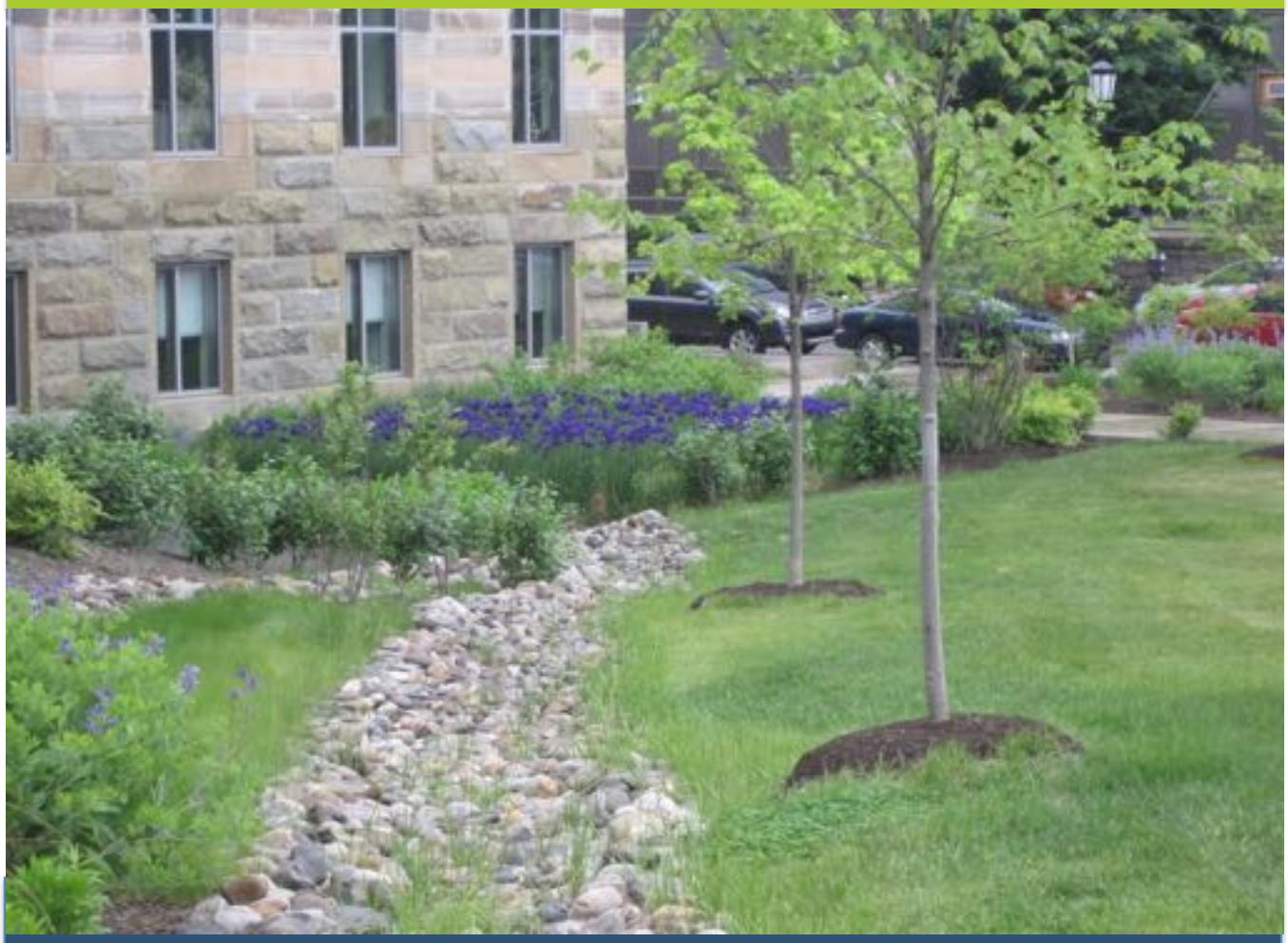
November 2014

Applying Asset Management to Stormwater: A Guidebook for the City of Scranton, Pennsylvania



APPLYING ASSET MANAGEMENT TO STORMWATER: A GUIDEBOOK FOR THE CITY OF SCRANTON, PENNSYLVANIA

November 2014

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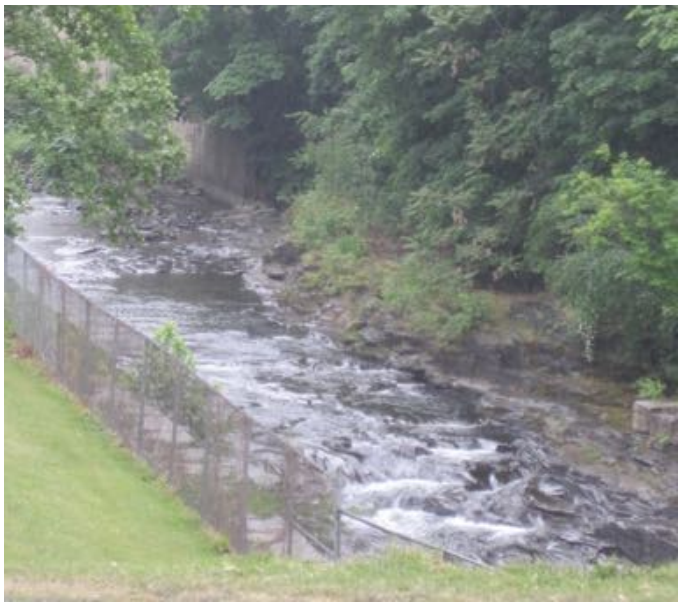
Stormwater in the City of Scranton

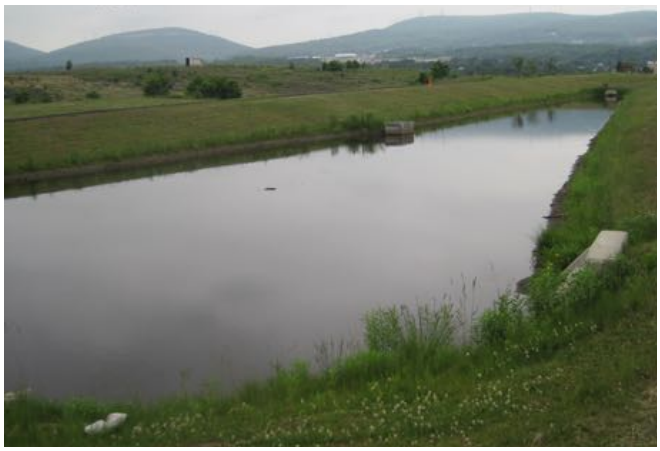


A view of the Lackawanna River from the Scranton Iron Furnaces Site

The City of Scranton is one of hundreds of municipalities in Pennsylvania holding a Municipal Separate Storm Sewer System (MS4) permit, and like many communities, has found itself in the position of dealing with aging infrastructure and the potential for more stringent requirements for managing stormwater into the future as growth continues across the region. Stormwater management in the City of Scranton has an additional layer of complexity, since the City is comprised of both a MS4 and Combined Sewer System (CSS), which is owned and operated by the Scranton Sewer Authority (SSA). Both the City and the SSA play an integral role in local efforts to improve water quality in the Lackawanna River, and are under stringent federal and state requirements to do so.

A Growing Need for Stormwater Management

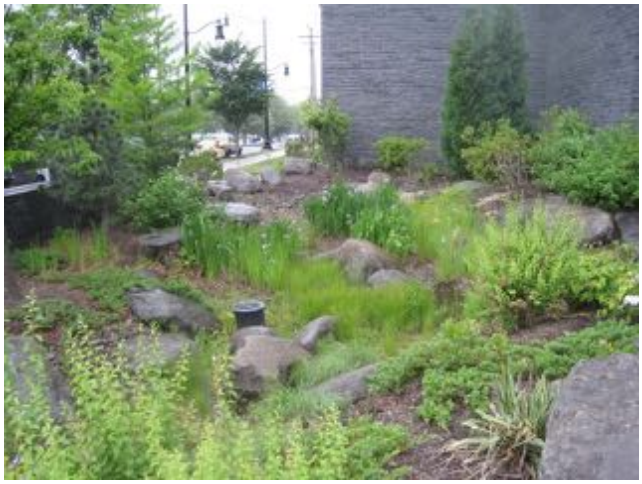
Stormwater infrastructure was originally constructed to convey water during rain events as quickly as possible to local rivers and streams. Since the Clean Water Act (CWA) was passed in 1972, communities are required through the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) permit program to not just *convey* water during rain events to local streams, but *treat* this often polluted water before it enters local waterways. Stormwater managers and operators in communities now must think about repairing and replacing the stormwater pipes that convey water to local streams *and* implementing best management practices (BMPs) that treat rain water before entering the stormwater pipe system.



A traditional display of stormwater manamgement at the Army Reserve in the City of Scranton.

For stormwater conveyance, the pipes, outfalls, and catch basins must be maintained, repaired, and replaced in order to mitigate any risks from overloading the system, while treating this rain water before it enters the system can be done using gray and green infrastructure practices. Gray infrastructure has been the widely used method of treating stormwater by holding the water in storage tanks, retention/detention basins, swales, etc. to slow the flow of rain into the pipes, lessening the burden after heavy rain events. As development pressures continue, adding to the impervious surface on our landscape, the

need to slow the flow *and* treat the rain water becomes more and more essential.



An exemplary display of green infrastructure at The Commonwealth Medical College in the City of Scranton.

Green infrastructure is quickly becoming a supplemental method used for communities looking to treat stormwater as cost-effectively as possible. This type of infrastructure, sometimes referred to as low impact development (LID), includes practices such as rain gardens, tree plantings, porous pavement, etc. which not only slows the flow of water, but mimics the natural environment allowing for nutrients to infiltrate into the earth. Like the drinking and waste water utilities that operate to ensure the integrity of the physical infrastructure, stormwater management also requires the capacity and resources to ensure the integrity of the conveyance system and the BMPs utilized to treat stormwater over time.

Project Support

In the fall of 2013, a Stormwater Management System Review was conducted for the City of Scranton for its MS4 and CSS. Funded by the National Fish and Wildlife Foundation (NFWF) and conducted by the Environmental Finance Center (EFC) at the University of Maryland, the Lackawanna River Corridor Association (LRCA), Thomas J. McLane and Associates, Inc., and Hatala Associates, the project concluded with an assessment and recommendation report for the efficient management and sustainable infrastructure of the system. The assessment made several recommendations to help the City's current stormwater management program become more efficient and robust through the effective use of existing resources. For more information on this assessment, visit: http://efc.umd.edu/assets/2013_scranton_nfwf_report_final.pdf.

In the spring of 2014, the NFWF awarded the EFC additional funding to provide the City with guidance on building a comprehensive asset management program for stormwater, a tool that can help the City advance its stormwater program with limited resources. The EFC enlisted the help of the Southwest Environmental Finance Center's (SWEFC) Director to train the City of Scranton's key stormwater staff and consultants in asset management and provide much of the content contained in this guidebook. The Director's expertise in asset management for drinking water and waste water utilities across the country is renowned. This expertise, combined with the EFC's experience working with communities on stormwater management and finance in the Chesapeake Bay region and beyond, led to the creation of a guidebook for Scranton to use to set up an asset management program for stormwater.

Project Approach

The Project Team, consisting of the EFC and SWEFC, worked closely with the City of Scranton staff and consultants to train them on utilizing asset management for the City's stormwater program. The Project Team conducted a two-day training in June 2014 with City staff including the Planner, Public Works Director, Engineer, and Business Administrator, as well as the LRCA Director on stormwater asset management. Prior to the training, the Project Team coordinated participants completing an Asset Management I.Q. test developed by the SWEFC as a way to gauge the City's current knowledge of its stormwater system. The training then included an introduction to the five core components of asset management. The SWEFC Director also provided the City with a full copy of the Environmental Finance

Center Network's A.M. KAN Work! tool. This tool was developed with funding from the Kansas Department of Health and Environment (KDHE) and is meant to be a self-help guide. It contains video clips of communities who have engaged in asset management activities to provide opportunities for peer to peer learning.

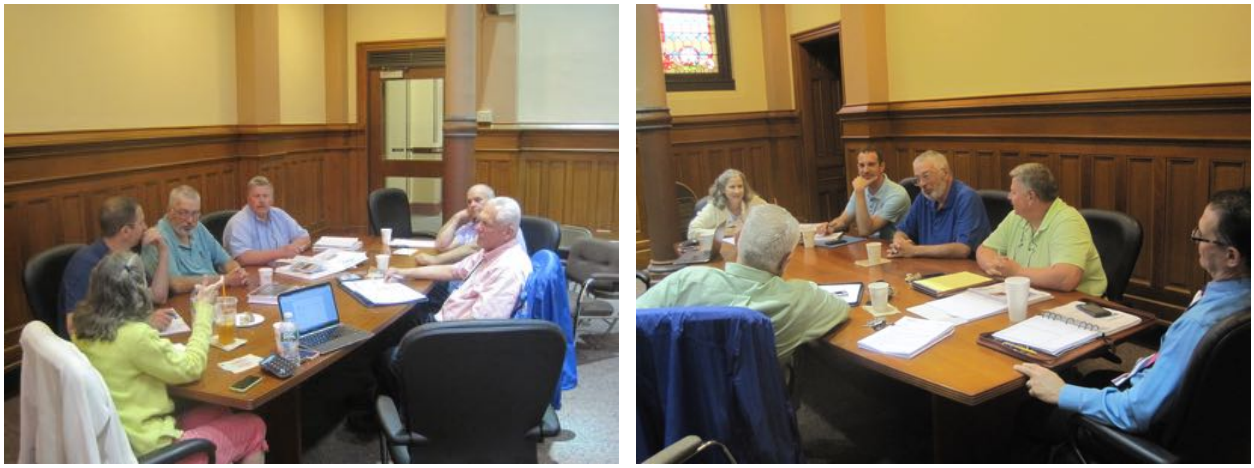


Photo of City staff and consultants hard at work during the stormwater asset management training held in June 2014 as part of this project.

In addition to the A.M. KAN Work! tool, the Project Team supplied Scranton with a punch list meant to serve as an interim set of recommendations for City staff to begin thinking about and implementing in order to develop a more robust stormwater asset management program. This list highlighted ways in which the City could begin developing an asset management program for its existing storm sewer system, encouraging staff to adopt some level of improvements immediately.

The Project Team's final deliverable is reflected in this guidebook developed for the City to help build a comprehensive asset management program for stormwater, a tool that can help the City advance its stormwater program with limited resources. The Guidebook is a collaboration that draws on the expertise of the SWEFC Director with the EFC's experience working with communities on stormwater management and finance in the Chesapeake Bay region and beyond. The Guidebook contains a process for implementing each of the five steps of asset management as well as several spreadsheets specifically developed for the City that addresses: 1) inventory of assets; 2) calculating the criticality of the system; and 3) capital improvement planning. Additionally, this process can be used as a model for working with other communities in the Chesapeake Bay region. The EFC Project Team presented the guidebook to City staff, elected officials, and the Mayor in mid-November 2014.

What is Asset Management?

Asset management, as defined by the SWEFC, is to maintain a desired level of service at the lowest life cycle cost. In simple terms, it provides a means of determining the best way to spend your limited dollars to achieve the maximum impact. In these times of "doing more with less," it's about "doing less better." There is no way to achieve everything you want to with a severely reduced budget, but it is possible with asset management techniques to achieve the maximum result within the available funding. Asset management provides a framework to make data driven decisions about how to operate, maintain, repair, rehabilitate, and replace assets. There are five core components of asset management:

1. **Current State of Assets** – Inventories all of the physical components of the facility and/or conveyance system. It is the most straightforward aspect of asset management.
2. **Level of Service** – Enables you to set goals for the facility and/or conveyance system regarding the services you want to provide.
3. **Criticality** – Used to determine which assets are the most vital to the sustained operation of the facility and/or conveyance system.
4. **Life Cycle Costing** – Builds upon the information regarding the first three components – what assets the City owns, what the City wants them to do, and which ones are critical to the sustained operation, which provides a framework to start making informed decisions about the operation, maintenance, and replacement of assets.
5. **Long-term Funding** – Managers must determine how much money they need to operate and maintain the assets and how much they need to replace or rehabilitate the assets over time. It is important to determine how to maintain adequate funding over time to achieve a desired level of service identified throughout the process of developing an asset management program.

Why Asset Management for Scranton

The issue of paying for stormwater, incorporating both gray and green infrastructure practices, looms large as Chesapeake Bay communities prepare to deal with a set of stringent regulations. The City of Scranton poses no exception, with both a MS4 and CSS to contend with, Total Maximum Daily Load (TMDL) allocations for the Lackawanna River and local tributaries, and additional regulations that require stormwater infrastructure to be maintained and replaced to accommodate urbanization in the region. Given the growing costs of managing stormwater and the City's limited budget, it is important that the City be able to deal effectively in a cost-efficient manner with the aging infrastructure that comprises the stormwater system. Managing infrastructure assets over time and continually addressing resource gaps has proven to be a cost-effective measure that can improve the functionality of a stormwater program.

Not only will an asset management program help the City maintain its system over time, a program set up to manage the stormwater system's assets will allow the City to do more with less, and mitigate the risks posed by heavier rain events and an aging system. An asset management program that includes a prioritized list of projects (capital improvement plan) also helps the City's stormwater staff communicate with the local decision makers on the investment needs that are required in order to keep the system from failing, which can be detrimental to the City's fiscal, environmental, and public health. Without an understanding of the community's needs regarding stormwater infrastructure, local decision makers are not able to make informed decisions about the level of investment required to adequately manage stormwater.

Asset Management Program Guidebook

Getting Started

The best way to get started with asset management is to just do it. Choose one area that seems reasonable to you and start there. Since the City of Scranton does not have a map of all stormwater assets, that is a great place to start – completing the map. A map can be completed at any sophistication level from a hand-drawn map to a map using free software, such as Google Earth or Mapquest, all the way to a Geographic Information System (GIS) map.

Once you jump into asset management, you will learn what information you need to have and then you can start collecting it. As you collect the information you need, the program will improve. You can start with any of the five components and you will naturally be led to each of the other components.

Measuring Progress

It's very important to measure the progress of your program. You want to be able to tell your staff, your elected officials, and your community members how well your program is working. One tool to help measure progress is the Asset Management IQ tool. This tool is a series of 30 questions that are all multiple choice with a score of 0 to 5 points per question. The 0 point answer indicates that nothing is being done in this area and the 5 point answer shows the organization is at the level they need to be for that item. It is recommended that a community undertake the IQ test at the very beginning, prior to starting any activities in asset management, in order to establish a baseline. Then, the IQ can be repeated on a routine basis, such as once a year, to measure the improvement in asset management implementation. Because the 30 questions are divided into six sections (one general section and one section for each of the five core components), by comparing scores from the individual sections, it is possible to tell how the community has improved in each part of the process. This tool can identify strengths in the program – places where the community is doing very well in asset management implementation as well as weaknesses in the program – places where additional activities may be required. The IQ tool is available on-line through the Environmental Finance Center Network.

Resources

There are many resources to help a community establish an asset management program. One tool is the Environmental Finance Center Network's A.M. KAN Work! tool. This tool was developed with funding from the Kansas Department of Health and Environment (KDHE) and is meant to be a self-help guide. It contains video clips of communities who have engaged in asset management activities to provide opportunities for peer-to-peer learning. In fact, one of the best resources for any community is another community that is also engaged in asset management. It is important to reach out to other people who are engaged in asset management and share experiences, advice, what worked well, and what didn't work so well. Sharing this type of information can really help you advance your own program.

Five Steps of Asset Management

The following sections break down each of the five core components of asset management. This is meant to provide the guidance and tools necessary for the City of Scranton to move forward with implementing a stormwater asset management program.

1. Current State of the Assets

Develop Asset Inventory

A fundamental aspect of the overall asset management process is determining what physical assets make up the system. In this component, it is necessary to answer the following questions:

- What assets make up the stormwater management system?
- Where are the assets located?
- What is the useful life remaining of each asset?
- What is the value of the assets?
- What is the current condition of the assets?
- Does the asset require energy?

This step involves taking an inventory of your assets so that you know what components are in your system. You will also want to collect information on the assets you own, such as: date of installation, condition, serial number, manufacturer, suggested maintenance, type of material, size, etc. The information can be stored in a computer program, such as a spreadsheet or database, or it can be stored using a commercial product specifically designed for asset inventory. This component also involves developing a map of your stormwater assets so you know where your assets are located.

A complete asset inventory (or as complete as possible) is the eventual goal of an asset management program. However, given the number of assets and information gathering required, it is not practical to complete this process in a short time period. This task should be done in steps over a reasonable time horizon.

The starting point for the inventory should be to inspect and inventory particular asset classes:

- Stormwater conveyance system -- stormwater outfalls and catch basins
- Stormwater treatment system -- public and private stormwater BMPs; green infrastructure BMPs

The best way to complete this inventory, given the extremely large number of assets in these classes, would be to complete the asset inventory over a 5-year period. This timeframe is ideal because approximately 20-25% of these outfalls and catch basins must be inspected each year to meet requirements for Scranton's MS4 permit. It is recommended that the inventory be completed by gathering the asset inventory information at the time of the inspections of each of these assets. If an inspection schedule is not currently in place, the City must first **determine a schedule of inspections (how many assets will be inspected when).**

Here is a checklist of items you'll want to capture and create, as a minimum:

- ✓ GPS locations
- ✓ Digital Pictures
- ✓ Excel database with unique identifier numbering system
- ✓ Collect serial numbers, if applicable
- ✓ Name/address/phone for the owner or entity responsible for maintenance if located on private property
- ✓ Year installed, if known
- ✓ Maintenance records

- ✓ Estimating the remaining useful life
- ✓ Discharge area (where applicable)
- ✓ Discharge to combined sewer or separate storm sewer
- ✓ Condition assessment

Use an inspection sheet for each inspection for both the stormwater conveyance system and treatment system. Inspection sheets have been created for the conveyance system for the City to modify as needed, see the following pages. The City should develop inspection sheets for the treatment system.

Since Scranton relies on the Lackawanna County Conservation District (LCCD) to inventory and track all *new* stormwater management BMPs, the City should develop a protocol to retrieve and track all BMPs in house. As part of the initial project, the EFC recommended the City work closely with the LCCD to track all stormwater projects, and that once a new BMP is constructed, there must be a formal procedure in place for ensuring all BMPs were implemented as designed. The City must keep an inventory of all post construction stormwater management BMPs and inspect privately-owned BMPs.

A picture should be taken of each asset and indicate where the picture is stored. A staff member(s) should be responsible for inputting inspection information into an excel spreadsheet following the inspection of each stormwater asset as part of the conveyance and treatment system. See "Spreadsheet 1. Asset Inventory" for an example of what an asset inventory and maintenance records spreadsheet looks like, and modify this spreadsheet to fit the City's needs.

Asset Management for Stormwater versus Drinking and Wastewater

While it has become common practice for communities to maintain drinking water and waste water infrastructure to ensure the health and safety of its users, stormwater infrastructure has not received the same attention. Drinking and wastewater customers make a clear connection between the utility rates they pay and their individual health and safety, enabling robust drinking and wastewater utilities to be set up over time. For stormwater the connection is still being made, resulting in a lack of investment in stormwater infrastructure that is required to mitigate the environmental and public health risks associated with impaired waterways.

Although stormwater infrastructure looks and acts differently than drinking water and wastewater, there are many overlaps between these sectors of water infrastructure, and asset management provides a framework for which all can be managed. In this very general context, asset management can be used for making smart decisions with a limited budget. It has become common practice for waste water and drinking water operators to utilize asset management in making decisions about investing in the physical infrastructure that conveys and treats these essential utilities in modern American communities, repairing and replacing assets strategically so that the risk is reduced for all users. In this case, the only difference between waste and drinking water and stormwater is the physical infrastructure that is necessary to convey and treat the water. But the same process can be used for developing an asset management program to help guide strategic decision-making.

Catch Basin Inspection Guide

Person Conducting Inspection: _____ Date of Inspection:_____

Phone Number: _____ Take Picture of Catch Basin and

E-Mail Address: _____ Indicate Where Picture is Stored

County:_____ _____

Township:_____

Asset Description:	Material: Shape of Basin: Size: Inlet Diameter: Pipe Material: Outlet Diameter: Pipe Material: ID #: Installation Date: Age: Catch Basin Discharges from Structure: _____ Yes _____ No If Yes, ID Number of Outfall: _____	Location:	Lat:_____ Long: _____ Street Location: _____
Condition:	Excellent Good Fair Poor	Estimated Remaining Useful Life:	
Estimated Replacement Cost:			
Comments on Catch Basin: (Include any information regarding the catch basin that is not otherwise included above)			

Catch Basin Inspection

Weather Conditions: (Circle One) Dry Dry But After Rain

Time, if same day, or Date (if no rain on date of inspection) of last Known Rain Event:_____

Maintenance Required Based on Inspection (Circle All That Apply)	Tree Work Required New Grate Required Pipe is Blocked Frame Maintenance Required Remove Accumulated Sediment Pipe Maintenance is Required Basin Undermined or Bypassed	Cannot Remove Cover Ditch Work Corrosion at Structure Erosion Around Structure Remove Trash & Debris Need Cement Around Grate	Other:_____ _____ _____ _____ _____
Catch Basin Grate Type (Circle One):	Bar Cascade Other: _____ _____ Properly Aligned: ___ Yes ___ No	Sediment Buildup Depth (Circle One):	0-6 inches 6-12 inches 12-18 inches 18-24 inches 24+ inches
Description of Flow (Circle One):	Heavy Moderate Slight Trickling	Is the Outlet Submerged with Water (Circle One):	_____ Yes _____ No If Yes, approx height above outlet invert: _____
Is There: Flow Standing Water Circle All That Apply	Color: _____ Odor:_____ Other:_____	Circle What's Present (Circle One):	Foam Sanitary Waste Orange Staining Excessive Sediment Oil Sheen Bacterial Sheen Floatables Pet Waste Other _____
Comments regarding visual observations and potential illicit discharges:			

Stormwater Outfall Inspection Guide

Person Conducting Inspection: _____ Date of Inspection:_____

Phone Number: _____ Take Picture of Outfall and

E-Mail Address: _____ Indicate Where Picture is Stored

County:_____ _____

Township:_____

Asset Description:	Material: Size: ID #: Installation Date: Age: Circle One: Pipe Outfall or Ditch Outfall Pipe Shape (circle one): Circular – Rectangular – Elliptical – Egg – Other Ditch Outfalls Back Slope: Fore Slope: Bottom width:	Location:	Lat:_____ Long: _____
Condition:	Excellent Good Fair Poor	Estimated Remaining Useful Life:	
Estimated Replacement Cost:			
Comments on Outfall: (Include any information regarding the outfall that is not otherwise included above)			

Dry Weather Flow Inspection

Weather Conditions: (Circle One) Dry Dry But After Rain

Time, if same day, or Date (if no rain on date of inspection) of last Known Rain Event:_____

Outfall Flow (Circle One): None Observed

Outfall Flow (Circle One):	None Observed Heavy Flow Moderate Flow Low Flow Trickle of Water	Color of Water in Outfall (Circle One):	N/A Green Yellow Brown Gray Blue Other:_____
Odor Present at Outfall (Circle One):	N/A (no flow) None Musty Sewage Solvent Sulfur Oil Gasoline Other: _____ _____	Floatables Present At Outfall (Circle One):	None Oil Sheen Sewage Foam/Bubbles Algae None:_____ _____
Turbidity of Water at Outfall (Circle One):	Clear Cloudy Opaque	Status of Potential Illicit Discharge (Circle One):	No Flow Low Priority Medium Priority High Priority
Source of Potential Illicit Discharge	None Industrial Commercial Other:_____	Description Of Site (Circle One):	Litter Contaminants Other site concerns: _____
Comments regarding visual observations and potential illicit discharges:			

The EFC recommends that while the inspection is taking place for each asset, the condition of the asset should also be assessed, making the asset management program development process much more efficient. Use the inspection sheets to mark the condition of assets. Here are a few items to keep in mind:

- Rate the condition on a scale from 1 to 5 or excellent-poor scale.
- Determine what each number (1 to 5) or word (excellent to poor) means for assets in that class.
- Compare assets within their own class. For example, compare a catch basin condition to another catch basin condition. Do not mix apples with oranges.
- Utilize past history to determine a priority for assessing assets. For example, if you know some assets are in poor shape, then visit those assetsfirst.
- As the assets are inventoried, it is important to make an estimate of the replacement costs. Keep these in mind:
    - Shape and size of asset; and
    - Material (such as brick, concrete and/or metal for pipes).

Track Maintenance Activities

It is essential for the City to begin tracking all maintenance activities for each asset. Enter as many ***past*** maintenance activities on Spreadsheet 1 as possible. Put all new maintenance activities on the spreadsheet after the maintenance is completed.

2. Level of Service

It is important to know what you want your assets to provide for your community. We refer to this as the level of service. This is the step where you state what it is you want your assets to do, and this step can be done while simultaneously developing the inventory of all stormwater assets. For example, you may want your assets to be able to contain a storm of a certain size without flooding streets.

Level of service is directly tied to cost. Higher levels of service mean higher cost. It is important for community members who will be paying for installation and upkeep of stormwater assets to understand this connection. If they want you to provide a higher level of service, you can do that, but it will cost them more money. The more directly the community members understand this connection, the easier it will be for you to receive the money you will need to install and maintain your assets.

As an initial starting point, Scranton should develop at least two goals for its stormwater management system. These goals should meet the following “SMART” critieria:

- ✓ Specific
- ✓ Measurable
- ✓ Attainable
- ✓ Realistic/Relevant
- ✓ Timebound

It is important to choose goals for which you have information to measure them or to choose goals for which you can start collecting the information to measure them. Once the goals are selected, choose a time frame in which you want to measure them. For example, once a month, every quarter, once a year, etc.

Over time, additional goals can be added but it is good to start with just a few goals. Perhaps the same 5 year time frame can be used and 1 or 2 goals can be added each year for a five year period. At the end of that time frame, Scranton would probably have most of the goals they would want.

3. Criticality

Not all assets are equally important to the system. Some assets are going to be much more important than others. It is important to be able to identify those assets that are more critical because those assets require more attention. There are two components of criticality: how likely the asset is to fail, referred to as the probability of failure, and how serious the consequence is if it does fail, referred to as the consequence of failure. An asset that is highly likely to fail and will cause serious consequences if it does fail is much more critical than one that is unlikely to fail and it doesn't matter if it does.

Conducting the Criticality Analysis

Probability of Failure (POF) -- Rank Each Asset from 1 to 5 on its likelihood to fail. Assets ranked 1 are very unlikely to fail and those ranked 5 are highly likely to fail.

1	Very unlikely to fail (generally these are new assets and those that are relatively new with excellent condition)
2	Unlikely to fail (assets with good condition and no other condition likely to cause failure)
3	Moderately likely to fail (these are assets that are in good to fair condition and have not shown signs of failure yet)
4	Highly likely to fail (these are assets that are in noticeably fair to bad condition, have shown preliminary signs of failure)
5	Extremely high likelihood to fail (these are assets that are in noticeably poor condition, have already shown signs of failure or have failed in the recent past with likelihood of failing again)

Consequence of Failure (COF) -- Rank Each Asset from 1 to 5 on its consequences of failure. Assets ranked 1 have very low consequences of failure and those ranked 5 have very high consequences of failure. Consequences can be financial, social, or environmental. The rankings should be considering all three.

1	Very low consequence of failure (assets that have little to no consequence if they fail)
2	Low consequence of failure
3	Moderate consequence of failure
4	High consequence of failure
5	Extremely high consequence of failure (assets that have extremely high consequence in one or all of the categories)

Calculate the risk ranking for each asset by multiplying the POF by the COF. See "Spreadsheet 2. Criticality Calculation" to automatically calculate the risk ranking, which is done as soon as the numbers are entered for POF and COF.

Once the assets that are more critical to the system are identified, extra efforts can be made to ensure that these assets are properly maintained and are replaced when needed in oder to prevent catastrophic events from happening.

4. Life Cycle Costing

Once assets are installed, there are two major activities related to them. One is the operation and maintenance (O&M) of the assets and the other is replacement of the assets. O&M represents those day to day activities that are done to the assets. We know that doing more preventative and routine maintenance on our assets can help extend their life, but we also know that these activities take time, money, and resources to complete. Therefore, we have to balance what to do, when to do it, and which assets to do it on. The best way to make these decisions is to consider the criticality – or risk – of the assets. We want to focus our preventative maintenance program on those assets that are most critical to the system. We don't want these assets to fail, so we want to do all we can to prevent the failures.

At some point, all assets will have to be replaced. The question always arises of when to replace the assets. Similar to the situation with the O&M activities, it is important to think of risk when considering asset replacement. Those assets that are of greatest risk or criticality should be replaced sooner before a failure occurs and those assets that are low risk should be allowed to fail prior to replacement.

Developing a Capital Improvement Plan

At this point in the process, the City can begin developing a capital improvement plan to aid in identifying which assets can be maintained, and which assets need replaced. Use "Spreadsheet 3. Capital Improvement Plan" to enter the following information, and modify as needed:

1. Develop list of all assets that rank 16 to 25 in Total Risk (this is the calculation of POF * COF) Determine the remaining useful life (listed on inventory sheet) of each of these assets
2. Add the asset to the Capital Improvements Table in Total Risk Rank Order
3. Use useful life as a secondary order for assets with the same total risk score (For example, if two assets are ranked 20 and one has a useful life of 2 years and one has a useful life of 3 years, the 2 year asset would rank higher than the 3 year asset)
4. Add the estimated replacement cost from the inventory to the capital improvements table
5. Examine the maintenance history of assets listed on the Capital Improvement Plan
6. Consider whether continued maintenance of each asset is a viable option or whether it would be cost inefficient to continue maintaining the asset
7. Consider whether the asset can be rehabilitated rather than replaced. Estimate the cost of this option verses the replacement cost.
8. For any assets that cannot be addressed through steps 6 or 7, replacement will be required
9. Place the capital improvement cost in the final column (see directions on the spreadsheet)
10. Add the total cost of the Capital Improvement Cost column

5. Long-term Funding Strategy

Managing assets always requires adequate funding. Funding is needed to perform routine and preventative maintenance, to hire and pay for staff, to repair assets, and to replace assets. It is important to determine how much money is needed to properly sustain the stormwater assets over time and to have a means of obtaining the needed funds. There are many ways of getting the necessary revenues. No matter what method is used, it is important to involve the community members who will

benefit from the stormwater assets in the process so that they are supportive of the revenue generating approaches used. They need to understand that the assets are providing a service to them and that they need to pay for this service. The more directly they understand this connection, the better able the community will be to collect and maintain the necessary revenue.

In the initial project, the EFC recommended the City continue using general funds to support the stormwater activities, and in addition, create a dedicated stormwater fee to help the City pay for stormwater management over time. This recommendation still holds true, and once the City goes through the steps to develop an asset management program and has a long-term capital improvement plan in place, can look to the finance strategy within the first report as a guide to setting up a fee if that is the direction the City takes.

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