BOROUGH OF HOUSTON

Pollutant Reduction Plan _ Chartiers Creek

December 2018

FOR PUBLIC REVIEW AND COMMENT
(DECEMBER 12, 2018 - JANUARY 13, 2019)
DATED: DECEMBER 12, 2018
SEE APPENDIX A FOR COMMENT PROCEDURE

HMT AND ASSOCIATES

ENGINEERING – SURVEYING – GEOGRAPHIC INFORMATION SYSTEMS

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Borough of
Houston

Pollutant Reduction Plan – Chartiers Creek

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Introduction

The Borough of Houston has developed a Pollution Reduction Plan (PRP) for its Municipal Separate Storm Sewer System (MS4) in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges from the Small Municipal Separate Storm Sewer Systems Pollution Reduction Plan Instructions as required by the NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4). This PRP addresses requirements for sediment and Phosphorus reduction for Chartiers Creek.

Section A – Public Participation

- Borough of Houston shall make a complete copy of the PRP available for public review
- Borough of Houston shall publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the plan, where it may be reviewed by the public, and the length of time the Borough of Houston will provide for the receipt of comments. The public notice must be published at least 45 days prior to the deadline for submission of the PRP to the DEP. Include a copy of the public notice with the PRP.
- Borough of Houston shall accept written comments for a minimum of 30 days from the date of public notice. Include a copy of all written comments received from the public with the PRP.
- Borough of Houston shall accept comments from any interested member of the public at a public meeting or hearing, which may include a regularly scheduled meeting of the governing body of the municipality or municipal authority that is the permittee.
- The Borough of Houston shall consider and make a record of the consideration of each timely comment received form the public during the public comment period concerning the plan, identifying any changes made to the plan in response to the comment. Include a copy of the Borough's record of consideration of all timely comments received in the public comment period with the PRP.

This Pollution Reduction Plan is available for review by the public for 30 days starting on December 12, 2018. A Public meeting was held on December 12, 2018 for public presentation and comment on the plan. Public comments will be received January 26, 2019.

Section B – Map

The full MS4 Outfall map is attached to this plan in Appendix D.

Section C – Pollutants of Concern

According to the MS4 Requirements table, Borough of Houston contributes to three Impaired Waters, Plum Run, Chartiers Run, and Chartiers Creek. Plum Run is impaired for Nutrients, Organic Enrichment/LOW D.O., Siltation (Appendix E). Charties Run is impaired for Metals (Appendix A), Suspended Solids (Appendix E), Pathogens (Appendix B), Nutrients, Organic Enrichment/Low D.O. (Appendix E), and Siltation (Appendix E). Chartiers Creek is impaired for Metals (Appendix A), PCBs (Appendix C), Suspended Solids (Appendix E), Pathogens (Appendix B), Organic Enrichment/Low D.O. (Appendix E), and Siltation (Appendix E). Plum Run is a tributary to Chartiers Run and Chartiers Run is a tributary to Chartiers Creek.

For each impaired stream to which the Borough discharges that has Appendix D or Appendix E requirements, a Pollutant Reduction plan is required. This plan serves to address Appendix E requirements for Plum Run, Chartiers Run, and Chartiers Run, which encompasses pollutants affecting Chartiers Creek.

The Borough is required to reduce their pollutant loading by 10% for sediment and 5% for Total Phosphorous. It is assumed that a reduction in sediment will also result in a reduction in Total Phosphorous.

Section D Existing Loading for Pollutants of Concern

The Borough of Houston in Washington County, PA has a total of 241.5 acres. Nearly all of Houston (234.8 acres) is considered Urbanized area as part of the Census – Urbanized Area Reference Map: Pittsburgh, PA.

The Planning area was determined as areas where runoff is generated that travels through an urbanized area to Plum Run/Chartiers Run/Chartiers Creek. The watershed for Plum Run/Chartiers Run/Chartiers Creek was determined from contours and it was determined that all of the Houston Borough is tributary to these streams. Several state roads are within the Borough. A fifty-foot buffer was applied to the state roads and the resulting 11.3 acres was parsed out of the planning area as the responsibility of the state and not the Borough. Additional parsed areas are shown on the MS4 Map and include: 6.6 acres of municipal park, 8.5 acres of areas adjacent to streams with no urbanized area and less than 300 feet in width, 23.7

acres of NPDES permitted use with SWM, and 40.2 acres that does not cross municipal property and is wooded open space. Therefore, the Planning area is 151.2 acres, of which 147.00 acres are considered urbanized. The total parsed area is

Using the Statewide Land Cover estimates table, the following areas were calculated:

BOROUGH OF HOUSTON	% Impervious	% Pervious
Urbanized Area	47%	53%
Non-urbanized Area	45%	55%

BOROUGH OF HOUSTON	Impervious	Pervious
Urbanized Area	71.1 ac	80.1 ac
Non-urbanized Area	1.89 ac	2.31 ac

Plum Run and Chartiers Run are impaired for Organic Enrichment/Low D.O., Suspended Solids and Siltation. The MS4 Requirements table specifies that a PRP for impaired waters (Appendix E) must be developed.

The loading rates according to Attachment B for Washington County (All other counties) are as follows:

Category	Sediment Loading Rate (lbs/acre/yr)	TP Loading Rate (lbs/acre/yr)
Impervious developed	1,839	2.28
Pervious developed	264.96	0.84
Undeveloped	234.6	0.33

The calculation of pollutant loading for the Borough of Houston is then as follows:

Sediment:

(71.1acres x 1,839 lbs/acre/yr) + (80.1 acres x 264.96 lbs/acre/yr) + (4.2 acres x 234.6 lbs/acre/yr)

= 152,962 lbs/year Sed.

Total Phosphorus:

(71.1 acres x 2.28 lbs/acre/yr) + (80.1 acres x 0.84 lbs/acre/yr) + (4.2 acres x .33 lbs/acre/yr)

= 231 lbs/year TP

The total amount of pollutants is 152,962 lbs of sediment and 231 lbs of Phosphorous. Therefore the 10% reduction in sediment required is 15,296 lbs. The 5% reduction in phosphorous required is 11.5 lbs and is assumed to be accounted for in the removal of sediment.

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

BMPs to achieve requirements include 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.

Nearly the entire Borough is considered an urbanized area that contributes runoff to Chartiers Creek through Plum Run or Chartiers Run. Within the Borough a park and a few small open spaces that can be used to capture and treat stormwater before it reaches Plum Run, Chartiers Run, and Chartiers Creek. Additionally, most streets in the Borough have catch basins which capture runoff from the street.

Inlet Filter bags – Sediment removal efficiency of 80% maximum

The sediment load for the Borough can be reduced by implementing filtering practices by installing inlet filter bags and cleaning or replacing these bags twice annually. This practice will help to remove sediment that would otherwise be washed into Plum Creek, Chartiers Run or Chartiers Creek. The sediment would then have to be weighed for final verification of the dry weight. To calculate the amount of sediment

that could be removed, local roads with catch basins were considered excluding state roads that have already been parsed out of the Planning Area.

A 50-foot buffer was applied to consider all runoff that may enter a nearby catch basin. This buffer may include areas that are not tributary to a catch basin, but may also include additional areas that discharge to the street, therefore it is assumed that on average a 50-foot buffer approximates the area generating runoff that is tributary to a catch basin. The total area considered would be 39 acres for the buffer, although given the number of existing inlets in the borough of Houston is 73, which does not include inlets owned or operated by PennDOT. The maximum drainage area treated by an inlet filter is 0.5 acre, the filtration area could not be greater than 36.5 acres. The Land Cover type estimate is used to break the areas down by impervious and pervious areas and the loading rates are applied to find an estimate of sediment removed. This is conservative since this area is most likely more impervious than the municipality's average.

(36.5 acres of urbanized area tributary to Chartiers Creek) * 47% = 17.2 acres impervious

(36.5 acres of urbanized area tributary to Chartiers Creek) * 53% = 19.3 acres pervious

(17.2 acres * 1,839 lbs/ac/year + 19.3 ac * 264 lbs/ac/year) * 80% efficiency = 29,380.8 lbs sediment

In total, 29,380.8 lbs of sediment can be removed through filtering practices. However, only 50% of the required sediment reduction is allowed to come from filtering. Therefore, the amount of removal that can be counted towards the requirement is 7,648 lbs of sediment.

Bioretention (A/B soil with underdrain – Sediment removal efficiency of 80%

Within the Borough is a park and playing fields where bioretention basin can be used to capture and treat stormwater. One area was identified and the watershed digitized to determine the area of runoff that could be captured. This area is shown on the MS4 Map. Houston Ballfield, located along Bishop Road and Chartiers Creek. The watershed here includes ball fields, pavement up to the roadway, residences, and some amount of roadway.

The total watershed area that is tributary to the park is approximately 13.2 acres. Using the Land Cover type estimates, the sediment load reduction can be calculated:

(13.2 acres of urbanized area tributary to Chartiers Creek) * 47% = 6.21 acres impervious

(13.2 acres of urbanized area tributary to Chartiers Creek) * 53% = 7.00 acres pervious

(6.21 acres * 1,839 lbs/ac/year + 7.00 ac * 264 lbs/ac/year) * 80% efficiency = 12,899 lbs sediment

This bioretention area has an annual removal amount of 12,899 lbs of sediment.

Combining these two practices will reduce the sediment load by 20,547 lbs/yr of sediment to Plum Run, Chartiers Run and Chartiers Creek. It is assumed the Total Phosphorus is also removed by 5%. This exceeds the requirements by 5,251 lbs., allowing for flexibility in final implementation considering the number of inlet filters that can be used.

Selected BMP	Estimated Sediment Loading Reduction (lbs/yr)
Filtering Practices	7,648
Bioretention (A/B)	12,899
Total Minimum	20,547
Required Difference	15,296
	(5,251)

Section F – Identify Funding Mechanism

Prior to approving coverage DEP will evaluate the feasibility of implementations of an applicant's PRP. Part of this analysis includes a review of the applicants proposed method(s) by which BMPs will be funded. Applicants must identify all project sponsors and partners and probable funding sources for each BMP. Possible Funding Possibilities:

- CDBG (Community Development Block Grant)
- CITF (Construction Industry Trust Fund)
- GTRP (Greenways, Trails and Recreation Program)
- DCNR Stream Bank and Riparian Buffer Restoration Grant Funding
- PADEP Environmental Stewardship and Watershed Protection Act Grants
- NOAA Habitat Conservation Program Grants

Section G – Identify Responsible Parties for Operation and Maintenance of BMPs

Once implemented, the BMPs must be maintained in order to continue producing the expected pollutant reductions. Applicants must identify the following for each selected BMP:

- The party(ies) responsible for ongoing O&M.
- The activities involved with O&M for each BMP; and

- The frequency at which O&M activities will occur.

Filtration Practices (Inlet Filter Bags) – Follow the manufactures' guidelines for maintenance and take into account expected pollutant load and site conditions. Initially, Inlets should be inspected monthly by Municipal staff. They should be emptied when over half full of sediment (and trash) and cleaned at least twice a year. They should also be inspected after major runoff events. Maintenance is crucial to the effectiveness of this BMP. The Borough Department of Public Works staff will review the process and be responsible for maintenance and inspection of the inlet filter bags.

Bioretention (A/B) – The bioretention area should be inspected monthly by Municipal staff to ensure that water is being captured and infiltrated through the soil. In addition, the structure should be monitored after significant rain events to ensure proper function. If the depressed area begins to fill with sediment, Municipal staff should remove sediment to the designed elevation and dispose of the material properly. Maintenance is crucial to the effectiveness of this BMP. The Borough Department of Public Works staff will review the process and be responsible for maintenance and inspection of the Bioretention area.

APPENDIX A

Public Advertisement

NOTICE

NOTICE IS HEREBY GIVEN that the Pollution Reduction Plan for the Borough of Houston will be presented at the regular scheduled borough council meeting on December 12, 2018, 7:00 p.m. (prevailing time) at 42 Western Avenue, Houston, PA 15342, which will demonstrate Houston Borough's strategy for installing best management practices which will reduce sediment and nutrient loads. Per the requirements of the Pennsylvania Department of Environmental Protection, Houston Borough's Pollution Reduction Plan will be available for public review and comment between December 12, 2018 and January 13, 2019.

Copies of the proposed Pollution Reduction Plan will be posted on the Township Engineer's website at https:/hmtandassociates.com under "Notices" or at the Houston Borough Office at 42 Western Avenue, Houston, PA 15342. Written comments can be mailed to HMT and Associates, 130 Cecil Street, Canonsburg, PA 15317, "Attn: Houston Pollutant Reduction Plan" or emailed to rkauffman@hmtandassociates.com, please make sure "Houston Pollutant Reduction Plan Comments" are noted in the subject line.

THE BOROUGH OF HOUSTON

By: Richard A. Kauffman, PE
Township Engineer
HMT and Associates

Date of Publication:
Observer Reporter, December 4, 2018

APPENDIX B

Public Advertisement Comments

TO BE COMPLETED AFTER PUBLIC COMMENT PERIOD

APPENDIX C

Public Comment Consideration

TO BE COMPLETED AFTER PUBLIC COMMENT PERIOD

APPENDIX D

MS4 Map

Borough of Houston

Washington County, PA

MS4 Map

Proposed Bio-Retention Area

Map Legend

- Inlet
- Manhole
- Outfall
- Index Contour
- NHD Flowline
- Building Footprint
- Catchment Area
- Local Road - 50 ft. Buffer
- State Road - 50 ft. Buffer
- Park Boundary
- Parsed Area
- NPDES Parsed Area
- Municipal Boundary

N

Data Sources:
Pennsylvania Spatial Data Access (PASDA)
USGS National Hydrography Dataset
Washington County, PA GIS Department
Esri World Imagery (Sources: Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)

Inlet and Outfall locations collected by HMT and Associates in November 2017.

Coordinate System:
NAD 1983 (2011) State Plane, Pennsylvania South (ft)

Print Date: 12/10/2018

0 0.05 0.1 0.15 0.2
Miles

1 inch = 200 feet