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HAMPTON TOWNSHIP

Pollutant Reduction Plan DEER CREEK 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 Deer Creek Watershed Background

Deer 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 Youghiogeny Rivers. For Deer Creek Watershed its tributary is the Allegheny River. On a smaller scale, there are then numerous smaller watersheds that are tributaries to Deer Creek. These small watersheds include Cedar Run, and West Branch Deer Creek.

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. Deer Creek Watershed is impacted by nutrients, siltation, and suspended solids. Within Deer Creek Watershed, there are several impaired streams that include Deer Creek, and Pine Creek.

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 (GWLFE) 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 Cedar Run Small Watershed Results

Cedar Run Watershed is about 1,471 acres in size, with only 515 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 234.4 acres. Table 3-1 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 62 acres. The urban area of mixed and residential use comprises nearly 59% of the watershed in Hampton.

Table 3-1: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	13,615.64	15.4
Stream Bank	32,199.96	1.3
Total	45,815.60	16.7

3.3.2 West Branch Deer Creek Small Watershed Results

West Branch Deer Creek Watershed is about 2,352 acres in size, with only 115 of those total acres being located within Hampton Township. However, after parsing the total watershed area within the MS4 boundary is 109.3 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 929 acres. The urban area of mixed and residential use comprises nearly 63% of the watershed in Hampton.

Table 3-2: Existing Pollutant Load Results without BMPs

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	5,638.51	6.3
Stream Bank	27,607.39	1.8
Total	33,245.90	8.1

3.3.3 Deer 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 3-3 shows the amount of sediment and phosphorus pollution from land cover and stream bank erosion.

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

SOURCE	SEDIMENT (lbs/yr)	PHOSPHORUS (lbs/yr)
Land Cover	19,254.15	21.7
Stream Bank	59,807.35	3.1
Total	79,061.5	24.8

Chapter 4. Existing Structural BMPs

The existing loads calculated in Chapter 3 do not account for any reductions of existing stormwater 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 (GWLFE) 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 Deer Creek Watershed, 6 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 42.3 hectares Medium Density Residential and 2.2 hectares High Density Residential. 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	74,745.10	7,474.51
Phosphorus	23.2	1.16

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's 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; Little Pine Creek – Pine 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 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.

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 than 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 Potential 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

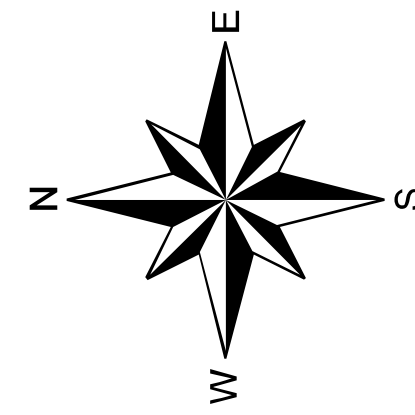
The proposed BMPs discussed previously will collectively meet the required sediment and phosphorus reductions. The Township plans to select, design, and construct enough of the proposed BMPs to meet the required reduction. Due to unforeseen circumstances, Hampton may not be able to construct enough of 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.*

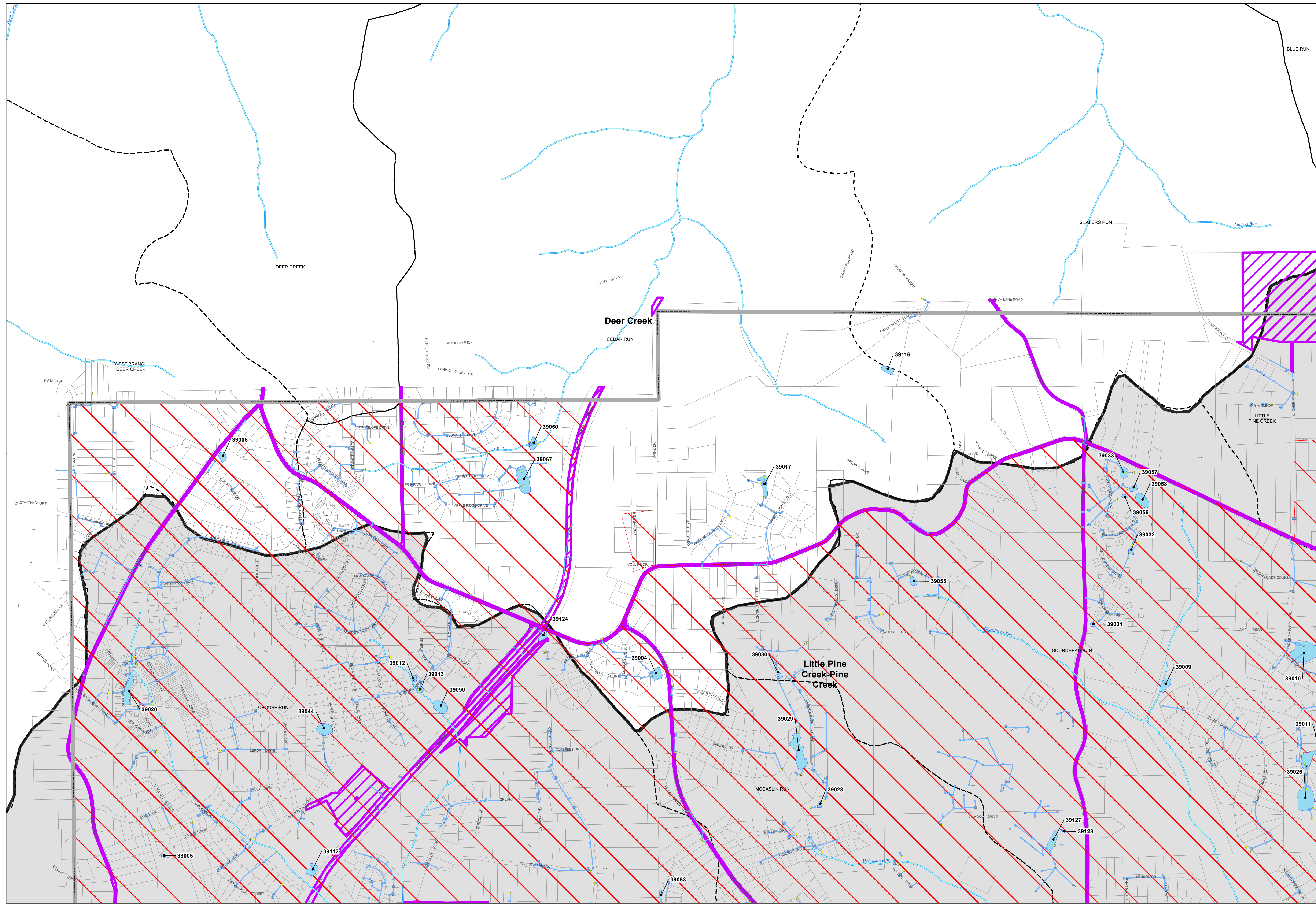
Appendix A – Planning Area Map



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

Hampton Township

Planning Area Map - Deer Creek



- 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
 - Parcel Area
 - Parcels
 - Small Watersheds
 - Deer Creek HUC 12 Watershed
 - Other HUC-12 Watersheds

100 McMorris Road
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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



Watershed Totals

Municipality Loads

Regulated Loads

Unregulated Loads

View loads for municipality:

Hampton Twp (32328)

Source	Source Area (ac)	Sediment		Nitrogen		Phosphorus	
		Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	Loading Rate (lb/ac)
Hay/Pasture	2	97.00	48.50	0.70	0.34	0.10	0.05
Cropland	2	1384.60	692.30	6.40	3.21	0.50	0.26
Forest	22	160.60	7.30	1.50	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	17	1951.60	114.80	12.80	0.75	0.70	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	5	57.50	11.50	1.50	0.29	0.20	0.03
MD Mixed	0	0.00	0.00	0.00	0.00	0.00	0.00
HD Mixed	10	600.00	60.00	13.30	1.33	1.40	0.14
LD Residential	42	487.20	11.60	12.20	0.29	1.30	0.03
MD Residential	15	900.00	60.00	19.80	1.32	2.10	0.14
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		27607.39		13.8		1.8	0.038
Groundwater				284.8		5.7	0.049
Point Sources				0.0		0.0	0.000
Septic Systems				240.8		0.0	0.049
Totals	115	33245.9		607.6		13.8	

Source Weighting

Print

Export to JPEG

Exit



Watershed Totals

Municipality Loads

Regulated Loads

Unregulated Loads

View loads for municipality:

Hampton Twp (32328)

Source	Source Area (ac)	Sediment		Nitrogen		Phosphorus	
		Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	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	47	568.70	12.10	3.80	0.08	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	54	7435.80	137.70	43.20	0.80	1.60	0.03
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	17	192.10	11.30	4.90	0.29	0.50	0.03
MD Mixed	0	0.00	0.00	0.00	0.00	0.00	0.00
HD Mixed	27	1506.60	55.80	32.40	1.20	3.50	0.13
LD Residential	37	421.80	11.40	10.70	0.29	1.10	0.03
MD Residential	62	3490.60	56.30	74.40	1.20	8.70	0.14
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		32199.96		16.0		1.3	0.228
Groundwater				592.2		13.1	0.167
Point Sources				0.0		0.0	0.000
Septic Systems				118.8		0.0	0.167
Totals	244	45815.6		896.4		29.8	

Source Weighting

Print

Export to JPEG

Exit

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



Watershed Totals

Municipality Loads

Regulated Loads

Unregulated Loads

View loads for municipality:

Hampton Twp (32328)

Source	Source Area (ac)	Sediment		Nitrogen		Phosphorus	
		Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	Loading Rate (lb/ac)
Hay/Pasture	2	97.00	48.50	0.70	0.34	0.10	0.05
Cropland	2	1384.60	692.30	6.40	3.21	0.50	0.26
Forest	22	160.60	7.30	1.50	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	17	1951.60	114.80	12.80	0.75	0.70	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	5	56.50	11.30	1.50	0.29	0.20	0.03
MD Mixed	0	0.00	0.00	0.00	0.00	0.00	0.00
HD Mixed	10	590.00	59.00	13.10	1.31	1.40	0.14
LD Residential	42	478.80	11.40	12.20	0.29	1.30	0.03
MD Residential	15	883.50	58.90	19.70	1.31	2.10	0.14
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		27275.21		13.6		1.8	0.038
Groundwater				284.8		5.7	0.049
Point Sources				0.0		0.0	0.000
Septic Systems				240.8		0.0	0.049
Totals	115	32877.8		607.1		13.8	

Source Weighting

Print

Export to JPEG

Exit



Watershed Totals

Municipality Loads

Regulated Loads

Unregulated Loads

View loads for municipality:

Hampton Twp (32328)

Source	Source Area (ac)	Sediment		Nitrogen		Phosphorus	
		Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	Loading Rate (lb/ac)	Total Load (lb)	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	47	568.70	12.10	3.80	0.08	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	54	7435.80	137.70	43.20	0.80	1.60	0.03
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	17	159.80	9.40	4.60	0.27	0.50	0.03
MD Mixed	0	0.00	0.00	0.00	0.00	0.00	0.00
HD Mixed	27	1252.80	46.40	29.70	1.10	3.20	0.12
LD Residential	37	347.80	9.40	10.00	0.27	1.10	0.03
MD Residential	62	2901.60	46.80	68.20	1.10	7.40	0.12
HD Residential	0	0.00	0.00	0.00	0.00	0.00	0.00
Water	0						
Farm Animals				0.0		0.0	0.000
Tile Drainage		0.00		0.0		0.0	0.000
Stream Bank		29200.78		14.8		1.3	0.228
Groundwater				592.2		13.1	0.167
Point Sources				0.0		0.0	0.000
Septic Systems				118.8		0.0	0.167
Totals	244	41867.3		885.3		28.2	

Source Weighting

Print

Export to JPEG

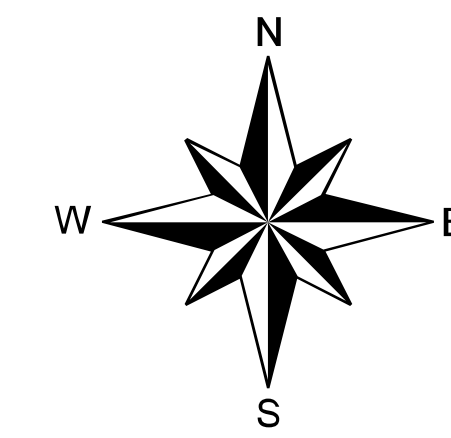
Exit

Appendix D – Existing Permitted BMPs Table

Deer Creek Watershed Existing Permitted BMPs

BMP ID	Site Name	BMP Type	Latitude	Longitude	Drainage Area (acres)	Permit Number	Installation Year
39067	Apple Ridge PRD	Surface Deten., Earth Emb	40.60057766710	-79.92405161310	28.668	N/A	2004
39004	Autumn Ridge	Surface Deten., Earth Emb	40.59592403700	-79.93252290360	7.8	N/A	1987
39006	Bruntonshire	Surface Deten., Earth Emb	40.61076270200	-79.92335637460	20.78	N/A	2003
39057	Hampton Meadows	Surface Deten., Earth Emb	40.57995714180	-79.92375286640	40.8	PAG02000205032R	1989
39017	Oaks of Northampton II	Detention Tank	40.59243918490	-79.92403142400	6.5	N/A	Pre 2002

Appendix E – Potential Structural BMPs Maps



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

Township of Hampton

Proposed Stream Restoration & BMPs

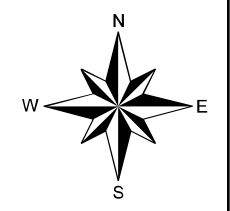
Project Location Overview

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

Township of Hampton

Proposed Stream Restoration & BMPs
Craighead Basin Retrofit

- ### 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

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



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Craighead Basin Retrofit

CRAIGHEAD ROAD

STATE HWY-8

MCCULLY ROAD

McCaskin Run

1110

1100

1090

1080

1070

1060

1050

1040

1040

1030

1050

1040

1070

1080

1090

1000

1020

1010

990

1000

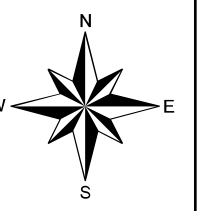
1010

1020

1030

1040

1050



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

Township of Hampton

Proposed Stream Restoration & BMPs

Mallard Landing Pond Restoration

Legend

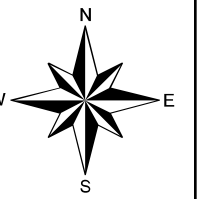
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- Streams
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Storm Sewer Manholes
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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

Township of Hampton

Proposed Stream Restoration & BMPs

Rihn Strasse Basin Retrofit

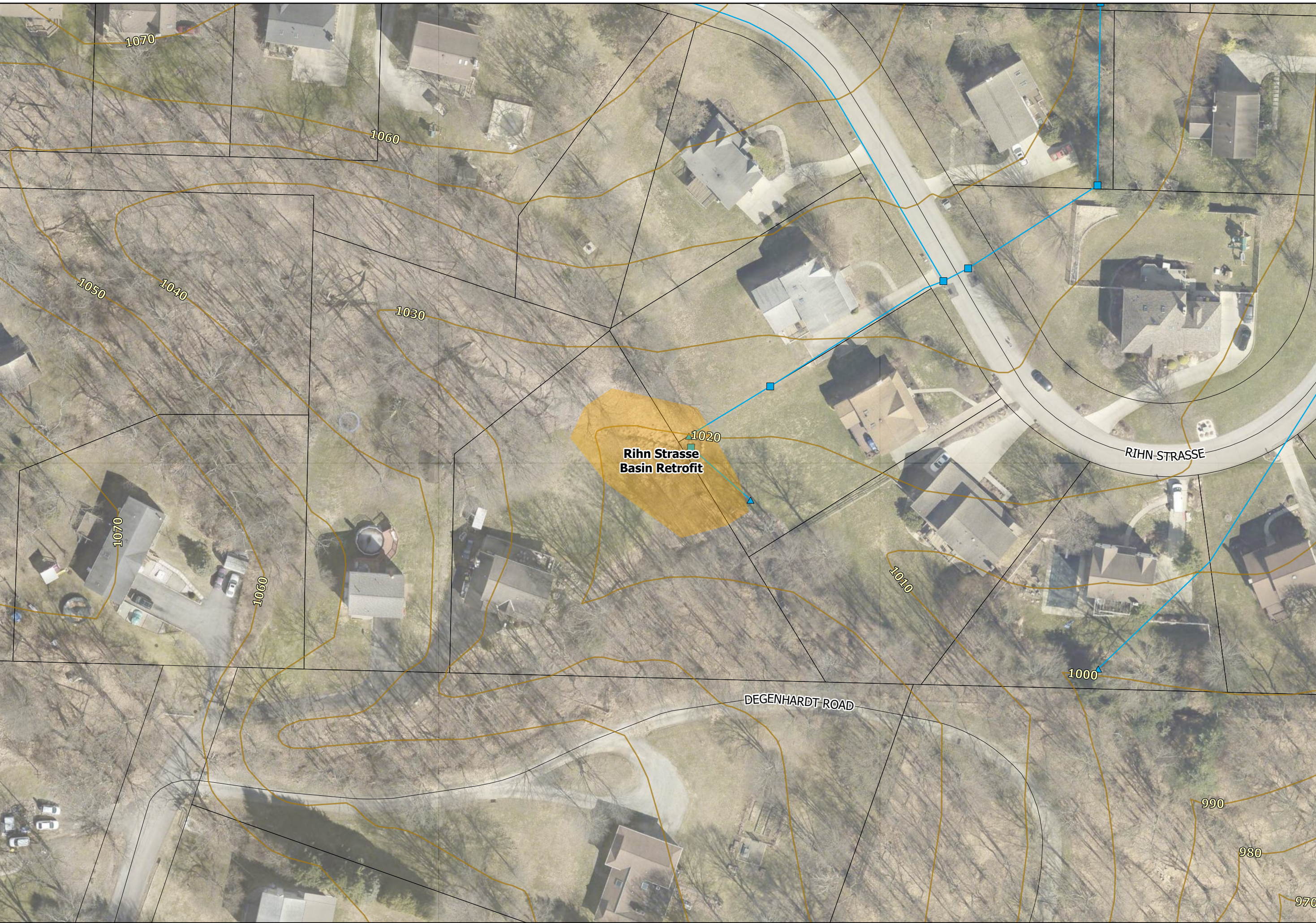
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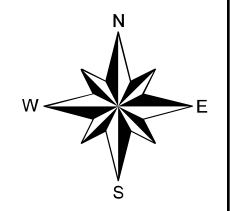
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- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
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Date: June 16, 2023
Job No. C-20419-0017
Scale: 1: 700

Township of Hampton

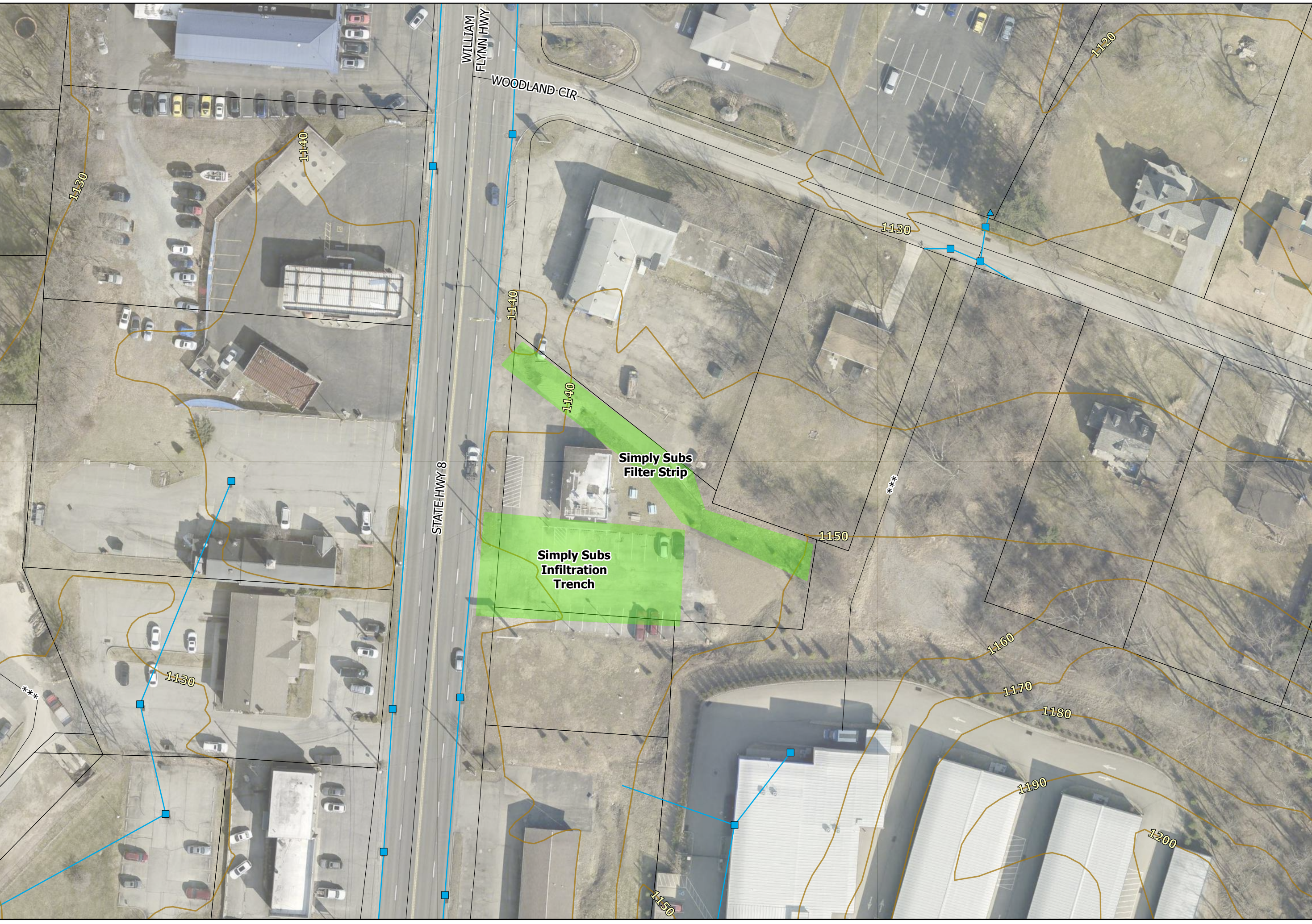
Proposed Stream Restoration & BMPs
Simply Subs Filter Strip

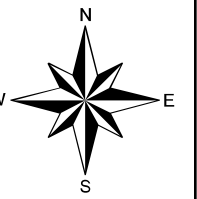
- Legend**
- New Stormwater BMP
 - PA HUC12
 - Storm Sewer Discharge Points
 - Storm Sewer Gravity Mains
 - Storm Sewer Inlets
 - Tax Parcels
 - Ten Foot Contours
 - Municipal Boundaries

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

Township of Hampton

Proposed Stream Restoration & BMPs

Simply Subs Infiltration Trench

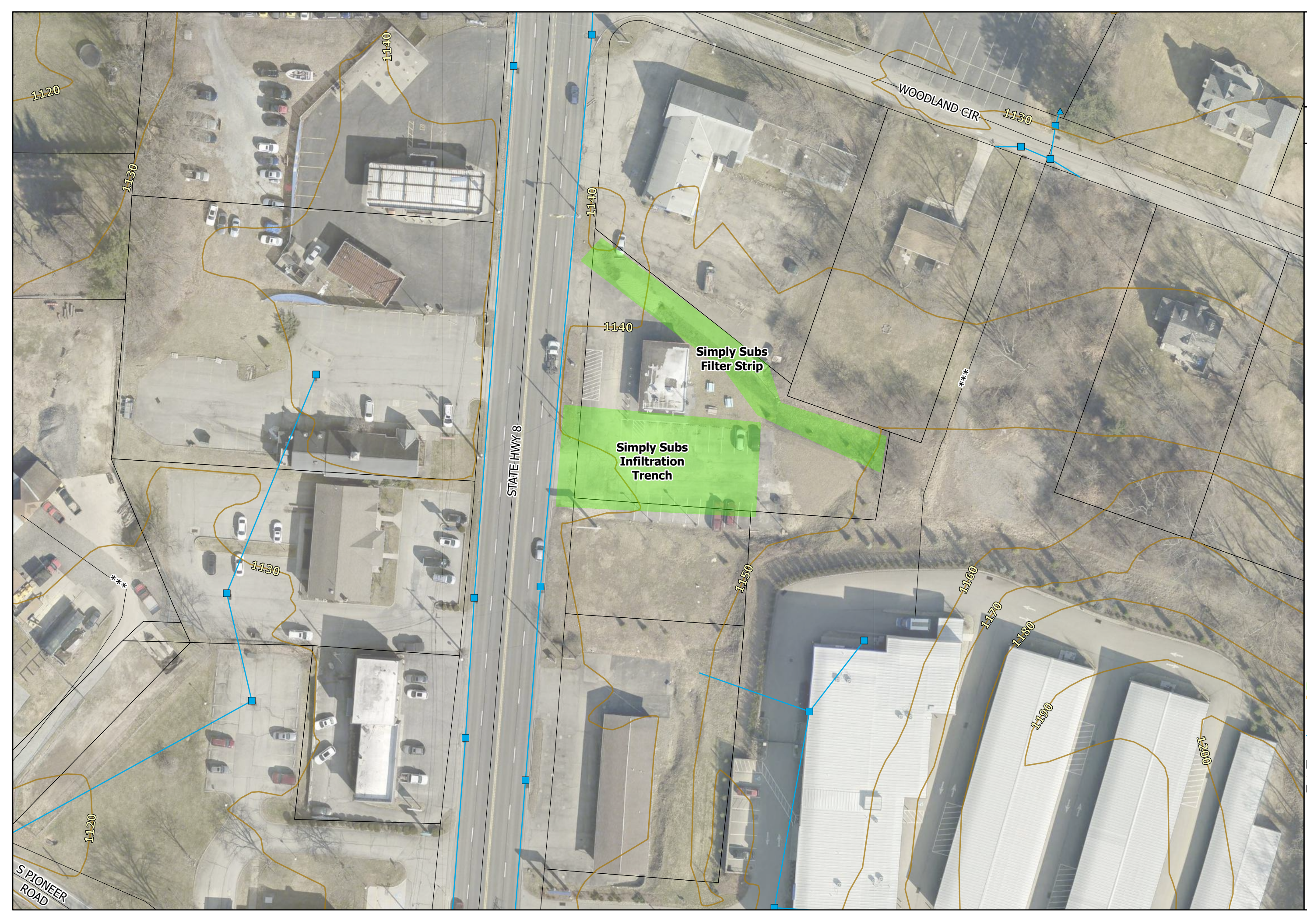
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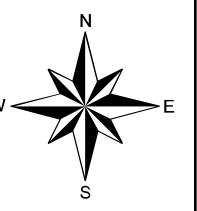
- New Stormwater BMP
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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

Township of Hampton

Proposed Stream Restoration & BMPs
Lightbridge Academy

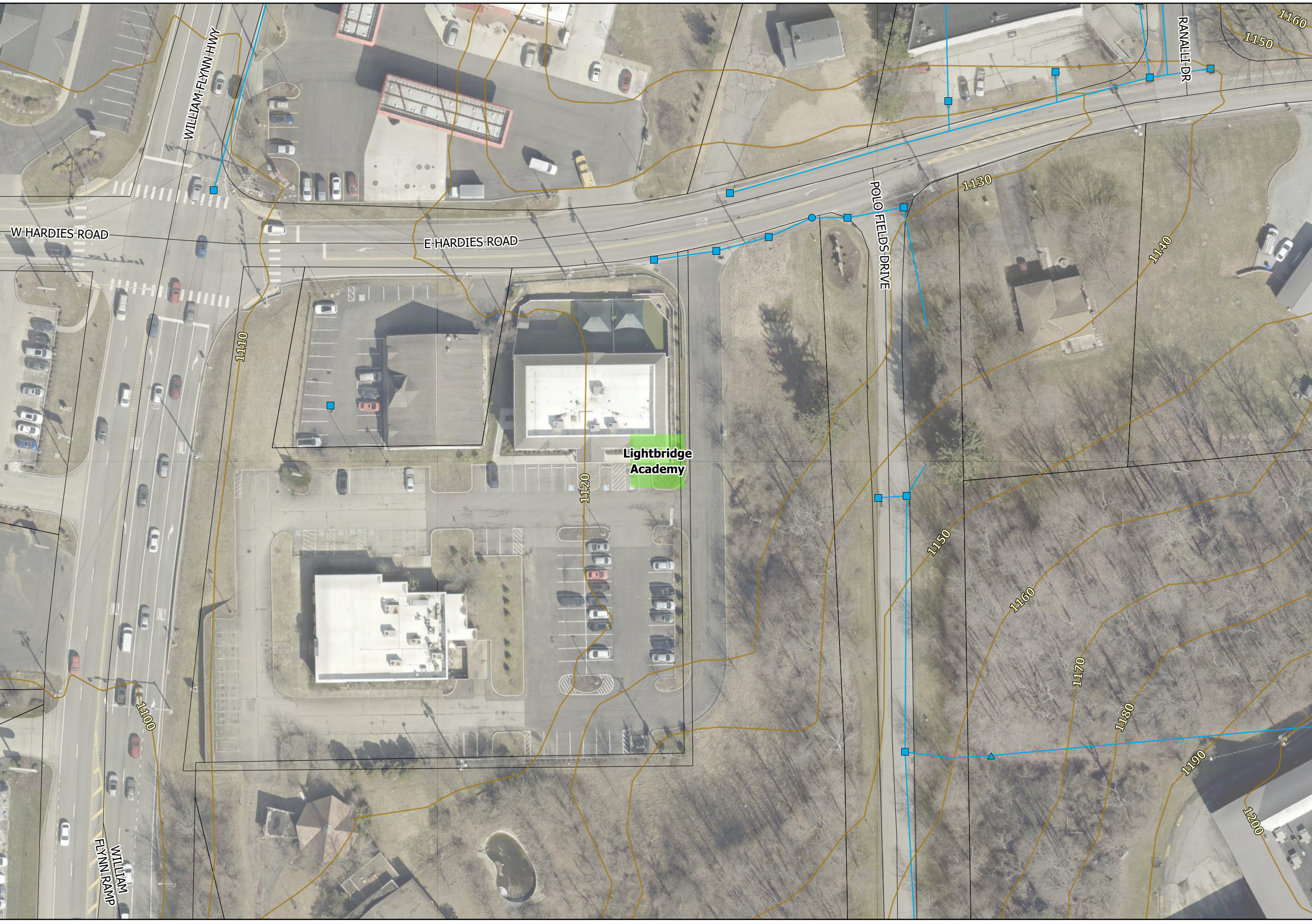
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- New Stormwater BMP
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Storm Sewer Manholes
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

100 McMorris Road
Pittsburgh, PA 15205
Phone: 855-634-9284
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W HARDIES ROAD

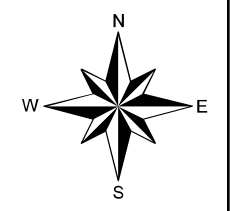
WILLIAM FLYNN HWY

RANALLI DR

POLO FIELDS DRIVE

Lightbridge Academy

WILLIAM FLYNN RAMP



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

Township of Hampton

Proposed Stream Restoration & BMPs

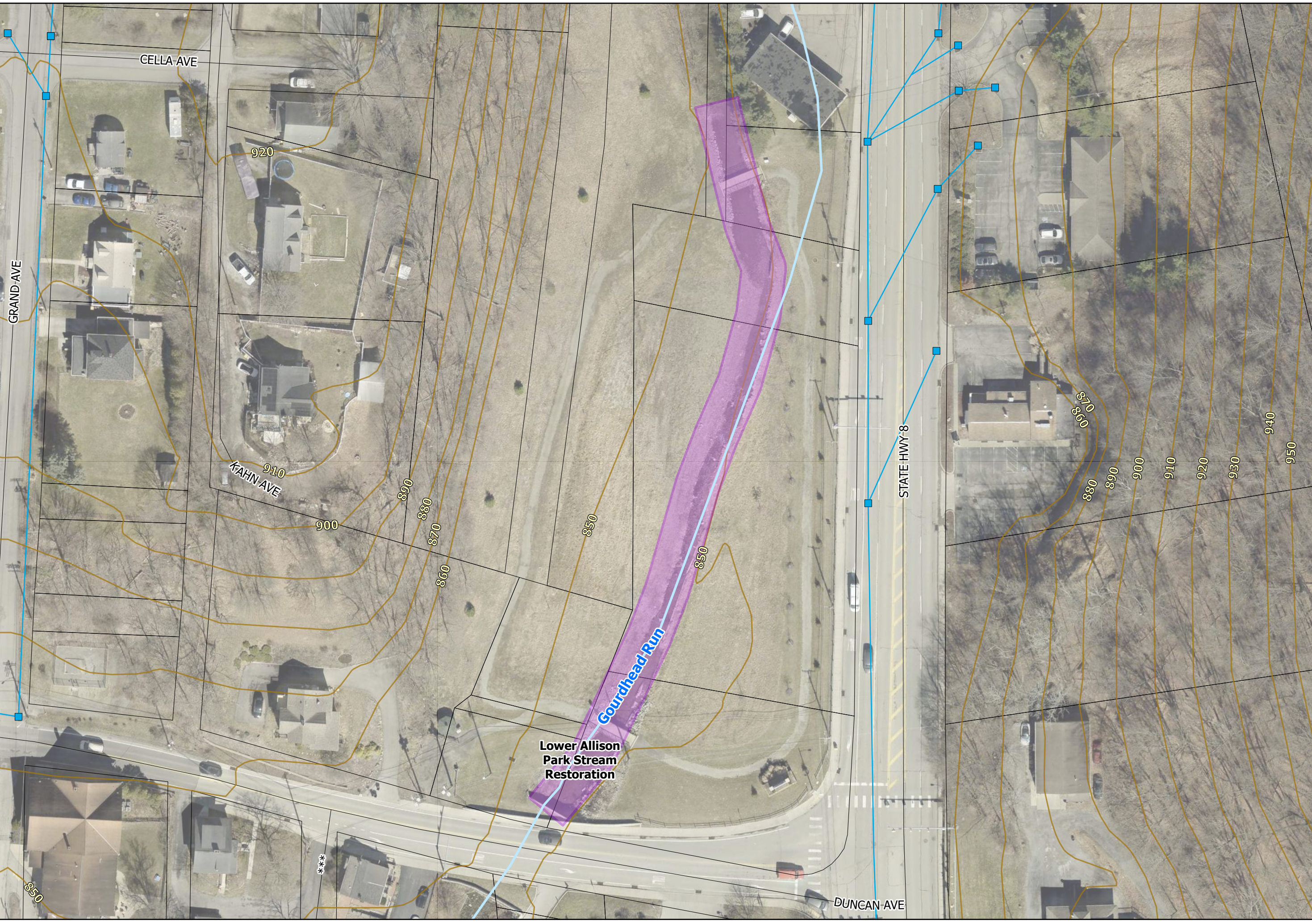
Lower Allison Park Stream Restoration

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

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



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Lower Allison Park Stream Restoration

Gourdhead Run

STATE HWY-8

CELLA-AVE

GRAND AVE

FAHN AVE

DUNCAN AVE

920

910

900

890

880

870

860

850

850

870

860

880

890

900

910

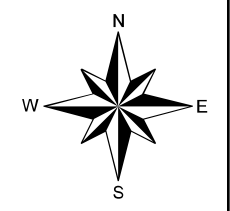
920

930

940

950

850



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

Township of Hampton

Proposed Stream Restoration & BMPs

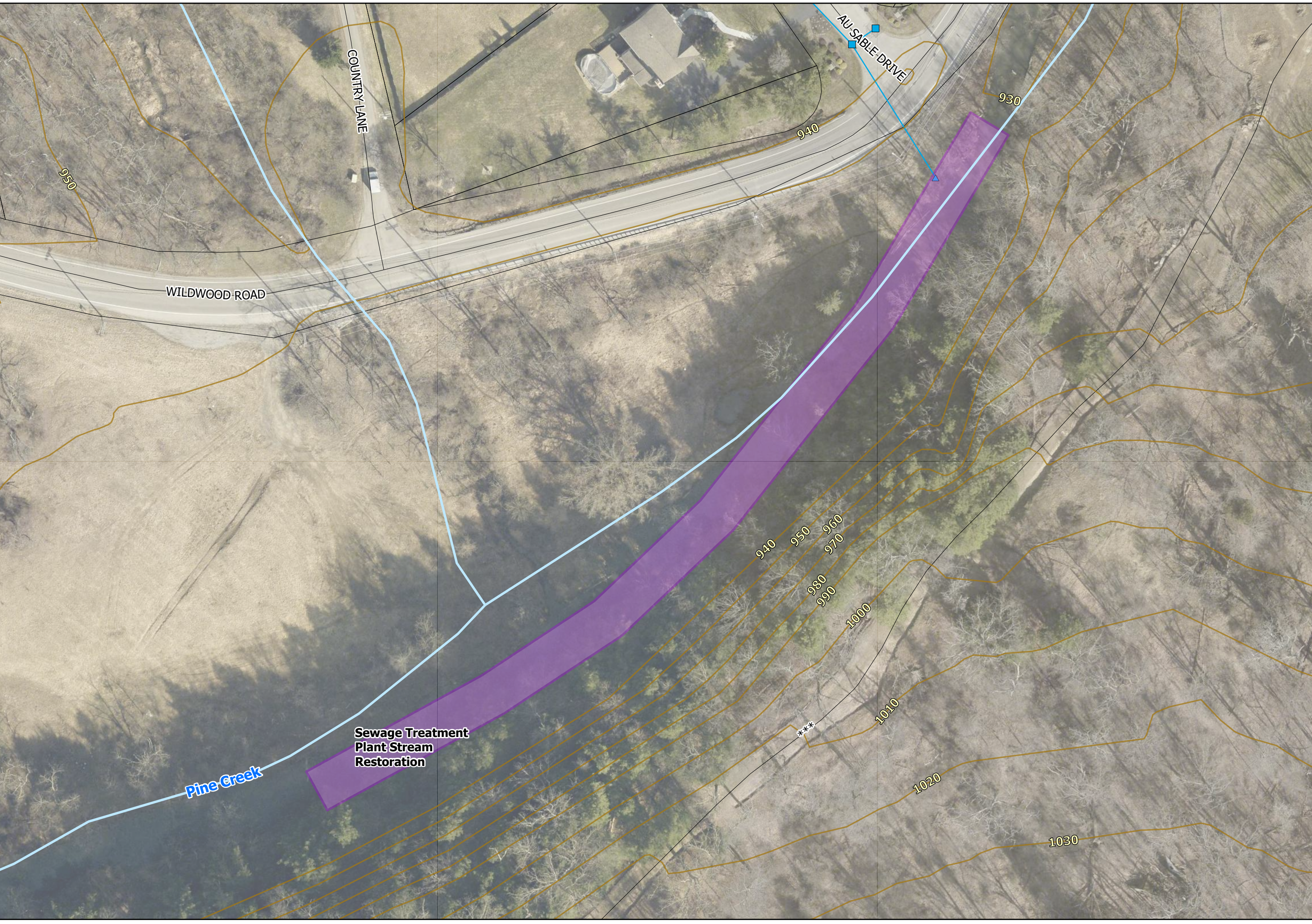
Sewage Treatment Plant Stream Restoration

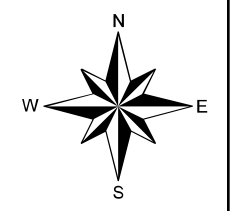
- ### Legend
- Stream Restoration
 - Streams
 - PA HUC12
 - Storm Sewer Discharge Points
 - Storm Sewer Gravity Mains
 - Storm Sewer Inlets
 - Tax Parcels
 - Ten Foot Contours
 - Municipal Boundaries

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



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

Township of Hampton

Proposed Stream Restoration & BMPs

Crouse Run Ravine Stream Restoration

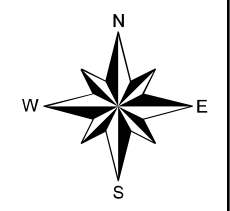
- Legend**
- Stream Restoration
 - Streams
 - PA HUC12
 - Tax Parcels
 - Ten Foot Contours
 - Municipal Boundaries

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



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

Township of Hampton

Proposed Stream Restoration & BMPs

Wildwood Sample Road Stream Restoration

- Legend**
- Stream Restoration
 - Streams
 - PA HUC12
 - Tax Parcels
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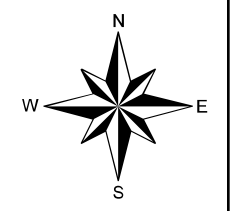
**Wildwood Sample
Road Stream
Restoration**

Pine Creek

WILDWOOD SAMPLE ROAD

SAMPLE ROAD

930
920
910
900
890
890
890
890
940
930
920
910
900
950
960



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Job No. C-20419-0017
Scale: 1: 700

Township of Hampton

Proposed Stream Restoration & BMPs

Crouse Run Pine Creek Confluence

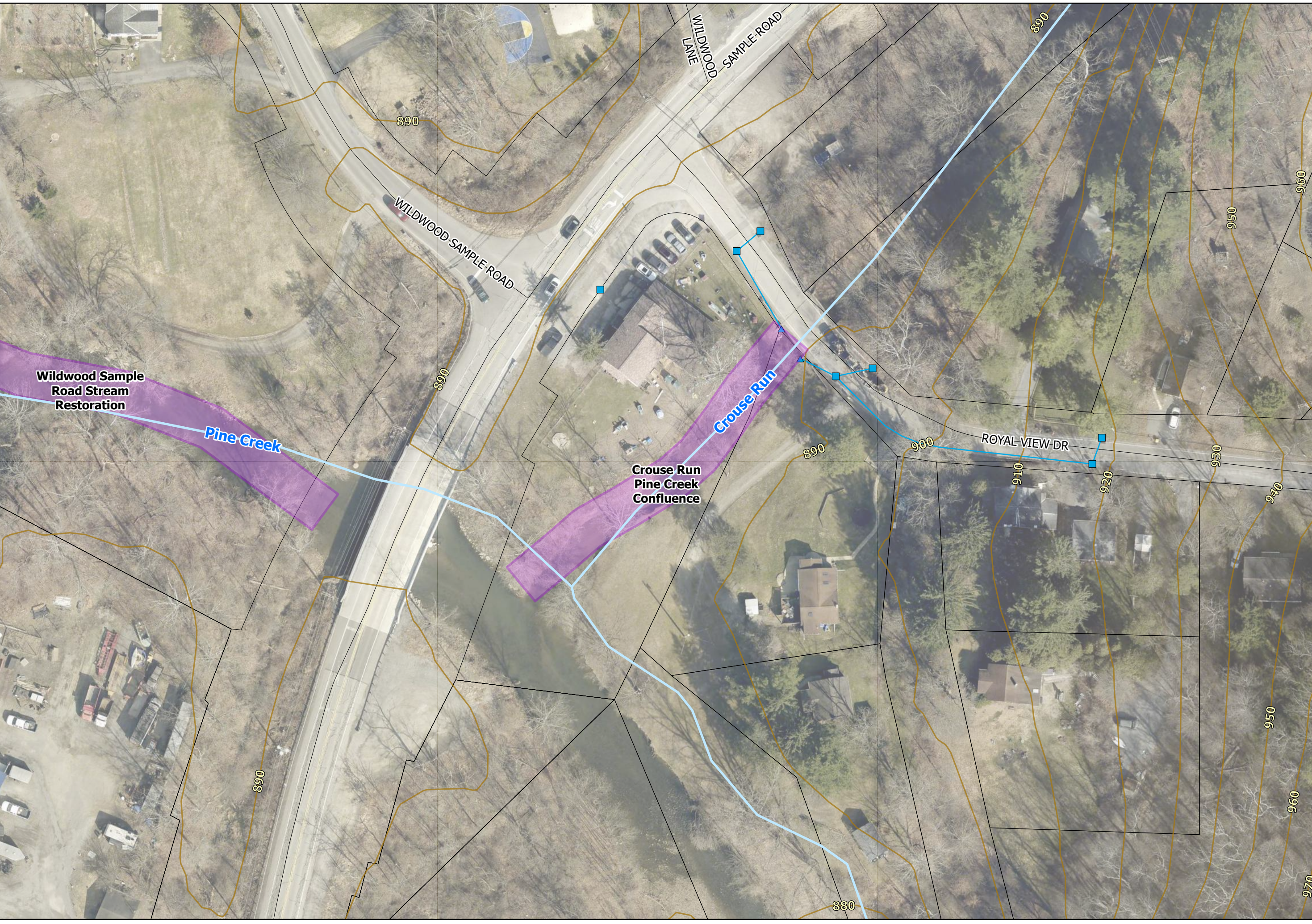
Legend

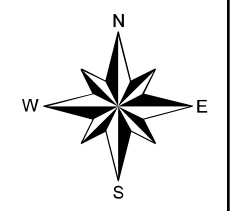
- Stream Restoration
- Streams
- PA HUC12
- Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
- Tax Parcels
- Ten Foot Contours
- Municipal Boundaries

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Township of Hampton

Proposed Stream Restoration & BMPs

Primanti Bros Coventry Square Basin

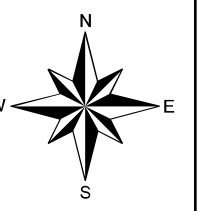
- ### Legend
- Existing BMP Retrofit
 - PA HUC12
 - Storm Sewer Discharge Points
 - Storm Sewer Gravity Mains
 - Storm Sewer Inlets
 - Tax Parcels
 - Ten Foot Contours
 - Municipal Boundaries

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Township of Hampton

Proposed Stream Restoration & BMPs
New Stormwater BMP

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Legend

- New Stormwater BMP
- PA HUC12
- ▲ Storm Sewer Discharge Points
- Storm Sewer Gravity Mains
- Storm Sewer Inlets
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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	