model (SWMM), prioritization of opportunities, and development of a report containing recommendations and conceptual plans for the best watershed restoration opportunities. The assessment identified 167 candidate project sites; 15 Tier 1 sites presented the best opportunities for the County's CIP program and many others are good candidates for Community Restoration efforts.

Two proposed Linganore CIP projects were selected for implementation at this time. The Pinecliff Park Stream Restoration Project will restore about 930 feet of stream by reconnecting it to its floodplain and reducing entrenchment, and will also involve riparian plantings and other stabilization techniques. The design engineering firm for the project is Greenhorne and O'Mara. The County Department of Program Development and Management in DPW is planning to redevelop the Public Safety Training Facility site and add water quality treatment through bioretention. This project is a good example of how to improve existing developed sites. The project is in the design phase, and water quality treatment is estimated at 43 acres.

Frederick County secured \$25,000 in grant funding from the Chesapeake Bay Trust (CBT) for community restoration projects in Libertytown and completed all projects by December 2006. Projects included Liberty Village Rain Gardens, Liberty Elementary School Rain Garden, Stream Buffer Restoration on Town Branch at St. Peter the Apostle Roman Catholic Church, and Tree Planting at Libertytown Community Park.

The National Fish and Wildlife Foundation (NFWF) provided \$40,000 in funding to improve water quality in the Linganore Creek watershed by supporting educational initiatives targeted to increase stewardship ethics among watershed citizens through the development of the “House Calls” program. The “House Calls” program has allowed the Community Restoration Coordinator to make site visits to interested landowners to discuss specific property conditions and possible voluntary restoration, enhancement, and protection options. The County’s Community Restoration Coordinator has met with several municipalities, homeowner associations, community groups, the Soil Conservation District, farm owners, and others.

The County has secured \$216,237 in grant funds through MDE under the EPA 319(h) program for its Linganore Creek Total Maximum Daily Load (TMDL) - Urban Demonstration Project. In this project, key landowners will be targeted and offered increased technical assistance in the design and installation of BMPs for sediment and phosphorus control. Efforts began in December 2006. The project will fund demonstration BMPs to treat 30 acres of urban land, help establish approximately three miles of riparian buffer, and effectively treat approximately 36 acres. Project sites will include schools, regional parks, golf courses, and other publicly owned property.

Reforestation of the Fred Archibald Sanctuary, located on Audubon Society property, is in progress. The two-acre planting is 300 yards from a tributary to Hazelnut Run (a tributary to Linganore Creek) and treats six acres.

Bennett Creek Watershed was assessed as part of the Lower Monocacy Watershed Restoration Action Strategy in 2004; 23 sites were listed as priority for restoration. In Bear, Fahrney, North, Pleasant, and Urbana Branches there are combinations of fish migration barriers, inadequate riparian buffer, livestock access to the stream (horses, cattle), exposure to future development, and several areas of accelerated erosion due to golf courses and residential developments. The County anticipates that Bennett Creek will be the next watershed listed for restoration in its third generation permit. In anticipation of this, the County is contracting with TetraTech to provide a Restoration/Retrofit Assessment.

Frederick County’s Watershed Management Section has been awarded \$71,300 from the Environmental Protection Agency (EPA) 319(h) program to develop an Urban Wetlands Program in a pilot watershed, Bennett Creek. Funds come through MDE and will be available beginning in January 2007. The Urban Wetlands Program, Bennett Creek Watershed Pilot will develop a mechanism for the County to establish wetland assessment standards and protocols, update and map the nontidal wetlands GIS overlay, define characteristics for benchmark nontidal wetlands in the Piedmont hydrophysiographic province in order to improve water quality and wetland habitat, provide regulatory guidance for land use change relating to wetlands, conduct

education and outreach to Frederick County Public School teachers and students about wetland functions, and establish two stormwater wetland restoration/enhancement projects.

Projects continue to develop through the Bennett Creek Restoration Initiative as more landowners and land managers seek to work with the Potomac Conservancy, a MCWA partner, to implement projects that will address water quality improvement goals in the Monocacy River Watershed. The Potomac Conservancy has been working closely with the Frederick County Community Restoration Coordinator, Natural Resources Conservation Service (NRCS), and the Frederick County Soil Conservation District to encourage private agricultural landowners to take advantage of the many cost-share conservations programs. After vandals on ATVs destroyed several acres of newly planted trees, students at Windsor Knolls Middle School replanted the vandalized area with over 200 trees.

Potomac Conservancy is planning follow-up meetings with landowners in the hopes that others will follow the example of their neighbors and work to improve stream health in the Bennett Creek watershed. Demonstration rain gardens will be installed at Kemptown Elementary and Windsor Knolls Middle Schools. At Kemptown Park, the Potomac Conservancy is teaming with CWP and Frederick County Parks and Recreation to create plans for an innovative bio-retention garden that will absorb water from a parking lot and road before it enters Fahrney Branch.

Frederick County is working on a number of other efforts to treat impervious areas in other watersheds:

- Frederick County will compile its list of vacant properties to evaluate for reforestation and to conduct restoration through the Community Restoration Program.
- The Canaan Valley Institute has received funding to conduct stream restoration project designs in Frederick County in 2007. The projects will most likely take place on about 800 feet of Owens Creek and will be designed to protect and restore brook trout habitat.
- The County and the Canaan Valley Institute have received \$700,000 in state Bay Restoration Fee funds to conduct septic upgrades to control nitrogen. The program will be targeting areas of known septic failures and high resource value.
- Catocin Mountain Park is increasing the riparian buffer at the park headquarters parking area and has installed porous pavers (turf block), an LID retrofit.
- In 2006, Highway Operations purchased a vacuum-assisted street sweeper and swept 242.8 acres of roads and bridges.
- The Potomac Watershed Partnership (PWP) continued to sponsor the Backyard Buffer program for the fourth year, providing tree seedlings and technical support to 75 households during 2006.
- The Town of Myersville will restore one mile of Little Catocin Creek to a stable, self-maintaining state. The project will include design and implementation of stream channel restoration, stream bank stabilization, and riparian plantings.
- The Thorpe Foundation will create a 1/4-acre model native plant demonstration garden in Frederick, MD, to educate landowners and contractors about the benefits of conservation landscaping.

- The Little Tuscarora Riparian Buffer project will treat 10 acres of urban land. The Maryland DNR Inland Fisheries program alerted the County to the need to buffer Tuscarora Creek, which was recently a brook trout supporting stream but may have lost its populations due to urbanization. The project is supported by the Interstate Commission on the Potomac River Basin (ICPRB) and the Catoctin, Antietam and Monocacy Brookie Initiative (CAMBI).
- The Brook Hill United Methodist Church would like to build a rain garden next to their church and enlisted the help of ICPRB to obtain grant funding and help manage the project.
- The Maryland State Highway Administration (SHA) has received funds from the Transportation Enhancement Program (TEP) to restore a small, unnamed tributary in Potomac Direct watershed. The project involves stream stabilization along 1,300 linear feet of channel. Project completion is targeted for October 2007.

### **Program Funding**

The NPDES program has consistently maintained adequate funding to support the requirements of the program. The FY 2006 budget included \$420,186 for the NPDES program operating funds, plus \$144,583 in salary and fringe funds for the program manager and staff, for a total of \$564,769. The FY 2007 budget includes \$159,984 budgeted for personnel costs and \$375,400 budgeted for program operating funds, for a total of \$535,384. The approved budget contained an additional \$60,000 which was moved into other budgets to cover NPDES-related items. Frederick County has also received several substantial grants to support its NPDES program, particularly through Community Restoration. The proposed FY 2008 budget year includes a request for \$156,897 in personnel expenses and \$435,400 in operating expenses for a total of \$592,297. This request is an increase of \$20,800 over the previous year for operating budget impacts from the CIP, specifically for project monitoring.

FY 2006 and 2007 CIP project budgets included funds for restoration projects in Ballenger, Linganore, Lower Bush, and Bennett Creek Watersheds. For FY 2008, CIP project funds have been requested for construction of projects in Linganore Creek Watershed and for land acquisition and site improvement in Bennett Creek Watershed.

### **Pollutant Loadings and Removals**

Annual stormwater loadings from municipal outfalls in Frederick County were calculated using the Simple Method for each pollutant of interest. An overall summary of pollutant removals at outfalls in Frederick County, by associated management practices shows that 40% of total suspended solids are removed by these facilities, with only 27% to 24% of total phosphorus and nitrogen being removed, respectively. These facilities also remove 13% of dissolved phosphorus and 21% of carbon (BOD and Chemical Oxygen Demand). Removal of metals ranged from 27% to 42%.

## **Special Programmatic Conditions**

Frederick County continues to work toward meeting the Chesapeake Bay 2000 Agreement and updates. In 2006, Frederick County continued the efforts that earned it recognition in the past. Additionally, the County participated in many activities, including attending Tributary Team meetings, conducting restoration and outreach in support of Chesapeake Bay 2000 Agreement goals, helping sponsor the Potomac Roundtable, participating in the Alice Ferguson Foundation's Trash Free Potomac Initiative, participating in the Schoolyard Habitats program, coordinating with the Eastern Brook Trout Joint Venture, developing stormwater wetland projects through the Bennett Creek Urban Wetland Pilot Project, developing a "House Calls" GIS tool to take to citizens that have an interest in voluntary conservation programs, facilitating the Monocacy & Catoctin Watershed Alliance, and cooperating with an U.S. General Accounting Office Audit on NPDES MS4 program costs. Future NPDES MS4 permits are likely to include language that relates to TMDL implementation; to this effect, Frederick County has been working diligently to address pollutant loads in the Linganore TMDL through numerous activities and via coordination with MDE and other agencies.

