MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT
MD0068322

REVIEW OF HOWARD COUNTY'S 2004 ANNUAL REPORT

Howard County was issued a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system discharge permit (MD0068322) on June 15, 2000. A new NPDES municipal stormwater permit was issued to the County on June 20, 2005. This new permit replaces the expired permit and will continue until June 20, 2010.

NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of stormwater pollutants to the "maximum extent practicable." For each year of the permit, an annual report is required to help assess the County's NPDES stormwater related programs. This annual report summarizes progress during the final year of Howard County's previous municipal stormwater permit. The following is a review of the annual report submitted to the Maryland Department of the Environment, Water Management Administration (MDE\WMA) by Howard County on June 15, 2005.

Permit Administration

Howard County is required to identify key administrative and technical personnel responsible for NPDES permit compliance. Updated information was submitted to MDE in this annual report and included an organizational chart. In addition, names, addresses, and phone numbers of personnel responsible for various aspects of the NPDES program were submitted. MDE considers this information complete.

Legal Authority

Howard County is required to maintain adequate legal authority in accordance with NPDES regulations 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) throughout the permit term. Adequate legal authority continues to be maintained. The County Office of Law previously certified that adequate legal authority exists to control the quality and quantity of discharges through the County storm drain system. Revisions to the County Code regarding illicit discharge detection and elimination and stormwater management were adopted in March 2005 and are described further in the management program section below. Overall, legal authority permit requirements continue to be satisfied by Howard County.

Source Identification

Howard County is required to identify sources of pollutants in stormwater runoff and link these sources to specific water quality impacts on a watershed-by-watershed basis. Additionally, the County is required to maintain geographic information system (GIS) data. Previously, many components of the County's GIS were updated including soils, topography, land use, and major outfalls. However, drainage areas to major outfalls were lacking. In this annual report, the County

provided GIS updates that included drainage areas for all of the 367 major storm drain outfalls that have been identified. These drainage areas have been subsequently used to estimate pollutant loads from all outfalls. Other GIS data layers that have been updated include 2004 orthophotos, digital elevation models, the cadastral layer, wetlands from the Maryland Department of Natural Resources, and 85 NPDES industrial locations.

The urban best management practices (BMP) database was submitted and contained 2,308 records. Stormwater management facility plans continue to be scanned and locations are routinely recorded using a global positioning system (GPS). As a result, all 2,308 records contain accurate location coordinates. Only about half of the records, however, contained drainage area acreage. This will need to be improved.

The County continues to maintain progress with its source identification requirements. The GIS components continue to be updated. The County is commended for its efforts to complete drainage area delineations for all of its major storm drain outfalls. Additionally, while the urban BMP database is being maintained, improvement is needed with regard to providing drainage areas.

Discharge Characterization

Howard County is required in its NPDES permit to conduct chemical monitoring at its Font Hill residential outfall and associated in-stream station. This monitoring also includes biological sampling and a physical stream assessment. In addition, the County is required to submit physical stream monitoring data to evaluate the effectiveness of a stormwater management system constructed in accordance with the *2000 Maryland Stormwater Design Manual.*

For chemical monitoring, ten storm events were monitored at each of the three monitoring stations: Burnside Drive (with stormwater management), Carrigan Drive (without stormwater management) in the Font Hill watershed, and an instream station. Additionally, baseflow samples were collected at the instream station in February, June, and December 2004. Event mean concentrations (EMC) were calculated and reported on MDE's chemical monitoring database. Subsequently, these EMCs were compared to previous County monitoring data since 2000 and the results were described.

The EMCs at the instream monitoring station for total suspended solids (TSS), total phosphorus (TP), five-day biochemical oxygen demand (BOD5), copper, lead, and zinc all decreased by more than 20% between 2003 and 2004. At the Burnside station EMCs decreased for nitrate + nitrite and lead but increased for TSS, TP, and cadmium. Results from the Carrigan station found decreases in TSS, TP, BOD5, copper, and zinc and an increase in cadmium. The EMCs at all three stations were also compared to MDE's statewide chemical monitoring database and continue to remain below State NPDES EMC averages. The County reported technical difficulties with collecting continuous flow data. This problem will need to be rectified in the future to ensure that pollutant loads can be better estimated.

Biological and physical monitoring occurred at the five stations in the Font Hill tributary during the Fall of 2004 and Spring of 2005. The biological community and physical habitat were judged to be "moderately disturbed." These results were similar to those reported in previous years. Additionally, the "non-supporting" physical habitat ratings combined with the "fair"

biological ratings continued with the worst conditions being found at the most downstream location. The poor biological results were primarily attributed to the overuse of lawn fertilizer by residents and beaver activity that has altered the stream habitat. The physical stability of the stream also remains poor. A Rosgen physical stream assessment was performed and the HEC-RAS hydraulic model was modified to include the 2005 data. Over the past six years, the upstream reaches have aggraded while the downstream reaches have degraded. Similar to the biological communities, the physical stability has been adversely affected by urbanization. To improve stream health at this location, potential improvements were identified including wetlands and floodplain restoration, riparian buffer development and enhancement, and low impact development approaches.

Monitoring the effectiveness of the *2000 Maryland Stormwater Design Manual* in the Hammond Branch watershed continues. An evaluation was performed in the Spring of 2005 at four permanently monumented cross-sections. TR-20 was updated to reflect the completion of all roads and stormwater management facilities and most houses. Overall, clear signs of disturbance with respect to geomorphologic and hydrologic conditions were found and attributed to the construction activity. However, recent stabilization of the site and the conversion of the sediment basins to stormwater management ponds have reduced the peak discharges from those levels found during the construction phase in 2002 and 2003.

The County's discharge characterization work continues to be excellent. Data reporting has improved and the reports provided that describe biological and physical monitoring at Font Hill and the *Design Manual* monitoring in Hammond Branch are detailed and complete. Howard County is commended for its efforts.

Management Programs

In its NPDES permit, Howard County is required to submit detailed information covering a wide variety of management programs. Requirements include maintaining acceptable erosion and sediment control and stormwater management programs and documenting all maintenance inspections, necessary corrective actions, and enforcement actions. Additional responsibilities include maintaining illicit connection detection and enforcement and public outreach programs.

For the County's stormwater management program, maintenance inspections were performed at 272 County-owned, 287 privately maintained (of approximately 900), and 29 Board of Education BMPs. The County continues to maintain a comprehensive database for inspection and maintenance of each BMP and link this information to GIS. Video cameras are used to provide more detailed pipe inspections when staff cannot physically enter confined spaces. Procedurally, changes to the County Code were adopted in May 2005 to improve County oversight of private stormwater facilities and drainage problems. There was also a change in the appropriation of fees-in-lieu collected to allow funding of stream restoration projects and watershed studies.

The County's illicit connection detection and elimination program continues with 110 major storm drain outfalls being screened. Areas in the western section of the County were targeted and six potential illicit discharges and three damaged outfalls were found. Most of the problems identified were high pH or water temperature and these outfalls will be reinspected to determine potential sources. Information from the field screening activities was reported on MDE's dry

weather flow database. Additionally, the County has placed a form on its website for public reporting of potential illicit discharges and illegal dumping. One complaint was received last year.

Erosion and sediment control enforcement authority was delegated to Howard County in 2004 for the maximum two-year period. This delegation period expires on June 30, 2006 with reapplication being required by October 1, 2005. The program will be reviewed by MDE this Fall. In 2004, the quarterly reports for earth disturbances greater than one acre resulted in 164 sites being reported with a total of 1,223 acres. Additionally, four responsible personnel certification classes were held.

The County continues its public education and outreach activities. These include the Stream Re-Leaf Outreach Project, ECO-Review monthly newsletter, a Recycling and Waste Reduction Division outreach program in school curricula, frog-calling surveys, and the distribution of a Natural Resource Activity Book called "The Adventures of H.C. Heron" to school children. Furthermore, 160 volunteers spent 344 hours collecting 2,152 pounds of trash from streams and ponds. Excellent work also continues for road maintenance activities. Street sweeping was performed along 1,300 curb miles, new paving mixes were tested, the Adopt-a-Road program remained popular, storm drain inlets were cleaned, and new road design ideas to help reduce polluted runoff were proposed. The Adopt-a-Road program resulted in 1,890 trash bags collected for 193 miles of roadways.

Howard County continues its excellent management program work. It is clear a significant effort has been made to ensure that the stormwater management, erosion and sediment control, and public education programs maintain high standards. The County is commended for its work in this regard.

Watershed Restoration

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

Previously, the County had prioritized ten watersheds with Centennial and Wilde Lakes being selected for restoration. In this report, the draft "Centennial and Wilde Lake Watershed Restoration Plan" was submitted. The report is comprehensive and includes overall watershed descriptions, field reconnaissance notes, and photographs. Furthermore, proposed restoration areas, cost estimates, stream channel stability and water quality management measure implementation, and monitoring were described in detail. For the Centennial Lake watershed, activities will focus on the protection of existing resources and the reduction of impacts from individual landowners, institutional uses, and the geese population. Additionally, areas identified as needing stormwater management will be targeted. The Wilde Lake watershed work will help reduce the impact of runoff from an area controlled by older stormwater management facilities or with no BMPs at all. As a result, stormwater retrofits and stream restoration projects are planned. The Watershed Treatment Model (WTM) was used to estimate pollutant load reductions resulting from

implementation of these restoration efforts. The County has made a substantial effort to document watershed conditions and make recommendations to improve the watershed restoration component of its NPDES permit.

Program Funding

Howard County is required to maintain adequate program funding to comply with all conditions of its NPDES permit. Revised funding information was provided. For this permit term, the County reported that total capital expenditures account for $9,761,000. Additionally, operation expenditures will be $4,883,000 and maintenance expenditures will be $3,036,000. Overall, more than $17 million will be used to fund NPDES activities. Adequate funding for NPDES-related programs continues to be maintained.

Assessment of Controls

Howard County is required to submit estimates of expected pollutant load reductions as a result of its proposed management programs. The County continues to maintain its "Management Program Effectiveness Evaluation Summary" spreadsheet for estimating pollutant loads from areas that do not drain to major outfalls or structural BMPs. However, a separate pollutant load model was developed using GIS and drainage areas derived from the County's digital terrain map. BMP pollutant removal efficiencies were used in conjunction with EMCs from the chemical monitoring to develop pollutant loads in six individual watersheds and Countywide. The modeling effort found that Countywide, 12% of flows discharge from major outfalls with 8% of these having drainage areas with stormwater management control. BMPS have helped reduce TSS loads by 5.5%, BOD by 3.7%, metals by 5%, nutrients between 4.5 and 5.4%, and fecal coliform by 4.2%. The County also continues to use the WTM to evaluate BMP effectiveness. Results showed a 15% reduction in total nitrogen, 8% reduction in total phosphorus, 16% reduction in TSS, and 5% reduction in fecal coliform.

Summary

Howard County continues to make excellent progress with regard to NPDES stormwater program implementation. Legal authority is acceptable, GIS efforts continue, the discharge characterization efforts and management programs continue to excel. Additionally, the County has made significant progress with regard to the watershed restoration component of its NPDES permit. Some minor issues such as completing drainage areas on the urban BMP database and collecting continuous flow data need to be resolved.