

## APPENDIX 1

### MARYLAND DEPARTMENT OF THE ENVIRONMENT

#### NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT APPLICATION SUMMARY

#### ANNE ARUNDEL COUNTY

##### PART I. STATEMENT OF AUTHORITY

###### A. United States Environmental Protection Agency

Section 402 of the Clean Water Act (CWA) prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Under the provisions of the NPDES regulations, stormwater discharges from municipal separate storm sewer systems are considered point sources that require an NPDES permit.

###### B. State of Maryland

The Maryland Department of the Environment (MDE) has been granted authority by the United States Environmental Protection Agency (EPA) to issue NPDES permits in accordance with statutory requirements promulgated by the CWA. The Environment Article, Title 9, Subtitle 3, Part IV, Annotated Code of Maryland requires a discharge permit for any activity that could cause or increase the discharge of pollutants into waters of the State. Additionally, Code of Maryland Regulations (COMAR) 26.08.04 requires MDE to administer the NPDES program as part of the State's own discharge permit system. These regulations also define municipal separate storm sewer systems as point sources of pollution subject to NPDES permit requirements.

###### C. Permittee Responsibilities

Section 402(p) of the CWA, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from large municipal separate storm sewer systems. A large municipal separate storm sewer system is defined in the CWA as serving a population of 250,000 or more. Anne Arundel County, according to the United States Department of Commerce's 1990 Census, has a total population of 427,139 and is therefore considered a large municipality. As a result, the County was required to submit a two-part NPDES permit application. Anne Arundel County has submitted an NPDES stormwater application that was prepared to satisfy the EPA's regulations for permitting stormwater discharges from municipal separate storm sewer systems. NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of pollutants to the "maximum extent practicable." Specific permit

conditions are summarized Permit # MS-AA-93-003 and in Appendix 2. Appendix 3 outlines MDE's long-term monitoring database and a spreadsheet for the reporting and tracking of NPDES data is included as Appendix 4. Additionally, NPDES regulatory requirements can be found in Appendix 5.

## **PART II. BACKGROUND**

### **A. Problems Associated with Stormwater Pollutants**

Pollutants in stormwater discharges from many sources are largely uncontrolled. The *National Water Quality Inventory, 1990 Report* to Congress provides a general assessment of water quality based on biennial reports submitted by the States under Section 305(b) of the CWA. The Report indicates that roughly 30% of identified cases of water quality impairment are attributable to stormwater discharges. During rain events that produce runoff, numerous pollutants including sediment, nutrients, bacteria, oil, metals, and pesticides are washed into storm sewer systems from diffuse sources such as construction sites, residential neighborhoods, commercial areas, parking lots, roads, and industrial facilities. Additionally, illegal dumping, sanitary sewer system leaks, and illicit connections to storm sewer systems can be significant sources of pollutants. Some of the more serious effects to receiving waters are the contamination of drinking water supplies, restrictions on water contact recreation, loss of wildlife habitat, decreases in the number and variety of aquatic organisms, and fish kills.

### **B. History of NPDES Stormwater Program**

Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants in point source discharges from industrial facilities and municipal sewage treatment plants. In response to the need for controlling stormwater discharges, Congress amended the CWA in 1987 requiring the EPA to establish NPDES requirements for stormwater discharges. In November 1990, EPA issued final stormwater regulations for eleven categories of industry and certain municipal separate storm sewer systems. As part of the municipal stormwater program, jurisdictions in Maryland operating large municipal storm sewer systems must submit a two-part application to MDE outlining programs for monitoring and controlling stormwater discharges. Required information includes Legal Authority, Source Identification, Discharge Characterization, Management Programs, Assessment of Controls, and Fiscal Resources.

### **C. Maryland's Perspective**

Maryland's efforts to reduce stormwater pollution have focused on protecting and restoring the water quality of Chesapeake Bay. The Maryland General Assembly passed the Erosion and Sediment Control Law in 1970 to control runoff from construction sites and in 1982 passed the Stormwater Management Act which requires that appropriate Best Management Practices (BMP) be used in order to maintain after development, as nearly as possible, the pre-development runoff conditions. Additionally, the Chesapeake Bay Program, a cooperative effort among the major Bay states and the federal government, has elevated the importance of stormwater management programs in Maryland by establishing a 40% nutrient reduction goal to the Chesapeake Bay and, more recently, by focusing cleanup efforts on the Bay's tributaries. Although Maryland's existing programs will aid local jurisdictions in satisfying NPDES stormwater requirements, additional

stormwater control measures will be needed for full compliance with the federal program.

### **PART III. APPLICATION SUMMARY**

#### **A. Jurisdiction Description**

##### **1. Physical Data**

Anne Arundel County is located in the east-central part of Maryland. It is bound on the east by the Chesapeake Bay, on the north by the Patapsco River and Baltimore City, on the northwest by Howard County, and on the south by Calvert County. The Patuxent River forms the County's border on the west and separates it from Prince George's County. According to the *Soil Survey of Anne Arundel County, Maryland (United States Department of Agriculture, 1973)*, the County's total land area encompasses approximately 417 square miles (266,880 acres).

According to the 1990 Census, Anne Arundel County has a population of 427,139. The Maryland Office of Planning (MdOP) estimates an annual growth rate of .73% between 1990 and 2000. This results in a projected population of 449,446 by 1997. The highest urban concentrations are in the Baltimore City suburban areas to the north and in the east around Annapolis. Further to the south, significantly higher concentrations of rural and agricultural land uses exist. It is estimated that the largest percentage population increases will occur in the southern rural and agricultural areas of the County where populations from 1990 to 2000 are projected to rise as much as 24%. The City of Annapolis and the Town of Highland Beach are the only separate incorporated municipalities within the County. These two municipalities have total populations of 33,187 and 102, respectively and, as a result, account for only 7.7% of the County's total 1990 population.

##### **2. Hydrologic Information**

According to its permit application, Anne Arundel County is divided into 12 major watersheds including Patapsco-tidal, Patapsco-nontidal, Magothy, Severn, South, Rhode, West, Patuxent-Middle, Patuxent-Upper, and Little Patuxent Rivers, in addition to Bodkin Creek and Herring Bay. Two-thirds of the County is drained through the Patapsco, Patuxent, Magothy, Severn, Rhode, South, and West Rivers, and Herring Bay watersheds. Creeks, streams, rivers, and the Chesapeake Bay provide the County 431 miles of shoreline. Anne Arundel lies in the physiographic region known as the Atlantic Coastal Plain. Elevation throughout the County ranges from sea level to 300 feet in the northwest section near the City of Laurel.

The County's climate is continental with mild winters and warm, moist summers. According to the County's permit application, the average annual precipitation from 1950 through 1988 at Baltimore-Washington International (BWI) Airport was approximately 41 inches. Precipitation during the fall and winter months is typically extended in duration due to low pressure systems moving northeast along the Atlantic coast. Short duration, high intensity storm events are typical during the spring and summer months due to showers and thunderstorms. Thunderstorms occur on an average of 31 days annually at BWI Airport. The highest average monthly rainfall usually occurs in August with the lowest occurring in January.

According to a review of maps delineating high water marks and through discussions with Anne Arundel County Department of Public Works (DPW) personnel, most flooding is limited to land adjacent to the Patapsco River in the northeast section of the County, the Patuxent River near the Laurel Race Track, and the Little Patuxent River near the Crofton Business Community. These areas experienced flooding during tropical storms Agnes (1972) and Eloise (1975). Each of these rivers has an extensive flood plain, however, flood damage is controlled by County planning procedures which restrict development in the 100-year flood plain. Other County stream networks exist primarily in the Coastal Plain and are more likely to be flooded by high tides associated with storm surges than from stormwater runoff.

According to Maryland's *Nonpoint Source Pollution Assessment Report for Section 319, April 1989*, watersheds in the County impacted by nonpoint source pollution include the Patapsco River basin, West Chesapeake Bay area, and the Patuxent River basin. The Patapsco River basin includes Marley, Stony, Main, Curtis, Rock, and Bodkin Creeks, and the Patapsco-tidal and non-tidal watersheds. Overall, the Patapsco River water quality ranges from good in the upper tributaries to poor in the lower urban and industrial areas. These lower areas are affected by urban runoff which results in high bacterial and nutrient levels. Nonpoint source pollution is particularly a problem in Bodkin Creek as it is listed in the Section 319 report as being impacted by low levels of dissolved oxygen.

The West Chesapeake Bay area includes the Magothy, Severn, South, West, North, and Rhode Rivers, and Herring Bay. This area is judged to have fair water quality with the most significant problem being high bacteria and nutrient levels. Those listed in the Section 319 report as being impacted by nonpoint source pollution include the Magothy, Severn, South, and West watersheds.

The Patuxent River basin has been designated by the Maryland General Assembly as one of the State's Scenic Rivers. The main tributary of the Patuxent River in Anne Arundel County is the Little Patuxent River. Water quality in the Patuxent River basin is judged to be fair, however, the Section 319 report designates the lower Patuxent as being impacted by high levels of bacteria.

The Anne Arundel County DPW has ranked watersheds based on problems caused by development including increased storm flow, erosion and sedimentation, and loss of aquatic resources. Concerns exist at the Jabez Branch in the Severn River watershed as its trout population is being adversely affected by temperature and sediment increases. In addition, Weems Creek in the Severn River watershed and Church Creek in the South River watershed have had a history of flooding and sedimentation problems. Further priority waterways include Rock, Marley, and Sawmill Creeks in the Patapsco River watershed, and the Patuxent River. Currently, pollutant sources at these watersheds are being identified and implementation of structural and non-structural controls to improve water quality is being proposed.

## **B. Programmatic Components**

The NPDES stormwater permit application process for municipal separate storm sewer systems is specified in 40 CFR 122.26(d). The two-part application process was devised to provide a basis for reducing and eliminating pollutants in stormwater discharges from large municipal separate storm sewer systems. Part 1 of the application process requires applicants to submit information regarding existing programs and legal authority, identify sources of pollutants, field screen major outfalls to detect illicit connections, and propose strategies to characterize discharges. The Part 2 application process requires the demonstration of adequate legal authority, additional information on pollutant source identification, characterization of discharges, a proposed stormwater management program, an estimate of the effectiveness of stormwater controls, and a fiscal analysis. The following sections (1 through 6) provide a summary of Anne Arundel County's application.

### **1. Legal Authority**

A summary of Anne Arundel County's NPDES stormwater application submittal, specific to the regulatory requirements for adequate legal authority, is as follows:

*§122.26(d)(2)(i) "(A) Control...the contribution of pollutants...associated with industrial activity...;"*

Pursuant to the Environment Article, Title 4, Annotated Code of Maryland, Anne Arundel County has adopted ordinances necessary to implement a stormwater management program. Additionally, the County has been delegated erosion and sediment control enforcement authority since 1985. Enforcement of Article 21, Title 2, Grading and Sediment Control and Article 21, Title 3, Stormwater Management, of the County Code should adequately control the quality of stormwater that is discharged to Anne Arundel County's storm sewer system from construction activities and new development. However, the County acknowledged that it does not have adequate legal authority to control the contribution of pollutants from other industrial activities or areas developed prior to implementation of its stormwater management program.

*§122.26(d)(2)(i) "(B) Prohibit...illicit discharges...;"*

Anne Arundel County Code, Article 11, Section 5-110, Crimes and Punishment, contains generic language regarding the tampering of County-owned property. This language is not specific to illicit connections to the municipal separate storm sewer system. As a result, the County has proposed to amend Article 21 of the Anne Arundel County Code to include provisions that prohibit connections to the public storm drain system unless approved by the Director of the DPW. Additionally, only stormwater of a certain defined quality will be permitted to discharge to public or private storm sewer systems.

*§122.26(d)(2)(i) "(C) Control...spills, dumping or disposal of materials other than storm water;"*

There is no specific provision in the County Code to control discharges to the municipal separate

storm sewer from spills, dumping, or disposal of materials other than stormwater. Proposed amendments to Article 21 of the Anne Arundel County Code will prohibit the spilling, dumping, or disposal of material other than stormwater as defined in 40 CFR §122.26 into public and private storm sewer systems.

*§122.26(d)(2)(i) "(D) Control...pollutants from one portion of the municipal system to another portion of the municipal system;"*

Anne Arundel County has authority over all public storm drain systems except for those located in the City of Annapolis and Town of Highland Beach. Section 405(o) of the Anne Arundel Charter grants authority to the County Executive to enter into agreements with other municipalities and counties. For example, the County could draft an agreement with the City of Annapolis that would allow for identification of storm drain outfalls within the City's jurisdiction.

MDE will draft an NPDES general permit that will cover stormwater discharges in separate incorporated municipalities. This will include Annapolis but exclude Highland Beach as its population is only 102. Permit conditions will define specific municipal roles, responsibilities, and points of coordination that will control the contribution of pollutants from one portion of the storm sewer system to another. In addition, MDE will issue an NPDES general permit for State (other than the State Highway Administration (SHA)) and an NPDES general permit for federal facilities located within Anne Arundel County. Regarding neighboring jurisdictions, Baltimore City, Baltimore County, Howard County, Prince George's County, and the State Highway Administration have applied to MDE for separate NPDES discharge permits for their respective storm sewer systems. Final permit conditions will be used to address inter-jurisdictional issues.

*§122.26(d)(2)(i) "(E) Require compliance..."*

Enforcement authority exists for the County's present subdivision, zoning, grading, sediment control, and stormwater management programs. Enforcement actions such as stop work orders, violation notices, civil citations, and injunctive relief may be used to gain compliance with associated regulations. Enforcement is usually undertaken during the building process and authority is primarily limited to construction activities associated with new development.

The County has proposed to include a provision in Article 21, Title 3, Stormwater Management, of the Anne Arundel County Code to authorize the DPW Director to promulgate regulations that would have the force of law. This provision would require any person using or permitting the use of any storm drain system, whether public or private, to do so only in accordance with Article 21, Title 3.

*§122.26(d)(2)(i) "(F) Carry out all inspection, surveillance and monitoring procedures..."*

Anne Arundel County has authority to carry out inspections, surveillance, and monitoring with regard to each permit it issues for development projects. Most work undertaken usually occurs

through a public works agreement, grading permit, or building permit that includes a requirement that the developer post security in any amount and form sufficient to insure that the work authorized is completed properly. However, this does not apply to inspection, surveillance, or monitoring for illicit connections.

## **Summary**

Anne Arundel has adequate legal authority for erosion and sediment control and stormwater management. Emphasis during the permit term will be placed on legal authority for controlling industrial discharges, illicit connections, and interjurisdictional discharges.

## **2. Source Identification**

A summary of Anne Arundel County's NPDES stormwater application submittal, specific to the regulatory requirements for source identification, is as follows:

*§122.26(d)(1)(iii) "(A) A description of the historic use of ordinances..."*

Anne Arundel County submitted Article 27 of the County Code, *Utilities*, Section 3-501 through 3-519. The County uses this ordinance to prohibit discharges to its system that do not conform to the stated provisions of the Code. The County's intent is to prevent the introduction of pollutants that will interfere with the operation of the system, pass through the system into receiving waters, contaminate waste sewage sludge, interfere with sludge recycling or reclamation, and adversely effect public health, safety and welfare. Facilities with significant discharges must obtain a Wastewater Discharge Permit from MDE and adhere to minimum EPA pretreatment standards.

*§122.26(d)(1)(iii) "(B) A USGS 7.5 minute topographic map..."*

Anne Arundel County created a 1:7200 scale base map from both County topography maps and USGS 7.5 minute topographic maps. Additional information on source identification is electronically mapped on the 1:7200 scale base maps.

*§122.26(d)(1)(iii)(B) "(1) The location of known municipal storm sewer system outfalls..."*

Anne Arundel County used DPW Storm Drain Operating Maps to locate all major and minor outfalls. Each outfall has been mapped on the County's base maps and assigned a number indicating watershed designation, ownership, and operating map reference. The County located 1768 outfalls, 373 of which are "major" (greater than or equal to 36").

*§122.26(d)(1)(iii)(B) "(2) A description of the land use activities...population densities...average runoff coefficient..."*

Anne Arundel County mapped land use information obtained from the MdOP. Land uses are

categorized as residential, commercial, industrial, and open lands which include agricultural, forests, and barren land. Population information was obtained from the United States Department of Commerce's 1990 Census. Runoff coefficients for each land use were obtained from MDE's Part 1 NPDES Municipal Stormwater Guidance Document dated 1991.

*§122.26(d)(1)(iii)(B) "(3) The location...of each currently operating or closed municipal landfill..."*

Information on currently operating and closed landfills was obtained from MDE and Anne Arundel County's Bureau of Solid Waste. Lists of landfills and whether they were open or closed were provided in table form. The County also mapped this information on its base maps. Eleven landfills were identified by the County including five privately owned, four County owned, one federally owned, and one owned by the City of Annapolis. Three of these landfills are closed.

*§122.26(d)(1)(iii)(B) "(4) The location and permit number of any known discharge...that has been issued a NPDES permit;"*

A list of prior and existing NPDES permit holders for industrial facilities in Anne Arundel County was obtained from MDE and mapped on the County's base maps. This list contains each permit holder's name and NPDES permit number.

*§122.26(d)(1)(iii)(B) "(5) The location of major structural controls..."*

Anne Arundel County obtained major structural control information from the Anne Arundel Soil Conservation District (SCD) and the County DPW. Of these major structural controls, only stormwater management ponds were mapped on the County's base maps. The County indicated that approximately 2462 acres of development are controlled by dry ponds, 134 acres by wet ponds, and 146 acres by infiltration facilities.

*§122.26(d)(1)(iii)(B) "(6) The identification of publicly owned parks..."*

Anne Arundel County obtained information on publicly owned land from the County's Tax Exempt Property List. Only County owned land was mapped and a minimum size limit was established to determine which of these lands would be mapped. Only those areas which were determined to have adequate space for stormwater management retrofit projects were identified on the County's base maps.

*§122.26(d)(2) "(ii) ...an inventory, organized by watershed...of each facility associated with industrial activity..."*

Anne Arundel County submitted information on industrial facilities to MDE that indicated names, addresses, and Standard Industrial Classification (SIC) codes describing the activities of these facilities. However, these facilities were not organized by watershed.



## **Summary**

Anne Arundel County collected most of the data to satisfy source identification requirements. The implementation and maintenance of a Geographic Information System (GIS) will be emphasized during the permit term.

### **3. Discharge Characterization**

A summary of Anne Arundel County's NPDES stormwater application submittal, specific to the regulatory requirements for discharge characterization, is as follows:

*§122.26(d)(1)(iv) "(A) Monthly mean rain and snow fall estimates..."*

Anne Arundel County submitted precipitation data that were compiled at BWI airport between 1951 and 1984. These data include mean monthly precipitation and snowfall depths, mean number of days with .01 inches or more of precipitation, and mean number of days with thunderstorms.

*§122.26(d)(1)(iv) "(B) Existing quantitative data..."*

Historically, the County has conducted in-stream monitoring rather than monitoring discharges directly from its municipal separate storm sewer system. In an effort to assess water quality in several of its major watersheds, the County Office of Planning and Zoning maintains ongoing in-stream monitoring at Church, Marley, Rock, and Weems Creeks.

Water quality studies were performed between 1987 and 1989 in Rock, Church, and Weems creeks and are summarized in the following reports: *Rock Creek Stream Monitoring Report (1989)*, *Church Creek Stream Monitoring Report (1989)*, *Weems Creek Monitoring Report (1989)*, and *Heavy Metals (Rock, Church, and Weems Creeks)(1989)*. Monitoring at Marley Creek has only recently commenced and results have yet to be summarized in report form. A water quality study was also conducted at Towser's Branch. The results of this study are summarized in *Towser's Branch Water Quality: Monitoring the Success of Nonpoint Pollution Retrofit Measures in a Suburban Maryland Watershed* and compare water quality before and after completion of a stormwater management retrofit project. Monitoring stations in all of these watersheds collected water samples which were analyzed for dissolved oxygen, nitrogen, phosphorus, BOD<sub>5</sub>, COD, suspended solids, and heavy metals during base and storm flow conditions.

Other water quality monitoring studies in the County include the USGS's ongoing, long-term water quality monitoring on Sawmill and Marley Creeks in the Patapsco River Basin, and on the Patuxent River near Bowie. In addition to the collection of quantitative data, a major volunteer stream survey was conducted along the Severn River. This survey is described in *The Great Severn River Stream Survey, 1991* and consisted of visual observations which were used to assess

problem pollution areas.

*§122.26(d)(1)(iv) "(C) A list of water bodies that receive discharges..."*

Anne Arundel County has 12 major watersheds that receive drainage from the municipal separate storm sewer system. All of these watersheds drain to the Chesapeake Bay and include Bodkin Creek, Herring Bay, Patapsco-tidal, Patapsco-nontidal, Magothy, Severn, South, Rhode, West, Patuxent-Middle, Patuxent-Upper, and Little Patuxent Rivers. Several of these watersheds and their subwatersheds are listed in various State water quality reports required under the CWA including *The Maryland Water Quality Inventory (1985-1987) for Section 305(b)*, *The Maryland Water Quality Inventory (1987-1989) for Section 304(l)*, and the *Nonpoint Source Pollution Assessment Report for Section 319, April 1989*. The Patapsco River area, which includes Marley and Rock Creeks, is listed under Section 305(b) as having poor water quality in its lower tributaries. Other watersheds listed in the 305(b) report include the Patapsco River, the West Chesapeake Sub-basin, and the Patuxent River. The most significant problems in each of these watersheds are high bacteria and suspended sediment levels.

Watersheds listed in the Section 304(l) report on waters impaired by toxic or conventional pollutants from either point or nonpoint sources include Bodkin Creek, West Chesapeake Bay area, Middle Chesapeake Bay, Lower Patapsco, Magothy, Severn, South, Little Patuxent and West Rivers, and some areas of the Patuxent River near Rte. 214. The primary problems in these watersheds are high levels of nutrients and bacteria.

Maryland's Section 319 report indicated that several waterways in the County are impacted by nonpoint source pollution. High nutrient and bacteria levels from agricultural, urban, and natural runoff, and waste disposal are the major problems in the Middle Chesapeake Bay area.

*§122.26(d)(1)(iv) "(D) Results of a field screening analysis for illicit connections..."*

The County completed field screening for 368 of the 500 outfalls required by the CWA. The County stated in its Part 1 application that 367 represented the total number of major outfalls and, therefore, no further field screening was required. However, an additional outfall was identified and screened during the Part 2 application process to bring the total number of outfalls identified to 368. LaMotte Test Kits were used to perform chemical analysis of several required parameters including copper, phenols, detergents, chlorine, water temperature, and pH. In addition to collecting chemical parameter data, visual observations were performed to provide further information regarding illicit discharges. All of this information was recorded on a database to enable detailed analysis and future targeting of potential illicit connections. An examination of these data indicated that only 24% of the major outfalls screened had dry weather flow.

*§122.26(d)(1)(iv) "(E)...the location of outfalls or field screening points appropriate for representative data collection..."*

In its proposed characterization plan, Anne Arundel County selected five major outfalls to be used for Part 2 stormwater monitoring purposes. These five outfalls included two draining predominately residential land uses, two draining industrial land uses, and one draining a commercial land use. Two of these sites, the commercial site at Parole Plaza and the residential site in Odenton, were selected because of their proximity to the Parole and Odenton Growth Management areas. Stormwater monitoring at these Growth Management areas will enable the County to assess the effectiveness of structural and non-structural controls on pollutant removal.

All of the proposed outfalls were reviewed by MDE for potential problems. While some were discovered to be influenced by backwater making sample collection difficult, others were difficult to access. As a result, alternative outfalls were selected and the County's characterization plan was approved.

*§122.26(d)(2)(iii) "(A) Quantitative data from...between five and ten outfalls representative of commercial, industrial, and residential..."*

The County has completed all of its stormwater monitoring requirements in accordance with 40 CFR 122.26(d)(2)(iii)(a). Monitoring at the five representative outfalls was performed over a period of three months from July 31 to October 30, 1992. Data were collected for the required 138 pollutant parameters for three storm events at each outfall and recorded on a database. The County noted in its application that these limited data are not statistically representative, however, it appears that basic pollutant trends can be observed. Of the 138 pollutants monitored, only 20 were consistently above the detection limit. In addition, these 20 were detected regardless of land use. Occasionally, a few additional pollutants such as mercury and methylene chloride were detected.

*§122.26(d)(2)(iii) "(B) Estimates of annual pollutant loads...and the event mean concentration..."*

Pollutant load estimates were calculated using Schueler's "Simple Method." Rather than using the limited results from the Part 2 monitoring, default values for event mean concentration were used. Use of the "Simple Method" in addition to default values is acceptable until more comprehensive data are collected.

*§122.26(d)(2)(iii) "(C) A proposed schedule to provide estimates...of the seasonal pollutant load..."*

The County reported that annual and seasonal pollutant loads will be calculated and refined as water quality data are collected during the permit term.

*§122.26(d)(2)(iii) "(D) A proposed monitoring program...for the term of the permit..."*

The County proposed to use three of the outfalls used in Part 2 for long-term monitoring. These

outfalls are a residential site at Odenton, a commercial site at Parole, and Midway Industrial Park. Only the Parole Plaza site has an existing in-stream monitoring station (Church Creek).

The County proposed to monitor 27 parameters. Selection of these parameters was based on those detected in Part 2 monitoring, those monitored at existing monitoring stations, and parameters that are commonly addressed in urban runoff studies. A sampling frequency of manual grab samples twice per year (winter and summer), field measurements twice per year (winter and summer), automated samples (once per season), and base flow grab samples (winter and summer) was similarly proposed.

### **Summary**

Anne Arundel County completed its Part 2 monitoring requirements. Implementation of its long term monitoring program will be the County's primary concern while refinement of pollutant load estimates will be subsequently performed.

### **4. Management Programs**

A summary of Anne Arundel County's NPDES stormwater application submittal, specific to the regulatory requirements for management programs, is as follows:

*§122.26(d)(2)(iv) "(A) A description of structural and source control measures..."*

*§122.26(d)(2)(iv)(A) "(1) A description of maintenance activities...for structural controls..."*

Anne Arundel County is required by Environment Article 4, Subtitle 2 to inspect stormwater management facilities once every three years. However, its goal is to inspect these facilities annually. The County is also required to perform, or cause to be performed, maintenance on existing stormwater management facilities. Publicly owned stormwater management facilities are maintained by the County. Privately owned stormwater management facilities are maintained through stormwater management maintenance agreements between the County and facility owners. Under these agreements, failure to maintain a facility will result in the County performing maintenance at the owner's expense. The County has a program to remove sediment from more than 120 of its stormwater management ponds.

*§122.26(d)(2)(iv)(A) "(2) A description of planning procedures...to reduce...pollutants...from areas of new development and significant redevelopment..."*

The County's stormwater management plan review process involves many agencies. The Development Services Division in the DPW reviews plans for all development and the Watershed Management Division reviews plans for stormwater management on Capital projects. If a project is in the Critical Area, or the Parole and Odenton Growth Management Areas, the Office of Planning and Zoning reviews stormwater management plans to ensure they address water quality.

Public participation is encouraged through various County planning committees such as the Severn River Commission, the South County Creeks Environmental Commission, and the Parole and Odenton Area Committees.

Currently, problems exist with requiring stormwater management on re-development projects. Water quality waivers are granted at many existing sites and "grandfathering" of projects that were approved prior to adoption of a stormwater management ordinance continues to occur. To remedy these problems, a County task force has been formed to revise its 1984 stormwater management ordinance to eliminate water quality waivers. In addition, MDE currently is revising State stormwater management regulations to address water quality control, redevelopment, and waivers.

Anne Arundel County's nonpoint source responsibilities are scattered among several departments making coordination of these programs difficult. The County has, however, reorganized these functions and, as a result, may be able to centralize all of its nonpoint source pollution programs.

The County is in the process of developing a comprehensive Master Plan for new development and significant redevelopment. Under the Master Plan, the County stormwater management program will be integrated with nonpoint source planning programs such as wetlands, designated watersheds, agricultural pollution control, and land use management. Presently, two areas of the County have this integrated approach to water quality. Regulations in the Parole and Odenton Town Center Growth Management Areas protect wetlands, require stormwater management quality and quantity control, require water quality monitoring of stormwater discharges, and require retrofits if water quality degradation is detected.

*§122.26(d)(2)(iv)(A) "(3) A description of practices for operating and maintaining public streets...;"*

EPA identified several highway maintenance procedures that potentially have impact on water quality including litter control, snow removal, road repair, and inadequate road side vegetation. The Anne Arundel County Bureau of Highways, housed in the County DPW, is responsible for all services relating to the County's 5,230 roads covering 1,530 miles and 35 bridges. These services include ditch maintenance, street sweeping, litter control, herbicide applications, snow and ice control, and a road operations program that addresses permanent erosion and sediment control measures for existing road operations facilities.

The County's litter control program utilizes prison labor to remove trash on County rights-of-way each weekend. In addition, one street sweeper is used in the northern, more urban sections of the County. However, it can be used elsewhere in the County when necessary. Truck mounted vacuum cleaners are used to remove debris and sediment from storm drains.

Salt, sand, and calcium are used for snow and ice removal purposes and are stored at seven locations throughout the County. Application rates for salt are approximately 500 pounds for

every mile of two-lane roadway. Decisions on the amount of materials to be used are based on a weather forecast system used by the County. This forecast system provides detailed information on winter storm intensity, duration, start and stop times, and snow accumulation.

Pesticides and fertilizers are not used for vegetation management on County road sides. However, the herbicide Roundup is used on road sides and is maintained at a storage facility in Crownsville.

*§122.26(d)(2)(iv)(A) "(4) A description of procedures to assure that flood management projects assess the impacts on the water quality...;"*

Anne Arundel County has a flood plain management ordinance that prohibits development within the 100 year flood plain in the County. This ordinance also provides open space and preserves natural features such as wetlands.

Under the County's flood plain management program, new and retrofit flood management structures are evaluated for water quality impacts. Several permits must be obtained prior to project approval. The Maryland Department of Natural Resources (DNR) requires a waterway construction permit for construction in nontidal waters and flood plains. The U.S. Army Corps of Engineers and DNR require wetlands permits and MDE requires Water Quality Certification. Finally, the Anne Arundel SCD reviews and approves erosion and sediment control plans. County approval is withheld until State and federal approvals are obtained.

The County has a Sensitive Areas Program that requires various controls on steep slopes of 15% or greater and areas within 300 feet of natural channels or flood plains, habitat areas, and Critical Areas. This program requires that the effects of construction activity on these areas be minimized and all disturbed areas be restored. The County's Critical Area Program was established to control development while minimizing water quality impacts in areas within 1000 feet of tidal waters, tidal wetlands, etc. This program addresses land use management, water dependent facilities (e.g., marinas), shore erosion protection, forest and woodland protection, agricultural protection, mineral resources, natural parks, and habitat protection.

Currently, there is no County program to implement stormwater management facilities in existing developed areas. However, through its Stormwater Management Pond Maintenance and Retrofit Program, the County DPW has a program to retrofit old ponds in developed areas to address new water quality standards. Retrofits take place only when funding is available as they are not included in the current Master Plan.

In the past, the County has developed and implemented some major retrofit projects. For example, in 1986, a joint effort by the County, State and federal governments helped fund a retrofit project for existing storm drain facilities with runoff problems. These facilities were located in a residential area developed prior to implementation of stormwater management regulations.

*§122.26(d)(2)(iv)(A) "(5) A description of a program to monitor pollutants from operating or closed municipal landfills...;"*

MDE's Industrial Permit Program is responsible for enforcement of controls for pollutants from landfills, hazardous waste sites, and industrial facilities. COMAR and CFR require that landfills and hazardous waste facilities divert runoff away from waste materials and collect runoff and seepage from waste materials as leachate. Leachate must be collected, treated, and discharged under an industrial NPDES permit issued by MDE. Discharge controls at these facilities include liners, tanks, and berms. The County reviews and comments on landfill permits issued by MDE.

Anne Arundel County has several of its own programs that regulate operating and closed municipal landfills. Landfills located in Millersville, Sudley, and Glen Burnie are currently involved in the County's landfill redesign program which requires improvements to liners, leachate control systems, and stormwater management ponds. In addition, trash that enters landfills is inspected for toxins, hazardous materials, etc. under the trash inspection program. A County landfill erosion and sediment control program is currently being established for all County-owned landfills. Under this program, landfills will be visually inspected and monitored for up to 20 years after closure. Another program, the landfill closure program includes the Glen Burnie landfill and several cells of the Millersville landfill. Certain areas in these landfills are capped to limit the potential release of contaminants.

Sewage pretreatment plants must obtain a wastewater discharge permit from MDE to comply with MDE's sewage pretreatment program. This program requires that treatment plants adhere to EPA, State, and local pretreatment standards.

*§122.26(d)(2)(iv)(A) "(6) A description of a program to reduce...pollutants... associated with the application of pesticides...;"*

The University of Maryland, in conjunction with the Maryland Department of Agriculture (MDA), trains applicators of restricted use herbicides and pesticides. As stated above, the County does not use pesticides or fertilizers on road side ditches. The MDA additionally distributes educational pamphlets to the public to inform them of alternatives to pesticides and herbicides.

*§122.26(d)(2)(iv) "(B) A description of a program...to detect and remove...illicit discharges...The program shall include:"*

*§122.26(d)(2)(iv)(B) "(1) A description of a program...to prevent illicit discharges...;"*

Anne Arundel County had no existing program to control illicit discharges to its municipal storm sewer system. In its permit application, the County proposed to identify illicit connections through continuous field screening and citizen complaints.

*§122.26(d)(2)(iv)(B) "(2) A description of...on-going field screening activities...;"*

Anne Arundel County will rely on visual observations and LaMotte Chemical Testing Kits to field screen 50 outfalls per year during the permit term. Part 1 field screening for illicit discharges resulted in 88 of 367 outfalls having dry weather flow. The County outlined its priorities for targeting field screening activities at 50 outfalls each year during the permit term. Twenty-five of the 50 proposed outfalls will include those that were field screened in Part 1. From these 25 outfalls, the County proposed to select randomly about half of the outfalls that had dry weather flow and half that did not have dry weather flow from Part 1 field screening results. In addition, selection of these outfalls would be proportionate to the number of outfalls in each major watershed. For example, more outfalls would be selected for field screening in the Patapsco River watershed than in the Rhode River watershed.

Field screening of the remaining 25 outfalls will be performed at outfalls not screened during Part 1. Areas where the probability of illicit discharges is highest will be screened first. These areas include the northern and eastern sections of the County and outfalls draining industrial land uses. Outfalls with a low probability of illicit discharges will be the lowest priority for field screening.

The County also plans to field screen minor outfalls (e.g., those that are less than 36" in diameter) and additional outfalls that are discovered. Furthermore, State and federal facilities will be contacted in an effort to locate and field screen outfalls located on these properties.

Ponding water and dry weather flow will be sampled at all screened outfalls. Outfalls with dry weather flow will be observed again in at least 24 hours but no less than four hours. All information will be recorded on the database that MDE provided for Part 1 field screening data.

*§122.26(d)(2)(iv)(B) "(3) A description of procedures...to investigate portions of the separate storm sewer system...;"*

If dry weather flow is present at an outfall, observations consistent with those required in Part 1 field screening will be performed. Screening personnel will record visual and olfactory observations such as color, odor, etc. as well as perform tests for the presence of chlorine, copper, detergents, ammonia, and phenols. The detection of any pollutants in the screening process will warrant additional investigation.

County personnel will make an effort to determine the source of the illicit discharge. An automated sampler will be used to monitor discharges once per week if the illicit discharge source is not apparent. If no further dry weather flow is detected, then monitoring will continue at two month intervals for one year. However, if dry weather flow continues to be detected, screening further upstream will be conducted in an effort to pinpoint the illicit connection.

A three part enforcement process will commence when an illicit discharge source is identified. First, the owner initially will be encouraged to remediate the illicit connection. Second, an order



to disconnect the illicit connection will be issued if the owner fails to remove it. Finally, if the order is unsuccessful, the County will make any necessary repairs at the expense of the owner.

*§122.26(d)(2)(iv)(B) "(4) A description of procedures to prevent, contain, and respond to spills...;"*

The County fire department is responsible for containing chemical spills. Containment practices such as dikes and absorbent materials are used to minimize receiving water contamination. Parties responsible for spills are obligated to remove spill material through a contractor. In the event of large scale spills, the State Office of Emergency Management is contacted to coordinate various agencies.

The County police department responds to illegal dumping complaints while zoning enforcement personnel respond to citizen complaints of illegal dumping on private property. Criminal charges may be used against parties responsible for illegal dumping.

*§122.26(d)(2)(iv)(B) "(5) A description of a program to promote...public reporting of...illicit discharges...;"*

Anne Arundel County outlined public reporting procedures for illegal dumping. Citizens can call "911" to report any illicit dumping activities. However, no program exists to promote public reporting of illicit discharges.

Other educational programs include the Baysavers program where students participate in projects such as channel restoration. A Citizens Monitoring Program allows residents to participate in water quality sampling in targeted areas. The County Office of Planning and Zoning sponsors distribution of educational materials, teaching elementary and secondary students about water quality, and informing citizens of specific environmental messages.

*§122.26(d)(2)(iv)(B) "(6) A description of educational activities...;"*

Under the County's Household Hazardous Waste Program, citizens are encouraged to dispose of toxic waste appropriately. Used oil and antifreeze is accepted for recycling at County landfills and transfer stations. Pamphlets are distributed to citizens twice each year to inform them of alternatives to toxic materials such as pesticides, herbicides, and household hazardous materials. In addition, these pamphlets are used to describe available recycling programs.

*§122.26(d)(2)(iv)(B) "(7) A description of controls to limit infiltration of seepage...;"*

The County performs preventative maintenance on sewer lines by cleaning them every two or three years. The DPW attempts to visit each manhole once every ten years for visual observations. Investigative procedures such as flow monitoring, physical inspection, and other sewer problem identification techniques are used to pinpoint pollutant sources. All sewer lines

that are discovered to have leaks are immediately repaired.

*§122.26(d)(2)(iv) "(C) A description of a program to monitor and control pollutants...from municipal landfills...The program shall:"*

*§122.26(d)(2)(iv)(C) "(1) Identify priorities and procedures for inspections...;"*

State and federal regulations require that discharges be controlled from landfills and hazardous waste facilities. Controls that are used include the diversion of runoff away from waste materials, the collection of any runoff and seepage as leachate, and subsequently the treatment and discharge of leachate under an NPDES point source permit.

COMAR requires that various containment structures such as liners and berms be visually inspected to detect leaks. The owner is required to correct any problems by implementing controls to contain leaks.

*§122.26(d)(2)(iv)(C) "(2) Describe a monitoring program..."*

Monitoring downstream of landfills, hazardous waste sites, and industrial facilities is required by MDE through industrial NPDES permits. Quarterly testing is performed and results are compared to background data. If any pollutants are detected above the background data, further monitoring is required to identify specific pollutant quantities.

The County indicated in its application that it is concerned that COMAR may be too weak to effectively control discharges from facilities. Three problem areas were outlined. First, only dry weather monitoring is required. Second, existing closed facilities are not subject to the regulatory requirements. Finally, existing private facilities are not required to comply with the regulations unless they are discovered to have violations. However, no plans for strengthening this program on the local level were outlined.

*§122.26(d)(2)(iv) "(D) A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in stormwater runoff from construction sites...which shall include:"*

*§122.26(d)(2)(iv)(D) "(1) A description of procedures for site planning...;"*

Anne Arundel County has been delegated erosion and sediment control enforcement authority since 1985. The County's Department of Inspections and Permits performs erosion and sediment control inspections. Erosion and sediment control plan review is performed by the County DPW, Office of Planning and Zoning, and the Anne Arundel SCD.

*§122.26(d)(2)(iv)(D) "(2) A description of requirements for non-structural and structural best management practices;"*

The County requires that disturbances greater than 5000 square feet or 100 cubic yards have approved erosion and sediment control plans prior to development. The disturbance limit in Critical Areas is 1000 square feet.

A Surface Mining Inspection Program was initiated in 1992 and requires erosion and sediment control plans and compliance on surface mines. In addition, the County currently is working on a program for implementation of erosion and sediment controls on landfills for as long as 20 years after closure, which is more stringent than State requirements.

*§122.26(d)(2)(iv)(D) "(3) A description of procedures for inspecting sites...;"*

Erosion and sediment control inspections are performed at construction sites once every two weeks as required by State law to ensure that sites are in compliance with approved erosion and sediment control plans. A detailed description of inspection procedures is contained in MDE's review of the County's erosion and sediment control program, dated 1992.

*§122.26(d)(2)(iv)(D) "(4) A description of appropriate educational and training measures for construction site operators."*

Maryland law requires "responsible personnel" to obtain certification by completing an approved training class. The County offers a four hour "responsible personnel" class that provides construction site operators erosion and sediment control certification.

### **Summary**

Comprehensive management programs for erosion and sediment control and stormwater management currently exist in Anne Arundel County. During the permit term, the County will concentrate on implementation of an illicit connection detection program and public educational programs.

### **5. Program Funding**

A summary of Anne Arundel County's NPDES application submittal, specific to the regulatory requirements for program funding, is as follows:

*§122.26(d)(2) "(vi) For each fiscal year to be covered by the permit, a fiscal analysis... shall include a description of the source of funds...to meet the necessary expenditures..."*

Anne Arundel County used funds from its Capital Budget Program to finance Parts 1 and 2 of its NPDES permit application. The use of these funds has been extended to include coordination and activity requirements during the permit term. The overall budget for all water quality programs in the County is approximately \$26 million. From this, approximately \$1.9 million is

budgeted for FY94 through FY98 to finance NPDES program implementation during an anticipated 5 year permit term. However, this budget figure does not account for program needs after the County's reorganization. The County stated in its application that, if necessary, program budgets can be revised each year to incorporate any program changes and unforeseen circumstances.

### **Summary**

Due to its current reorganization efforts, Anne Arundel County will work to ensure that funding is secured to continue implementation of its NPDES programs during the permit term.

## **6. Assessment of Controls**

A summary of Anne Arundel County's NPDES application submittal, specific to the regulatory requirements for assessment of controls, is as follows:

*§122.26(d)(2) "(v) Estimated reductions in loadings...expected as a result...of the management program..."*

Anne Arundel County provided pollutant load reduction estimates, in pounds, for each of its watersheds. Load reductions were estimated for BOD<sub>5</sub>, COD, TDS, TSS, Total Phosphorus, Dissolved Phosphorus, Total Nitrogen, Nitrate plus Nitrite, Zinc, Lead, Copper, and Cadmium. These estimates are based on pollutant load reduction factors for dry ponds, wet ponds, extended detention ponds, and infiltration facilities. For example, dry ponds reduce TSS by 55% whereas extended detention ponds can reduce TSS by as much as 80%. In addition, populations were projected and the number of corresponding structural controls for future development in each watershed were estimated for the year 2000. However, the pollutant loads were estimated without consideration of more rigorous water quality management programs that will be required in the future. Anne Arundel County has projected that stormwater management quality control practices such as extended detention will remain absent in all watersheds.

The County provided an outline of non-structural control assessments. These assessments include the number of feet of storm drains maintained, the number of erosion and sediment control inspections, and the number of acres protected under the Flood Management Program. However, several inconsistencies between assessment of controls and funding were discovered. For instance, the County indicated that there are no budget figures available for inlet painting and educational programs for FY92 and FY93. However, a review of the fiscal resources section of the application indicates \$2900 and \$13,600 designated for inlet painting and educational programs, respectively.

### **Summary**

Anne Arundel County will refine pollutant load estimates during the permit term as more water quality data are collected and public education programs are implemented.