MS4 Permit Program Management

Perspective based on USEPA Expectations

Southwest Pennsylvania Commission
Community & Recreation Center at Boyce Matthew Park
Upper St. Clair, PA
May 18, 2016

Michael T. LaSala, CMS4S(CPMSM), CSI
Senior MS4 Program Analyst

Land Studies

Introduction - Agenda

Introduction and Background (10-15 minutes)

“It’s about the streams” (15-20 minutes)

SWMP Development (10-15 minutes)

How the MCMs support the SWMP (10-15 minutes)

SWMP Development Example (10-15 minutes)

What to expect is EPA reviews your SWMP (15-20 minutes)

Mock Audit Examples (20-30 minutes)

Inspection variances (20-25 minutes)

Other considerations and final thoughts/discussion (20-30 minutes)

MS4 Permit Program Management

Introduction & Background

Land Studies

Stormwater Management - A "Brief" History

- Evidence stormwater was managed back to the Bronze Age as villages emerged.
- Primary management over the past 2500 years aimed at collecting and conveying stormwater to a stream, river, etc. (flood control) for the most part
  - Storm Sewers (open and closed)
  - Combined sewers
- Stormwater managed for a variety of factors: nuisance, irrigation, preservation, and so on
- Nuisance issues were customarily the driving factors in system design upgrades and innovation.
  - Flooding issues followed by water quality or "back and forth."

LandStudies

Storm Sewers (or Storm Drains)

- Ur (Lower Mesopotamia)
  Evidence of a “crude” drainage system dating back to around 5000 B.C.

- Mohenjo-Daru (Pakistan)
  Evidence of a more comprehensive and well-designed system that appears to have addressed capacity dating back to around 2500 B.C.

- Crete (and Greece to an extent)
  Evidence of a complete conveyance system of inlets, channels, and outfalls to collect and discharge stormwater runoff as early as 2000 B.C.

- Roman Empire
  Extensive systems throughout the empire that further addressed developed structures such as roads as a part of the conveyance system, implementation of complex underground piping/sewer systems, capacity, and “Green Infrastructure”

Storm Sewers (or Storm Drains)

- Middle Ages

  Took several steps backwards in the early part. Example: evidence of open ditches as the primary choice for stormwater management from around 700-1300 A.D. in western Europe.

  "Advancements" from 1300-1800 A.D. and can be seen in the extensive structures built in Paris and London.

- Modern Day

  More comprehensive systems with new materials in conjunction with the rise of industrialization.

  Still followed the same network "design" to convey stormwater by collect (inlets)—channel (piping)—discharge (outfall to river/stream, dry well, etc.) for the most part.

Roman “Gully Hole”

Ostia Antica (Harbor City of Rome)

“Downtown” Rome

Cloaca Maxima (“Greatest Sewer”)

Mouth (near the Tiber in Rome)

Underground(Near the Roman Forum)

Cloaca Maxima (“Greatest Sewer”)

Sewers of Paris

Cleaning Ball

LandStudies

Recent Considerations

- From around 1800 A.D. to early 20th century
  - "New" conventional systems built (addressing flood control)
  - Impervious coverage increasing
  - Noticeable decrease in water quality (primarily sewage) of receiving waterways

- Mid 20th century
  - Exponential rise in development, human activities, industrial activities, and so on
  - Increasing problematic issues associated with flooding and water quality

- Late 20th century
  - Development continuing (urban sprawl)
  - Flooding becoming more of a pressing issue along with accelerated erosion (capacity overload) in streams, waterways, etc.
  - Water quality an issue, but more of a back seat to flooding problems

- Present day
  - Water quality at the forefront ("large" 303(d) lists & TMDLs)

Water Quality “Problems”

“Managing” the Nuisance

Water quality is no longer observed as simply a nuisance in a general sense anymore, but is now a nuisance in a legal sense

LandStudies

Laws associated with recent considerations

1899: Rivers and Harbors Act
Oldest federal environmental law in the United States

1937: PA Act 394 “Clean Streams Law”

1948: Federal Water Pollution Control Act
Legislation calling for the **reduction** of water pollution

1972: **“Clean Water Act”** (Amendment to the original 1948 legislation)
Significant new language calling for the **control** of water pollution
Created the NPDES

1978: PA Act 167 “Stormwater Management Act”
Addresses accelerated stormwater runoff (flooding problems)
Considered “revolutionary” in its approach

1987: “Water Quality Act” (Amendment to the original 1948 legislation)
Additional language that specifically labeled stormwater a problem with respect to water pollution

1992: TMDL Procedural Regulations established
Total Maximum Daily Load of a pollutant or set of pollutants that a water body can receive while meeting water quality standards (designated uses, etc.)

Clean Water Act (CWA)

- Primary federal law governing water pollution.

- Primary objective/purpose is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by
  - Preventing point and nonpoint source pollution sources
  - Providing assistance to publicly-owned treatment works (WWTPs)
  - Maintain the integrity of wetlands

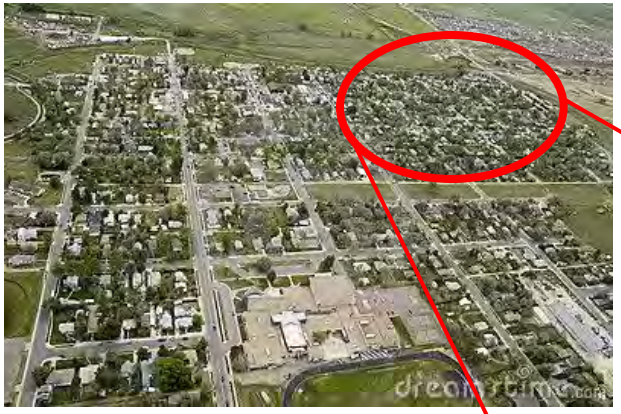
The primary pollution control strategy for point sources is the National Pollutant Discharge Elimination System (NPDES)

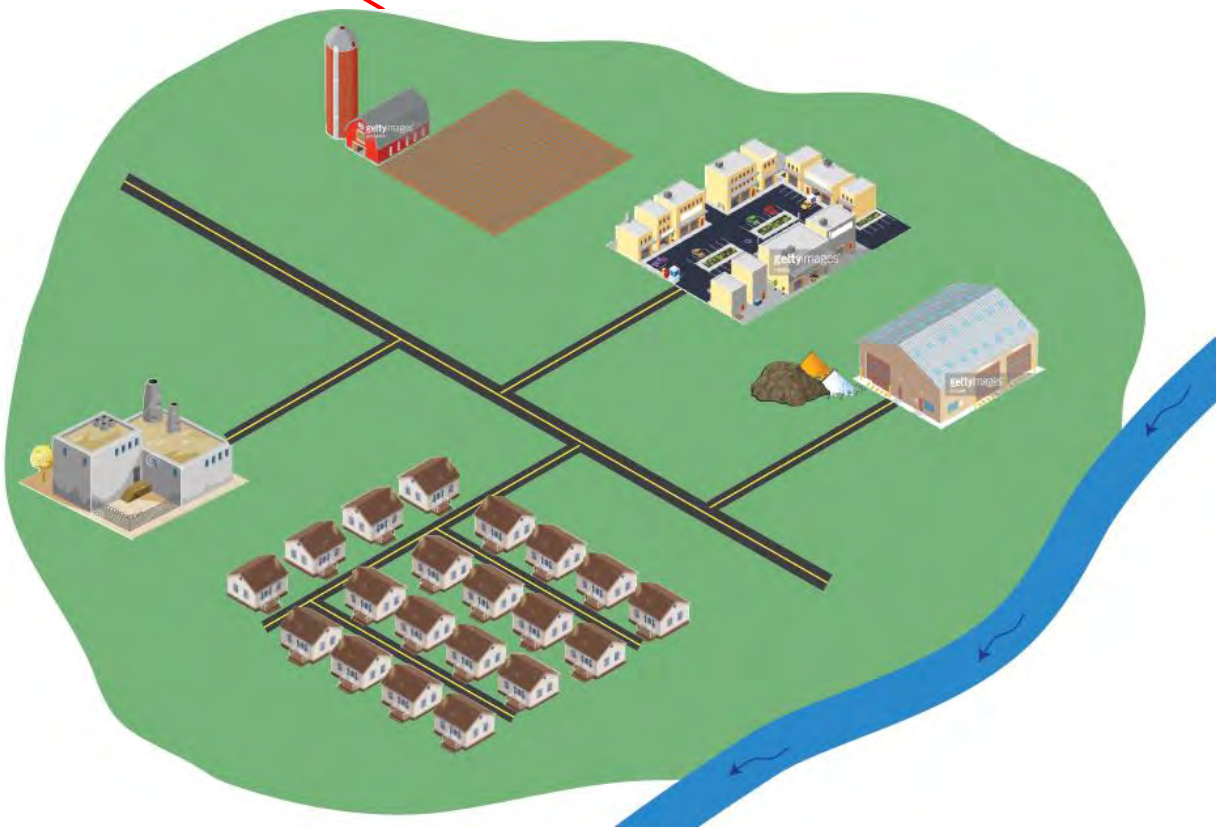
MS4 Permit Program Management

“It’s about the streams”

Land Studies

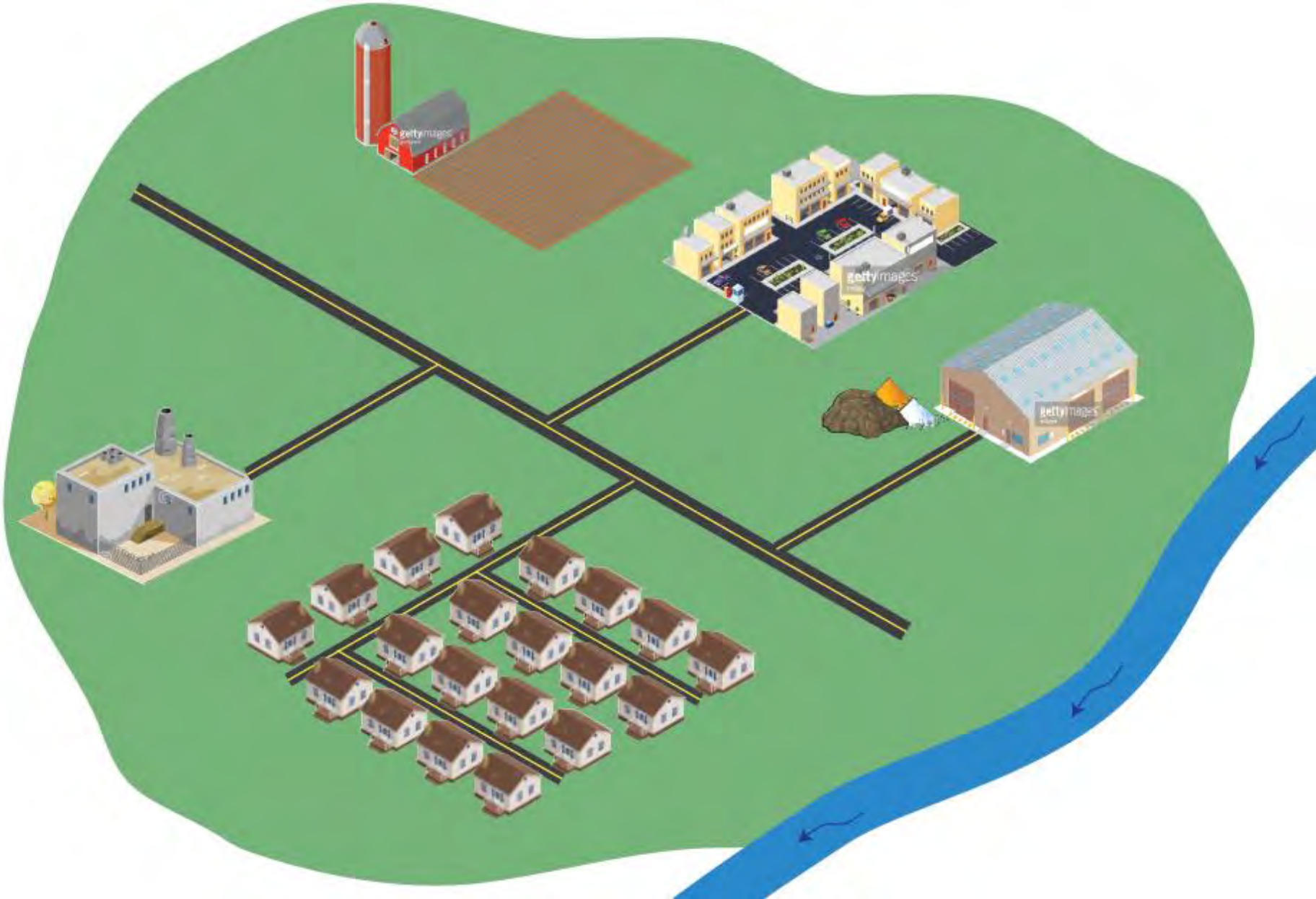
“Hometown, USA”





Clean Water Act – “It’s about the streams”

“Hometown, USA”



Clean Water Act – It's about the streams

The Clean Water Act (CWA) is the primary federal law in the United States governing water pollution.

Primary purpose of the CWA:

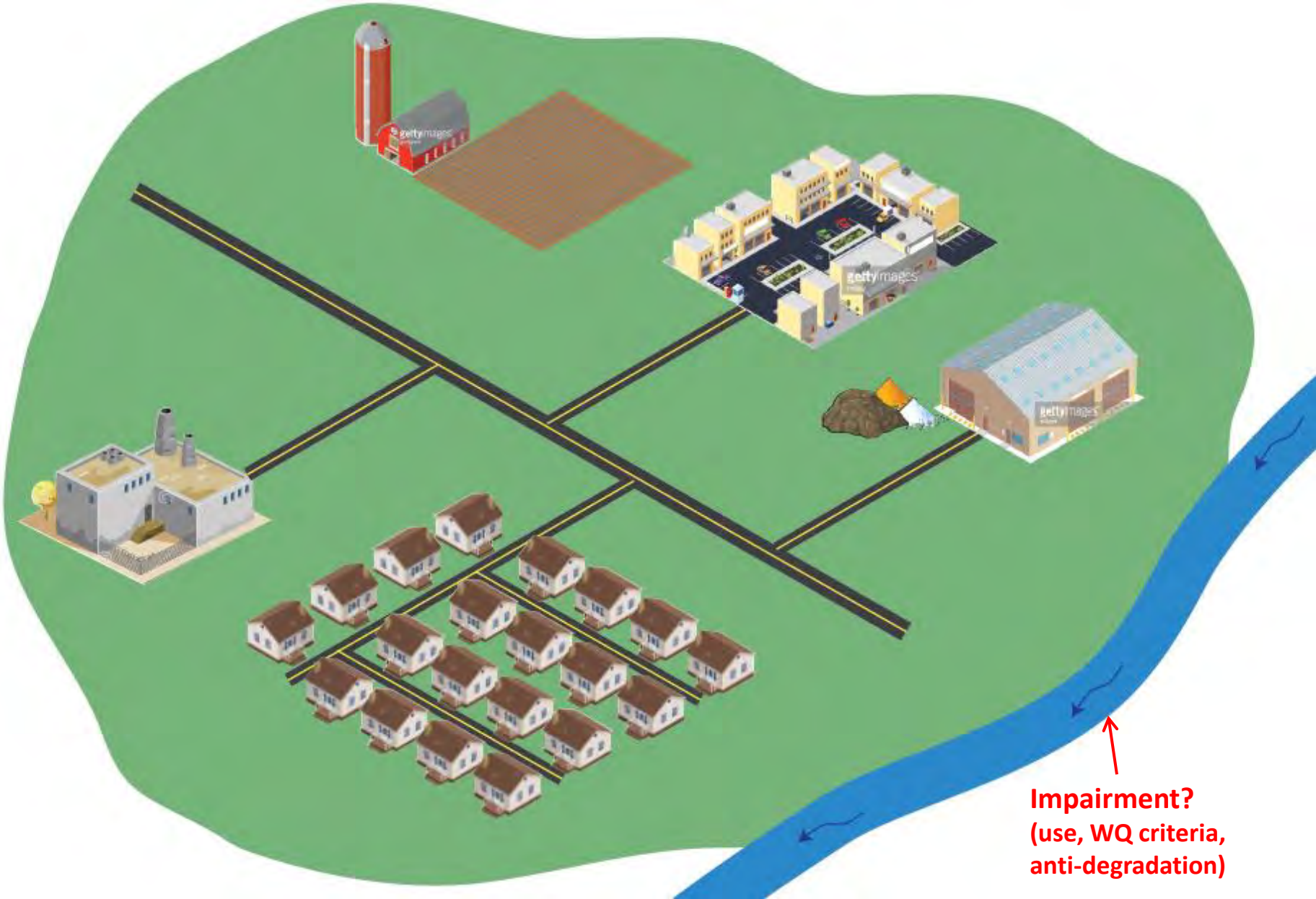
- Protect the beneficial uses of surface waters (recreational, drinking supply, habitat, etc.)

CWA Requirements for Water Quality Standards:

1. Designated Uses
2. Water Quality Criteria
3. Anti-degradation policy

LandStudies

“Hometown, USA” – impairment on waterway

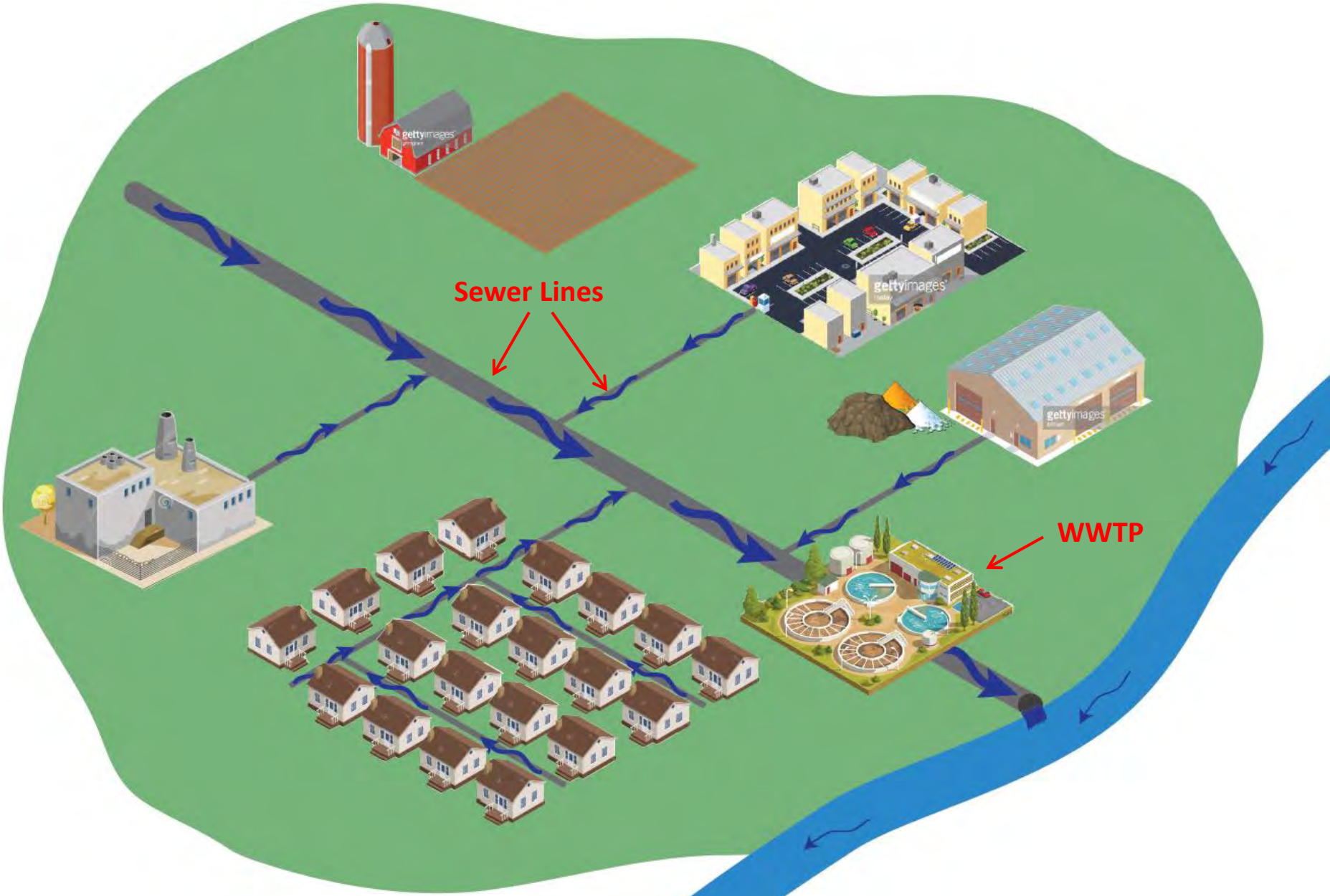


Municipal Facilities (Infrastructure)

Examples:

- Roads/Bridges
- Water Supply
- Sewer Lines
- Sewer Plant (WWTP)
- Parks
- Storm Drains
- Public Works Facilities

“Hometown, USA” – with a Wastewater Treatment Plant (WWTP)



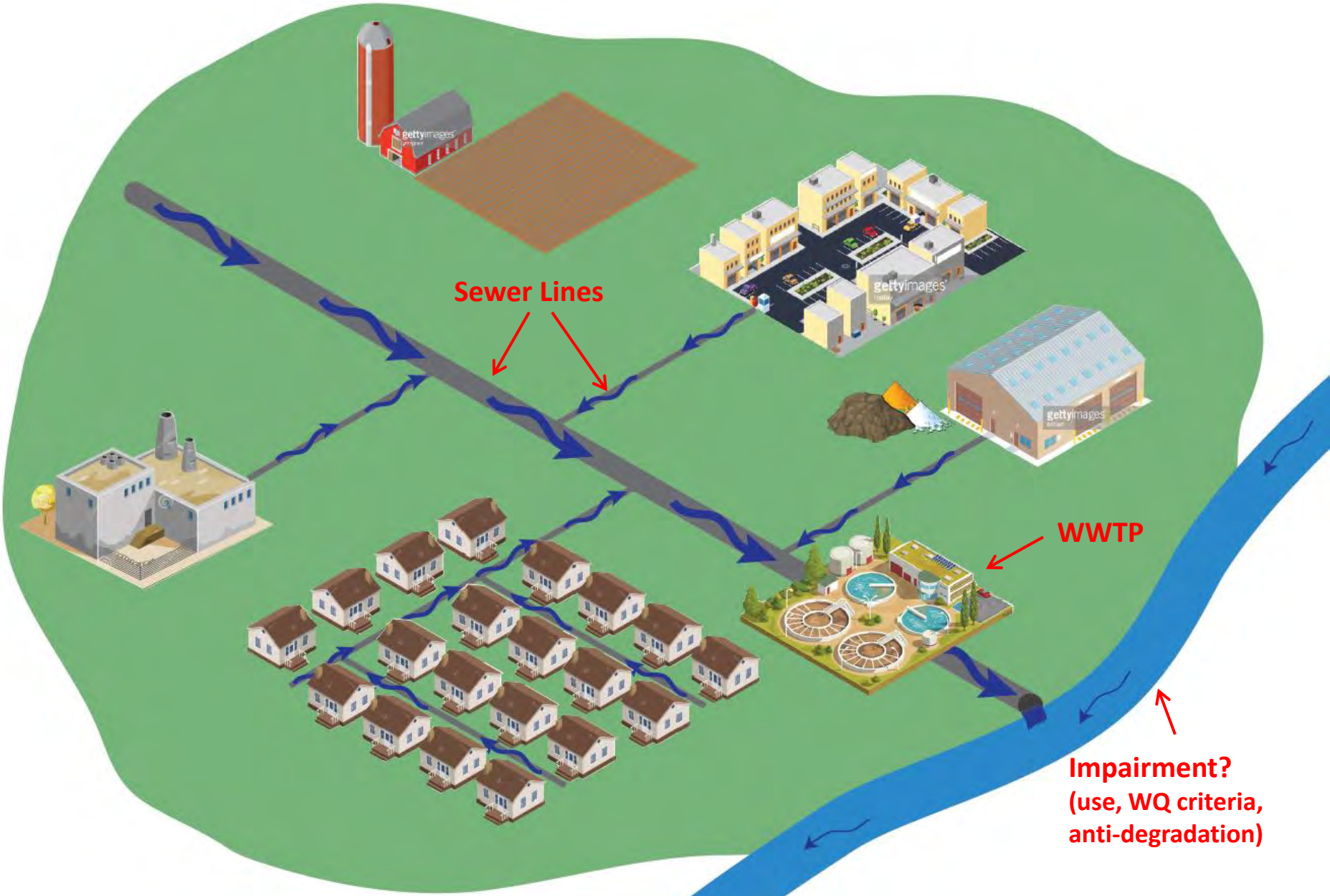
Outfall 101

*An **outfall** is the discharge point of a waste stream into a body of water*

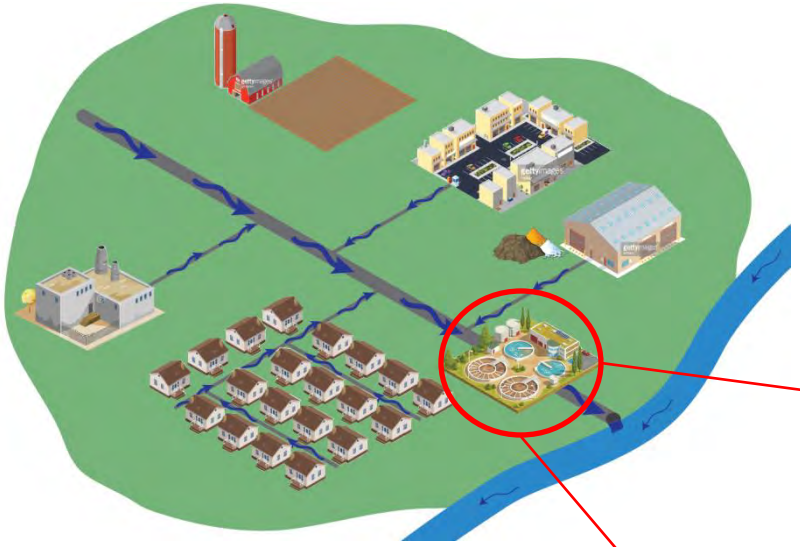
WWTP Outfall

MS4 Outfall

“Hometown, USA” – with a treatment plant



“Hometown, USA” – with a treatment plant



Municipal wastewater collection and treatment – “closed” system

The treatment plant collects and converts wastewater into an effluent that can be returned to the water cycle with minimal environmental issues.

LandStudies

NPDES Permit – Wastewater Treatment Plant (WWTP)

National Pollutant Discharge Elimination System (NPDES) Permit

Any facility that discharges wastewater directly to surface water must obtain an NPDES Permit (from the USEPA or state) – such as a treatment plant

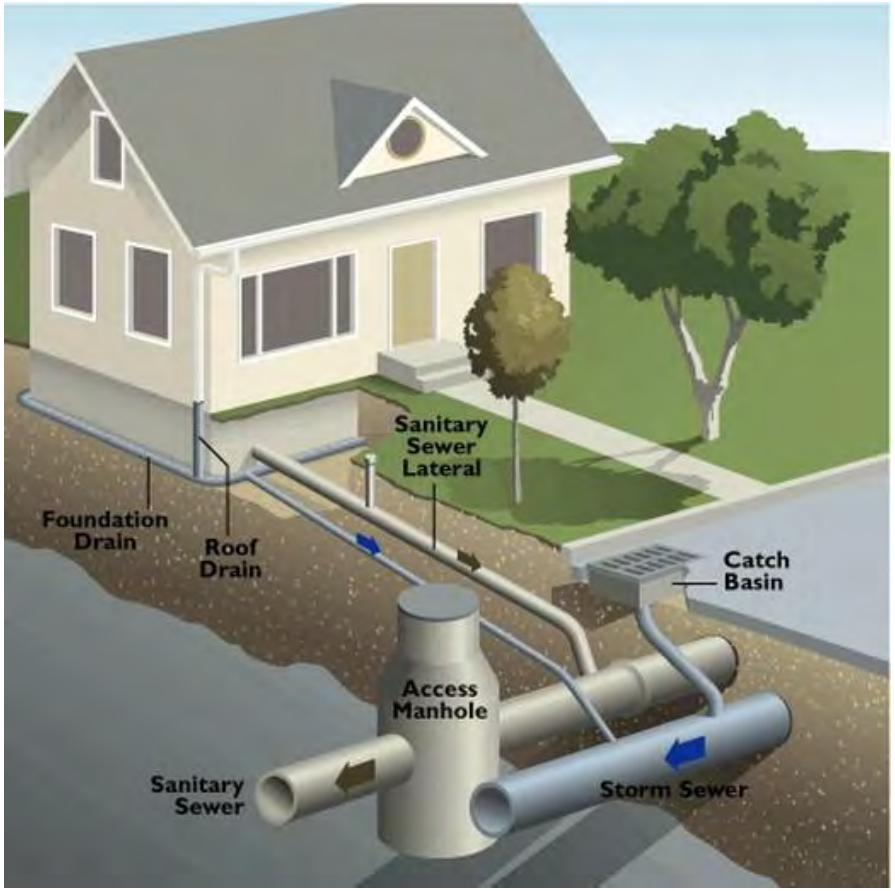
Requirements generally found in a WWTP Permit:

- Limitations (mostly numeric) on certain pollutants discharged after treatment of waste water
  - An impairment on a receiving waterway can result in more stringent limitations on discharges
- Discharge Monitoring Reports
- Reporting & Recordkeeping
  - "Pollution Prevention Programs" (e.g. Long-Term Control Plan (LTCP), Operational Plan, etc.)

A closed system and discharge is more "easily" controlled when considering the waterways use, WQ criteria, and anti-degradation.

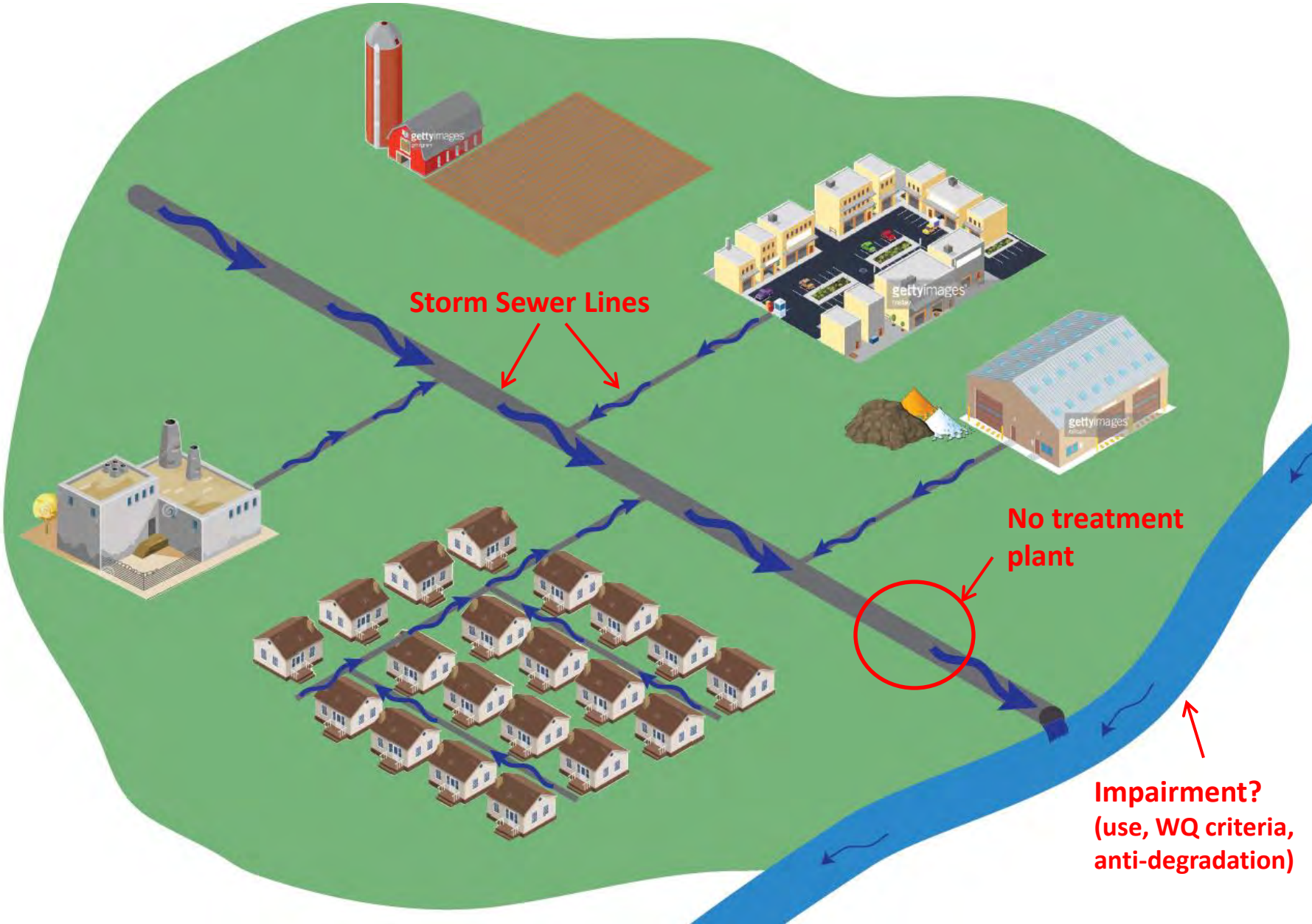
“Hometown, USA” – Two Systems Side-by-Side

Sanitary Sewer and Storm Sewer Systems

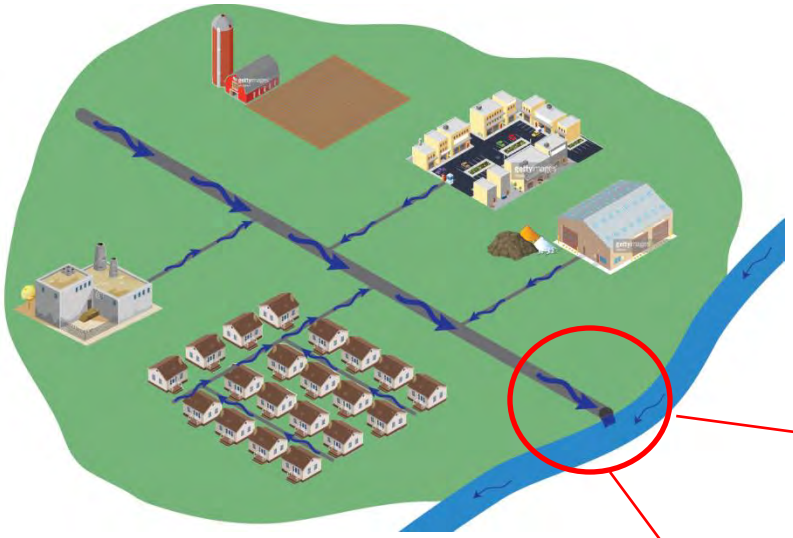


LandStudies

“Hometown, USA” – Storm Sewer (or Storm Drain)

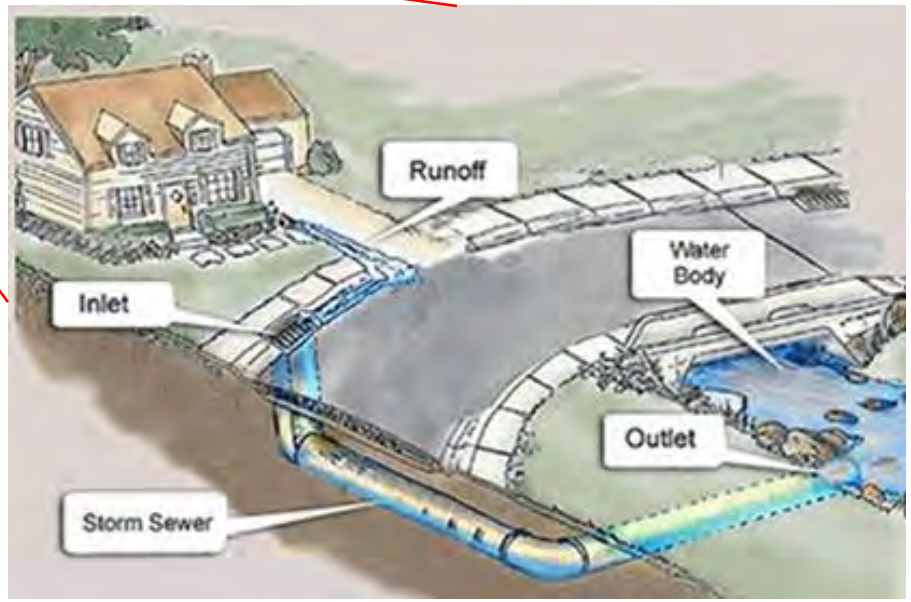


“Hometown, USA” – MS4



MS4 = Municipal Separate Storm Sewer System
It is an “open” system

MS4 collects stormwater (or other run-off) and returns to the water cycle via direct discharge to a waterway.



LandStudies

NPDES Permit – MS4

Any facility that discharges wastewater directly to surface water must obtain an NPDES Permit (from the USEPA or state) – such as an MS4

Requirements generally found in an MS4 Permit:

- Limitations (mostly narrative) on certain pollutants discharged via the MS4
  - **Why narrative?** Intent was to allow local conditions dictate numeric considerations
- Monitoring Requirements
- Reporting & Recordkeeping
  - "Pollution Prevention Programs"

An open system and discharge concerns need to be defined when considering the waterways use, WQ criteria, and anti-degradation.

WWTP Permit vs. MS4 Permit

WWTP Permit

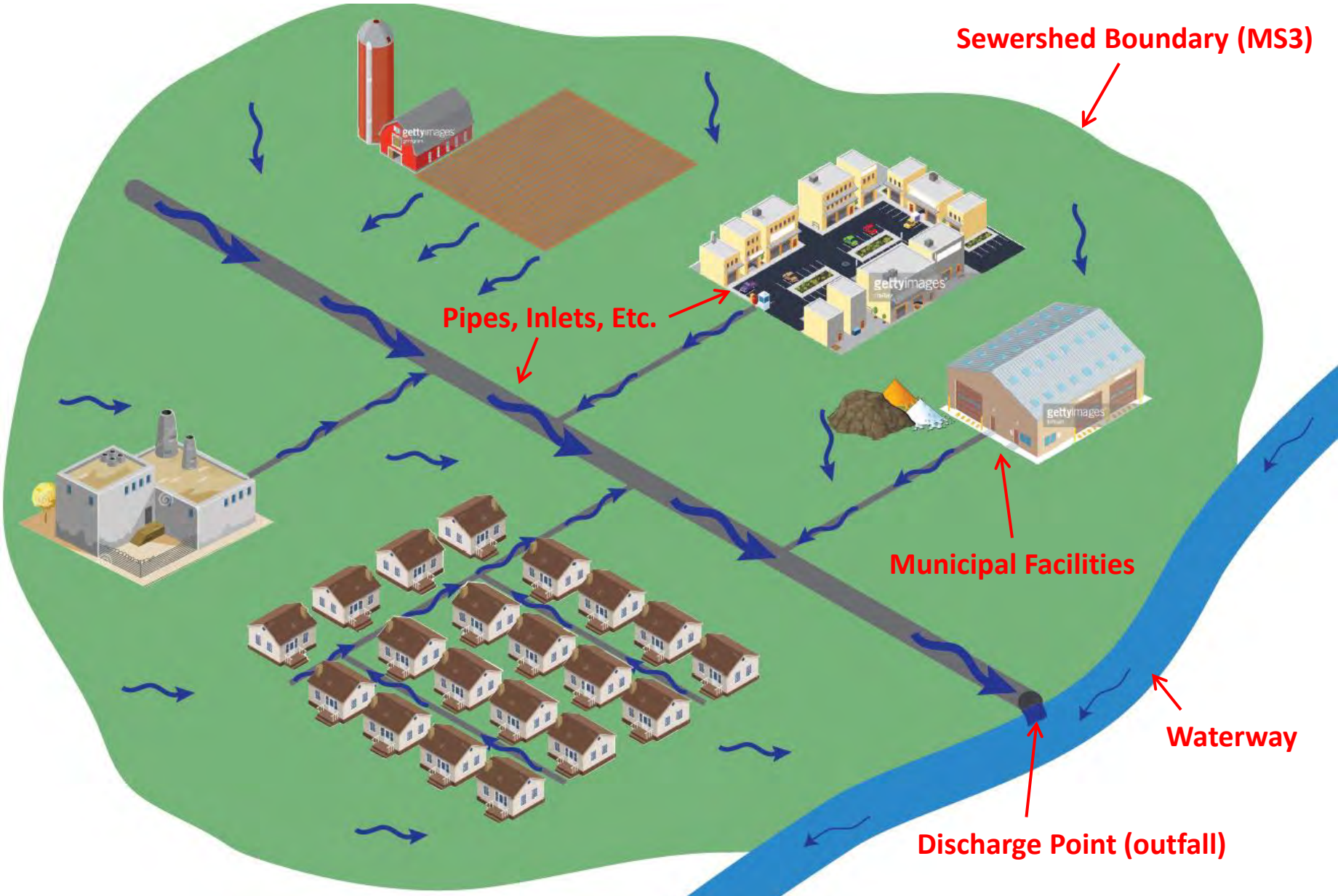
- **Closed** System
- Protect water quality
- Satisfy WQ requirements of the CWA
- **Numeric** limitations based on receiving waterway's use, WQ criteria, and the anti-degradation policy
- Implement "Pollution Prevention Program"

MS4 Permit

- **Open** System
- Protect water quality
- Satisfy WQ requirements of the CWA
- **Narrative** limitations **providing the ability to determine numeric considerations** based on a receiving waterway's use, WQ criteria, and the anti-degradation policy
- Implement "Pollution Prevention Program"

LandStudies

“Hometown, USA” – MS4 System Considerations



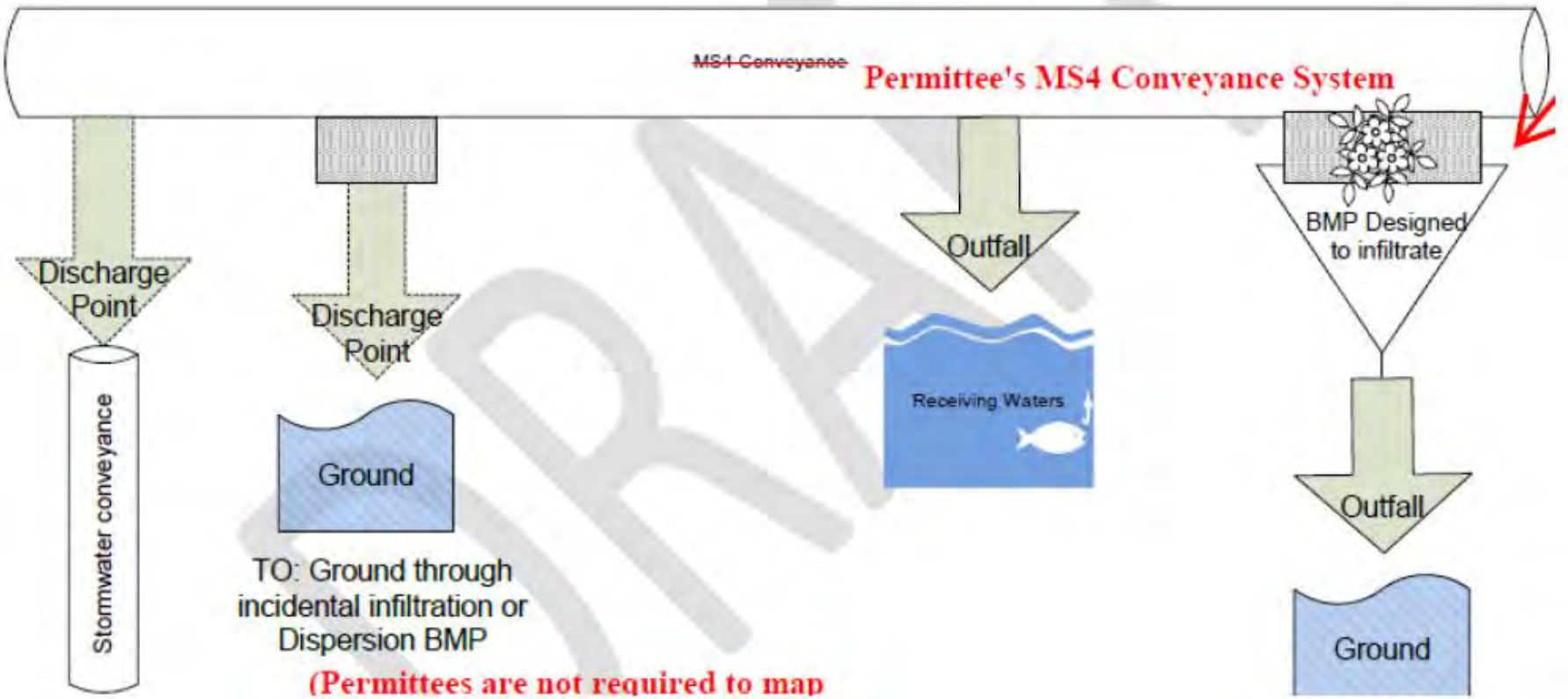
Outfall 201 (for MS4 Permits)

The point where a conveyance or system of conveyances that disposes stormwater that are owned or operated by a municipality; and is **designed or used for collecting or conveying storm water** to a defined and discernible point from which pollutants are or may be discharged—and that discharges to waters of the United States is an ***Outfall.***

Outfall

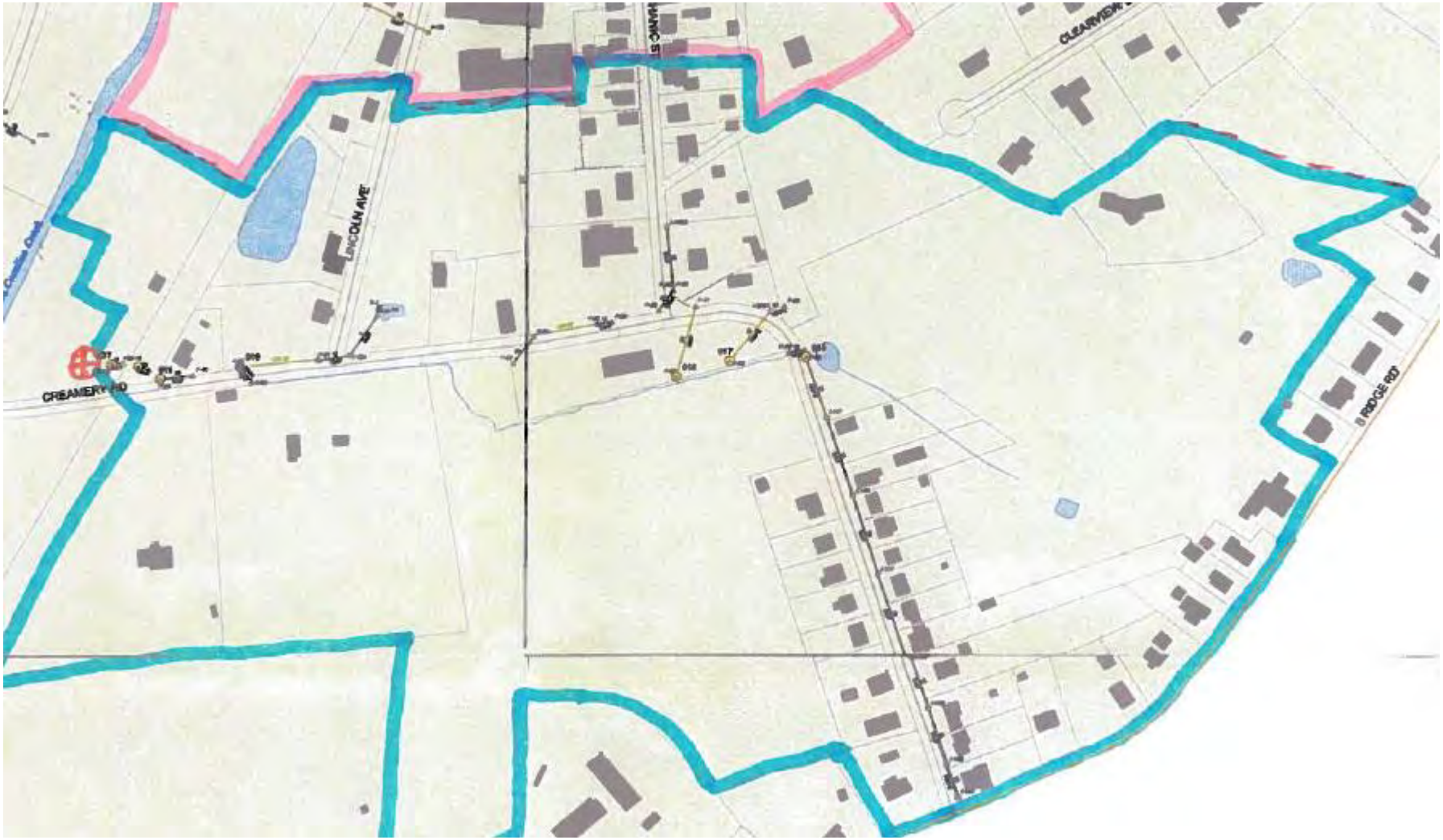
Not an outfall

Outfall vs. Discharge Point



***Only where a "significant nexus" exists or meets "adjacent" criteria**

Municipal Separate Storm Sewershed (MS3)

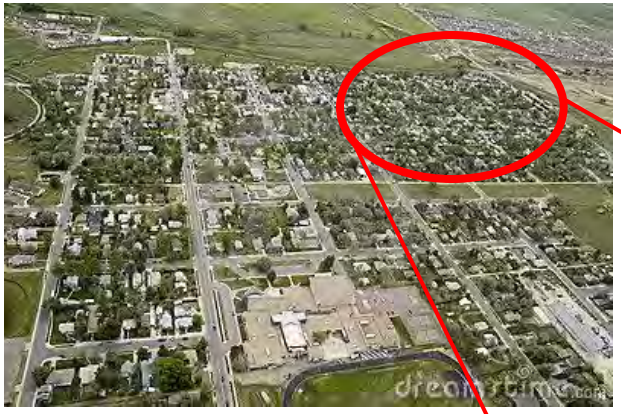


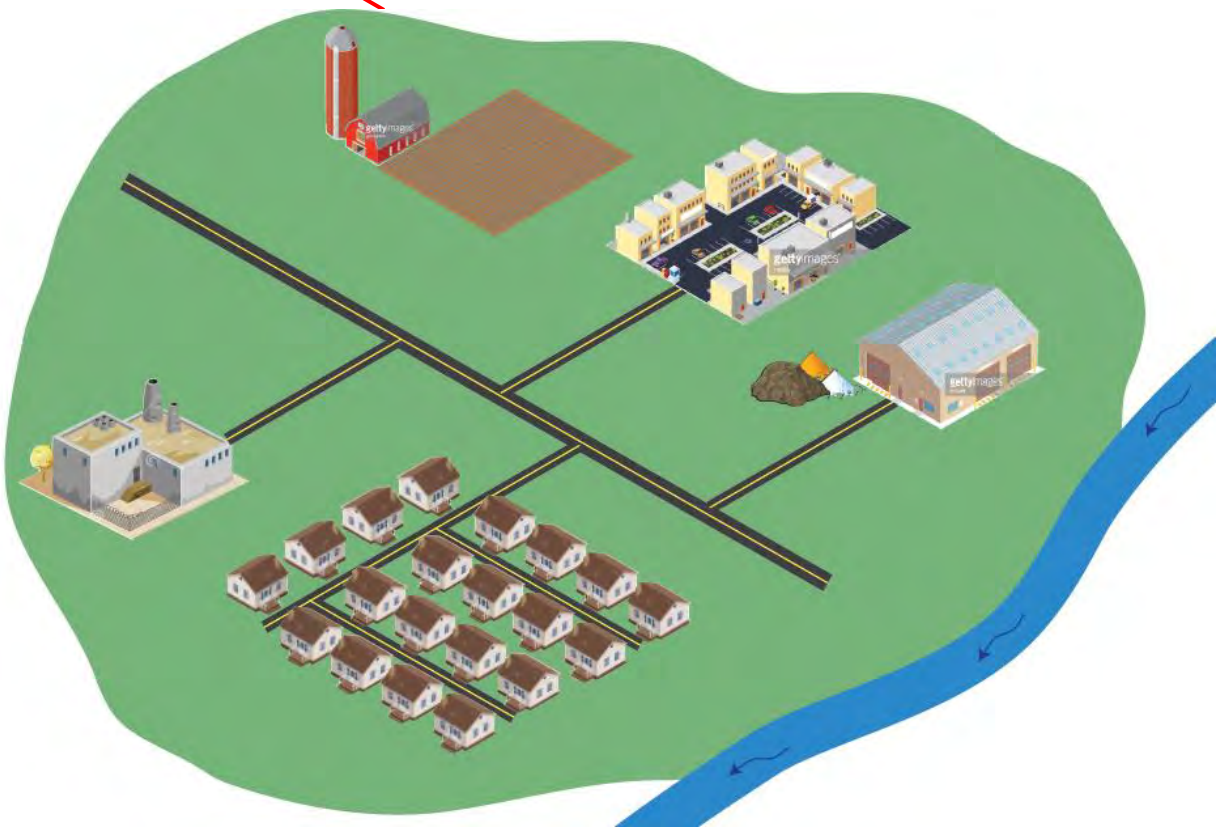
MS4 Permit Program Management

SWMP Development

Land Studies

“Hometown, USA”





Hometown, USA has an MS4 Permit

Several requirements:

Annually publish at least one issue of a newsletter, pamphlet, flyer, or web site that includes general stormwater educational information….

Ensure adequate operation and maintenance of all post-construction stormwater management (PCSM) BMPs installed at all qualifying development and/or redevelopment projects….maintain an inventory (that includes the maintenance required)….note inspection activities of the BMPs…

Develop and maintain a map of your regulated MS4. The map must show the location of all outfalls and locations and names of all surface waters/receiving waters that receive discharge from those outfalls….

Develop and implement measures to encourage and expand the use of Low Impact Development (LID)in new and redevelopment…encourage retrofitting LID into existing development….

Important regulatory and MS4 Permit language

Authorization to Discharge

- "2013 PAG-13" – Limitations on Coverage (part 2.j)
- "2018 PAG-13 (draft)" – Discharges Not Authorized (item 6)

"The discharge is not, or will not, result in compliance with an applicable effluent limitation or water quality standard."

The operator must, at a minimum, develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from the MS4:

- to the maximum extent practicable (MEP),
- to protect water quality, and
- to satisfy the appropriate water quality requirements of the Clean Water Act. [40 CFR 122.34(a)]

LandStudies

Overall Program Development Consideration

Quantified data provides the basis of choosing narrative "approaches"

EPA memorandum regarding "interim approach for water quality-based effluent limitations in storm water permits (such as an MS4 Permit):

QUESTION 9: The interim permitting approach states that permits should include monitoring programs to generate necessary information to determine the extent to which permits are providing for the attainment of water quality standards. What types of monitoring should be included and how much monitoring is necessary?

Overall Program Approach Consideration

ANSWER 9: The amount and types of monitoring necessary will vary depending on the individual circumstances of each storm water discharge. EPA encourages dischargers and permitting authorities to carefully evaluate monitoring needs and storm water program objectives so as to select useful and cost-effective monitoring approaches. For most dischargers, storm water monitoring can be conducted for two basic reasons:

1) to identify if problems are present, either in the receiving water **or in the discharge**, and to characterize the cause(s) of such problems; and

2) to assess the effectiveness of storm water controls in reducing contaminants and making improvements in water quality.

LandStudies

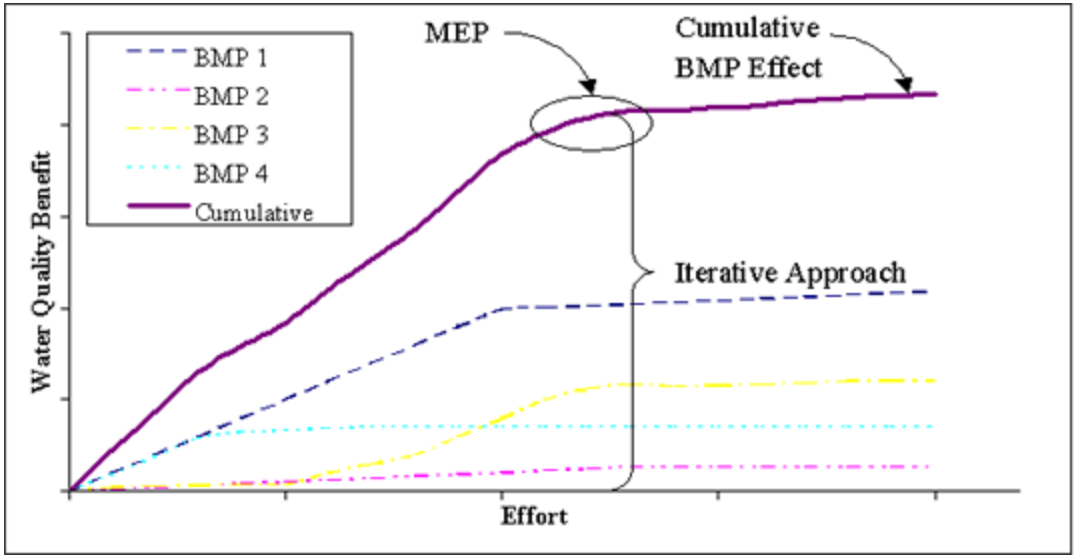
Back to the SWMP design requirements

The operator must, at a minimum, develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from the MS4:

- to the maximum extent practicable (MEP),
- to protect water quality, and
- to satisfy the appropriate water quality requirements of the Clean Water Act. [40 CFR 122.34(a)]

Maximum Extent Practicable (MEP)

It is recognized that "pollutant reductions that represent MEP may be different for each small MS4, given the unique local hydrologic and geologic concerns that may exist and the differing possible pollutant control strategies. Therefore, each permittee will determine appropriate BMPs to satisfy each of the six minimum control measures through an evaluative process" (Federal Register, Volume 64, No. 235, page 68754, December 8, 1999.).



Source: CA.gov

The preamble to the Federal Register states: "EPA has intentionally not provided a precise definition of MEP to allow maximum flexibility in MS4 permitting. MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis…"

LandStudies

Protect Water Quality

In reality, the most general of the three requirements…but a very simple objective overall

"Keep pollution out of water supplies"

Examples:

- Controlling impacts from new or existing development.
- Waste management
- Education
- Use of different products

Source: wwf.panda.org

Satisfy Appropriate Water Quality Requirements of the CWA

The “meat” of the requirements…there are three applicable WQ requirements of the CWA:

1. Designated Uses
   - States must identify and designate how each waterbody in the state is used.

2. Water Quality Criteria
   - States must set specific numeric criteria and/or narrative criteria necessary to protect each designated use.

3. Anti-degradation Policy
   - Rules (or policies) to protect existing uses and prevent clean waters from being degraded.

Stream	Zone	County	Water Uses Protected	Exceptions To Specific Criteria
1—Susquehanna River	Main Stem, Juniata River to PA-MD State Border	York- Lancaster	WWF, MF	None
2—Unnamed Tributaries to Susquehanna River	Basins, Juniata River to Muddy Run	Perry-Cumberland-Dauphin-York-Lancaster	WWF, MF	None
2—Little Juniata Creek	Basin	Perry	CWF, MF	None
2—Sherman Creek	Basin, Source to Cisna Run Village	Perry	HQ-CWF, MF	None

Parameter	*Symbol*	*Criteria*	*Critical Use**
Alkalinity	Alk	Minimum 20 mg/l as CaCO3, except where natural conditions are less. Where discharges are to waters with 20 mg/l or less alkalinity, the discharge should not further reduce the alkalinity of the receiving waters.	CWF, WWF, TSF, MF

LandStudies

How do we design a SWMP to meet these requirements?

USEPA Expectations for an MS4 Permit Program

Stormwater Management for Small MS4s…are the following addressed?

- **Applicability**
- **Limitations on Coverage**
- **Discharges to Water Quality Impaired Waters**
- **Stormwater Management Program (SWMP)**
- Public Education and Outreach (MCM 1)
- Public Involvement/Participation (MCM 2)
- Illicit Discharge Detection & Elimination (MCM 3)
- Construction Site Stormwater Runoff Control (MCM 4)
- Post-Construction Stormwater Management in New Development and Redevelopment (MCM 5)
- Pollution Prevention/Good Housekeeping for Municipal Operations (MCM 6)
- **Sharing Responsibility**
- **Reviewing and Updating SWMPs**
- **Monitoring**
- **Recordkeeping**
- **Reporting**

EPA "Protocol" – cont'd

14.0 Reviewing and Updating Stormwater Management Programs [40 CFR 122.34(g)] (MS4		
The operator must evaluate program compliance, the appropriateness of the identified best management practices, and progress towards achieving the identified measurable goals. [40 CFR 122.34(g)] Permits... may be modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon the Director's initiative. However, permits may only be modified, revoked and reissued, or terminated for the reasons specified in §122.62 or §122.64... All requests shall be in writing and shall contain facts or reasons supporting the request. [40	Verify the operator has performed an annual review of the SWMP in conjunction with the annual report. If modifications have been made to the SWMP, verify a record of written notification of proposed change including: • An analysis of why the BMP is ineffective or infeasible • Expectations of the effectiveness of the replacement BMP • The analysis of why the replacement BMP is expected to achieve goals of replaced BMP • Any modifications to the SWMP	☐ ☐ ☐ ☐ ☐

EPA “Protocol”

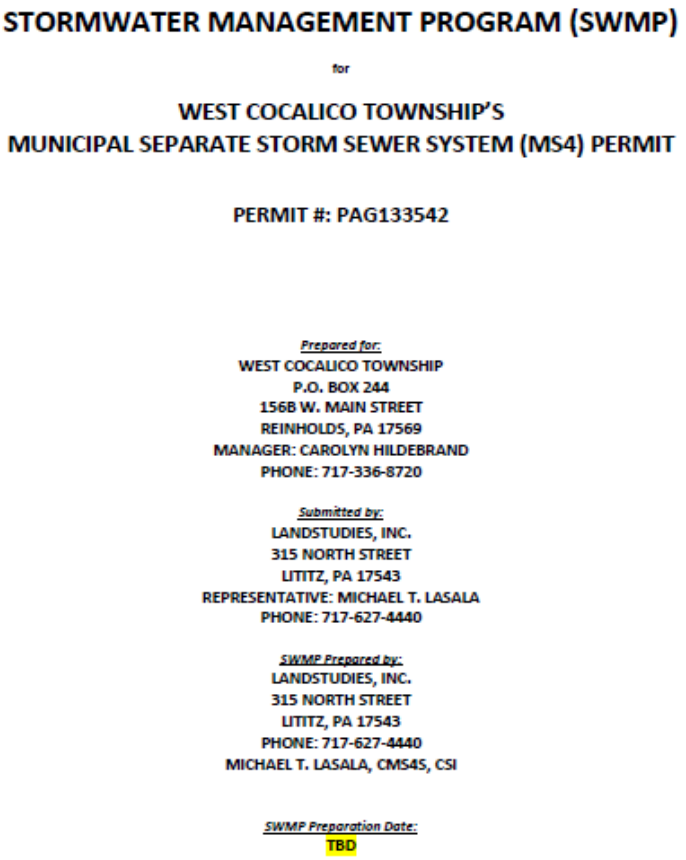
11.0 Discharges to Water Quality Impaired Waters (MS4 - 3.1)		
The operator must comply with any more stringent effluent limitations in the permit, including permit requirements that modify, or are in addition to, the minimum control measures based on an approved total maximum daily load (TMDL) or equivalent analysis. [40 CFR 122.34(e)(1)]	Determine if a waterbody to which the MS4 discharges has been designated as a 303(d) listed water or a TMDL has been developed for the waterbody. If discharging to an impaired water, verify the SWMP discusses: • How discharges of pollutants of concern will be controlled • How the operator will ensure discharges will not cause or contribute to exceedances of water quality standards • Measures and BMPs that will control these discharges If a TMDL has been developed for	☐ ☐ ☐ ☐

Stormwater Management Program (SWMP)

The SWMP is the programmatic document for managing the MS4 Permit and the quality of discharges….addresses and outlines rationale, decision processes, and so on.

USEPA Expectations:
If discharging to an impaired water, verify the SWMP discusses:

- How discharges of pollutants of concern will be controlled
- How the operator will ensure discharges will not cause or contribute to exceedances of water quality standards
- Measures and BMPs that will control these discharges



STORMWATER MANAGEMENT PROGRAM (SWMP)

for

WEST COCALICO TOWNSHIP'S
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT

PERMIT #: PAG133542

Prepared for:
WEST COCALICO TOWNSHIP
P.O. BOX 244
156B W. MAIN STREET
REINHOLDS, PA 17569
MANAGER: CAROLYN HILDEBRAND
PHONE: 717-336-8720

Submitted by:
LANDSTUDIES, INC.
315 NORTH STREET
LITITZ, PA 17543
REPRESENTATIVE: MICHAEL T. LASALA
PHONE: 717-627-4440

SWMP Prepared by:
LANDSTUDIES, INC.
315 NORTH STREET
LITITZ, PA 17543
PHONE: 717-627-4440
MICHAEL T. LASALA, CMS4S, CSI

SWMP Preparation Date:
TBD

LandStudies

SWMP Contents – Narrative

Processes, schedule(s), etc. to facilitate permit requirements

System Map Update

- The Engineer-of-Record (EOR) holds the "master" digital system map files.
- Current paper versions of the map(s) are found in Attachments C and D of the SWMP.
- The Director of Public Works holds (at a minimum) two paper copies for field operations and maintenance, IDD&E activities, etc.
- The Director of Public Works keeps a set of working notes and hard copies outlining inaccuracies encountered in the field, needed changes to the map, and similar. This would include "red line" markings on the current version of a map denoting the change, modification, etc. that is required. Changes or modifications can include:
  - Re-designation (term) associated with a structure.
  - MS4 location.
  - Inlet location.
  - Private and/or other MS4 and structures deemed appropriate on the map.
  - MS3 delineation/considerations.
  - Prioritization notes and/or designations.
  - Items deemed appropriate by a member of the MS4 Committee.
- The Director of Public Works delivers an accrued set of working notes and hard copies to the EOR approximately one month prior to required map update. If no changes or modifications are required, notice is provided to the EOR as such.
- The EOR updates the master digital system map files to reflect changes and

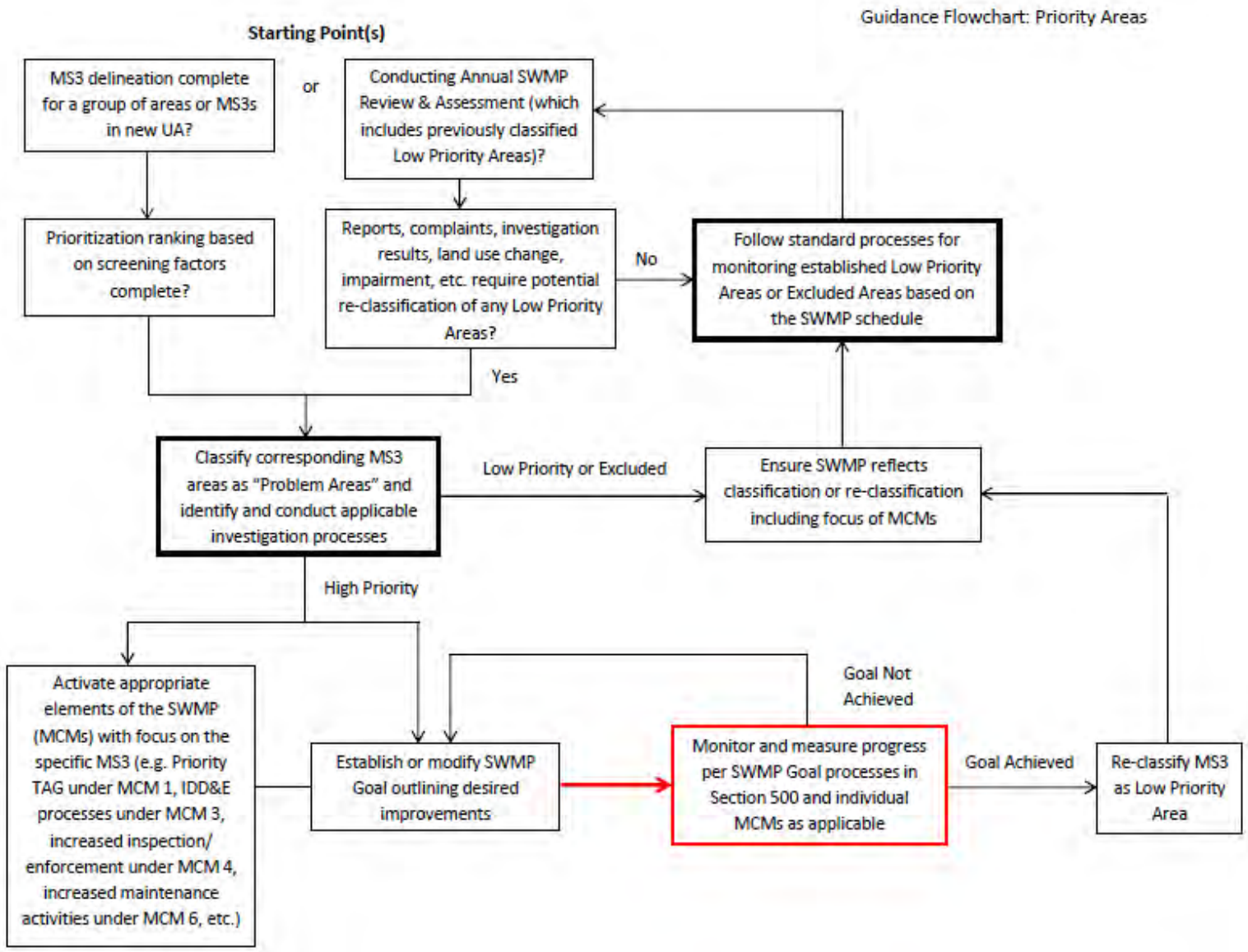
Rationale, decision points, etc.

Priority Areas

Determination of Priority Areas is a critical process to help ensure the success of the SWMP overall and assist with IDD&E investigations as applicable. Priority Areas determine locations and general areas for focus of efforts to help the township ensure compliance with the terms and conditions of the MS4 Permit. Priority Areas are inherently tied to MS3s. MS3s are not listed into a Priority Area classification until completion of an MS3 delineation process for a given area within a catchment. Upon completion of the MS3 delineation process, an individual MS3 is reviewed against a set of screening factors to prioritize the investigation process of all MS3s and ultimately classify an area. MS3s shall, at a minimum, consider the following screening factors (in order) for prioritization of the investigation process and/or revisiting classified Priority Areas during new permit cycles:

- Existing and known information (past complaints, reports (e.g. IDD&E reports, wet weather screening reports, etc.), Areas where it is known improvements or a need for improvements (e.g. removal of or remaining illicit connection, etc.) is required.
- Historic and/or active Combined Sewer Systems (CSS). Historic systems are areas where the combined system has been separated into sanitary sewer and storm sewer.
- Age of corresponding development and infrastructure within the MS3. Areas with development (specifically industrial) where the sanitary sewer is greater than 50

SWMP Contents - Visuals



Process Described – Narrative for "Receiving Waterways"

Waterbodies and Designated Uses

Approximately 0.5 miles of streams are found within or along the borough borders. All stream segments are located within the UA. Based on the 02050306 identification code, a table of receiving waterbodies within the UA (or receives discharges from the regulated system) and corresponding appropriate information (e.g. reach identification code, impairments (if applicable,), uses, etc.) is found at the end of this section. Receiving waterbodies are those waterbodies with a defined reach code and/or common identifier, and found within the National Hydrography Dataset (NHD) and shown within the PADEP WAVE Silverlight (or emappa) database. Per Pa. Code Ch. 93.9o, the following water uses are protected within the small watershed:

- Little Conestoga Creek Basin, Source to Swarr Run TSF, MF

TSF is "Trout Stocking Fishery." MF is "Migratory Fishes."

The Designated Uses noted above are in addition to the designated uses noted in Pa. Code Ch. 93.4 (Statewide Water Uses), and more commonly known as "Table 2." The uses listed in Table 2 apply to all surface waters unless specified otherwise. In turn, all reach code-defined waterbodies within the borough have the following uses in addition (or reiteration) of the uses noted above:

- Aquatic Life
  - WWF

Process Described – Narrative for MS3s

MS3 boundaries are approximated, but intended to give the borough a general idea of the extent of the properties within a given drainage area collected by the regulated system. The boundaries of the MS3 follow property boundaries (except for certain special cases such as crossing railroad tracks or very large parcels (e.g. park areas, farms, or golf courses)) whether run-off is collected from the entire or a portion of the property by the regulated system. This allows the borough to tie parcels and properties to drainage end points (e.g. outfalls). Delineation of MS3s is an important tool and set of information to allow the borough to implement and facilitate the program. The process for determining MS3s is as follows:

- The system/outfall map is reviewed to further delineate and identification of end points (e.g. outfalls, discharge points, etc.) for a portion of the regulated system.
    - It is confirmed the map appropriately reflects waterbodies as determined in Section 300-3.
- A field review is conducted with observing general drainage conditions originating at the end point mapped to confirm the map reflects identification of outfalls.
- The field review continues by matching observed general drainage flows (or the determination that the regulated system (inlets, curb & gutter, etc.) tied to the end point reasonably collects stormwater run-off from individual parcels reviewed). The field review is supported by a condensed desk-top analysis reviewing approximate elevations of an aerial image (Google Earth or similar).
    - The map is "red-lined" to reflect and capture the parcels it was reasonably determined are collected into the system and discharge via the outfall. Map updates to incorporate the red-lined MS3s follow the map update procedures in Section 500 at a minimum.
- The MS3 is numbered and catalogued. The MS3 numbering system follows the outfall numbering system with "MS3" denoted (e.g. MS3-004, denotes the MS3 tied to MS4 Outfall 004).
    - The numbering system is also used for end points that may discharge via private outfalls or other systems. However, these MS3 numbers include a denotation that the system is not tied to an MS4 Outfall (e.g. MS3-P14, denotes the MS3 is tied to private outfall 14).
- The MS3 inventory is found in Attachment D.

Process Described – Narrative for Pollutants of Concern

500-1 Pollutants of Concern

The primary purpose of the SWMP is to reduce the discharge of pollutants from the MS4 to the Maximum Extent Practicable (MEP), to protect and improve the quality of water bodies in West Cocalico Township (WCT) within the Cocalico Creek watershed, and adhere to the appropriate water quality standards requirements in the CWA (designated uses, water quality criteria for uses, and the anti-degradation policy).

The Pollutants of Concern are identified based on the following:

- Included on the current 303(d) list.
- Included within data found on PADEP WAVE/emappa.
- Encountered through the SWMP Development exercise.
- Encountered through two or more monitoring cycles within the established Monitoring Program.
- Listed as a concern within the issued MS4 Permit by the permitting authority (PADEP).
- A parameter of consideration of the water quality criteria associated with the Designated Uses of receiving waterbodies within the Urbanized Area (UA) (or the regulated system drains to the receiving waterbody).
- Determined as a concern by WCT based on appropriate rationale.

The Pollutants of Concern for WCT and corresponding reasoning for listing are:

- Alkalinity
    - Parameter associated with WWF, TSF, and MF Designated Uses
- Ammonia-Nitrogen
    - Parameter associated with WWF, TSF, and MF Designated Uses

Process Described – Develop program goals

500-3 SWMP Goals

A set of over-arching and guiding goals has been established to facilitate the SWMP and achieve the primary purpose of the SWMP. The goals are further considered guiding objectives and/or references during the Annual SWMP Review and Assessment. SWMP goals are assessed annually. Two types of goals are established within the Body of SWMP: 1) Qualitative (Narrative) and 2) Quantitative (Numeric).

Qualitative (narrative) goals are best described as development goals. Development goals are associated with establishing an understanding, baseline, information, and so on that is necessary to have in place to facilitate the program and adhere to permit requirements. Examples of qualitative goals are as follows:

- Complete MS3 delineations within the Urbanized Area
- Establish a baseline understanding of the nature and public's understanding of sediment-laden discharges
- Collaborate, support, and work towards Cocalico Creek watershed attaining all uses.

Quantitative (numeric) goals are better described as pollutant reduction goals identified based on information generated during program facilitation and/or outlined in the permit. MEP is identified and established with each quantitative goal, and annual assessments (based on criteria outlined within the Body of SWMP) dictate modifications, changes, etc. that may be required to achieve MEP (the iterative process). Examples of quantitative goals are as follows:

- Reduce the sediment loading in discharges from Outfall 001 by 10% in five (5) years
- Reduce the observed and averaged concentration of sediment in discharges from Outfall 001 by 60 NTUs in three (3) years
- Reduce sediment collected and found in the regulated system in MS3-001 by 25% in seven (7) years.

Process Described – Assess goal progress

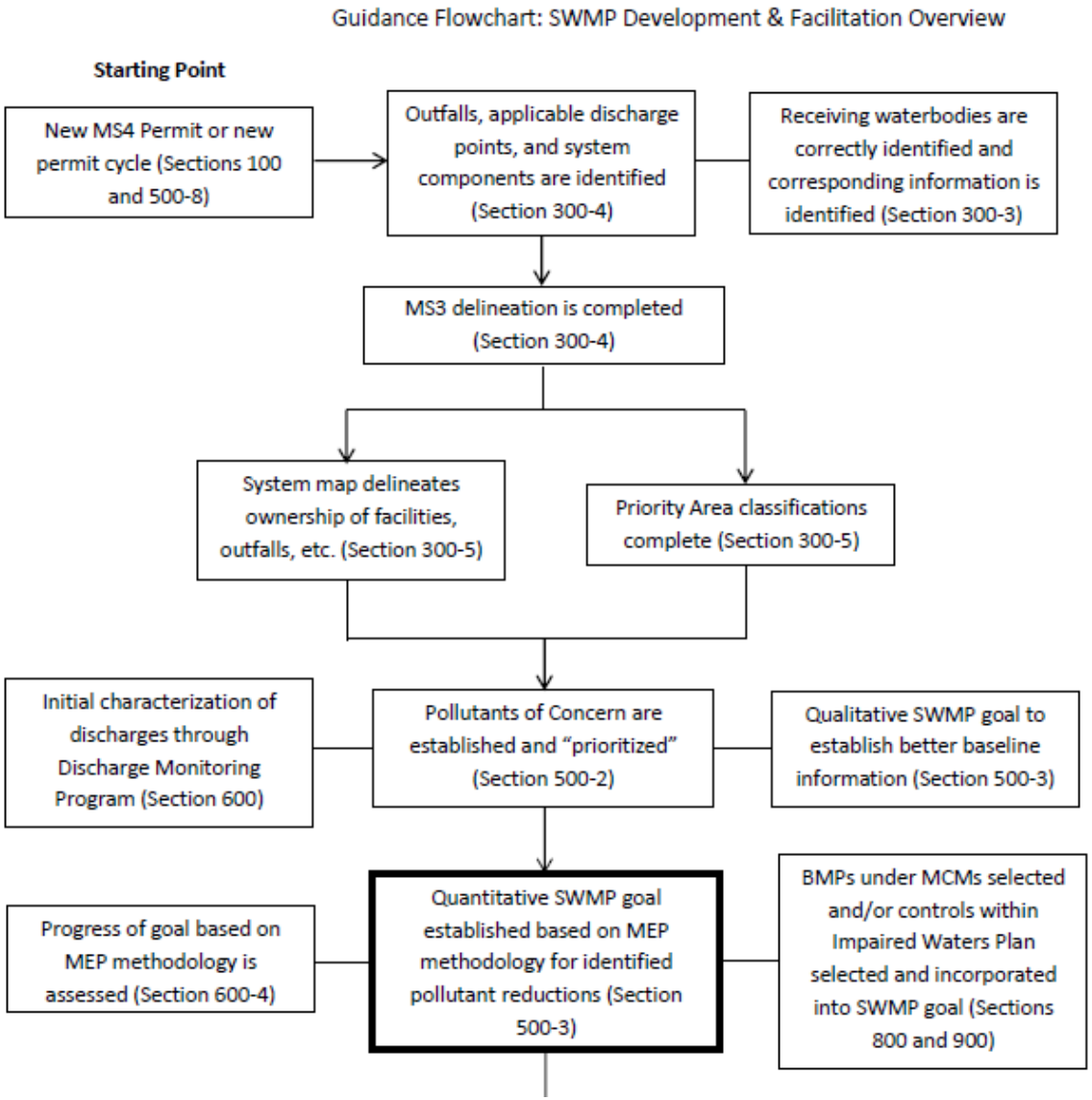
500-4 SWMP Performance and Assessment Criteria

The criteria for measuring and assessing SWMP (and elements of the SWMP) performance and effectiveness is based on the United States Environmental Protection Agency (USEPA) Protocol for Conducting Environmental Compliance Audits under the Stormwater Program for Small MS4s ("Protocol"). The USEPA recommends municipalities subject to terms and conditions of an issued MS4 Permit conduct "self-audits" of their SWMP to ascertain the progress of program implementation against measurable goals. The recommendation is an approach to meet requirements of the Clean Water Act (CWA) and National Pollutant Discharge Elimination System (NPDES). 40 CFR 122.26(d)(2)(v) and 122.34(g) requires MS4s to assess controls and effectiveness of their SWMPs—and to document such assessments.

- MAINTAIN: A SWMP goal (and supporting components) will be maintained if measurement (interim milestone, supporting data, or similar) associated with the established goal is:
  - being met (within 10% of the numeric measurement), or
  - exceeded, or
  - anticipated will be met (rationale will be provided if it is anticipated an established goal will be met); and/or
  - the purpose (rationale) of the goal will support long-term success of the program and future goals, and
  - the goal is associated with a Pollutants of Concern of the SWMP.
- MODIFY: A SWMP goal will be modified if an interim measurement associated with the established goal provides an indication the established goal will:
  - not be fully met (short by greater than 10% of the numeric measurement) , or

LandStudies

SWMP Contents - Visuals



Summary of a SWMP

In the end, the purpose of the SWMP is the description(s) and schedule(s) of the processes to reach decisions based on documented rationale to protect, preserve, or improve the quality of Waters of the U.S. receiving stormwater discharges. Developing an appropriate SWMP will lead to more cost-effective and "meaningful" activities and achieve CWA, NPDES, and permit compliance.

SWMP **Development** – Step 1

The SWMP is your set of specifications to guide a program….a “choose your own path” book as well

Initially, gain an understanding and establish

- Receiving waterways (and health of the streams)
- Outfalls and MS3 boundaries
- Nature of the system (input points)

Establish procedures for reaching decisions, roles and responsibilities, assessment criteria, and so on

LandStudies

SWMP **Implementation** – Step 2

Only consider the waterway and discharge point…**establish "pollutants of concern"**

Remember:

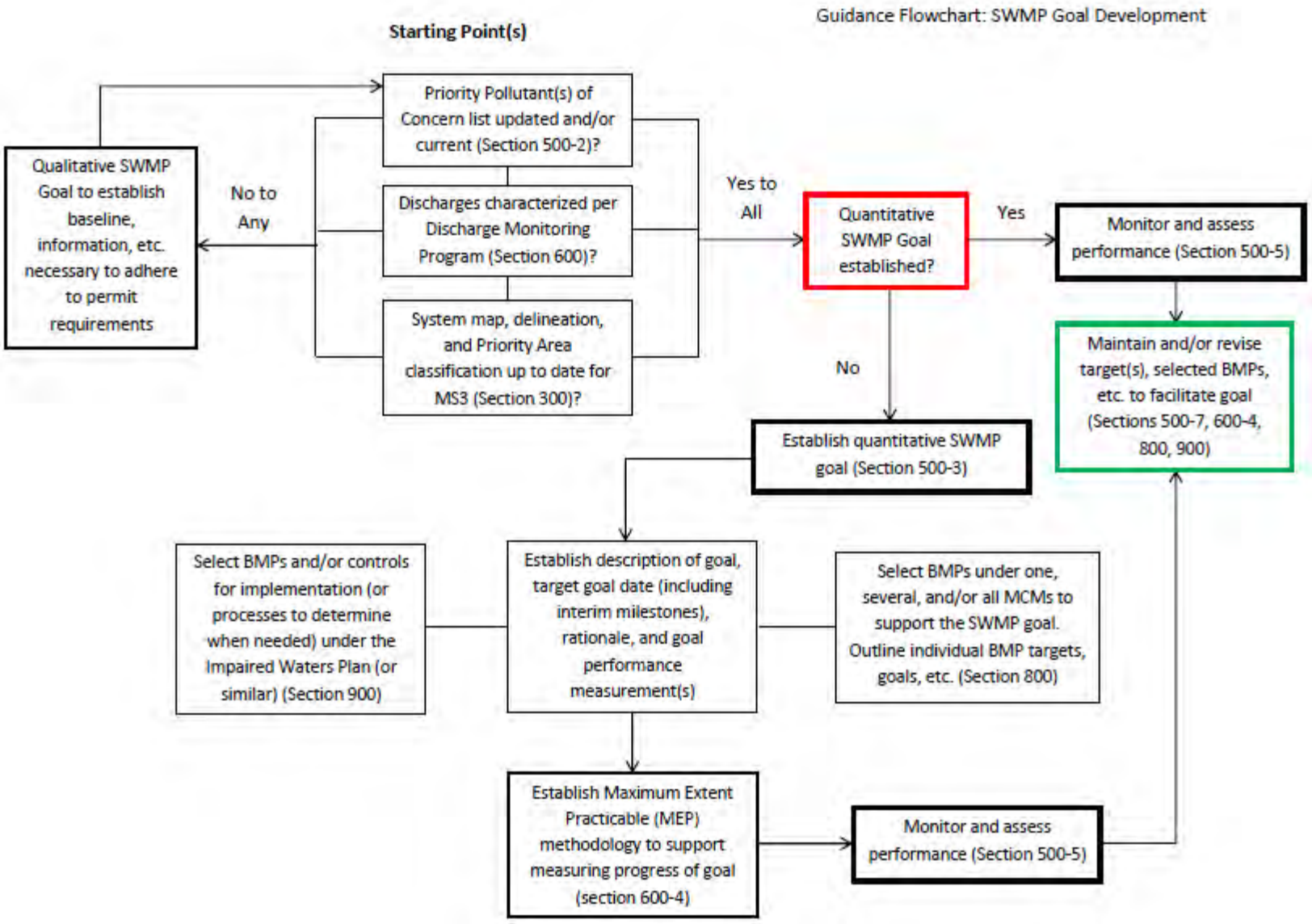
- The CWA is about protecting the beneficial uses of surface waters
- The CWA includes WQ Standards Requirements – that are about the stream
  - Designated Uses, WQ criteria, anti-degradation policy
- The NPDES is the mechanism in place to facilitate these requirements (MS4 Permit)

In turn, for SWMP development, a municipality needs to determine:

- "Is my MS4 discharging pollutants that are the same as the impairment of the waterway?"
  - Contributing to the impairment?
- "Is my MS4 discharging any pollutants that could impair the waterway?"

Sample discharges …understand health of the receiving waters

SWMP Contents – Visual for SWMP Goals



MS4 Permit Program Management

MCMs support the SWMP

Land Studies

Hometown, USA has an MS4 Permit

Several requirements:

Annually publish at least one issue of a newsletter, pamphlet, flyer, or web site that includes general stormwater educational information….

Ensure adequate operation and maintenance of all post-construction stormwater management (PCSM) BMPs installed at all qualifying development and/or redevelopment projects….maintain an inventory (that includes the maintenance required)….note inspection activities of the BMPs…

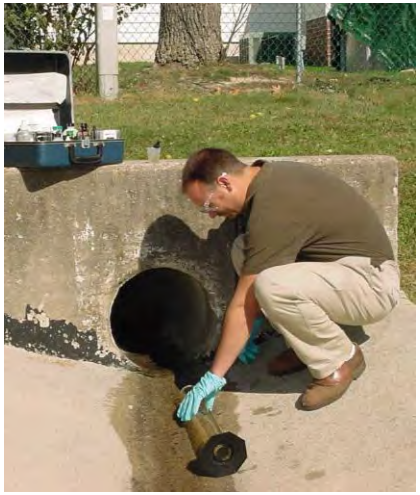
Develop and maintain a map of your regulated MS4. The map must show the location of all outfalls and locations and names of all surface waters/receiving waters that receive discharge from those outfalls….

Develop and implement measures to encourage and expand the use of Low Impact Development (LID)in new and redevelopment…encourage retrofitting LID into existing development….

Sidebar on SWMP Development – MCMs

Choose BMPs in reverse order

- MCM 6: Good Housekeeping
- MCM 5: Post-Construction SWM
- MCM 4: Construction Site Runoff Control
- MCM 3: Illicit Discharge & Detection
- MCM 2: Public Involvement & Participation
- MCM 1: Public Education & Outreach



LandStudies

The MCMs are “tools”

for SWMP facilitation

Public Education & Outreach (MCM 1)

---Active vs. passive outreach---

Educational materials (pamphlets, booklets, flyers, etc.)

Educational outreach methods (radio commercials, interactive displays, etc.)

Interactive events (meetings, local “fair” booth, etc.)

MCM 1 is a set of communication tools (dominated by communication techniques and marketing).

Public Involvement & Participation (MCM 2)

An “extension” of the overall program….but performed by the “public.”

Monitoring by “others,” educational outreach by “others,” and so on

Component of the program that allows for public input

MCM 2 is a variety of tools based on whatever “others” perform, complete, and so on.

LandStudies

Illicit Discharge Detection & Elimination (MCM 3)

Field investigations to detect illicit materials before entering the system, in the system, and exiting the system (outfall screening)

Chemical analyses

Tracing (dye, smoke, TV, etc.)

Regulation(s)

MCM 3 is a set of field, administrative, and technical tools.

Construction Site Runoff Control (MCM 4)

---System (MS4) protection mechanism---

In place to help ensure “others” (construction site operators) are implementing and maintaining their tools.

Inspections and enforcement

Regulation(s)

MCM 4 is a set of “back-stop” tools to help protect your system.

LandStudies

Post-Construction Stormwater Management (MCM 5)

---System (MS4) protection mechanism---

Standards and performance criteria for structural and non-structural BMPs treating stormwater associated with new development (and re-development)

Inspections, administration, and enforcement

Regulation(s)

MCM 5 is primarily a set of engineering-based tools related to performance and supported by administrative tools to help protect your system.

Good Housekeeping for Municipal Operations (MCM 6)

---Most “important” set of tools---

A set of structural and non-structural approaches, practices, etc. intended to **compliment** activities and facilities for protection of water quality

Training

Maintenance

MCM 6 is a set of tools to either compliment activities and facilities (prevention), or improve water quality (reduction).

LandStudies

How the MCMs support the SWMP

- Provides tools and mechanisms to help identify if issues or problems arise and avenues for resolution with the intent to reduce the potential for the **MS4 causing an exceedance** to water quality standards.

- Provides tools and mechanisms to help administer approaches with the intent to reduce the **MS4 contributing to an exceedance** to water quality standards.

MCMs in the issued MS4 Permit

In PA: they assist with “not causing an exceedance to water quality standards.”

- Distribute a pamphlet regarding general stormwater pollution
- Screen outfalls
- Hold a public meeting annually
- Keep an inventory of facilities and activities that could generate or impact stormwater runoff

MS4 Permit Program Management

SWMP Implementation Example

Land Studies

SWMP Implementation - Example

- Have your SWMP developed
- Individual MCM Plans developed
- Impaired Waters Plan, etc. developed

What do we do now?!?

STORMWATER MANAGEMENT PROGRAM (SWMP)

for

WEST COCALICO TOWNSHIP'S
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT

PERMIT #: PAG133542

Prepared for:
WEST COCALICO TOWNSHIP
P.O. BOX 244
156B W. MAIN STREET
REINHOLDS, PA 17569
MANAGER: CAROLYN HILDEBRAND
PHONE: 717-336-8720

Submitted by:
LANDSTUDIES, INC.
315 NORTH STREET
LITITZ, PA 17543
REPRESENTATIVE: MICHAEL T. LASALA
PHONE: 717-627-4440

SWMP Prepared by:
LANDSTUDIES, INC.
315 NORTH STREET
LITITZ, PA 17543
PHONE: 717-627-4440
MICHAEL T. LASALA, CMS4S, CSI

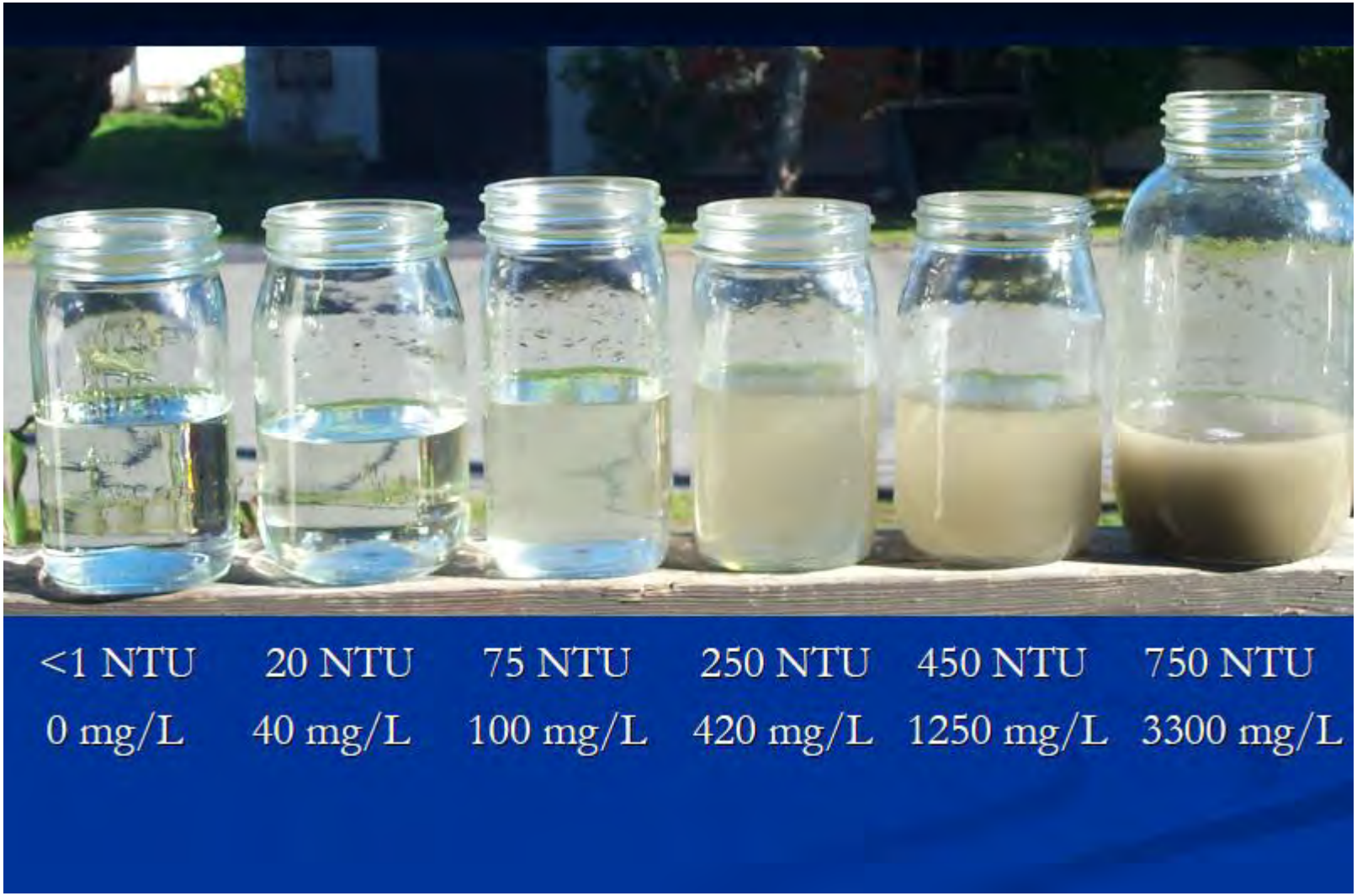
SWMP Preparation Date:
TBD

Characterization of stormwater discharges

Parameters	Results	Flag	Units	RDL	Method
WET CHEMISTRY					
Ammonia-N	0.303		mg/L	0.100	D6919-09
Nitrate/Nitrite-N	0.36		mg/L	0.20	EPA 300.0
Phosphorus, Total	0.42		mg/L	0.10	EPA 365.1
Total Kjeldahl Nitrogen	2.0		mg/L	1.0	S4500NH3G-11
Total Nitrogen	2.36		mg/L	1.20	Calculation
Total Suspended Solids	220		mg/L	5	S2540D-11
MICROBIOLOGY					
Fecal Coliform	2600		col/100mL	100	S9222D-97
Total Coliform	>2419.6 col/100ml		col/100mL	1	S9223B-04

LandStudies

TSS vs. turbidity



TSS vs. turbidity

Conducted field investigation as well

- Area (MS3) collected by the system is entirely low-density to medium-density residential land uses (approximately 30 homes overall).
- A basin (with a sediment removal function) serves a portion of the area for the medium-density residential area (small housing development) – basin is not being maintained properly (erosion and bare soils observed in the basin; sediment build-up observed).
- A number of yards had disturbed soils or exposed soils (no vegetation established) (a high number of small home projects were underway – storage shed, new patio, etc.).
- Most homes had debris collection areas (or pseudo-compost bins) present that contained debris such as old leaves, branches, and so on immediately in drainage patterns.
- Presence of sediment and debris on roadways, with heavy accumulation at inlets.
- Presence of sediment deposition at outfall discharge area.

SWMP – Quantitative Goal

All SWMP goals include the following information:

- Description of the goal
- Target goal date
- Rationale behind the goal
- Measurement of the goal (including interim milestones)
- BMPs that will be used to support facilitation of the goal

Goal "in a nutshell"

- Reduce TSS observed in discharges at MS4 Outfall 001 to below 50 mg/L
- Over 3 years
- Reduction supports efforts associated with sediment reductions for CBPRP
- Will measure concentrations once per year (October)

Parameters	Results	Flag	Units	RDL	Method
WET CHEMISTRY					
Ammonia-N	0.303		mg/L	0.100	D6919-09
Nitrate/Nitrite-N	0.36		mg/L	0.20	EPA 300.0
Phosphorus, Total	0.42		mg/L	0.10	EPA 365.1
Total Kjeldahl Nitrogen	2.0		mg/L	1.0	S4500NH3G-11
Total Nitrogen	2.36		mg/L	1.20	Calculation
Total Suspended Solids	220		mg/L	5	S2540D-11
MICROBIOLOGY					
Fecal Coliform	2600		col/100mL	100	S9222D-97
Total Coliform	>2419.6 col/100ml		col/100mL	1	S9223B-04

SWMP Goal – Need to pick the tools

MCM 6 (Good Housekeeping)

- Street sweeping four times (every other month) from April – October
  - *Keep track of sediment/debris removed (tonnage)*
- Shovel and remove sediment build-up adjacent to inlets in conjunction with street sweeping
  - *Keep track of sediment/debris removed (tonnage)*
- Inspect inlets at same time for sediment build-up, remove sediment from inlets
  - *Keep track of inlets inspected vs. inlets that required sediment removal (along with amount of sediment removed)*
- Confirm agreement with neighboring municipality allowing homeowners to drop off landscape debris (including soil) at composting facility.

MCM 5 (PCSM)

- Send letter to basin owner outlining maintenance needs and corrective action currently needed.
  - *Returns the basin to intended design and operational function*
- Inspect basin annually to ensure it is maintained
  - *Ensures basin is operating and maintained as intended*

MCM 4 (Construction Site Runoff Control)

- Require E&S Controls with small projects permits (update ordinance)

SWMP Goal – Need to pick the tools cont'd

MCM 3 (IDD&E)

- Screen outfall once a year during dry weather for presence of sediment deposition
  - *Visual comparisons year-to-year for changes in sediment deposition to support goal for sediment reductions*
- Screen inlets (per MCM 6)

MCM 2 (Public Participation)

- Invite the homeowners (TAG) in MS3 to annual MS4 meeting to communicate issue and responsibilities.
  - *Send invite to all homeowners, anticipate 10% participation first year*
- Tied to MCM 1….with homeowner "improvements."

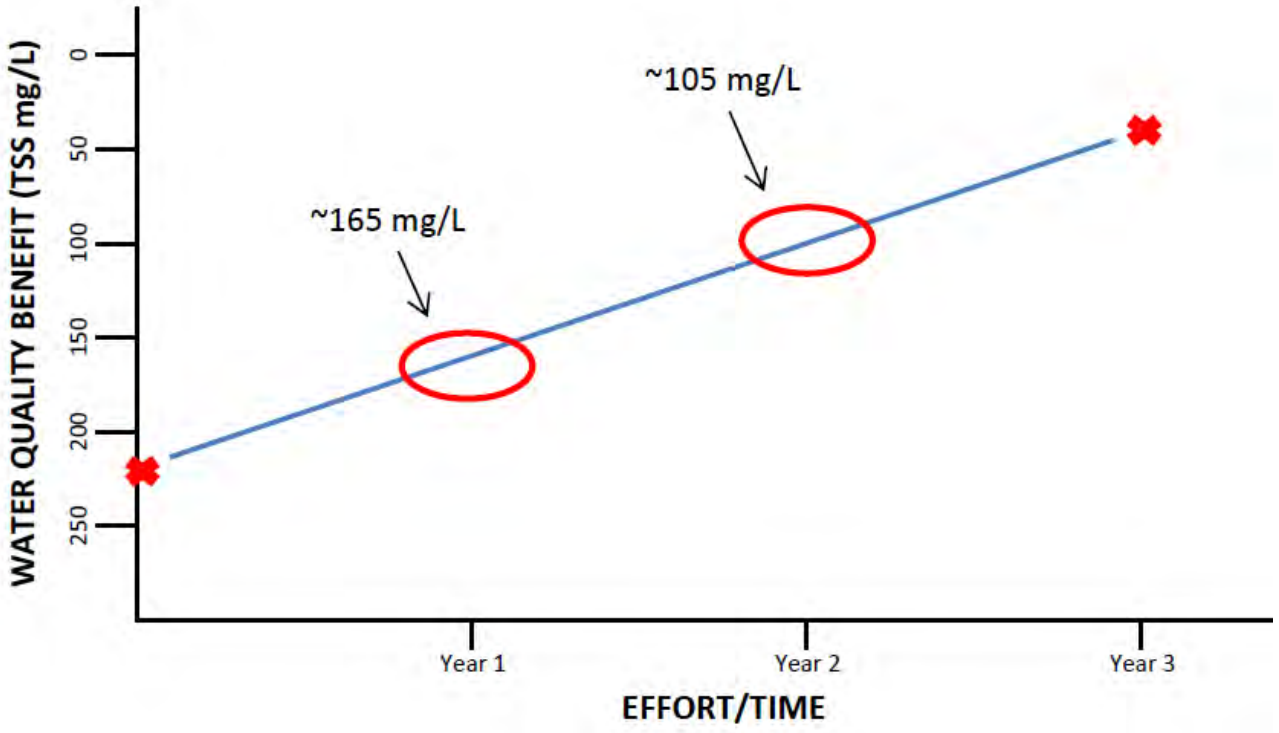
MCM 1 (Public Outreach)

- Generate flyer for MS3 outlining problems, responsibilities, and methods the homeowners can help with addressing the issues. Emphasize ability to delivery landscape debris to neighboring municipality composting facility.
  - *Send to all 30 homeowners every year*
  - *Use concentration reduction monitoring as measurement of progress*

SWMP Goal – Summary

Primary “tools” selected to support SWMP goal:

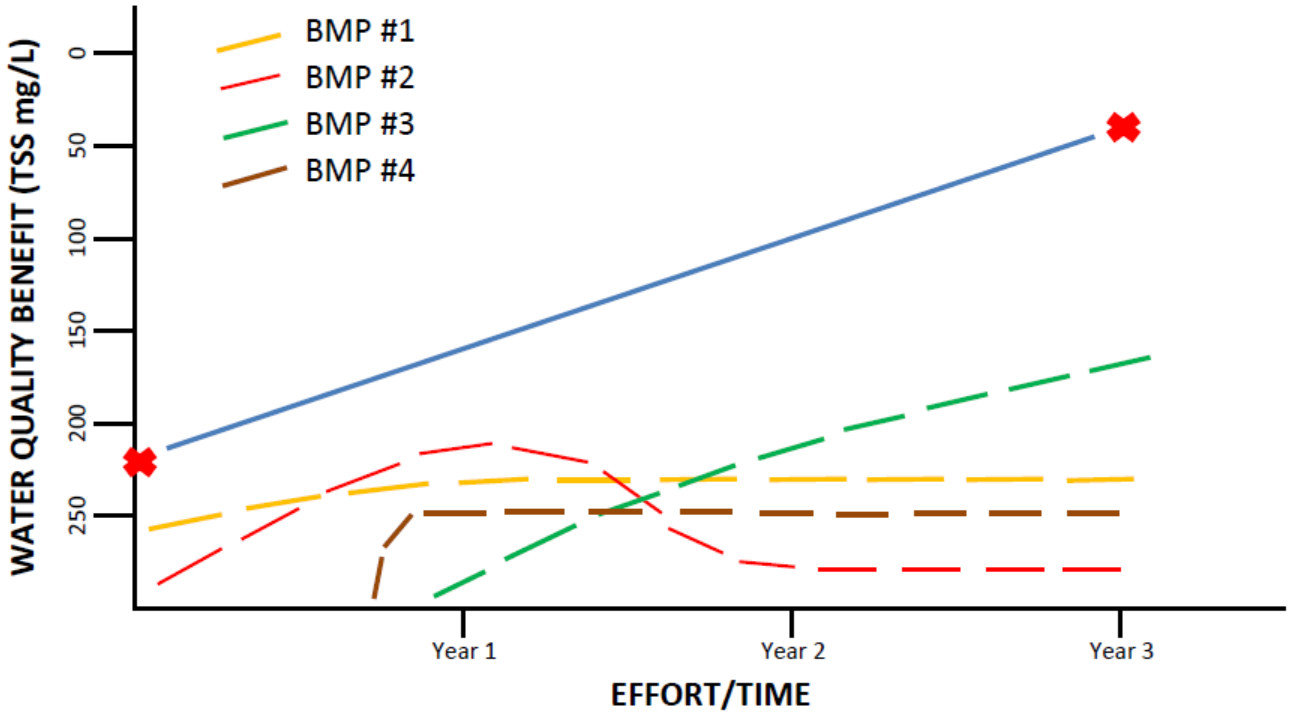
- BMP #1: Street sweeping under MCM 6
- BMP #2: System maintenance under MCM 6
- BMP #3: Public outreach and corresponding homeowner “improvements” under MCMs 1&2
- BMP #4: maintained basin under MCM 5



SWMP Goal – MEP Details (preliminary)

Primary “tools” selected to support SWMP goal:

- BMP #1: Street sweeping under MCM 6
- BMP #2: System maintenance under MCM 6
- BMP #3: Public outreach and corresponding homeowner “improvements” under MCMs 1&2
- BMP #4: maintained basin under MCM 5



SWMP Goal – Year 1 Assessment

Went out in October, and collected samples (wet weather/stormwater discharges)

- MEP showed a desired concentration of ~165 mg/L
- Results came back at 195 mg/L

Individual BMP analysis summary:

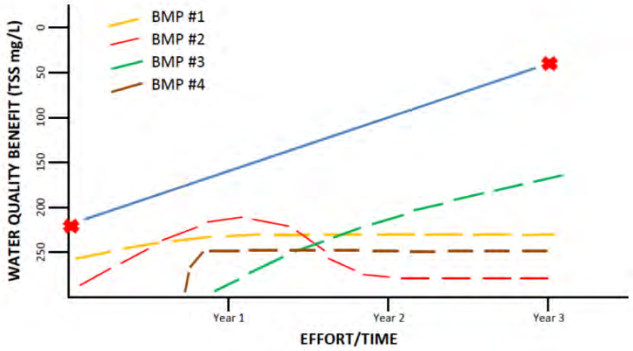
- Street sweeping consistently removed a significant amount of sediment (every other month)
- System maintenance: always sediment built up that had to be removed, over half of inlets had to have sediment removed (every other month)…did not decrease at end of year
- Public outreach/participation: 4 homeowners showed up to meeting, and want to do "the right thing"
- Basin was repaired, and is functioning as intended (per inspection)

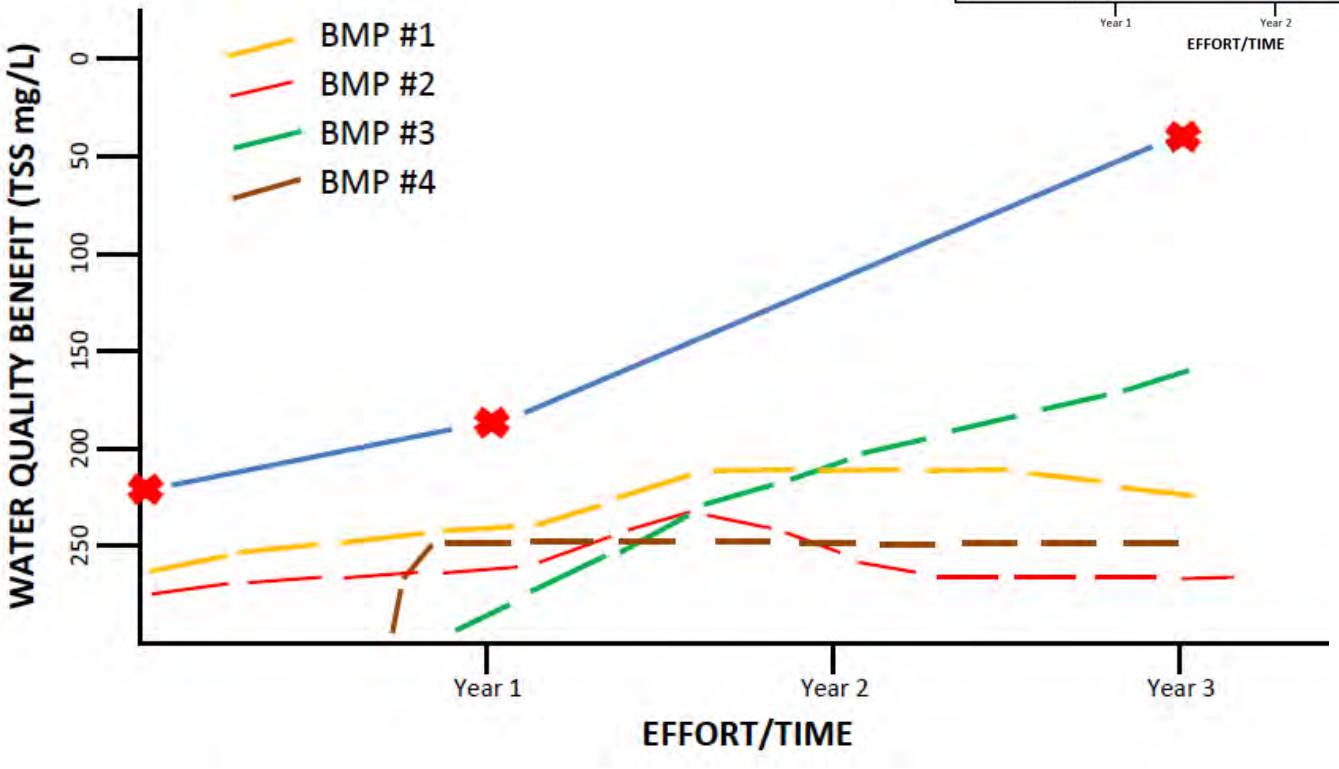
Supporting BMP analysis summary

- Sediment deposition at outfall discharge point still significant (per dry weather screening)
- One small project permit issued, and homeowner installed E&S Controls during project
- Field investigation revealed significant exposed areas on properties still exist, several homes stabilized however

SWMP Goal – Year 1 Modifications (Iterative Process)

- Increase street sweeping and system maintenance to once per month from April-October
  - Homeowner “improvements” should result in decrease of frequency in future
- Conduct outreach efforts twice during year 2





SWMP Goal – Year 2 Assessment

Went out in October, and collected samples (wet weather/stormwater discharges)

- MEP showed a desired concentration of ~125 mg/L
- Results came back at 90 mg/L

Individual BMP analysis summary:

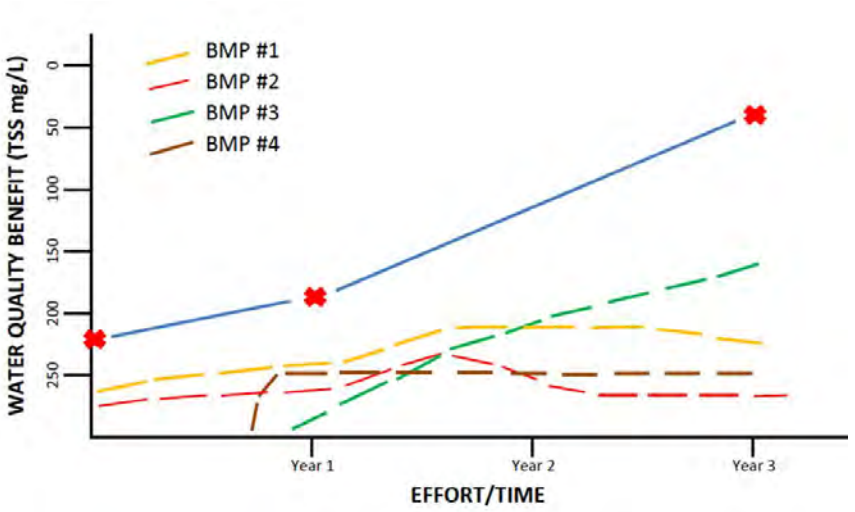
- Street sweeping consistently removed a significant amount of sediment during first part of year, but “tailed off” during second half of year (less per load) (every month)
- System maintenance: always sediment built up that had to be removed during first half of year, over half of inlets had to have sediment removed (every month)…did a decrease in sediment observed and removed decreased significantly during second half of year
- Public outreach/participation: 6 “new” homeowners showed up to meeting, and want to do “the right thing”
- Basin was inspected, and was maintained and is functioning as intended

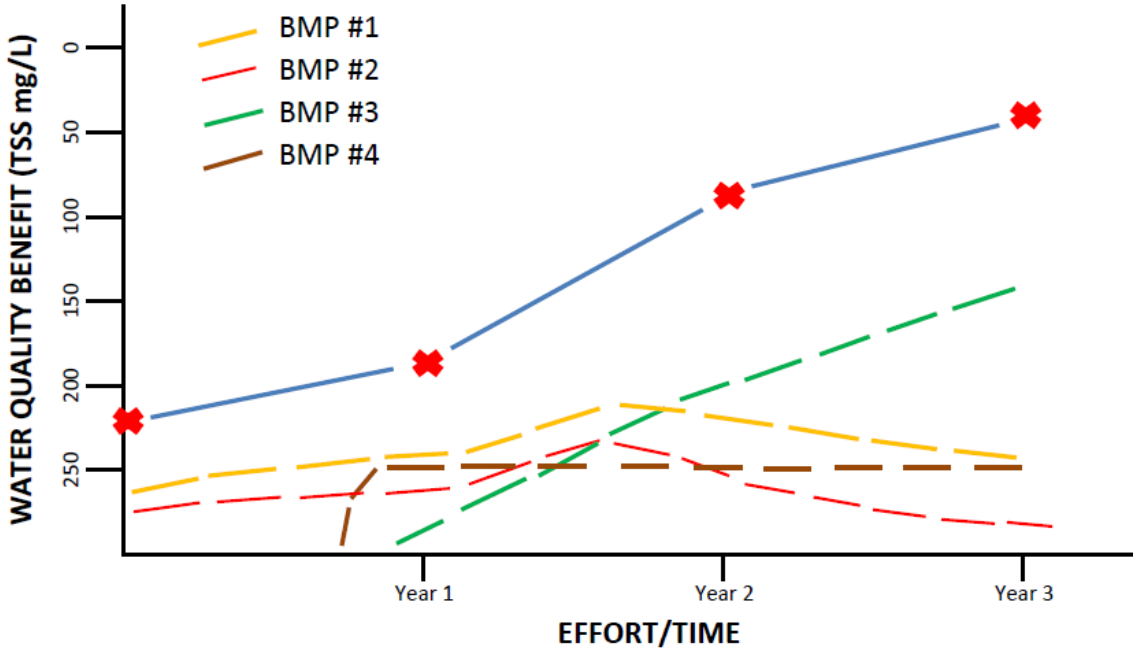
Supporting BMP analysis summary

- Sediment deposition at outfall discharge point much less from a visual comparison (per dry weather screening)
- Two small project permits issued, and homeowners installed E&S Controls during project
- Field investigation revealed a number of previously exposed areas on properties have been stabilized….noticeable decrease in the number of “debris piles.”

SWMP Goal – Year 2 Modifications (Iterative Process)

- Back down street sweeping and system maintenance to every other month from April-October
  - Homeowner “improvements” should continue to result in decrease of frequency in future
- Maintain outreach efforts twice during year
again





SWMP Goal – Year 3 Assessment

Went out in October, and collected samples (wet weather/stormwater discharges)

- MEP showed a desired concentration of ~50 mg/L
- Results came back at 20 mg/L

Individual BMP analysis summary:

- Debris removed by street sweeping consistently and significantly decreased every other month
- System maintenance: sediment build-up had to be removed early in the year, but essentially no build-up by the end of the year
- Public outreach/participation: 6 more “new” homeowners showed up to meeting, and want to do “the right thing”
- Basin was inspected, and was maintained and is functioning as intended

Supporting BMP analysis summary

- Sediment deposition at outfall discharge point is essentially non-existent
- One small project permit issued, and homeowner installed E&S Controls during project
- Field investigation revealed a number of previously exposed areas on properties have been stabilized….noticeable decrease in the number of “debris piles” for second straight year.

SWMP Goal Achieved

MS3 classification changed to “Low Priority.”

- Dry weather screening once a permit term
- Characterization of stormwater discharges and MS3 once a permit term
- Street sweeping and system maintenance once a year (in spring)
- Homeowners in MS3 are no longer a Priority TAG
- Maintain agreement with neighboring municipality for residents to use compost facility
- Conduct basin inspection once a permit term….have homeowner submit “Maintenance Verification Form” annually

SWMP - Considerations

- If you have multiple areas that become classified “High Priority,” do not try to address all of them at once if you do not have the resources….prioritize and address based on prioritization ranking

- If you are not going to achieve a goal based on the original timeline – extend the goal date per the iterative process (annual assessment). Likewise, if you are performing better than anticipated, you can move the goal date up.

- If goal progress is underperforming, may need to inject more BMPs (including physical facilities or structural BMPs per the Impaired Waters Plan).

- At times, you may “top out” below the intended goal value….in this case, your current set of tools represent the most that can be done and you have actually achieved Maximum Extent Practicable.

MS4 Permit Program Management

USEPA Audit/Review

Land Studies

EPA View – “mock audit” (of scenario example)

Potential Permit Violation: Measurable improvements of the PEOP (PAG-13, Appendix A, Stormwater Management Program, MCM #1, BMP #1)

The PEOP fails to outline performance criteria and effectiveness considerations to “achieve measurable improvements in the target audience’s understanding…” An essential aspect of a SWMP is assessing program (including individual elements (e.g. MCMs) of the SMWP) effectiveness based on measurable goals. While publishing a newsletter (or similar) and documenting the newsletter was published can be considered a measurable goal, it fails as a measureable goal that could indicate the effectiveness of the newsletter distribution.

Significant Concern: PEOP rationale

The PEOP fails to describe or outline decision processes and/or rationale for:

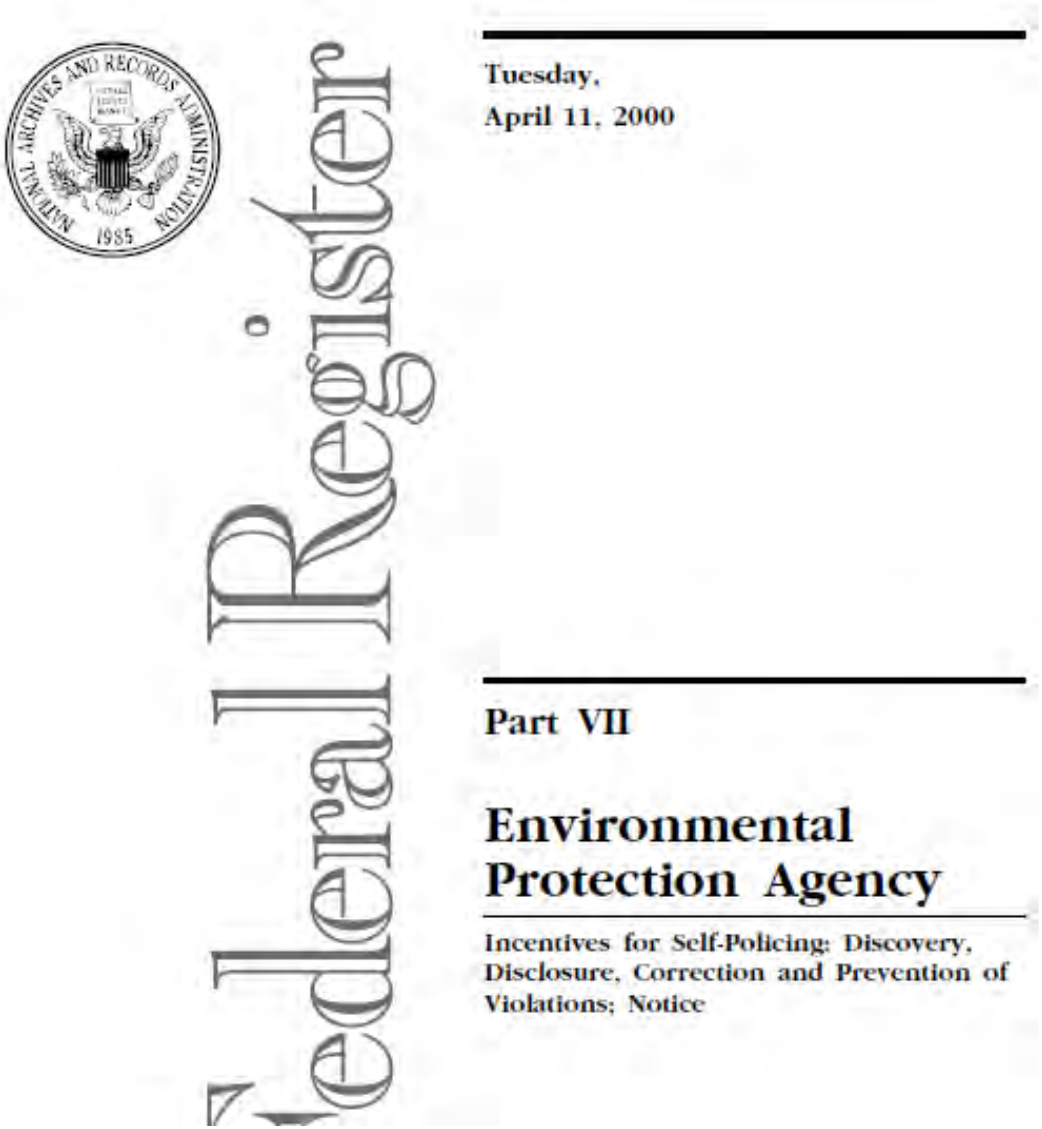
- Why target audience groups are selected
- Targeted pollutant sources

Essentially, there is no **rationale** or relationship for the primary educational efforts and what should be a primary focal point of the SWMP (303(d) listed impairments). The primary impairments associated with urban/suburban causes include siltation (or sediment) and pathogens. However, the primary piece of educational efforts focuses on nutrients (Nitrogen and Phosphorus). No reasonable rationale could be provided for selecting the educational materials. Additionally, the PEOP fails to support or coordinate with the other MCMs.

Program Rationale

An important aspect to consider and note as a result of the audit is that you can document every minute detail, generate long and drawn-out processes and Standard Operating Procedures (SOPs), build large databases, use massive checklists to facilitate certain activities outlined in the permit, produce and attach a number of reports (e.g. lab analysis results) to documents, and so on. However, all this documentation will not compensate for the absence of appropriate rationale behind a program. The summary provides considerations for initial focus for establishing appropriate rationale. Generally, with established appropriate rationale, a permittee does not need to generate the extensive items noted above in this paragraph; or the rationale supports those items if a permittee desires to "over-document."

USEPA Audit Policy



USEPA Audit Policy

Regulated entities that satisfy the following conditions are eligible for Audit Policy benefits. Even if an entity fails to meet the first condition - systematic discovery - it can still be eligible for 75% penalty mitigation, and a recommendation for no criminal prosecution of the violations.

Systematic discovery of the violation through an environmental audit or the implementation of a compliance management system.
Voluntary discovery of the violation was not detected as a result of a legally required monitoring,sampling or auditing procedure.
Prompt disclosure in writing to EPA within 21 days of discovery or such shorter time as may be required by law. Discovery occurs when any officer, director, employee or agent of the facility has an objectively reasonable basis for believing that a violation has or may have occurred.
Independent discovery and disclosure before EPA or another regulator would likely have identified the violation through its own investigation or based on information provided by a third- party.

USEPA Audit Policy

Correction and remediation within 60 calendar days, in most cases, from the date of discovery.
Prevent recurrence of the violation.
Repeat violations are ineligible, *i.e.*, the specific (or closely related) violations have occurred at the same facility within the past 3 years or those that have occurred as part of a pattern at multiple facilities owned or operated by the same entity within the past 5 years; if the facility has been newly acquired, the existence of a violation prior to acquisition does not trigger the repeat violations exclusion.
Certain types of violations are ineligible such as those that result in serious actual harm, those that may have presented an imminent and substantial endangerment, and those that violate the specific terms of an administrative or judicial order or consent agreement.
Cooperation by the disclosing entity is required.

CWA Audits/Inspections

Stormwater pollution occurs when debris, chemicals, sediment or other pollutants are washed into storm drains and flows into water bodies. The CWA, and its implementing regulations, requires that certain industrial facilities, construction sites, and Municipal Separate Storm Sewer Systems (MS4) obtain coverage for their stormwater discharges under an NPDES permit, develop a Stormwater Pollution Prevention Plan (SWPPP) or Stormwater Management Plan (SWMP) and put measures in place to prevent discharges of pollutants in stormwater runoff.

EPA conducts inspections of three types of facility operations subject to the storm water regulations:

- construction sites
- industrial sites
- Municipal Separate Storm Sewer Systems (MS4)

LandStudies

CWA Audits/Inspections

These inspections involve:

- reviewing the storm water permit, the SWPPP or SWMP, and stormwater records and reports
- interviewing personnel knowledgeable of the SWPPP or SWMP and facility operations
- reviewing and observing best management practices and control measures in place, and
- sampling stormwater discharges if appropriate.

For MS4 operators, EPA also conducts audits designed to provide a comprehensive review of primary facets (or program elements) of the Stormwater Management Program (SWMP), namely:

- control of illicit discharges,
- discharges from construction sites (active and post construction),
- discharges from industrial facilities (typically only for the largest MS4s),
- implementation of pollution prevention/good housekeeping practices, and
- involvement of and outreach to the public.

MS4 Audit/Inspection Purpose

To determine if your program (whether developed or currently in development) meets the requirements of the MS4 Permit **and** stormwater program to promote and produce higher water quality of "Waters of the U.S." as defined within the meaning of Section 502 of the CWA, 33 USC Section 1362, and 40 CFR Section 122.2.

MS4 Audit/Inspection “Front-end” Protocol

- Selection Process
- Notification to the permittee
- Information Request (by EPA)
- Draft Agenda

Example agenda

Day	Time	Activity	
		Team 1	Team 2
Tuesday April 7, 2009	8:00 am – 9:00 am	Kick-off Meeting & Program Management Overview	
	9:00 am – 10:00am	**Source Identification (Office)** – Permit PART III.C	
	10:00 am – 11:00am	**Illicit Discharge Detection and Elimination (IDDE)/ Industrial (Office)** – Permit PART III.E.4	**Construction (Office)** – Erosion and Sediment Control Permit PART III.E.3
	11:00 am – 12:00pm	Commercial/Industrial Surveys – Permit PART III.E.4.b	BMP Construction Inspection – Permit PART III.E.2.a
	1:00 pm – 4:30 pm	**Illicit Discharge Detection and Elimination (IDDE)/ Industrial (Field)** – Permit PART III.E.4	**Post Construction (Office)** Stormwater Management – Permit PART III.E.1 BMP Maintenance Inspection – Permit PART III.E.2.b
	4:30 pm – 5:00 pm	Recap and Logistics Planning for Wednesday	

MS4 Audit vs. Inspection

- Audit

- Overall picture of your program
- Determine you are doing what you said you are doing (or will be doing) in your annual report, SWMP, etc.
- All BMPs are generally reviewed

Phase II MS4 Audits are generally 1-2 days

- Inspection

- 1-2 BMPs are “inspected”
- Generally a reason for the inspection (EPA initiative, citizen complaint, etc.)
- Pre-permit reissuance
- Audit prerequisite

Phase II MS4 Inspections will be at least 2 days

LandStudies

Example – in the field “focus”

Photograph 15. Central Garage – Example of staining on paved area.

Land Studies

So...you receive a phone call from EPA

Front-end activities for EPA Audit

- Review your permit
- Ask for a copy of latest annual report (possibly…probably already have a copy)
- Ask for a copy of your SWMP and review (possibly…may request to see it during the audit)
- Set date(s) and times (draft agenda)
- Request an elected official (most likely the chair) be present (especially for the entrance and exit interviews)

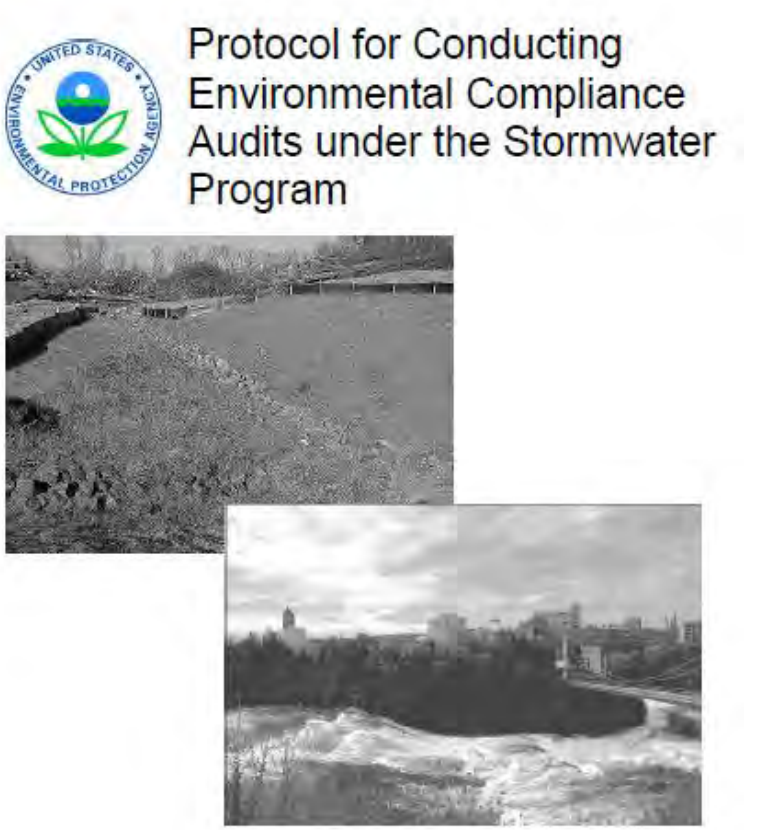
Example questions during Audit

- Who does what? How do they do it? What do they do? How do you document? And so on, so on….
- What legal authority do you have?
- How do you handle citizen complaints? How do you track them?
- Do you believe your program is effective? Do you have enough people to run the program effectively?

Audit checklist

- May be tailored to preliminary review of provided information, or may be a "standard" checklist

- "Mock" audits….use a combination of:
  - EPA "Protocol for Conducting Environmental Compliance Audits under the Stormwater Program"
  - NPDES Compliance Inspection Manual
  - MS4 Program Evaluation Guidance Manual (2007 Field test version)



LandStudies

EPA “Protocol”

12.6 Pollution Prevention/Good Housekeeping for Municipal Operations [122.34(b)(6)] (MS4 - 4			

The operator must develop and implement an operation and maintenance (O&M) program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. [122.34(b)(6)]	Verify the SWMP describes the process for program development including:
	• A description of the O&M program to prevent or reduce pollutant runoff from municipal operations including:
	  • Municipal operations impacted by the O&M program
	  • A list of municipally-owned industrial facilities discharging to the MS4 that are subject to industrial stormwater permitting (including permit number or industrial NOI)
		☐
		☐
		☐	

EPA NPDES Compliance Inspection Manual

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
☐☐☐☐☐	_____
☐☐☐☐☐	_____
☐☐☐☐☐	_____
☐☐☐☐☐	_____

Management Practice Violations	
B0019	Best Management Practice Deficiencies
B0024	Biosolids/Sewage Sludge Violation (Part 503)
B0026	Failure to Allow Entry
B0012	Failure to Conduct Inspections
B0027	Failure to Develop Adequate SPCC Plan
B0017	Failure to develop any or adequate SWPPP/SWMP
B0011	Failure to Develop/Enforce Standards
B0028	Failure to Implement SPCC Plan
B0018	Failure to Implement SWPPP/SWMP
B0041	Failure to Maintain Records
B0040	Improper Chemical Handling
B0023	Improper Land Application (non-503, non-CAFO)
B0020	Improper Operation and Maintenance

EPA MS4 Program Evaluation Guidance Manual

Post-Construction Controls

Key questions to ask:

- ✓ Describe your post-construction design standards and legal authority.
- ✓ Describe your process for reviewing plans to ensure post-construction BMPs are addressed. Do plan reviewers use checklists to ensure consistent plan review?
- ✓ Describe your post-construction operation and maintenance (O&M) program (including your inventory of post-construction BMPs and your inspection and maintenance schedule).

Potential information to review:

- ✓ Post-construction plan reviewed and approved by MS4
- ✓ Records for post-construction BMP inspection and maintenance; both private and public if applicable
- ✓ An O&M plan for post-construction BMPs from a recently approved project

EPA MS4 Program Evaluation Guidance Manual cont'd

Program Management

Key questions to ask:

- ✓ Does your written stormwater management plan include specific milestones and quantities for each program/BMP?
- ✓ Describe how your SWMP is coordinated across departments.
- ✓ Describe the impaired waters, pollutants of concern and TMDLs for the waterbodies you discharge to. Does your SWMP include programs or BMPs specifically addressing these impairments?
- ✓ Describe how you evaluate the success of your stormwater management program.

Potential information to review:

- ✓ Stormwater management plan document
- ✓ Most recent annual report
- ✓ Organizational chart showing departments with stormwater responsibilities

EPA MS4 Program Evaluation Guidance Manual cont'd

Records Review

The following records might help in evaluating the permittee's program management structure. Ask for copies of relevant information where it will help in writing the report or documenting a permit violation.

Documentation	What to Look For
▪ Stormwater program staff lists ▪ Organizational charts ▪ Contact names and responsibilities	▪ Are specific departments and/or individual positions identified as responsible for each part of the SWMP? ▪ Are lines of authority and responsibility clear?
▪ Performance standards ▪ Program goals/measurable goals ▪ Implementation schedule	▪ Has the permittee documented a schedule and goals for guiding the SWMP in subsequent years? ▪ Are these goals specific enough for the SWMP to be evaluated?
MOUs or other agreements	▪ Does the permittee document partnerships with other agencies, nonprofit organizations, or other cooperating entities? ▪ Are the roles and responsibilities of each entity clearly identified?
▪ Tracking systems	▪ Has the permittee established procedures or

EPA MS4 Program Evaluation Guidance Manual cont'd

ASSESSMENT AND EVALUATION

Programs

- ✓ Does the permittee regularly measure progress against the established performance standards and goals?
- ✓ Are the goals quantifiable?
- ✓ Is the permittee analyzing data in the annual report to identify program activities that may need to change to address problem areas?
- ✓ Has the SWMP been altered based on this evaluation?

BMPs

- ✓ Is the permittee able to track both structural BMPs and non-structural BMPs and activities?
- ✓ Has the permittee set measurable goals or performance standards to evaluate individual BMPs and activities or suites of BMPs that address a particular pollutant source?
- ✓ Is there a process to evaluate or revise individual BMPs and suites of BMPs when receiving water

LandStudies

EPA MS4 Program Evaluation Guidance Manual cont'd

Common Issues Identified During Program Evaluations

- ✓ The permittee lacks necessary intradepartmental coordination on stormwater issues.
- ✓ The permittee does not describe a formal, coordinated program framework.
- ✓ The SWMP does not identify pollutants of concern or program priorities.

- ✓ The program does not have measurable goals to track and quantify progress towards desired outcomes.
- ✓ The "umbrella" group for multiple co-permittees has a program or plan, but nothing has been developed for each specific co-permittee to detail actual implementation or goals specific to each co-permittee's program.
- ✓ No SWMP planning document(s) exist to guide the implementation of SWMP components.
- ✓ The SWMP has not been revised and updated based on evaluations of effectiveness.

Results of EPA Audits/Inspections – Report

2.4.2. Failure to Track the status of SWPPP Development and Implementation. Part III.E.5 of the Permit requires the City to annually report the status of pollution prevention plan development and implementation. The City reported in their Year 4 Annual Report that an NOI and SWPPP would be completed for the new Central Maintenance Garage after construction was completed in 2008. At the time of the EPA Inspection, the City had failed to develop an adequate SWPPP for its Central Maintenance Garage and was not able to provide a SWPPP for its Northwest Transfer facility. In addition, based upon a cursory review of SWPPPs provided for the facilities managed by the General Services Department, the SWPPPs appeared to be generic (e.g., did not adequately identify facility specific BMPs), did not contain certification statements with signatures, were prepared in April 2002 and appeared to have been revised only one time (April 1, 2009), and lacked training documentation and other required records, and topographic maps. The facilities include the following:

Results of EPA Audits/Inspections – Enforcement Action

Administrative Order (maximum $16,000/day fine)

- Baseline USEPA approach to impose a fine without court action
- Considers nature of violation, prior history, circumstances, etc. to determine fine level and duration

Civil Suit without an AO (maximum $37,500/day fine)

- Generally pursued for more serious violations, if a history violations exists, etc.

Criminal penalties ($37,500/day and/or imprisonment)

- Violations may include failure to maintain records, BMPs, etc.

Results of EPA Audits/Inspections – AO

IV. VIOLATIONS

MCM #6: Pollution Prevention/Good Housekeeping for Municipal Operations

27. Part A.2 of the Permit requires the Respondent to, among other things, implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

28. The Permit, through item 18 of the Annual Report Form, MCM #6, requires the Respondent to identify the following in the Annual Report:

    a. a written Operation & Maintenance (O&M) plan if not previously submitted.

29. The August 2009 File Review indicated that the Respondent had failed to comply with the Permit by not identifying the following in the Annual Report:

    a. a written Operation & Maintenance (O&M) plan if not previously submitted.

31. Within one hundred and twenty (120) days of the effective date of this Order and Request, Respondent shall:

    a. Complete the requirements of the Permit and submit a completed Protocol;

    b. Provide the dates when the Annual Report Form BMPs that have been alleged in violations identified in this Order were first implemented;

MS4 Permit Program Management

Mock Inspection Examples

Land Studies

Self-audits

The audit also serves as a "self-certification" assistance process for the permittee. The U.S. Environmental Protection Agency (USEPA) recommends municipalities subject to terms and conditions of an issued MS4 Permit conduct "self-audits" of their SWMP to ascertain the progress of program implementation against measurable goals. The recommendation is an approach to meet requirements of the Clean Water Act (CWA) and National Pollutant Discharge Elimination System (NPDES). 40 CFR 122.26(d)(2)(v) and 122.34(g) requires MS4s to assess controls and effectiveness of their SWMPs—and to document such assessments.

Mock Inspection Examples

Public Works Facilities

Outfall discharges

Source Control(s)

LandStudies

Public Works Facilities – Fueling Areas

Significant Concern: Vehicle & Equipment Fueling controls for reducing or eliminating the discharge of pollutants

The fuel tank appears to meet most compliance considerations (level concrete pad, protection bollards, etc.). However, the activity of fueling is conducted with no run-off/run-on delineation and/or cover over a sloped asphalt surface receiving run-off and discharging via an outfall to a waterway.

- Vehicle and Equipment Fueling
  - See attached BMP Fact Sheet with specific focal points and considerations highlighted.
  - Extend impervious surface at equipment/vehicle fuel station; secondary containment should be considered (berm, overhang, etc.).
    - The tank is on an appropriate impervious surface (concrete pad), but the activity of fueling is conducted over a pervious surface and in the drainage patterns that discharge to the Cocalico Creek.

Stored bags exposed directly to rain.

Public Works Facilities – Fueling Areas

LandStudies

Public Works Facilities – Fueling Areas

Public Works Facilities – Fueling Areas

LandStudies

Public Works Facilities – Fueling Areas (inspections)

A.4. Fueling Area

a. Pumps

While fueling, the driver shall remain outside of the vehicle at the pump.

A spill clean up kit is stored in the pumping area. If fuel drips, leaks or sprays from fueling, the spill should be immediately cleaned up using the kit. After clean up, the used materials should be disposed of in a covered trash receptacle. The fueling area shall be inspected monthly and documented on the form "Municipal Facilities O&M Plan Maintenance Log: Area A".

b. Vehicle Washing

Vehicle washing shall take place in a designated indoor area equipped with a floor drain that is connected to the sanitary sewer system. All chemicals used to wash vehicles shall be stored in leak proof containers. The washing area shall be inspected monthly for visible leaks, spills or drips and the inspection documented on the form "Municipal Facilities O&M Plan Maintenance Log: Area A". No flows from vehicle washing should enter the storm sewer system.

Important Note

Do not treat all activities and facilities equally

Public Works Facilities – General Material Storage

Public Works Facilities – Waste Management

- Secondary containment should be considered for waste management areas (cover, berm, etc.) – specifically for the general trash dumpster adjacent to the building.
  - The current waste container could be considered in a runoff flow pattern on site
  - A Waste Management Plan would be appropriate (with documented training) for appropriate disposal procedures ("what can and cannot be disposed in the dumpster); hazardous materials could interact with runoff and infiltrate.
  - Relocation of the dumpster to a more appropriate area (removed from drainage patterns) may be appropriate.

Dumpster (located in drainage patterns to inlets)

- Failure to develop, implement, and maintain waste management procedures

MCM 6 – EPA "Protocol"

12.6 Pollution Prevention/Good Housekeeping for Municipal Operations [122.34(b)(6)] (MS4 - 4.2.6)			

The operator must develop and implement an operation and maintenance (O&M) program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. [122.34(b)(6)]	Verify the SWMP describes the process for program development including:
	
	• A description of the O&M program to prevent or reduce pollutant runoff from municipal operations including:
	  • Municipal operations impacted by the O&M program
	  • A list of municipally-owned industrial facilities discharging to the MS4 that are subject to industrial stormwater permitting (including permit number or industrial NOI)
		☐
		
		☐
		
		☐	

MCM 6 – EPA “Protocol”

Regulatory Requirement or Management Practice:	Reviewer Checks	Reviewer Completed	
	training program used to prevent/reduce stormwater pollution from municipal activities including: • A description of exiting materials used • Description of how the training program is coordinated with public information and illicit discharge minimum measures	☐ ☐ ☐	

MCM 6 – EPA “Protocol”

• A program description addressing:
  • Maintenance activities, schedules, and long-term inspection procedures for controls to reduce floatables/ pollutants to the MS4
  • Controls for reducing or eliminating discharges from streets, parking lots, storage yards, etc.
  • Procedures for proper disposal of waste removed from MS4 and municipal operations
  • Procedures ensure flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection
	☐
	☐
	☐
	☐

MCM 6 – EPA “Protocol”

• Person(s) responsible for management and implementation of the program/BMPs • How success of minimum measures are evaluated	☐
• How measurable goals were selected	☐
Verify the training program for the municipal staff achieves the intended goal of educating staff associated with reducing pollutant runoff from municipal operations.	☐ ☐
Verify that proposed maintenance activities are performed.	
Verify the BMPs and measurable goals outlined in the plan have been met by the schedule set forth in the SWMP.	☐ ☐

Public Works Facilities – self-audit (documentation review)

Does your O&M program include a map or layout of facilities with locations with the potential to discharge pollutants or pollute stormwater runoff? IN A GIS LOCATION ATM	YES *	NO
Is there an organizational chart in place for the O&M Program?	YES	NO
Does your O&M program describe BMPs used to reduce the potential for polluting stormwater runoff or the discharge of pollutants?	YES	NO
Does your O&M program include a BMP maintenance schedule?	YES	NO
If contractors are used, are they aware of your O&M Program?	YES	NO
Is someone responsible to develop and administer policies and procedures? NCA COMMITTEE	YES	NO
Does your O&M Program include a component addressing Waste Management?	YES	NO

Public Works Facilities – self-audit (field review)

WASTE MANAGEMENT AREAS	Yes	No	?	Flag	Comments
Clean	✓				
Consolidated	✓	✓	✓		TWO CONS. AREAS
Removed from drainage patterns		✓		✓	
Staining					N/A → RAINED
Dumpsters	✓		✓		
Structurally sound		✓		✓	
Run-on/run-off protection		✓		✓	

DISCHARGE POINTS	Yes	No	?	Flag	Comments
Directly to waterway	✓	✓	✓	✓	VEG. FILTRATION PRIOR TO DISCH
Impaired	✓				
sampling/testing		✓			
Sediment	✓			✓	
Debris or litter	✓				SEDIMENT

MCM 6 – Basic Recommended Approach (The Platform)

1. Develop your inventory (list) – **all** facilities and activities
   - For facilities: conduct a "WQ Impact Assessment" for prioritization
   - For both: indicate pollutants that could be generated or could pollute stormwater run-off
   - Ultimately want to itemize groupings of facilities (specifically the MS4)

2. Develop Primary O&M Plan Component
   - start with Standard Operating Procedures (SOPs) for the activities
   - "tag" activities to facilities (e.g. mowing at the park or re-paving township roads)
   - Select BMPs to compliment SOPs - both activities and facilities (e.g. protect inlets during re-paving operations)
   - Assign "conditions" to the BMPs (e.g. protect inlets that would receive drainage in areas of re-paving, maintenance of the inlet protection devices, inspection requirements, and so on)

MCM 6 – How it is supposed to work

- You continually conduct a set of operations complimented by water quality protection BMPs to **prevent or reduce** the discharge of pollutants to the system and ultimately receiving waterways. This may include additional BMPs to compliment the system as a whole (e.g. street sweeping).

- The SWMP itself is supposed to be designed and administered with the intent to identify and respond to issues, poor health of receiving waterways, and so on based on delineated and prioritized areas (MS3s).

- When an issue does arise (with the nature of stormwater discharges), the SWMP is supposed to react to **specifically reduce** the pollutant(s) of concern discharging by Maximum Extent Practicable (MEP) methodology.

- Through the SWMP – a group of activities, BMPs, etc. under the MCMs and other elements of the SWMP (e.g. Impaired Waters Plan) are selected to **specifically reduce** the pollutant(s) of concern discharging – the SWMP goal

MCM 6 – How it is supposed to work

- For example purposes, there is a sediment issue that the SWMP is responding to within a specific MS3 tied to an MS4 Outfall discharging to a waterway with a sediment impairment.

- The activities and/or BMPs selected under MCM 6 include street sweeping and system cleaning (could be increased system cleaning) in the MS3 as components to **specifically reduce** sediment in discharges. (BMPs and/or activities are selected from other MCMs as well….public education (MCM #1) and increased illicit discharge monitoring (MCM #3).

- For the first year, records are kept of the amount of sediment removed from street cleaning and system cleaning (along with measurements of the other MCMs). The SWMP "measures" progress by re-characterizing the nature of the sediment in stormwater discharges to conduct a progress assessment of the SWMP goal by MEP methodology (beginning of the "iterative process") at the end of the first year.

MCM 6 – How it is supposed to work

- If the SWMP goal assessment indicates the reduction in sediment is on track with the established SWMP goal (following the desired trend)….then the rationale is appropriate for holding activities and BMPs constant until the goal is achieved.

- If the SWMP goal assessment indicates the reduction in sediment is above and beyond expectations…then a decision needs to be made that could include revising the goal timeline (shorter timeframe), keeping the timeline the same but adjusting the BMPs used to allocate resources in other needed areas, etc.

- If the SWMP goal assessment indicates the reduction in sediment is falling short of expectations established…then a decision needs to be made that may result in increased frequency of street sweeping, adjusting timeframes, etc.

*Note on increased frequency of street sweeping and MEP.

MCM 6 – How it is supposed to work

On an annual basis, assess performance (documented self-audit) and plan/implement adjustments to reduce and/or eliminate pollutants.

LandStudies

“Mock Audit” - Receiving Waterways

***Potential Permit Violation: Non-compliance with Water Quality Standards - Discharges that would cause or contribute to instream exceedances of water quality standards (Authorization to Discharge-General Permit Coverage and Limitations-Part 2.j)*

[redacted] could neither prove nor disprove the following based on the permit limitation that the permit does not authorize discharges that do not, or shall not, result in compliance with applicable effluent limitations or water quality standards:

- If discharges from the regulated MS4 cause or contribute to the established instream exceedance of water quality standards
    - NOTE: Exceedances of water quality standards are observed within the jurisdiction. Over 90% of tributaries and reaches of the Little Conestoga watershed include a 303(d) listed impairment of siltation from urban runoff, nutrients & siltation impairment from agricultural runoff, and a general pathogens impairment (applies to both agricultural sector and urban/suburban sector). As of late 2015, all tributaries and reaches of the Little Conestoga include a pathogens impairment on the PADEP WAVE database (which can be considered the forthcoming 2016 303(d) listing).

In reality, this potential violation may be difficult to “prove” by enforcement of a regulatory agency. However, it should be noted that through an audit the other noted concerns and observations listed in this summary could be elevated to non-compliance status.

“Mock Audit” - Receiving Waterways

***Significant Concern: Discharges to a designated 303(d) listed water*

The SWMP fails to discuss:

- How discharges of pollutants of concern will be controlled
- How the operator will ensure discharges will not cause or contribute to exceedances of water quality standards
- Measures and BMPs that will control these discharges

In general, the SWMP fails to identify pollutants of concern and associated controls. Assumptions can be reached on probable pollutants of concern based on the 303(d) list. However, the SWMP fails to outline pollutants of concern and whether discharges are contributing to or causing the impairment.

***Significant Concern: Measuring and Assessing Program Effectiveness*

The SWMP (and corresponding MCM elements) fails to provide processes, guidance, or results of measuring and assessing effectiveness of program activities and components. At times, items described as goals (proposed and current) are listed in the existing program. However, there is no attempt or description of criteria to assess if a proposed task, BMP, or similar was (or what needs to occur) effective in supporting program goals and objectives as required by the NPDES.

“Mock Audit” - Receiving Waterways

Observation: SWMP does not include an appropriate program management component
It appears the SWMP fails to address two of three requirements of 40CFR 122.34(a) regarding SWMP development and implementation—protect water quality and satisfy the appropriate water quality requirements of the CWA. The SWMP fails to offer rationale or appropriate processes and/or organization to evaluate program compliance and progress towards achieving identified measurable goals. Primary supporting observations of this focal point include:

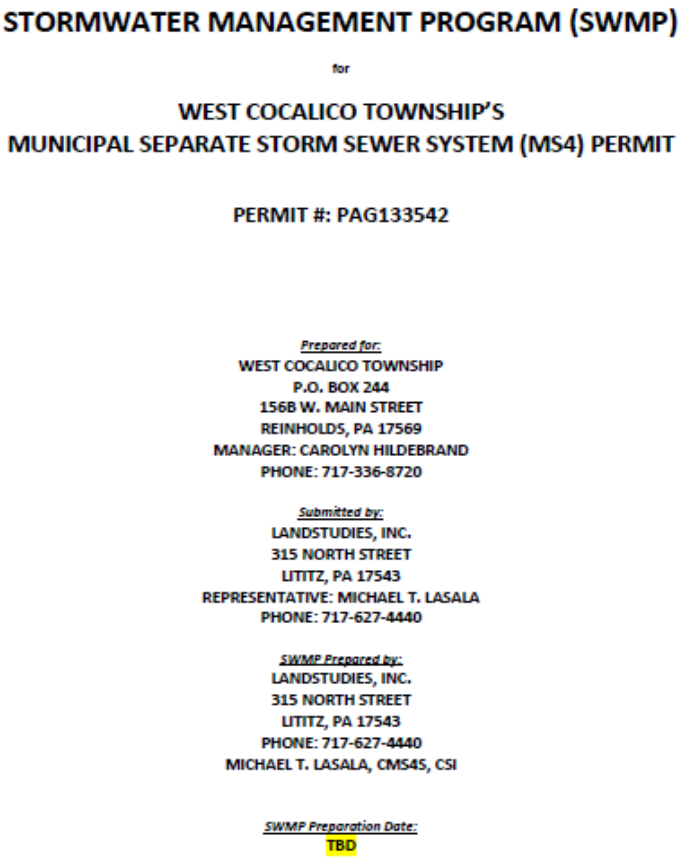
- Lack of agreements, MOUs, and similar for all entities involved or referenced as stakeholders for facilitation of the program. Additionally, the SWMP fails to address roles and/or responsibilities of each stakeholder or entity involved in SWMP facilitation. An MOU does exist with the Lancaster Conservation District (LCCD) – which is discussed in more detail under the MCM #4 program area review.
- SWMP fails to describe the impaired waters receiving discharges and pollutants of concern.
- SWMP fails to identify BMPs (or provide rationale) specifically for sources or discharges to waters with listed impairments
- SWMP fails to include milestones (or goals) associated with the listed impairments.
- SWMP fails to address the impairments at any level.
- SWMP fails to outline SWMP review, assessment, and performance criteria
- SWMP fails to describe roles and responsibilities for facilitation and review of the program

Stormwater Management Program (SWMP)

The SWMP is the programmatic document for managing the MS4 Permit and the quality of discharges….addresses and outlines rationale, decision processes, and so on.

USEPA Expectations:
If discharging to an impaired water, verify the SWMP discusses:

- How discharges of pollutants of concern will be controlled
- How the operator will ensure discharges will not cause or contribute to exceedances of water quality standards
- Measures and BMPs that will control these discharges



STORMWATER MANAGEMENT PROGRAM (SWMP)

for

WEST COCALICO TOWNSHIP'S
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT

PERMIT #: PAG133542

Prepared for:
WEST COCALICO TOWNSHIP
P.O. BOX 244
156B W. MAIN STREET
REINHOLDS, PA 17569
MANAGER: CAROLYN HILDEBRAND
PHONE: 717-336-8720

Submitted by:
LANDSTUDIES, INC.
315 NORTH STREET
LITITZ, PA 17543
REPRESENTATIVE: MICHAEL T. LASALA
PHONE: 717-627-4440

SWMP Prepared by:
LANDSTUDIES, INC.
315 NORTH STREET
LITITZ, PA 17543
PHONE: 717-627-4440
MICHAEL T. LASALA, CMS4S, CSI

SWMP Preparation Date:
TBD

LandStudies

Common Program Issues (per USEPA)

- Permittee does not describe a formal, coordinated program framework
- SWMP does not identify pollutants of concern or program priorities
- Program does not have measureable goals to track and quantify progress towards desired outcomes
- No SWMP planning document(s) exist to guide the implementation of SWMP components
- The SWMP has not been revised and updated based on evaluations of effectiveness

“Mock Audit” – Source Control

This “mock audit” example essentially applies to the bulk of the rest of the SWMP (specifically most of the MCMs).

LandStudies

“Mock Audit” – Source Control

Significant Concern: Adequate operation and maintenance of all PCSM BMPs

In 2015, 17 of a total possible 67 sites were inspected. 15 sites (~88%) were found to have PCSM BMP deficiencies. If all sites are considered based on this statistic, then approximately 59 PCSM BMPs are not operating or being maintained as originally designed and/or intended. This statistic presents a significant concern in that there may be a “weak point” with understanding obligations, requirements, and similar for appropriate O&M operations for a PCSM facility during the occupancy phase of development or redevelopment. This significant concern does not necessarily point out a deficiency within the township’s program relative to the occupancy phase. However, it is the township’s obligation to ensure adequate operation and maintenance of all PCSM BMPs installed is occurring.

The township’s current protocol for inspecting facilities and ensuring repairs are implemented does meet obligations to a point, and appears to work well for the township. However, it may be more cost-effective and compliant (how the township will ensure long-term O&M for PCSM facilities) for the township to develop and implement a process that coincides with the occupancy phase to ensure long-term operations and maintenance of PCSM BMPs.

“Mock Audit” – Source Control

Significant Concern: Waste Management

Three approximate six-yard dumpsters are located at the northeast portion of the municipal yard, and immediately adjacent to Waters of the United States. The waste management area does not include run-off/run-on delineation (containment) and/or cover protection as well. Furthermore, the O&M Plan fails to address individual waste disposal practices and procedures (e.g. used oil filters, batteries, general waste, etc.). It is assumed these containers receive all waste generated from site operations that probably contain potential pollutants. The O&M Plan further outlines inspecting this area on a monthly basis for noticeable leaks and spills. It should be noted, any spill or leak will immediately enter Waters of the United States. An individual Waste Management Plan would be appropriate for inclusion into the O&M Plan.

Uncontained dumpsters located immediately adjacent to waterway (note litter on ground)

LandStudies

“Mock Audit” – Source Control

Significant Concern: Vehicle & Equipment Fueling controls for reducing or eliminating the discharge of pollutants

The fuel tank appears to meet most compliance considerations (level concrete pad, protection bollards, etc.). However, the activity of fueling is conducted with no run-off/run-on delineation and/or cover over a sloped asphalt surface receiving run-off and discharging via an outfall to a waterway.

“Mock Audit” – Source Control

- A construction site was visited along Nissley Road. E&S Controls were observed in place. However, there was significant evidence of sediment tracking off of the site. Township personnel indicated there have been repeat episodes associated with the sediment tracking. However, the site operator has consistently responded to township “direction” to clean up the tracked sediment. It should be noted, it should not take repeated direction from an MS4 permittee for an operator of an NPDES construction permitted site to conduct E&S Control operations that is already required by the permit, NPDES, and CWA. It is the MS4 permittee’s responsibility to ensure construction site operators are simply adhering to their requirements and enforcement is provided if requirements are not met.
    - It was also visually noted, and supports the notes under the MCM #4 program review, waste controls were essentially non-existent. A portable toilet, sediment piles, debris, and stored materials with the potential to pollute were observed along a paved roadway on site that slopes towards and connects to Pennscot Drive and corresponding regulated MS4 inlets.

“Mock Audit” – Source Control

Potential Permit Violation: 40CFR Part 122.34(b)(4)(ii) (C) [develop and implement requirements for construction site operators to control waste…] and 40CFR Part 122.34(b)(4)(ii)(F) […procedures for site inspections and enforcement of control measures]
Despite the presence of a QLP for MCM #4 and the presence of language requiring construction site operators to develop Preparedness, Prevention, and Contingency (PPC) Plans in Chapter 102, it is very evident that waste controls (building material waste, chemicals, concrete washouts, sanitary waste, etc.) are afforded no focus from a plan review, inspection, and/or enforcement standpoint. Section I of the MOU between the LCCD and township—which can be described as representative of the details of the QLP at a local level—only references erosion and sediment control and PCSM considerations and responsibilities. No inspection guidance (including a checklist) is available or used for waste controls (only PCSM and E&S controls are considered).

- NOTE: federal regulations require construction site operators with an issued NPDES Permit for Construction Activities to develop, implement, and manage a Stormwater Pollution Prevention Plan (SWPPP) that addresses the requirements of the CWA and NPDES for water quality impacts. The primary requirements for a SWPPP include E&S Controls, Waste Controls, and PCSM considerations. In Pennsylvania, this requirement has been “broken up” into three separate and distinct requirements: 1) E&S Plan, 2) PCSM Plan, and 3) PPC Plan. The PPC Plan is intended to address waste controls.

MS4 Permit Program Management

Inspection Variances

Land Studies

MCM 1 Findings

MCM 1: Website excellent with extensive information, annual reports, hotline for complaints about illicit discharges. A few links, including the one to the DEP website, are broken. Residents can subscribe to it and get regular email updates. Appears to be meeting all BMPs. Need to make sure two new distribution methods of stormwater education are undertaken each permit year. This was done in the past year. Note that just having brochures on hand is not a distribution method; it needs to be proactive.

MCM	Item	Yes	No
1	Public Education and Outreach Program (PEOP) (written plan)	☒	☐
	Lists of target audience groups	☒	☐
	Published stormwater educational materials	☒	☐
	Two methods of distributing educational materials in past year	☒	☐

MCM 1 Findings - EPA "Mock Audit"

Potential Permit Violation: Measurable improvements of the PEOP (PAG-13, Appendix A, Stormwater Management Program, MCM #1, BMP #1)

The PEOP fails to outline performance criteria and effectiveness considerations to "achieve measurable improvements in the target audience's understanding…" An essential aspect of a SWMP is assessing program (including individual elements (e.g. MCMs) of the SMWP) effectiveness based on measurable goals. While publishing a newsletter (or similar) and documenting the newsletter was published can be considered a measurable goal, it fails as a measureable goal that could indicate the effectiveness of the newsletter distribution.

Significant Concern: PEOP rationale

The PEOP fails to describe or outline decision processes and/or rationale for:

- Why target audience groups are selected
- Targeted pollutant sources

Essentially, there is no rationale or relationship for the primary educational efforts and what should be a primary focal point of the SWMP (303(d) listed impairments). The primary impairments associated with urban/suburban causes include siltation (or sediment) and pathogens. However, the primary piece of educational efforts focuses on nutrients (Nitrogen and Phosphorus). No reasonable rationale could be provided for selecting the educational materials. Additionally, the PEOP fails to support or coordinate with the other MCMs.

MCM 1 – EPA "Protocol"

12.1 Public Education and Outreach on Stormwater Impacts [122.34(b)(1)] (MS4 - 4.2.1)		
The operator must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff. [40 CFR 122.34(b)(1)]	Verify the SWMP describes the decision process for program development including: • Plans to inform individuals/ households about reducing stormwater pollution • Plans to inform individuals/groups about involvement with the stormwater program • The target audiences and why they are selected • The targeted pollutant sources • The outreach strategy and methods that will be used to	☐ ☐ ☐ ☐ ☐ ☐

MCM 1 – EPA “Protocol” cont’d

		reach targeted audiences • The number of people expected to be reached by the strategy in permit term • Who is responsible for management and implementation of the program/BMPs • How the success of the minimum measure will be evaluated • How the measurable goals were selected Verify the BMPs and measurable goals outlined in the plan have been met by the schedule in the SWMP.	☐ ☐ ☐ ☐ ☐

MCM 1 – EPA Program Evaluation Manual

- ✓ MS4 permit provisions
- ✓ SWMP provisions
- ✓ Most recent annual report

- **MS4 NPDES permit provisions.** Review the permit requirements for public education and public participation to identify any specific requirements (such as the type of activities the program must include or the pollutants the program must address). The NPDES permit will serve as the primary basis for the program evaluation.
- **SWMP provisions.** The permittee's SWMP should describe the overall outreach structure of the program and any measurable goals.

TARGET AUDIENCES

- ✓ Has the permittee identified target audiences for outreach efforts? How are these target audiences selected? What are the target audiences?

EVALUATION METHODS

- ✓ How does the permittee evaluate the effectiveness of the outreach strategy?
- ✓ Has the permittee conducted a public awareness survey?
- ✓ Which outreach materials have been the most effective in soliciting public involvement and participation? Changing audience behaviors? Increasing general stormwater awareness?
- ✓ Have any changes been made to the outreach strategy or materials based on an evaluation of effectiveness?

MCM 3 Findings

3	Illicit Discharge Detection and Elimination (IDD&E) Program (written plan)	☒	☐
	Outfall inspection and illicit discharge tracking system	☒	☐
	Complaint tracking system for illicit discharges	☒	☐
	Map of all outfalls, receiving waters, stormwater collection system, swales, basins, etc.	☒	☐
	Stormwater sampling and monitoring records	☒	☐
	Ordinance (municipal) or SOP (non-municipal) prohibiting non-stormwater discharges	☒	☐

MCM 3 Findings - EPA "Mock Audit"

Significant Concern: Discharges that would cause or contribute to instream exceedances of water quality standards

All waterways in the township include a pathogens impairment. Bacterial contamination cannot be detected by sight, smell, or taste. The current and only acceptable method to determine presence of pathogens is through lab analysis. As an example, Outfall ID OFL00003 was screened on 9/16/2015 and the presence of a moderate dry weather flow was indicated. No physical indicators were identified for both potential chemical (odor, color, etc.) and physical parameters (stains, abnormal vegetation, etc.). The report did not confirm if a sample was or was not collected for lab analysis. During the site review, a verbal confirmation was provided that sample acquisition has occurred, and samples have been sent to "Lancaster Labs" for analysis.

A lab analysis record was provided for Outfall 3 in follow-up documentation. Rationale for parameters analyzed is unclear. It appears the township is attempting to follow the original "Pitt flowchart" (and subsequently revised by the University of Alabama and found in the current IDD&E Guidance Manual referenced by the USEPA) for tracing the source of a dry weather flow. The parameters analyzed (Boron, Potassium, Fluoride, and Ammonia) are core parameter checkpoints for a preliminary determination of the source of a dry weather flow **for**

MCM 3 Findings - EPA "Mock Audit" cont'd

residential land use sources. The field screening form indicates a dominant Industrial land use; which would trigger the industrial/commercial checklist in lieu of the residential flowchart that is assumed to be the basis of the parameters analyzed. If the township is using the "Pitt flowchart" for sample parameter guidance, it would be appropriate for the IDD&E plan to indicate as such. The lack of this reference reinforces the over-arching observation of a majority of the program that the township is simply completing bean-counting motions with no guiding objectives or purpose to the program.

If the township is using the "Pitt flowchart" for sample parameter guidance, it would be appropriate for the IDD&E plan to indicate as such.

- NOTE: Based on the provided documentation, a summary should be included; and, if based on the Pitt flowchart, should essentially summarize the following (despite the industrial land use noted on the screening form as the dominant land use):
  - Boron was found to be in a concentration less than 0.35 mg/L. In turn, the sample was analyzed for fluoride. The concentration of fluoride was found to be less than 0.25 mg/L. As a result, it was preliminarily determined the source of the dry weather flow is likely a natural water source.
    - It would be appropriate to complete the field investigation and note if this determination is accurate or not.

MCM 3 – EPA "Protocol"

12.3 Illicit Discharge Detection and Elimination [122.34(b)(3)] (MS4 - 4.2.3)		
The operator must develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at 122.26(b)(2)). [122.34(b)(3)]	Verify a storm sewer map has been developed indicating location of outfalls and receiving waters.	☐
	Verify the SWMP describes the decision process for program development including:	☐
	• How a storm sewer map is or will be developed and how it will be updated	☐
	• The regulatory mechanism that will be used to prohibit discharges (i.e., ordinance) including:	☐
	◦ Why the mechanism was chosen	☐
	◦ A description of the plan to develop the mechanism or copy of relevant sections if already developed	☐
	◦ A description of the plan to ensure compliance of this regulatory mechanism through enforcement procedures and actions	☐

LandStudies

MCM 3 – EPA “Protocol” cont’d

• A plan to detect and address illicit discharges including:	☐
• Dry weather screening for non stormwater flows	☐
• Field tests of selected chemical parameters	☐
• A mechanism to address on-site sewage disposal systems that flow into the storm drainage system	☐
and procedures for:	
• Locating priority areas	☐
• Tracing source o f discharges (including techniques)	☐
• Removing the source of the illicit discharges	☐
• Program evaluation and assessment	☐

MCM 3 – EPA “Protocol” cont’d

• A plan to inform public employees, businesses, and the general public of the hazards of illegal discharges and improper disposal (including how this will coordinate with public education, pollution prevention/ good housekeeping)	
• Person(s) responsible for management and implementation of the program/BMPs	☐
• How success of minimum measures are evaluated	☐
• How measurable goals were selected	☐
If already developed, verify the storm sewer map shows the location of the outfalls and names and location of receiving waters.	☐
Verify the BMPs and measurable goals outlined in the plan have been met by the schedule set forth in the SWMP.	☐

LandStudies

MCM 4 Findings

Township Relying on State QLP for MCM 4 and 5 BMPs1-3.

4	If not relying on PA's program, a written stormwater associated with construction activities program (written plan)	☐	☐	☒
	If not relying on PA's program, an ordinance (municipal) or SOP (non-municipal) requiring implementation of erosion and sediment control BMPs	☐	☐	☒
	If not relying on PA's program, written procedures for managing public inquiries of local construction activities	☐	☐	☒

MCM 4 Findings - EPA “Mock Audit”

Potential Permit Violation: 40CFR Part 122.34(b)(4)(ii) (C) [develop and implement requirements for construction site operators to control waste…] and 40CFR Part 122.34(b)(4)(ii)(F) […procedures for site inspections and enforcement of control measures]
Despite the presence of a QLP for MCM #4 and the presence of language requiring construction site operators to develop Preparedness, Prevention, and Contingency (PPC) Plans in Chapter 102, it is very evident that waste controls (building material waste, chemicals, concrete washouts, sanitary waste, etc.) are afforded no focus from a plan review, inspection, and/or enforcement standpoint. Section I of the MOU between the LCCD and township—which can be described as representative of the details of the QLP at a local level—only references erosion and sediment control and PCSM considerations and responsibilities. No inspection guidance (including a checklist) is available or used for waste controls (only PCSM and E&S controls are considered).

Sharing Responsibility – EPA "Protocol"

13.0 Sharing Responsibility (40 CFR 122.35) (MS4 - 4.4)		
The operator may rely on another entity to satisfy the operator's NPDES permit obligation to implement a minimum control measure (40 CFR 122.35).	If an entity other than the MS4 is implementing part or all of a minimum control measure, verify the operator: • Has actually implemented the measure • Has implemented a control measure or component of the control measure that is at least as stringent as the corresponding permit requirements • Has agreed to implement the control measure on the municipality's behalf and that this obligation is maintained as part of the description of the stormwater management program (in the form of a Memorandum of Agreement, etc.)	☐ ☐ ☐

LandStudies

MCM 6 Findings

6	Inventory of municipal facilities and land uses that contribute to stormwater runoff	☒	☐
	Written Operation & Maintenance Plan for municipal facilities addressing housekeeping	☒	☐
	Written employee training program	☒	☐

MCM 6 Findings - EPA “Mock Audit”

***Significant Concern: Develop and implement an employee training program (PAG-13, Appendix A, Stormwater Management Program, MCM #6, BMP #3 and 40CFR Part 122.34(b)(6)(i))*

The O&M Plan does not include an annual employee training plan. However, the O&M Plan does identify the need for development of a plan. Lack of an annual training plan is a permit violation. However, the violation has been downgraded to a significant concern since the township recognizes the requirement and need to develop the annual training plan.

- NOTE: this concern provides a good example for addressing permit requirements without trying to resolve the issue “overnight.” As long as a requirement is properly recognized, noted, and a plan of action is provided, the concern will be downgraded. However, the concern will remain until the plan of action is implemented.

MCM 6 – Annual Training Plan

Annual Municipal Employee Training and Education Plan

Municipality: [redacted]

Date of Plan: TBD

Plan Dates: TBD

Permit #:

Permit Cycle Year: 2016 - 2017

This plan provides an outline of training and education activities for the municipality's employees (and contractors as applicable) for the dates lindicated. This plan does not inhibit the potential to pursue and/or conduct other training activities the municipality may deem necessary during the permit cycle year. This plan is developed to help document the municipality's compliance efforts with the selected and implemented Best Management Practice (BMP) GH-1 "Employee Training and Education."

Training Event	Target Employee Audience	Target Date(s)	Topic(s)/Description
SWMP Review	All Staff (conducted with IDD&E training)	May-16	Update of planned activities and goals progress
Illicit Discharge and Detection	All Staff (police and fire invited)	May-16	Review of previous year's investigations, this year's activities, and general IDD&E info.
Target BMP Event: Stormwater BMPs for Road and Street Maintenance	Public Works staff	April-16	In the field event regarding implementation and maintenance of control BMPs during road maint. activities
Target BMP Event: Salt storage, loading, and clean-up	Public Works staff	November-16	In the field event regarding proper truck loading, clean-up, and control of salt storage
Spill Response and Prevention Training Event	Public Works staff	August-16	Mock spill control training event at the PW yard
Monthly tail-gate training:	Public Works staff	March-16	Vehicle & Equipment fueling

MS4 Permit Program Management

Supporting Documentation

Land Studies

Supporting documentation

Essentially need the paperwork (documentation) to “match” what you do.

LandStudies

Supporting Documentation – Annual Assessment

OVERVIEW OF DISCHARGES TO IMPAIRED WATERS

Impairments on current 303(d) list?	Changes from previous 303(d) list?	If a change, describe
Yes No	Yes No	

TMDL(s) in place for waterways?	TMDL Plan developed or needed?	Follow-up actions
Yes No	Yes No	

Description (if any) of changes to impairments and/or TMDLs with associated waterways listed on receiving waterbodies list at the end of Section 300

Pollutants of Concern (Section 500-2) include impairments and/or TMDLs?	If no, reasoning and/or corrective actions
Yes No	

Supporting Documentation – Annual Assessment cont'd

Does the PEOP include a list of targeted pollutant sources? Yes No	If no, corrective action and schedule
If yes, are the targeted sources tied to a goal of the SWMP or a listed Pollutant of Concern? Yes No	If no, reasoning and corrective action
Does the list of targeted pollutant sources include corresponding activities? Yes No	If no, reasoning and corrective action
Does the PEOP include relevant IDD&E considerations as required by the plan? Yes No	If no, corrective action and schedule

LandStudies

Supporting Documentation – Annual Assessment cont'd

SWMP GOALS (individual sheets for each goal)

SWMP Goal	Location in SWMP Section 500-3

Summary of activities conducted for goal facilitation (SWMP processes, MCMs, etc.)

Primary results of activities

Interim milestone met? Yes No	If no, reasoning and follow-up actions required

Supporting Documentation – Priority Areas

Priority Area Screening and Classification Guidance Form

MS3 SCREENING PROCESS		Points
☐	Existing and known information (past complaints, reports (e.g. IDD&E reports, wet weather screening reports, etc.), Areas where it is known improvements or a need for improvements (e.g. removal of or remaining illicit connection, etc.) is required.	20
☐	Historic and/or active Combined Sewer Systems (CSS). Historic systems are areas where the combined system has been separated into sanitary sewer and storm sewer.	10

SELECTED INVESTIGATION PROCESSES FOR CLASSIFICATION

- ☐ Wet weather screening/sampling
- ☐ Dry weather screening/sampling
- ☐ Field review of MS3
- ☐ System investigation (TV, smoke, dye tabs, or other)
- ☐ Other: _____

LandStudies

Supporting Documentation – Important documents

- Annual Report
- Annual “self-certification”
- Annual SWMP Review and Assessment

Land Studies

Collected documentation is intended to support your annual assessment and allow you to adjust focus areas, intensity of activities, and overall approach to an “issue.”

Final Thoughts and Questions?

Michael T. LaSala, CPMSM
mike@landstudies.com
717-627-4440

Land Studies