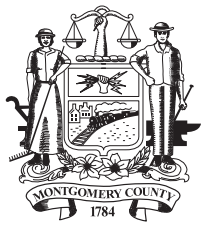
SWAMP CREEK WATERSHED

ACT 167 STORMWATER MANAGEMENT PLAN

VOLUME I

EXECUTIVE SUMMARY



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September 2006

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PLAN INTENT

The Swamp Creek Watershed Stormwater Management Plan has been prepared under an agreement with the Pennsylvania Department of Environmental Protection (DEP), and with assistance from ARRO Consulting, Inc. The intent of this plan is to coordinate stormwater management efforts within the watershed through a model ordinance. The ordinance contains regulations that will prevent existing problems from becoming worse, and avoid the projected problems. The regulations include a 50% release rate - control of the peak rate of stormwater discharge after development at 50% of what it was prior to development. The ordinance also has provisions for stormwater infiltration, water quality, and streambank protection.

Public input was received from participating municipalities and agencies through the Watershed Plan Advisory Committee (WPAC) and the public hearing held on September 28, 2006.

THE MODEL ORDINANCE

The WPAC was formed of representatives from the watershed municipalities, the County Conservation District and interested citizen groups. Data was gathered from the WPAC through a municipal questionnaire and field work. The model of the watershed used the data collected to simulate the behavior of runoff and analyze hydrologic data in the watershed for a range of storms. The data needed for the model includes elevations, soils, geology, land use, floodplain/wetlands, and stream obstructions (bridges and culverts).

The modeling effort is described in more detail in Section VI, Stormwater Control Standards. The output from the model and information from the municipal questionnaire were used to develop the 50% stormwater release rate. This release rate was then incorporated in the model ordinance. The ordinance also includes including detention standards to protect streambanks from excessive erosion and to improve water quality, and infiltration standards to encourage groundwater recharge. The ordinance was reviewed and language added to bring it into compliance with DEP's MS4 stormwater

program. A draft of the ordinance was distributed to the WPAC and DEP for review, and the final ordinance is included in the Plan.

CRITIQUE OF RUNOFF CONTROL TECHNIQUES

The Swamp Creek Watershed Stormwater Management Plan promotes management of stormwater on a watershed-wide basis. The model Swamp Creek Stormwater Management Ordinance, discussed in Section VI, provides stormwater management requirements, design guidelines, and enforcement provisions to achieve this goal. Various techniques to reduce and/or delay runoff corresponding to development type are listed in Table 2 in the Plan. A more exhaustive list of techniques, along with specific design criteria, can be found in the *Pennsylvania Stormwater Best Management Practices Manual*, latest edition.

Best Management Practices (BMPs) are structural or non-structural in nature. Either will be designed to detain or treat stormwater to improve water quality and recharge, protect stream channels from erosion, and decrease flooding. Some BMPs specifically control runoff, while others specifically control pollution. Several BMPs perform both of these functions. The Plan contains a summary of various BMPs, such as natural area conservation, disconnection of rooftop runoff, grass channels, bioretention, filter strips, infiltration trenches and basins,and wet and dry detention basins. The plan contains information on the applicability of runoff control measures in the Swamp Creek watershed.

STORMWATER CONTROL STANDARDS

The watershed model addressed the following:

- Peak discharges at the points of interest of each of the 51 subwatersheds.
- Time to peak for the above discharges.
- Runoff contributions of individual subareas at all downstream locations.
- Overall watershed timing.

Stremtul was used to model the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year storm events for the purpose of comparing existing and future flows and then making recommendations regarding appropriate stormwater management practices to prevent future stormwater problems in the watershed.

To address future increased runoff as a result of development, various release rate scenarios were applied to future conditions. The results showed increases in flow of greater than 5% at multiple subareas, with the exception of the 50% reduction scenario, where only the future flow in subarea 1-14 was 6% greater than the existing flow. The 50% reduction scenario was the one that had the greatest reduction of flows along the main stem, which is where many of the problem areas and predicted increases in flow due to development are located.

National Pollutant Discharge Elimination System (NPDES), Phase II Requirements

In addition to the Pennsylvania Act 167 program, the Federal NPDES program also serves to encourage a comprehensive widespread approach to stormwater management. The NPDES Program Phase II regulations were published in the Federal Register in December 1999. All municipalities within the Swamp Creek watershed are MS4 municipalities, with the exception of District and Pike Townships in Berks County.

These municipalities are required to implement six minimum control measures (public education and outreach, public involvement and participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management, and pollution prevention/good housekeeping). The Act 167 program serves to fulfill several NPDES permit requirements.

Stormwater Performance Standards

The ordinance contains stormwater performance standards, including:

- *Groundwater Recharge Standard* – to maintain groundwater recharge

- *Water Quality Standard* – to implement non-point source pollution removal technologies

- *Streambank Erosion Standard* - to reduce channel erosion

- *Stormwater Peak Rate Control Standard* – to manage overbank and extreme flood events

MODEL STORMWATER MANAGEMENT ORDINANCE

Among the requirements of Act 167 is the requirement that municipalities implement the stormwater management plan through a stormwater ordinance that was developed as part of the plan. This ordinance could be adopted essentially "as is" by a municipality, or the municipality could make some modifications to the model ordinance to fulfill the specific needs of the municipality. Additionally, a municipality may need to make some revisions to their Subdivision and Land Development Ordinance and/or their Zoning Ordinance to ensure that these ordinances are consistent with the Stormwater Management Ordinance and include appropriate cross-references.

The Swamp Creek Model Stormwater Management Ordinance will not completely replace the existing storm drainage ordinance provisions currently in effect in the watershed's municipalities. Not all of the municipalities in the Swamp Creek watershed are completely within the watershed. For those portions of the municipality outside the Swamp Creek watershed, the existing ordinance provisions would still apply. According to the Stormwater Management Act, Swamp Creek municipalities shall adopt or amend and implement such ordinances and regulations as are necessary to regulate development within the municipality in a manner consistent with the Swamp Creek Stormwater Management Plan and other applicable provisions of the Act. This shall occur within six months of the adoption and approval of the Swamp Creek Stormwater Management Plan.

PLAN IMPLEMENTATION

The final steps in development of the Plan involve adoption of the plan by Berks and Montgomery Counties, and approval of the plan by DEP. Once the plan is

approved by DEP, it is implemented by the municipalities, which revise their existing stormwater ordinance or adopt the stand-alone ordinance contained in the plan. As required by Act 167, the Swamp Creek watershed municipalities have six months from DEP approval to adopt the necessary ordinance provisions.