

City of Lancaster
Chesapeake Bay Pollutant Reduction Plan
(2018-2023)
September 2017

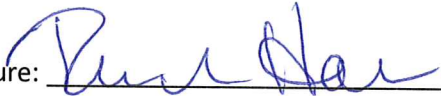
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Certification

I, the undersigned, a Registered Professional Engineer in Pennsylvania, do hereby certify to the best of my knowledge and belief, that this Chesapeake Bay Pollutant Reduction Plan for the City of Lancaster, is based on the best information available and appropriate modeling techniques to facilitate the planning of sediment and nutrient load reduction practices designed to achieve pollutant reductions consistent with the goals established in the Chesapeake Bay Watershed Implementation Plan and the requirements of the Pennsylvania Department of Environmental Protection's National Pollutant Discharge Eliminations System General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (PAG-13).

Professional Engineer Name: Ruth Ayn Hocker

Signature: 

Date: 9/7/17

License No: PE078222

License Expiration Date: September 30, 2019

Company: City of Lancaster

Telephone: 717.735.0350

Engineer's Seal



Introduction

This Chesapeake Bay Pollutant Reduction Plan (CBPRP) represents the City of Lancaster's effort to meet one component of the Pennsylvania Department of Environmental Protection (PADEP) Municipal Separate Storm Sewer (MS4) permitting requirements. In particular, this plan includes permitting requirements to reduce polluted stormwater discharges to local surface waters impaired for nutrient and/or sediment, and meet Chesapeake Bay pollutant reductions for stormwater discharges to surface waters located within the Chesapeake Bay watershed.

This document was prepared in accordance with the guidance provided in the "National Pollutant Discharges Elimination System (NPDES) Stormwater Discharges from Small Municipal Separate Storm Sewer Systems Pollutant Reduction Plan (PRP) Instructions" (PADEP DOC#3800-PM-BCW0100k; rev. 3/2017).

Section A – Public Participation

A complete copy of this CBPRP was made available for public review at Lancaster City Hall and posted on the City of Lancaster’s website from August 3, 2017, to September 5, 2017. The availability of this document was publicized in *LNP* on August 3, 2017. The published public notice contained a brief description of the plan, the dates and locations at which the plan was available for review by the public, the length of time provided for receipt of written comments, and the date/time/location of the public meeting. A copy of the public notice is included in Appendix I.

Public comments were accepted for 30 days following the publication date of the public notice. The City received no comments on the draft report.

A public meeting was held on Tuesday, September 5, 2017, at Lancaster City Hall, 120 N. Duke Street, Lancaster, Pennsylvania, to present the information contained in this CBPRP to the public. There were no comments received during this meeting.

Section B – Map

The Planning Area Map shows the planning areas, land uses, and locations of proposed structural BMP(s) locations for each HUC-12 Planning Area. The CBPRP encompasses a total of approximately 2,271-acres across two HUC-12 watersheds. Little Conestoga Creek, comprised of approximately 753-acres, and Conestoga River, comprised of approximately 1,518-acres, were delineated based on topographical data with two (2) foot contours, City municipal boundary lines, and existing drainage networks. The Conestoga River Planning Area includes the contributing planning areas for two unnamed tributaries subject to the same pollutant reductions as those for the Conestoga River.

Appendix II contains maps depicting the planning areas, land uses in each planning area, and BMP locations maps. The land uses were aggregated from County land use data into five (5) land uses – Residential, Commercial, Institutional, Industrial, and Other – for input into the WinSLAMM model, discussed in Section D.

Section C – Pollutants of Concern

The City’s MS4 Planning Areas drain to four (4) impaired watersheds (Little Conestoga Creek, Conestoga River, Unnamed Tributary to Conestoga River (SE), and Unnamed Tributary to the Conestoga River (E)). The pollutants of concern for each watershed were determined by referencing PADEP’s Pollutant Aggregation Suggestions for MS4 Requirements Table (Municipal) (rev. 5/9/2017). As there are multiple impaired stream segments with identical pollutant reduction requirements, this plan addressed impairments and pollutants of concern on a HUC-12 watershed basis rather than by individual stream (Table 1).

Planning Area Watershed	Pollutants of Concern
Lower Conestoga River, Muddy Run-Mill Creek HUC-12: 020503061107	Chesapeake Bay Nutrients/Sediment, Conestoga River; Appendix D – Siltation/Nutrients; Appendix E – Nutrients, Organic Enrichment/Low D.O., Siltation
Lower Conestoga River HUC-12: 020503061107	Conestoga River, Little Conestoga Creek Appendix B – Pathogens; Appendix E – Nutrients, Organic Enrichment/Low D.O., Siltation
Lower Conestoga River, Muddy Run – Mill Creek HUC-12: 020503061107	Chesapeake Bay Nutrients/Sediment, Conestoga River; Appendix D – Siltation/Nutrients; Appendix E – Nutrients, Organic Enrichment/Low D.O., Siltation
Millers Run-Little Conestoga Creek, West Branch Little Conestoga Creek – Little Conestoga Creek HUC-12: 020503061001	Chesapeake Bay Nutrients/Sediment, Little Conestoga Creek Appendix B – Pathogens; Appendix D – Siltation/Nutrients; Appendix E – Nutrients, Organic Enrichment/Low D.O., Siltation

Table 1. Pollutants of Concern by HUC-12 Watershed.

According to the guidance provided in the PRP Instructions, the assumption can be made that meeting a sediment reduction goal of ten percent (10%) will also result in achievement of the nutrient reductions goals for all pollutants of concern listed in Table 1. For this reason, this plan focuses on sediment as the sole pollutant of concern.

Section D – Existing Loading for Pollutants of Concern

The City of Lancaster determined existing pollutant loads through a continuous simulation model called WinSLAMM. WinSLAMM, or the Windows-based Source Loading and Management Model, uses data obtained during the U.S. Environmental Protection Agency’s Nationwide Urban Runoff Program (NURP), and additional field studies completed throughout the 1990’s in locations across the United States. The extensive data incorporated into the WinSLAMM model’s algorithms allow WinSLAMM to be used as a tool for evaluating the effectiveness of different stormwater controls in urban areas.

The existing baseline pollutant loadings (sediment), determined with WinSLAMMv10.3.1, are shown in Table 2 below.

Watershed	Existing Baseline Pollutant Loading TSS (lbs/yr)
HUC-12: 020503061107 Lower Conestoga River	1,586,572
HUC-12: 020503061001 Little Conestoga Creek	1,369,000

Table 2. Existing Baseline Pollutant Loading

Several structural best management practices (BMPs) were constructed prior to the completion of the CBPRP and continue to function as designed. These BMPs include three green alley projects (Alley 142SW, Alley 156SW, and Alley 148SW) and one bioretention area at the intersection of Broad and New Dauphin Streets. These projects were constructed as part of the City of Lancaster’s Green Infrastructure program in conjunction with planned capital improvements and are all located within the Lower Conestoga River HUC-12 Planning Area.

More detailed information on the design, construction, operation and maintenance for each constructed BMP is on file at City Hall. For more information on the City’ Green Infrastructure Plan, please visit www.saveitlancaster.org.

These structural BMPs were added to and modeled in WinSLAMM and resulted in an adjustment to the existing baseline pollutant loadings (sediment) shown in Table 3 below. These adjusted baseline loadings are the values from which the 10% sediment reduction must be achieved during the 2018-2023 permit period.

Watershed	Existing Baseline Pollutant Loading TSS (lbs/yr)
HUC-12: 020503061107 Lower Conestoga River	1,585,572
HUC-12: 020503061001 Little Conestoga Creek	1,369,000

Table 3. Adjusted Baseline Pollutant Loading

Section E – BMPs to Achieve the Minimum Required Reductions in Pollutant Loading

Pollutant Reduction Requirements

The City of Lancaster is regulated by PAG-13 (General Permit) and required to meet pollutant reductions to address the impairments caused by the pollutants of concern listed in Table 1. Appendices D and E are the pollutants which must be addressed by this PRP. Appendix D requires a minimum 10% reduction of total suspended solids (TSS), minimum 5% of total phosphorus (TP), and minimum 3% of total nitrogen (TN). Appendix E requires a minimum 10% reduction of total suspended solids (TSS), minimum 5% of total phosphorus (TP), and minimum 5% of total nitrogen (TN). However, in accordance with PADEP Document 3800-PM-BCW0100k, it is presumed that within the Chesapeake Bay watershed, TP and TN goals will be achieved when a 10% reduction in TSS is attained. The total required reduced pollutant loading for each HUC-12 Planning Area is shown in Table 4.

Watershed	Existing Baseline Pollutant Loading TSS (lbs/yr)	Required Reduced Pollutant Loading TSS (lbs/yr)
HUC-12: 020503061107 Lower Conestoga River	1,585,572	1,427,015
HUC-12: 020503061001 Little Conestoga Creek	1,369,000	1,232,100

Table 4. Required Reduced Pollutant Loading

Proposed BMPs

There are several BMPs proposed in each HUC-12 Planning Area that have been implemented or are undergoing design. These include street sweeping in all areas, a green roadway project with pervious pavers and bioretention in the Lower Conestoga River HUC-12 Planning area (Shelley Road), and a green park retrofit in the Little Conestoga Creek HUC-12 Planning area (Long's Park). More detailed information on the design and anticipated operation and maintenance for each proposed BMP, as well as the City's street cleaning plan, are on file at City Hall.

These strategies were input to and modeled in WinSLAMM to determine the pollutant loading (and reductions) in Table 5 below.

Watershed	Existing Baseline Pollutant Loading TSS (lbs/yr)	Required Reduced Pollutant Loading TSS (lbs/yr)
HUC-12: 020503061107 Lower Conestoga River	1,585,572	1,295,000 (21% Reduction)
HUC-12: 020503061001 Little Conestoga Creek	1,369,000	1,255,000 (5% Reduction)
TOTAL MS4 Planning Area	2,955,572	2,541,747 (14% Reduction)

Table 5. Proposed BMPs (In Progress)

When combined with street cleaning, performed at a minimum every two weeks (at least 25 times per year), the pollutant reductions projected for the planned Shelley Road project exceed the minimum 10% TSS reduction required. When combined with street cleaning, the pollutant reduction projected for the planned Long’s Park project achieve only 5% of the minimum 10% TSS reduction required. In accordance with PADEP Document 3800-PM-BCW0100k, pollutant controls may be located such that they reduce the load in one sub-watershed by less than 10% and by more than 10% in another as long as the overall amount of pounds reduced constitutes 10% of the entire existing loading.

Table 5 shows that the City will meet its required reduced pollutant loading through implementation of street cleaning protocols and construction of the Shelley Road and Long’s Park projects, both currently undergoing design.

In addition to these two planned projects, the City will continue to pursue green infrastructure projects in accordance with the City’s Green Infrastructure Plan and dedication to integrating stormwater management practices into planned capital improvement projects. It is also anticipated that local-level BMPs, required for all projects between 100-square feet and less than 1-acre or constructed as retrofit for stormwater management fee credit, will further reduce pollutant loadings during the 2018-2023 permit term in both HUC-12 Planning Areas.

Section F – Funding Mechanisms

The City's CBPRP identifies one programmatic strategy and 2 projects to be constructed during the 2018-2023 permit cycle. The programmatic strategy (street cleaning) is already being implemented by the City at frequencies consistent with Expert Panel documents (minimum 25 times per year). The two projects (Shelley Road and Long's Park) are estimated to cost approximately \$1.2 million.

The two projects will be constructed using funds from a number of sources that may include, but may not be limited to, the following:

- Pennsylvania Infrastructure Investment Authority (PENNVEST)
- Growing Greener Plus
- PA DEP
- Pennsylvania Department of Conservation and Natural Resources (DCNR)
- National Fish and Wildlife Foundation (NFWF)
- Low Volume and Dirt and Gravel Roads (Act 89 of 2013, PennState Center for Dirt and Gravel Road Studies)

As appropriate, capital bond funds may also be used. Additionally, the City has implemented a stormwater management fee, assed to all properties in the City; these funds may also be used to assist with implementation.

Section G – Operation and Maintenance

The BMP strategy and projects constructed under this CBPRP will be owned and operation by the City since they will be constructed on City-owned property and/or rights-of-way. Operation and maintenance activities involved with each BMP type proposed will be carried out in accordance with the PADEP Stormwater BMP Manual. As projects move through final design, additional operation and maintenance activities may be determined; these will be noted on final design plans, which will be kept on file at Lancaster City Hall. After construction has been completed and as required by the PRP Instructions, actual operation and maintenance activities will be reported in the Annual MS4 Status Reports.

Appendix I – Public Participation Documents

PROOF OF PUBLICATION NOTICE IN

State of Pennsylvania}
 } ss:
County of Lancaster}

An Affiant of the County and State aforesaid, being duly sworn, deposes and says that the LNP, a daily newspaper of general circulation published at Lancaster, County and State aforesaid, was established 1794-1877 since which date said daily newspaper has been regularly issued in said county, and that a copy of the printed notice or publication is attached hereto exactly the same as was printed and published in the regular editions and issues of said daily newspaper on the following dates:

3RD DAY OF AUGUST 2017

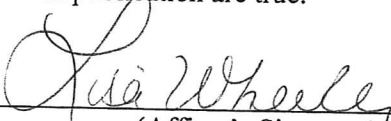
Affiant further deposes that he/she is the Clerk duly authorized by the LNP Media Group, Inc., a corporation, publisher of said LNP, a newspaper of general circulation, to verify the foregoing statement under oath, and also declares that affiant is not interested in the subject matter of the aforesaid notice or advertisement and that all allegations in the foregoing statement as to time, place and character of publication are true.

pared to meet the requirements of the Municipal Separate Storm Sewer (MS4) permit with the PA Department of Environmental Protection (DEP). It includes an estimate of the baseload of pollutants that are discharged to streams in the planning area; the required pollutant reductions as identified by PA DEP; proposed stormwater improvement projects to achieve the minimum required pollutant reductions; probably funding sources; and operation and maintenance responsibilities.

The City's CBPRP will be available for public review Monday through Friday between the hours of 8:30 AM and 4:30 PM in the Stormwater Bureau Office, located on the third floor of the City Hall, 120 N. Duke St., Lancaster, PA. The Plan will also be available for public review on the City's website, www.cityoflancasterpa.com. Comments must be provided in writing to the attention of Ruth Hocker, Stormwater Program Manager, at the above address or submitted

via email to RHocker@cityoflancasterpa.com. Comments will also be accepted at a Public Meeting to be held at 6:00 PM on September 5, 2017, at City Hall, 120 N. Duke St., Lancaster, PA.

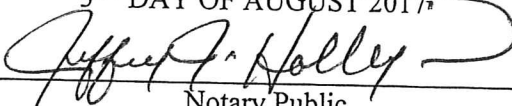
PUBLIC NOTICE
CITY OF LANCASTER
Chesapeake Bay Pollutant Reduction Plan
The City of Lancaster's Department of Public Works Stormwater Bureau will accept public comments related to the City's Chesapeake Bay Pollutant Reduction Plan (CBPRP) beginning on August 3, 2017, and extending through September 5, 2017. The City's CBPRP was pre-



(Affiant's Signature)

COPY OF NOTICE OF PUBLICATION

Sworn and subscribed to before me this
3RD DAY OF AUGUST 2017



Notary Public

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Jeffrey J. Hollinger, Notary Public
City of Lancaster, Lancaster County
My Commission Expires June 10, 2021
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Chesapeake Bay Pollutant Reduction Plan

for the City of Lancaster, PA

Ruth Ayn Hocker, P.E., D.WRE

Program Manager
Bureau of Stormwater
Department of Public Works



Public Meeting Presentation

September 5, 2017

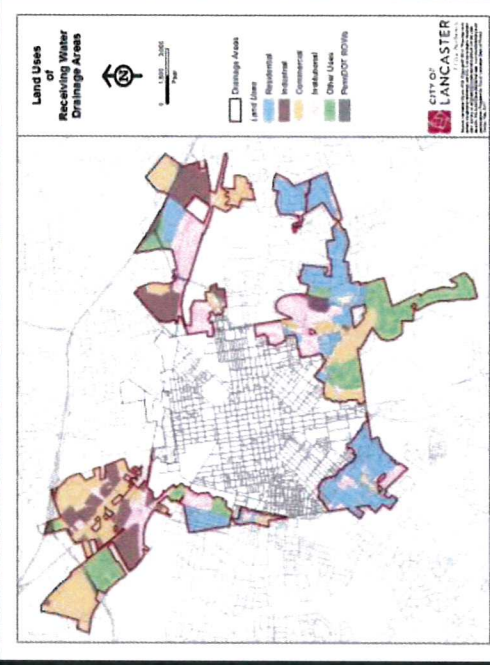
NPDES MS4 Permit Requirements

- All regulated Mmunicipal Separate Sewer Systems (MS4s) must:
 - Submit a Renewal Notice of Intent (NOI) for coverage by September 16, 2017;
 - Submit a Chesapeake Bay Pollutant Reduction Plan (CBPRP) with the Renewal NOI that demonstrates appropriate reductions from the regulated areas;
 - Provide a 30-day public comment period for the draft CBPRP; and
 - Hold one public meeting where the draft CBPRP is discussed.

Calculating Pollutant Loadings

- All pollutant loadings and reductions were calculated with WinSLAMM (Source Load And Management Model)
 - Developed in mid-1970s as a tool for EPA's Storm and Combined Sewer Pollution Control Program;
 - Evaluates runoff volume and quality for multiple source areas with a continuous simulation model; and
 - Includes empirical data collected from various project sites across the U.S., including many obtained during EPA's National Urban Runoff Program (NURP).

WinSLAMM Source Areas



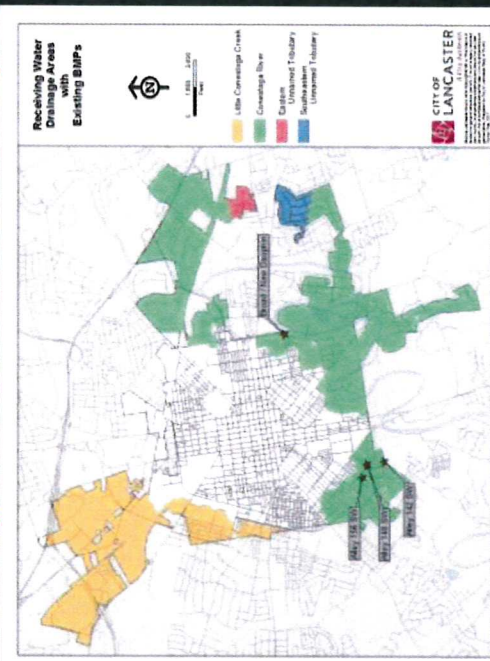
NPDES MS4 Pollutant Baseline Loadings

Watershed	Existing Baseline Pollutant Loading
HUC-12-020503061107 Lower Conestoga River	TSS (lbs/yr) 1,586,572
HUC-12-020503061001 Little Conestoga Creek	1,369,000
Existing Baseline Pollutant Loading (Sediment)	



Watershed	Existing Baseline Pollutant Loading
HUC-12-020503061107 Lower Conestoga River	TSS (lbs/yr) 1,585,572
HUC-12-020503061001 Little Conestoga Creek	1,369,000
Adjusted Baseline Pollutant Loading (Sediment)	

Previously Constructed MS4 GI Projects



Pollutant Reductions Required

Watershed	Existing Baseline Pollutant Loading TSS (lbs/yr)	Required Reduced Pollutant Loading TSS (lbs/yr)
HUC-12: 020503061107 Lower Conestoga River	1,585,572	1,427,015
HUC-12: 020503061001 Little Conestoga Creek	1,369,000	1,232,100
Required Reduced Pollutant Loading		

It is assumed that nitrogen and phosphorus reductions will be satisfied if sediment reductions are achieved. Therefore, the primary pollutant modeled was sediment and a reduction of 10% from all source areas was calculated.

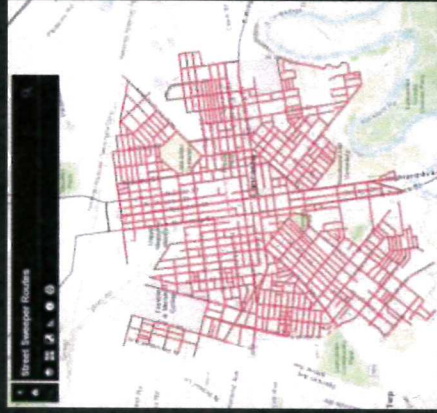
Reducing Pollutants

- Stormwater Best Management Practices (BMPs) used to achieve pollutant reductions include:
 - Street Sweeping (existing program)
 - Construction of Shelley Road GI Project
 - Construction of GI in Long's Park

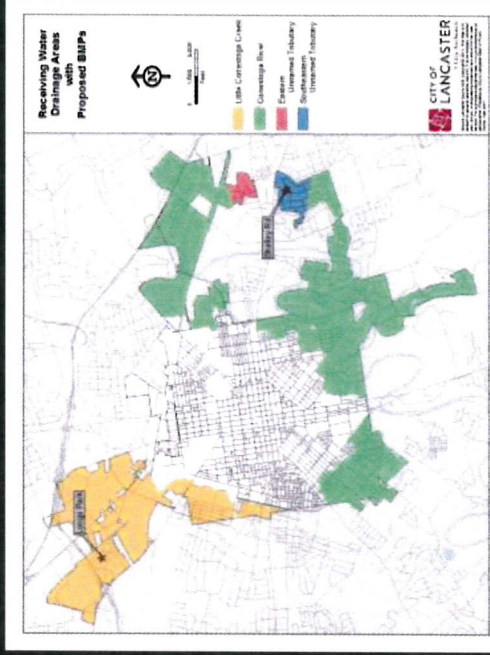
Watershed	Existing Baseline Pollutant Loading TSS (lbs/yr)	Required Reduced Pollutant Loading TSS (lbs/yr)
HUC-12: 020503061107 Lower Conestoga River	1,585,572	1,295,000 (21% Reduction)
HUC-12: 020503061001 Little Conestoga Creek	1,369,000	1,255,000 (9% Reduction)
TOTAL TMS4 Planning Area		
	2,955,572	2,541,747 (14% Reduction)

Street Sweeping

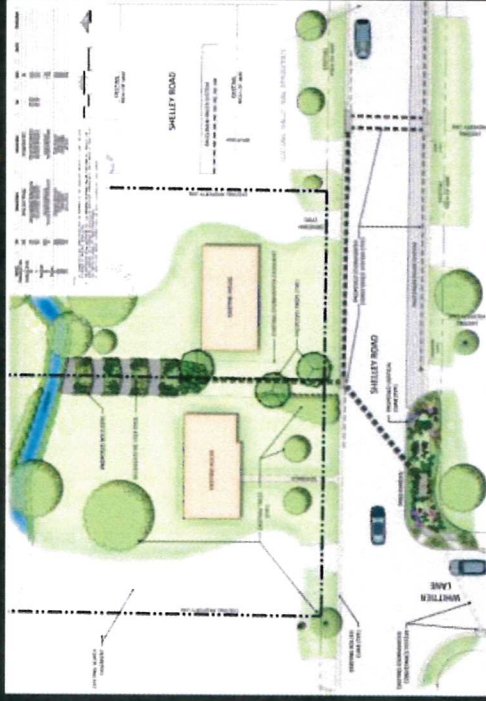
- Modeled as currently performed by Public Works
- No proposed changes to existing program



Proposed MS4 GI Projects



Shelley Road GI Concept



Long's Park GI Concept



Costs, Funding, Operations & Maintenance

- Street Sweeping
 - \$800,000 annually (staff, equipment, mat'l disp.)
 - Funded through annual budget line item
 - Sweeping performed by City personnel
- Shelley Road
 - Estimated construction cost of \$260,000
 - Funded through PENNVEST, Low Volume Road, other
 - O&M performed by City personnel
- Long's Park
 - Estimated construction cost of \$900,000
 - Funded through PA F&BC, DCNR, DEP, other
 - O&M performed by City personnel

Any Questions?

Thank you!

Ruth Ayn Hocker, P.E., D.WRE

Program Manager
Bureau of Stormwater
Department of Public Works
rthocker@cityoflancasterpa.com
717.735.0350

Appendix II – Maps

Receiving Water Drainage Areas

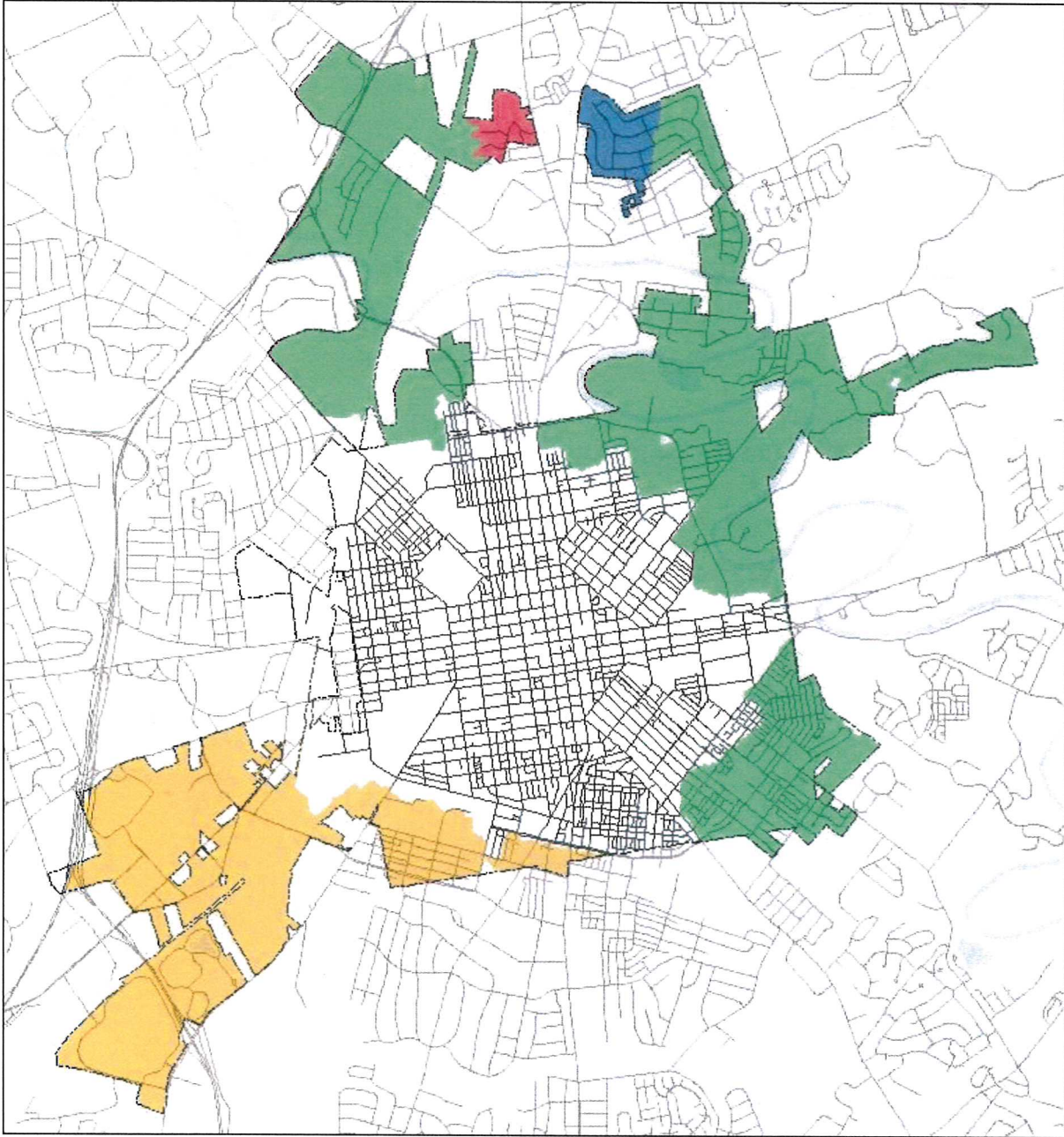


0 1,500 3,000
Feet

- Little Conestoga Creek
- Conestoga River
- Eastern Unnamed Tributary
- Southeastern Unnamed Tributary



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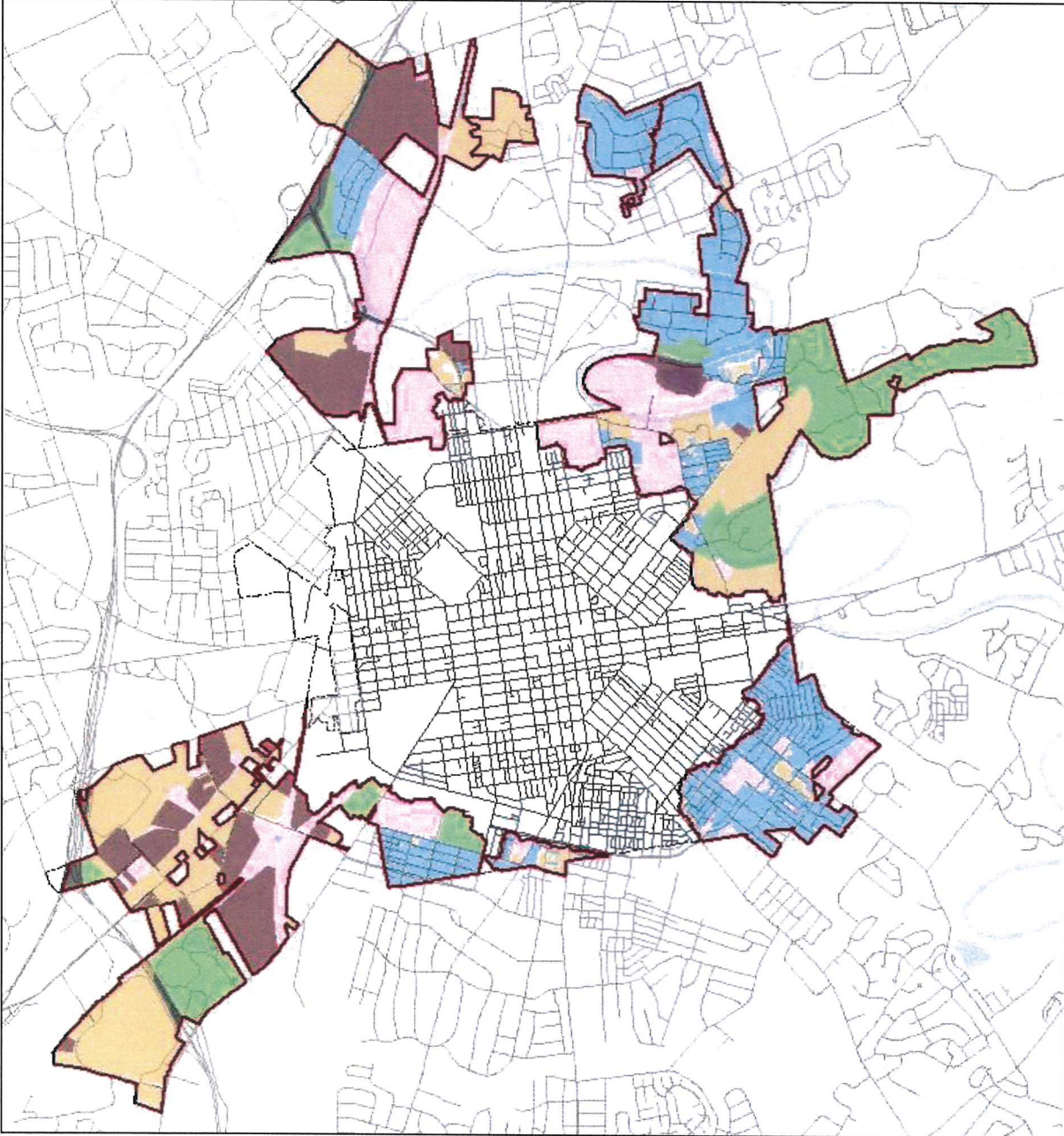
Land Uses of Receiving Water Drainage Areas



- Drainage Areas**
- Drainage Areas
- Land Uses**
- Residential
 - Industrial
 - Commercial
 - Institutional
 - Other Uses
 - PennDOT ROWs



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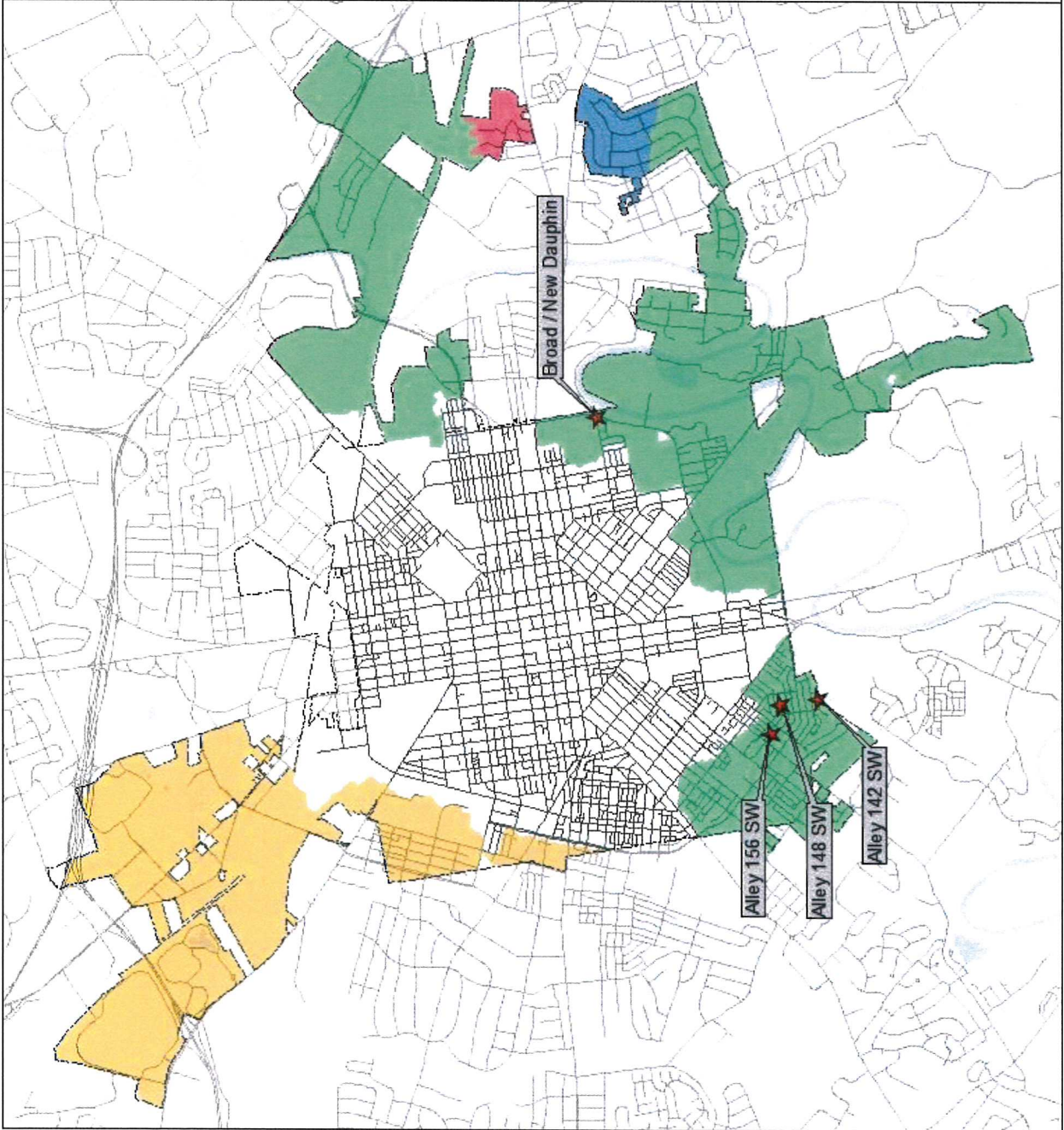
**Receiving Water
Drainage Areas
with
Existing BMPs**



- Little Conestoga Creek
- Conestoga River
- Eastern Unnamed Tributary
- Southeastern Unnamed Tributary



A City Authentic
 South Lancaster, PA 17350
 717.391.1000
 www.cityoflanaster.com
 Planning Department
 1000 North 10th Street
 Lancaster, PA 17303
 Version: 04/2021



**Receiving Water
Drainage Areas
with
Proposed BMPs**



0 1,500 3,000
Feet

- Little Conestoga Creek
- Conestoga River
- Eastern Unnamed Tributary
- Southeastern Unnamed Tributary



A City Authority
Source: Lancaster County GIS, Copyright © 2014. This map is intended for general reference use only. It is not a legal document. Plans, surveys, or engineering schematics should not be created from this map. Prepared by City of Lancaster, Dept. of Public Works, 5/16/2017.

