

Borough of East Stroudsburg MS4 Pollution Reduction Plan (PRP)

Prepared by:

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112 North Courtland Street
East Stroudsburg, PA 18301
Project No. 10205.229

July 2017

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East Stroudsburg Borough – Sambo Creek Sediment Reduction PRP Narrative

1. Introduction

The Environmental Protection Agency (EPA) expanded the NPDES stormwater permit program in 1999 by issuing the Regulations for Revision of the Water Pollution Control Program Addressing Stormwater Discharges (Phase II Rule), which regulates small Municipal Separate Storm Sewer Systems (MS4s). As a result of EPA's action, municipalities located within an Urbanized Area (UA) designated by the Bureau of the Census are automatically required to apply for an MS4 stormwater NPDES permit.

The Pennsylvania Department of Environmental Protection (PA DEP) notified the Borough of the MS4 program requirements including the mandatory submission of the Notice of Intent (NOI) for coverage under the PAG-13 General Permit by September 16th, 2017. In December of 2016 the Borough submitted an MS4 advanced waiver request to DEP. On March 27, 2017, the DEP informed the Borough that the eligibility for a waiver from Permit requirements could not be determined. Therefore, the Borough is required to submit a Pollution Reduction Plan (PRP) for the Sambo Creek Planning Area, designated as impaired for siltation along with the MS4 (NOI).

Appendix E of the General Permit outlines requirements for the PRP plan for pollutant discharges to waters impaired for sediment. Appendix E requires a PRP be developed outlining Best Management Practices (BMP's) to achieve a 10% sediment reduction in stormwater discharges from the East Stroudsburg MS4 planning area to the impaired water, the Sambo Creek. Unless a waiver is granted, the measures outlined in the PRP must be implemented within 5 years of the General Permit issuance. This reduction is to be achieved through the implementation of Best Management Practices in the Sambo Creek Planning Area. This narrative and the attached plans comprise the East Stroudsburg Borough's Pollution Reduction

2. Pollution Reduction Plan

A. Public Participation

The PRP is required to be available for public review at least 45 days prior to the September 16, 2017 deadline for submission of the PRP to DEP. A copy of the PRP will be available on July 31, 2017 on the Borough website, and a hardcopy will be available for review during normal business hours at the East Stroudsburg Municipal Building. The plan will be discussed, and the public will have the opportunity to comment at the August 1, 2017 Borough Council meeting. Written comments will be received until September 1, 2017.

Notice of the public comment period and public meeting has been published in the Pocono Record in accordance with the permit requirements. This notice is included in Appendix A of this plan.

A copy of all timely comments received and documentation of comments received during the Borough Council meeting will be included as Appendix B of the PRP. The PRP will be revised as necessary to consider public comment. The Borough's record of consideration of comments will be included in the submission of the PRP as Appendix C of the PRP.

B. Map

A PRP map for the Sambo Creek watershed within East Stroudsburg Borough has been prepared and is included in Appendix D.2. The base map shows aerial photography dated 2015 to show the limits of pervious and impervious surfaces and to delineate the Sambo Creek Planning Area. The map was prepared by RKR Hess based on mapping prepared with assistance from the Monroe County GIS department and Borough Public Works Department. The overall Sambo Creek Watershed within the Borough is shown with sub drainage areas mapped to verify the Borough Planning Area in support of the sediment loading calculations.

The locations of potential sediment reduction best management practices (BMPs) are shown on the map.

C. Pollutants of Concern for PRP Plan

According to the PA DEP MS4 Requirements Table (Municipal), East Stroudsburg Borough contributes stormwater to the Brodhead Creek, the Delaware River, and Sambo Creek. The Sambo Creek is listed as impaired for siltation (sediment), requiring the preparation of the PRP plan as part of the MS4 permit process.

D. Determine Existing Loading for Pollutants of Concern

Approximately 300 acres located in the Urbanized Area within the Borough drain to the Sambo Creek. Approximately 100 of these acres are included in the Borough Planning Area. The remaining areas drain directly to the creek, to depressed areas with no discharge, to private stormwater collection systems and to PennDOT storm collection systems and have been parsed from the Planning Area.

To determine the total yearly sediment load to Sambo Creek, the sediment loading values of 1839.00 lb/acre/year for impervious developed land and 264.96 lb./acre/year for pervious developed land were used. These values are taken from Attachment B of the PRP Instructions and are to be used with the DEP Simplified Method as loading rates for MS4s outside of the Chesapeake Bay watershed. Wiki Watersheds was used to determine the acreage of impervious and pervious land in most drainage areas. Impervious and impervious areas for the Willow Street and Brookside Avenue were calculated separately as indicated in the calculations. More detailed survey information was available for Willow Street and Brookside Avenue as the Borough is currently in the design process of a roadway rehabilitation project. The total sediment load of the Borough Planning Area is calculated to be 81,591 lb. /year.

The load reductions achieved by existing BMPs have been calculated and subtracted from the total load to reduce the required sediment reduction. The existing Borough street sweeping program already meets the MS4 load reduction criteria and reduces the existing load by 1,903 lb./year.

Three small existing stormwater basins are located on Grandview Street. The reduction in existing sediment loading appears to be insignificant in the determination of the loadings for the purpose of this report. The net sediment loading subtracting the load reduction from street sweeping is 79,687 lb. /year.

E. Select BMPs To Achieve the Minimum Required Reduction in Pollutant Loading

Options for BMP's to achieve a sediment reduction goals have been reviewed for applicability to the specific conditions in the Borough. Most of the undeveloped areas in the Sambo Creek watershed are private property and/or constrained by natural features, limiting the feasibility of potential options for sediment reduction BMP's.

The Sambo Creek traverses approximately 3,500 feet through the Borough. The Borough does not own any of the property adjoining the Sambo Creek in the Borough.

The areas surrounding the majority of the stream channel are wooded. No evidence of significant stream bank erosion was noted. Where the Sambo Creek discharges to the Brodhead Creek, a section of the Sambo Creek stream bank was armored with riprap as a result of erosion caused by the overflow of the Brodhead Creek. No active construction sites within the Borough were observed with the potential to discharge sediment to the Sambo Creek.

BMP's were identified with the potential to provide the required pollution loading reduction. A detailed feasibility analysis of the BMP's to confirm the effectiveness, cost and if site acquisition is required prior to implementation. The calculations prepared to support the selection of BMPs are included in Appendix F.

Street Sweeping

The Borough maintains streets and drainage facilities throughout the Borough. The Borough performs street sweeping weekly in the Sambo watershed and throughout the Borough when weather permits. The removal of debris and sediment from the roadway reduces the amount of sediment discharged to the Sambo Creek from Borough facilities. The Borough will continue to perform street sweeping.

Vegetated Swales and Rain Gardens

Flat, vegetated swales have the ability to clean storm water. The MS4 manual allows up to a 70% sediment reduction rate and references the BMP Manual. Most areas of the Borough right of ways are impractical to install vegetated street side swales due to the existing private improvements adjoining the roadway and the steep grades in most portions of the Planning Area.

The Borough project proposing street and stormwater systems improvements on Willow Street provides an opportunity to utilize 6-inch deep grassy swales along the side of the street for the majority of its length. The goal is to provide these swales as BMP's for the purpose of reducing

sediment from the roadway and adjoining properties. The general location of the proposed swales is shown in Appendix D.3 and the estimate of potential sediment reduction for this option is provided in Appendix F.

The existing Borough culvert under Oak Street near 4th Street discharges to a private storm sewer on the down slope property, formerly the Bustin Industries site. The storm sewer construction on the Bustin site was installed without permits from the Borough and resulted in changes to the existing drainage patterns, resulting in stormwater backing up on the upstream side of Oak Street. The property owner is working on solutions to correct the drainage conditions. The coordination of resolution of the drainage issue by the property owner and the installation of a sediment reducing BMP such as a vegetated swale or rain garden at the site is an option to be considered. Potential sediment loading reductions are provided in Appendix F.

Hydrodynamic Separators -

Given the limited area of Borough properties in critical areas for stormwater BMP's, hydrodynamic separators should be considered. A potential locations for a CDS (continuous deflective separation) unit would be on Oak Street at the 6th Street storm sewer discharge. Although the regulations only provide for sediment reduction of 10% for hydrodynamic units, manufacturers claim effectiveness rates of up to 80% for water flowing through the unit. There is the potential that some increase level of efficiency for this type of unit will be verified and accepted by DEP for an installation such as the Borough where land area is limited for BMP installation. A review of the stream bank conditions in the Borough confirm stream bank erosion does not appear to be a substantial source of siltation within the limits of Borough. Potential sediment loading reduction has been provided in Appendix F.

Tree Planting

One BMP the Borough already utilizes is planting trees. The Borough would need to plant 2,000 to 14,000 trees to meet the required reduction. Areas for tree planting on this scale are not available.

Stream Bank Restoration/Buffer restoration

The Borough does not own any property along the Sambo Creek stream banks. Significant erosion of the Sambo Creek stream banks from the limits of the Borough boundary to the discharge in the Brodhead's Creek were not observed. Most of the property along the Sambo Creek Stream banks in the Borough is forested.

Detention Basins Retrofit

Limited numbers of stormwater detention basin potential exists in the East Stroudsburg portion of the Sambo Creek watershed. The Act 167 stormwater management studies determined that based on the Borough's location at the bottom of the Sambo Creek and Brodhead's Creek drainage areas, it was desirable to discharge stormwater directly to the Creeks without detention. The peak storm flow from sites in the Borough are discharged to the Sambo and Brodhead Creeks before the peak flow of the upslope portion of the drainage area reach the portion of the Creeks in the Borough.

The existing three detention basins at the top of Grandview Street are small. These basins provide limited area for modifications that would allow the existing basins to continue to provide the required stormwater management function, to reduce flows to the existing Borough stormwater collection system, as well as provide a sediment reduction BMP.

Joint Municipal Projects

Most of the Sambo Creek watershed is located in Stroud, Smithfield and Middle Smithfield Townships as shown in the Sambo Creek Drainage Area map prepared by the Monroe County Planning Commission included in Appendix D.1. At the time of the preparation of this report, the details of potential sediment reduction BMP's in these municipalities were in the very preliminary planning stages. At this time no specific BMP outlined in Stroud or Smithfield Townships have been identified that would facilitate a joint project with East Stroudsburg; however, the Borough will continue to be in contact with these municipalities to consider all options.

E. Identify Funding Mechanism(s)

Unless funding changes are provided at the State and Federal levels, the funding of design and installation of BMP's required by the State and Federal MS4 program will be the responsibility of the Borough. The Borough will seek grants from any available sources including Federal, State and private sources.

F. Identify Responsible Parties for Operation and Maintenance (O&M) of BMPs

A written O&M program will be developed specifically with the detailed design of each BMP. East Stroudsburg Borough will be the responsible party to maintain all BMP's. General O&M measures are described below.

Street Sweeping - Street Sweeping will continue using a vacuum truck on Borough Streets in the Sambo Creek Drainage area at least 25 times per year.

Vegetated Swales/Rain Gardens – Vegetated roadside swale conditions will be reviewed each spring to determine if plow damage or sediment deposits over the winter require maintenance. If necessary, sediment shall be removed and any areas where vegetation was damaged shall be seeded and mulched, or matted as necessary to reestablish vegetation.

Swales shall also be reviewed after rain events over a 2 year storm frequency to confirm erosion is not taking place as a result of the storm.

Hydrodynamic Separators – Sediment shall be removed from the unit as recommended by the manufacturer or at least in the spring and fall.

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NOTICE OF PUBLIC COMMENT PERIOD FOR NPDES STORMWATER DISCHARGE POLLUTANT REDUCTION PLAN

East Stroudsburg Borough is preparing an application for a 2018-2023 National Pollution Discharge Elimination System (NPDES) General Stormwater Permit for Stormwater Discharges from Small Municipal Separate Storm Sewers Systems (MS4s) to be submitted in September of 2017 to the PA Department of Environmental Protection (PADEP). The Borough is required to submit a Pollution Reduction Plan (PRP) to the PADEP as a part of the MS4 application. The Plan describes potential sediment reduction measures in the Sambo Creek watershed.

The Borough is hereby giving notice of the public comment period on the PRP, which is a requirement of the General MS4 Permit. The Borough shall accept comments from July 31, 2017 through August 30, 2017. A copy of the plan will be available on July 31, 2017 at the Borough website, at www.eaststroudsburgboro.org. A hardcopy can be reviewed in person during normal business hours at the East Stroudsburg Municipal Building located at 24 Analomink Street, East Stroudsburg, PA 18301. Written comments may be submitted to the Borough Manager at this address during the comment period. The plan will be discussed, and the public will have the opportunity to comment at the August 1, 2017 Borough Council meeting.

P:\PA\Monroe Co\East Stroudsburg Bor_Authorities\East Stroudsburg Bor\ESB Projects 10205 Series\10205.229 MS4 NOI & PRP Preparation\WP\Permit Applications\PRP Plan\WP\PRP Notice for Public Comment Period.docx

APPENDIX B

PUBLIC COMMENTS

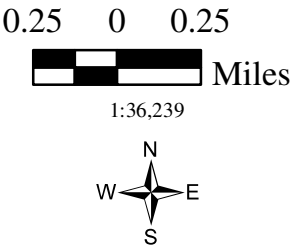
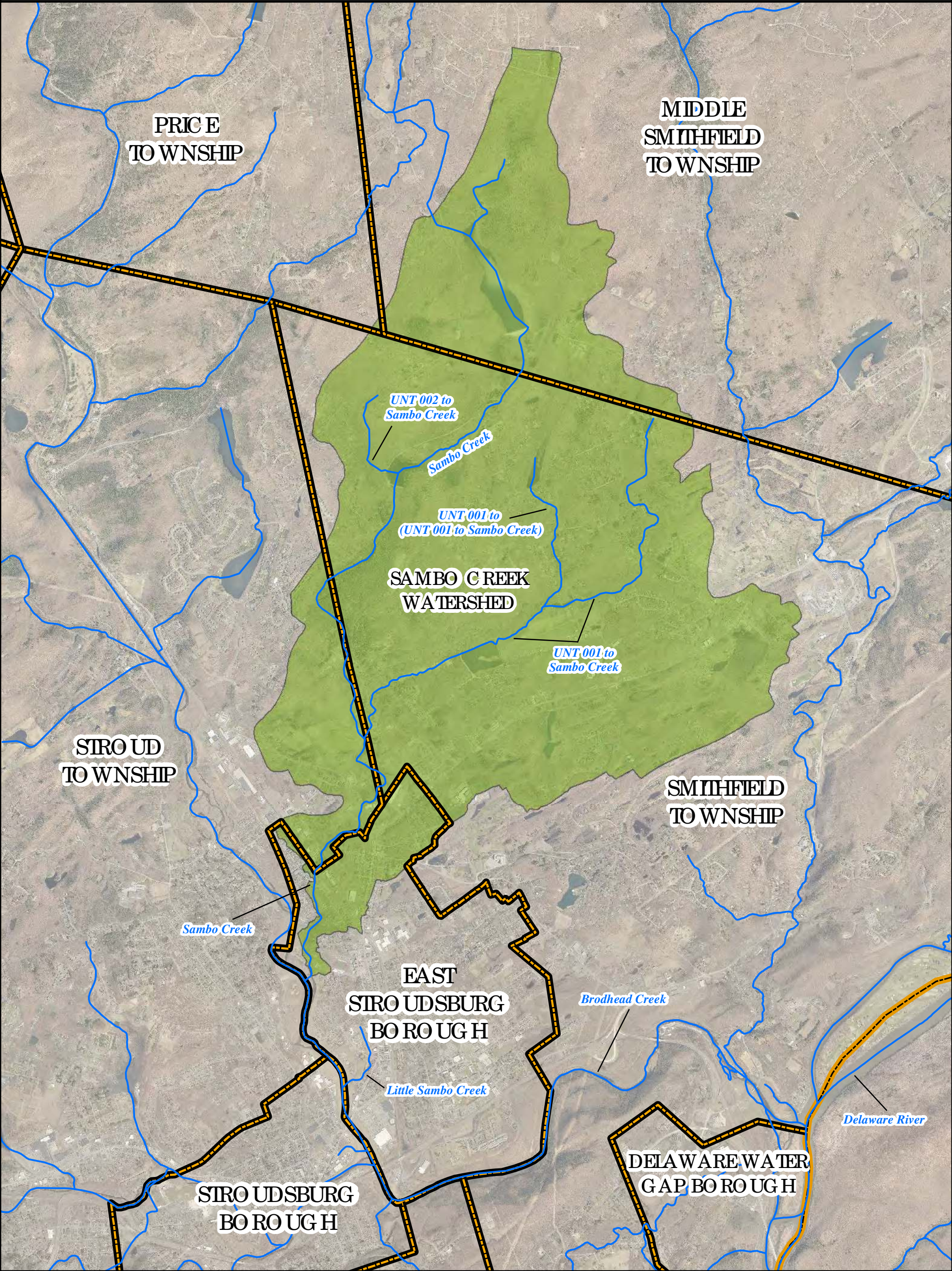
**(TO BE INCLUDED AT THE END OF
THE PUBLIC REVIEW PERIOD)**

APPENDIX C

RECORD OF CONSIDERATION OF
COMMENTS

(TO BE INCLUDED AT THE END OF
THE PUBLIC REVIEW PERIOD)

SAMBO CREEK
DRAINAGE AREA
MONROE COUNTY
PENNSYLVANIA



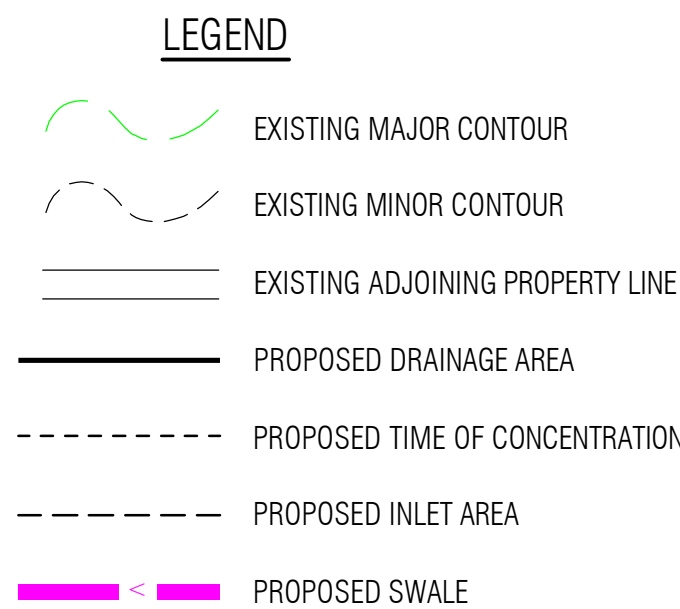
- Legend**
- Stream
 - Municipal Boundary
 - County Boundary
 - Sambo Creek Watershed

The County of Monroe makes no express or implied warranties concerning the release of this information. The County of Monroe is unaware of the use or uses to be made of this data. Consequently, the County of Monroe does not warrant this data as fit for any particular purpose.

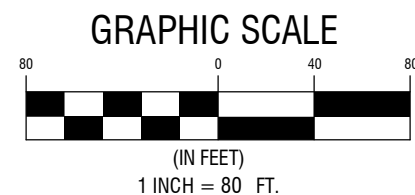


PREPARED BY
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July 2017



1. PHOTO IS BASED ON AERIAL PHOTOGRAPHY DATED 04-2008 FROM THE PENNSYLVANIA SPATIAL DATA ACCESS (PSDA) WEBSITE.
2. TOPOGRAPHY SHOWN BASED ON AIRBORNE LIDAR DETECTION AND RANGING (LIDAR) SURVEYS FROM THE PENNSYLVANIA SPATIAL DATA ACCESS (PSDA) WEBSITE. LIDAR SURVEY BASED ON AERIAL PHOTOGRAPHY DATED 04-2008. HORIZONTAL DATUM US NAD83 AND VERTICAL DATUM IS NAV88.
3. PROPERTY LINES SHOWN BASED IN MONROE COUNTY PARCEL DATA FROM THE MONROE COUNTY PLANNING COMMISSION.

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Appendix E Sediment Load Calculations

7/28/2017 2:10 PM

	Sub Drainage Areas to Planning Area	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Impervious TSS (lb/yr)	Pervious TSS (lb/yr)	Total Sediment Load (lb/yr)	Required Reduction (lb/yr)
1	Sterling Lane	1.24	1.11	0.13	2,038.2	34.5	2,072.6	207.3
2	Grandview Street	26.86	5.28	21.58	9,716.3	5,717.1	15,433.4	1,543.3
3	Elm Street	3.45	0.42	3.03	779.5	801.7	1,581.2	158.1
4	Eagle Valley Lane	6.74	1.75	4.98	3,225.7	1,320.1	4,545.8	454.6
5	6th Street	7.84	4.16	3.68	7,654.3	975.4	8,629.7	863.0
6	5th Street	4.65	2.51	2.14	4,620.2	566.8	5,187.1	518.7
7	Upper 4th Street	6.34	2.47	3.87	4,550.0	1,024.9	5,574.9	557.5
8	Lower 4th Street	4.92	2.06	2.86	3,785.9	757.6	4,543.5	454.3
9	Spruce Street	10.72	7.36	3.35	13,543.0	887.8	14,430.8	1,443.1
10	Williams Street	0.79	0.37	0.42	678.2	111.6	789.8	79.0
11	Pearl Street	0.32	0.06	0.26	112.6	69.2	181.8	18.2
12	Maple Street	2.43	0.60	1.83	1,095.3	485.9	1,581.2	158.1
13	Willow Street	7.54	3.84	3.70	7,068.5	980.4	8,048.9	804.9
16	East 3rd Street	0.21	0.11	0.11	195.3	28.1	223.4	22.3
17	East 2nd Street	0.07	0.07	0.01	121.7	1.9	123.6	12.4
19	Race Street	0.87	0.43	0.43	798.9	115.1	914.0	91.4
20	Monroe Street	0.36	0.18	0.18	334.4	48.2	382.6	38.3
21	Pearl Street	1.25	0.25	1.00	458.1	264.0	722.1	72.2
22	Perry Street	6.52	1.30	5.22	2,397.9	1,381.9	3,779.8	378.0
23	Perry Street	0.32	0.16	0.16	298.1	43.0	341.1	34.1
24	Park north of Rte 447	6.54	0.49	6.05	901.5	1,601.9	2,503.3	250.3
	Total - Planning Area	99.98	35.00	64.98	64,373.5	17,217.1	81,590.6	8,159.1

Project No. 10205.229

Last Revision:

6/30/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Sterling Lane

land cover distribution from national land cover database

Total Area

53,942 ft^2

Type	From CAD		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)					J+K
	Poly Lines							F*H	G*I			
	Area	Coverage					Area	Impervious	Impervious	Pervious	TSS	
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr	
Open Water		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space		0	0.00	0.00	0.19	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Low Intensity		0	0.00	0.00	0.49	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Medium Intensity		26,971	50.00	0.62	0.79	0.49	0.13	1839.00	264.96	899.53	34.45	933.99
Developed, High Intensity		26,971	50.00	0.62	1.00	0.62	0.00	1839.00	264.96	1,138.65	0.00	1,138.65
Barren Land (Rock/Sand/Clay)		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands		0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL		53,942	100.00	1.24		1.11	0.13			2,038.19	34.45	2,072.64
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr	
% reduction for Sediment												0.1
Minimum Sediment Reduction Required												207.26

Project No. 10205.229

Last Revision: 6/30/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Grandview

land cover distribution from national land cover database

Total Area 1,170,046 ft²

Type	Coverage % From WikiWatershed		conversion Area acres	standard Impervious NLCD	D*E Impervious acres	D-F Pervious acres	County Loading Rates from Binder Attachment B (PRP instructions)		F*H Impervious Sediment lb/yr	G*I Pervious Sediment lb/yr	J+K Total Sediment lb/yr
	Area ft ²	Coverage %					TSS Impervious Developed lbs/acre/yr	TSS Pervious Developed lbs/acre/yr			
Open Water	0	0	0	0	0	0	1839	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0	0	0	0	0	1839	264.96	0.00	0.00	0.00
Developed, Open Space	228,159	19.50	5.24	0.19	1.00	4.24	1839	264.96	1,830.14	1,124.13	2,954.27
Developed, Low Intensity	317,082	27.10	7.28	0.49	3.57	3.71	1839	264.96	6,559.37	983.64	7,543.01
Developed, Medium Intensity	39,782	3.40	0.91	0.79	0.72	0.19	1839	264.96	1,326.79	50.82	1,377.61
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Deciduous Forest	575,663	49.20	13.22	0.00	0.00	13.22	1839	264.96	0.00	3,501.55	3,501.55
Evergreen Forest	9,360	0.80	0.21	0.00	0.00	0.21	1839	264.96	0.00	56.94	56.94
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839	264.96	0.00	0.00	0.00
TOTAL	1,170,046	100.00	26.86			5.28	21.58		9,716.31	5,717.07	15,433.37
	ft ²	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											1543.34

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	2,691.33	2.5
D - Very Slow Infiltration	103,167.49	97.5

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885

Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.39	412.28
Evapotranspiration	0.423	447.6
Infiltration	1.687	1,783.39

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	54.994	5.201	133.4
Total Nitrogen	1.435	0.136	3.5
Total Phosphorus	0.277	0.026	0.7

Project No. 10205.229

Last Revision:

6/30/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Elm Street

Total Area

150,119 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion		standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment	
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	0.00
Developed, Open Space	9,457	6.30	0.22	0.19	0.04	0.18	1839.00	264.96	75.86	46.60	122.46	
Developed, Low Intensity	18,765	12.50	0.43	0.49	0.21	0.22	1839.00	264.96	388.18	58.21	446.39	
Developed, Medium Intensity	9,457	6.30	0.22	0.79	0.17	0.05	1839.00	264.96	315.43	12.08	327.51	
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Deciduous Forest	56,295	37.50	1.29	0.00	0.00	1.29	1839.00	264.96	0.00	342.42	342.42	
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Mixed Forest	56,295	37.50	1.29	0.00	0.00	1.29	1839.00	264.96	0.00	342.42	342.42	
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00	
TOTAL	150,269	100.10	3.45			0.42	3.03		779.47	801.73	1,581.20	
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr	
% reduction for Sediment												0.1
Minimum Sediment Reduction Required												158.12

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
D - Very Slow Infiltration	14,353.73	100

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885

Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.28	40.3
Evapotranspiration	0.459	66.11
Infiltration	1.761	253.59

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	4.577	3.178	113.6
Total Nitrogen	0.141	0.098	3.5
Total Phosphorus	0.025	0.018	0.6

Project No. 10205.229

Last Revision:

6/30/2017

East Stroudsburg Borough MS4: Post
Development Sediment Loading

Eagle Valley

Total Area

293,432 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	58,686	20.00	1.35	0.19	0.26	1.09	1839.00	264.96	470.74	289.14	759.89
Developed, Low Intensity	117,373	40.00	2.69	0.49	1.32	1.37	1839.00	264.96	2,428.05	364.11	2,792.16
Developed, Medium Intensity	9,801	3.34	0.22	0.79	0.18	0.05	1839.00	264.96	326.87	12.52	339.39
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	97,801	33.33	2.25	0.00	0.00	2.25	1839.00	264.96	0.00	594.89	594.89
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	9,771	3.33	0.22	0.00	0.00	0.22	1839.00	264.96	0.00	59.44	59.44
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	293,432	100.00	6.74		1.75	4.98			3,225.66	1,320.09	4,545.76
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											454.58

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	1,794.22	6.7
D - Very Slow Infiltration	25,119.03	93.3

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885



Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.457	130.97
Evapotranspiration	0.384	110.03
Infiltration	1.659	475.03

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	17.061	5.957	130.3
Total Nitrogen	0.46	0.161	3.5
Total Phosphorus	0.089	0.031	0.7

Project No. 10205.229

Last Revision:

6/30/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

6th Street

Total Area

341,667 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	73,800	21.60	1.69	0.19	0.32	1.37	1839.00	264.96	591.98	363.61	955.58
Developed, Low Intensity	147,771	43.25	3.39	0.49	1.66	1.73	1839.00	264.96	3,056.88	458.41	3,515.29
Developed, Medium Intensity	120,096	35.15	2.76	0.79	2.18	0.58	1839.00	264.96	4,005.43	153.41	4,158.84
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	341,667	100.00	7.84		4.16	3.68			7,654.29	975.42	8,629.71
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											862.97

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	29,604.59	89.2
D - Very Slow Infiltration	3,588.44	10.8

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885



Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.718	203.41
Evapotranspiration	0.237	67.03
Infiltration	1.545	437.4

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	34.583	12.214	170
Total Nitrogen	1.29	0.456	6.3
Total Phosphorus	0.23	0.081	1.1

Project No. 10205.229

Last Revision:

7/17/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

5th Street

Total Area

202,626 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	16,818	8.30	0.39	0.19	0.07	0.31	1839.00	264.96	134.90	82.86	217.76
Developed, Low Intensity	135,152	66.70	3.10	0.49	1.52	1.58	1839.00	264.96	2,795.83	419.26	3,215.09
Developed, Medium Intensity	50,657	25.00	1.16	0.79	0.92	0.24	1839.00	264.96	1,689.49	64.71	1,754.20
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	202,626	100.00	4.65		2.51	2.14			4,620.23	566.83	5,187.05
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											518.71

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	5,382.65	50
D - Very Slow Infiltration	5,382.65	50

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885



Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.736	89.29
Evapotranspiration	0.213	25.77
Infiltration	1.551	188.16

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	11.512	9.492	128.9
Total Nitrogen	0.406	0.335	4.5
Total Phosphorus	0.073	0.06	0.8

Project No. 10205.229

Last Revision:

7/17/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

8. Upper 4th Street

Total Area

276,274 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	91,999	33.30	2.11	0.19	0.40	1.71	1839.00	264.96	737.96	453.27	1191.23
Developed, Low Intensity	184,275	66.70	4.23	0.49	2.07	2.16	1839.00	264.96	3812.03	571.65	4383.67
Developed, Medium Intensity	0	0.00	0.00	0.79	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	276,274	100.00	6.34		2.47	3.87			4549.98	1024.92	5574.91
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											557.49

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	897.11	33.3
D - Very Slow Infiltration	1,794.22	66.7

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885



Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.598	17.5
Evapotranspiration	0.314	9.18
Infiltration	1.588	46.48

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	2.409	8.233	137.7
Total Nitrogen	0.06	0.206	3.4
Total Phosphorus	0.012	0.041	0.7

Project No. 10205.229

Last Revision:

6/30/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Lower 4th Street

land cover distribution from national land cover database											
from CAD poly lines											
Total Area	214,226 ft^2										
	Coverage % From		conversion	standard	D*E	D-F	County Loading Rates from		F*H	G*I	J+K
Type	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0.00	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0.00	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	61,269	28.60	1.41	0.19	0.27	1.14	1839.00	264.96	491.46	301.87	793.32
Developed, Low Intensity	142,675	66.60	3.28	0.49	1.60	1.67	1839.00	264.96	2,951.46	442.60	3,394.05
Developed, Medium Intensity	10,283	4.80	0.24	0.79	0.19	0.05	1839.00	264.96	342.95	13.13	356.09
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	214,226	100.00	4.92		2.06	2.86			3,785.87	757.60	4,543.47
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											454.35

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	18,839.29	100

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885



Wikiwatershed Model: 24 hour hypothetical storm event

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.519	103.52
Evapotranspiration	0.294	58.72
Infiltration	1.686	336.32

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	14.492	7.267	140
Total Nitrogen	0.406	0.204	3.9
Total Phosphorus	0.078	0.039	0.8

Project No. 10205.229

Last Revision:

7/28/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Spruce Street

Total Area

466,753 ft^2

land cover distribution from national land cover database
from CAD poly lines



Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	41,541	8.90	0.95	0.19	0.18	0.77	1839.00	264.96	333.22	204.67	537.89
Developed, Low Intensity	134,892	28.90	3.10	0.49	1.52	1.58	1839.00	264.96	2,790.45	418.45	3,208.91
Developed, Medium Intensity	207,238	44.40	4.76	0.79	3.76	1.00	1839.00	264.96	6,911.80	264.72	7,176.52
Developed, High Intensity	83,082	17.80	1.91	1.00	1.91	0.00	1839.00	264.96	3,507.53	0.00	3,507.53
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	466,753	100.00	10.72		7.36	3.35			13,542.99	887.84	14,430.83
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											1,443.08

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	40,369.92	100

Quality

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
 7005	302.97	5.577	0.352	444.336	0.331	0.019	5.906
 7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.963	400.54
Evapotranspiration	0.156	64.81
Infiltration	1.381	574.13

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	68.422	16.456	170.8
Total Nitrogen	2.701	0.65	6.7
Total Phosphorus	0.452	0.109	1.1

Project No. 10205.229

Last Revision:

7/28/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Williams Street

Total Area

34,407 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage					TSS Impervious Developed	TSS Pervious Developed			
	ft^2	%	Area	Impervious	Impervious	Pervious	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	9,255	26.90	0.21	0.19	0.04	0.17	1839.00	264.96	74.24	45.60	119.84
Developed, Low Intensity	18,545	53.90	0.43	0.49	0.21	0.22	1839.00	264.96	383.64	57.53	441.17
Developed, Medium Intensity	6,606	19.20	0.15	0.79	0.12	0.03	1839.00	264.96	220.33	8.44	228.77
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	34,407	100.00	0.79		0.37	0.42			678.21	111.57	789.78
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											78.98

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)
A - High Infiltration	15,250.86	65.4
C - Slow Infiltration	1,794.22	7.7
D - Very Slow Infiltration	6,279.77	26.9

Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)
7005	302.97	5.577	0.352	444.336	0.331	0.019	5.906
7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.656	154.69
Evapotranspiration	0.272	64.04
Infiltration	1.572	370.8

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	22.466	9.527	145.2
Total Nitrogen	0.73	0.31	4.7
Total Phosphorus	0.135	0.057	0.9

Project No. 10205.229

Last Revision: 7/31/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Willow Street/Brookside Ave/ Monroe Street/ Race Street

Total Area 328,358 ft^2 from CAD poly lines

Type	Coverage From Design Project		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Lawn	160,963	49.02%	3.70	0.00%	0.00	3.70	1839.00	264.96	0.00	980.35	980.35
Gravel	7,805	2.38%	0.18	100.00%	0.18	0.00	1839.00	264.96	331.02	0.00	331.02
Stone	11,317	3.45%	0.26	100.00%	0.26	0.00	1839.00	264.96	477.78	0.00	477.78
Building	53,083	16.17%	1.22	100.00%	1.22	0.00	1839.00	264.96	2,241.04	0.00	2,241.04
Driveway	11,763	3.58%	0.27	100.00%	0.27	0.00	1839.00	264.96	496.61	0.00	496.61
Parking	22,724	6.92%	0.52	100.00%	0.52	0.00	1839.00	264.96	959.35	0.00	959.35
Road	60,703	18.49%	1.39	100.00%	1.39	0.00	1839.00	264.96	2,562.74	0.00	2,562.74
TOTAL	328,358	100.00%	7.54		3.84	3.70			7,068.53	980.35	8,048.88
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											804.89

Project No. 10205.229

Last Revision: 7/17/2017

East Stroudsburg Borough MS4: Post Development Sediment Loading

Maple Street & Berwick Heights Road



Total Area 105,831 ft^2

land cover distribution from national land cover database
from CAD poly lines

Type	Coverage % From WikiWatershed		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area	Coverage	Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2	%	acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Open Water	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Perennial Ice/Snow	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Developed, Open Space	17,621	16.65	0.40	0.19	0.08	0.33	1839.00	264.96	141.34	86.82	228.16
Developed, Low Intensity	17,621	16.65	0.40	0.49	0.20	0.21	1839.00	264.96	364.52	54.66	419.18
Developed, Medium Intensity	17,674	16.70	0.41	0.79	0.32	0.09	1839.00	264.96	589.45	22.58	612.03
Developed, High Intensity	0	0.00	0.00	1.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Barren Land (Rock/Sand/Clay)	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Deciduous Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Evergreen Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Mixed Forest	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Shrub/Scrub	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Grassland/Herbaceous	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Pasture/Hay	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Cultivated Crops	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
Woody Wetlands	52,916	50.00	1.21	0.00	0.00	1.21	1839.00	264.96	0.00	321.87	321.87
Emergent Herbaceous Wetlands	0	0.00	0.00	0.00	0.00	0.00	1839.00	264.96	0.00	0.00	0.00
TOTAL	105,831	100.00	2.43		0.60	1.83			1095.31	485.92	1581.24
	ft^2	%	acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1
Minimum Sediment Reduction Required											158.12

From Wikiwatershed:

Soils

Type	Area (m2)	Coverage (%)						
A - High Infiltration	897.11	16.7						
C - Slow Infiltration	1,794.22	33.3						
D - Very Slow Infiltration	2,691.33	50						
Id	Area (ha)	Total N (kg/ha)	Total P (kg/ha)	Total SS (kg/ha)	Avg TN (mg/l)	Avg TP (mg/l)	Avg TSS (mg/l)	
 7174	478.24	4.793	0.299	363.93	0.484	0.026	17.885	
								

Runoff Partition	Water Depth (cm)	Water Volume (m3)
Runoff	0.367	24.26
Evapotranspiration	0.451	29.81
Infiltration	1.681	111.05

Quality Measure	Load (kg)	Loading Rate (kg/ha)	Average Concentration (mg/L)
Total Suspended Solids	2.88	4.361	118.7
Total Nitrogen	0.105	0.159	4.3
Total Phosphorus	0.019	0.028	0.8

Project No. 10205.229
 Last Revision: 7/28/2017
 East Stroudsburg Borough MS4: Post Development Sediment Loading

Misc. Areas to use for Cleaning calculations

Type	Coverage From Design Project		conversion	standard	D*E	D-F	County Loading Rates from Binder Attachment B (PRP instructions)		F*H	G*I	J+K
	Area		Area	Impervious	Impervious	Pervious	TSS Impervious Developed	TSS Pervious Developed	Impervious Sediment	Pervious Sediment	Total Sediment
	ft^2		acres	NLCD	acres	acres	lbs/acre/yr	lbs/acre/yr	lb/yr	lb/yr	lb/yr
Park			6.27	0.00%	0.00	6.27	1839.00	264.96	0.00	1,661.30	1,661.30
Industrial Lot	528,819		12.14	50.00%	6.07	6.07	1839.00	264.96	11,162.74	1,608.31	12,771.05
Area of Street going to private detention basins on Grandview Avenue											
E1 & E2	20,728		0.48	100.00%	0.48	0.00	1839.00	264.96	875.09	0.00	875.09
West	20,128		0.46	100.00%	0.46	0.00	1839.00	264.96	849.76	0.00	849.76
TOTAL	40,856		0.94		0.94	0.00			1724.84	0.00	1724.84
	ft^2		acres		acres	acres			lb/yr	lb/yr	lb/yr
Areas draining to existing BMPs											
14 - pond	470,068		10.79	50.00%	5.40	5.40	1839.00	264.96	9,922.58	1,429.63	11,352.21
15- swale	146,740		3.37	80.00%	2.69	0.67	1839.00	264.96	4,956.01	178.51	5,134.53
16-E 3rd	9,251		0.21	50.00%	0.11	0.11	1839.00	264.96	195.28	28.14	223.41
17-E 2nd	3,202		0.07	90.00%	0.07	0.01	1839.00	264.96	121.66	1.95	123.61
18-Birch Street	54,671		1.26	30.00%	0.38	0.88	1839.00	264.96	692.42	232.78	925.21
19-Race Street	37,847		0.87	50.00%	0.43	0.43	1839.00	264.96	798.91	115.10	914.01
20-Monroe Street	15,842		0.36	50.00%	0.18	0.18	1839.00	264.96	334.41	48.18	382.59
21 - Pearl Street	54,256		1.25	20.00%	0.25	1.00	1839.00	264.96	458.11	264.02	722.13
22 - Perry Street	283,990		6.52	20.00%	1.30	5.22	1839.00	264.96	2,397.88	1,381.93	3,779.81
23 - Perry Street	14,123		0.32	50.00%	0.16	0.16	1839.00	264.96	298.12	42.95	341.07
24 - Park	284,702		6.54	7.50%	0.49	6.05	1839.00	264.96	901.46	1,601.86	2,503.32
	ft^2		acres		acres	acres			lb/yr	lb/yr	lb/yr
% reduction for Sediment											0.1

Statewide MS4 Land Cover Estimates

County	Municipality	UA % Impervious	UA % Pervious	Outside of UA % Impervious	Outside of UA % Pervious	UA Acres
	TWP					
Northampton	EASTON CITY	47%	53%	42%	58%	2,673.0
Carbon	EAST PENN TWP	27%	73%	4%	96%	265.5
Cumberland	EAST PENNSBORO TWP	35%	65%	29%	71%	5,664.3
Lancaster	EAST PETERSBURG BORO	51%	49%	51%	49%	772.0
Chester	EAST PIKELAND TWP	23%	77%	20%	80%	4,553.3
Allegheny	EAST PITTSBURGH BORO	67%	33%	68%	32%	245.0
York	EAST PROSPECT BORO	27%	73%	27%	73%	210.4
Beaver	EAST ROCHESTER BORO	42%	58%	42%	58%	288.2
Bucks	EAST ROCKHILL TWP	16%	84%	8%	92%	1,987.0
Monroe	EAST STROUDSBURG BORO	46%	54%	47%	53%	1,826.6
Cambria	EAST TAYLOR TWP	20%	80%	8%	92%	1,129.8
Chester	EASTTOWN TWP	35%	65%	33%	67%	4,879.9
Beaver	EASTVALE BORO	45%	55%	38%	62%	69.1
Westmoreland	EAST VANDERGRIFT BORO	45%	55%	46%	54%	97.9
Chester	EAST VINCENT TWP	18%	82%	12%	88%	3,532.2
Washington	EAST WASHINGTON BORO	50%	50%	50%	50%	286.3
Chester	EAST WHITELAND TWP	37%	63%	37%	63%	6,995.7
Beaver	ECONOMY BORO	17%	83%	11%	89%	4,832.8
Delaware	EDDYSTONE BORO	68%	32%	55%	45%	637.8
Allegheny	EDGEWOOD BORO	47%	53%	47%	53%	372.0
Allegheny	EDGEWORTH BORO	27%	73%	27%	73%	1,056.3
Delaware	EDGMONT TWP	14%	86%	8%	92%	2,827.3
Luzerne	EDWARDSVILLE BORO	44%	56%	44%	56%	779.1
Washington	ELCO BORO	31%	69%	12%	88%	80.1
Allegheny	ELIZABETH BORO	46%	54%	45%	55%	259.0
Allegheny	ELIZABETH TWP	17%	83%	9%	91%	5,773.7
Lancaster	ELIZABETH TWP	18%	82%	7%	93%	1,494.2
Lancaster	ELIZABETHTOWN BORO	49%	51%	49%	51%	1,702.4
Chester	ELK TWP	17%	83%	6%	94%	560.1
Lawrence	ELLPORT BORO	38%	62%	38%	62%	322.4
Washington	ELLSWORTH BORO	24%	76%	24%	76%	469.6
Lawrence	ELLWOOD CITY BORO	47%	53%	44%	56%	1,339.2
Lehigh	EMMAUS BORO	48%	52%	48%	52%	1,841.7
Allegheny	EMSWORTH BORO	36%	64%	36%	64%	437.9
Lancaster	EPHRATA BORO	49%	51%	50%	50%	2,219.8
Lancaster	EPHRATA TWP	24%	76%	12%	88%	3,436.7
Erie	ERIE CITY	61%	39%	61%	39%	11,566.7
Allegheny	ETNA BORO	61%	39%	61%	39%	504.2
Butler	EVANS CITY BORO	26%	74%	25%	75%	506.4
Fayette	EVERSON BORO	30%	70%	28%	72%	119.6
Berks	EXETER TWP	29%	71%	16%	84%	7,339.1
Luzerne	EXETER BORO	33%	67%	19%	81%	1,592.1
Westmoreland	EXPORT BORO	19%	81%	19%	81%	258.5
Wyoming	FACTORYVILLE BORO	21%	79%	21%	79%	462.3
Fayette	FAIRCHANCE BORO	36%	64%	36%	64%	759.5
Lycoming	FAIRFIELD TWP	17%	83%	7%	93%	1,761.2

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
McKean	impervious developed	38.7	20.93	3.21	1,843.27
	pervious developed	5.3	22.58	1.45	249.26
Mifflin	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Montour	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Northumberland	impervious developed	8,687.3	25.73	1.54	2,197.08
	pervious developed	25,168.3	24.63	0.54	367.84
Perry	impervious developed	5,041.1	26.77	1.32	2,314.7
	pervious developed	9,977	23.94	0.51	343.16
Potter	impervious developed	2,936.3	16.95	2.75	1,728.34
	pervious developed	2,699.3	17.11	1.09	265.2
Schuylkill	impervious developed	5,638.7	30.49	1.56	1,921.08
	pervious developed	14,797.2	29.41	0.57	264.04
Snyder	impervious developed	4,934.2	28.6	1.11	2,068.16
	pervious developed	14,718.1	24.35	0.4	301.5
Somerset	impervious developed	1,013.6	25.13	2.79	1,845.7
	pervious developed	851.2	25.71	1.14	293.42
Sullivan	impervious developed	3,031.7	19.08	2.85	2,013.9
	pervious developed	3,943.4	21.55	1.31	301.58
Susquehanna	impervious developed	7,042.1	19.29	2.86	1,405.73
	pervious developed	14,749.7	20.77	1.21	203.85
Tioga	impervious developed	7,966.9	12.37	2.09	1,767.75
	pervious developed	18,090.3	12.22	0.76	261.94
Union	impervious developed	4,382.6	22.98	2.04	2,393.55
	pervious developed	14,065.3	20.88	0.69	343.81
Wayne	impervious developed	320.5	18.69	2.89	1,002.58
	pervious developed	509	21.14	1.31	158.48
Wyoming	impervious developed	3,634.4	16.03	2.53	2,022.32
	pervious developed	10,792.9	13.75	0.7	238.26
York	impervious developed	10,330.7	29.69	1.18	1,614.15
	pervious developed	40,374.8	18.73	0.29	220.4
All Other Counties	impervious developed	-	23.06	2.28	1,839
	pervious developed	-	20.72	0.84	264.96

Notes:

- 1 These land loading rate values may be used to derive existing pollutant loading estimates under DEP's simplified method for PRP development. MS4s may choose to develop estimates using other scientifically sound methods.
- 2 Acres and land loading rate values for named counties in the Chesapeake Bay watershed are derived from CAST. (The column for Acres represents acres within the Chesapeake Bay watershed). For MS4s located outside of the Chesapeake Bay watershed, the land loading rates for "All Other Counties" may be used to develop PRPs under Appendix E; these values are average values across the Chesapeake Bay watershed.
- 3 For land area outside of the urbanized area, undeveloped land loading rates may be used where appropriate. When using the simplified method, DEP recommends the following loading rates (for any county) for undeveloped land:
 - TN – 10 lbs/acre/yr
 - TP – 0.33 lbs/acre/yr
 - TSS (Sediment) – 234.6 lbs/acre/yr

These values were derived by using the existing loads for each pollutant, according to the 2014 Chesapeake Bay Progress Run, and dividing by the number of acres for the unregulated stormwater subsector.

Appendix F Sediment Reduction Calculations

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Sediment Reduction Calculations

BMP	Effectiveness	Applicable Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Impervious Load (lb/yr)	Pervious Load (lb/yr)	Total Load (lb/yr)	Reduction (lb/yr)
total Reduction Required							81,590.60	8,159.06

EXISTING REDUCTIONS TO LOAD

Existing Street Sweeping meets Sediment Reduction criteria = reduction of existing load

Street Sweeping (Borough Streets)	9.00%	11.50	11.50	0	21,148.5		21,148.5	1,903.4
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LOAD REMAINING AFTER REDUCTIONS FROM EXISTING SWEEPING & REMAINING REQUIRED REDUCTION

79,687.24	7,968.72
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POTENTIAL BMP'S TO MEET SEDIMENT REDUCTION REQUIREMENTS

Willow Street - design in process - Street needs to be reconstructed - existing pavement is disintegrating.

Subtract sediment load already removed by sweeping streets draining to swales

Street Sweeping	9.00%	1.00	1.00	0	1,844.0		1,844.0	166.0
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Sediment Load to proposed swales along the side of the road

Swales (Willow)	70.00%	5.97	2.99	2.98	5,498.6	789.6	6,288.2	
Load to swales after sweeping							6,122.2	
Total Sediment Reduction Willow Street		percentage Sediment Reduction / Total required					53.8%	4,285.6

Construct Rain Garden or swale at outfall of West 4th Street & Oak Street - Drainage Areas 7 & 8

Swales	70.00%	11.26	4.53	6.73	8,335.8	1782.5	10,118.4	7,082.9
percentage Sediment Reduction / Total required							88.9%	

CDS Unit Drainage Area 5 on the branch along Oak Street to the intersection with 6th Street

CDS Unit 6th	45.00%	7.84	4.16	3.68	7,654.3	975.4	8,629.7	3,883.4
Total Sediment Reduction 6th Street		percentage Sediment Reduction / Total required					48.7%	