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Hampton Township

Pollutant Reduction Plan Little Pine Creek – Pine Creek HUC-12 Watershed

Municipal Separate Storm Sewer System

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Chapter 1. Introduction

1.1 Purpose

Municipalities throughout the country are under a federal mandate requiring a stormwater management program for reducing pollution impacts from stormwater runoff. In 2003, Hampton 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-136281). 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.

1.2 Little Pine Creek – Pine Creek Watershed Background

Little Pine Creek-Pine Creek Watershed is considered the Hydrologic Unit Code (HUC) 12 watershed. Within the Southwestern region of Pennsylvania, these HUC12 watersheds are tributaries to either the Ohio, Monongahela, Allegheny, or Youghiogheny Rivers. For Little Pine Creek-Pine Creek Watershed its tributary is the Allegheny River. On a smaller scale, there are then numerous smaller watersheds that are tributaries to Little Pine Creek-Pine Creek. Within Hampton Township, these small watersheds include: Montour Run, Willow Run, Crouse Run, McCaslin Run, Gourdhead Run, Pine Creek 6506, Little Pine Creek 6211 (East) and Little Pine Creek 6211 (West).

Once every two years, PADEP publishes a report entitled "Pennsylvania Integrated Water Quality Monitoring and Assessment Report" that summarizes the various water quality management programs including water quality standards. The PRP was assigned for each MS4 based on the 2014 report. If a stream was assigned as impaired from siltation, organic enrichment, low dissolved oxygen, or nutrients then a PRP is required. Little Pine Creek-Pine Creek Watershed is primarily impacted by pathogens, however, Little Pine Creek is a tributary to Pine Creek, which is polluted by nutrients and siltation from small residential runoff and land development.

Chapter 2. Outfall Sewersheds & Planning Areas

Before beginning the calculations of the pollutant loads, delineation of the outfall sewersheds and identifying the PRP planning area are the first steps.

2.1 Delineation Procedures

As part of the PRP process, outfall sewersheds were required to be delineated. An outfall sewershed is an area of land in which stormwater flows into a storm sewer system and is discharged into a stream, lake, or waterway. Accurate outfall sewersheds were drawn based on topography (2006), aerial (2013), and streams in ESRI ArcMap. By following these layers and the storm sewer network, all outfalls were assigned a sewershed. The map which will be submitted with the Notice of Intent illustrates the outfall sewersheds. Aside from being a requirement of the PRP, delineation of the outfall sewersheds is useful if any parsing is implemented.

2.2 Planning Area

The planning area is defined as the area used to calculate existing loads and plan load reductions. PADEP offered several options for how to define the planning area for each impaired water. The options varied from using a combination of the storm sewersheds to using watershed boundaries. Hampton plans to utilize the HUC-12 watershed boundary as its planning area with some additional parsing that is described in the next section.

2.3 Parsing

Once the preliminary planning area was defined; additional parsing within the area was performed to eliminate spaces that either do not drain to the MS4's system or land that is already covered by an NPDES permit for the control of stormwater. Parsing reduces the MS4's area of responsibility and therefore the pollutant loads. Hampton decided to parse out Allegheny County and PennDOT owned roadways. Appendix A illustrates the final planning area for the MS4 by displaying the HUC-12 and small watershed boundaries and the parsed-out areas.

Chapter 3. Existing Loading without BMPs

PADEP provides several suggested methods that are scientifically-supported for estimating the existing loads. The approved methods for calculating the loads include PADEP Simplified Method land use loading rates, MapShed, or other watershed models that reflect both overland flow and in-stream erosion components. For the purpose of this PRP, MapShed was chosen as the most appropriate method. The loads generated within this PRP were calculated in May 2017.

3.1 MapShed Modeling Overview

MapShed is a free and publicly available software developed by Pennsylvania State University that derives the loadings rates from mathematical simulation of pollutant generation and hydrologic processes. The software takes into account hydrology, land cover, soils, weather, topography and other environmental data to calculate sediment and nutrient loads. MapShed utilizes well known soil and hydrologic equations to model surface runoff and soil erosion.

For modeling surface runoff and streamflow, MapShed uses the National Resources Conservation Service Curve Number (NRCS-CN) combined with daily precipitation and temperature data. Evapotranspiration is calculated using the daily weather data and a land cover dependent factor. To model monthly erosion and sediment loss, the Universal Soil Loss Equation is applied. Nitrogen, phosphorus, and total suspended solids are modeled for each type of land cover using export coefficients for both the dissolved and solid phases. Overall, the software uses geographic data, land use runoff coefficients, daily weather, and the universal soil loss equations to calculate pollutant loads in terms of mass and concentration.

3.2 MapShed Modeling Methodology

In order for MapShed to perform these hydrologic calculations, initial data is needed beforehand. There are six required input sources and up to eleven optional sources in MapShed. The required data includes basins, weather stations, streams, soils, land use/cover, and surface elevation. The optional layers, which were included as part of this PRP, consist of urban areas, soil-phosphorus, physiographic provinces, and counties. Each data source is described below in more detail.

3.2.1 Basin Layer

The Basins layer in MapSheds serves as the area modeled for the pollutant loads. The small watershed boundaries were used for this layer. The small watershed boundaries were obtained from Pennsylvania Spatial Data Access (PASDA) and are defined as catchment areas for named and unnamed streams. Utilizing the small watershed boundaries as the basin layer adequately accounts for downstream channel impacts. The small watershed boundaries were altered slightly depending on the amount of parsing incorporated into the PRP planning area.

3.2.2 Urban Area Layer

The Urban Area layer is considered optional in MapShed; however, it is required for the PRP in order to properly allocated the loads in which the MS4 is responsible for. MapShed's urban area data that is available is considered the 2010 Urbanized Areas boundaries which is based on the U.S. Census Bureau's database. The Urban Area layer simulated loads that are area weighted for each based upon their land use/cover percent distribution within the basin.

3.2.3 Weather Stations Layer

With MapShed, weather data for the Generalized Watershed Loading Functions-Enhanced (GWLF-E) input file are automatically prepared using daily climate data contained in "csv-formatted" Excel files. These Excel files are connected to a weather station shapefile through the use of a unique station ID number. Statewide weather database contains temperature and precipitation from 78 weather stations around the state between 1975 and 1998.

3.2.4 Streams Layer

In order to better estimate erosion, a streams layer is required within the model. The stream segments are derived from the National Hydrography Datasets at a 1:24,000 scale or better. The length of a stream within a basin affects many things such as streambank erosion.

3.2.5 Soils Layer

The soils layer holds information pertaining to various soil properties such as the available water-holding capacity, soil erodibility factor and the dominant hydrologic soil group. These properties are crucial when calculating the loads generated within a basin. Within Lowries Run Watershed, Hampton has soils mostly comprised of Group C.

3.2.6 Land Use Layer

The Land Use layer is one of the most critical layers used by MapShed since pollutant loads generated within a watershed are largely influenced by land surface conditions. These surface conditions are correlated to runoff, surface erosion and infiltration, which are directly associated with vegetative cover. MapShed's land use data is obtained from the 2011 National Land Cover Database. There are 16 land use classes that each generate different loading rates.

3.2.7 Surface Elevation Layer

This particular grid layer is used to calculate land slope-related data for use within the model. The 30-meter digital elevation model used is considered a higher resolution grid cell data.

3.2.8 County Boundaries Layer

Having the boundary for each Pennsylvania county loaded into Mapshed will represent geographically estimates of the cropping management and erosion control practice factors for hay/pasture, row crops and wooded land covers.

3.2.9 Physiographic Province Layer

The physiographic province layer covers geographically and seasonally based estimates for the groundwater recession rate and erosivity coefficient values. Hampton is located within the Appalachian Plateaus Province, which has a groundwater recession rate of 0.1, a cool rain factor of 0.08 and a warm rain factor of 0.26.

3.2.10 Soil Phosphorus Layer

The soil phosphorus layer is used to estimate the phosphorus concentrations in sediment transported to nearby streams. For the purpose of the PRP, the layer is depicted as Soil Test P. The soil Test P is an estimate of available soil phosphorus that was measured by standard lab tests.

3.3 MapShed Model Results

Each small watershed was analyzed separately in MapShed and the results can be found in Appendix B. The results from MapShed for the existing loads without BMPs are captured as screenshots of the Urban Area Viewer.

3.3.1 Montour Run Small Watershed Results

Montour Run Watershed is about 3,427 acres in size, with only 468 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 463.1 acres. Table 3-1 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. Montour Run watershed is mostly comprised of forest, which covers 284 acres.

Table 3-1: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	31,667.08	17.5
Stream Bank	50,213.42	2.1
Total	**81,880.50**	**19.6**

3.3.2 Willow Run Small Watershed Results

Willow Run Watershed is about 2,837 acres in size, with only 726 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 707.6 acres. Table 3-2 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of low density residential, which covers 250 acres.

Table 3-2: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	24,834.19	26.9
Stream Bank	104,211.71	5.4
Total	**129,045.9**	**32.3**

3.3.3 Crouse Run Small Watershed Results

Crouse Run Watershed is about 2,791 acres in size, with only 2,165 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 2,072.4 acres. Table 3-3 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of forest, which covers 284 acres. However, the urban area of mixed and residential use comprises nearly 57% of the watershed in Hampton.

Table 3-3: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	96,813.93	140.6
Stream Bank	404,815.47	19.8
Total	**501,629.4**	**160.4**

3.3.4 McCaslin Run Small Watershed Results

McCaslin Run Watershed is about 618 acres in size, with 618 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 566.7 acres. Table 3-4 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of forest, which covers 188 acres. However, the urban area of mixed and residential use comprises nearly 47% of the watershed in Hampton.

Table 3-4: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	24,235.43	33.1
Stream Bank	41,976.17	3.9
Total	**66,211.6**	**37.0**

3.3.5 Gourdhead Run Small Watershed Results

Gourdhead Run Watershed is about 1,980 acres in size, with 1,980 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 1,918 acres. Table 3-5 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of forest, which covers 615 acres. However, the urban area of mixed and residential use comprises nearly 45% of the watershed in Hampton.

Table 3-5: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	129,599.38	122.0
Stream Bank	239,685.72	11.6
Total	**369,285.1**	**133.6**

3.3.6 Pine Creek 6506 Small Watershed Results

Pine Creek 6506 Watershed is about 6,566 acres in size, with only 2,858 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 2,395 acres. Table 3-6 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of forest, which covers 929 acres. However, the urban area of mixed and residential use comprises nearly 45% of the watershed in Hampton.

Table 3-6: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	249,571.04	190.4
Stream Bank	1,052,788.86	56.9
Total	**1,302,359.9**	**247.3**

3.3.7 Little Pine Creek 6621 (East) Small Watershed Results

Little Pine Creek 6621 Watershed is about 2,452 acres in size, with only 661 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 595 acres. Table 3-7 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of forest, which covers 385 acres.

Table 3-7: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	76,256.93	32.9
Stream Bank	27,394.97	1.7
Total	**103,651.9**	**34.6**

3.3.8 Little Pine Creek 6611 (West) Small Watershed Results

Little Pine Creek 6611 Watershed is about 4,371 acres in size, with only 92 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 76 acres. Table 3-8 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion. The watershed is mostly comprised of medium density residential, which covers 57 acres.

Table 3-8: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	4,866.94	8.8
Stream Bank	31,106.66	2.1
Total	**35,973.6**	**10.9**

3.3.9 Little Pine Creek – Pine Creek HUC-12 Watershed Results

The PRP comprised in this report is focused on load reductions on a HUC-12 watershed basis. The small watersheds analyzed are part of the HUC-12 watershed and are thus collectively summed together to obtain the existing load within Hampton. Table 3-9 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion.

Table 3-9: HUC-12 Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	637,844.92	572.2
Stream Bank	1,952,192.98	103.5
Total	**2,590,037.90**	**675.7**

Chapter 4. Existing Structural BMPs

The existing loads calculated in Chapter 3 do not account for any reductions of existing stormwater best management practices (BMPs). PADEP is allowing communities to reduce their existing load by taking credit for only Chapter 102 permitted stormwater BMPs. The locations of the existing permitted BMPs are located on the Planning Area Map in Appendix A.

4.1 BMP Performance Calculation Overview

PADEP provides several suggested methods that are scientifically-supported for estimating the pollution reduction potential of BMPs. The recommended approved method for calculating the reductions of existing Chapter 102 BMPs is the Expert Panel New Development Performance Standards Report. The method requires knowing the drainage area to the BMP, which can be obtained through permit documents or can be delineated. Additionally, the two year volume increase between the existing and proposed conditions needs to be found through permit documents or calculated. The two year volume increase is also known as the Engineering Parameter.

Once the Engineering Parameter is determined, the next step is to calculate the runoff depth captured per impervious acre. The runoff depth captured is calculated from dividing the Engineering Parameter by the amount of impervious acres in the post drainage area and multiplying the value by 12 to convert it to inches. The runoff depth is then used to determine the phosphorus and sediment percent removals for the BMP based on the performance curves.

These performance curves are built on whether the stormwater BMP is a runoff reduction or stormwater treatment practice. Guidance on what kind of practice a BMP is classified as is further described in the Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards Report. MapShed uses polynomial equations from the performance curve graphs to calculate the percent removals for the applicable BMP.

For calculating the pollutant loads generated within the BMP's drainage area, the simplified approach of analyzing all existing BMPs collectively in MapShed was utilized. The collective approach involves using an average for the runoff depth captured per impervious acres in the BMP Data input editor within the Generalized Watershed Loading Functions-Enhanced (GWLF-E) Model Simulation tool. The retrofits section of the Urban Scenario BMP Editor is used for calculation of existing BMPs. The tool only accounts for load reduction in the urban areas, and therefore does not reduce load from any forest, hay/pasture, cropland, turf grass, or open land areas. The amount of urban area within a BMPs drainage area is accounted for utilizing the Land Cover Distribution tool in MapShed.

4.2 Existing Loadings from Stormwater BMPs

For the Little Pine Creek – Pine Creek Watershed, 83 existing permitted BMPs were utilized to reduce the existing load. The BMPs were collectively analyzed in MapShed as a Stormwater Treatment practice. The total area treated from all the BMPs include 172 hectares Medium Density Residential, 60 hectares High Density Residential, and 82.2 hectares High Density Mixed. Based on a runoff depth of 5.97 cm, the calculated reduction efficiencies are 62% Total Phosphorus and 78% Total Sediment. All permitted BMPs that were used as credit to reduce the existing loading estimates continue to function as they were originally designed for. The BMPs are also frequently inspected by the Township's stormwater engineer to ensure appropriate operation and maintenance is being implemented by the owner. Each BMP has its own operation and maintenance plan that closely follows the applicable structural BMP located in the PADEP Stormwater BMP Manual. Information on the geographic location, type of BMP, drainage area, permit number, and the installation date can be found in Appendix D.

4.3 Final Existing Loading and Required Reductions

After incorporating all the permitted existing BMPs, the final existing load for sediment and phosphorus within the PRP planning area was determined and is illustrated in Table 4-1. The required reduction is based on a 10% reduction for sediment and 5% for phosphorus. In accordance with PADEP guidance, the MS4 plans to take a presumption approach that a 10% reduction of sediment will also accomplish a 5% phosphorus reduction.

Table 4-1 Final Existing Loads and Required Reductions

POLLUTANT	FINAL EXISTING LOAD (lbs/yr)	REQUIRED REDUCTION (lbs/yr)
Sediment	2,430,556.2	**243,055.62**
Phosphorus	635.7	**31.79**

Chapter 5. Achieving Load Reductions

Based on the PRP requirements, the final existing load calculated in Chapter 4 needs to be reduced by implementing proposed structural and non-structural BMPs. PADEP is leaving it up to the MS4 on how they will plan to reduce the required pollution reduction. At the time of this submission, Hampton is proposing structural BMPs that include existing BMP retrofits, new BMP retrofits, and stream restoration throughout the PRP planning area. Appendix E entails maps of the proposed BMP locations and associated drainage areas. There are various methods used to determine the removal rates of each type of BMP. These approved methods are discussed in further detail below.

Hampton' stormwater ordinance goes above and beyond the Chapter 102 NPDES permit requirements for stormwater associated with construction activities. As a result, the MS4 can take credit for those pollution reductions that will occur from exceeding PADEP regulatory requirements.

Hampton may also update this plan in the future based on opportunities with various conservation and environmental groups. These types of organizations are dedicated to reducing pollution through outreach and small BMP installation to accomplish their goals. Another opportunity that the Township will explore is partnering with the North Hills Council of Governments for funding and constructing stormwater BMPs on a regional level. The Township recognizes these opportunities and will continue to promote outreach to such organizations.

An additional opportunity that Hampton will investigate as a way to comply with its sediment reduction requirement is utilizing its Stormwater BMP Maintenance Program. The program was initiated in order to sustain the performance of stormwater detention facilities within the Town. The program mainly focuses on enhancing performance in facilities designed for flood control; Hampton will plan to integrate sediment and phosphorus removal as well into its maintenance program.

Hampton Township has an additional impaired HUC-12 watersheds within its municipal boundaries; Deer Creek. For this PRP submission, the Township is proposing to address both HUC-12 watersheds collectively by reducing the total sediment load by 10%. At the time of this submission, Hampton is proposing structural BMPs that include existing BMP retrofits, new retrofit BMPs, water quality inserts, and stream restoration projects throughout the PRP planning area. Appendix E entails maps of the proposed BMP locations. There are various methods used to determine the removal rates of each type of BMP. These approved methods are discussed in further detail below.

Aside from retrofitting existing BMPs through its BMP Maintenance Program, Hampton is also planning to propose load reductions through new retrofit BMPs. These types of BMPs are still considered retrofits because the drainage area in which the new BMP will be installed is not

being developed or changed. PADEP provides several methods that are scientifically-supported for estimating the pollution reduction potential of new retrofit BMPs. These approved methods for calculating the reductions are the PADEP BMP Effectiveness Values Table and the Expert Panel Removal Rates for Urban Stormwater Retrofit Projects. Hampton plans to calculate the efficiency of the new retrofit BMPs through the PADEP BMP Effectiveness Values Table.

For calculating the pollutant loads generated within the BMP's drainage area, the simplified approach of determining the amount of pervious and impervious coverage in the BMPs drainage area was utilized. Appendix F depicts the proposed stormwater BMPs and associated existing loads, BMP effectiveness and associated reductions for each small watershed analyzed.

Though stream restoration projects are classified as structural BMPs, the method used to calculate their reduction efficiency is slightly different then the previously discussed methods. For simplicity purposes, a default effectiveness rate of 115 lb/ft/yr for sediment load will be used for each proposed stream restoration project. To obtain the phosphorus loading rate, a default value of 1.05 pounds of phosphorus per ton of sediment is used.

5.1 Proposed Structural BMPs By Watershed

5.1.1 Little Pine Creek – Pine Creek HUC-12 Watershed BMPs

Sewage Treatment Plant Stream Restoration (P01)

- *Location*: Start: N 40° 35' 34.0778", W 79° 59' 13.8480"
  End: N 40° 35' 38.6783", W 79° 59' 8.0661"
- *Description*: Approximately 500 LF of Pine Creek was rehabilitated near Wildwood Road.
- *Estimated Reductions:* The project will reduce 57,500 lbs/year of sediment from the Sub-Watershed 7960.
- *Operation & Maintenance*: Operation and maintenance of the restored stream will be performed by the Township in accordance with the approved permit.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Lower Allison Park Stream Restoration (P02)

- *Location*: Start: N 40° 33' 39.4289", W 79° 57' 34.9984"
  End: N 40° 33' 34.6329", W 79° 57' 36.3455"
- *Description*: Approximately 519 LF of Unnamed Tributary to Pine Creek was rehabilitated near Duncan Ave.
- *Estimated Reductions:* The project will reduce 59,685.0 lbs/year of sediment from the Sub-Watershed 8015.
- *Operation & Maintenance*: Operation and maintenance of the restored stream will be performed by the Township in accordance with the approved permit.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Primanti Bros' Basin Restoration (P03)

- *Location*: N 40° 35' 35.7542", W 79° 57' 0.3002"
- *Description*: The Township restored and enhanced the Dry Extended Detention Basin. The treated drainage area is 1.176 acres and is approximately 92% impervious and 8% pervious land coverage.
- *Estimated Reductions:* The project will reduce 1,208.7 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the Township in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Crouse Run Ravine Stream Restoration (P04)

- *Location*: Start: N 40° 35' 21.0479", W 79° 57' 28.7678"
  End: N 40° 35' 17.8185", W 79° 57' 34.9193"
- *Description*: Approximately 275 LF of Crouse Run was rehabilitated near Wildwood Rd.
- *Estimated Reductions:* The project will reduce 31,625 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the restored stream will be performed by the Township in accordance with the approved permit.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Simply Subs - Filter Strip (P05)

- *Location*: N 40° 35' 48.1275", W 79° 56' 49.6899"
- *Description*: A Vegetated Filter Strip was constructed to treat impervious surface located near William Flynn Hwy. The treated drainage area is 0.145 acres and is approximately 100% impervious and 0% pervious land coverage.
- *Estimated Reductions:* The project will reduce 58.7 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the property owner in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Privately funded.
- *Project Requirements*: Inspection of stormwater facility by Township.

Simply Subs – Infiltration Trench (P06)

- *Location*: N 40° 35' 47.3902", W 79° 56' 50.3790"
- *Description*: An Infiltration Trench was constructed to treat impervious surface located at the William Flynn Hwy. The treated drainage area is 0.081 acres and is approximately 100% impervious and 0% pervious land coverage.
- *Estimated Reductions:* The project will reduce 141.5 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the property owner in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Privately funded.
- *Project Requirements*: Inspection of stormwater facility by Township.

Lightbridge Academy (P07)

- *Location*: N 40° 36' 48.5293", W 79° 56' 46.1304"
- *Description*: A Detention Tank was constructed to treat impervious surface located at the William Flynn Hwy. The treated drainage area is 0.75 acres and is approximately 95% impervious and 5% pervious land coverage.
- *Estimated Reductions:* The project will reduce 132 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the property owner in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Privately funded.
- *Project Requirements*: Inspection of stormwater facility by Township.

Crouse Run / Pine Confluence Stream Restoration (P08)

- *Location*: Start: N 40° 34' 43.2722", W 79° 58' 6.6563"
  End: N 40° 34' 41.5490", W 79° 58' 8.9774"
- *Description*: Approximately 225 LF of Crouse Run was rehabilitated near Royalview Drive.
- *Estimated Reductions:* The project will reduce 25,875.0 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the restored stream will be performed by the Township in accordance with the approved permit.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Mallard Landing Pond Restoration (P09)

- *Location*: N 40° 36' 51.7350", W 79° 57' 6.8332"
- *Description*: The Township restored and enhanced the Wet Pond. The treated drainage area is 41 acres and is approximately 35% impervious and 65% pervious land coverage.
- *Estimated Reductions:* The project will reduce 20,071.1 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the Township in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Route 8 ATM (P10)

- *Location*: N 40° 35' 27.924", W 79° 56' 51.1722"
- *Description*: A Detention Tank was constructed to treat impervious surface located along Route 8. The treated drainage area is 0.27 acres and is approximately 25% impervious and 75% pervious land coverage.
- *Estimated Reductions:* The project will reduce 17.8 lbs/year of sediment from the Sub-Watershed 7883.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the property owner in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Privately funded.
- *Project Requirements*: Inspection of stormwater facility by Township.

Rihn Strasse Basin Retrofit (P11)

- *Location*: N 40° 36' 17.0888", W 79° 58' 22.4627"
- *Description*: The Township restored and enhanced the Dry Extended Detention Basin. The treated drainage area is 15 acres and is approximately 25% impervious and 75% pervious land coverage.
- *Estimated Reductions:* The project will reduce 4,134.1 lbs/year of sediment from the Sub-Watershed 7786.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the Township in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Craighead Basin Retrofit (P12)

- *Location*: N 40° 34' 46.5989", W 79° 57' 13.5926"
- *Description*: The Township restored and enhanced the Dry Extended Detention Basin. The treated drainage area is 82 acres and is approximately 20% impervious and 80% pervious land coverage.
- *Estimated Reductions:* The project will reduce 26,149 lbs/year of sediment from the Sub-Watershed 8005.
- *Operation & Maintenance*: Operation and maintenance of the stormwater facility may be performed by the Township in accordance with the PA Stormwater BMP Manual for the applicable type of BMP.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

Wildwood Sample Stream Restoration (P13)

- *Location*: Start: N 40° 34' 43.7166", W 79° 58' 21.4476"
  End: N 40° 34' 42.0058", W 79° 58' 10.7375"
- *Description*: Approximately 250 LF of Pine Creek will be rehabilitated near Wildwood Sample Road.
- *Estimated Reductions:* The project will reduce 28,750 lbs/year of sediment from the Sub-Watershed 7960.
- *Operation & Maintenance*: Operation and maintenance of the restored stream will be performed by the Township in accordance with the approved permit.
- *Funding*: Township's Capital Budget, Grant opportunities, and other watershed based funding opportunities.

5.2 Summary of Potential BMPs

The proposed BMPs discussed previously will collectively meet the required sediment and phosphorus reductions. The Township plans to select, design, and construct enough of the proposed BMPs to meet the required reduction. Due to unforeseen circumstances, Hampton may not be able to construct enough of the proposed BMPs prior to the March 15, 2023 deadline; however, the Township is working diligently to implement these projects in a timely matter that is financially possible and reasonably attainable. Hampton recognizes the importance of these PRP projects in addressing sediment and nutrient pollution in stormwater runoff and intends to construct the proposed BMPs to meet the PRP reduction requirement. Table 5-1 illustrates the existing load, required reduction, and anticipated reduction. The MS4 will achieve its load reduction requirement through the implementation of the proposed BMPs.

Table 5-1: Expected Load Reductions from Potential BMPs

POLLUTANT	EXISTING LOAD (lbs/yr)	REQUIRED REDUCTION (lbs/yr)	ACHIEVED REDUCTION (lbs/yr)
Sediment	2,505,301.3	250,530.13	255,347.92
Phosphorus	658.9	32.95	N/A*

** In accordance with PADEP guidance, the MS4 plans to take a presumption approach that a 10% reduction of sediment will also accomplish a 5% phosphorus reduction.*

Appendix A – Planning Area Map

Hampton Township

Planning Area Map - Little Pine Creek

Date: July 20, 2017
Job No. C-20419-0009
Scale: 1" = 1,000'

Map Features

- Municipal Boundary
- Storm Discharge Points
- Storm Inlets
- Storm Manholes
- Storm Sewer Pipes
- Storm Network Structures
- Storm Clean Outs
- Storm BMPs
- MS4 Urbanized Areas
- Chapter 93 Streams
- Parced Area
- Parcels
- Small Watersheds
- L. Pine Ck. HUC 12 Watershed
- Other HUC-12 Watersheds

100 McMorris Road
Pittsburgh, PA 15205
Phone: 855-634-9284
Fax 412-921-9960

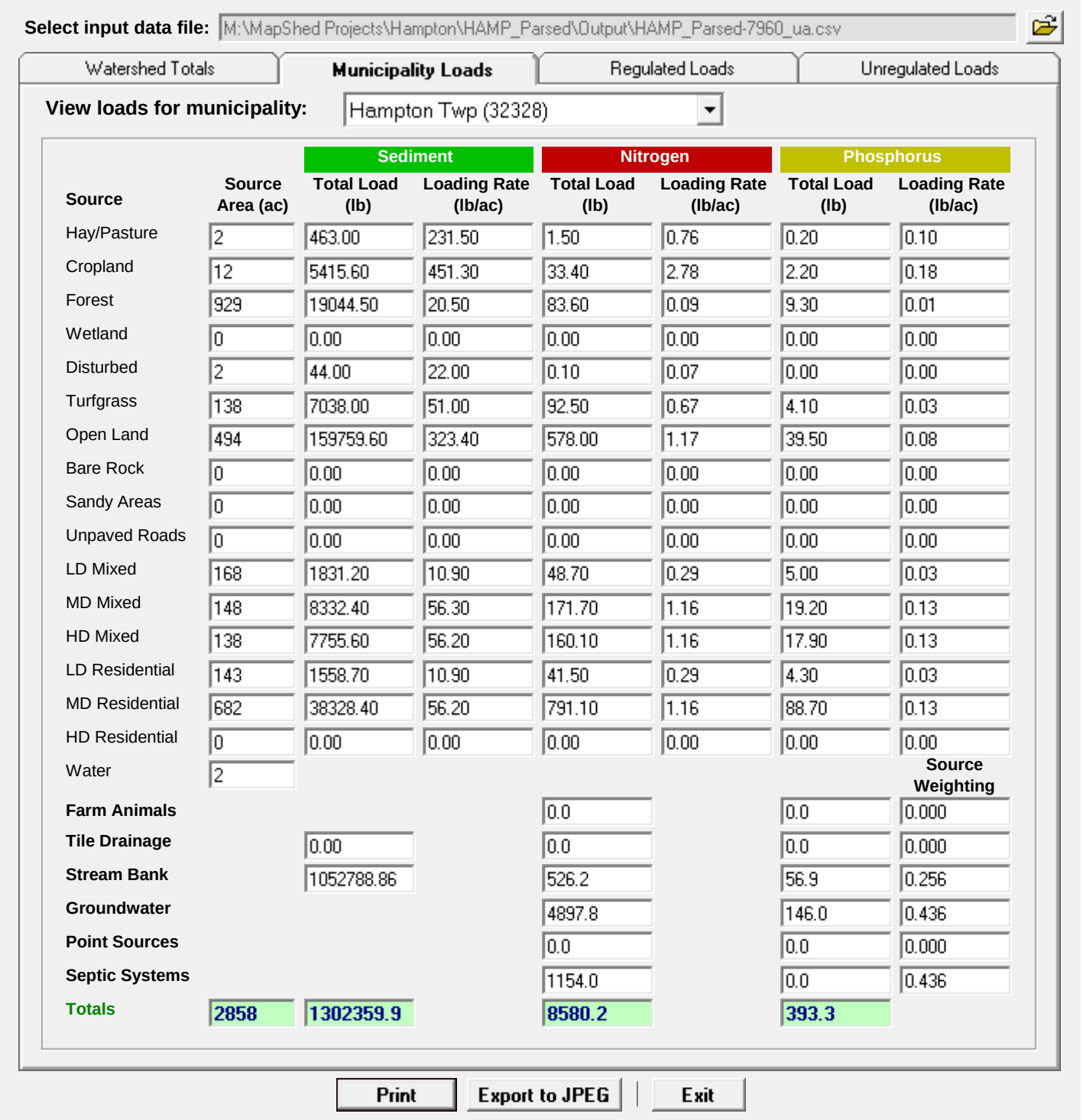
GATEWAY
On Call. On Time. On Target.

Path: D:\Hampton_MS4\Planning_Area_Maps\2017_07_19\Little_Pine_Creek_Planning_Area_Map.mxd

Appendix B – Existing Loads without BMPs

HAMPTON TOWNSHIP LOADING SUMMARY - WITHOUT BMP'S

SUBAREA	Stream Name	Total Area (Acres)	Area in Hampton (Acres)	% of Drainage Area	Urban Area (Acres)	% of Total Area	Total Sediment (lbs.)	Streambank Sediment (lbs.)	Nitrogen (lbs.)	Phosphorus (lbs.)
7768	**Montour Run**	3427	468	13.66%	468	13.66%	81,880.50	50,213.42	1,345.2	41.8
7782	**West Branch Deer Creek**	2352	115	4.89%	115	4.89%	33,245.90	27,607.39	607.6	13.8
7786	**Willow Run**	2837	726	25.59%	726	25.59%	129,045.90	104,211.71	2,761.1	62.2
7883	**Crouse Run**	2791	2165	77.57%	2,165	77.57%	501,629.40	404,815.47	8,184.5	250.7
7960	**Pine Creek**	6566	2858	43.53%	2,858	43.53%	1,302,359.90	1,052,788.86	8,580.2	393.3
7971	**Cedar Run**	1471	515	35.01%	244	16.59%	45,815.60	32,199.96	896.4	29.8
8005	**McCaslin Run**	618	618	100.00%	603	97.57%	66,211.60	41,976.17	2,212.3	64.8
8015	**Gourdhead Run**	1980	1980	100.00%	1,918	96.87%	369,285.10	239,685.72	6,676.2	233.9
8065	**West Little Pine Creek**	4371	76	1.74%	76	1.74%	35,973.60	31,106.66	323.0	15.5
8075	**East Little Pine Creek**	2452	661	26.96%	595	24.27%	103,651.90	27,394.97	1,675.8	63.4
TOTALS					**9,768**		**2,669,099**	**2,012,000**	**33,262.3**	**1,169.2**



PINE CREEK (7960) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed\Output\HAMP_Parsed-8005_ua.csv

Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	15	948.00	63.20	5.60	0.37	0.90	0.06
Cropland	0	0.00	0.00	0.00	0.00	0.00	0.00
Forest	188	1052.80	5.60	11.30	0.06	0.00	0.00
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	0	0.00	0.00	0.00	0.00	0.00	0.00
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	114	11548.20	101.30	82.10	0.72	4.60	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	37	407.00	11.00	10.70	0.29	1.10	0.03
MD Mixed	27	1587.60	58.80	37.00	1.37	4.10	0.15
HD Mixed	49	2866.50	58.50	66.60	1.36	7.40	0.15
LD Residential	91	1028.30	11.30	26.40	0.29	2.70	0.03
MD Residential	82	4797.00	58.50	111.50	1.36	12.30	0.15
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		41976.17		21.4		3.9	0.733
Groundwater				1155.1		27.8	0.977
Point Sources				0.0		0.0	0.000
Septic Systems				684.6		0.0	0.977
Totals	603	66211.6		2212.3		64.8	

Print | Export to JPEG | Exit

MCCASLIN RUN (8005) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed\Output\HAMP_Parsed-8015_ua.csv

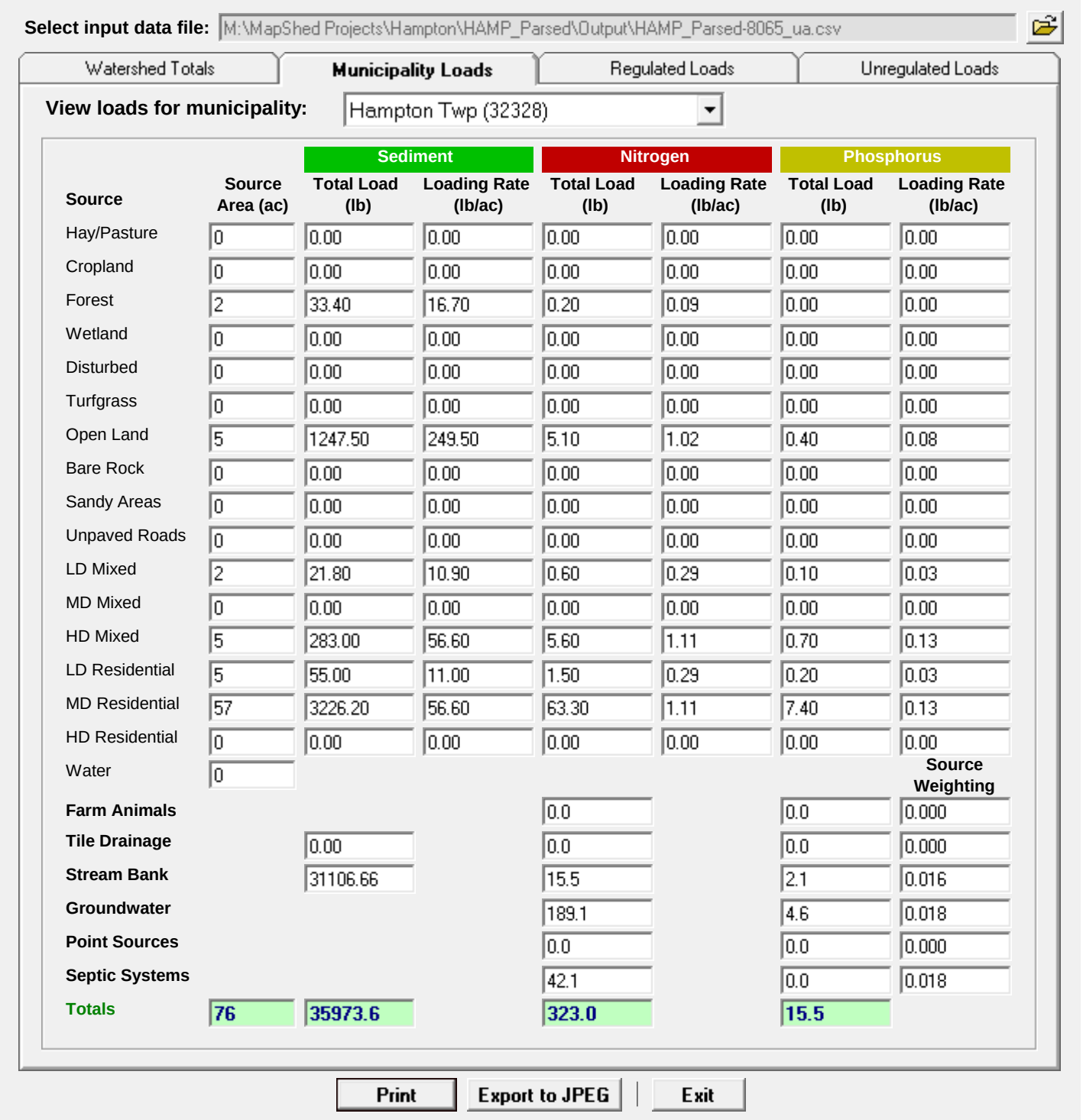
Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

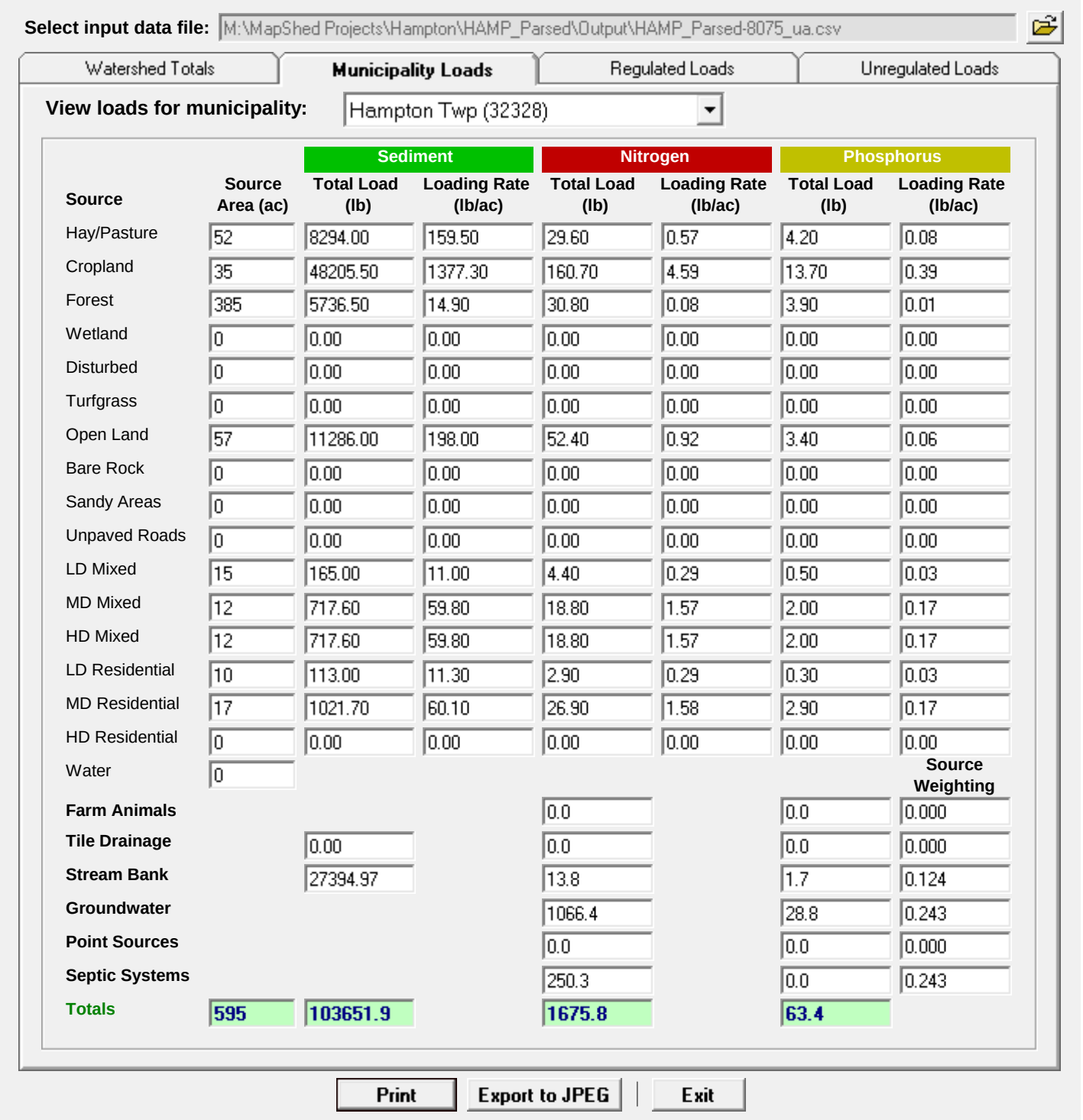
Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	30	2316.00	77.20	12.00	0.40	1.50	0.05
Cropland	17	7563.30	444.90	46.90	2.76	2.70	0.16
Forest	615	8733.00	14.20	49.20	0.08	6.20	0.01
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	12	816.00	68.00	1.90	0.16	0.40	0.03
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	385	68414.50	177.70	338.80	0.88	15.40	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	54	615.60	11.40	15.70	0.29	1.60	0.03
MD Mixed	91	5187.00	57.00	101.00	1.11	11.80	0.13
HD Mixed	96	5491.20	57.20	106.60	1.11	12.50	0.13
LD Residential	104	1164.80	11.20	30.20	0.29	3.10	0.03
MD Residential	514	29298.00	57.00	570.50	1.11	66.80	0.13
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		239685.72		120.1		11.6	0.739
Groundwater				4454.7		100.3	0.971
Point Sources				0.0		0.0	0.000
Septic Systems				828.6		0.0	0.971
Totals	1918	369285.1		6676.2		233.9	

Print | Export to JPEG | Exit

GOURDHEAD RUN (8015) WATERSHED



WEST LITTLE PINE CREEK (8065) WATERSHED



EAST LITTLE PINE CREEK (8075) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed\Output\HAMP_Parsed-7768_ua.csv

Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	7	660.10	94.30	3.10	0.44	0.40	0.05
Cropland	7	11105.50	1586.50	35.10	5.01	2.30	0.33
Forest	284	3237.60	11.40	19.90	0.07	0.00	0.00
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	0	0.00	0.00	0.00	0.00	0.00	0.00
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	77	12397.00	161.00	64.70	0.84	3.10	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	7	79.80	11.40	2.00	0.29	0.20	0.03
MD Mixed	0	0.00	0.00	0.00	0.00	0.00	0.00
HD Mixed	17	986.00	58.00	24.70	1.45	2.70	0.16
LD Residential	17	195.50	11.50	4.90	0.29	0.50	0.03
MD Residential	52	3005.60	57.80	74.90	1.44	8.30	0.16
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		50213.42		25.0		2.1	0.099
Groundwater				793.9		22.2	0.137
Point Sources				0.0		0.0	0.000
Septic Systems				297.0		0.0	0.137
Totals	468	81880.5		1345.2		41.8	

Print | Export to JPEG | Exit

MONTOUR RUN (7768) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed\Output\HAMP_Parsed-7786_ua.csv

Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	0	0.00	0.00	0.00	0.00	0.00	0.00
Cropland	0	0.00	0.00	0.00	0.00	0.00	0.00
Forest	247	1729.00	7.00	17.30	0.07	0.00	0.00
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	0	0.00	0.00	0.00	0.00	0.00	0.00
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	121	14810.40	122.40	93.20	0.77	4.80	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	27	315.90	11.70	7.80	0.29	0.80	0.03
MD Mixed	27	1703.70	63.10	44.30	1.64	4.60	0.17
HD Mixed	47	2932.80	62.40	76.10	1.62	8.00	0.17
LD Residential	250	2900.00	11.60	72.50	0.29	7.50	0.03
MD Residential	7	442.40	63.20	11.40	1.63	1.20	0.17
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		104211.71		52.3		5.4	0.234
Groundwater				893.5		29.9	0.256
Point Sources				0.0		0.0	0.000
Septic Systems				1492.7		0.0	0.256
Totals	726	129045.9		2761.1		62.2	

Print | Export to JPEG | Exit

WILLOW RUN (7786) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed\Output\HAMP_Parsed-7883_ua.csv

Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	2	264.60	132.30	1.10	0.57	0.20	0.08
Cropland	5	749.50	149.90	10.70	2.13	0.60	0.11
Forest	603	5366.70	8.90	42.20	0.07	0.00	0.00
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	0	0.00	0.00	0.00	0.00	0.00	0.00
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	329	45895.50	139.50	263.20	0.80	13.20	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	77	900.90	11.70	22.30	0.29	2.30	0.03
MD Mixed	104	6146.40	59.10	168.50	1.62	17.70	0.17
HD Mixed	269	15871.00	59.00	435.80	1.62	45.70	0.17
LD Residential	509	5904.40	11.60	147.60	0.29	15.30	0.03
MD Residential	250	14700.00	58.80	402.50	1.61	42.50	0.17
HD Residential	17	1014.90	59.70	27.90	1.64	3.10	0.18
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		404815.47		202.4		19.8	0.560
Groundwater				2932.3		90.3	0.777
Point Sources				0.0		0.0	0.000
Septic Systems				3528.0		0.0	0.777
Totals	2165	501629.4		8184.5		250.7	

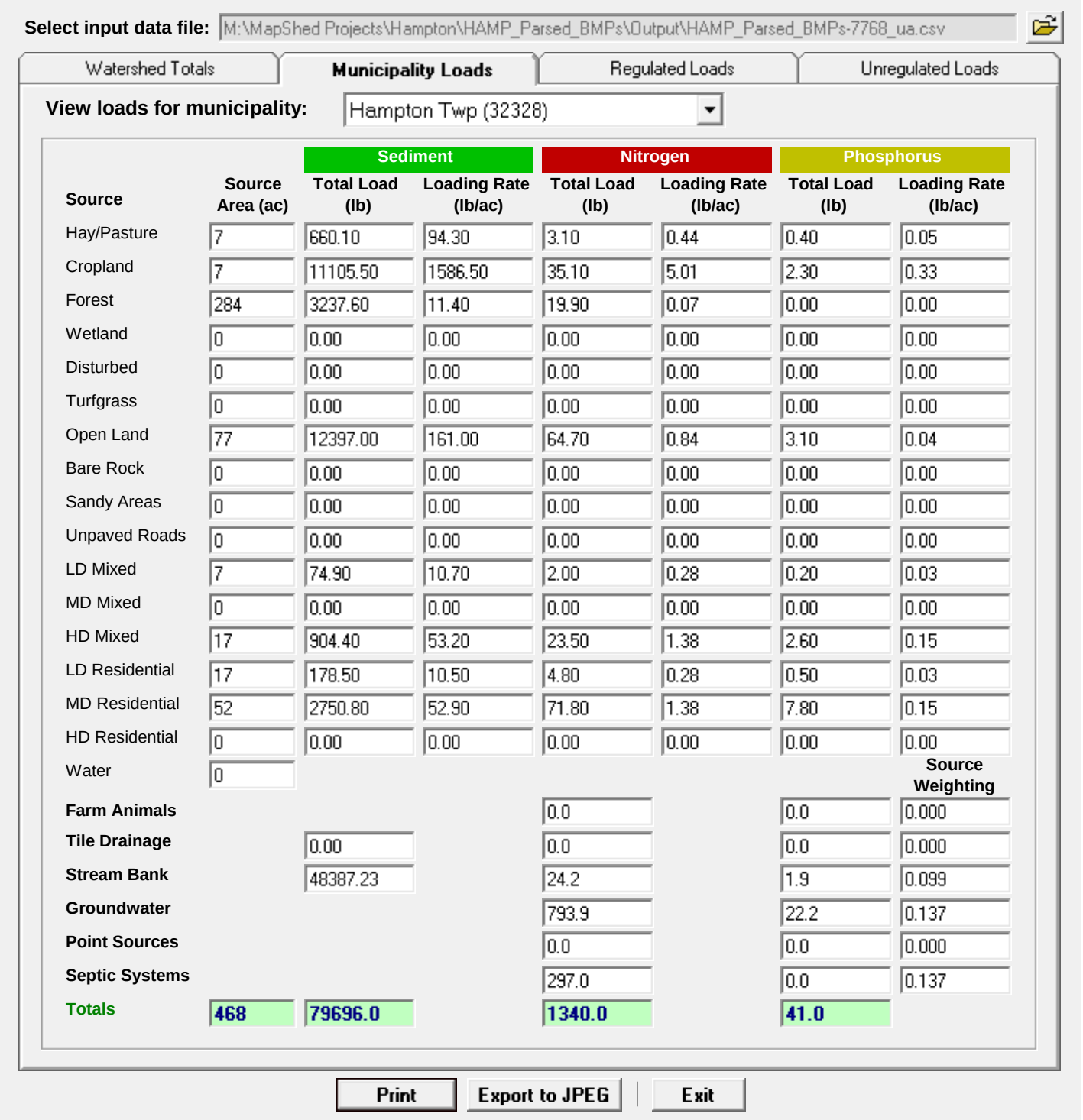
Print | Export to JPEG | Exit

CROUSE RUN (7883) WATERSHED

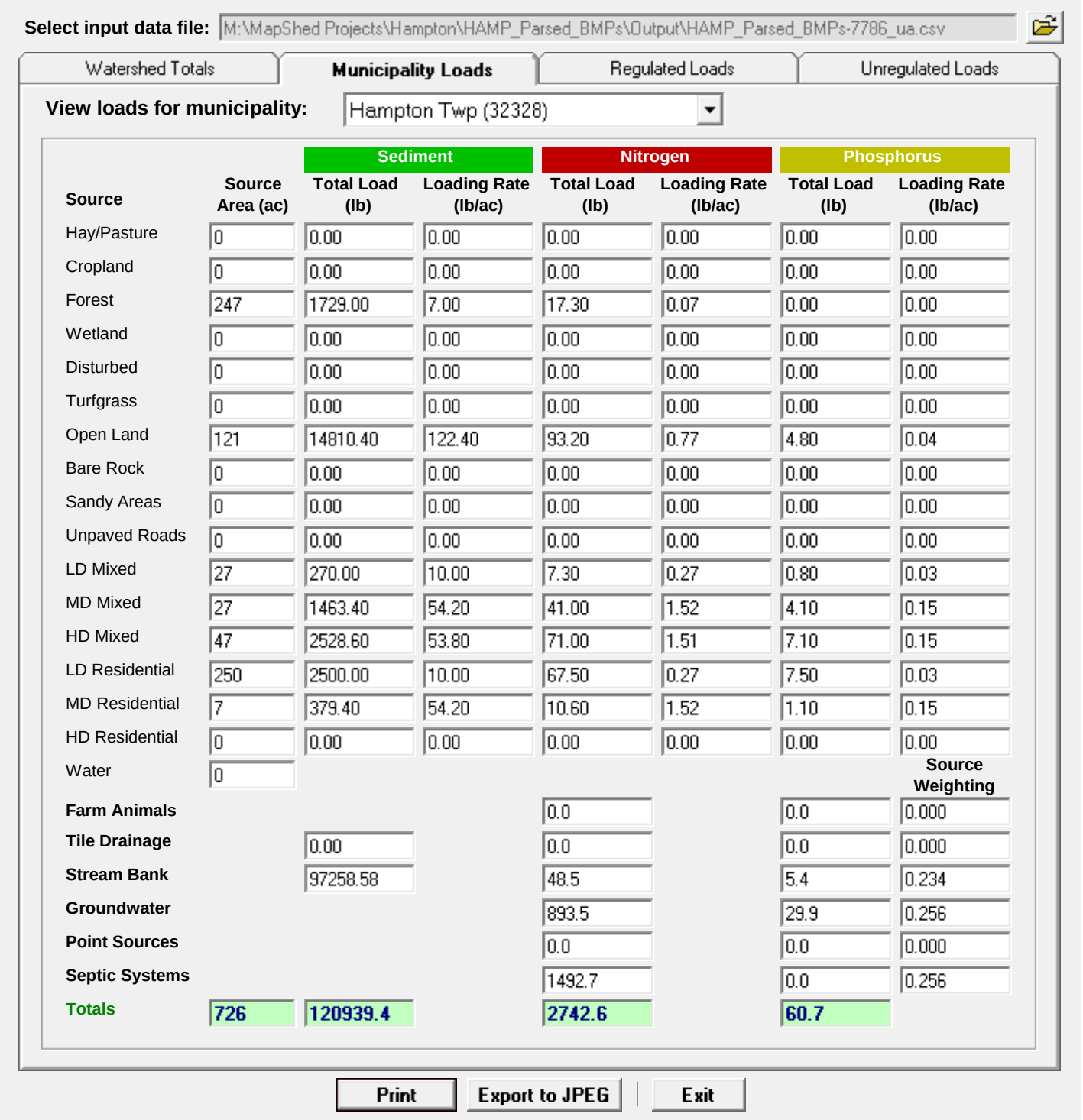
Appendix C – Existing Loads with BMPs

HAMPTON TOWNSHIP LOADING SUMMARY - WITH BMP'S

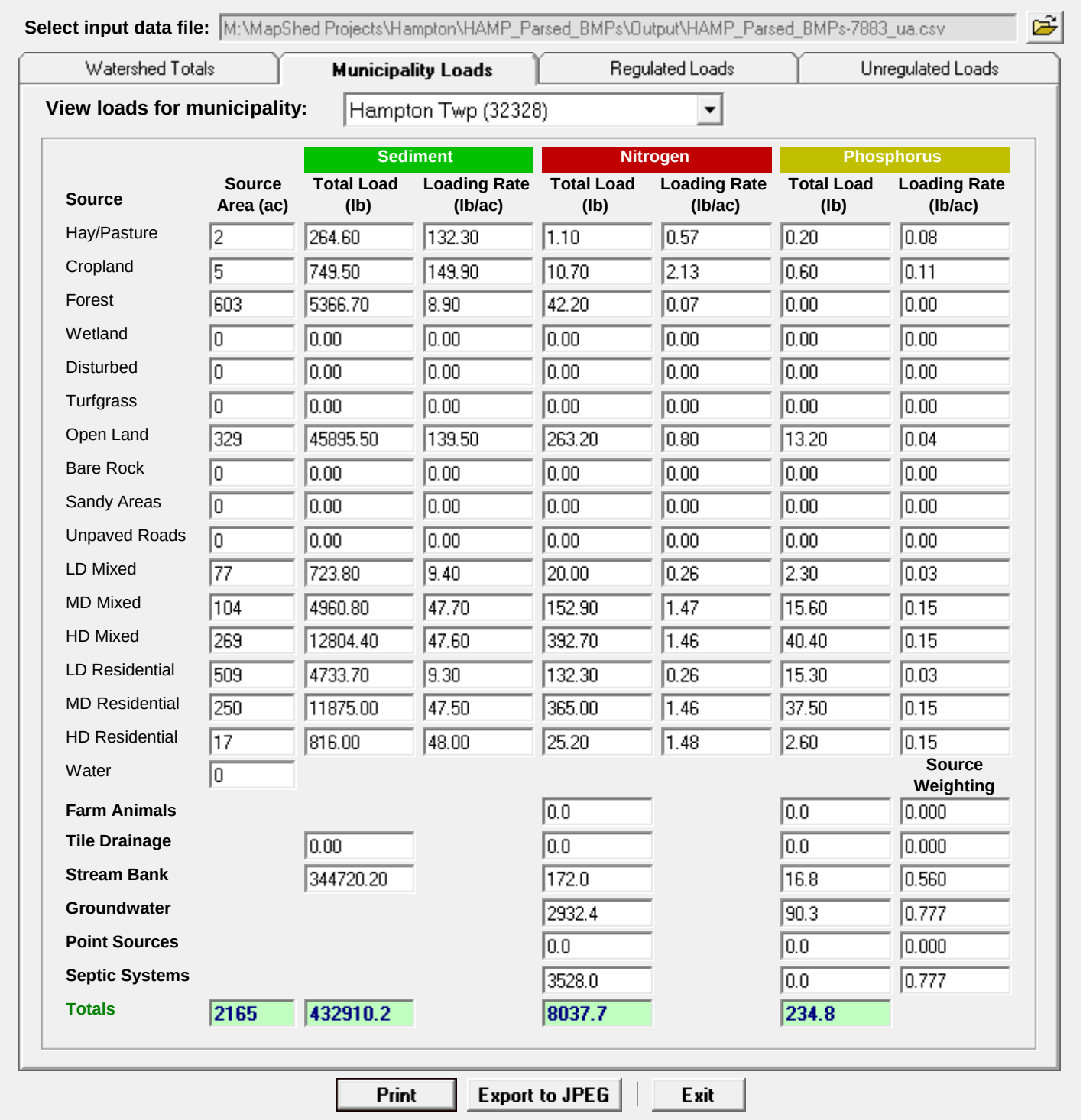
SUBAREA	Stream Name	Total Area (Acres)	Area in Hampton (Acres)	% of Drainage Area	Urban Area (Acres)	% of Total Area	Total Sediment (lbs.)	Streambank Sediment (lbs.)	Nitrogen (lbs.)	Phosphorus (lbs.)
7768	**Montour Run**	3427	468	13.66%	468	13.66%	79,696.00	45,646.58	1,340.0	41.0
7782	**West Branch Deer Creek**	2352	115	4.89%	115	4.89%	32,877.80	27,275.21	607.1	13.8
7786	**Willow Run**	2837	726	25.59%	726	25.59%	120,939.40	97,258.58	2,742.6	60.7
7883	**Crouse Run**	2791	2165	77.57%	2,165	77.57%	432,910.20	344,720.20	8,037.7	234.8
7960	**Pine Creek**	6566	2858	43.53%	2,858	43.53%	1,243,287.90	997,963.61	8,511.0	380.5
7971	**Cedar Run**	1471	515	35.01%	244	16.59%	41,867.30	29,200.78	885.3	28.2
8005	**McCaslin Run**	618	618	100.00%	603	97.57%	63,601.10	40,108.81	2,202.2	63.2
8015	**Gourdhead Run**	1980	1980	100.00%	1,918	96.87%	351,217.20	225,732.60	6,625.7	226.9
8065	**West Little Pine Creek**	4371	76	1.74%	76	1.74%	35,913.90	31,053.65	322.3	15.5
8075	**East Little Pine Creek**	2452	661	26.96%	595	24.27%	102,990.50	26,859.24	1,673.7	63.0
TOTALS					**9,768**		**2,505,301**	**1,865,819**	**32,947.6**	**1,127.6**



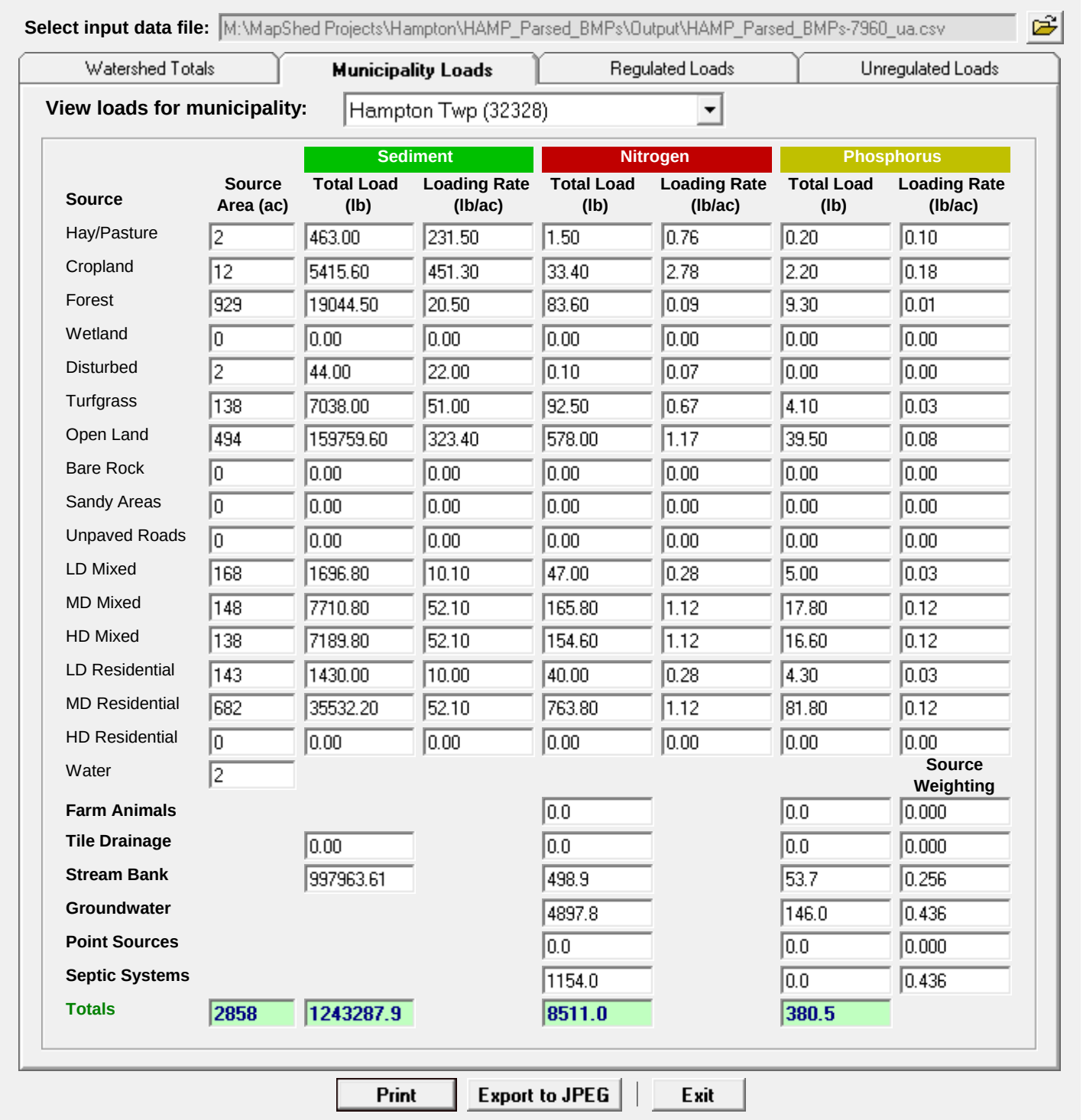
MONTOUR RUN (7768) WATERSHED



WILLOW RUN (7786) WATERSHED



CROUSE RUN (7883) WATERSHED



PINE CREEK (7960) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed_BMPs\Output\HAMP_Parsed_BMPs-8005_ua.csv

Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	15	948.00	63.20	5.60	0.37	0.90	0.06
Cropland	0	0.00	0.00	0.00	0.00	0.00	0.00
Forest	188	1052.80	5.60	11.30	0.06	0.00	0.00
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	0	0.00	0.00	0.00	0.00	0.00	0.00
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	114	11548.20	101.30	82.10	0.72	4.60	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	37	388.50	10.50	10.40	0.28	1.10	0.03
MD Mixed	27	1476.90	54.70	35.90	1.33	3.80	0.14
HD Mixed	49	2660.70	54.30	64.20	1.31	6.90	0.14
LD Residential	91	964.60	10.60	25.50	0.28	2.70	0.03
MD Residential	82	4452.60	54.30	108.20	1.32	11.50	0.14
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		40108.81		19.3		3.9	0.733
Groundwater				1155.1		27.8	0.977
Point Sources				0.0		0.0	0.000
Septic Systems				684.6		0.0	0.977
Totals	603	63601.1		2202.2		63.2	

Print | Export to JPEG | Exit

MCCASLIN RUN (8005) WATERSHED

Select input data file: M:\MapShed Projects\Hampton\HAMP_Parsed_BMPs\Output\HAMP_Parsed_BMPs-8015_ua.csv

Watershed Totals | **Municipality Loads** | Regulated Loads | Unregulated Loads

View loads for municipality: Hampton Twp (32328)

Source	Source Area (ac)	Sediment Total Load (lb)	Sediment Loading Rate (lb/ac)	Nitrogen Total Load (lb)	Nitrogen Loading Rate (lb/ac)	Phosphorus Total Load (lb)	Phosphorus Loading Rate (lb/ac)
Hay/Pasture	30	2316.00	77.20	12.00	0.40	1.50	0.05
Cropland	17	7563.30	444.90	46.90	2.76	2.70	0.16
Forest	615	8733.00	14.20	49.20	0.08	6.20	0.01
Wetland	0	0.00	0.00	0.00	0.00	0.00	0.00
Disturbed	12	816.00	68.00	1.90	0.16	0.40	0.03
Turfgrass	0	0.00	0.00	0.00	0.00	0.00	0.00
Open Land	385	68414.50	177.70	338.80	0.88	15.40	0.04
Bare Rock	0	0.00	0.00	0.00	0.00	0.00	0.00
Sandy Areas	0	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Roads	0	0.00	0.00	0.00	0.00	0.00	0.00
LD Mixed	54	540.00	10.00	15.10	0.28	1.60	0.03
MD Mixed	91	4677.40	51.40	95.60	1.05	10.90	0.12
HD Mixed	96	4944.00	51.50	101.80	1.06	11.50	0.12
LD Residential	104	1060.80	10.20	29.10	0.28	3.10	0.03
MD Residential	514	26419.60	51.40	539.70	1.05	61.70	0.12
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
							Source Weighting
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		225732.60		112.3		11.6	0.739
Groundwater				4454.7		100.3	0.971
Point Sources				0.0		0.0	0.000
Septic Systems				828.6		0.0	0.971
Totals	1918	351217.2		6625.7		226.9	

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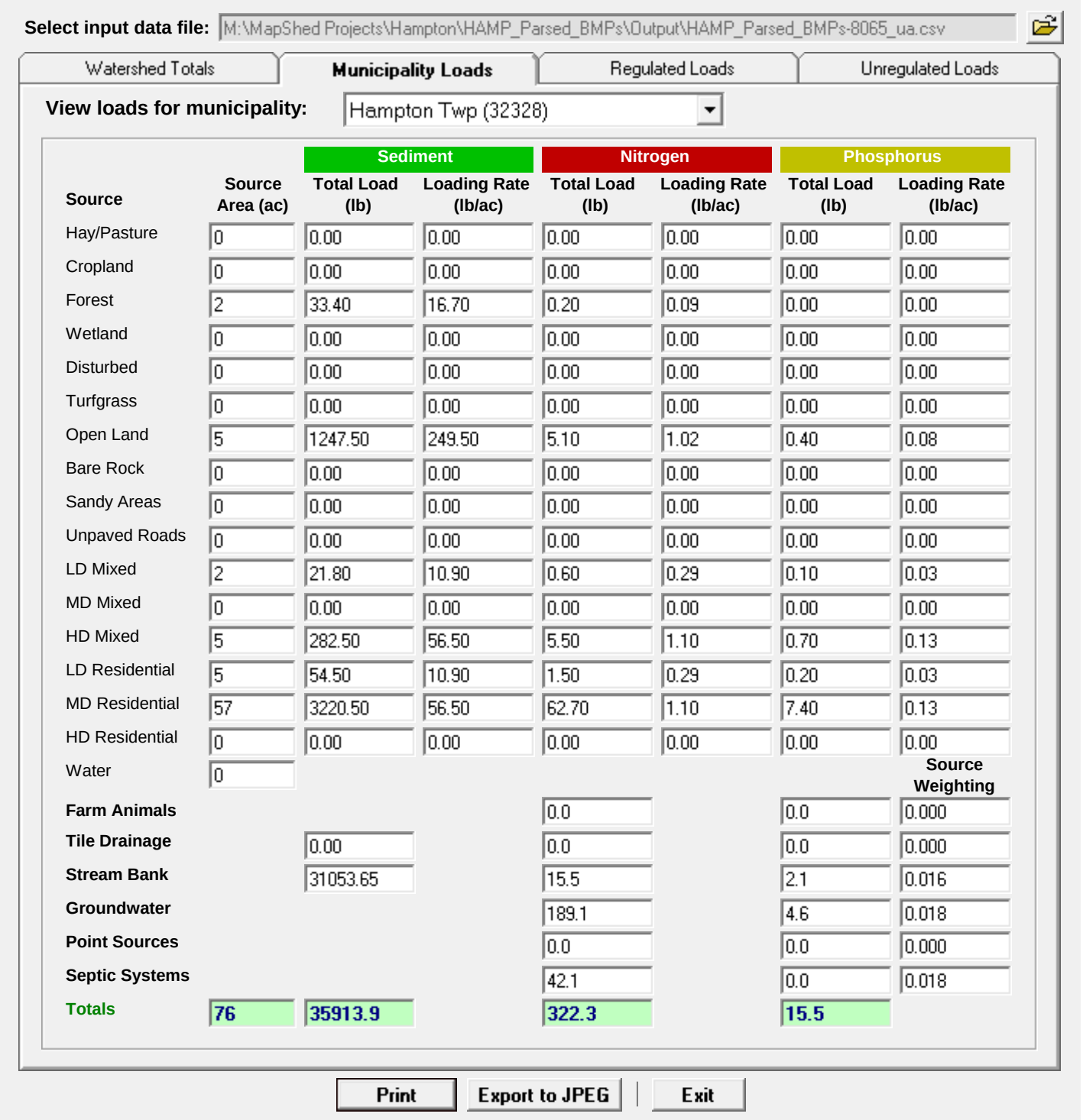
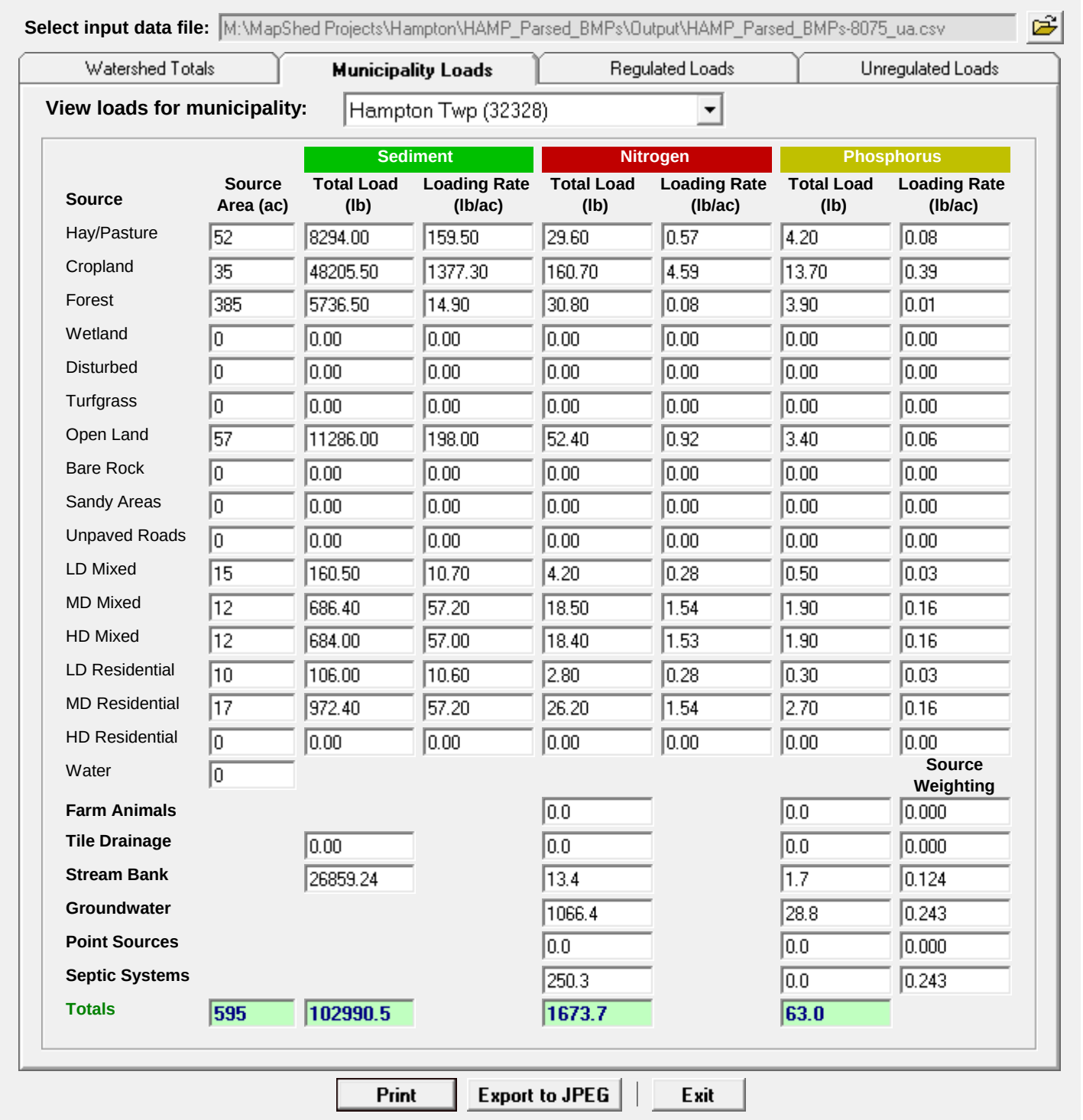
GOURDHEAD RUN (8015) WATERSHED



WEST LITTLE PINE CREEK (8065) WATERSHED



EAST LITTLE PINE CREEK (8075) WATERSHED

Appendix D – Existing Permitted BMPs Table

Little Pine Creek Watershed Existing Permitted BMPs

BMP ID	Site Name	BMP Type	Latitude	Longitude	Drainage Area (acres)	Permit Number	Installation Year
39120	ABC, Inc.	Surface Deten., Earth Emb	40.59455933460	-79.97706420810	1.57	N/A	Summer 2014
39002	Adam Ridge Final Subdivision	Surface Deten., Earth Emb	40.55538011790	-79.93900713730	4.87	N/A	Summer 2002
39065	Allison Pk Assembly of God II	Surface Deten., Earth Emb	40.56444008990	-79.97468516330	8.55	PAG2000203031	Summer 2003
39064	Aquinas Academy Gymanasium	Surface Deten., Earth Emb	40.59904861160	-79.96793851450	6.18	PAG-2-00-02-08-007	6/1/2008
39063	Aquinas Academy Lot Consolidation	Surface Deten., Earth Emb	40.59693093780	-79.96766609160	1.7	N/A	8/2/2006
39051	Arbors Two	Surface Deten., Earth Emb	40.56933020600	-79.98308526860	6.92	N/A	8/1/1984
39003	Ash Acres	Surface Deten., Earth Emb	40.55508446030	-79.94040016980	15.6	N/A	7/1/2000
39001	Ashland Court	Surface Deten., Earth Emb	40.55766713250	-79.98105714700	31	N/A	10/1/1993
39068	Bitner Vision Site Plan (UC)	Detention Tank	40.55604223990	-79.97263754880	0.8	N/A	2/1/2004
39069	Boston Chicken	Detention Tank	40.59001613690	-79.94826215130	1.02	N/A	9/1/1994
39070	BP Oil (3915 Rt. 8/Duncan Ave.)	Detention Tank	40.55891662060	-79.96018918710	1.73	N/A	6/1/1999
39071	BP Oil (4630 Rt. 8)	Detention Tank	40.59082094010	-79.94769616260	1	N/A	9/1999
39072	Cardiff Arms	Surface Deten., Earth Emb	40.59195428670	-79.94339034140	5.37	N/A	8/1/1977
39073	Caro Brothers	Surface Deten., Earth Emb	40.59068319280	-79.94613753450	1.3	N/A	4/1/2000
39007	Carriage House Estates	Detention Tank	40.57775558360	-79.96196548720	9.94	N/A	2009
39074	Clean Town USA Plan of Lots	Surface Deten., Earth Emb	40.60152070500	-79.94927915830	3.63	N/A	Summer 2004
39075	Coventry Square Rev	Surface Deten., Earth Emb	40.59296716220	-79.94999947420	17.1	N/A	Spring 1988
39113	Cross Creek	Surface Deten., Earth Emb	40.60495752670	-79.94465859680	7.31	N/A	5/1/2014
39045	Devlin's Pointe Rev.	Surface Deten., Earth Emb	40.59012956150	-79.95410625680	18.95	N/A	2003
39047	DRB Construction	Existing Facility	40.57322765770	-79.95190687930	12.9	N/A	2/1/1997
39076	Eat N' Park Rev.	Detention Tank	40.61231083890	-79.94879752980	0.17	N/A	10/1/1995
39117	Enterprise Bank Rev.	Surface Deten., Earth Emb	40.56678447890	-79.96656338760	1.92	PAG02000212037	8/1/2001
39039	Envirotest Synterra	Surface Deten., Earth Emb	40.59560557760	-79.97566808190	1.68	N/A	4/1/1994
39022	Estates AT Villa Phase V	Surface Deten., Earth Emb	40.60898689360	-79.98432694470	13.4	N/A	2009
39024	Estates of the Villa, Phase 5 Final Prd	Surface Deten., Earth Emb	40.60481507230	-79.98953357370	38.66	N/A	2009
39008	Ferguson Woods	Surface Deten., Earth Emb	40.55826104510	-79.98787229170	9.2	N/A	Spring 1988
39078	Fernstrom Rev.	Surface Deten., Earth Emb	40.59748666760	-79.97361327510	0.309	N/A	5/1/1993
39038	Fries Landscaping	Surface Deten., Earth Emb	40.59610000000	-79.97310000000	5.23	PAG2000207023	6/1/2012
39026	Glades III Phase II	Surface Deten., Earth Emb	40.57387150940	-79.93734443360	26.4	N/A	Winter 1999
39114	Hampton Industrial Park Rev.	Surface Deten., Earth Emb	40.56606314000	-79.96743513740	7.6	PAG2000203029	9/1/2006
39027	Hampton Place	Surface Deten., Earth Emb	40.61061821660	-79.96200013640	32.53	PAG02000215073	9/1/2016
39048	Hampton Presbyterian Church Lot Con	Surface Deten., Earth Emb	40.61361518570	-79.94549081940	11.08	N/A	12/2006
39089	Hampton School Dist. Rev. (HS and MS)	Detention Tank	40.58792947690	-79.94561785010	2	N/A	9/1/1997
39088	Hampton Twp. Middle School Rev.	Surface Deten., Earth Emb	40.58720795570	-79.94456331070	0.6	N/A	1/1/2000
39127	Hampton Twp. School Dist. Rev.	Surface Deten., Earth Emb	40.58238631980	-79.93945734540	6.9	N/A	4/1/1998
39053	Hampton Woodlands Plan	Surface Deten., Earth Emb	40.59558511960	-79.94259739160	1.7	PAG2000204085	6/26/1995
39079	Highwood Acres	Surface Deten., Earth Emb	40.60199034240	-79.98671525140	5.5	N/A	10/1/1994
39037	Jehovahs Witness Rev	Detention Tank	40.59504260920	-79.96772718790	2.85	N/A	9/1/1990
39111	Jewart Gymnastics	Surface Deten., Earth Emb	40.59283175370	-79.96924052170	2.75	PAG2000207080	7/1/1905
39080	Kaminski	Detention Tank	40.59110029480	-79.94738657860	1.858	N/A	12/1/2001
39082	Lawn Maintenance Services	Surface Deten., Earth Emb	40.57297919540	-79.91867543500	9.39	N/A	1/1/1995
39084	Marsico Corp.	Detention Tank	40.56168528960	-79.95907930640	0.3	N/A	6/1/2000
39087	Max & Erma's	Detention Tank	40.61335143600	-79.94686560290	3.26	N/A	12/2001
39042	Mccaslin Ridge Plan of Lots	Surface Deten., Earth Emb	40.58180134000	-79.96989640590	15.6	PAG-2-0005-0002-03-43-R	6/1/2006
39031	Meadows at Hampton 1	Surface Deten., Earth Emb	40.58123021750	-79.92983203820	10.9	PAG2000205032-R	Summer 2008
39032	Meadows at Hampton 2	Surface Deten., Earth Emb	40.57998508730	-79.92653342980	5.23	PAG2000205032-R	Summer 2006
39033	Meadows at Hampton 3	Surface Deten., Earth Emb	40.58029473200	-79.92307974090	15.52	PAG2000205032-R	Summer 2008
39090	Mohawk	Surface Deten., Earth Emb	40.60319715310	-79.93419534740	45	N/A	Summer 2005
39091	Monroe Muffler & Brake Rev.	Detention Tank	40.60243619280	-79.94738217590	0.366	N/A	11/1998
39092	MTRM	Surface Deten., Earth Emb	40.59572366620	-79.97820874460	10.5	N/A	4/1/1988

BMP ID	Site Name	BMP Type	Latitude	Longitude	Drainage Area (acres)	Permit Number	Installation Year
39015	Oakhurst Estates	Surface Deten., Earth Emb	40.59970474750	-79.96445455630	16.19	N/A	9/1/1993
39014	Oakhurst Estates 2	Surface Deten., Earth Emb	40.59683355860	-79.96353901300	12.09		Summer 2004
39130	Orion Rev.	Surface Deten., Earth Emb	40.5578622	-79.9798761	31	N/A	Summer 2007
39123	PA. Turnpike Commission Rev.	Surface Deten., Earth Emb	40.61374536270	-79.97304335010	13.97	PAG2000205023	7/5/2006
39124	PA. Turnpike Commission Rev.2	Surface Deten., Earth Emb	40.59978615480	-79.93095861660	2.55	PAG2000205023	7/1/2006
39110	Pine Creek Golf Center Rev.	Surface Deten., Earth Emb	40.56664976790	-79.97401852810	4	N/A	10/1/1997
39112	Poff Elementary School	Surface Deten., Earth Emb	40.60738823250	-79.94158560270	8.59	PAG2000207085	2009
39019	Polo Fields at Hampton	Detention Tank	40.61061274740	-79.94509624520	6.08	N/A	Fall 2003
39020	Raintree Manor	Surface Deten., Earth Emb	40.61375532670	-79.93379152250	62.2	PAG2000205134	3/1/1978
39043	Revco Cond. Use	Detention Tank	40.59012423150	-79.94720605530	1.69	N/A	3/1/1996
39129	Rosarius Parking Lot	Detention Tank	40.6142602	-79.9453372	2.2	N/A	3/1/1995
39093	Ruby's Cleaners Rev	Detention Tank	40.60012700340	-79.94814948350	0.56	N/A	7/1/1994
39094	Saw Sales Machinery Rev.	Detention Tank	40.61367718640	-79.94872318230	11	N/A	Pre 2002
39095	Sheetz Revised Site Plan	Detention Tank	40.61417307540	-79.94706367000	2.289	N/A	5/1/2003
39096	Shoppers Plaza Plan No. 1	Detention Tank	40.60361528160	-79.94606243100	13.13	N/A	2003
39097	Spadafora Rev. (UC)	Detention Tank	40.56040585070	-79.95914503690	0.94	N/A	4/1/2005
39098	St. Catherine's of Sweden Rev. Site Plan	Surface Deten., Earth Emb	40.59201641570	-79.96796307730	1.5	PAR10A607	4/1/2003
39131	St. Mary's Rev.	Detention Tank	40.5544246	-79.9313392	2.53	N/A	1/1/2003
39100	St. Paul's Rev.	Surface Deten., Earth Emb	40.56601539650	-79.98802216970	0.89	N/A	5/1/1996
39101	St. Ursula Rev. Phase 1	Detention Tank	40.56006858940	-79.96260053770	2.1	PAG2000204101	8/4/2006
39062	Stonebridge 1	Surface Deten., Earth Emb	40.59927300050	-79.95710290250	5.82	PAG2000206088	2009
39061	Stonebridge 2	Surface Deten., Earth Emb	40.59875603840	-79.95365201330	6.33	PAG2000206088	2012
39060	Stonebridge 3	Surface Deten., Earth Emb	40.59785381290	-79.95626349930	9.37	PAG2000206088	2014
39102	Trillium Ridge	Surface Deten., Earth Emb	40.58919435970	-79.96088941840	10.3	N/A	2/1/1996
39041	Twelve Oaks at Hampton Final Prd/Phase II	Surface Deten., Earth Emb	40.58997127130	-79.97045785300	41.4	N/A	Summer 2006
39105	UHL Const. Rev	Surface Deten., Earth Emb	40.57632666170	-79.96993091060	5.25	N/A	5/1/1993
39081	Wendy's International Site Plan/Cond Use	Detention Tank	40.59283018810	-79.94870150280	0.81	N/A	6/1/1998
39030	Whispering Creek 1	Surface Deten., Earth Emb	40.59179523910	-79.93235336260	9.63	PAG2000206108	10/1/2008
39028	Whispering Creek 2	Surface Deten., Earth Emb	40.59029091810	-79.93813445020	14.6	PAG2000206108	10/1/2008
39106	Wildwood Highlands	Surface Deten., Earth Emb	40.59460814290	-79.97963983380	11.78	N/A	3/1/1995
39107	Willow Run Final Prd	Surface Deten., Earth Emb	40.60231766780	-79.97336365690	4.48	PAG20002050961	Summer 2005
39109	Winchester Thurston Rev.	Surface Deten., Earth Emb	40.57288412720	-79.92788969640	10.23	PAG2000204107	12/1/2003
39118	Woodwind	Surface Deten., Earth Emb	40.57236538530	-79.98894213790	6.61	PAG02000212052R	7/1/2013

Appendix E – Potential Structural BMPs Maps

Mallard Landing Pond Restoration
Lightbridge Academy
Rihn Strasse Basin Retrofit
Willow Run
Pine Creek
Monour Run
Deer Creek
Simply Subs Infiltration Trench
Simply Subs Filter Strip
Sewage Treatment Plant Stream Restoration
Pine Creek
Primanti Bros Coventry Square Basin
Cedar Run
New Stormwater BMP
Crouse Run Ravine Stream Restoration
Shafers Run
Pine Creek
Crouse Run
McCaskin Run
Wildwood Sample Road Stream Restoration
Crouse Run Pine Creek Confluence
Craighead Basin Retrofit
Little Pine Creek
Gourdhead Run
Blue Run
Lower Allison Park Stream Restoration
Little Pine Creek

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Date: June 16, 2023
Job No. C-20419-0017
Scale: 1: 16000

Township of Hampton

Proposed Stream Restoration & BMPs
Project Location Overview

Legend

- Stream Restoration
- Existing BMP Retrofit
- New Stormwater BMP
- PA HUC12
- Streams
- Municipal Boundaries
- Road Centerline

100 McMorris Road
Pittsburgh, PA 15205
Phone: 855-634-9284
Fax 412-921-9960

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Township of Hampton

Proposed Stream Restoration & BMPs

Craighead Basin Retrofit

Date: June 16, 2023
Job No. C-20419-0017
Scale: 1: 700

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Craighead Basin Retrofit

CRAIGHEAD ROAD

STATE HWY 8

MCCULLY ROAD

McGaskin Run

1110 1100 1090 1080 1070 1060 1050 1040 1030 1020 1010 1000 990

***

Legend

- Existing BMP Retrofit
- Streams
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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Township of Hampton

Proposed Stream Restoration & BMPs

Mallard Landing Pond Restoration

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Legend

- Existing BMP Retrofit
- Streams
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Storm Sewer Manholes
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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Township of Hampton

Proposed Stream Restoration & BMPs

Rihn Strasse Basin Retrofit

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RIHN STRASSE

DEGENHARDT ROAD

Rihn Strasse
Basin Retrofit

1070
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1040
1030
1020
1010
1000
990
980
970
1070
1090

Legend

- Existing BMP Retrofit
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WILLIAM FLYNN HWY

WOODLAND CIR

STATE HWY 8

1120

1130

1140

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1180

1190

1200

Simply Subs Filter Strip

Simply Subs Infiltration Trench

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Township of Hampton

Proposed Stream Restoration & BMPs

Simply Subs Filter Strip

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Legend

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Proposed Stream Restoration & BMPs

Simply Subs Infiltration Trench

Legend

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Township of Hampton

Proposed Stream Restoration & BMPs

Lightbridge Academy

Legend

- New Stormwater BMP
- PA HUC12
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CELLA AVE

GRAND AVE

KAHN AVE

STATE HWY 8

DUNCAN AVE

Gourdhead Run

Lower Allison Park Stream Restoration

920 910 900 890 880 870 860 850 940 950 930

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Date: June 16, 2023
Job No. C-20419-0017
Scale: 1: 700

Township of Hampton

Proposed Stream Restoration & BMPs

Lower Allison Park Stream Restoration

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Legend

- Stream Restoration
- Streams
- PA HUC12
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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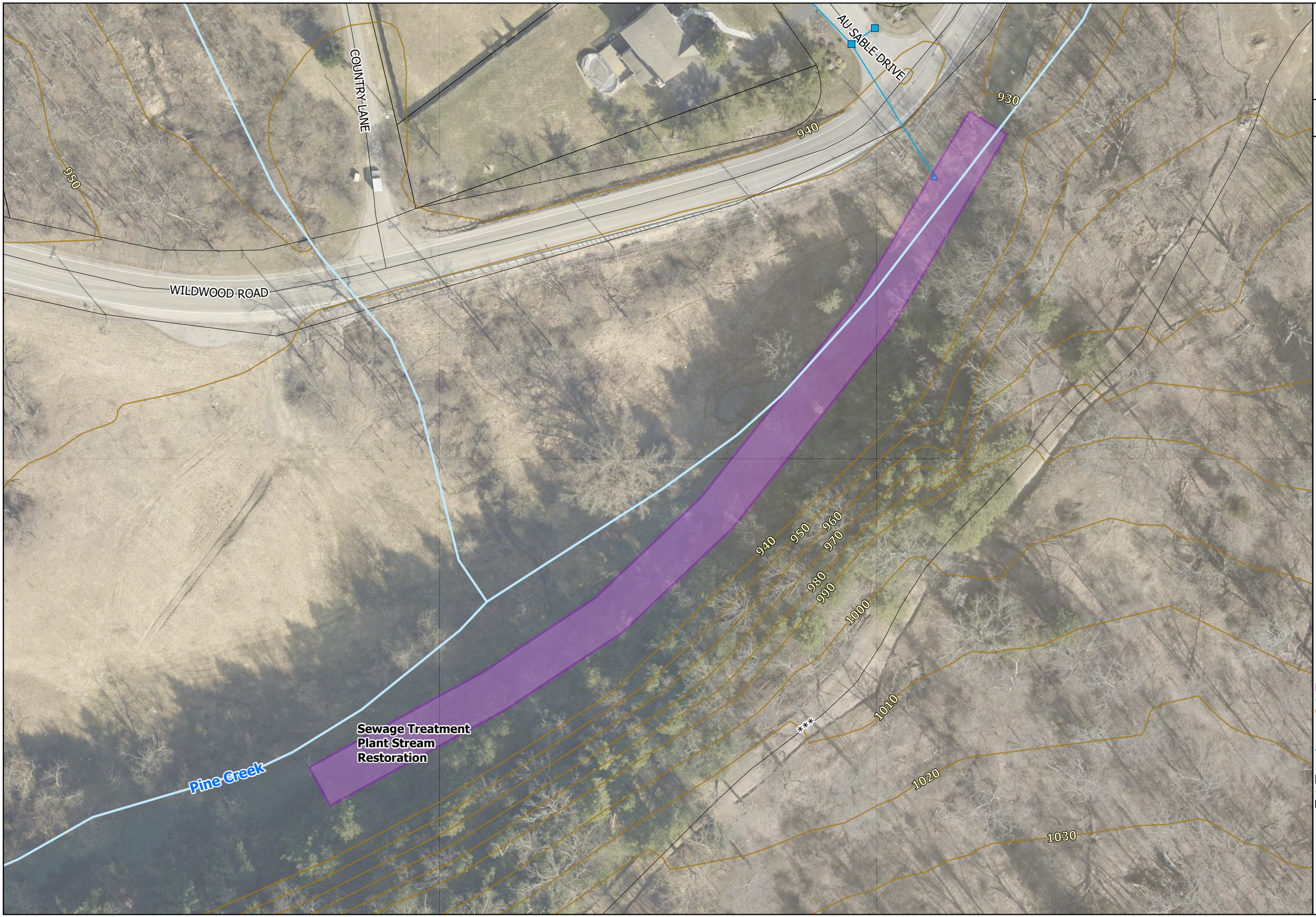

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Date: June 16, 2023
Job No. C-20419-0017
Scale: 1: 700

Township of Hampton

Proposed Stream Restoration & BMPs

Sewage Treatment Plant Stream Restoration

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Legend

- Stream Restoration
- Streams
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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Township of Hampton

Proposed Stream Restoration & BMPs

Crouse Run Ravine Stream Restoration

Legend

- Stream Restoration
- Streams
- PA HUC12
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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Township of Hampton

Proposed Stream Restoration & BMPs

Wildwood Sample Road Stream Restoration

Legend

- Stream Restoration
- Streams
- PA HUC12
- Tax Parcels
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- Municipal Boundaries

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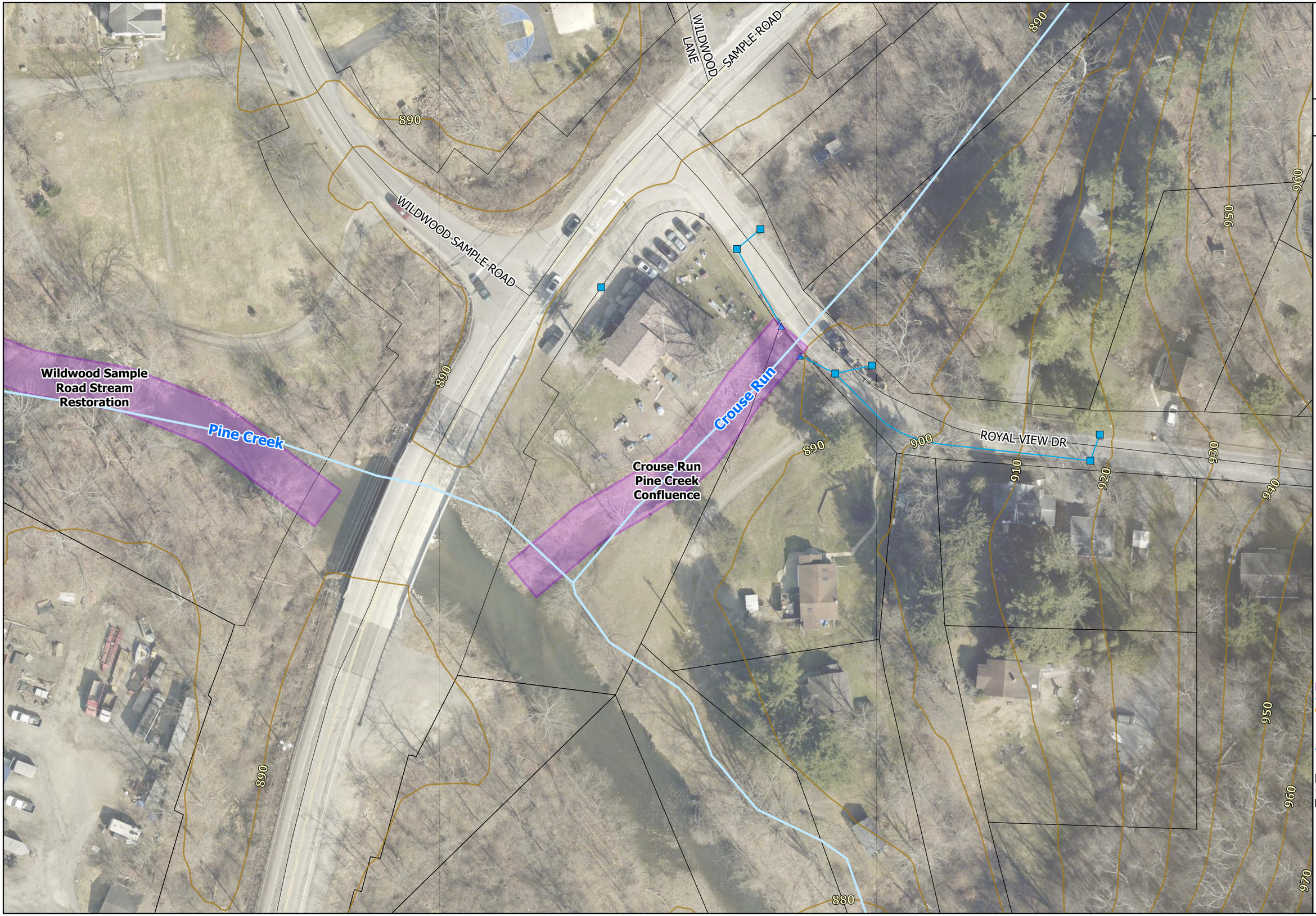

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Township of Hampton

Proposed Stream Restoration & BMPs

Crouse Run Pine Creek Confluence

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Legend

- Stream Restoration
- Streams
- PA HUC12
- Storm Sewer Discharge Points
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Scale: 1: 700

Township of Hampton

Proposed Stream Restoration & BMPs

Primanti Bros Coventry Square Basin

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Legend

- Existing BMP Retrofit
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

100 McMorris Road
Pittsburgh, PA 15205
Phone: 855-634-9284
Fax 412-921-9960

GATEWAY ENGINEERS

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Date: June 16, 2023
Job No. C-20419-0017
Scale: 1: 700

Township of Hampton

Proposed Stream Restoration & BMPs

New Stormwater BMP

Legend

- New Stormwater BMP
- PA HUC12
- Storm Sewer Discharge Points
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Appendix F – Potential Stormwater BMPs Reductions Table

PROPOSED BMP'S FOR LOADING CALCULATIONS

Year	#	Name	BMP Type	SubWatershed	Drainage Area (Acres)	Impervious Area	Pervious Area	Existing Sediment Load (lbs/yr)	BMP Effectiveness	Sediment Removed lbs/yr	Stream Length (ft)
2018	P01	Sewage Treatment Plant Stream Restoration	Stream Restoration	7960	N/A	N/A	N/A	57,500.00	100%	**57,500.00**	500
2018	P02	Lower Allison Park Stream Restoration	Stream Restoration	8015	N/A	N/A	N/A	59,685.00	100%	**59,685.00**	519
2018	P03	Primanti Bros. Basin Restoration	Dry Extended Detention Basin	7883	1.176	92%	8%	2,014.58	60%	**1,208.75**	N/A
2019	P04	Crouse Run Ravine Stream Restoration	Stream Restoration	7883	N/A	N/A	N/A	31,625.00	100%	**31,625.00**	275
2019	P05	Simply Subs - Filter Strip	Vegetated Filter Strip	7883	0.145	100%	0%	266.66	22%	**58.66**	N/A
2019	P06	Simply Subs - Infiltration Trench	Infiltration Trench	7883	0.081	100%	0%	148.96	95%	**141.51**	N/A
2020	P07	Lightbridge Academy	Detention Tank	7883	0.75	95%	5%	1,320.23	10%	**132.02**	N/A
2021	P08	Crouse Run/Pine Confluence Stream Restoration	Stream Restoration	7883	N/A	N/A	N/A	25,875.00	100%	**25,875.00**	225
2021	P09	Mallard Landing Pond Restoration	Wet Pond	7883	41	35%	65%	33,451.90	60%	**20,071.14**	N/A
2021	P10	Route 8 ATM	Detention Tank	7883	0.27	25%	75%	177.80	10%	**17.78**	N/A
2022	P11	Rihn Strasse Basin Retrofit	Dry Extended Detention Basin	7786	15	15%	85%	7,516.50	55%	**4,134.08**	N/A
2022	P12	Craighead Basin Retrofit	Dry Extended Detention Basin	8005	82	20%	80%	47,543.60	55%	**26,148.98**	N/A
2023	P13	Wildwood Sample Stream Restoration	Stream Restoration	7960	N/A	N/A	N/A	28,750.00	100%	**28,750.00**	250
Total										**255,347.92**	