

Eastern Delaware County Council of Governments MS4 Stormwater Coordination Project

Final Recommendations, Findings, & Observations

**Prepared for the Southeastern Pennsylvania
Resource Conservation & Development Council**

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Executive Summary

Properly managing stormwater is one of the most costly and complicated tasks we face today. The effort to meet the Federal and State Municipal Separate Storm Sewer System (MS4) program requirements presents challenges to state and local governments alike. These regulations mandate compliance, yet offer little in the way of assistance in that endeavor, leaving local governments and state regulatory agencies struggling to find the resources to implement necessary programs.

It was in this vein that the Southeastern Pennsylvania Resource Conservation and Development Council (RC&D) hired the project team of the University of Maryland Environmental Finance Center (EFC), Environmental Rate Consultants, Inc. (ERC) and URS Corporation (URS) (hereafter the EFC Team) to evaluate the NPDES Phase II permit plans and associated costs of implementing those plans for six to eight Pennsylvania municipalities (and invited neighboring municipalities) in the eastern Delaware County Council of Governments (COG) area. This evaluation was intended to compare expected compliance costs against actual costs and evaluate local capacity to meet MS4 requirements.

The primary assumption of this project presumes that coordinating compliance with the minimum control measures (MCM) outlined in the MS4 requirements would create economies of scale not realized under the current individual municipal management approach. This project also assumes that working together to meet the MS4 requirements and hiring a watershed coordinator could result in a higher and more consistent level of service with a corresponding reduction in costs, thereby easing financial and resource allocation burdens these regulations place on the municipalities. The potential cost savings is further strengthened by the possibility of funding from the William Penn Foundation for a shared stormwater manager, for up to two years, to initiate the on-the-ground implementation of collaborative stormwater management efforts.

In this project, developing an accurate assessment of the potential savings to each municipality in the COG depended on the following:

- The quality of data provided to the EFC Team documenting the effort each municipality in the COG is currently performing to meet the MS4 regulations;
- The extent to which this data can be translated into accounting, financial, and/or budgetary terms;
- The level of “volunteer” effort each municipality in the COG is currently receiving to meet the MS4 regulations; and
- The extent to which each municipality is currently meeting the MS4 regulations according to DEP and the annual reports.

In short, an analysis is only as good as the data set it is based upon. Unfortunately, many of the municipalities involved in this project were already so resource strapped that full documentation was difficult to obtain – further making the case for the assistance desperately needed to achieve

regulatory compliance. The inability for communities to document and prove activities and costs associated with the MS4 program, and having the proper accounting systems in place, is a major issue facing all communities throughout the United States. Despite some very well-intentioned efforts, the COG municipalities found it very difficult and, in some cases, impossible to provide the project team with consistent, reliable, useable data for this analysis.

The EFC Team performed four analyses based on the MS4 cost data provided by the COG municipalities. The following is a summary of the four analyses thoroughly explained in the full technical document:

- Table 1 is a summary of the data the municipalities provided through the questionnaire process. These data were presented as collected and no changes were made or augmentation performed by the EFC team.
- Table 2 is an extrapolation of the original data presented in Table 1. The data were constructed to provide a more accurate representation of what municipalities should be spending to implement their stormwater programs and meet the MS4 NPDES Phase II regulations. In this analysis, the original data were slightly augmented by the EFC team to account for additional expenses such as equipment costs, overhead charges, fringe rate costs, etc. often overlooked when accounting for MS4 program outlays.¹
- Table 3 is a second extrapolation approach that has been used by the EFC team with multiple other clients. This regionalization approach essentially used the costs reported by Upper Darby Township and adjusted them accordingly based on parcel data (an impervious area surrogate) for each community. Upper Darby data were used for extrapolation purposes because comprehensive and consistent data were provided for all MCMs and it was most reflective of national trends.
- After presenting these tables to the municipalities, the Delaware County staff requested an additional analysis, using “per unit” costs, that the planning team thought would characterize existing costs and potential savings through collaborative implementation of some activities in support of the MCMs. While this was somewhat outside of the original scope of work and atypical of the approach used by the EFC Team in past stormwater projects, the team worked to complete such an analysis. This analysis is presented as Table 4 (including a Companion Document to aid users in their understanding of the assumptions made in the table) and Tables 5A through 5E. The basic premise of the tables is that economies of scale may be achieved when two or more municipalities in the eastern Delaware County COG region collaborate. Tables 4 and 5A-E can be found in Appendix D and E.

When the extrapolation of costs was distributed to each of the participating municipalities (two methods shown in Table 2 and Table 3), the overall cost increased by approximately 8%. This increase could be because a number of municipalities must rely on volunteers to carry out certain aspects of their activities, as well as due to the fact that many municipalities lack the resources to completely capture the real costs of their program activities.

¹ This augmentation was performed because it has been the experience of the EFC Team working in other parts of the country that virtually all municipalities throughout the United States do not account for and do not track 100% of the true full costs to meet the MS4 regulations and program.

The analysis conducted in Table 4 showed a total of \$65,583.50 or approximately 41.6% regional cost savings and significantly more savings when considering the savings on a per-municipality basis (see Table 5 series). This savings could be leveraged to help the municipalities achieve even greater levels of savings, if invested in a shared MS4 stormwater program coordinator and/or inspector. This shared coordinator position could add additional potential savings to the program up to 30-40% because of the advantages of having an expert in water quality and NPDES permitting to guide all of the municipalities. Such an expert could anticipate changes in the MS4 program, develop cost effective ways to address the challenges of this complex program, and be a one point contact for working with EPA and DEP. The coordinator would be a single point of contact for information, training, education, and shared community resources.

One additional analysis was conducted to show a range of potential monthly rates per Equivalent Residential Unit (ERU) if the eastern Delaware County COG municipalities were to proceed with creating a stormwater authority. This analysis is shown in Table 6 and indicates that, in order to meet the \$1,521,262 annual program costs, a monthly rate per ERU would have to be established at \$3.73 per month.

Based on the compiled and extrapolated data provided by each municipality and the assumption that most of the municipalities make use of volunteers to perform many of the activities tied to meeting MS4 requirements, as well as the fact that DEP has reviewed, approved, and accepted each of the individual municipality's MS4 plans as meeting the MS4 regulation standards, municipalities may find it difficult to justify pursuing a collaborative approach to managing their stormwater management programs. However, the EFC Team believes it would be possible to calculate a definitive regional cost savings achieved by coordinating MS4 compliance efforts in the Darby Creek watershed if each municipality were fully performing and funding all of the activities reflected in their MS4 annual reports and the "actual" costs of those activities were truly identified in the municipalities' budgets.

Although it appears that a substantial cost savings will not be experienced unless DEP increases the municipal MS4 requirements in the future or a more thorough accounting of the MS4 programs is accomplished by each municipality, **the cost savings demonstrated in Table 4 and Table 5 A-E alone would provide sufficient resources to sustain a watershed coordinator for the Darby Creek area. If additional communities were to join the effort, an even greater savings can be realized.**

We strongly encourage the municipal leadership to work together and to agree to pursue the possibility of a William Penn-funded shared watershed coordinator. This will provide a reasonable cost savings that could grow to a substantial cost savings over time, expertise that would increase the efficiency and quality of the program, and a comprehensive approach that will prepare the municipalities for the additional regulatory issues of the future. The state, too, would likely realize certain benefits. Joint coordination of MCMs – and perhaps even permitting in the future – will help streamline regulatory activities, creating state-level efficiencies and improved service levels as well.

The opportunities that this project presents not only affect the Darby Creek watershed area but also can be applied to the State of Pennsylvania and the entire country. The benefits include lower cost through economies of scale, multiple communities joining together to produce a single MS4 report, improved quality of MS4 programs, shared staff, effective proactive planning and use of GIS, and less review time for DEP and other agencies.

At the same time, in the process of working with these MS4 municipalities, we have experienced several barriers that need to be resolved in order to successfully implement effective water quality programs. These barriers include:

- lack of understanding on the part of elected official and the public concerning NPDES MS4 water quality programs,
- lack of dedicated funding for stormwater,
- (potential) lack of legal authority to develop stormwater programs and generate funding for them based on stormwater fees,
- a piecemeal approach to stormwater management,
- lack of budgeting and accounting methods to track MS4 programs, and the
- public desire for drainage and flooding solutions over water quality solutions.

Although the lack of consistent data from municipalities made it difficult to prove substantial cost savings, the EFC Team finds that continuing to pursue this regional approach and hiring an MS4 coordinator for all of the municipalities in the COG will ease the burden of MS4 compliance. It will also result in higher and more consistent level of service delivery as compared to the current individual municipal management of each MS4 permit activity. **Should the member municipalities of the eastern Delaware County Council of Governments MS4 Coordination Project choose to move forward with this collaborative approach, they will find themselves uniquely positioned to be a leader and innovator in meeting their MS4 Phase II permit requirements and their approach could serve as a model for the rest of the state.**

Introduction

The Southeastern Pennsylvania Resource Conservation and Development Council (RC&D) commissioned the project team of the University of Maryland Environmental Finance Center (EFC), Environmental Rate Consultants, Inc. (ERC), and URS Corporation (URS) (the EFC Team) in August 2007 to evaluate the NPDES Phase II permit plans and associated costs for six to eight municipalities in the eastern Delaware County Council of Governments (COG) area. At the outset of the project, all of the COG municipalities and a number of neighboring boroughs were invited to participate. The five municipalities of Aldan, Clifton Heights, East Lansdowne, Lansdowne Borough, and Upper Darby Township agreed to participate in the project entitled the “eastern Delaware County Council of Governments MS4 Stormwater Coordination Project.” Darby and Yeadon Boroughs also expressed interest in participating but were not able to provide enough data to be included in this analysis. All the municipalities are part of the Darby Creek Watershed. In order to provide technical oversight assistance, as well as to provide an additional source for MS4 cost data, the Delaware County Planning Department as well as the Delaware County Conservation District actively participated in the project. Thus, Delaware County served as an active project partner as well as a “permittee” under the MS4 program.

Original Methodology

This analysis was designed to examine expected costs against actual costs and evaluate local capacity to comply with the Federal and State Municipal Separate Storm Sewer System (MS4) program requirements. To accomplish this, the EFC Team, with assistance from the Delaware County Planning Department and the Delaware County Conservation District, collected data on each community’s existing MS4 program and embarked upon a process to consider how a collaborative approach to meeting the MS4 program requirements could result in higher and more consistent level of service delivery and corresponding reductions in cost. While the methodology evolved over time, due to various circumstances explained in detail in the section entitled “Modifications to Original Methodology,” the original analysis included the following six steps:

1. Review Existing MS4 Programs

This step, as envisioned, involved gathering data from each community through a detailed questionnaire that would be submitted to the EFC Team for analysis by November 2007. Once these data were compiled, the EFC Team intended to assess the status of each community’s MS4 program.

2. Develop Three Organization Plans

The EFC Team planned to present three potential organization plans for consideration by the participating municipalities. Each plan would include a comparison of the permitting framework, the organizational framework, funding options, staffing options, technical considerations, and tasks, activities, and responsibilities. The following is a brief summary of each:

- 1) Existing Structure: This organization plan presents the current strategy used by municipalities in the COG region. In essence, this is the structure that will be present if communities continue administering and funding their permits separately.

- 2) **Inter-local Agreement:** This organization plan considers the structure and agreements necessary for an inter-municipality agreement to work collectively on stormwater issues (either through individual or joint permits).
- 3) **Regional Authority:** This organization plan presents steps necessary to establish an official organization that collects revenue with the responsibility for a joint permit and/or individual permits.

3. Develop the Appropriate Level of Service Plans

As originally envisioned, level of service plans were to be crafted to match the three organization plans based on the current level of service and the level of service required to meet the MS4 permit requirements.

4. Determine If the Organization Plans Have Legal Authority

As originally envisioned, this part of the analysis was specifically intended to explore the legal standing of establishing a stormwater authority in Pennsylvania, as described in Organization Plan 3: Regional Authority (District). As currently written, the Pennsylvania Municipal Authorities Act does not specifically address stormwater.

5. Develop Individual MS4 Plans for Compliance Based on Questionnaire

As originally envisioned, the EFC Team intended to develop individual compliance plans that address the six MCMs in each community. These compliance plans were intended to be based upon information obtained from the municipal questionnaire. Drainage and flooding activities and responsibilities and major capital improvements and repairs were not included as part of this analysis as they are implemented by each of the municipalities on an as-needed basis.

6. Develop One MS4 Plan for Compliance for All Communities

As originally envisioned, the EFC Team planned to develop a compliance plan, based on the questionnaires, which addresses water quality MS4 activities in the combined group area. Again, drainage and flooding activities and responsibilities and major infrastructure improvements were not part of this analysis or project.

7. Develop a Funding Estimate Plan for One MS4 Group Plan

As originally envisioned, the EFC Team planned to develop a funding estimate for the plan described in Step 6.

Modifications to Original Methodology

The data-collection process described in Step 1 proved more complicated than originally expected, which had a drastic impact on the analysis as envisioned. In practice, the questionnaire was introduced over the course of two in-person meetings with the project municipalities and was distributed in September 2007. The comprehensive questionnaire was designed to collect all the required data needed to thoroughly analyze the status of the municipalities' MS4 program activities and costs. Responses were requested from the municipalities by the end of November 2007.

However, when it became apparent that the municipalities were having difficulty gathering the data, the deadline was extended to January 2008. Despite the extension, many of the municipalities continued to have difficulty gathering the data in the requested format and several iterations of the data were submitted through April 2008. To aid this process, the EFC Team followed up with all of the municipalities through telephone calls and emails in an attempt to

collect sufficient levels of information to conduct a meaningful analysis. The data collection and compilation process took significantly longer (six months) than originally anticipated.

This process, while frustrating to all involved, highlights a core structural weakness in requiring communities to meet the regulations of an unfunded mandate like the MS4 Program. Because many communities are not set up to track stormwater activities from an accounting standpoint, much less from an engineering standpoint, staff found the questionnaire confusing and the prospect of gathering the requested data financially daunting. Some municipalities had to hire consultants to find the data for them. All of the municipalities who participated in this coordination project and completed the questionnaire stated that significant additional costs to tabulate the information were incurred, including compensating consultants, overtime to staff, etc.

In short, an analysis is only as good as the data set it is based upon. The COG area municipalities found it very difficult, and almost impossible in some cases, to provide the EFC Team with consistent, reliable, useable data for this analysis, and this drastically impacted the ability of the EFC Team to perform the prescribed analysis. It should be noted, however, that Delaware County Planning Department provided a great deal of general data that was useful to this analysis.

Developing an accurate assessment of the potential savings to each municipality in the COG was dependent on the following:

- The quality of data provided to the EFC Team documenting the effort each municipality in the COG is currently performing to meet the MS4 regulations;
- The extent to which this data can be translated into accounting, financial, and/or budgetary terms;
- The level of “volunteer” effort each municipality in the COG is currently receiving to meet the MS4 regulations; and
- The extent to which each municipality is currently meeting the MS4 regulations according to DEP and the annual reports.

When it became apparent that the data were not useable for the project as originally intended, the EFC Team changed strategy and decided to base the analysis on data obtainable through the annual reports. Thus, Step 1 was retooled to use the financial data in the annual reports to assess, to the extent possible, the status of each community’s MS4 program.

Step 2, involving the development of potential organization plans, was possible to complete as originally envisioned. (Please see Appendix A for more information.)

Step 3 evolved from a “development” step to an “assessment” step. Because this step was dependent on the quality of data collected from the municipalities, an assessment of what they are currently spending (i.e., their current level of service) on their MS4 programs and what they should be spending to truly conduct their programs as reflected in the annual reports, proved to be more appropriate. (This information is presented in Table 1 and extrapolated to create Table 2, using one kind of estimation approach, and Table 3, using a second kind of estimation approach.)

As the project evolved, it became clear that the municipalities were not ready to head in the direction of a stormwater authority or district and, therefore determining the legality of establishing such an authority (as originally envisioned in Step 4), became a less relevant exercise. A more topical exercise, it seemed, would be to examine the legality of the municipalities filing together under a joint permit and/or working together under a Memorandum of Understanding (MOU) or similar type of agreement. These ideas are discussed later in this report under Project Next Steps.

Step 5 and Step 6, both based on data that the EFC Team assumed would be collected during Step 1, evolved into an analysis of possible ways for the municipalities to work together to share costs of their MS4 programs. Tables 4 and 5A-5E were created to illustrate these possible savings through economies of scale.

In summary, after gaining more of an understanding of the unique circumstances facing the eastern Delaware COG municipalities, the EFC Team, with guidance from the municipalities and project partners significantly retooled the data analysis in order to develop a product that would be most valuable to the five participating municipalities (as well as project partner and MS4 “permitee”, Delaware County). Thus, the remainder of this report is oriented to present the data collected (Table 1), to walk through the extrapolated data (Tables 2 and 3), and to highlight some cost-sharing collaboration possibilities (Table 4, Tables 5A-5E, and Table 6) generated as part of the revised analysis.

General Findings, Issues, and Observations

The EFC Team made several noteworthy observations as part of this process. Some observations were assembled as a result of collecting each community's questionnaire. Data on financial, technical, and administrative aspects were also gleaned during public meetings, follow up conference calls, and from each community's annual report.² Finally, some of the observations reported here are based on the EFC Team's experience working on similar projects.

Financial Findings, Issues, and Observations

Two issues surfaced concerning difficulties with how the MS4 Program requires communities to report costs. First, it was noted that the Federal NPDES Phase II annual permit cycle program for all states runs from approximately March 10 through approximately March 9 of the following year. This is inconsistent with a majority of municipalities that observe the calendar year as their fiscal year. It is extremely difficult for municipalities to document "annual permit costs" to coincide with the permit cycle. Second, as documented in the annual reports, many municipalities utilize other departments and/or agencies to meet various Minimum Control Measures (MCM) requirements. For example, many municipalities list volunteer, county and/or watershed group activities in their annual reports. Utilizing many departments and other organizations, a necessity for the small municipalities participating in this project, makes it very difficult to identify annual permit costs for budgeting purposes.

Technical Findings, Issues and Observations

Several observations were collected from the municipalities regarding technical aspects of meeting the MCMs. First, it appears that the eastern Delaware County COG municipalities have focused their efforts on MCMs 1, 2, and 3 (Public Education and Outreach, Public Participation, and Illicit Discharge Detection and Elimination). It also appears that the municipalities have put less emphasis on MCMs 4 and 5 (Construction Site Runoff Control and Post Construction Stormwater Runoff Control), likely because they are built-out and do not experience a great deal of new construction. Second, in the public meetings for this project, several municipalities expressed the concern that numerous illicit discharge problems were present in their storm sewer systems as a result of sanitary sewer failures.³

² Please see the section entitled MS4 Findings, Issues, and Observations for a description of which annual report (2004/2005, 2005/2006, or 2006/2007) was used for each community.

³ Review of the dry weather testing data does not support this conclusion. Upper Darby Township reported three illicit discharges out of a total of 340 outfalls and Lansdowne Borough reported four illicit discharges in the storm system but did not relate this to the sanitary sewer system. It is apparent that in the process of capturing the cost of stormwater activities, the communities have found other activities that will qualify as MS4 permitting activities. It is important that communities report these activities as a part of the MS4 plan.

Legal Findings, Issues, and Observations

In the process of analyzing the unique needs of the eastern Delaware County COG municipalities, the EFC Team considered the legality of funding stormwater activities in the State of Pennsylvania. Pennsylvania does not have legislation in place enabling communities to charge or assess specifically for stormwater management activities (the Pennsylvania Municipal Authorities Act supports the creation of authorities but does not specifically address stormwater). Although this does not prevent the municipalities from developing funding systems for stormwater management, a specific legislative tool would provide incentive to move with confidence to a funding system. The soon-to-be introduced House Bill (the next generation of Representative Steil's House Bill 2266 which was not passed during the September 2008 session), supported by Senator Erickson and Representative Freeman, is intended to address this very issue and give legal standing to the creation of a stormwater authority in Pennsylvania.

This issue has been addressed in other states in at least two ways. In Ohio and Kentucky, "stormwater" language was added to the existing sanitary sewer legislation to include stormwater. The second option is to implement new legislation specifically developed to permit municipalities (individual or jointly) to charge or assess for stormwater management activities.

There is wide-based support in Pennsylvania for the belief that that the current legislation does allow for communities to charge for stormwater activities. However, most communities are not willing to take the risk to "see if it is legal," so no such action has taken place to date. The Erickson/Freeman House Bill referenced above would provide language that explicitly states the legality of charging or assessing for stormwater activities at the local level.

An additional legal issue is that of joint permitting. The Pennsylvania Department of Environmental Protection (DEP) currently has no provision for a co-permit, joint permit, or watershed permit. However, Federal MS4 guidelines allow for the use of joint permits. The EFC Team is aware of a handful of states, including Michigan, Ohio, and Kentucky, which allow for a co-permit, joint permit, or watershed permit.

MS4 Findings, Issues, and Observations

The following are the EFC Team’s findings, issues, and observations relating to each municipality’s (as well as project partner and MS4 “permittee”, Delaware County) NPDES MS4 Phase II program.⁴ Data were derived, to the best extent possible, from information collected from the questionnaires. Data were also derived, particularly for the communities who were unable to provide the quality of data needed for the original analysis, from the annual reports.

Each of the participating communities provided an annual report that represented their most up-to-date reporting.⁵ The annual reports listed below were used as the basis for the financial data in this report:

- Aldan (March 10, 2006 through March 9, 2007);
- Clifton Heights (March 10, 2004 through March 9, 2005);
- East Lansdowne Borough (March 10, 2005 through March 9, 2006);
- Lansdowne Borough (March 10, 2005 through March 9, 2006);
- Upper Darby Township (March 10, 2005 through March 9, 2006); and
- Delaware County (March 10, 2005 through March 9, 2006).

Based on the available data, the EFC Team was able to make some generalizations about how the communities are addressing each MCM in their individual MS4 programs. The following is a summary of some of the key findings⁶:

- For MCM 1 – Public Education and Outreach – the EFC Team was able to determine that five of the five communities utilized fact sheets, newsletters, workshops, the school system (student outreach), and newspapers as outreach strategies. Four out of five communities utilized websites, and three out of five utilized an MS4 coordinator. Five of the five communities reported in their annual report that they relied on another organization to perform all or a portion of their public education and outreach activities.
- For MCM 2 – Public Participation – five of the five communities reported that they utilized workshops, seminars, and meetings as public participation strategies.

⁴ Because of the inclusion of Delaware County’s data in parts of this analysis, the municipalities will be referred to as “communities” in the sections pertaining to Table 1 and Table 2. In the section pertaining to Table 3, Delaware County data are not used and the term “municipalities” is applicable.

⁵ Darby and Yeadon Boroughs also expressed interest in participating in this project. Unfortunately, the data from these communities were not submitted in a fashion that was useful to the EFC Team. Please see more comments in the *Table 4 Companion Document* on the possibility of including additional municipalities in future collaborative activities.

⁶ Clifton Heights data were not broken down by MCM so the bulleted list of observations made here includes the **five** communities of Aldan, East Lansdowne Borough, Lansdowne Borough, Upper Darby Township, and Delaware County.

- For MCM 3 – Illicit Discharge Detection and Elimination System – five of the five communities reported that they have mapping in place, have ordinance(s) in place, have performed dry screenings, and have performed inspections. Four of the five communities reported that they have performed samplings, and three of the five communities reported no illicit discharges.
- For MCM 4 – Construction Site Runoff Control – five of the five communities reported having construction fact sheets and performing regular inspections. Three of the five communities reported having inspection ordinance in place.
- For MCM 5 – Post Construction Stormwater Runoff Control – five out of five communities reported minimal activity.
- For MCM 6 – Pollution Prevention and Good Housekeeping – four out of five communities reported having pollution prevention plans in place.

MS4 Costs Provided by Communities: Data and Commentary

After reviewing the questionnaires and notes from the follow-up interviews, the EFC Team assessed the available data and prepared Table I. Table I represents Step 3, as discussed above, an assessment of what the communities are currently spending on their MS4 programs, in other words their current level of service, according to the communities themselves. The table is incomplete because, as discussed, most of the communities had difficulty providing the necessary data.

Table I. Current MS4 Program Expenditures as Reported by Each Community⁷

Community	MCM 1	MCM 2	MCM 3	MCM 4	MCM 5	MCM 6	Costs to Prepare annual report	Donated Time?	Equipment	Total Cost
Aldan	\$98	\$498	\$808	\$98	\$98	\$98	\$1,500	X	Not Provided	\$3,200
Clifton Heights										
East Lansdowne	\$618	\$518	\$750	\$290	\$293	\$5,506	Donated Time	X	Not Provided	\$7,974
Lansdowne Borough							Donated Time	X	Not Provided	\$150,000
Upper Darby Township	\$16,500	\$13,700	\$84,960	\$9,400	\$4,350	\$14,102			Not Provided	\$143,012
Delaware County			\$34,000					X	Not Provided	\$34,000
Total Cost	\$17,216	\$14,716	\$120,518	\$9,788	\$4,741	\$19,707	\$1,500			\$338,186

Again, the EFC Team developed Table I based solely on information provided via the questionnaires and interviews conducted via email, fax, or conference call. In Table I, the EFC Team did not extrapolate any of the information provided. Each community was responsible for

⁷ The data displayed in Table I are annual totals of the costs incurred by each community attempting to meet and comply with the NPDES Phase II Permit Program. Data were reported by each community. The data from Clifton Heights were provided in a format that did not translate well into this table. For instance, the data did not show costs nor were broken down by Control Measure.

validating the information provided and was asked to verify that the data were "in the ball park" of actual expenditures at a meeting taking place on May 29, 2008. However, it was understood that participating communities provided best estimates and that the intent was not to be exact.

The EFC Team established a few "rules of thumb" for placing costs in Table I. For instance, if the community provided costs for the MS4 stormwater program by MCM, or if there was an indication of cost distribution by MCM, then the consulting team distributed those costs as indicated by the community. Costs provided for general activities such as administration and engineering that were not allocated to specific MCMs, were allocated by the project team equally over all six of the MCMs. In the situation where the communities provided specific stormwater maintenance related costs, and did not allocate these costs, the EFC Team allocated them to MCM 6.

Also, several of the communities identified "donated" time to prepare the annual report but did not provide an actual cost for these activities. In these cases, the EFC Team created a category referred to as "Donated Time" in the matrix. None of the communities indicated "Equipment Costs" but the EFC Team believed that it was important to include this column for future assessments. (It is the experience of the EFC Team that most communities across the country are not set up to track equipment costs and seldom can even account for labor and staff time specific to stormwater activities. This is a situation that needs to be remedied not just in eastern Delaware County but in communities around the country.)

Finally, several communities did not account for and did not provide costs for preparing the NPDES Phase II annual report. The EFC Team created a new category called "costs to prepare annual report" to account for those costs.

A few additional clarifications should also be made regarding the specific reporting of individual communities. As shown in Table I, five of the six communities were able to provide useful financial information: Aldan, East Lansdowne, Lansdowne Boroughs, Upper Darby Township, and Delaware County. Clifton Heights was unable to provide data in a form useful to the EFC Team; however, extrapolated data for Clifton Heights is included in Table 3 and Table 4. Lansdowne Borough provided labor costs of \$85,000 for skilled labor and \$65,000 for non-skilled labor but the EFC Team was not able to distribute costs by MCM. Delaware County provided information for MCM 3 but no data to indicate expenditures on the other MCMs. Upper Darby Township provided the most detailed information by stormwater activities and by MCM. This information was "exactly" what the consultant team was in search of for this project, very likely due to the fact that Upper Darby has paid, full-time staff to implement their stormwater program.

Finally, the data in Table I show that, as previously observed, communities are primarily focusing on MCMs 1, 2, and 3. Again, this is due to the fact that most of the communities are built-out and are not experiencing new construction.

Extrapolated MS4 Costs (Cost Escalation Approach): Data and Commentary

Based on the experience of the EFC Team, the costs provided by some of the communities appear to be lower than expected considering the activities reported in the annual reports. Some of this discrepancy may be explained if the actual costs of conducting MS4 activities are buried in other parts of the community's budget. Regardless of the reason behind the discrepancy, Table 2 was constructed to provide a more accurate representation of what the

communities should be spending based on the activities reported in their annual reports. This table uses the information from the communities in conjunction with the team’s analysis of the MS4 programs and accepted accounting and allocation methods to develop costs that the communities should be spending to implement their stormwater programs. This table was designed as a first step in the process of developing cost estimates for what the communities should be spending to meet the MS4 criterion.

Table 2. Extrapolated Costs for MS4 Stormwater Program as Developed by EFC Team (Cost Escalation Approach)

Community	MCM 1	MCM 2	MCM 3	MCM 4	MCM 5	MCM 6	Costs to Prepare annual report	Donated Time	Equipment	Total Cost
Aldan	\$108	\$548	\$889	\$108	\$108	\$108	\$3,000	\$2,000	\$271	\$7,141
Clifton Heights	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
East Lansdowne	\$679	\$569	\$825	\$319	\$322	\$6,057	\$3,000	\$2,000	\$797	\$14,569
Lansdowne Borough	\$15,583	\$15,583	\$15,583	\$15,583	\$15,583	\$87,083	\$3,000	\$2,000	\$15,000	\$185,000
Upper Darby Township	\$18,150	\$15,070	\$93,456	\$10,340	\$112,171	\$725,325	\$3,000	\$2,000	\$95,361	\$1,074,873
Delaware County	\$0	\$0	\$37,400	\$0	\$0	\$0	\$0	\$0	\$3,740	\$41,140
Total Cost	\$34,521	\$31,771	\$148,154	\$26,351	\$128,185	\$818,573	\$12,000	\$8,000	\$115,169	\$1,322,723

To calculate the data in Table 2, the EFC Team made five adjustments to the data in Table 1.

(1) First, the EFC Team calculated a 10% "overhead" rate cost (i.e., 10% of the total budget for each community and each individual MCM) based on the data provided in Table 1. This cost was then added to the original cost to account for overhead. (Examples of overhead costs include rent, copier and computer fees, utilities etc). For example, Upper Darby Township provided costs for MCM 1 in Table 1 of \$16,500. Adding a 10% overhead rate increased Upper Darby Township costs for MCM 1 in Table 2 to \$18,150 and so on for all six MCMs in each community.

(2) Second, the EFC Team increased the costs of preparing the annual report. In Table 1, one community reported a cost of \$1,500 for preparation of the annual report and the other communities either had no data or reported using “Donated Time.” The EFC Team set costs for preparing the annual report at 40 hours x \$50/hour plus \$1,000 for materials and supplies. Thus, for each community that provided annual report costs, the EFC Team adjusted costs to \$3,000. An assumption was made in the case of Upper Darby, who did not originally provide annual report costs for Table 1, that this methodology was appropriate as well.

(3) Third, in a similar manner as described above, the EFC Team estimated a cost of \$2,000 (40 hours x \$50/hour) to correspond with each community’s reporting of Donated Time. Although Upper Darby did not originally report the use of Donated Time, the EFC Team believed that it was fair to include these costs in the Upper Darby estimate. “Donated Time” refers to various costs such as preparing the annual report,

public education, public outreach, etc. that have typically been absorbed by the community.

(4) Fourth, the EFC Team estimated equipment costs, such as trucks, backhoes, and the like, at roughly 10% of the total budget for each community. Because this information was not provided by most of the communities, these numbers were discerned based on complex methodology, as well as knowledge of equipment needs and market costs, utilized by the EFC Team in other communities. In the case of Upper Darby, with data that listed a total cost of \$953,000 in equipment costs covering four departments (highway, sewer, public works, and sanitation – each providing some equipment support to the stormwater program), the EFC Team used exactly 10% of this budget to estimate equipment costs.

(5) Fifth, the EFC Team created estimates for Lansdowne Borough. Lansdowne Borough was able to come up with two costs associated with their stormwater program - \$85,000 and \$65,000 totaling \$150,000 – but these costs were not in a format that was useable in Table 1. In order to calculate a 10% "overhead" rate cost, the EFC Team generated estimates in the following manner:

- $\$85,000 + (\$85,000 \times 10\%) = \$93,500$ (\$93,500 was then divided by 6 and \$15,583 was allocated to each of the six MCM.)
- \$65,000 applied to MCM 6 only. Therefore, the EFC Team did the same calculation as described above ($\$65,000 + (\$65,000 \times 10\%) = \$71,500$) plus \$15,583 = \$87,083.

Based on the methodology described above, data cells that were left blank in Table 1 could not be extrapolated for Table 2. These cells are indicated in Table 2 as \$0, aside from the calculations already described for Lansdowne Borough and the exceptions made for Upper Darby.

One final codicil that must be made is Upper Darby's costs for MCM 5 and MCM 6 which increase in Table 2 by far more than 10%. Upper Darby provided updated (and extremely detailed) cost information. Thus, MCM 5 included costs from Public Works and MCM 6 included costs from the Highway Department, Sewer Department, and Sanitation Department – and these updated figures were used in this table.

In summary, the intent of Table 2 was to begin adding cost escalation factors to the community information summarized in Table 1. **The intent of Table 2 was not to report a final cost for all communities to meet the MS4 water quality permit activities.**

Extrapolated MS4 Costs (Regionalization Approach): Data and Commentary

The EFC Team also experimented with a second extrapolation approach based on the very complete data given by the Upper Darby Township officials. This regionalization approach essentially used the costs reported by Upper Darby Township and adjusted them accordingly based on parcel data (an impervious area surrogate) for each municipality. Again, this approach, as shown in Table 3, was intended to be an assessment of what the communities could be spending to achieve an improved level of service. This approach was used because the EFC Team recognized that the other municipalities in the region will need to have programs comparable to that of Upper Darby Township and invest similar amounts to comply with EPA

regulations. In addition, the EFC Team began this analysis only after receiving acceptance from the municipalities on the method used in Tables 1 and 2.

Table 3. Extrapolated Costs for MS4 Stormwater Program as Developed by EFC Team (Regionalization Approach)

Community (Parcels) (% of UDT)	MCM 1	MCM 2	MCM 3	MCM 4	MCM 5	MCM 6	Costs to Prepare annual report	Equipment	Total Cost
Aldan (1,592) (7.452%)	\$1,353	\$1,123	\$6,965	\$771	\$8,360	\$54,055	\$1,529	\$6,965	\$81,119
Clifton Heights (2,370) (11.094%)	\$2,014	\$1,672	\$10,368	\$1,147	\$12,445	\$80,471	\$2,277	\$10,580	\$120,973
East Lansdowne (865) (4.049%)	\$735	\$610	\$3,784	\$419	\$4,542	\$29,370	\$831	\$3,861	\$44,153
Lansdowne Borough (3,617) (16.932%)	\$3,073	\$2,552	\$15,824	\$1,751	\$18,993	\$122,812	\$3,474	\$16,146	\$184,625
Upper Darby Township (21,362) (100%)	\$18,150	\$15,070	\$93,456	\$10,340	\$112,171	\$725,325	\$20,520	\$95,361	\$1,090,392
Total Cost	\$25,324	\$21,027	\$130,397	\$14,427	\$156,510	\$1,012,032	\$28,630	\$132,913	\$1,521,262

To create this extrapolation for MCM 1 through 6, the EFC Team first utilized parcel data provided by the Delaware County Planning Department. The number of parcels in each municipality is shown in Table 3 in green. Cost percentages, shown in Table 3 in blue, were generated by dividing the number of parcels in a given municipality by the number of parcels in Upper Darby Township and multiplying by 100. (For East Lansdowne, for example, 865 parcels/21,362 parcels x100 = 4.049%). Next, for each MCM in each municipality, the cost percentage was then multiplied by the Upper Darby cost for that MCM. (Again, for East Lansdowne, for example, Upper Darby’s cost of \$18,150 for MCM 1 was multiplied by 4.049% for a cost of \$735.)⁸ Equipment costs were calculated in the same manner.

To determine the costs for annual report preparation shown in Table 3, the EFC Team requested that Upper Darby Township provide a more accurate breakdown of costs associated with the preparation of the MS4 annual report for each MCM. Upper Darby reported that the cost of the annual report should be roughly equal to:

⁸ A few exceptions to this analysis must be noted. First, since this analysis was based upon the Upper Darby numbers from Table 2, the Upper Darby data shown above in Table 3 are identical to that in Table 2 (with the exception of the annual report cost). Second, because Delaware County does not contain mutually exclusive parcels that are not already accounted for by the communities listed in Table 3, the EFC Team could not conduct this analysis for Delaware County MS4 costs. For this reason, and because the county will not ultimately share in the cost of collaborative stormwater activities, Delaware County data are not included in Table 3.

- 2% of MCM 1 costs,
- 2% of MCM 2 costs,
- 5% of MCM 3 costs,
- 1% of MCM 4 costs,
- 1% of MCM 5 costs, *and*
- 2% of MCM 6 costs.

Thus, the Upper Darby Township cost percentages were calculated, summed, and used as a new estimate for Upper Darby report preparation. This cost was then used as the basis to determine staff time and costs to prepare the annual report for each of the other municipalities, based on the same parcel allocation method explained for MCM 1 through 6 above.

The EFC Team made the decision to remove Donated Time from Table 3. While the team acknowledges the fact that a great deal of donated time goes into preparing reports, etc., relying on donated time to cover program costs is both unreliable and risky. As originally discussed in the notes on Table 1, Upper Darby did not rely on donated time. Since this analysis is based upon Upper Darby's model, it seemed appropriate to remove this column from Table 3. In addition, the EFC Team believes that real costs must be accounted for in order to make the most useful estimate of stormwater program costs and, with appropriate funding, stormwater programs should not need to rely on donated time.

The most significant observation from this extrapolation is that costs developed by the EFC Team in Table 2 increased by slightly more than 13% using the parcel-based cost allocation method and shown in Table 3 above.

This parcel-based cost allocation method has been used with much success by members of the EFC Team on projects in Hamilton County, OH and other regions across the country. Because parcels provide a good representation of impervious area, and because Upper Darby had the most successful stormwater program in respect to the Pennsylvania guidelines, the EFC Team believes this was a valuable exercise and resulted in a very strong estimate of appropriate program costs.

Overview of Stormwater Financing

Much of the traditional stormwater management practices and the associated infrastructure are “hidden” and can be considered a “forgotten investment. Stormwater infrastructure has historically been designed to whisk rainwater away quickly and, as unobtrusively as possible, from the built environment. In contrast, many of the current best management practice attempt to retain and infiltrate as much of that water as possible on-site, imitating the natural water cycles present prior to development.

The costs and benefits of stormwater management are also hidden and not at all apparent to many sectors of the public, creating public opposition and/or apathy toward funding for stormwater management. The public is accustomed to paying meter-based user fees, for example, for drinking water and sewer, and views metering as both acceptable and equitable. However, the public may have difficulty seeing stormwater management as an equal necessity. Finally, allocations for stormwater management, if present at all, may be hidden in flood control, public works, transportation and other municipal government budgets.

Today, many communities in Pennsylvania are facing water shortages, water quality issues, flooding, and failing infrastructure. There is great potential, therefore, for “multi-objective watershed management” but successful implementation of these types of programs will necessitate a multi-pronged finance approach. As stormwater programs evolve beyond flood control to incorporate natural resource management and environmental protection, the costs of repairing and retrofitting municipal stormwater management systems will only be compounded. In addition, new developments have the financial burden of attaining standards set by codes, as well as the future cost of maintenance long after initial compliance is met.

Finally, it is important to differentiate between the terms “funding” and “financing”. While funding does provide revenue that can directed toward paying for a program or project, it is generally finite, volatile, and unsustainable. Financing, on the other hand, is a process for acquiring, investing, and managing fiscal resources with a goal of leveraging sustainable, dedicated revenue streams –balancing revenue with expenditures to minimize costs while maximizing return on investment.

Cost Reducing Strategies

In the public sector, return on investment is typically measured by the extent to which costs can be reduced. The financing mechanisms associated with reducing costs include:

- **Regulation:** Effectively enforced regulations such as zoning ordinances or comprehensive planning efforts can determine where and to what extent land use impacts can take place. Limiting the location where stormwater can occur or the extent to which it can occur or impact surrounding water bodies in turn limits the investment that must be made to manage or treat stormwater flows.
- **Market-based programs:** One of the most powerful economic organizing tools available, markets create efficiencies that attain desired results while reducing implementation costs. Trading programs, markets often driven by regulation, enable reductions in stormwater to occur, but allow supply and demand in the marketplace to

determine exactly how these reductions will be achieved. Density bonuses or expedited permitting for developers and reductions in stormwater fees for property owners are some of the voluntary markets used to incentivize good stormwater management or low impact development practices in the private sector.

- **Leveraging other community priorities:** Achieving stormwater management goals can be coordinated with otherwise competing priorities such as health and safety, recreation, transportation, and others. Holistic decision-making across community priorities creates an opportunity to leverage the funds and resources dedicated to these issues and can expand the support base for these efforts.
- **Donated resources:** There are a host of private sector organizations with priorities that are closely aligned with municipal stormwater management goals. Often these organizations can provide assistance in program implementation, particularly with activities related to on-the-ground pilot projects, monitoring, maintenance, and outreach and public education, although it is not advisable to rely solely on this type of input as these organizations are subject to fluctuations in organizational priorities and funding availability.

Even when implementation costs are reduced to the greatest extent possible, a financing gap between the existing funds available and the dollars needed to achieve the level of service desired will typically remain. Generally, the most effective finance-gap filling strategies evolve from a community-guided process, with input from all stakeholder groups and combine different types of funding sources, tools, and programs as well as reflect the needs of multiple stakeholders and environments, including governments, landowners, land users, and landscapes.

The following is a discussion of some of the financing options available to communities as they contemplate creating or updating their financing plans. Although varying in stability and sustainability, these revenue sources can play a role in a sound financing plan.

Revenue Generating Mechanisms

Grants – There is not, never has been, and never will be enough grant funding, public or private, to sustainably fund all of a community’s stormwater management needs. That is not to say, however, that these types of funds cannot play an important role in stormwater financing. Federal, state, and private grants and technical assistance programs can be an excellent way to initiate a program and build momentum while other, more sustainable revenue sources are identified. These funds can also be particularly effective for developing education and outreach programs or to implement pilot projects that will foster the support of community members and decision-makers.

Taxes – Traditionally, stormwater management systems have been constructed with capital budgets supported by local taxes. Today, it is acknowledged that taxes *and* fees should form the basis of any stormwater financing program. Taxes, also known as general revenue appropriations, are mandatory charges, levied by governments at the federal, state, county, and/or local levels, to fund services for the common benefit. Examples are property, income, and sales taxes. Tax programs may take the form of general fund expenditures, dedicated tax programs, or tax incentive programs.

Taxes can be critical to building local capacity and often provide the greatest spending flexibility and stability. However, it should also be noted that taxes based upon sales, rather than property, have a tendency to be less stable during times of economic strife. Additionally, taxes can be seen as burdensome by some sectors of the public and can present significant political risk for decision makers. Although the majority of cities' and counties' general revenue appropriations may be adequate to cover the costs of current stormwater maintenance, reliance on this revenue stream alone forces stormwater programs to compete with a variety of other community services including schools, public health and safety. And, in the case of communities needing major infrastructure repairs, such as many of Pennsylvania's municipalities, these funds may not be sufficient.

The equitability of applying traditional tax systems to stormwater management is questionable as well. These systems are usually based on property value, which is not a true indicator of a parcel's contribution to stormwater runoff. Properties with little impervious cover or low-intensity land uses may add little to the stormwater burden; whereas, others with significant impervious cover, poor stormwater management, or intensive land use create greater demand on the system and may not pay accordingly for maintenance of the system. In addition, tax-exempt institutions, such as schools, churches, universities, and nonprofit organizations with large amounts of impervious cover may not be held to any obligation to support the stormwater management system from which they benefit.

As a final note, a tax-based stormwater management system could offer a potential advantage in situations where regional collaboration among neighboring municipalities is desired. If, as is the case in much of Pennsylvania, individual municipalities cannot support a large enough tax base, communities within a given watershed may partner to build a more sustainable tax base. For example, when bonds are issued to provide a community significant start-up funds for a compliance program, taxes are often used to pay off that debt over time. Because bond ratings are based upon the tax base in a community (lower ratings will make the project costs higher), municipalities have the opportunity to band together to expand their tax base, improve their bond rating, and limit costs.

Regulatory Fees and Penalties – Fees can provide an important revenue stream for stormwater management activities. Regulatory fees, sometimes called development fees, inspection fees, or impact fees, are assessed by local governments to cover the costs associated with stormwater management activities such as the design, construction, maintenance, and regulatory oversight of stormwater infrastructure. Fines, such as illicit discharge fees, are assessed as a penalty for the violation of an ordinance, but tend to provide a small and inconsistent proportion of needed revenue. Several types of fees may be appropriate for stormwater programs in Pennsylvania communities.

- **Inspection fees:** These fees are collected on a one-time basis from developers building new developments with stormwater management infrastructure, as required by local municipalities. Although there are requirements to create such infrastructure, this is not typically any requirements that assure the long-term viability of these BMPs. Development inspection fees, therefore, are intended to offset any future costs for monitoring and maintenance of these stormwater facilities. In the case of new residential developments, these fees are usually passed along by the developer and, probably unknowingly, absorbed by the homebuyer.

- **Stormwater impact fees:** These fees are also designed to mitigate the burden of development on stormwater infrastructure and water quality. However, they differ from development inspection fees in that they are intended to offset development impacts through the construction of public, offsite improvements when it is not possible to resolve the impacts onsite. Revenue from these fees is earmarked for very specific uses, often rendering the fee impractical.

In Pennsylvania, impact fees are required to remain onsite and cannot be used for maintenance elsewhere in the system, meaning that newer segments of a system are being maintained, but older portions are not receiving upgrades and maintenance. In the case of stormwater infrastructure, maintenance that does not address the entire system will have a limited effect on overall watershed health.

- **In-lieu-of Construction Fees:** In-lieu-of construction fees are levied as an alternative to requiring developers to construct onsite stormwater systems. In contrast to impact fees, in-lieu-of fees may be used in situations where stormwater problems could possibly be solved onsite, but are more practically solved offsite. Rather than depending on developers to install the most efficient, effective, and reliable systems, this type of fee gives the municipality the opportunity to use the revenue generated to leverage additional financial support and create systems that are the most likely to be effective.

One advantage offered by this type of fee is the flexibility offered to both developers and municipalities. Although these fees do not generate enough revenue on their own to fund major infrastructure construction and improvements, they can serve as an important piece of a broader stormwater financing strategy.

Stormwater Utilities/Enterprise Funds/Authorities – The above terms are used interchangeably and refer to a fee-based system assessed and dedicated to a specific service, in this case stormwater. Unlike relying on general funds to pay for stormwater programs, these funds cannot be allocated to other activities. They are dedicated, not discretionary, thereby providing long-term security for the stormwater management program.

An enterprise fund is simply a broader term that refers to the general function of collecting fees and disseminating them for a particular purpose. In Pennsylvania, an institution that collects and distributes funds for a dedicated program but does not generate profit is referred to as an authority rather than a utility, a term that suggests a for-profit model.

The stormwater utility/authority approach has been used with success in many parts of the United States and could present another valuable option for funding stormwater management in Pennsylvania. Under this system, property owners are charged a fee based on an assessment of parcel size, intensity of use, and/or degree of imperviousness – essentially the contribution of a given property to stormwater runoff. This provides a measure of the corresponding stormwater services provided to that property owner. Fees are structured to cover the actual costs of the service, and are implemented and collected by the local government or a designated utility/authority.

The stormwater utility/authority fee has the advantage of being dedicated for a specific use, which is not the case with a tax. This enables the utility/authority to provide a stable, reliable, and predictable income stream that is not at the discretion of political motivations or the annual budget allocation process. The stormwater utility/authority fee is also equitable and based upon a scientifically calculated and agreed-upon approach to determine fee levels.

The utility/authority approach has been successfully implemented in over five hundreds cases across the country. The strengths of this approach include:

- ✓ The revenue from the utility is stable, reliable, and dedicated.
- ✓ The fee is charged equitably to all users, based upon their property's contribution to stormwater runoff from impervious area.
- ✓ Fees are collected from tax-exempt properties, like schools, churches, and public universities who are often large contributors to stormwater runoff.
- ✓ A fee based on impervious area would allow for an incentive program that encourages innovative design that limits impervious area or practices that manage stormwater onsite.
- ✓ A majority of homeowners would likely pay less in fees than they would under a tax system.

In addition, once a fee schedule is established, it opens the door for incorporation of a voluntary market system. Rebates or credits towards the fee can be offered for property owners that employ low impact development practices or put onsite stormwater management facilities in place, such as rain barrels, rain gardens, or other wet weather harvesting mechanisms. These practices reduce stormwater runoff and the costs associated with managing these flows.

Pennsylvania is unique because of the large number of small local governments across the state. The fragmented structure of the local government system could present challenges to establishing a traditional stormwater authority. There are several scales at which Pennsylvania communities may want to consider operating a utility/authority: as a local user fee, a regional user fee, a countywide user fee, or a watershed or river basin district user fee.

If implemented at a local scale, communities may be comfortable with the high degree of local control and may already have systems in place for the administration of the fee. Although locally controlled utilities may lack the technical expertise to finance costly infrastructure projects or the personnel capacity to administer such a program.

At a regional level, clusters of two to ten or more municipalities would have the advantage of drawing from a larger body of technical knowledge and may be able to share administrative costs across the region. However, at this scale there could also be some unwillingness to collaborate with neighboring municipalities. Creating a fee structure that is considered equitable and acceptable across the region could prove difficult as well.

On a county level, authorities would have access to an even greater body of knowledge and expertise, particularly because counties have gained experience in watershed-level planning as they have moved through the process of creating Act 167 Stormwater Management Plans. However, in Pennsylvania, counties have scant regulatory authority which could prove to be a

disadvantage to operating an authority at this scale. In addition, individual municipalities may not be comfortable relinquishing control to some local authority. A watershed-level authority, or, at an even more comprehensive scale, a river basin-level authority, would enhance the effectiveness of decision-making around a complete watershed, but would present similar disadvantages.

Cost-Sharing Possibilities

In light of the stormwater financing options described above, two approaches are recommended by this analysis. First is a series of cost-sharing activities described in Table 4 and Tables 5A-5E. Second is the assessment of a fee to pay for stormwater programs in eastern Delaware County.

Economies of Scale Approach

Tables 1, 2, and 3 above are based on actual data gathered from the questionnaires, interviews, and annual reports provided by each of the five municipalities (and, where appropriate, Delaware County). After presenting these tables to the municipalities, the Delaware County staff requested an additional analysis, using “per unit” costs, that the planning team thought would characterize existing costs and potential savings through collaborative implementation of some activities in support of the MCMs. While this was somewhat outside of the original scope of work and atypical of the approach used by the EFC Team in past stormwater projects, the team worked to complete such an analysis. This analysis is presented as Table 4 and Tables 5A through 5E and can be found in Appendix D through I. The basic premise of the tables is that economies of scale may be achieved when two or more municipalities in the eastern Delaware County COG region collaborate.

The approach illustrated in Tables 4 and 5A-5E is intended as a tool for the eastern Delaware County COG municipalities to use when considering opportunities for collaboration and cost savings on some of the common elements of the MS4 permit. **All activities presented in the table (such as printing a newsletter) are simply one possible way for a municipality to meet the MCM I requirements. In addition, all costs presented in the tables are estimates based on current market rates and a set of assumptions made by the combined knowledge, and some “quick and dirty” research, of the EFC Team.**

It is important to understand, when reviewing this set of tables, that they are dynamic tools. The tables are structured so that information may be changed, added to, or taken out of the tables depending on the needs of the municipalities. If municipalities find, for instance, that local rates for printing costs are different than what is indicated in the tables, this information can be easily modified. In short, the tables attempt to illustrate that individual municipalities will pay more for staff time, public outreach brochures, etc. by purchasing these services on their own. Based on the principles of economies of scale, costs will decrease when two or more municipalities come together to purchase the same thing.

In Table 4, the EFC Team listed one or more activities that could be completed for each MCM to meet compliance. For instance, for MCM 6 - Pollution Prevention and Good Housekeeping – the municipalities may determine that they need to conduct staff training. The EFC Team estimated that each municipality might require 80 hours of staff trainer time and materials per year at \$50 per hour for a total cost to each municipality of \$4,000. Alternately, if one or more municipalities could band together to provide staff training, \$4,000 worth of training could still be provided (with the cost divided and shared among the municipalities) but a larger number of staff representing each of the municipalities would be able to participate. Table 4 considers the potential savings generated when municipalities use a regional approach to cost savings. Tables 5A-5E present the same hypothetical analysis as Table 4 but are broken down by individual municipality.

The analysis presented in Tables 4 and 5A-5E shows a total of \$65,583.50 or approximately 41.6% regional cost savings. This savings could be leveraged to help the municipalities achieve even greater levels of savings, if invested in a shared MS4 stormwater program coordinator and/or inspector. This will be explored in more detail in the Recommendations section of this document.

Fee Assessment

One possibility for funding a collaborative stormwater program, as discussed in this report, is to assess a nominal fee per Equivalent Residential Unit (ERU). The annual revenue required to implement all stormwater program needs is assumed to be \$1,521,262 based on the annual program costs developed and presented in Table 3. The Table 3 value was used because it was the method that resulted in the most expensive program and, thus, could be seen as a “worst case scenario”.

Table 6 shows a range of potential monthly rates per Equivalent Residential Unit (ERU). Potential rates were generated ranging from \$1.00 per month per ERU through \$7.00 per month per ERU. In order to meet the \$1,521,262 annual program costs estimated in Table 3, a monthly rate per ERU would have to be established at \$3.73 per month per ERU as shown below.

Table 6. Range of Monthly Rates per Equivalent Residential Unit (ERU)⁹

Community	\$1.00 Monthly Rate	\$2.00 Monthly Rate	\$3.73 Monthly Rate	\$4.00 Monthly Rate	\$5.00 Monthly Rate	\$6.00 Monthly Rate	\$7.00 Monthly Rate	ERU Estimate
Aldan	\$19,944	\$39,888	\$74,391	\$79,776	\$99,720	\$119,664	\$139,608	19,944
Clifton Heights	\$36,744	\$73,488	\$137,055	\$146,976	\$183,720	\$220,464	\$257,208	36,744
East Lansdowne	\$11,580	\$23,160	\$43,193	\$46,320	\$57,900	\$69,480	\$81,060	11,580
Lansdowne Borough	\$50,388	\$100,776	\$187,947	\$201,552	\$251,940	\$302,328	\$352,716	50,388
Upper Darby Township	\$289,248	\$578,496	\$1,078,895	\$1,156,992	\$1,446,240	\$1,735,488	\$2,024,736	289,248
Total Revenue Generated	\$407,904	\$815,808	\$1,521,482	\$1,631,616	\$2,039,520	\$2,447,424	\$2,855,328	\$407,904

Based on past experience by the EFC Team, the impervious area rate structure method, used here to determine ERU, typically measures approximately 400 residential parcels from aerial photography to determine an "average" amount of impervious area (hard surfaces such as parking lots, roof tops, patios etc.) for all residential parcels. Typically, the ERU will range from 2,500 to 3,000 square feet of impervious area. **All residential parcels will therefore be**

⁹ The rate indicated in blue - \$3.73 per ERU - if charged across the five municipalities, would generate enough revenue to fund a stormwater program at the \$1,521,262 level.

assessed one flat rate charge. Residents in the eastern Delaware COG municipalities would, therefore, pay \$3.69 per month.

The impervious area rate structure method also assumes that all non-residential parcels are measured and calculated from aerial photography. These properties will be assessed charges based on increments of the ERU. For example, assume the residential ERU is determined to be 3,000 square feet of impervious area. Thus, a non-residential parcel containing 30,000 square feet of impervious surface area will be charged ten ERUs or ten times a residential parcel.

In summary, the EFC Team created ERU estimates based on population estimates, parcel data provided by the Delaware County Planning Department, and past experience. While some parts of the county have suburban characteristics, the densely populated nature of the participating municipalities was similar to other EFC Team projects in urbanized areas.

Recommendations

Despite the challenges encountered with collecting appropriate and timely data from the municipalities – a circumstance that made it difficult to prove substantial cost-savings through collaboration and follow through with the analysis as originally envisioned – **the EFC Team finds that continuing to pursue this regional approach and hiring an MS4 coordinator for all of the municipalities in the COG will ease the burden of MS4 compliance, as well as result in higher and more consistent level of service delivery as compared to the current individual municipal management of each MS4 permit activity.** Should the member municipalities of the eastern Delaware County Council of Governments MS4 Coordination Project choose to move forward with any version of a collaborative approach, including those suggested in this analysis, they will find themselves uniquely positioned to be a leader and innovator in meeting their MS4 Phase II permit requirements and their approach could serve as a model for the rest of the state.

The opportunities that this project presents not only affect the COG portion of the Darby Creek watershed area, but could ultimately be applied throughout the state of Pennsylvania, as well as to the rest of the country. The benefits of this approach include lower cost through economies of scale, the convenience of producing a single MS4 report (lessening the burden on the state to review multiple reports), improved quality of MS4 programs, shared staff, consistent and higher-quality public education/outreach across the entire project area, effective proactive planning and use of GIS, and less review time for DEP and other agencies.

Although on the surface it appears that a substantial cost savings will not be experienced unless DEP increases the municipal MS4 requirements in the future, or a more thorough accounting of the MS4 programs is accomplished by each municipality, **the cost savings demonstrated in Table 4 and Table 5A-5E alone would provide sufficient resources to sustain a watershed coordinator for the Darby Creek Watershed area.** If additional municipalities were to join the effort, an even greater savings could be realized.

These ideas are further explored in the following sections: Barriers to Overcome, Collaboration Possibilities, and Next Steps.

Barriers to Overcome

In the process of working with the eastern Delaware County municipalities, the EFC Team experienced several barriers in need of resolution (or, if irresolvable, at least acknowledged) in order to successfully implement effective water quality programs in the region. These barriers include obstacles raised by the public and elected officials, programmatic flaws in the MS4 regulations, and issues not unique to, but nonetheless critical to, the success of stormwater management in the eastern Delaware County region.

Public Perception of Stormwater Management Programs

It is not a coincidence that MCM 1 and MCM 2 (*Public Education and Outreach* and *Public Participation*) both involve communicating to the public the intentions behind a municipality's stormwater management program. Without public education, understanding, and buy-in, the general public may acknowledge and accept drainage and flooding costs but will continue to be resistant to paying for water quality costs. In other words, public resistance to "paying for

rainfall” will be strong. Without public buy-in, stormwater managers will be hard pressed to convince the public to increase taxes, form an authority, or collaborate with neighboring municipalities to share costs. It is the overwhelming observation of the EFC Team that the participating municipalities must strengthen their efforts to reach out to the public on the importance of a strong stormwater management program in their municipality.

However, municipalities should not be solely responsible for these efforts. The EPA, in conjunction with all state water quality regulators, needs to begin a national public education campaign to address the MS4 program. This program should be designed to inform and educate the general public on the unfunded mandate and the purpose of the NPDES Phase II water quality regulations.

Finally, one other common misconception held by the public is that the smaller the municipality (geographically), the less money it should need to spend on a stormwater program. For example, small municipalities such as Aldan should spend less money to meet MS4 requirements as compared to costs and activities for larger municipalities such as Upper Darby Township. While there is a base minimum set of activities necessary for compliance with MCM I through MCM 6, (as identified in the NPDES permit), the reality is that, regardless of the size of the population and size of the infrastructure within a municipality, the activities to meet the MS4 regulations are the same.

At the same time, as the size of the municipality increases, costs may increase. For example, outfall inspection in Upper Darby Township will cost significantly more, due to an increased number of outfalls, than in a small municipality. An opposite argument could be made for activities related to MCMs 4 and 5, where perhaps a small community experiencing a great deal of growth is compared to a very large, yet land-locked, zero-development growth community. The point of this barrier is that the size of the community may eventually come into play at some point.

Elected Officials’ Perception of Stormwater Management Programs

Throughout the eastern Delaware County region, the EFC Team has observed the pressure on local elected officials to meet the unfunded mandates of the MS4 program in the face of resistance from their local constituency. Local elected officials who support the MS4 program receive much criticism from the general public and, consequently, take little to no action on furthering the program’s goals. Local elected officials who do not support the MS4 program take the position of waiting until their community is forced to comply. In either scenario, local staffs are not provided with sufficient funding and, therefore, municipalities prepare insufficient or minimal plans to address water quality.

Elected officials, in other parts of the state and country, have actually been the force behind the creation of an adequately funded and effective stormwater program. **Thus, a significant opportunity exists in eastern Delaware County for stormwater champions to emerge with the political will to establish dedicated funding for stormwater management and the MS4 program.**

Criticisms of the NPDES MS4 Program

Current expectations of the NPDES MS4 program do not include reporting program costs per MCM and, thus, budgeting and reporting costs in this way is not a priority for local communities. This situation leads to a cyclical quandary because only municipalities that have implemented a stormwater utility user fee or service charge (i.e., a dedicated funding source) and a

corresponding separate stormwater budget, can begin to identify costs associated with each MCM and budget appropriately for the next fiscal year. Municipalities, like those in eastern Delaware County, who do not yet have a dedicated stormwater budget, must pull funds from various departments and budgets and find it extremely difficult to assess costs per MCM. Thus, a true accounting of costs per MCM is unavailable which then undermines the potential for gathering evidence for creating a dedicated stormwater program budget.

Finally, as previously mentioned, the March-to-March permit cycle utilized by the NPDES MS4 program makes identifying water quality costs difficult because most municipalities utilize the calendar year as their fiscal year. The state should consider working with the municipalities to adjust the permit cycle to make accounting more feasible and working with the EPA to discuss potential steps to make the MS4 program more staff friendly and promote water quality regulations that actually increase water quality.

Obstacles in eastern Delaware County COG Region

Two legal issues will require consideration as municipalities in the eastern Delaware COG move forward with their MS4 programs. First, the State of Pennsylvania does not have specific legislation that would allow communities to charge or assess for stormwater management activities. There is a need for additional research to determine if existing legislation can be modified to accommodate such a fee, or if new legislation is required to implement a stormwater charge.

The legality of an approach that seeks to establish a stormwater authority is questionable at best. The existing legislation allowing for the establishment of authorities in Pennsylvania does not specifically speak to stormwater authorities. Although some believe extending the interpretation of existing legislation to include stormwater is all that is necessary to move forward, allowing for the creation of stormwater authorities would most likely require amending the language to the existing legislation to specifically reference stormwater.

Second, DEP has not developed a protocol for a group of municipalities to file a joint watershed permit at this time. Providing for these alternative permit mechanisms would make it possible for communities to work together through inter-local agreements or regional authorities and realize potentially significant cost-savings.

The EFC Team also made the following observations that are true for the eastern Delaware County municipalities, as well as for many communities around the country. First, most communities do not identify dedicated funding in their community budgets for stormwater management, and more specifically, for the MS4 program. A lack of consistent, reliable funding leaves stormwater programs vulnerable when communities need money to shore up other budgets. Supplemental state or federal grants/loans must be made available to communities like those in eastern Delaware County to partially meet this need.

Second, as already discussed in this report, donated time is utilized by many municipalities to perform MS4 activities. While donated time represents an unaccounted for cost of the MS4 program in a municipality and, therefore, must be accounted for in this type of analysis, the EFC Team strongly advises against relying on donated time to fulfill the MS4 requirements.

Managing, financing, budgeting, and then reporting on MS4 water quality activities and costs is an incredibly complicated process at many levels for all municipalities throughout the United States. These communities typically approach stormwater in a piecemeal manner because of the

number of departments required to adequately manage these activities. However, without a coordinated approach, municipalities in eastern Delaware County, as well as throughout the United States, cannot easily budget or track stormwater activities.

Exacerbating this situation is that most municipal accounting and finance budgeting systems are not organized to track costs across departments. The EFC Team strongly recommends that municipalities start accurately accounting for program costs, particularly equipment costs. Municipalities need to begin by segregating stormwater activities and costs into two primary categories: (1) drainage and (2) water quality activities is an excellent starting point.

Finally, the EFC Team observed the potential positive impact that could be gained if DEP were to provide better compliance enforcement. The difficulties in gathering data from the municipalities in this project suggest that MS4 programs around the state could reach higher if DEP were to raise the bar on enforcement in order for municipalities to be legitimately in compliance with the regulations.

Collaboration Possibilities

Based on the compiled and extrapolated data provided by each community and the assumption that most of the municipalities make use of volunteers to perform many of the activities tied to meeting MS4 requirements, as well as the fact that DEP has reviewed, approved and accepted each of the individual municipality's MS4 plans as meeting the MS4 regulation standards, municipalities may find it difficult to justify pursuing a collaborative approach to managing their stormwater management programs. However, the EFC Team believes it would be possible to calculate a definitive regional cost-savings achieved by coordinating MS4 compliance efforts in the Darby Creek Watershed if each municipality were fully performing and funding all of the activities reflected in their MS4 annual reports and the "actual" costs of those activities were truly identified in the municipalities' budgets.

One of the strongest ideas that emerged from this analysis is that of using the momentum generated by Upper Darby's strong stormwater management program to pull along the other municipalities. Upper Darby, in fact, has expressed the willingness to run the MS4 program for the entire group, and the EFC project team believes that this could result in a marked increase in the quality of stormwater management activities throughout eastern Delaware County. This model has been used with success in other EFC Team projects including in Hamilton County, Ohio. (Please see Appendix B for more information on the Hamilton County, OH project.)

During project meetings, the municipalities expressed willingness to explore this approach. However, the EFC Team also believes the following collaboration ideas should be considered. General recommendations for collaboration include the following and will be elaborated on in the Next Steps section below:

- Pursuing the possibility of a shared, William Penn-funded Watershed Coordinator.
- Working together to submit a joint MS4 permit to the state.
- Considering the Organization Plans included in the Appendix and further discussing the most viable organizational options.
- Identifying small, yet tangible, opportunities that will take the first steps toward collaboration.

Next Steps

Pursue a shared Watershed Coordinator. First, the EFC Team believes that a shared, William Penn-funded Watershed Coordinator is an outstanding opportunity for the eastern Delaware County municipalities. This shared coordinator position could add additional potential savings to the program up to 30-40% because of the advantages of having an expert in water quality and NPDES permitting to guide all of the municipalities. Such an expert could anticipate changes in the MS4 program, develop cost-effective ways to address the challenges of this complex program, and be a one-point contact for working with EPA and DEP. In addition, the coordinator would be a one-stop information source that could train, educate, and share community resources. This action would provide a reasonable cost-savings that could grow to a substantial cost-savings over time, in addition to expertise that would increase the efficiency and quality of the program. The EFC Team strongly recommends that the eastern Delaware County municipalities apply for this funding.

Pursue a joint permit. Second, submitting a joint permit to the state could potentially save both the municipalities and the state a considerable amount of time and work in reviewing permits, as well as increase the overall quality of the program. While the state has yet to establish a protocol within DEP to manage/review these potential joint permits, the regional DEP office has expressed interest to the central office in trying out this concept to reduce review time and to reduce costs. **The EFC Team urges the eastern Delaware County municipalities to become the first within Pennsylvania to submit jointly thus setting a precedent of innovation that could be modeled throughout the state.**

Continue to explore the legality of establishing a stormwater authority. The legality of an approach that seeks to establish a stormwater authority is still up for discussion among environmental lawyers in Pennsylvania. The existing legislation allowing for the establishment of authorities in Pennsylvania does not specifically speak to stormwater authorities. Although some believe extending the interpretation of existing legislation to include stormwater is all that is necessary to move forward, allowing for the creation of stormwater authorities would most likely require amending the language to the existing legislation to specifically reference stormwater. The soon-to-be introduced House Bill (the next generation of Representative Steil's House Bill 2266 which was not passed during the September 2008 session), supported by Senator Erickson and Representative Freeman, is intended to address this very issue and give legal standing to the creation of a stormwater authority in Pennsylvania. The COG municipalities are encouraged to become involved in the crafting of this legislation and to monitor its progress.

Consider Local Agreements in the absence of a Regional Authority. Third, the three organization plans included in the appendix address the most viable organizational options. If the COG municipalities are not ready to move forward with a Regional Authority, Local Agreements should be explored that will result in cost-savings for all. **Please see Appendix J for a matrix entitled Comparison of Potential MS4 Approaches.**

Consider collaborating on MCMs where feasible as a first step. Finally, the EFC Team has two recommendations that would be important first steps toward collaboration. One would be mobilizing a jointly-funded, watershed-level public outreach and education campaign. Messaging and information that is uniform across an entire watershed would have significant impacts on public awareness of stormwater issues and would also represent a cost savings. Watershed groups interested in assisting communities with meeting MCM 1 and 2 for a fee should be identified, contacted, and evaluated for participation in this process. Another recommendation

would be to seek out laboratories who would offer group discounts if communities submitted fecal coliform samples together. Laboratories interested in assisting communities with meeting the testing requirements of MCM 3 should be identified, contacted, and evaluated for participation in this process. These two ideas are just a few ways that the eastern Delaware County municipalities could begin working together for cost-savings.

Conclusion

In closing, the EFC Team appreciates the opportunity to provide these recommendations, findings, and observations to the eastern Delaware County municipalities. The opportunities for cost-savings through collaboration outlined in this report have the potential for greatly increasing the level of service offered by the stormwater programs in the COG region.

The Project Team

Project Managers

Megan Hughes, Program Manager – mhughes3@umd.edu

Megan Hughes comes to the EFC most recently from Bowling Green State University in Bowling Green, OH, where she served for four years as an Instructor and Internship Coordinator for the Center for Environmental Programs. She also worked for two years with the Chapel Hill, NC, firm Environmental Consultants and Research (EC/R, Inc.) as a contractor to the Environmental Protection Agency Office of Air Quality Planning and Standards (OAQPS). Ms. Hughes received her Master of Environmental Management degree from Duke University's Nicholas School of the Environment and Earth Sciences and a Bachelor of Arts Degree in Environmental Studies from the University of North Carolina at Wilmington. Her Master's Project, entitled "Creating the Urban Toolshed: A case study of Durham children's perceptions of nature and neighborhood," was authored during her time as an environmental education consultant for Durham Parks and Recreation in Durham, NC. During graduate studies, she also held a series of positions in the Triangle region of NC with the North Carolina Solar Center, the Center for Environmental Education, and Triangle J Council of Governments.

Lisa Grayson, President, Resource Dynamics, Inc – lgrayson@rdinc.net

Lisa Grayson was a Program Manager for the Environmental Finance Center from 2005 through the fall of 2008, primarily managing the EFC's Stormwater Financing Initiative. This program was designed to provide communities with the tools and resources needed to effectively finance and implement stormwater management programs. She has since left the EFC to further develop Resource Dynamics, Inc., her company that focuses on facilitating the implementation of green building practices. Currently she is working with the Delaware Valley Green Building Council (a chapter of the USGBC) to launch the Green Advantage® training workshop targeted to the building trades. Overall, Lisa has over 18 years of experience managing and coordinating national and regional environmental and natural resource conservation projects, meetings, workshops, and conferences. Her three core areas of focus are in: water and watershed related efforts, green building, and corporate environmental health and safety management. Lisa serves on the board of the Delaware Valley Green Building Council and is a member of the Lower Makefield Environmental Advisory Council. Lisa is a graduate of Sarah Lawrence College, in Bronxville, NY.

Jennifer Cotting, Program Manager – jcotting@umd.edu

Jennifer Cotting joined the EFC in 2004 to manage an EPA funded program designed to help communities and organizations in Region 3 overcome barriers to implementing and financing their watershed protection efforts. Now she coordinates a number of the EFC's core programs, with a particular focus on urban greening, tree canopy, and green infrastructure issues. Prior to joining the EFC, Ms. Cotting worked as an independent consultant developing and implementing environmentally based education and outreach programs for nonprofit organizations and government agencies. She received her M.S. in Sustainable Development and Conservation Biology from the University of Maryland and her B.A. in Communications from Marymount University. Ms. Cotting is also co-editor of Urban Wildlife News, the biannual newsletter of the Urban Wildlife Working Group of The Wildlife Society.

Special Consultants to the EFC

John Damico, President of Environmental Rate Consultants, (ERC)

ERC projects focus solely on working with communities regarding rates and financing, institutional and organizational, management and policies, public involvement and facilitation and utility billing system implementations in a needs analysis project or full implementation project scenarios.

John Damico's experience includes over 22 years of water resource, financial and rate setting and public relations experience implementing over 30 municipal and regional stormwater utility programs and performing over 60 water/sewer and stormwater rate studies all across the country. Additionally, he has experience in facilitating and consensus building for large and small groups, implementing water resource public involvement campaigns, financing options analysis, strategic planning development, rate structure design and analysis, cost of service analysis, cash flow analysis, organizational analysis, stormwater utility billing system design and implementation, and GIS program cost/benefit analysis and implementations.

John has done work throughout the United States with over 60 similar projects, working with and facilitating county wide and watershed groups to reach consensus on program missions, other policy issues such as funding institutional, management and organizational aspects of their groups.

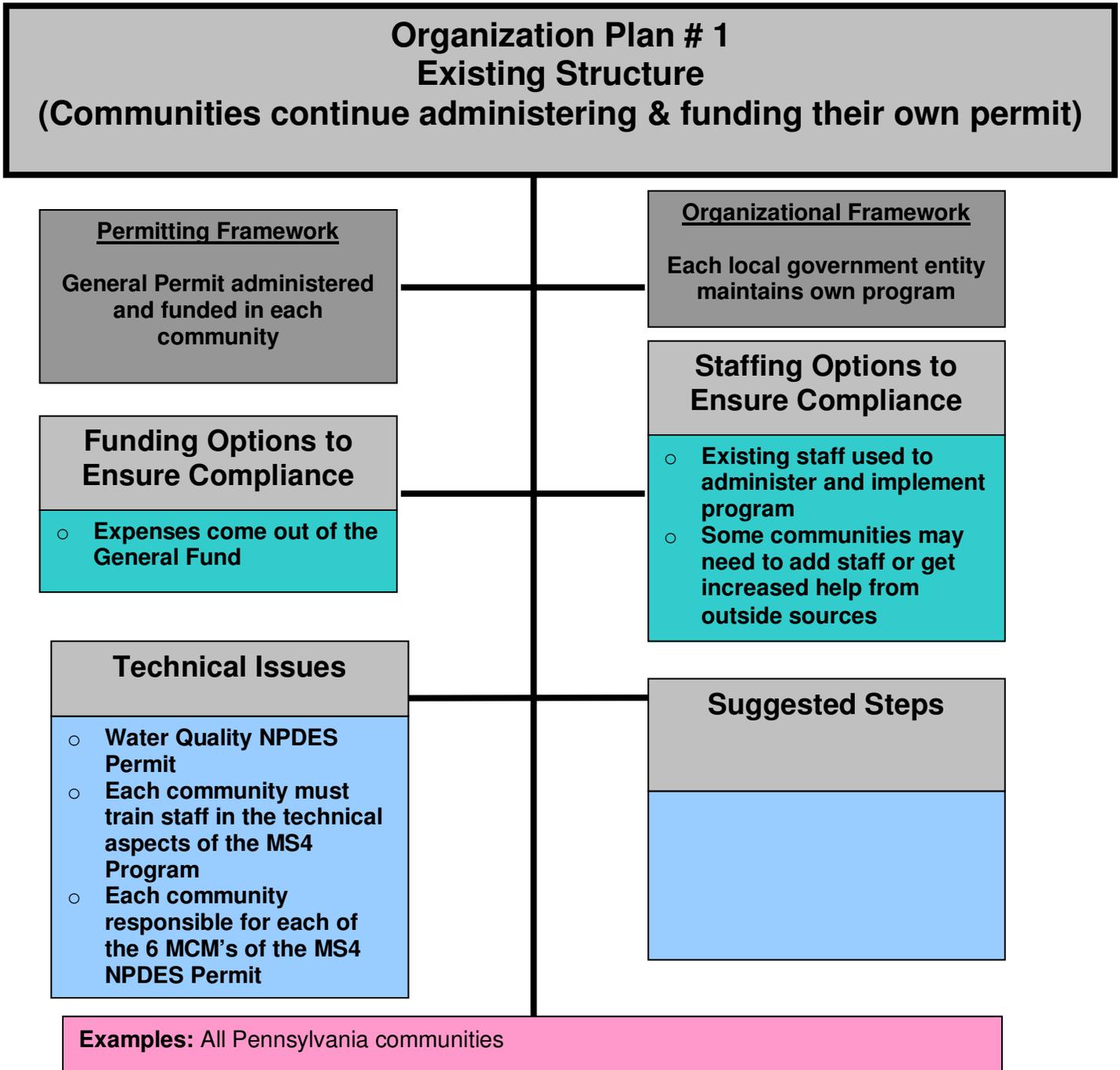
Steven McKinley, Vice President and Director of Water Resources, URS Corporation

Steve McKinley is a graduate of the University of Kentucky School of Engineering and a Registered Professional Engineer. Steve has 30 years experience in water resource development, planning, and design. His experience includes stormwater utility development, stormwater program evaluation, FEMA floodplain studies and floodplain management, dam inspection and design, wet weather and watershed management efforts. Steve has successfully developed stormwater and wet weather programs for Louisville, Kentucky; Columbus, Ohio; Fort Wayne, Indiana; Toledo, Ohio; Hamilton County, Ohio; Gwinnett County, Georgia and assessed the Chattanooga, Tennessee Stormwater Program.

Appendices

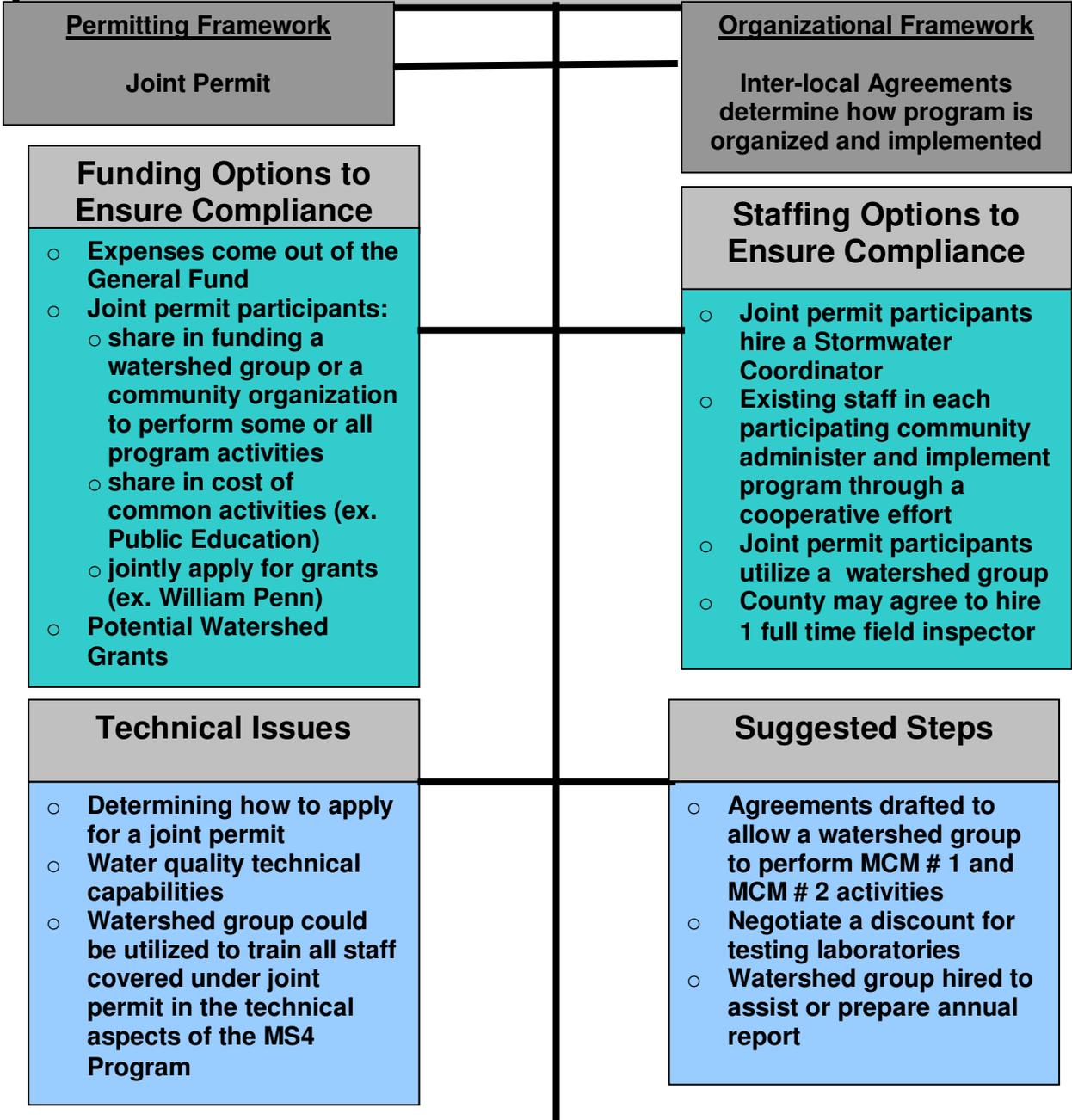
- Appendix A:** Organization Plan 1
- Appendix B:** Organization Plan 2
- Appendix C:** Organization Plan 3
- Appendix D:** Table 4 and Collaboration & Cost Savings Companion Document
- Appendix E:** Table 5A
- Appendix F:** Table 5B
- Appendix G:** Table 5C
- Appendix H:** Table 5D
- Appendix I:** Table 5E
- Appendix J:** Comparison of Potential MS4 Approaches - Matrix

Appendix A: Organization Plan I



Appendix B: Organization Plan 2

**Organization Plan # 2
Local Agreements
(Cooperation through legal contracts)**



Examples:
 (1) Rouge River Watershed Joint Permit (Detroit, MI and 47 other communities)
 (2) Hamilton County Ohio Stormwater District Joint Permit (44 communities)

Rouge River Watershed Joint Permit (Detroit, MI and 47 other communities)

Local communities in southeast Michigan and the state regulatory agency are attempting, for the first time, a consensus, cooperative approach to stormwater management and regulation under the NPDES program. The Michigan general permit is a watershed-based, general stormwater permit issued under the National Pollutant Discharge Elimination System. The permit requires permittees to immediately initiate some activities such as illicit discharge elimination and to participate in watershed management planning for a self-determined subwatershed unit. The watershed management plan will form the basis for implementing watershed goals and objectives that will result in improved water quality and pollution control. This new regulatory program implements the watershed approach endorsed by USEPA and others and should facilitate watershed-based integration of control programs for different pollution sources such as stormwater and combined sewer overflows which may be present with a large, urban watershed. This program empowers local government and their stakeholders in identifying problems, choosing from alternative solutions, establishing priorities and schedules, and developing common strategies with neighbors. Communities and others involved in this new program are also addressing issues such as coordination of subwatershed efforts within larger subwatersheds. It is hoped that this effort and the work of the Rouge River National Wet Weather Demonstration Project will continue to identify and quantify the benefits of cooperative, watershed-based efforts to protect and restore our nation's water resources.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grant #X995743-01, 02, 03 and 04 and #C995743-01. The views expressed by individual authors are their own and do not necessarily reflect those of EPA. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying, official EPA approval, endorsement, or recommendation.

Resources: : IMPLEMENTING A MODEL WATERSHED APPROACH THROUGH A STATE GENERAL STORM WATER NPDES PERMIT (Published Paper)

Contact Information

(Rouge River Watershed Joint Permit)
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Hamilton County Ohio Stormwater District Joint Permit (44 communities)

Beginning in March of 2000 the Hamilton County Board of Commissioners (BOCC) through the Metropolitan Sewer District of Greater Cincinnati and the Cincinnati Stormwater Utility initiated a District stormwater process to evaluate the feasibility of developing a District Stormwater District under Ohio Law. This process involved representatives from the county government, townships, cities, villages, watershed organizations, educational organizations, local and state agencies as well as elected officials. To facilitate this effort, a Steering Committee consisting of representatives from many of the 49 municipalities (21 cities, 16 villages, 12 townships) staff and management, several elected officials, county department representatives, watershed and environmental groups, university representatives and others. Through 20 meetings over a two-year period a group of 35 to 40 representatives attended on a regular basis. The process also involved the creation of an eight member Executive Committee

comprised of officials from selected communities, the Township Trustees Association, the Municipal League, City of Cincinnati, the BOCC, the County Engineer and the Metropolitan Sewer District of Greater Cincinnati.

A Steering Committee was established by the BOCC to assist in development of the roles and responsibilities for the District. The Metropolitan Sewer District of Greater Cincinnati acting on behalf of the County Commissioners funded and managed the consultant contract which facilitated the Steering Committee through a two year, 20 meeting process that ultimately recommended the development of a District Stormwater District under Ohio Revised Code (ORC) 6117. Much of the early discussion centered on the establishment of a comprehensive District stormwater organization that would be responsible for both water quality issues as well as flooding and drainage. However, because the Environmental Protection Agency deadline for the NPDES Phase II Stormwater Permit is March 10, 2003, it was determined by the group to first address the stormwater permit and craft an organization to manage stormwater quality. Once this organization was created, additional work could be done to expand the District to include water quantity (flood control, drainage & erosion control), maintenance and capital construction.

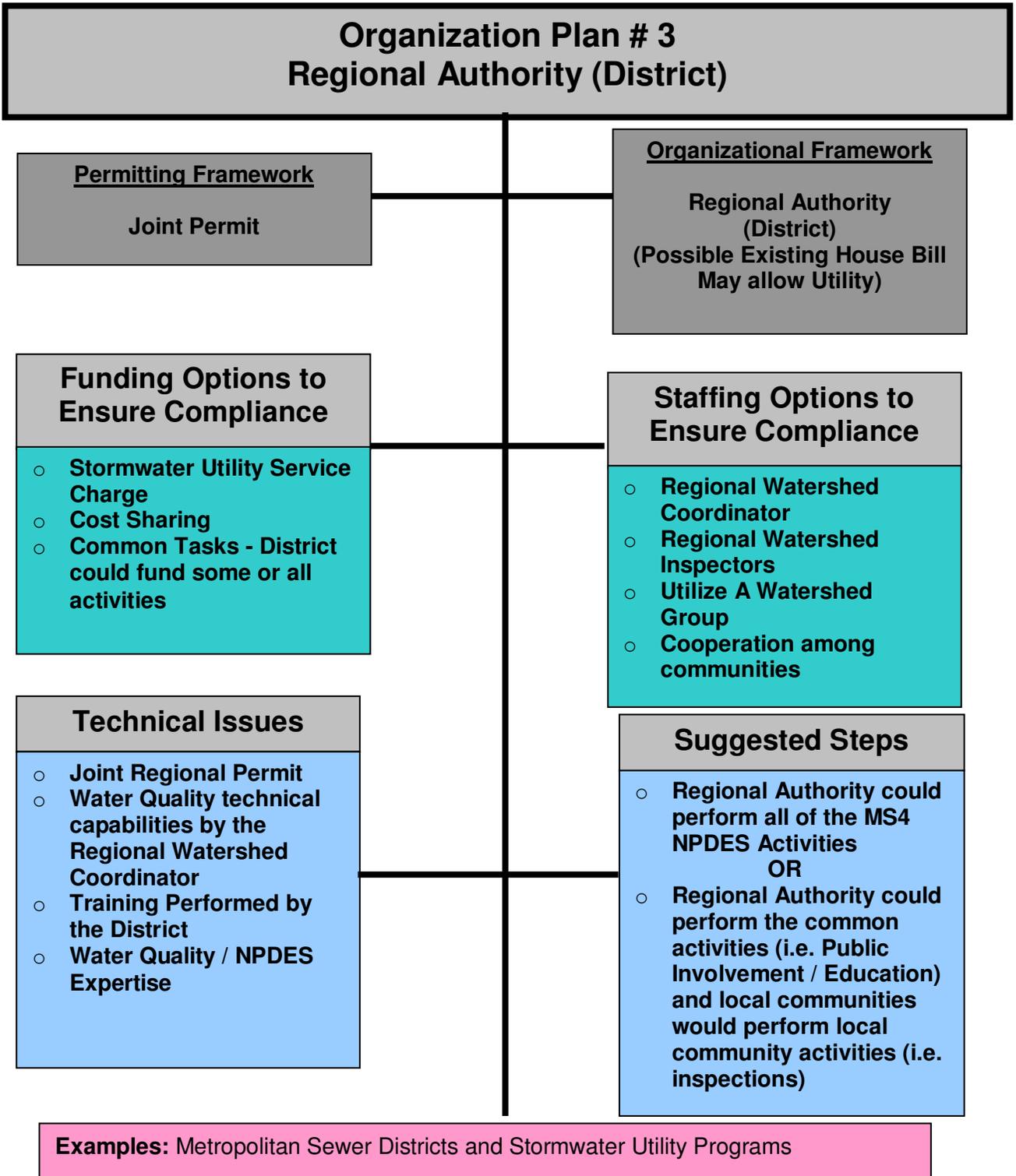
Since this District will primarily be responsible for the NPDES Phase II Stormwater Permit, the Steering Committee developed a level of service that covered the six minimum controls of the permit.

1. Public Information & Education
2. Public Involvement & Participation
3. Illicit Discharge Detection
4. Construction Site Runoff Control
5. Post Construction Site Runoff Control
6. Pollution Prevention & Good Housekeeping

Monthly Steering Committee meetings have been held since March of 2000 to craft a District stormwater program.

It is anticipated that a combination of existing county staff and new employees will make up the staff that performs the above listed efforts. In order to accomplish the Phase II directives, District management and staff will be responsible for carrying out the specific programs and tasks listed in the NPDES Phase II Permit Application or Notice of Intent (NOI) which includes a stormwater quality management plan for the region based on the Six Minimum Control Measures. The District will coordinate these activities with the member communities (Townships, Cities, & Villages) and provide assistance, guidance, and training to the District members. It is initially anticipated that four to five staff positions will be needed to perform the NPDES Phase II Permit duties and responsibilities; however, this number may be reduced due to reutilization of existing county staff and member participation. The staff will initially include one or two engineers, public relations/grants writer and GIS specialist. They will carry out the day-to-day duties of the District.

Appendix C: Organization Plan 3



Appendix D: Table 4 – Collaboration & Cost Savings Companion Document

It is important to understand, when using Table 4 and the Table 5 series found in Appendix D through Appendix I of the report entitled **Eastern Delaware County Council of Governments MS4 Coordination Project – Final Recommendations, Findings, & Observations**, that the tables are dynamic tools. In short, the tables attempt to illustrate that individual communities will pay more for staff time, consulting services, printing costs, etc. by purchasing these services on their own. Based on the principles of economies of scale, costs will decrease when two or more communities come together to purchase the same thing. **The biggest economies of scale will result from the participation of all five communities featured in this analysis in a collaboration to achieve cost savings.**

Please refer to the following information on the assumptions made when estimating costs, labor, and hours for the ten possible collaboration activities displayed in Table 4. This information is being provided in detail to allow the Eastern Delaware County COG municipalities the flexibility to, when possible:

- *Account for changing markets* – As costs fluctuate now and in the future, municipalities can tweak the assumptions (salary, printing costs, etc.) made in this analysis to reflect current market conditions.
- *Include additional municipalities in the calculations* – In some instances where costs are divided equally by municipality (MCM 1 – Website Development, MCM 2, and MCM 6), it is possible to estimate how costs to each municipality would decrease (or, in some cases, increase) if more than five municipalities decided to participate in a particular initiative. In these cases, an additional table and/or explanatory text is included in this document to show cost savings to each municipality beyond the five municipalities included in this analysis. In the specific case of the Eastern Delaware County COG MS4 Stormwater Coordination project, Darby and Yeadon Boroughs expressed interest in participating but were not able to submit data in a fashion that was useful to the EFC Team. However, based on the flexible variables built into the analysis, these two communities could easily be included in future Table 4 scenarios.
- *Calculate savings for fewer than five municipalities* - In some instances where costs are divided equally (MCM 1 – Website Development, MCM 2, and MCM 6), it is possible to estimate the cost savings to each municipality if fewer than five municipalities decided to participate in a particular initiative. In these cases, a simple calculation that divides the total cost by the number of participating municipalities will yield the cost to each municipality.¹⁰

¹⁰ With the exception of the three activities mentioned - MCM 1 (Website Development only), MCM 2 (Organization of Public Participation Workshops, Seminars, Meetings, etc.), and MCM 6 (Staff Training) - it is too complex to create a quick formula for determining how the numbers

- *Support local businesses and form partnerships* – Because this project encourages collaboration and creative cost-sharing initiatives, municipalities are encouraged to work with local vendors, including watershed organizations, to find the lowest cost services. If less expensive fees are negotiated, the decreased cost can be easily replaced in the tables.

MCM I – Public Education and Outreach

One possible way to fulfill the requirements of MCM I would be generating a newsletter to inform the public about the stormwater program. In addition, brochures and/or posters could be produced and distributed/posted in local businesses. Hosting an up-to-date website that provides information about the stormwater program could also be an effective way to reach the public. Some of the municipalities in this analysis are already conducting such activities. Below are the assumptions we made when looking at the cost savings gained by working together on similar public outreach strategies. These costs assume the participation of all five communities in this analysis.

When major cost savings are not realized (such as Lansdowne Borough saving \$40 per year by sharing in brochure printing costs), a strong argument can be made that (1) small cost savings add up over the lifetime of a stormwater program, (2) any cost savings is better than none, (3) small cost savings opportunities now may lead to much larger cost savings opportunities in the future as regulations are enforced more stringently, and (4) promoting a culture of thriftiness without diminishing services is good business. In addition, major gains in public knowledge are possible if the public is getting consistent, quality stormwater information across the watershed.

- **Newsletter Printing Costs** – Accepted marketing techniques target 20% of households in a given area. Thus, we took the population for each community and divided it by 2.56 persons to determine the number of households in each community. (Nationally, an average of 2.56 persons reside in each household.) Finally, we took 20% of each municipality's total number of households and used this number to represent both households and number of newsletters needed.

The newsletter in this example is 8 ½" x 11", printed in color ink, on both sides with no fold. (Cost data obtained from Kinkos in College Park, MD and Zen Reprographics in Louisville, KY in Jan 2009 but local costs may be slightly higher or lower.) This estimate does not include newsletter distribution costs.

would change if one (or more) of the five municipalities in this analysis decides not to participate in any of the seven remaining activities. Upper Darby, in particular, provides volume to this analysis. Because the other municipalities benefit from the discount, it is reasonable to assume that Upper Darby's lack of participation would significantly affect the cost savings in the printing activities (newsletters, brochures, posters), outfall screening/sampling, inspections, etc. Thus, in the situation where two to four municipalities want to work together on a cost-saving activity, a case-by-case analysis would need to be executed based on the cost data for that activity, the participating municipalities, and the number of units each municipality adds to the analysis.

- *Individual Costs* – If newsletters are distributed by each individual municipality to 20% of households, printing costs for each municipality except Upper Darby will be \$1.04 per newsletter (200-900 newsletters). Because of Upper Darby's size, costs would be approximately \$0.61 per newsletter (6000 newsletters).
- *Shared Costs* – If one newsletter is jointly created by the participating municipalities for 20% of the households, printing costs will be \$0.61 per newsletter (8000 newsletters). One way to divide up the shared cost would be to pro-rate each municipality's share based on number of households. For instance, Aldan, with 337 households would pay $\$0.61 \times 337 = \205.57 instead of $\$1.04 \times 337 = \350.48 and ultimately save \$144.91 each time a newsletter is printed (monthly, quarterly, or annually depending on the needs of the participating municipalities). (See Table 5A for more on Aldan.)
- **Brochure Printing Costs** – Based on population size, we allocated between 50 and 500 brochures for each municipality. These brochures would be placed as counter-top displays in local businesses. Brochures would be printed on 8 ½" x 11" paper, printed in color ink, on both sides with a tri-fold. (Cost data obtained from Kinkos in College Park, MD and Zen Reprographics in Louisville, KY in Jan 2009 but local costs may be slightly higher or lower.)
 - *Individual Costs* – If brochures were printed by individual municipalities, printing costs for each municipality except Upper Darby will be \$1.10 per brochure (50-200 brochures). Because of Upper Darby's size, costs would be approximately \$0.90 per brochure (500 brochures).
 - *Shared Costs* – If a brochure is developed jointly and printing costs are shared, all of the municipalities would pay the lower rate of \$0.90 per brochure. One way to divide up the shared cost would be to pro-rate each municipality's share based on the proportionate number of brochures ordered for that municipality. For instance, we estimated that Lansdowne Borough would need 200 brochures. Instead of paying $\$1.10 \times 200 = \220 they would pay $\$0.90 \times 200 = \180 for a savings of \$40. (See Table 5D for more on Lansdowne Borough).
- **Informational Poster Printing Costs** – Based on population size, we allocated between 10 and 100 informational posters for each municipality. These posters would be displayed in local businesses. Posters would be printed on 2'x3' paper and printed in color ink (one side only). (Cost data obtained from Kinkos in College Park, MD and Zen Reprographics in Louisville, KY in Jan 2009 but local costs may be slightly higher or lower.)

- *Individual Costs* – If posters were printed by individual municipalities, printing costs for each municipality would be approximately \$48 per poster.
- *Shared Costs* – If one poster is jointly developed and printing costs are shared, all of the municipalities would pay a significantly lower rate of \$14.15 per poster. This significant savings is due to the fact that large printing jobs such as this would be sent to an off-set press. One way to divide up the shared cost would be to prorate each municipality's share based on the proportionate number of posters ordered for that municipality. For instance, we estimated that East Lansdowne Borough would need 10 posters. Instead of paying $\$48 \times 10 = \480 they would pay $\$14.50 \times 10 = \145 for a savings of \$335. In the case of Upper Darby, the shared costs would decrease their printing costs from $\$48 \times 100 = \4800 to $\$14.50 \times 100 = \1450 for a savings of \$3350. (See Table 5C and 5E for more on East Lansdowne Borough and Upper Darby Township respectively.)
- **Website Development** – Web development costs were estimated based on 40 hours of labor per year by a skilled webmaster or IT professional charging \$50 per hour (including overhead costs). (Cost data estimated based upon going rate for website development professional.)
 - *Individual Costs* – If each municipality separately pays for a skilled webmaster or IT professional to create a website for their municipality, each municipality will pay \$2000 (40 hours of labor at a rate of \$50 per hour).
 - *Shared Costs* – If a skilled webmaster or IT professional was hired jointly by all five municipalities together, the joint cost would be \$2000 (40 hours of labor at a rate of \$50 per hour). One way to divide up the shared cost would be to decide that each of the five municipalities will have an equal “share” in the website. Thus, each of the five municipalities would essentially pay for 8 hours of labor. Each municipality, therefore, would pay a total of $\$50 \times 8 \text{ hours} = \400 instead of paying $\$50 \times 40 \text{ hours} = \2000 for a substantial savings for *each municipality* of \$1600. (See the Table 5 series.) In this case, the product, a public outreach website, would have much higher quality for a much lower cost. If fewer than five municipalities choose to participate, we estimate that \$2000 (40 hrs x \$50/hr) for development of a website is not changeable. Thus, a simple calculation of \$2000 divided by the number of participating municipalities will yield the cost to each municipality (\$1000 each if two municipalities participate, \$667 each if three municipalities participate, etc.)

- *Shared Costs Beyond the Scope of This Analysis* – We believe that shared website development is one of the most compelling, cost-effective pieces of this cost analysis and could bring municipalities to the table who did not participate in this analysis. Beyond five municipalities, we believe that a skilled webmaster or IT professional could need to invest slightly more time into website creation due to the time demands of coordinating with more stakeholders. Thus, if more than five municipalities wanted to participate in the development of this website, we estimate that the following cost share could take place:

Number of Participating Municipalities	Cost of website development	Cost of Labor	Cost to each municipality
5 (this analysis)	\$2000	40 hrs x \$50	\$400
6	\$2250	45 hrs x \$50	\$375
7	\$2250	45 hrs x \$50	\$320
8	\$2500	50 hrs x \$50	\$310
9	\$3000	60 hrs x \$50	\$333
10	\$3250	65 hrs x \$50	\$325

MCM 2 – Public Participation

One possible way to fulfill the requirements of MCM 2 would be to engage the public in workshops, seminars, charettes, and/or public meetings regarding the stormwater program. Some of the municipalities in this analysis are already conducting similar activities. As noted in the notes for MCM 1 above, major gains in public knowledge are possible if the public is getting consistent, quality stormwater information across the watershed. Below are the assumptions we made when looking at the cost savings gained by working together on public participation programming. These costs assume the participation of all five communities in this analysis.

- **Costs to Organize Public Participation Workshops, Seminars, Charettes, Meetings, etc.** – It was estimated that each municipality should stage two public participation events per year and that planning for each event would involve 40 hours per event. Thus, 80 hours each year would be devoted to public participation programming at a cost of \$50 per hour of labor. (Cost estimates were based on known rates of professionals who conduct meetings and events of this nature.) This cost does not include printed materials, supplies, refreshments, or event space.
 - *Individual Costs* – If each municipality separately hosted two public participation events each year, each municipality would pay \$4000 (80 hours of labor at a rate of \$50 per hour).
 - *Shared Costs* – If all five municipalities joined together to stage two public participation events each year, the joint cost would be \$4000 (80 hours

of labor at a rate of \$50 per hour). One way to divide up the shared cost would be to decide that each of the five municipalities will have an equal “share” in the public participation programming. Thus, each of the five municipalities would essentially pay for 16 hours of labor. Each municipality, therefore, would pay a total of $\$50 \times 16 \text{ hours} = \800 instead of paying $\$50 \times 80 \text{ hours} = \4000 for a substantial savings for *each municipality* of \$3200. (See the Table 5 series.) In this case, the product, two public participation events, would have much higher quality for a much lower cost per municipality. If fewer than five municipalities choose to participate, we estimate that \$4000 (80 hrs x \$50/hr) for development of public participation programming is not changeable. Thus, a simple calculation of \$4000 divided by the number of participating municipalities will yield the cost to each municipality (\$2000 each if two municipalities participate, \$1333 each if three municipalities participate, etc.)

- *Shared Costs Beyond the Scope of This Analysis* – We believe that shared public participation activities are another compelling, cost-effective piece of this cost analysis and could bring municipalities to the table who did not participate in this analysis. Beyond five municipalities, we believe that the cost to coordinate with additional municipalities for public participation programming would not increase. (Costs for printed materials, supplies, or event space could increase because there would likely be more attendees at each event. However, we did not include these costs in the original analysis. We do not believe that these costs would be prohibitive.) Thus, if more than five municipalities wanted to participate in the development of public participation programming, a simple calculation of \$4000 divided by the number of participating municipalities will yield the cost to each municipality (\$667 each if six municipalities participate, \$571 each if seven municipalities participate, etc.).

MCM 3 – Illicit Discharge Detection and Elimination System

To meet the requirements of MCM 3, municipalities in different states and regions utilize different protocols for illicit discharge detection. One method is for municipalities to inspect 25% of outfalls within their jurisdiction each year. Thus, in a four year period, all outfalls have been inspected once. Outfalls are screened in dry weather and, if water flow is observed, additional sampling is conducted using Hach Stormwater Test Kits or a similar kit. Water samples are taken on-site and tested for water temperature, pH, phenol, chlorine, copper, and detergents. Fecal coliform samples are also taken and sent to a lab.¹¹

¹¹ Some communities take advantage of local science center labs to analyze fecal coliform samples at a cost of approximately \$20 per sample (plus the cost of transporting the samples to the lab).

Below are the assumptions we made when looking at the cost savings gained by working together on illicit discharge detection. These costs assume the participation of all five communities in this analysis.

- **Outfall Screening/Sampling** – We determined the number of outfalls that need to be inspected for each municipality by consulting the annual report. Lansdowne Borough, for example, has approximately 27 outfalls and, if inspecting 25% of them each year, will complete 7 inspections. We are also assuming that 1/3 of the inspected outfalls will exhibit flow and will need water sampling. Thus the labor and time estimates below are averages assuming that 2/3 of the inspections will be dry screenings only and 1/3 of the inspections will require wet sampling. Time includes travel time, testing time, following chain of custody protocol, and transporting samples to lab, when necessary. The estimates used below are made based on the assumption that two inspectors participate in the screenings but, in the future, municipalities may choose to conduct screenings with one person only.¹²
 - *Individual Costs* – We estimate that it would take two inspectors, three hours per outfall to complete an inspection. Thus, if each municipality separately completed their own outfall screening, the cost would be \$300 per outfall (6 hours of labor at a rate of \$50 per hour).
 - *Shared Costs* – If all five municipalities joined together to complete outfall inspections, we estimate that a two hour savings of labor would result per inspection (i.e. per outfall). Thus, we estimate that it would take two inspectors, two hours per outfall to complete an inspection at a cost of \$200 per outfall (4 hours of labor at a rate of \$50 per hour). One way to divide up the shared cost would be to prorate each municipality's share based on the number of inspections conducted in their municipality. For instance, we estimated that Aldan would conduct two outfall inspections. Instead of paying $\$300 \times 2 = \600 they would pay $\$200 \times 2 = \400 for a savings of \$200. (See Table 5A for more on Aldan.)

MCM 4 – Construction Site Runoff Control

Inspections for construction site runoff are required as part of the MCM 4 regulations. New construction in this region is limited, and a few municipalities have only one inspection site per year, but all five municipalities did report conducting regular inspections. Regardless of the volume of inspections, this is an area of potential cost

¹² In some communities, the first round of outfall screening will require two inspectors but subsequent rounds may only need one. In inspecting outfalls for the first time, some communities use a GPS unit to locate the outfall, take photographs of each outfall, install inlet markers, and/or conduct other maintenance. Thus, the initial efforts may require more staff. In addition, many communities choose to send two inspectors so that more than one person in a department is trained for inspections.

savings if a shared strategy is used. Below are the assumptions we made when looking at the cost savings gained by working together on construction inspections. These costs assume the participation of all five communities in this analysis.

- **Construction Inspection Costs** – The number of inspections in each municipality was estimated based upon population size. Thus, we allocated between one and five inspections to each municipality. Inspections were estimated at 4 hours of labor (inspection plus documentation) per inspection. Labor rates were based on a range of \$50 to \$80 an hour and, therefore, \$65 an hour was used in this estimate. Thus, we estimated that one inspection costs 4 hours x \$65 per hour = \$260.
 - *Individual Costs* – If each municipality separately completed their own construction inspections, the cost would be \$260 per inspection (4 hours of labor at a rate of \$65 per hour).
 - *Shared Costs* – If all five municipalities joined together to complete construction inspections, we estimate that a one hour savings of labor would result per inspection. Thus, the cost per inspection would be \$195 per inspection (3 hours of labor at a rate of \$65 per hour). One way to divide up the shared cost would be to prorate each municipality's share based on the number of inspections conducted in their municipality. For instance, we estimated that Lansdowne Borough would conduct one construction inspection. Instead of paying \$260 for that inspection they would pay \$195 for a savings of \$65. (See Table 5D for more on Lansdowne Borough).

MCM 5 – Post Construction Stormwater Runoff Control

Inspections for post construction site runoff are required as part of the MCM 5 regulations. This is another area of potential cost savings if a shared strategy is used. Below are the assumptions we made when looking at the cost savings gained by working together on post construction inspections. These costs assume the participation of all five communities in this analysis.

- **Post Construction Inspection Costs** – The number of inspections in each municipality was estimated based upon population size. Thus, we allocated between one and five inspections to each municipality. Inspections were estimated at 4 hours of labor (inspection plus documentation) per inspection. Labor rates were based on a range of \$50 to \$80 an hour and, therefore, \$65 an hour was used in this estimate. Thus, we estimated that one inspection costs 4 hours x \$65 per hour = \$260.
 - *Individual Costs* – If each municipality separately completed their own post construction inspections, the cost would be \$260 per inspection (4 hours of labor at a rate of \$65 per hour).

- *Shared Costs* – If all five municipalities joined together to complete post construction inspections, we estimate that a one hour savings of labor would result per inspection. Thus, the cost per inspection would be \$195 per inspection (3 hours of labor at a rate of \$65 per hour). One way to divide up the shared cost would be to prorate each municipality's share based on the number of inspections conducted in their municipality. For instance, we estimated that Clifton Heights would conduct one post construction inspection. Instead of paying \$260 for that inspection they would pay \$195 for a savings of \$65. (See Table 5B for more on Clifton Heights).

MCM 6 – Pollution Prevention and Good Housekeeping

One possible way to fulfill the requirements of MCM 6 would be to conduct staff training in pollution prevention and good housekeeping techniques. Below are the assumptions we made when looking at the cost savings gained by working together on pollution prevention and good housekeeping programming for municipal staff. These costs assume the participation of all five communities in this analysis.

- **Staff Training** – It was estimated that each municipality should stage two staff training events per year and that planning for each event would involve 40 hours per event. Thus, 80 hours each year would be devoted to staff training at a cost of \$50 per hour of labor. (Cost estimates were based on known rates of professionals who conduct staff trainings of this nature.)
 - *Individual Costs* – If each municipality separately hosted two staff training events each year, each municipality would pay \$4000 (80 hours of labor at a rate of \$50 per hour).
 - *Shared Costs* – If all five municipalities joined together to stage two staff training events each year, the joint cost would be \$4000 (80 hours of labor at a rate of \$50 per hour). One way to divide up the shared cost would be to decide that each of the five municipalities will have an equal “share” in the staff training programming. Thus, each of the five municipalities would essentially pay for 16 hours of labor. Each municipality, therefore, would pay a total of \$50 x 16 hours = \$800 instead of paying \$50 x 80 hours = \$4000 for a substantial savings for *each municipality* of \$3200. (See the Table 5 series.) In this case, the product, two staff training events, would likely be of higher quality for a much lower cost per municipality and would provide municipal staff from neighboring municipalities a chance to network and share ideas. If fewer than five municipalities choose to participate, we estimate that \$4000 (80 hrs x \$50/hr) for development of staff training events is not changeable. Thus, a simple calculation of \$4000 divided by the number of participating municipalities will yield the cost to each municipality (\$2000 each if two

municipalities participate, \$1333 each if three municipalities participate, etc.)

- *Shared Costs Beyond the Scope of This Analysis* – We believe that shared staff training events are another compelling, cost-effective piece of this cost analysis and could bring municipalities to the table who did not participate in this analysis. Beyond five municipalities, we believe that the cost to coordinate with additional municipalities for staff training would not increase. (Costs for printed materials, supplies, or event space could increase because there would likely be more attendees at each event. However, we did not include these costs in the original analysis. We do not believe that these costs would be prohibitive.) Thus, if more than 5 municipalities wanted to participate in the development of staff training events, a simple calculation of \$4000 divided by the number of participating municipalities will yield the cost to each municipality (\$667 each if six municipalities participate, \$571 each if seven municipalities participate, etc.).

Annual Reporting

Below are the assumptions we made when looking at the cost savings gained by working together on annual report preparation. These costs assume the participation of all five communities in this analysis.

- **Annual Report Preparation** – It was estimated that each municipality spends 35 hours each year (Upper Darby about 50 hours due to a substantial number of outfalls) completing their annual report. Thus, in each municipality, 35-50 hours each year is devoted to annual report preparation at a cost of \$50 per hour of labor. (Cost estimates were based on known rates of professionals.)
 - *Individual Costs* – If each municipality separately generated an annual report, each municipality would pay \$1750 and Upper Darby would pay \$2500 (35 hours of labor at a rate of \$50 per hour; 50 hours of labor at a rate of \$50 per hour for Upper Darby).
 - *Shared Costs* – If all five municipalities joined together to complete one annual report, the joint cost would be \$3000 (60 hours of labor at a rate of \$50 per hour). As Upper Darby has the most outfalls to report upon, we estimated 10 hours beyond the 50 hour mark. One way to divide up the shared cost would be to decide that each of the five municipalities will have an equal “share” in the annual reporting costs. Thus, because completion of the report is of equal value to each municipality (regardless of number of outfalls, population, or parcels) each of the five municipalities would essentially pay for 12 hours of labor. Each municipality, therefore, would pay a total of $\$50 \times 12 \text{ hours} = \600 instead of paying $\$50 \times 35 \text{ hours} = \1750 (and $\$50 \times 50 \text{ hours} = \2500

in Upper Darby's case) for a substantial savings for *each municipality* of \$1150 (and \$1900 in Upper Darby's case). (See the Table 5 series.) In this case, the product, one jointly filed annual report, would likely be of higher quality for a much lower cost per municipality and would save the state the time and money involved with reviewing five separate annual reports.

Appendix J: Comparison of Potential MS4 Approaches - Matrix

Comparison of Potential MS4 Approaches						
Approach	Level of Service	Associated Costs	Equitability	Political Feasibility	Legality	
Individual MS4 Management	The level of service would remain comparable to the existing level of service in each municipality	Costs associated with this approach are expected to remain consistent with existing costs	This is a relatively equitable approach as each municipality is responsible for its own compliance	This approach is politically feasible, as it is essentially a status quo approach and would not require any changes in procedure	This approach is legally feasible, as it is essentially a status quo approach and would not require any changes in procedure	

Collaborative		Approach
Shared Stormwater Manager with Separate Permits	MS4 Managed by 1 Municipality (1 or More Permits)	
A further improved level of service would be expected due to the efficiencies that could be achieved by streamlining implementation processes.	An improved level of service would be expected due to the consistent approach across jurisdictional boundaries.	Level of Service
A reduction in costs associated with meeting MS4 requirements would be expected due to the additional economies of scale and implementation efficiencies that could be achieved. Participating municipalities would contribute to pay for stormwater manager's time. May cost more to hire a new staff member or consultant.	A reduction in costs associated with meeting MS4 requirements would be expected due to certain economies of scale. Participating municipalities contract to pay another municipality to complete MS4 paperwork using existing staff. Least expensive option.	Associated Costs
Having one stormwater manager equally responsible for all participating municipalities would provide the opportunity to spread the burden of compliance more equitably.	The burden of managing all MS4 requirements for all participating municipalities fall onto one community, which serves the role of stormwater manager.	Equitability
Having one stormwater manager equally accountable to all participating municipalities would level the playing field for approaching MS4 requirements collaboratively.	Although effective, collaboration takes place on other issues. Relinquishing control of MS4 program management may not appeal to all municipalities.	Political Feasibility
Would seem legally feasible based on the existence of other inter-jurisdictional agreements in the state.	Would seem legally feasible based on the existence of other inter-jurisdictional agreements in the state.	Legality

Establish Stormwater Authority	Approach	Shared Stormwater Manager Under Joint Permit
Level of service improvements comparable to those associated with collaborative MS4 management would be expected. Level of service could be expanded as future needs/desires dictate.	Level of Service	A further improved level of service would be expected due to the efficiencies that could be achieved by streamlining reporting efforts processes.
This approach would establish a system for collecting a dedicated revenue stream for MS4 activities. In addition, cost reductions to overall program could be expected from incentives that encourage increased property owner management in stormwater activities.	Associated Costs	Even greater cost reductions would be expected due to the resulting reductions in reporting requirements. Participating municipalities would contribute to pay for stormwater manager's time. May cost more to hire a new staff member or consultant.
Greater equitability would be expected community members' responsibility for MS4 requirements could be more closely tied to their contribution to stormwater runoff.	Equitability	
Loss of ability to act independently may not appeal to all municipalities.	Political Feasibility	
Questionable, but would likely require amending existing authority enabling legislation.	Legality	Precedent for joint MS4 permitting exists across the country as well as in Pennsylvania.