POLLUTION REDUCTION PLAN

Prepared For:

CHARLEROI BOROUGH

Prepared By:

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RIDC Park West
117 Industry Drive
Pittsburgh, PA 15275-1015

September 2017

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SECTION A – PUBLIC PARTICIPATION

This Pollution Reduction Plan (PRP) was made available for public review at the Charleroi Borough Building. The notice was advertised in the Mon Valley Independent. The proof of advertisement is below.

Charleroi Borough, Washington County, PA hereby gives notice that the Pollution Reduction Plan as part of Borough's MS4 permit application will be on display at the borough building for public review and comment from October 2nd, 2017 through October 31st, 2017.

A 30-day comment period was available from October 2nd through October 31st. 2017. During the 30-day comment period the plan was available for public review. Written comments were accepted and logged at the Borough. The comments are included in Appendix A.

SECTION B – MAPS

Mapping of the Borough's Municipal Separate Storm Sewer System (MS4) regulated area was created as part of Minimum Control Measure 3 of the National Discharge Elimination System (NPDES) permit. The map identifies the PRP Planning Area used for this report. Within the planning area the urbanized area as defined by the U.S. Census Bureau (2010) is shown. The entire Borough is classified as an urbanized area. This report only applies to urban runoff that flows through municipal owned and operated storm water infrastructure with a concentrated discharge (outfall) to a surface water.

The mapping identifies the entire storm water network within the Borough. The Borough consists of a combined sewer system as well as an MS4 system. The map includes all drainage structures (inlets, manholes, etc.) pipes and outfalls. These structures were located using a GPS device. For the purpose of this report the map only delineates the drainage areas flowing to the MS4 outfalls that outlets to a sediment impaired water. Each area flowing to these outfalls are shaded and has a number associated with it. All the other areas on the map flow to the Monongahela River and were not considered in this report.

Land cover maps used to determine the type of land use within each drainage area are also included. Land cover is based on National Land Cover Database data.

The maps can be found in Appendix B.

SECTION C – POLLUTANTS OF CONCERN

The Pennsylvania Department of Environmental Protect (PADEP) MS4 requirement table lists three bodies of water as impaired waters for Charleroi Borough. The Monongahela River has PCBs as the impairment. This report does not address that impairment. An Unnamed Tributary to the Monongahela River on the north side of the borough and Maple Creek on the south side of the borough both have siltation as impairments. The source of the impairments have been identified as Land Development and Urban Runoff/Storm Sewers. This PRP will address those impairments. See the table below.

MS4 Name	NPDES ID	Individual Permit Required?	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Washington County					
CHARLEROI BORO	PAG136102	No	Unnamed Tributaries to Monongahela River	Appendix E-Siltation (5)	
			Maple Creek	Appendix A-Metals (5), Appendix E-Organic Enrichment/Low D.O., Siltation (5)	Water/Flow Variability (4c)
			Monongahela River	Appendix C-PCB (4a)	

As per the PRP instructions, MS4s shall calculate the existing loading of the pollutant of concern, in lbs/year; calculate the minimum reduction in loading, select Best Management Practices (BMP) to reduce the loading, and demonstrate that the selected BMPs will achieve the minimum reductions. A 10% sediment reduction is required for siltation impairment. This process will be coved in later sections of the report.

SECTION D – DETERMINATION OF EXISTING LOADING FOR POLLUTANTS OF CONCERN

The PADEP Simplified Method was used to calculate the existing pollution loading. The total planning area was broken down into drainage areas that contribute to each outfall that empty into the tributaries within the Borough. The drainage areas were then further broken down into land use categories using the National Land Cover Database maps. These maps break down each area into seven different land uses. A percentage of impervious/pervious area is assumed per land use. See below.

Land Use	% Impervious	% Pervious
Developed, Open Space	19	81
Developed, Low Intensity	49	51
Developed, Medium Intensity	79	21
Developed, High Intensity	100	0
Deciduous Forest	0	100
Grassland/Herbaceous	0	100
Pasture/Hay	0	100

Once the total impervious/pervious area per drainage area is determined a sediment loading is applied. The sediment loading is based on tables developed by DEP for each county within Pennsylvania. These tables are located in Attachment B of the PRP Instructions. Washington County falls in the category of "All Other Counties". The loadings for this category are as follows.

Impervious Developed = 1,839.00 lbs/acres/year
Pervious Developed = 264.96 lbs/acres/year
Natural Areas Undeveloped = 234.6 lbs/acres/year

From these loadings, a total sediment loading for each drainage area can be calculated and used to find the total sediment loading for the entire Borough. The total loading for Charleroi Borough is 115,711 lbs/yr requiring a 10% reduction of 11,571 lbs/yr.

A complete breakdown down of these calculations are shown in Appendix C.

SECTION E– SELECTION OF BMPS

As stated above, Charleroi is required to remove 11,571 lbs/yr of sediment. To achieve this reduction, the Borough will implement BMPs during the five-year period. The following BMP projects are being planned.

Stream Restoration – An annual mass nutrient and sediment reduction credit for qualifying stream restoration practices that prevent channel or bank erosion that otherwise would be delivered downstream from an actively enlarging or incising urban stream. Applies to 0 to 3rd order streams that are not tidally influenced. If one of the protocols is cited and pounds are reported, then the mass reduction is received for the protocol.

As per DEP's BMP Effectiveness Values tables a reduction of 44.88 lbs/ft/yr can be used for this BMP. Stream restoration projects will address known erosion trouble in areas of Maple Creek and the Tributary to the Monongahela River. The area of Maple Creek behind the Maple Creek Beer Distributor is showing signs of bank erosion. A stream restoration project is planned to restore about 50' of stream bank in that area. Also, there are signs of bank erosions on the banks of the Tributary to the Monongahela River bedside Thorpes Personal Care Home. A second stream restoration project is planned to restore about 50' of that stream bank. The map in Appendix B shows the area of restoration. The Proposed BMP Sediment Reduction Table in Appendix C show the reduction calculations.

Storm Sewer System Solids Removal (Inlet Filter Inserts) - This BMP (also referred to as "Storm Drain Cleaning") involves the collection or capture and proper disposal of solid material within the storm system to prevent discharge to surface waters. Examples include catch basins, stormwater inlet filter bags, end of pipe or outlet solids removal systems and related practices. Credit is authorized for this BMP only when proper maintenance practices are observed (i.e., inspection and removal of solids as recommended by the system manufacturer or other available guidelines). The entity using this BMP for pollutant removal credits must demonstrate that they have developed and are implementing a standard operating procedure for tracking the material removed from the sewer system. Locating such BMPs should consider the potential for backups onto roadways or other areas that can produce safety hazards.

As per DEP's BMP Effectiveness Values tables, DEP will allow up to 50% of total pollutant reduction requirements to be met through this BMP. The drainage area treated by this BMP may be individually no greater than 0.5 acre unless it can be demonstrated that the specific system proposed is capable of treating stormwater from larger drainage areas. For planning purposes, the sediment removal efficiency specified by the manufacturer may be assumed, but no higher than 80%.

This BMP will be used on 20 inlets throughout the Borough. The BMP will remove 5,000 lbs/yr of sediment based on an average 0.4 acres contributing to each device. This

does not exceed the maximum 50% of the total amount of the required reduction. Bioretention – Raingarden - An excavated pit backfilled 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. This BMP has an underdrain and is in C or D soil.

The borough will investigate three potential sites to construct rain gardens. The first site is a 9,000 sf lot located in drainage area #2 at the corner of Lincoln Avenue and Lincoln Avenue Extension. This is a private lot that the borough will have to acquire for use. The second site is a 5,000 sf lot located in drainage area #3 on Shady Avenue. This is also a private lot that the borough will have to acquire for use. The third site is a 12,000 sf site located in drainage area #7 between Prospect Avenue and Lincoln Avenue. This property is already owned by Charleroi Borough therefore no cost will be required for acquisition.

The location of the stream restoration and raingardens can be found on the map in Appendix B.

The table below summarizes the proposed BMPs and their reduction amount. These quantities give an example of what the Borough can do to satisfy their reduction requirements. The Borough will utilize their own road crew to install the BMPs, therefore they may consider changing the quantity of each BMP to better suite their manpower.

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PROPOSED BMP SEDIMENT REDUCTION TABLE

REQUIRED 10% REDUCTION PER YEAR							11,571 lbs/yr
Proposed BMP	**Quantity**	**Unit**	**Sediment Load Reduction Rate (lb/unit/year)**	**BMP contributing area**	**10% reduction required**	**BMP effective ness**	**Total Sediment Load Reduction Per BMP (lb/yr)**
Inlet Filter Insert	20	Each	250.00				5,000.00
Stream Restoration	100	LF	44.88				4,488.00
Raingarden #1	1	Each		35.4	4397.02	55%	2,418.36
Drainage Area #2							
19 Hill Crest Avenue							
Charleroi, PA 15022							

Raingarden #2	1	Each		24.98	3010.10	55%	1,655.56
Drainage Area #3							
204 Shady Avenue							
Charleroi, PA 15022							
Raingarden #3	1	Each		8.4	2388.70	55%	1,313.79
Drainage Area #7							
Charleroi Borough							
Total amount of Sediment Reduction							14,875.70
Balance of Sediment Requirement							+ 3304.55

SECTION F– FUNDING

Charleroi Borough intends to budget costs associated with the implementation of the PRP as part of their annual capital budget over the next 5 years. This budget should include all costs associated with permitting, design, construction and maintenance. The following table provides a summary of the anticipated costs for each BMP. The costs were derived from contractor bid results from similar projects. These are preliminary numbers. The costs may change once final design begins and it is determined what permits will be needed to complete the work.

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PROPOSED BMP COST TABLE

Proposed BMP	Quantity	Unit	Cost Per Unit	Total Preliminary Cost
Inlet Filter Insert	20	Each	$ 1,000.00	$ 20,000.00
Stream Restoration	100	LF	$ 100.00	$ 10,000.00
Raingarden #1	1	Each	$ 5,000.00	$ 10,000.00
Approximate Acquisition Cost			$ 5,000.00	
Raingarden #2	1	Each	$ 5,000.00	$ 20,000.00
Approximate Acquisition Cost			$ 15,000.00	
Raingarden #3	1	Each	$ 5,000.00	$ 5,000.00
Total Cost				$ 65,000.00

SECTION G– RESPONSIBLE PARTIES FOR OPERATION AND MAINTENANCE

The Charleroi Borough road crew will be responsible for the operation and maintenance (O&M) of each proposed BMP. O&M details and sequences will be prepared as part of the final design of each BMP.

REFERENCES

United States Census Bureau 2010 Urban and Rural Classification
https://www.census.gov/geo/reference/ua/urban-rural-2010.html

Commonwealth of Pennsylvania. Department of Environmental Protection Municipal Stormwater website.
http://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Stormwater/Pages/default.aspx

National Land Cover Database 2011.
https://www.mrlc.gov/nlcd2011.php

NPDES Stormwater Discharge from Small Municipal Separate Storm Sewer Systems BMP Effectiveness Values.
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-112621/3800-PM-BCW0100m%20BMP%20Effectiveness%20(Final).pdf

Pollutant Reduction Plan (PRP) Instructions
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-116283/3800-PM-BCW0100k%20PRP%20Instructions%20(3-28-17)%20(003).pdf

APPENDIX A
Public PRP Comments

APPENDIX B
Maps

Charleroi MS4 Map

Washington County, PA

Legend

- Charleroi Boundary
- Planning Area / Urbanized Area
- Parcel Boundary
- State Road
- Local Road
- Stream
- Impaired Stream
- Raingarden
- Stream Restoration

Drainage Area

- 1
- 2
- 3
- 7

- MS4 Inlet
- CSS Inlet
- MS4 Manhole
- CSS Manhole
- CSS Overflow
- MS4 Outfall
- Stormwater Pipe

1 inch = 150 feet

Data sources:

Washington County Planning Commission GIS: roads, parcels
PASDA: streams, impaired streams
Mackin: inlets, manholes, outfalls, pipes

Map created on: 9/21/2017

Map prepared by Mackin Engineering Company

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Charleroi Land Cover Map

Washington County, PA

Legend

- Charleroi Boundary
- Planning Area / Urbanized Area
- Parcel Boundary
- State Road
- Local Road
- Stream
- Impaired Stream
- Raingarden
- Stream Restoration

Land Cover

- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed High Intensity
- Deciduous Forest
- Grassland/Herbaceous

- MS4 Inlet
- CSS Inlet
- MS4 Manhole
- CSS Manhole
- CSS Overflow
- MS4 Outfall
- Stormwater Pipe

1 inch = 150 feet

Data sources:

Washington County Planning Commission GIS: roads, parcels
PASDA: streams, impaired streams
Mackin: inlets, manholes, outfalls, pipes

Map created on: 9/20/2017

Map prepared by Mackin Engineering Company

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1

2

3

7

APPENDIX C
Calculations

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Project Charteroi Borough MS4 Pollution Reduction Plan Job No 5201-001 Made By DAP Date 9/22/17
Description MS4 PRP Loading Calculations From Drainage Areas Revised Date
Checked Date

Drainage Area	Land Use	Area (SM)	Area (acres)	% Impervious	Impervious Area (acres)	Total Impervious Area (acres)	TSS, Sediment Impervious (lbs/acres/yr)	Total Impervious Sediment Loading (lb/yr)	Pervious Area (acres)	Total Pervious Area (acres)	TSS, Sediment Pervious (lbs/acres/yr)	Total Pervious Sediment Loading (lb/yr)	Total Existing Sediment Loading (lb/yr)
1	Developed, Open Space	0	0.00	19	0.00	5.06	1,839.00	9,299.38	0.00	0.08	264.96	20.29	**9,320**
	Developed, Low Intensity	0	0.00	49	0.00				0.00				
	Developed, Medium Intensity	15,886	0.36	79	0.29				0.08				
	Developed, High Intensity	207,721	4.77	100	4.77				0.00				
	Deciduous Forest	0	0.00	0	0.00				0.00				
	Grassland/Herbaceous	0	0.00	0	0.00				0.00				
	Pasture/Hay	0	0.00	0	0.00				0.00				
2	Developed, Open Space	418,254	9.60	19	1.82	26.19	1,839.00	48,165.42	7.78	16.00	264.96	4,238.85	**52,404**
	Developed, Low Intensity	391,849	9.00	49	4.41				4.59				
	Developed, Medium Intensity	753,536	17.30	79	13.67				3.63				
	Developed, High Intensity	274,109	6.29	100	6.29				0.00				
	Deciduous Forest	0	0.00	0	0.00				0.00				
	Grassland/Herbaceous	0	0.00	0	0.00				0.00				
	Pasture/Hay	0	0.00	0	0.00				0.00				
3	Developed, Open Space	35,253	0.81	19	0.15	14.92	1,839.00	27,435.00	0.66	10.06	264.96	2,665.61	**30,101**
	Developed, Low Intensity	602,035	13.82	49	6.77				7.05				
	Developed, Medium Intensity	440,693	10.12	79	7.99				2.12				
	Developed, High Intensity	0	0.00	100	0.00				0.00				
	Deciduous Forest	0	0.00	0	0.00				0.00				
	Grassland/Herbaceous	10,091	0.23	0	0.00				0.23				
	Pasture/Hay	0	0.00	0	0.00				0.00				
7	Developed, Open Space	241,799	5.55	19	1.05	10.95	1,839.00	20,134.40	4.50	14.16	264.96	3,752.54	**23,887**
	Developed, Low Intensity	381,386	8.76	49	4.29				4.47				
	Developed, Medium Intensity	308,425	7.08	79	5.59				1.49				
	Developed, High Intensity	439	0.01	100	0.01				0.00				
	Deciduous Forest	161,788	3.71	0	0.00				3.71				
	Grassland/Herbaceous	0	0.00	0	0.00				0.00				
	Pasture/Hay	0	0.00	0	0.00				0.00				
TOTAL LOADING CALCULATIONS FROM DRAINAGE AREAS						**57**	**7,356**	**105,034**		**40**	**1,060**	**10,677**	**115,711**
Required 10% Reduction Per Year in the 5-Year Period													**11,571**