



ROSS TOWNSHIP
Allegheny County, Pennsylvania

Ross Township Municipal Separate Storm Sewer System (MS4)

POLLUTANT REDUCTION PLAN Little Pine Creek Sewershed

**Ross Township, Allegheny County, Pennsylvania
(NPDES Permit No. PAG136221)**

Situated In
Allegheny County, Pennsylvania

Prepared For:
Ross Township Board of Commissioners
1000 Ross Municipal Drive
Pittsburgh, PA 15237

September 2017
Prepared By: The Gateway Engineers, Inc.

October 2024
Revised By: Gibson-Thomas Engineering, Co., Inc.



Gibson-Thomas
ENGINEERING

Pollutant Reduction Plan: Little Pine Creek

Ross Township, Allegheny County, Pennsylvania

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Attachments:

Attachment A – PADEP PAG-13 General Permit for Stormwater Discharges from Small MS4s
(NPDES PERMIT NO. PAG136282)

Attachment B - Proof of Publication

Attachment C – Existing Loading Sewersheds: Girtys Run, Jacks Run, Killbuck Run & Little Pine Creek

Attachment D - Proposed BMPs Sewersheds: Girtys Run, Jacks Run, Killbuck Run & Little Pine Creek

Attachment E – Figure 1: MS4 – Sewersheds & Land Use Cover Map

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1. Executive Summary

Municipalities throughout the country are under a federal mandate requiring a stormwater management program for reducing pollution impacts from stormwater runoff. In 2018, Ross Township was issued a Municipal Separate Storm Sewer System (MS4) Permit through the Pennsylvania Department of Environmental Protection (PADEP) and the Environmental Protection Agency. The Township is regulated under PADEP's General NPDES Permit (PAG-136221). Implemented through the Clean Water Act, the permit's numerous requirements are through six Minimum Control Measures (MCMs). In addition, PADEP is requiring MS4s that discharge to an impaired stream prepare a Pollutant Reduction Plan (PRP) for sediment, nitrogen, and/or phosphorus. The goal of the PRP is to reduce pollution caused by sediment and/or nutrients in impaired streams.

2. General Permit Information

Permittee Name:	Ross Township	NPDES Permit No:	PAG136221
Mailing Address:	1000 Ross Municipal Road	Effective Date:	March 18, 2018
City, State, Zip	Pittsburgh, PA 15237	Expiration Date:	March 15, 2025
MS4 Contact Person:	Michael Funk	Renewal Date:	
Title:	Director of Public Works	Municipality:	Ross Township
Phone:	412-931-3956	County:	<i>Allegheny</i>
Email:	mfunk@ross.pa.us	Consultant Name:	<i>Gibson-Thomas Engineering Co., Inc.</i>
Permittee Web Address:	http://www.ross.pa.us	Consultant Contact Information:	1004 Ligonier Street Latrobe, PA 15650 724-539-8562 Attn: Doug Siler, P.E.

3. Pollutants of Concern

Little Pine Creek Watershed Background

The Little Pine Creek Watershed is considered the Hydrologic Unit Code (HUC) 12 watershed. Within the Southwestern region of Pennsylvania, these HUC-12 watersheds are tributaries to either the Ohio, Monongahela, Allegheny, or Youghiogheny Rivers. For the Little Pine Creek Watershed, its tributary is the Allegheny River. On a smaller scale, there is a smaller watershed that is a tributary to Little Pine Creek. This smaller watershed is Little Pine Creek 6611. The Little Pine Creek Watershed is impaired for nutrients.

4. Determining Existing Loading for Pollutants of Concern

The previous engineer used the entirety of the HUC-12 watershed boundary for the applicable watersheds in the previously approved Pollutant Reduction Plan. PennDOT and Allegheny County owned right of ways were parsed out as part of the sewershed delineation. From there, Total Suspended Solids and Total Phosphorus loads were calculated using the MapShed software. The plan was broken into four separate plans that focused on the Girtys Run Sewershed area, Killbuck Run Sewershed area, Little Pine Creek Sewershed area and Lowries Run Sewershed area.

For the updated 2024 Pollutant Reduction Plan, drainage areas were delineated based on outfalls that drain into Ross Township's MS4 system. From there, the TSS and TP loads were calculated for impaired sewershed areas, using the PADEP Simplified Method land use loading rates. PennDOT and Allegheny County owned right of ways were parsed out as part of the sewershed delineation the same as the previously approved PRP.

The PADEP Simplified Method was implemented in determination of existing pollutant loading. Existing loading calculations have an effective date of June 2024. Mapping of regulated MS4 infrastructure is presented with best available information as of June 2024 and land cover information used is from the most recent issuance of National Land Cover Database (NLCD) data, dated 2021.

Storm sewer tributary watershed areas were calculated using mapping presented in [Figure 1](#) and with sewershed boundaries delineated based on current topography and accounting for the presence of existing collection and conveyance facilities, including inlets, pipes, swales, curbs, etc.

GIS software was used to tabulate the land cover composition of each individual storm sewershed based on NLCD data. NLCD defines the following categories of developed land cover:

- **Open Water** - areas of open water, generally with less than 25% cover of vegetation or soil.
- **Developed, Open Space** - areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
- **Developed, Low Intensity** - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
- **Developed, Medium Intensity** - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
- **Developed High Intensity** - highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
- **Barren Land (Rock/Sand/Clay)** - areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other

accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.

- **Deciduous Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
- **Evergreen Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
- **Mixed Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
- **Shrub/Scrub** - areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
- **Grassland/Herbaceous** - areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
- **Pasture/Hay** - areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
- **Cultivated Crops** - areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.

Land Cover categories were converted to impervious and pervious areas to allow for application of the Simplified Method Loading Rates. Impervious/Pervious Area ratios were applied as follows based on the above noted NLCD descriptions. The most conservative (i.e. highest impervious area percentage) was used for each category. The following table presents impervious area ratios applied for developed land cover.

Land Cover	Impervious Cover	Pervious Cover
Developed, High Intensity	100%	0%
Developed, Low Intensity	49%	51%
Developed, Medium Intensity	79%	21%
Developed, Open Space	19%	81%

*Undeveloped land (i.e. deciduous forest, evergreen forest, cultivated crops, etc) was assumed to be entirely pervious.

Following determination of impervious and pervious cover for each storm sewershed, pollutant loads were applied based on the values presented in **Attachment B of the PADEP PRP Instructions, Developed Land Loading Rates for PA Counties**. As Ross Township is located in Allegheny County, loadings listed for "All Other Counties" were used as noted in the following table:

Pollutant Loading Rates by Land Cover Type			
Land Cover Type	Total Nitrogen (lb/acre/yr)	Total Phosphorus (lb/acre/yr)	Total Sediments (lb/acre/yr)
Developed Impervious	1839	2.28	1,839
Developed Pervious	264.96	0.84	264.96
Undeveloped	234.6	0.33	234.6

Attachment D-1 provides a complete tabulation of the storm sewershed associated with each regulated MS4 Outfall including land cover composition, impervious and pervious area acreages and the calculated existing annual sediment loading.

The existing nutrient loading is 113 pounds per year of the Planning Area for Ross Township's regulated MS4.

Total Sewershed Areas Existing Pollutant Loads						
Sewershed Area	Land Use Area (Acres)	Developed Impervious Area (Acres)	Developed Pervious Area (Acres)	Undeveloped Area (Acres)	TP Load (lb/yr)	TSS Load (lb/yr)
Little Pine Creek	967				113.19	

Existing Pollutant Loads within Impaired Little Pine Creek Sewershed Areas		
Sewershed Area	TP Load (lb/yr)	TSS Load (lb/yr)
Little Pine Creek	113	-
Load Reduction Percentage	5%	10%
Minimum Load Reduction	6	-

5. Selection of BMPs to Achieve Required Reductions in Pollutant Loading

A reduction of 5% of the existing nutrient loading is required. Based on an existing nutrient loading of 13 pounds per year, the Township minimum pollutant reduction is 6 pounds per year.

The Township will implement BMPs during the PRP period to achieve the required reduction. The Township intends to implement a combination of BMPs during this permit period as described below. Calculations have been provided to demonstrate feasibility of the pollutant reduction potential for each selected BMP option. These calculations assume that new and existing retrofits will utilize filtration practices to achieve pollutant reductions. As this PRP is intended to be a planning document, the final design of BMPs has not been completed. Existing field conditions, detailed surveys, geotechnical investigations and other information will dictate the type of BMPs selected to achieve pollutant reduction and the Township reserves the right to alter BMP types as needed in implementation of the PRP. For example, if infiltration testing yields favorable infiltration rates, infiltration practices may be implemented in lieu of the assumed filtration practices. At the time of final design, the BMP type that best suits the existing conditions will be selected. BMP name and description that may be implemented, as identified in the Chesapeake Bay Program Model are identified as follows:

Dry Extended Detention Basins - Dry extended detention (ED) basins are depressions created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Dry ED basins are designed to dry out between storm events, in contrast with wet ponds, which contain standing water permanently. As such, they are similar in construction and function to dry detention basins, except that the duration of detention of stormwater is designed to be longer, theoretically improving treatment effectiveness.

Infiltration Practices w/ Sand or Vegetation - A depression to form an infiltration basin where sediment is trapped and water infiltrates the soil. No underdrains are associated with infiltration basins and trenches, because by definition these systems provide complete infiltration. Design specifications require infiltration basins and trenches to be built in good soil, they are not constructed on poor soils, such as C and D soil types. Engineers are required to test the soil before approval to build is issued. To receive credit over the longer term, jurisdictions must conduct yearly inspections to determine if the basin or trench is still infiltrating runoff

Filtering Practices - Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media. There are various sand filter designs, such as above ground, below ground, perimeter, etc. An organic media filter uses another medium besides sand to enhance pollutant removal for many compounds due to the increased cation exchange capacity achieved by increasing the organic matter. These systems require yearly inspection and maintenance to receive pollutant reduction credit.

Bioretention/Rain Gardens - An excavated pit with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants.

Figure 2 provides a listing of proposed BMPs with corresponding locations. **Attachment E-1** provides a tabulation of tributary area and land covers to calculate exiting pollutant loading to the BMPs using the methodology described in Section 4, above.

The Little Pine Creek Sewershed area will consist of one (1) previously completed stream restoration project. The project took place in the Bruno Sammartino Park along UNT to Little Pine Creek. 144 linear feet of stream bank was restored for this project.

Proposed BMPs:

Little Pine Creek Sewershed

1. 144 linear feet of Stream Restoration at Bruno Sammartino Park (Complete)

<u>Little Pine Creek Sewershed</u>		
Proposed BMP	TP Reduction (lb/yr)	TSS Reduction (lb/yr)
144 LF of Stream Restoration at Bruno Sammartino Park (Complete)	9.8	-
BMP Load Reduction Total	9.8	-
Minimum Load Reduction Requirement	6	-

Description - BMP implementation consists of alteration of an existing dry detention basins to provide additional treatment capability. Sample feasibility calculations included in this Plan assume treatment will be achieved through engineered filtering media practices. Final design for new retrofits will be dependent upon field conditions, detailed surveys, geotechnical investigations and other information and in consideration of the above qualifying BMPs options, the optimal BMP type will be designs, constructed and implemented.

Description - BMP implementation consists of new BMPs to capture and treat runoff from existing developed areas. Sample feasibility calculations included in this Plan assume BMPs will consist of surface storage basins intended to detain captured runoff for treatment. Sample feasibility calculations included in this Plan assume treatment will be achieved through engineered filtering media practices. Final design for new retrofits will be dependent upon field conditions, detailed surveys, geotechnical investigations and other information and in consideration of the above qualifying BMPs options, the optimal BMP type will be designs, constructed and implemented.

The Township intends to budget costs associated with implementation of the PRP as part of their annual general fund budget, including costs associated with design, permitting, property acquisition, construction and maintenance. Other finding considerations including PENNVEST and/or establishing a stormwater fee if statutorily permissible will be explored during this permit cycle.

6. Funding

There will be no projected cost associated with this project given it has already been implemented.

7. Responsible Parties for Operation and Maintenance

South Fayette Township will be responsible for operation and maintenance of each proposed BMP. Detailed O&M Plans will be developed with the final design of each BMP. Typical O&M procedures are noted below. Routine inspections of all BMPs will be conducted annually and after rainfall events in excess of one inch.

The following is a list of items that shall be inspected and corrective action taken:

1. Monitor accumulation of debris within structural BMPs.
2. Monitor the mulch layer in bio-filtration/rain gardens.
3. Monitor the condition of the filter media within the water quality filters.
4. Monitor growth of vegetation.

The following actions will be taken to help ensure the implemented BMPs are in working order:

1. Replace or repair facilities so as to function as intended.
2. Remove silt debris and trash accumulated within the BMP.
3. Disposal of collected silt, debris and trash in a manner which will not adversely affect the environment.
4. Replace eroded material and re-vegetate eroded areas.
5. Monitor the condition of the bio-filtration/rain garden areas. Remove and replace the mulch material every three years and additionally as needed. Remove and replace soils as necessary to function properly.
6. Replace dead and dying plantings within the bio-filtration/rain garden areas yearly.
7. When ponding of water is observed in the vicinity of infiltration or filtration BMPs, replace media as necessary to function as intended.

8. Public Participation

This Pollutant Reduction Plan was advertised in the Township's general circulation newspaper of record to solicit public comment. The advertisement was placed on July 28, 2017 and identified a 30 day comment beginning on July 31, 2017 and ending August 30, 2017. A copy of proof of publication of the public notice is included as Attachment A-1. During the 30-day comment period, the draft PRP document was available for public review and comment at the Township Office. No comments were received.

The PRP was discussed as an agenda item at the regularly scheduled August 9, 2017 meeting of the Township Board of Commissioners. Notice of discussion of PRP at the August 9, 2017 Board of Commissioners meeting was included in the above noted public notice. No comments were received.