Addendum to Doylestown Township Total Maximum Daily Load Plan (TMDL Plan) and Pollutant Reduction Plan (PRP)

Prepared For:
Doylestown Township
425 Wells Road
Doylestown, Pa 18901

Prepared By:
Gilmore and Associates, Inc.
65 East Butler Avenue
New Britain, Pa 18901

Project # 2009078PLN

Date: October 10, 2024

Draft Plan Approved by Doylestown Township Manager:

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(DATE)

Draft Plan Approved by Doylestown Township Board of Supervisors:

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(DATE)

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

Purpose of the Addendum

This addendum provides updates to the "Doylestown Township Total Maximum Daily Load Plan (TMDL Plan) and Pollutant Reduction Plan (PRP) prepared by GHD, last revised April 2019. This addendum addresses the changes to the proposed Best Management Practices (BMPs) to satisfy Doylestown Township's pollutant reduction requirement for Neshaminy Creek, Pine Run, Cooks Run, and Mill Creek.

After consultation with the Pennsylvania Department of Environmental Protection (PA DEP) on July 2, 2024, the Township may combine the individual HUC-12 watershed's (i.e. drainage basin's) loading requirement into a singular overall loading requirement.

Since the Township can be analyzed as a singular drainage basin, it eliminates the need for BMPs to be proposed within each watershed. Hence, the plan will be revised to remove costly and possibly unqualified stream restoration projects for more economical and feasible Township-owned basin retrofits.

Additionally, the "Existing BMP Pollutant Reduction Credits" utilized in the original report to reduce the baseline sediment loading was removed since the identified BMPs were installed after the TMDL approval date and the calculation methodology was not consistent with the Baseline Sediment Loading calculations.

Apart from those above mentioned revisions, this document supplements the original report and should be read in conjunction with it.

Summary of Revisions and Updates

Within section D of the original report, the existing sediment loading was identified for Neshaminy Creek, Pine Run, Cooks Run, and Mill Creek as 1,597,562 lbs, 449,292 lbs, 443,868 lbs, and 66,452 lbs, respectively, and demonstrated in Table D.1. Existing BMPs in each watershed since 2003 reduced the baseline loading for Neshaminy Creek, Pine Run, Cooks Run and Mill Creek to produce an adjusted existing sediment load of 1,539,720 lbs, 424,272 lbs, 396,635 lbs, and 66,269 lbs, respectively. The Township was required to reduce this adjusted existing sediment loading by 10% in the five-year permit cycle, which is set to expire by November 30, 2024.

The revised addendum removes Table D.2 "Existing BMP Pollutant Reduction Credits" and Table D.3 "Adjusted Sediment Loads and Minimum Required Reductions in Pollutant Loading". The values found in Table D.1 of the original report are shown below in Section D with a new overall minimum sediment reduction requirement included.

A. Public Participation

A copy of this addendum will be made available at the Doylestown Township municipal office. A public notice advertising this addendum will be published in the Intelligencer newspaper. Additionally, the Doylestown MS4 Permit with the revised changes to the PRP/TMDL will be presented at the Board of Supervisors meeting held on October 15, 2024. The Township will accept comments at the meeting which will be included in the final addendum at the end of the 30-day comment period.

B. Map

The map has been updated to identify the new proposed BMPs locations and is included in Appendix C of this addendum.

D. Determination of Existing Loading for Pollutants of Concern

Table D.1 Base Existing Sediment Load Calculations **(Revised)**

Watershed	TMDL WLA?	MS4 Planning Area Total Acres	Wiki Watershed Load Calculations for TSS (lbs)	Minimum Sediment Reduction (lbs)
Neshaminy Creek	N	3,454	1,597,562	159,756
Pine Run	Y	996	449,292	44,929
Cooks Run	N	596	443,868	44,387
Mill Creek	Y	199	66,452	6645
Entire Planning Area		5,245	2,557,174	255,717

With a new sediment reduction requirement of 255,717 lbs and the ability to locate BMPs regardless of watershed area, the Township has identified new potential sediment reduction BMPs to be installed. The following section removes and replaces Section E of the original report.

E. Selection of BMPs to Achieve the Minimum Required Reductions in Pollutant Loading

The Township has identified nineteen potential BMP projects to satisfy the short-term 10% sediment reduction requirement and to overcompensate for the long-term reduction requirement. Within this permit cycle, five BMPs were selected and highlighted in yellow on Table E.1 below to achieve the Township's short-term goal.

The five BMPs include a stream restoration project and four (4) basin retrofit projects. As of the summer of 2024, construction of the stream restoration project (BMP-A) has commenced and will be completed by the November 30th load reduction deadline which satisfies 80% of the Township's pollutant reduction requirement. This stream restoration project was proposed in

the original PRP/TMDL report. The proposed basin retrofit located on Sheridan Road and identified as BMP-S is in the design phase and the Township intends to have this project out to construction in 2026. The remaining three basin retrofits (BMPs J,M,P) are in the preliminary design budgeting phase with construction to begin in 2026. The five BMPs will provide a total sediment reduction of 262,203.10 lbs.

Individual BMP summaries with project descriptions, BMP types, load calculations, land uses, treated drainage areas, O&M requirements, project costs, and funding mechanisms are attached to this addendum in Appendix A. Proposed BMP Exhibits are included in Appendix B which clearly identifies BMP locations. If during the preliminary analysis phase, it is discovered that the pollutant loading will not be achieved with the following five BMPs, the remaining BMPs identified on Table E.1 will be considered.

Table E.1 PRP/TMDL BMP Summary Table

Proposed BMP	BMP Map #	BMP Description	Location	Lat.	Long.	BMP Type	TSS Removal Efficiency (%)[1]	Treated Drainage Area (ac)	Load Reduction (lbs/yr)[2]	Estimated Project Cost	Cost/lb Removed	Basin Area (sf)	Projected Time of Completion	Responsible Party	O&M Requirements	Project Phase (Update 2024)	Project Description
A	N/A	Unnamed tributary to Neshaminy Creek Stream Restoration	Doylestown Central Park	N/A		Stream Restoration	115 lbs/ft/yr	N/A	207,000	$ 820,000.00	$ 3.96	N/A	2024	Doylestown Township	See BMP Summary	In Construction	To address the eroded streambanks and related creek flow regime problems. Stabilization and enhancement efforts to be installed along several locations of stream
B	1	Spring Valley Basin	Spring Valley Road	40°18'09",	-75°05'46",	Dry Extented Detention Basin	60	9.58	3193.96	$ 35,000.00	$ 10.32	21000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Remove low flow concrete channel, outlet structure modification to promote recharge and vegetation naturalization
C	2	Valley View Basin 1	Valley Circle	40°17'27",	-75°05'57",	Dry Extented Detention Basin	60	7.13	2327.77	$ 32,000.00	$ 13.23	12700	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Outlet structure modification to promote recharge and vegetation naturalization
D	3	Valley View Basin 2	Vale View Drive	40°17'31",	-75°08'48",	Dry Extented Detention Basin	60	22.69	8795.42	$ 400,000.00	$ 48.58	31000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Sediment and standing water is present within the basin which will require remediation including soil amendments, underdrain installation, forebay grading, removal of low flow channel and vegetation naturalization
E	5	Ridings at Covered Bridge Basin 1	Ridings Lane	40°18'37",	-75°11'17",	Dry Extented Detention Basin	60	14.92	4226.91	$ 35,000.00	$ 7.74	20000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Outlet structure modification to promote recharge and vegetation naturalization
F	6	Ridings at Covered Bridge Basin 2	Mystic View Lane	40°18'31",	-75°11'06",	Dry Extented Detention Basin	60	12.32	3955.54	$ 45,000.00	$ 10.63	56000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Outlet structure modification to promote recharge and vegetation naturalization
G	7	Ridings at Covered Bridge Basin 3	Longwood Circle	40°18'24",	-75°11'15",	Dry Extented Detention Basin	60	23.63	7435.75	$ 40,000.00	$ 4.92	35000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Remove low flow concrete channel, outlet structure modification to promote recharge and vegetation naturalization
H	8	Covered Bridge Basin 1	407 Hagan Court	40°18'42",	-75°11'06",	Dry Extented Detention Basin	60	4.87	1718.74	$ 32,000.00	$ 17.36	9000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Outlet structure modification to promote recharge and vegetation naturalization
I	9	Covered Bridge Basin 2	699 Covered Bridge Lane	40°18'48",	-75°10'52",	Dry Extented Detention Basin	60	21.77	5889.86	$ 42,000.00	$ 6.83	49000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Outlet structure modification to promote recharge and vegetation naturalization
J	10	Doylestown Knoll Basin 1	38 Brinker Drive	40°16'40",	-75°09'14",	Dry Extented Detention Basin	60	22.22	10526.5	$ 35,000.00	$ 3.11	20000	2026	Doylestown Township	See BMP Summary	2025 Preliminary Analysis Budget	Outlet structure modification to promote recharge and vegetation naturalization
K	11	Doylestown Knoll Basin 2	81 Brinker Drive	40°16'37",	-75°09'26",	Dry Extented Detention Basin	60	20.99	11788.5	$ 420,000.00	$ 39.76	34000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Sediment and standing water is present within the basin which will require remediation including soil amendments, underdrain installation, forebay grading, removal of low flow channel and vegetation naturalization
L	13	Doylestown Hunt Basin 2	266 Fox Chase Lane	40°17'54"",	-75°07'58",	Dry Extented Detention Basin	60	30.41	17675.8	$ 35,000.00	$ 1.86	21000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Remove low flow concrete channel, outlet structure modification to promote recharge and vegetation naturalization
M	14	Doylestown Hunt Basin 3	235 Tether Way	40°17'48",	-75°08'28",	Dry Extented Detention Basin	60	46.87	30,260.10	$ 45,000.00	$ 1.31	47000	2026	Doylestown Township	See BMP Summary	2025 Preliminary Analysis Budget	Remove low flow concrete channel, outlet structure modification to promote recharge and vegetation naturalization
N	15	Doylestown Lea Basin 1	27 Bittersweet Drive	40°16'54",	-75°09'82",	Dry Extented Detention Basin	60	15.59	9,331.50	$ 42,000.00	$ 4.48	55000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Remove low flow concrete channel, outlet structure modification to promote recharge and vegetation naturalization
O	16	Doylestown Lea Basin 2	Arbor Lea Circle	40°17'05",	-75°08'37",	Dry Extented Detention Basin	60	22.75	14,834.20	$ 442,000.00	$ 24.16	26000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Sediment and standing water is present within the basin which will require remediation including soil amendments, underdrain installation, forebay grading, removal of low flow channel and vegetation naturalization

Table E.1 PRP/TMDL BMP Summary Table

Proposed BMP	BMP Map #	BMP Description	Location	Lat.	Long.	BMP Type	TSS Removal Efficiency (%)[1]	Treated Drainage Area (ac)	Load Reduction (lbs/yr)[2]	Estimated Project Cost	Cost/lb Removed	Basin Area (sf)	Projected Time of Completion	Responsible Party	O&M Requirements	Project Phase (Update 2024)	Project Description
P	17	Doylestown Lea Basin 3	1 Bittersweet Drive	40°16'56",	-75°08'39",	Dry Extented Detention Basin	60	13.64	8,871.20	$ 35,000.00	$ 3.70	19500	2026	Doylestown Township	See BMP Summary	2025 Preliminary Analysis Budget	Outlet structure modification to promote recharge and vegetation naturalization
Q	18	Doylestown Lea Basin 4	49 Bittersweet Drive	40°16'51",	-75°08'57",	Dry Extented Detention Basin	60	15.26	8,191.30	$ 40,000.00	$ 4.42	32000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Outlet structure modification to promote recharge and vegetation naturalization
R	97	Cedarcrest Court Basin	Cedarcrest Court	40°17'02",	-75°10'38",	Dry Extented Detention Basin	60	46.93	28,108.20	$ 382,000.00	$ 18.64	38000	TBD	Doylestown Township	See BMP Summary	Vegetation Naturalization	Sediment and standing water is present within the basin which will require remediation including soil amendments, underdrain installation, forebay grading, removal of low flow channel and vegetation naturalization
S	104	Sheridan Road Basin	Sheridan Road	40°16'48",	-75°06'58",	Dry Extented Detention Basin	60	46.93	5,545.30	$ 290,000.00	$ 50.96	20500	2026	Doylestown Township	See BMP Summary	Preliminary Design/Analysis	Sediment and standing water is present within the basin which will require remediation including soil amendments, underdrain installation, forebay grading, removal of low flow channel and vegetation naturalization

				Estimated Project Cost
2019-2024 Sediment Reduction Requirement (lbs)	*255,717*	**Total Load Reduction (All BMPs) (lbs/yr)**	389,676.55	$ 3,247,000.00
Recommended BMPs to be constructed to satisfy requirement	A,J,M,P,S	**Load Reduction (BMPs A, J,M,P,S)**	262,203.10	$ 1,225,000.00

Update 9/19/24: BMP A Stream Restoration in construction — **Remaining Project Costs (BMP J,M,P,S)** $ **405,000.00** — **Pollutant Reduction (%) Completed (end of 2024)** **81%**

1:Based on BMP Effectiveness Values 3800-PM-BCW0100m, Rev 06/2018

2:See Loading Reduction Calculations on BMP Summary

*Estimated Cost based upon work performed through Public Works Department. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will vary.

Appendix A:
BMP Summary

BMP # A

BMP Description:	Unnamed Tributary to Neshaminy Creek Stream Restoration
Location:	Doylestown Central Park
Lat/Long:	N/A
BMP type:	Streambank Restoration

Project Description:
The Township intends to remediate eroded streambanks and related creek flow regime problems along several sections along the tributary to the Neshaminy Creek. Stabilization and enhancement efforts will be installed at several locations to prevent or mitigate future erosion and scour.

Estimated Project Cost:
$820,000.00

Project Funding: General Funds

Restoration Length: 1800 LF

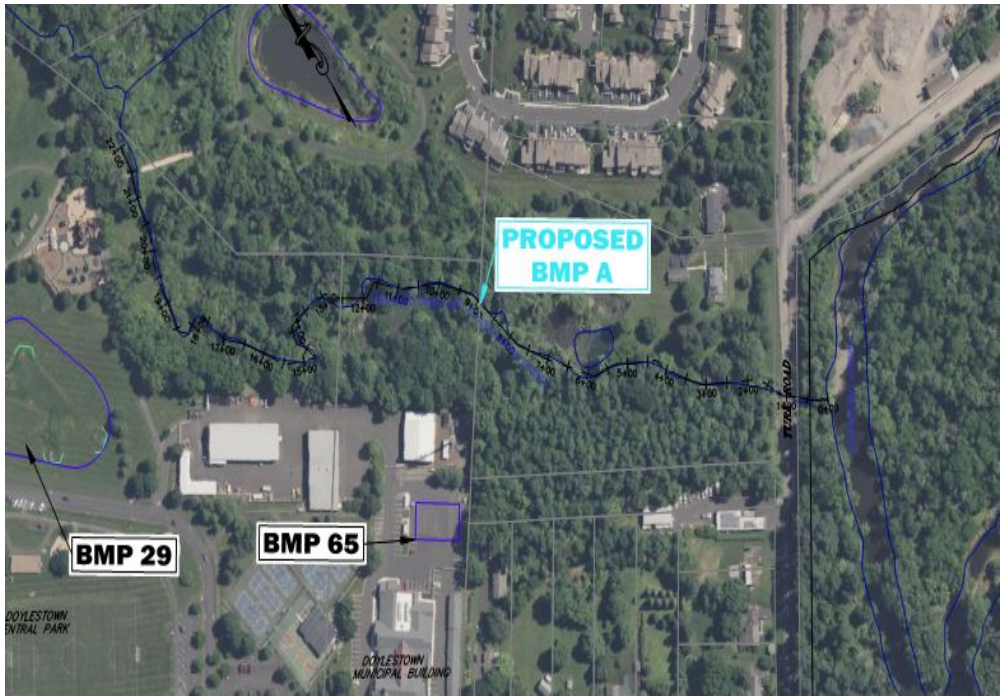
Siting Criteria:

- 1st Order Stream
- Addresses approximately 2000 LF of streambank
- Impervious upstream areas are treated sufficiently through implementation of stormwater management ordinance

Load Reduction Credit:
*Mapshed default rate: 115 lb/ft

1800 LF x 115 lb/ft = **207,000 lbs**

LOCATION



BMP # A

BMP Description:	Unnamed Tributary to Neshaminy Creek Stream Restoration
Location:	Doylestown Central Park
Lat/Long:	N/A
BMP type:	Streambank Restoration

Existing Site Conditions

View looking downstream showing channel migration. The stream bank is vertical with exposed fine grained soil and excessive new gravel deposition of the inside of the meander. Lack of woody riparian zone.

Operations & Maintenance Program

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

• Trash and debris removal, rodent removal and repairs of physical damage. Invasive and/or noxious species shall be removed immediately when noted, including but not limited to English Ivy, Japanese stilt grass, mulitflora rose, wineberry, cattails, phragmites, and poision ivy.

Quarterly –

Coir-fiber log toe protection: Inspected to ensure they remain anchored to slope and streambed. Jute matting shall be placed under the log prior to installation of new stakes and wires as needed to re-establish contact with bed/bank of the stream.

- If erosion or scour has occurred along slope behind the log, contact Doylestown Township for maintenance:
  1) for small areas, additional logs shall be installed perpendicular to the stream flow to prevent further erosion in this area. If biolog is not available, erosion area may be filled with R-4 riprap and live stakes driven through the stone at 3ft on center to stabilize the stone.
  2) If erosion or scour has occurred along the length of the biolog, it shall be filled with Class C well-graded stone. Class C stone shall consist of 1 part R-6 riprap + 2 parts R-5 riprap + 2 parts R-4 riprap.

Sloped banks with Jute Fabric and Vegetation

A. 100% vegetative coverage by herbaceous species must be maintained throughout all areas of the slope. Any areas that become void of vegetation must be immediately corrected by replanting, reseeding or other adequate measures necessary to prevent erosion that may jeopardize the structural integrity of the facility.

B. All vegetation throughout all areas of the facility must be mowed at a minimum of one time per year in the spring, and a maximum of three times per year. Minimum height of vegetation when mown shall be six (6") inches.

C. Any erosion, slumping or other soil disturbances that are noted during routine maintenance shall be immediately repaired. Additional materials shall be added where necessary to return eroded areas to grade. All repaired areas shall be immediately re-vegetated with live stakes or other recommended herbaceous species.

1. To re-vegetate with live stakes, harvest live cuttings from existing onsite plant material per following specification on 'Harvesting and Handling of Woody Cuttings.'

D. Invasive or noxious species (see above) shall be removed immediately when observed. For persistent weed species, spot treat with a weed killer approved for use in wetland areas.

Geotextile soil wrap with brush layers

A. There are minimal maintenance or inspection requirements for this type of installation. The embankment shall be inspected per the above noted schedule to insure structural stability and adequate growth of the brush layers.

B. Invasive or noxious species (see above) shall be removed immediately when observed. For persistent weed species, spot treat with a weed killer approved for use in wetland areas.

C. Any areas of soil wrap that become void of vegetation must be immediately corrected by installation of additional live stakes. Due to nature of the stabilization measure, it may be necessary to create a pilot hole by driving rebar into slope prior to installation of the live stake.

1. To re-vegetate with live stakes, harvest live cuttings from existing onsite plant material per following specification on 'Harvesting and Handling of Woody Cuttings.'

D. In the event that areas of the treated slope fail or erosion develops along or adjacent to the slope, Doylestown Township shall be contacted to address the problems beyond the scope of maintenance procedures.

Rock Diversions

A. There are minimal maintenance or inspection requirements for this type of installation. The rock shall be inspected per the above noted schedule to insure structural stability.

B. Keyway into embankment shall be inspected for erosion along edges of stone. Any areas of erosion shall be repaired/restored per Section 3 on Jute Matting with Vegetation.

Brush Mattress with Live Stakes

A. There are minimal maintenance or inspection requirements for this type of installation. The brush mattress area shall be inspected per the above noted schedule to insure stability.

B. If erosion has occurred along this area, contact Doylestown Township for inspection and/or repair.

Update 9/2024: Project is in construction phase. DEP MS4 Department had a site visit on 8/14/24 to assure construction techniques will qualify for restoration credit.

BMP # B

BMP Description:	Spring Valley Basin
Location:	Spring Valley Road
Lat/Long:	40°18'09", -75°05'46",
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

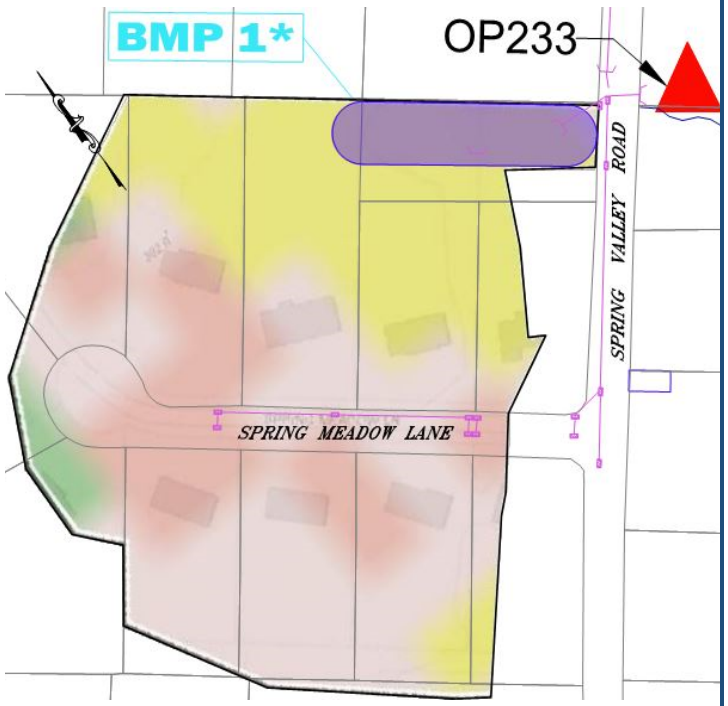
From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through removal of the low flow concrete channel, reconfiguration of the outlet structure to promote recharge and vegetation naturalization.
Year Constructed:
1990
Estimated Project Cost:
$35,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
9.58 acres
BMP Efficiency: 60%
Map #: 1

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*52.3%*
Developed, Low	1260	*18.2%*
Hay/Pasture	380	*29.6%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (9.58 ac x 0.523 x 410 lb/ac/yr x 0.60) + (9.58 ac x 0.182 x 1260 lb/ac/yr x 0.60)+ (9.58 ac x 0.296 x 380 lb/ac/yr x 0.60) = **3193.96 lbs**

BMP # B

BMP Description:	Spring Valley Basin
Location:	Spring Valley Road
Lat/Long:	40°18'09", -75°05'46",
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 8-3-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

BMP # C

BMP Description:	Valley View Basin 1
Location:	Valley Circle
Lat/Long:	40°17'27", -75°05'57"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

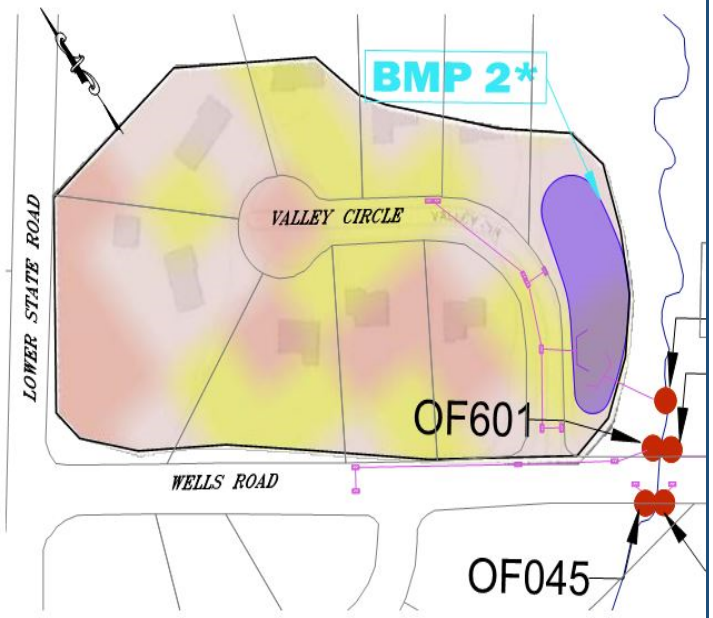
From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.
Year Constructed:
1990
Estimated Project Cost:
$32,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
7.13 acres
BMP Efficiency: 60%
Map #: 2

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*41.4%*
Developed, Low	1260	*17.2%*
Hay/Pasture	380	*41.4%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (7.13 ac x 0.414 x 410 lb/ac/yr x 0.60) + (7.13 ac x 0.172 x 1260 lb/ac/yr x 0.60)+ (7.13 ac x 0.414 x 380 lb/ac/yr x 0.60) = **2327.77 lbs**

BMP # C

BMP Description:	Valley View Basin 1
Location:	Valley Circle
Lat/Long:	40°17'27", -75°05'57"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Picture taken 8-3-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-24-24 – Basin continues to naturalize – Maintenance Needed: Remove encroaching vegetation and sediment buildup at outfall.

BMP # D

BMP Description:	Valley View Basin 2
Location:	Vale View Drive
Lat/Long:	40°17'31", -75°08'48"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, removal of low flow channel, soil amendment, underdrain installation, forebay grading and vegetation naturalization.

Year Constructed:
1990

Estimated Project Cost:
$400,000.00

Project Funding: General Funds/Grants

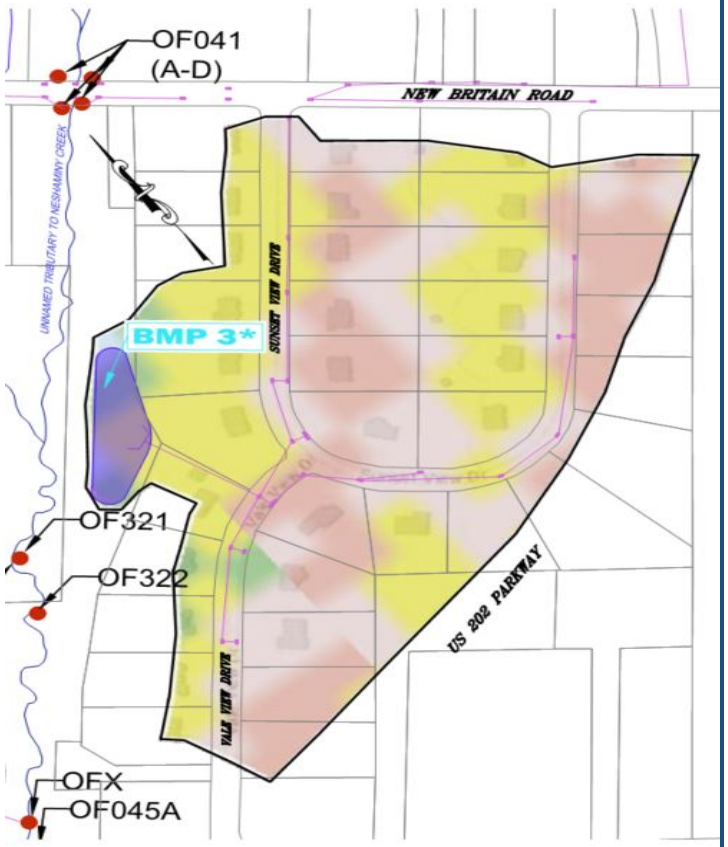
Treated Drainage Area:
22.69 acres

BMP Efficiency: 60%

Map #: 3

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*31.4%*
Developed, Low	1260	*27.5%*
Hay/Pasture	380	*40.2%*
Developed, Medium	1881	*1.0%*

LOCATION



** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= *(Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate*

= (22.69 ac x 0.314x 410 lb/ac/yr x 0.60) + (22.69 ac x 0.275 x 1260 lb/ac/yr x 0.60)+ (22.69 ac x 0.402 x 380 lb/ac/yr x 0.60) + (22.69 ac x 0.01 x 1881 lb/ac/yr x 0.60) = **8795.42 lbs**

BMP # D

BMP Description:	Valley View Basin 2
Location:	Vale View Drive
Lat/Long:	40°17'31", -75°08'48"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall

Picture taken 8-3-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-24-24 – Basin continues to naturalize. Maintenance needed – Standing water, remove buildup of sediment

BMP # E

BMP Description:	Ridings at Covered Bridge Basin 1
Location:	Ridings Lane
Lat/Long:	40°18'37", -75°11'17"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

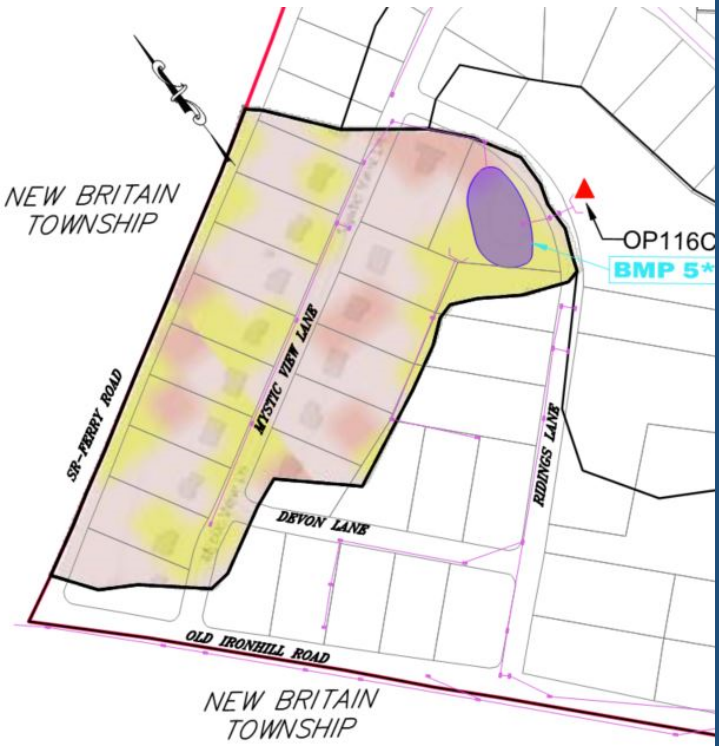
From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.
Year Constructed:
1992
Estimated Project Cost:
$35,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
14.92 acres
BMP Efficiency: 60%
Map #: 5

Land Use NLCD 2011 in DA:

Land Use	Loading Rate lb/ac/yr**	% Coverage
Open Space, Developed	410	*48.5%*
Developed, Low	1260	*8.8%*
Hay/Pasture	380	*42.7%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (14.92 ac x 0.485 x 410 lb/ac/yr x 0.60) + (14.92 ac x 0.088 x 1260 lb/ac/yr x 0.60)+ (14.92 ac x 0.427 x 380 lb/ac/yr x 0.60) = **4226.91 lbs**

BMP # E

BMP Description:	Ridings at Covered Bridge Basin 1
Location:	Ridings Lane
Lat/Long:	40°18'37", -75°11'17"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-28-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-24-24 – Basin continues to naturalize. Maintenance needed – Remove invasive species

BMP # F

BMP Description:	Ridings at Covered Bridge Basin 2
Location:	Mystic View Lane
Lat/Long:	40°18'31", -75°11'06"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.

Year Constructed:
1992

Estimated Project Cost:
$45,000.00*

Project Funding: General Funds/Grants

Treated Drainage Area:
12.32 acres

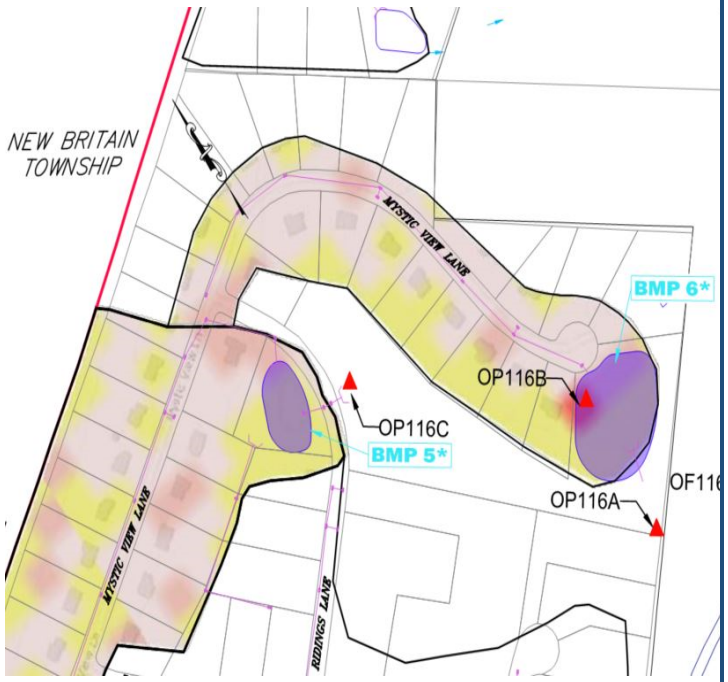
BMP Efficiency: 60%

Map #: 6

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*44.4%*
Developed, Low	1260	*13.0%*
Hay/Pasture	380	*40.7%*
Developed, Medium	1881	*1.9%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (12.32 ac x 0.444 x 410 lb/ac/yr x 0.60) + (12.32 ac x 0.130 x 1260 lb/ac/yr x 0.60)+ (12.32 ac x 0.407 x 380 lb/ac/yr x 0.60) + (12.32 ac x 0.019 x 1881 lb/ac/yr x 0.60) = **3955.54 lbs**

BMP # F

BMP Description:	Ridings at Covered Bridge Basin 2
Location:	Mystic View Lane
Lat/Long:	40°18'31", -75°11'06"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-28-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-21-24 – Basin continues to naturalize. Maintenance needed – Remove invasive species

BMP # G

BMP Description:	Ridings at Covered Bridge Basin 3
Location:	Longwood Circle
Lat/Long:	40°18'24", -75°11'15"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through removal of low flow concrete channel, reconfiguration of the outlet structure to promote recharge and vegetation naturalization.

Year Constructed:
1992

Estimated Project Cost:
$40,000.00*

Project Funding: General Funds/Grants

Treated Drainage Area:
23.63 acres

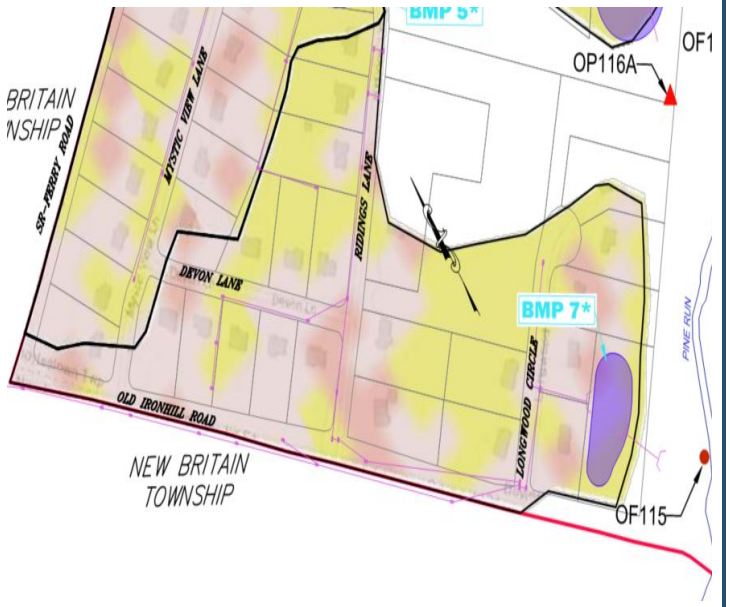
BMP Efficiency: 60%

Map #: 7

Land Use NLCD 2011 in DA:

Land Use	Loading Rate lb/ac/yr**	% Coverage
Open Space, Developed	410	*43.0%*
Developed, Low	1260	*15.0%*
Hay/Pasture	380	*42.0%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (23.63 ac x 0.430 x 410 lb/ac/yr x 0.60) + (23.63 ac x 0.150 x 1260 lb/ac/yr x 0.60)+ (23.63 ac x 0.420 x 380 lb/ac/yr x 0.60) = **7435.75 lbs**

BMP # G

BMP Description:	Ridings at Covered Bridge Basin 3
Location:	Longwood Circle
Lat/Long:	40°18'24", -75°11'15"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-28-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-21-24 – Basin continues to naturalize. Maintenance needed – Break up remaining low flow channel concrete, remove trees encroaching outfall wing walls, monitor and remove invasive species, remove woody vegetation from spillway, remove yard waste near outfall

BMP # H

BMP Description:	Covered Bridge Basin 1
Location:	407 Hagan Court
Lat/Long:	40°18'42", -75°11'06"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

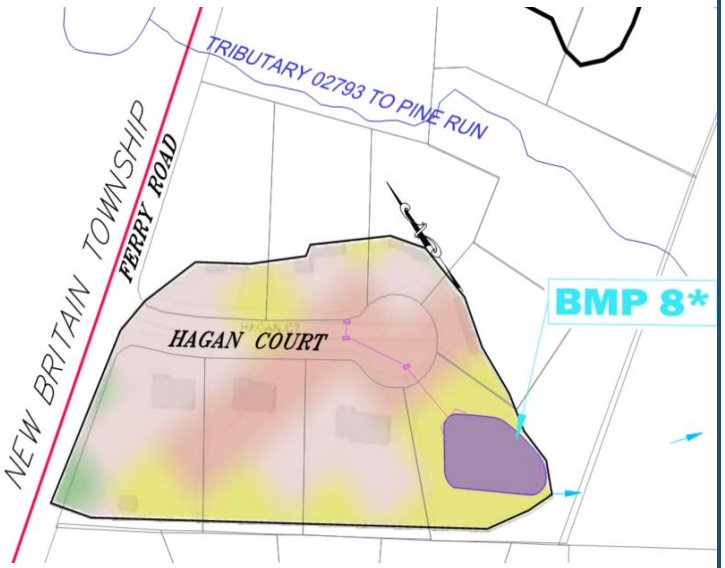
A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.
Year Constructed:
1993
Estimated Project Cost:
$32,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
4.87 acres
BMP Efficiency: 60%
Map #: 8
Land Use NLCD 2011 in DA:

Land Use	Loading Rate lb/ac/yr**	% Coverage
Open Space, Developed	410	*27.3%*
Developed, Low	1260	*22.7%*
Hay/Pasture	380	*50.0%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= *(Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate*

= (4.87 ac x 0.273 x 410 lb/ac/yr x 0.60) + (4.87 ac x 0.227 x 1260 lb/ac/yr x 0.60)+ (4.87 ac x 0.50 x 380 lb/ac/yr x 0.60) = **1718.74 lbs**

BMP # H

BMP Description:	Covered Bridge Basin 1
Location:	407 Hagan Court
Lat/Long:	40°18'42", -75°11'06"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-27-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-21-24 – Basin continues to naturalize. Maintenance needed – Remove fallen tree and vegetation encroaching outfall; restore access to outfall. Monitor and remove invasive species, remove organic and sediment debris buildup at infall, and remove invasive species

BMP # I

BMP Description:	Covered Bridge Basin 2
Location:	699 Covered Bridge Lane
Lat/Long:	40°18'48", -75°10'52"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.
Year Constructed:
1993
Estimated Project Cost:
$42,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
21.77 acres
BMP Efficiency: 60%
Map #: 9
Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*59.4%*
Developed, Low	1260	*14.6%*
Hay/Pasture	380	*6.3%*
Deciduous, Forest	30	*19.8%*

LOCATION

*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (21.77 ac x 0.594 x 410 lb/ac/yr x 0.60) + (21.77ac x 0.146 x 1260 lb/ac/yr x 0.60)+ (21.77 ac x 0.063 x 380 lb/ac/yr x 0.60) + (21.77 ac x 0.198 x 30 lb/ac/yr X 0.60) =

5889.86 lbs

BMP # I

BMP Description:	Covered Bridge Basin 2
Location:	699 Covered Bridge Lane
Lat/Long:	40°18'48", -75°10'52"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-28-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-25-24 – Basin continues to naturalize. Maintenance needed – Remove vegetation to restore access to outfall. Monitor and remove invasive species

BMP # J

BMP Description:	Doylestown Knoll Basin 1
Location:	38 Brinker Drive
Lat/Long:	40°16'40", -75°09'14"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

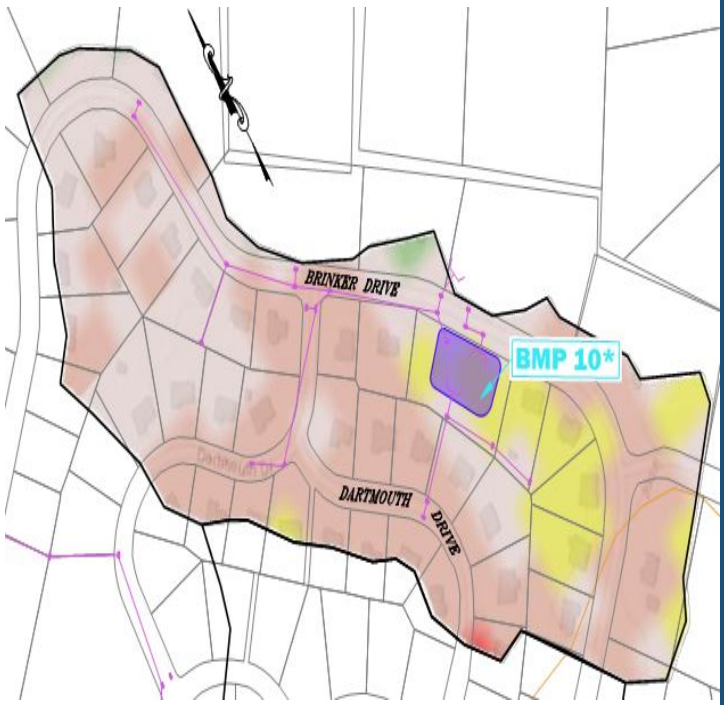
A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.
Year Constructed:
1994
Estimated Project Cost:
$35,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
22.22 acres
BMP Efficiency: 60%
Map #: 10
Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*42.2%*
Developed, Low	1260	*45.0%*
Hay/Pasture	380	*12.8%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (22.22 ac x 0.422 x 410 lb/ac/yr x 0.60) + (22.22 ac x 0.450 x 1260 lb/ac/yr x 0.60)+ (22.22 ac x 0.128 x 380 lb/ac/yr x 0.60) = **10,526.5 lbs**

BMP # J

BMP Description:	Doylestown Knoll Basin 1
Location:	38 Brinker Drive
Lat/Long:	40°16'40", -75°09'14"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-28-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-03-24 – Basin continues to naturalize. Maintenance needed – Add rip rap to infall to reduce scour/standing water, remove cattails, remove aggressive and invasive species.

BMP # K

BMP Description:	Doylestown Knoll Basin 2
Location:	81 Brinker Drive
Lat/Long:	40°16'37", -75°09'26"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

*From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, removal of low flow channel, soil amendment, underdrain installation, forebay grading and vegetation naturalization.

Year Constructed:
1994

Estimated Project Cost:
$420,000.00

Project Funding: General Funds/Grants

Treated Drainage Area:
20.99 acres

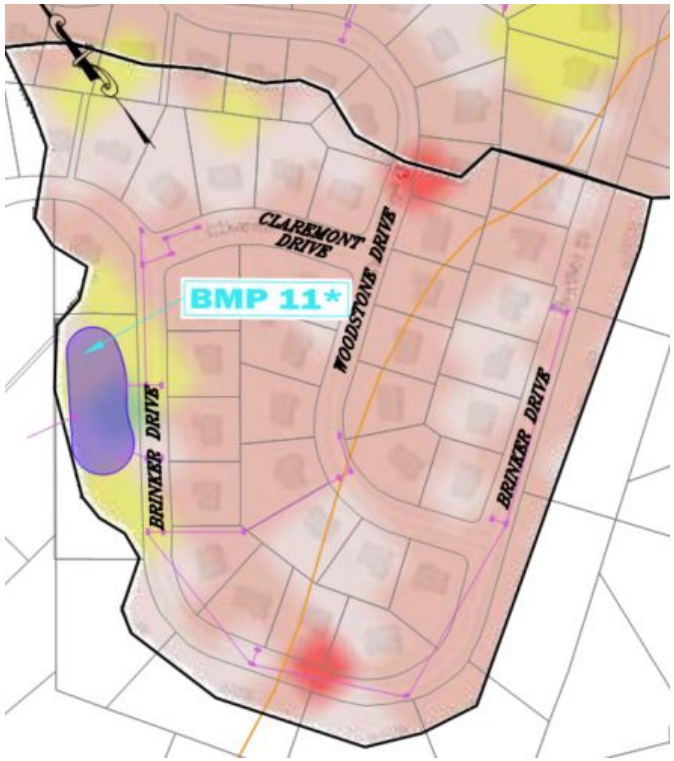
BMP Efficiency: 60%

Map #: 11

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*27.4%*
Developed, Low	1260	*63.2%*
Hay/Pasture	380	*7.4%*
Developed, Medium	1881	*2.0%*

LOCATION



** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= *(Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate*

= (20.99 ac x 0.274 x 410 lb/ac/yr x 0.60) + (20.99 ac x 0.632 x 1260 lb/ac/yr x 0.60)+ (20.99 ac x 0.074 x 380 lb/ac/yr x 0.60 + (20.99 ac x 0.02 x 1881 lb/ac/yr x 0.60) = **11,788.5 lbs**

BMP # K

BMP Description:	Doylestown Knoll Basin 2
Location:	81 Brinker Drive
Lat/Long:	40°16'37", -75°09'26"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 8-2-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-03-24 – Basin continues to naturalize. Maintenance needed – Sediment and standing water issues, need treatment for mosquitos, remove cattail vegetation, remove woody vines encroaching outlet structure, remove invasive and aggressive species

BMP # L

BMP Description:	Doylestown Hunt Basin 2
Location:	266 Fox Chase Lane
Lat/Long:	40°17'54", -75°07'58"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, removal of low flow channel, and vegetation naturalization.

Year Constructed:
1995

Estimated Project Cost:
$35,000.00*

Project Funding: General Funds/Grants

Treated Drainage Area:
30.41 acres

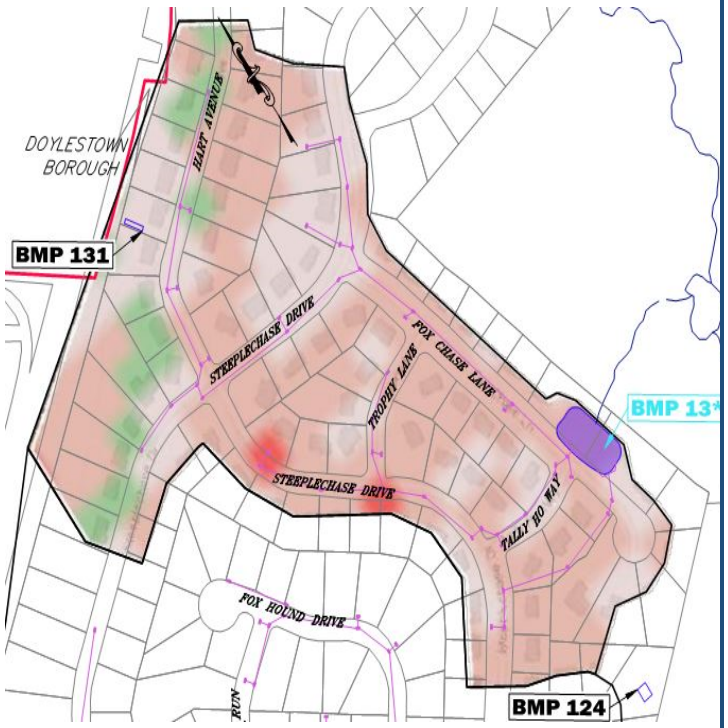
BMP Efficiency: 60%

Map #: 13

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*28.5%*
Developed, Low	1260	*64.2%*
Developed, Medium	1881	*2.2%*
Deciduous Forest	30	*5.1%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (30.41 ac x 0.285 x 410 lb/ac/yr x 0.60) + (30.41 ac x 0.642 x 1260 lb/ac/yr x 0.60)+ (30.41 ac x 0.022 x 1881 lb/ac/yr x 0.60) + (30.41 ac x 0.051 x 30 lb/ac/yr x 0.60) =

17,675.80 lbs

BMP # L

BMP Description:	Doylestown Hunt Basin 2
Location:	266 Fox Chase Lane
Lat/Long:	40°17'54", -75°07'58"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-29-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-03-24 – Basin continues to naturalize. Maintenance needed – Remove invasive species in the basin as they appear, remove yard waste, monitor degrading area of outfall structure, mow herbaceous and undesired woody vegetation 1x per year to reduce growth of woody invasives.

BMP # M

BMP Description:	Doylestown Hunt Basin 3
Location:	235 Tether Way
Lat/Long:	40°17'48", -75°08'28"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

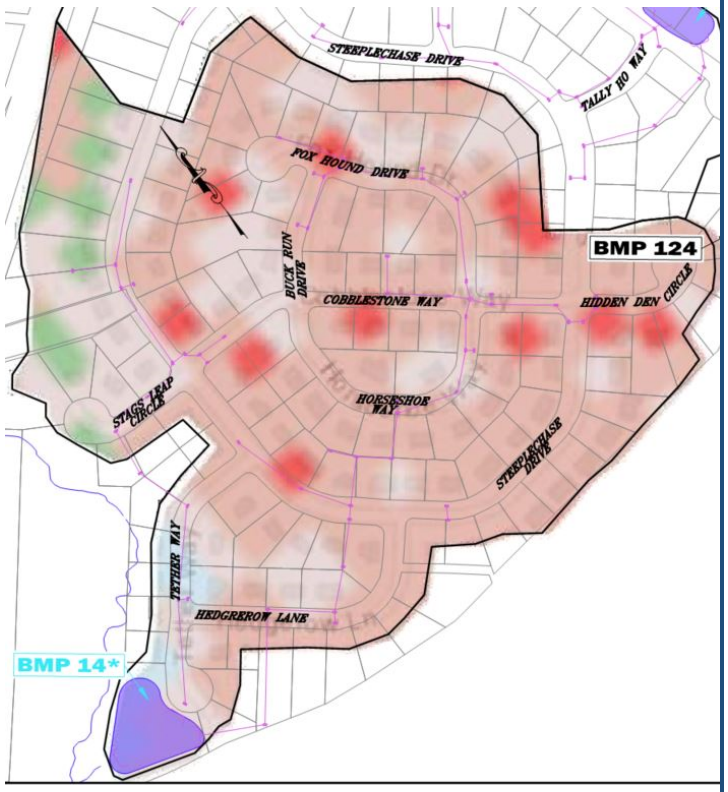
A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, removal of low flow channel, and vegetation naturalization.
Year Constructed:
1995
Estimated Project Cost:
$45,000.00*
Project Funding: General Funds/Grants
Treated Drainage Area:
46.87 acres
BMP Efficiency: 60%
Map #: 14
Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*4.4%*
Developed, Low	1260	*66.2%*
Developed, Medium	1881	*1.9%*
Deciduous Forest	30	*7.5%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (46.87 ac x 0.044 x 410 lb/ac/yr x 0.60) + (46.87 ac x 0.662 x 1260 lb/ac/yr x 0.60)+ (46.87 ac x 0.019 x 1881 lb/ac/yr x 0.60) + (46.87 ac x 0.075 x 30 lb/ac/yr x 0.60) =
30,260.10 lbs

BMP # M

BMP Description:	Doylestown Hunt Basin 3
Location:	235 Tether Way
Lat/Long:	40°17'48", -75°08'28"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-29-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-03-24 – Basin continues to naturalize. Maintenance needed – Replenish riprap at outfall to reduce scour and erosion, remove vegetation and fallen trees blocking outfall access, remove vines encroaching outfall, remove sapling from infall 1, repair any damage to infall structure, remove invasive and aggressive species, remove yard waste, mow herbaceous and undesired woody vegetation

BMP # N

BMP Description:	Doylestown Lea Basin 1
Location:	27 Bittersweet Drive
Lat/Long:	40°16'54", -75°09'82"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, removal of low flow channel, and vegetation naturalization.

Year Constructed:
1996

Estimated Project Cost:
$42,000.00*

Project Funding: General Funds/Grants

Treated Drainage Area:
15.59 acres

BMP Efficiency: 60%

Map #: 15

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*30.4%*
Developed, Low	1260	*66.7%*
Developed, Medium	1881	*1.5%*
Hay/Pasture	380	*1.5%*

LOCATION

*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (15.59 ac x 0.304 x 410 lb/ac/yr x 0.60) + (15.59 ac x 0.667 x 1260 lb/ac/yr x 0.60)+ (15.59 ac x 0.015 x 1881 lb/ac/yr x 0.60) + (15.59 ac x 0.015 x 380 lb/ac/yr x 0.60) =

9331.5 lbs

BMP # N

BMP Description:	Doylestown Lea Basin 1
Location:	27 Bittersweet Drive
Lat/Long:	40°16'54", -75°09'82"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 7: Overall Basin

Picture taken 8-2-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-25-24 – Basin continues to naturalize. Maintenance needed – Remove tree encroaching infall 2, remove yard waste at infall 2 and remind neighbors prohibition on dumping, mow herbaceious and undesired vegetation 1x per year to reduce growth of woody invasives. Remove invasive and aggressive species. Remove vines and other vegetation encroaching infall 1. Remove vegetation encroaching outlet. Remove tree from outfall riprap

BMP # O

BMP Description:	Doylestown Lea Basin 2
Location:	Arbor Lea Circle
Lat/Long:	40°17'05", -75°08'37"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

** Values taken from approved 2019 GHD PRP/TMDL Report

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, removal of low flow channel, soil testing and amendment, underdrain installation and vegetation naturalization.

Year Constructed:
1996

Estimated Project Cost:
$442,000.00

Project Funding: General Funds/Grants

Treated Drainage Area:
22.75 acres

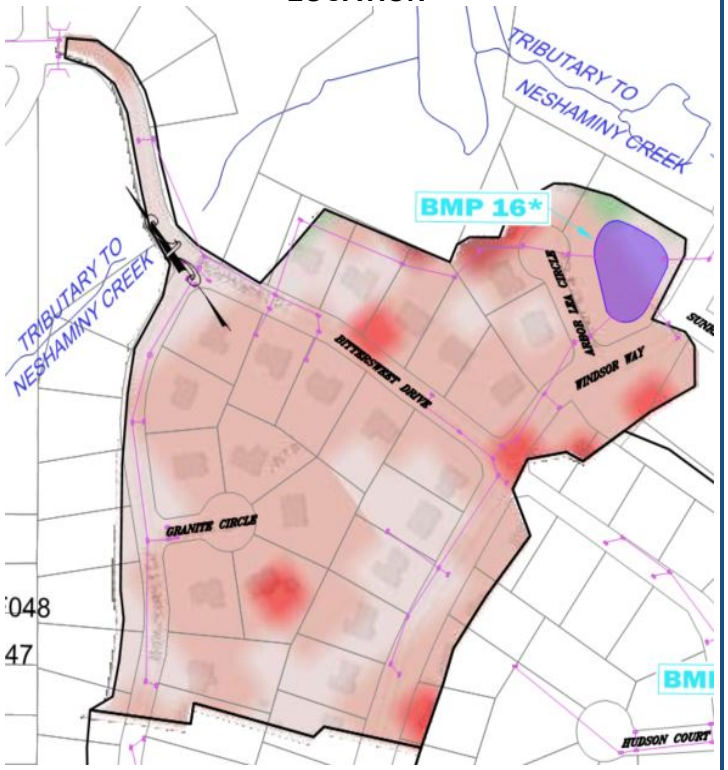
BMP Efficiency: 60%

Map #: 16

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*25.0%*
Developed, Low	1260	*66.3%*
Developed, Medium	1881	*7.7%*
Grassland/ Herbaceous	440	*1.0%*

LOCATION



Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (22.75 ac x 0.25 x 410 lb/ac/yr x 0.60) + (22.75 ac x 0.663 x 1260 lb/ac/yr x 0.60)+ (22.75 ac x 0.077 x 1881 lb/ac/yr x 0.60) + (22.75 ac x 0.01 x 440 lb/ac/yr x 0.60) =

14,834.2 lbs

BMP # O

BMP Description:	Doylestown Lea Basin 2
Location:	Arbor Lea Circle
Lat/Long:	40°17'05", -75°08'37"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Overall Basin

Picture taken 7-28-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-20-24 – Basin continues to naturalize. Maintenance needed – Replenish rip rap at infalls 1 and 2 to reduce scour. Remove woody vegetation encroaching infalls 1 and 2. Remove trash throughout basin. Remove yard waste from basin and remind neighbors of prohibition of dumping. Access front of outlet structure and clear orifice if needed. Remediate basin as needed to allow basin to function properly and drain. Treat standing water for mosquitos. Remove invasive and aggressive species.

BMP # P

BMP Description:	Doylestown Lea Basin 3
Location:	1 Bittersweet Drive
Lat/Long:	40°16'56", -75°08'39"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.

Year Constructed:
1996

Estimated Project Cost:
$35,000.00*

Project Funding: General Funds/Grants

Treated Drainage Area:
13.64 acres

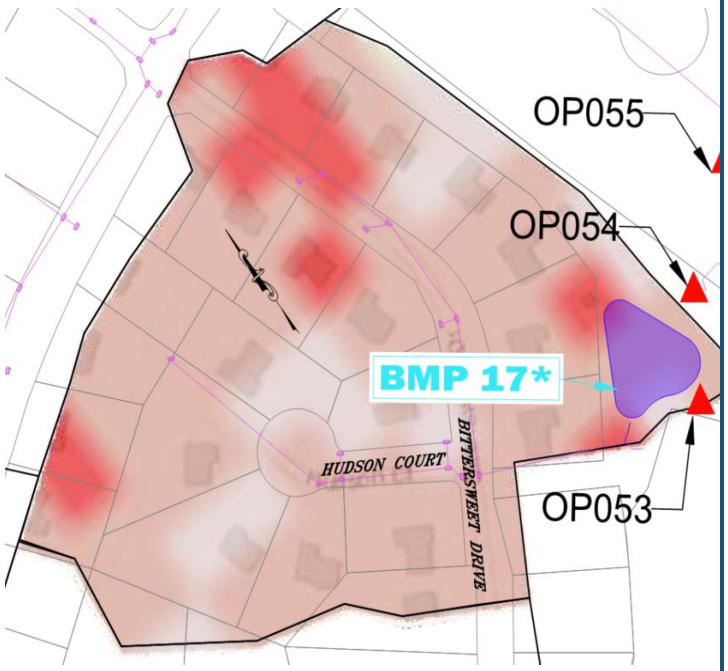
BMP Efficiency: 60%

Map #: 17

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*25.0%*
Developed, Low	1260	*65.0%*
Developed, Medium	1881	*8.3%*
Hay/Pasture	380	*1.7%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (13.64 ac x 0.25 x 410 lb/ac/yr x 0.60) + (13.64 ac x 0.65 x 1260 lb/ac/yr x 0.60)+ (13.64 ac x 0.083 x 1881 lb/ac/yr x 0.60) + (13.64 ac x 0.017 x 380 lb/ac/yr x 0.60) =
8871.2 lbs

BMP # P

BMP Description:	Doylestown Lea Basin 3
Location:	1 Bittersweet Drive
Lat/Long:	40°16'56", -75°08'39"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Basin Overall

Picture taken 8-4-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-25-24 – Basin continues to naturalize. Maintenance needed – Remove tree encroaching infall and outfall, remove vines encroaching outlet structure, replenish rip rap at infall and outfall to reduce scour, remove yard waste and remind neighbors prohibition on dumping, mow herbaceous and desired vegetation 1x per year to reduce growth of woody invasives. Remove invasive and aggressive species.

BMP # Q

BMP Description:	Doylestown Lea Basin 4
Location:	49 Bittersweet Drive
Lat/Long:	40°16'51", -75°08'57"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge and vegetation naturalization.

Year Constructed:
1996

Estimated Project Cost:
$40,000.00*

Project Funding: General Funds/Grants

Treated Drainage Area:
15.26 acres

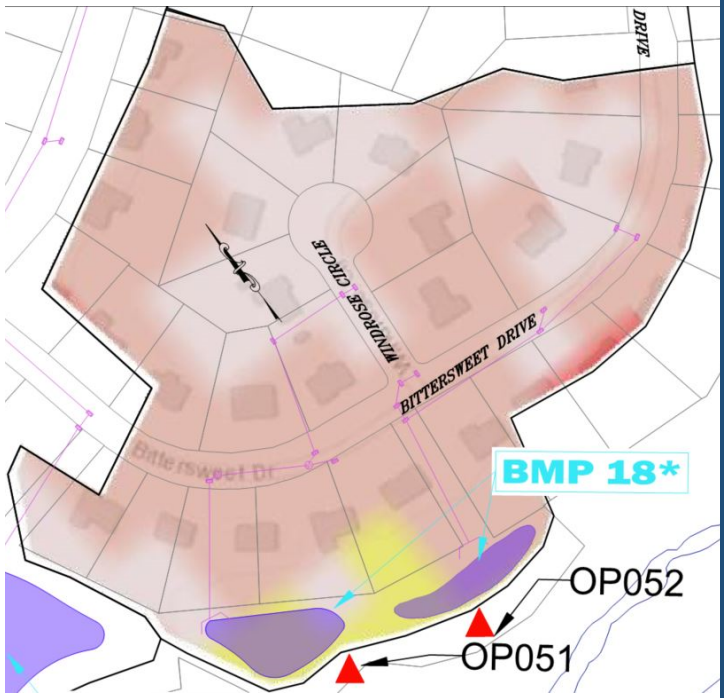
BMP Efficiency: 60%

Map #: 18

Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*31.3%*
Developed, Low	1260	*52.3%*
Developed, Medium	1881	*3.0%*
Hay/Pasture	380	*13.4%*

LOCATION



*Estimated Cost based upon work performed by Public Works. If infiltration testing results are not favorable and amended soils/underdrain are needed, costs will increase.
** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (15.26 ac x 0.313 x 410 lb/ac/yr x 0.60) + (15.26 ac x 0.523 x 1260 lb/ac/yr x 0.60)+ (15.26 ac x 0.03 x 1881 lb/ac/yr x 0.60) + (15.26 ac x 0.134 x 380 lb/ac/yr x 0.60) =

8191.3 lbs

BMP # Q

BMP Description:	Doylestown Lea Basin 4
Location:	49 Bittersweet Drive
Lat/Long:	40°16'51", -75°08'57"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 7: Overall Basin (2 of 2)

Picture taken 8-2-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-23-24 – Basin continues to naturalize. Maintenance needed – Remove encroaching vegetation from infall 2. Remove invasive and aggressive species. Mow herbaceous and undesired vegetation one time per year. Inspect erosion and hole over infall 1 pipe connection and pipe separation. Remove vines encroaching infall 2. Remove tree and shrubs encroaching outfall 2. Remove yard waste from basin and remind neighbors of prohibition of dumping. Remove vines encroaching outlet 2.

BMP # R

BMP Description: Cedarcrest Court Basin
Location: Cedarcrest Court
Lat/Long: 40°17'02", -75°10'38"
BMP type: Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

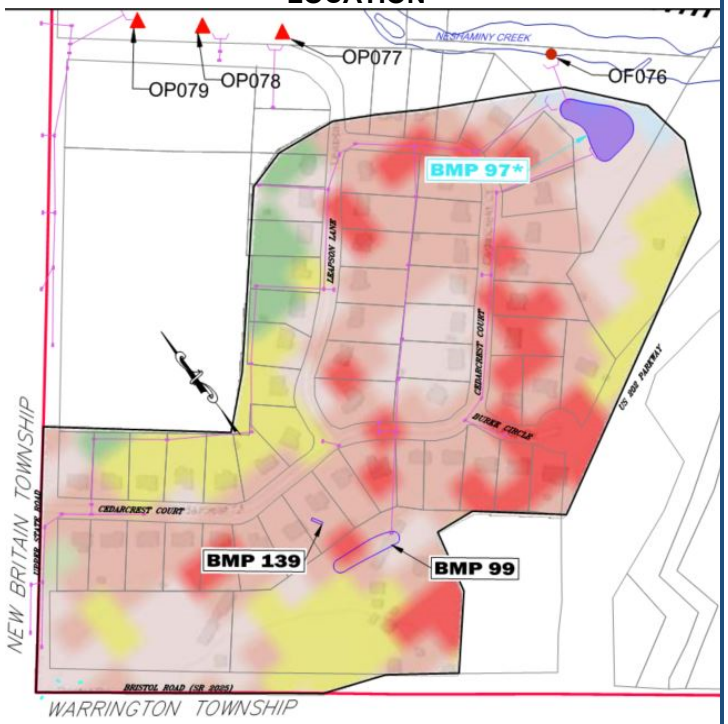
A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, soil testing and amendment, underdrain installation and vegetation naturalization.
Year Constructed:
1999
Estimated Project Cost:
$382,000.00
Project Funding: General Funds/Grants
Treated Drainage Area:
46.93 acres
BMP Efficiency: 60%
Map #: 97
Land Use NLCD 2011 in DA:

Land Use	Loading Rate lb/ac/yr**	% Coverage
Open Space, Developed	410	*21.0%*
Developed, Low	1260	*43.0%*
Developed, Medium	1881	*15.9%*
Hay/Pasture	380	*18.7%*
Deciduous Forest	30	*1.4%*

LOCATION



** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= *(Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate*

= (46.93 ac x 0.210 x 410 lb/ac/yr x 0.60) + (46.93 ac x 0.43 x 1260 lb/ac/yr x 0.60)+ (46.93 ac x 0.159 x 1881 lb/ac/yr x 0.60) + (46.93 ac x 0.187 x 380 lb/ac/yr x 0.60) + (46.93 ac x 0.014 x 30 lb/ac/yr x 0.60) = **28,108.2 lbs**

BMP # R

BMP Description:	Cedarcrest Court Basin
Location:	Cedarcrest Court
Lat/Long:	40°17'02", -75°10'38"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 1: Basin Overall

Picture taken 8-3-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 6-25-24 – Basin continues to naturalize. Maintenance needed – Remove trees encroaching infalls 1 and 2 and outlet structure. Monitor erosion behind infall 2 wingwall and repair. Replenish rip rap at outfall to reduce scour. Remediate basin as needed to allow basin to function properly and drain. Mow herbaceous and undesired woody vegetation 1x per year to reduce growth of woody invasives. Remove invasive and aggressive species. Monitor concrete deterioration of outfall. Removed trash and yard waste from basin.

BMP # S

BMP Description:	Sheridan Road Basin
Location:	Sheridan Road
Lat/Long:	40°16'48", -75°06'58"
BMP type:	Dry Extended Detention Basin

BMP Information

BMP 6.6.3: Dry Extended Detention Basin

A dry extended detention basin is an earthen structure constructed either by impoundment of a natural depression or excavation of existing soil, that provides temporary storage of runoff and functions hydraulically to attenuate stormwater runoff peaks. The dry detention basin, as constructed in countless locations since the mid-1970's and representing the primary BMP measure until now, has served to control the peak rate of runoff, although some water quality benefit accrued by settlement of the larger particulate fraction of suspended solids. This extended version is intended to enhance this mechanism in order to maximize water quality benefits.

From PA BMP Manual

Project Description:
The Township intends to retrofit the existing detention basin through reconfiguration of the outlet structure to promote recharge, soil testing and amendment, underdrain installation and vegetation naturalization.
Year Constructed:
1999
Estimated Project Cost:
$290,000.00
Project Funding: General Funds/Grants
Treated Drainage Area:
22.67 acres
BMP Efficiency: 60%
Map #: 104
Land Use NLCD 2011 in DA:

Land Use	*Loading Rate lb/ac/yr***	*% Coverage*
Open Space, Developed	410	*68.0%*
Developed, Low	1260	*9.7%*
Mixed Forest	30	*8.7%*
Deciduous Forest	30	*13.6%*

LOCATION

** Values taken from approved 2019 GHD PRP/TMDL Report

Load Reduction Calculations

Load Reduction (lbs) =

= (Drainage Area)x(% land use) x (Land Use Loading Rates) x BMP Efficiency Rate

= (22.67ac x 0.68 x 410 lb/ac/yr x 0.60) + (22.67 ac x 0.097 x 1260 lb/ac/yr x 0.60)+ (22.67 ac x 0.087 x 30 lb/ac/yr x 0.60) + (22.67 ac x 0.136 x 380 lb/ac/yr x 0.60) = **5545.3 lbs**

BMP # S

BMP Description:	Sheridan Road Basin
Location:	Sheridan Road
Lat/Long:	40°16'48", -75°06'58"
BMP type:	Dry Extended Detention Basin

Existing BMP:

Photo No. 5: Basin Overall

Picture taken 8-3-21

Operations & Maintenance Program

**adapted from PA BMP Manual*

Responsible Party: Doylestown Township
Contact Number: 215-348-9915

As needed –

- Mowing and/or trimming of vegetation should be performed to sustain the system, but all detritus should be removed from the basin.

Greater than 1 inch storm –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Quarterly –

- All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation

Annually –

- Vegetated areas should be inspected annually for erosion, unwanted growth of exotic/invasive species and maintained at a minimum of 95%.

Update: Inspection 4-22-244 – Basin continues to naturalize. Maintenance needed – Remove trees encroaching infalls 1 and 2 and outlet structure. Remediate basin as needed to allow basin to function properly and drain. Mow herbaceous and undesired woody vegetation 1x per year to reduce growth of woody invasives. Remove invasive and aggressive species. Remove trash and yard waste from basin.

Appendix B:
BMP Exhibits

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GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
65 EAST BUTLER AVENUE, SUITE 100, NEW BRITAIN, PA 18901 • (215) 345-4330

PROPOSED BMPS

DOYLESTOWN PRP/TMDL

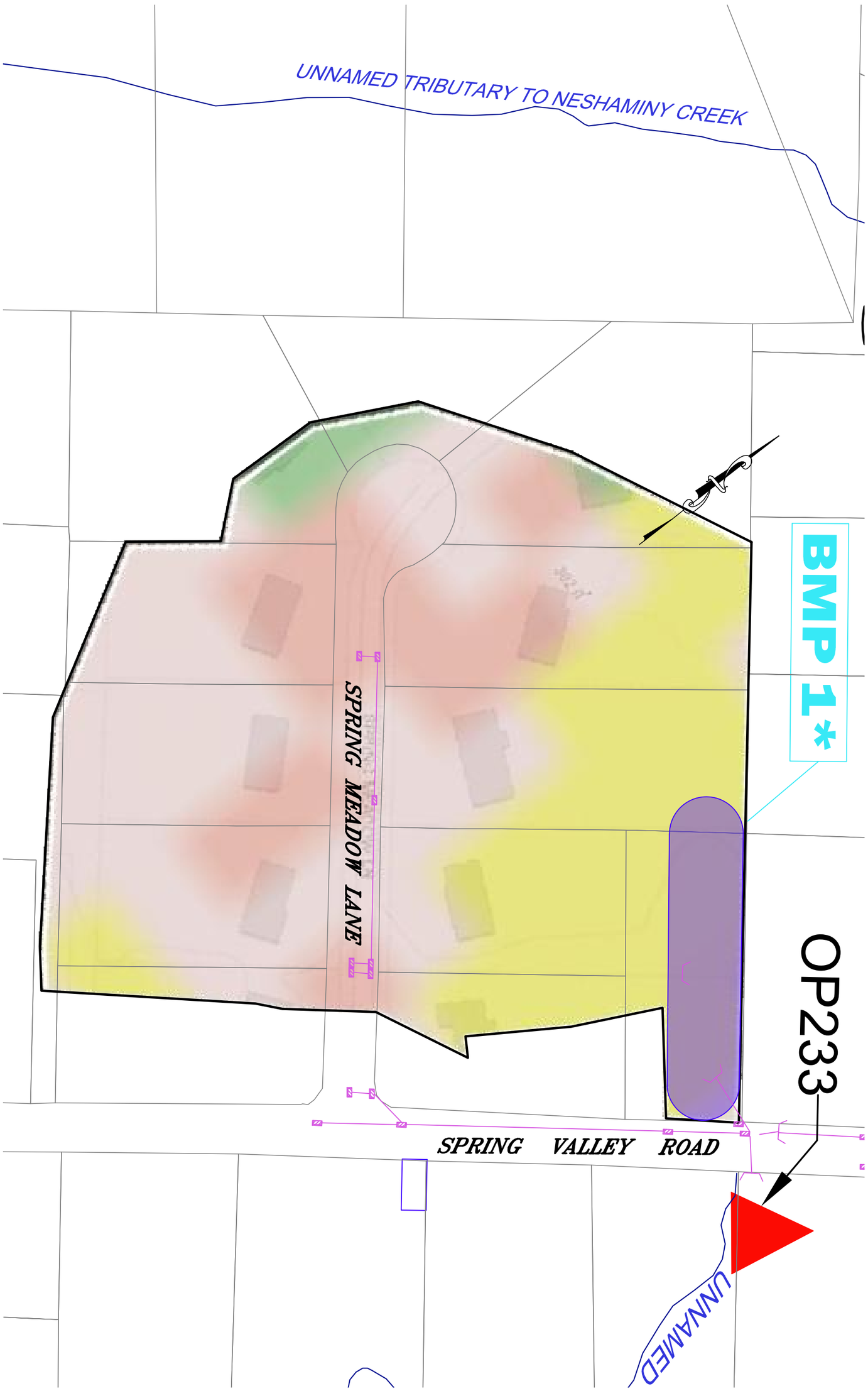
PROPOSED BMP A

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	DRAWN BY:
2009078PLN_DT	XXX
DATE: 09/10/2024	
SCALE: 1"=200'	

200 0 200 400
SCALE IN FEET

O:\MUNICIPL\0-999 Municipal General Services\9991029.03-DT_MS4 Annual Reporting\Permits\Doylestown Township SWMP\PRP_TMDL Plans and Report\CAD\Xref\ba



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DRAWN BY: XXX

100 0 100 200
SCALE IN FEET

PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP B

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT

DATE: 09/10/2024

SCALE: 1"=100'

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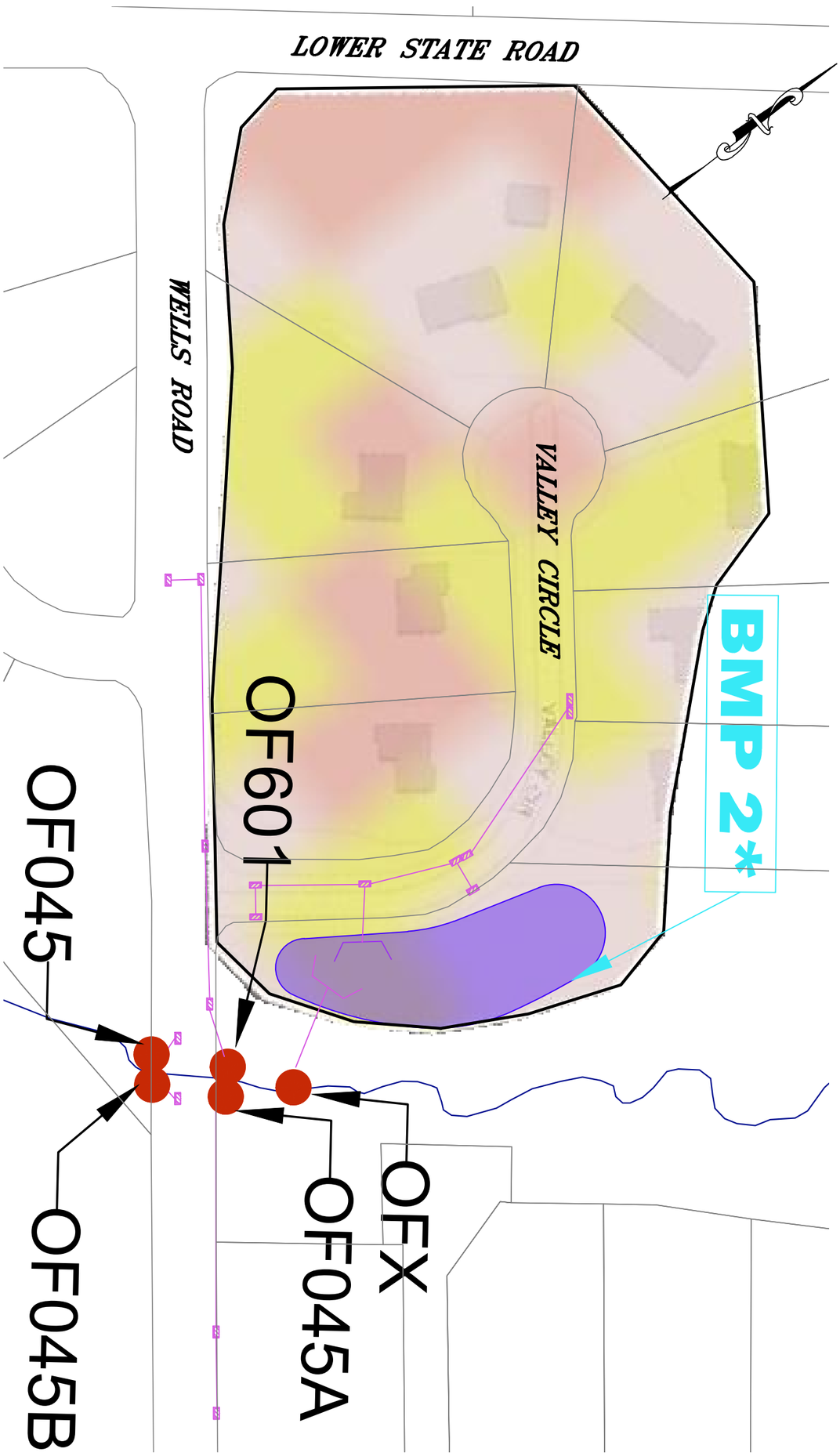

GILMORE & ASSOCIATES, INC. ENGINEERING & CONSULTING SERVICES 65 EAST BUTLER AVENUE, SUITE 100, NEW BRITAIN, PA 18901 • (215) 345-4330	PROPOSED BMPS DOYLESTOWN PRP/TMDL *PROPOSED BMP C* DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA	JOB NO.: 2009078PLN_DT	
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		SCALE: 1"=100'	

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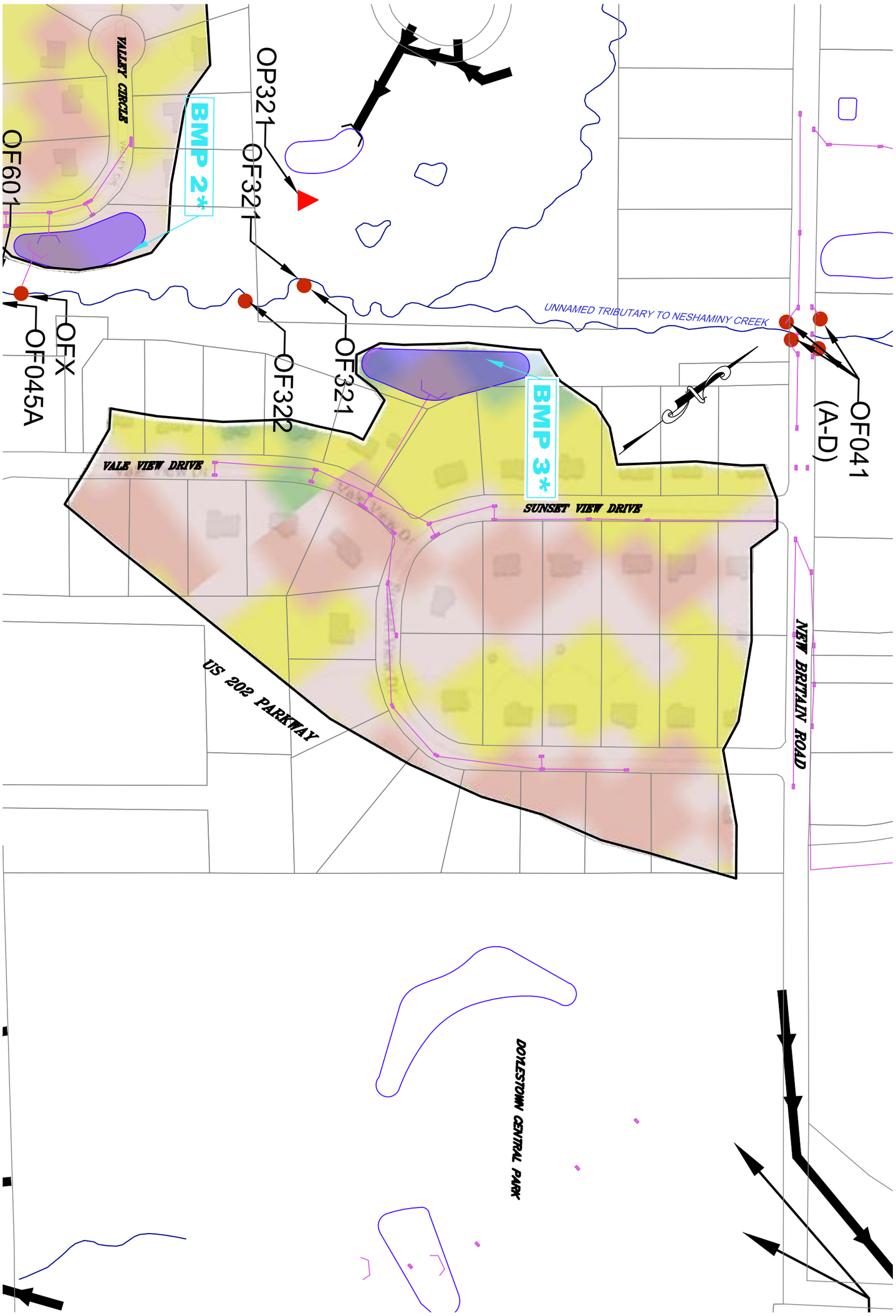

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP D

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT

DATE: 09/10/2024

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP E

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
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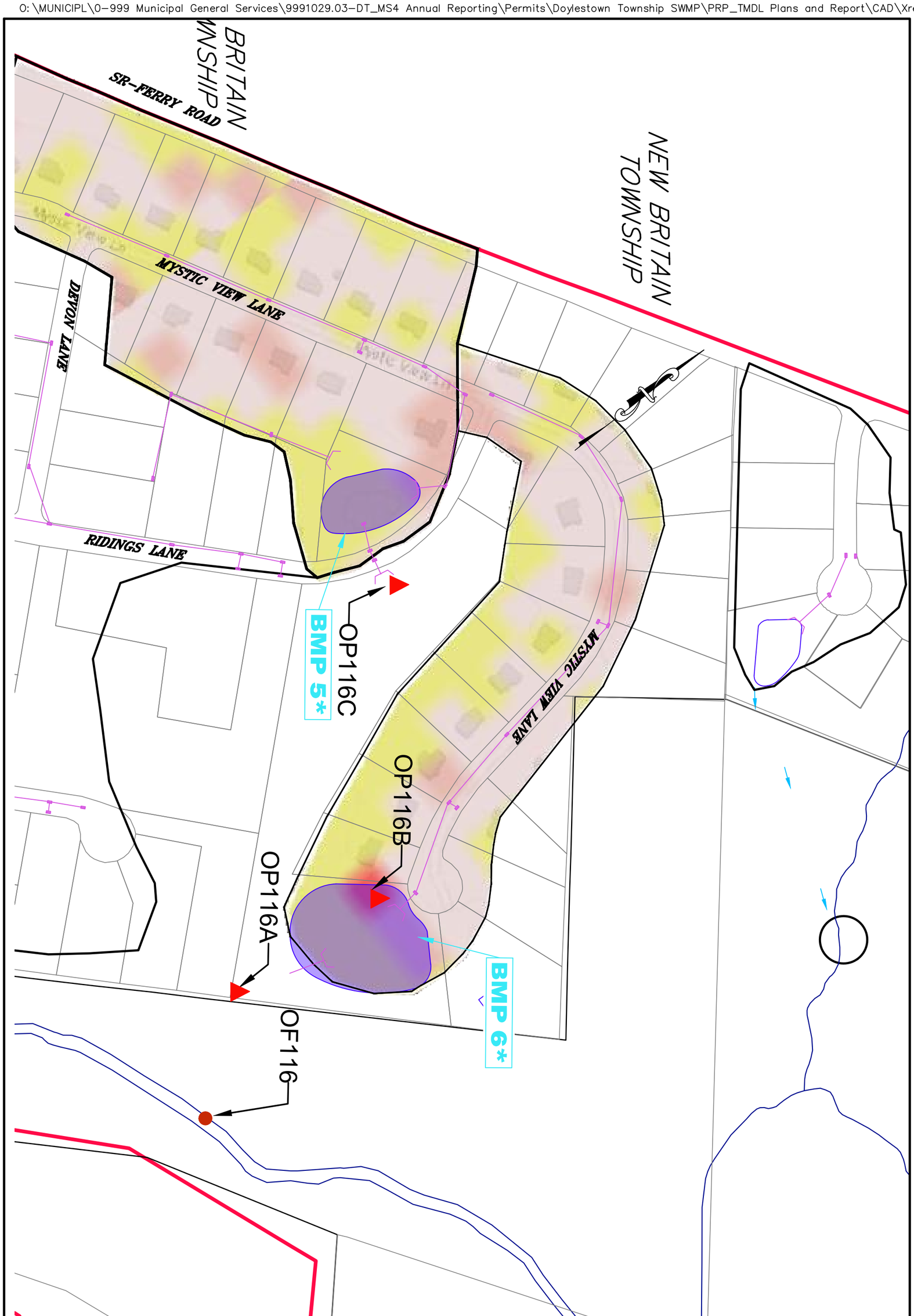

GILMORE & ASSOCIATES, INC. ENGINEERING & CONSULTING SERVICES 65 EAST BUTLER AVENUE, SUITE 100, NEW BRITAIN, PA 18901 • (215) 345-4330	PROPOSED BMPS DOYLESTOWN PRP/TMDL *PROPOSED BMP F* DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA	JOB NO.: 2009078PLN_DT	
DRAWN BY: XXX	100 0 100 200 SCALE IN FEET	DATE: 09/10/2024	
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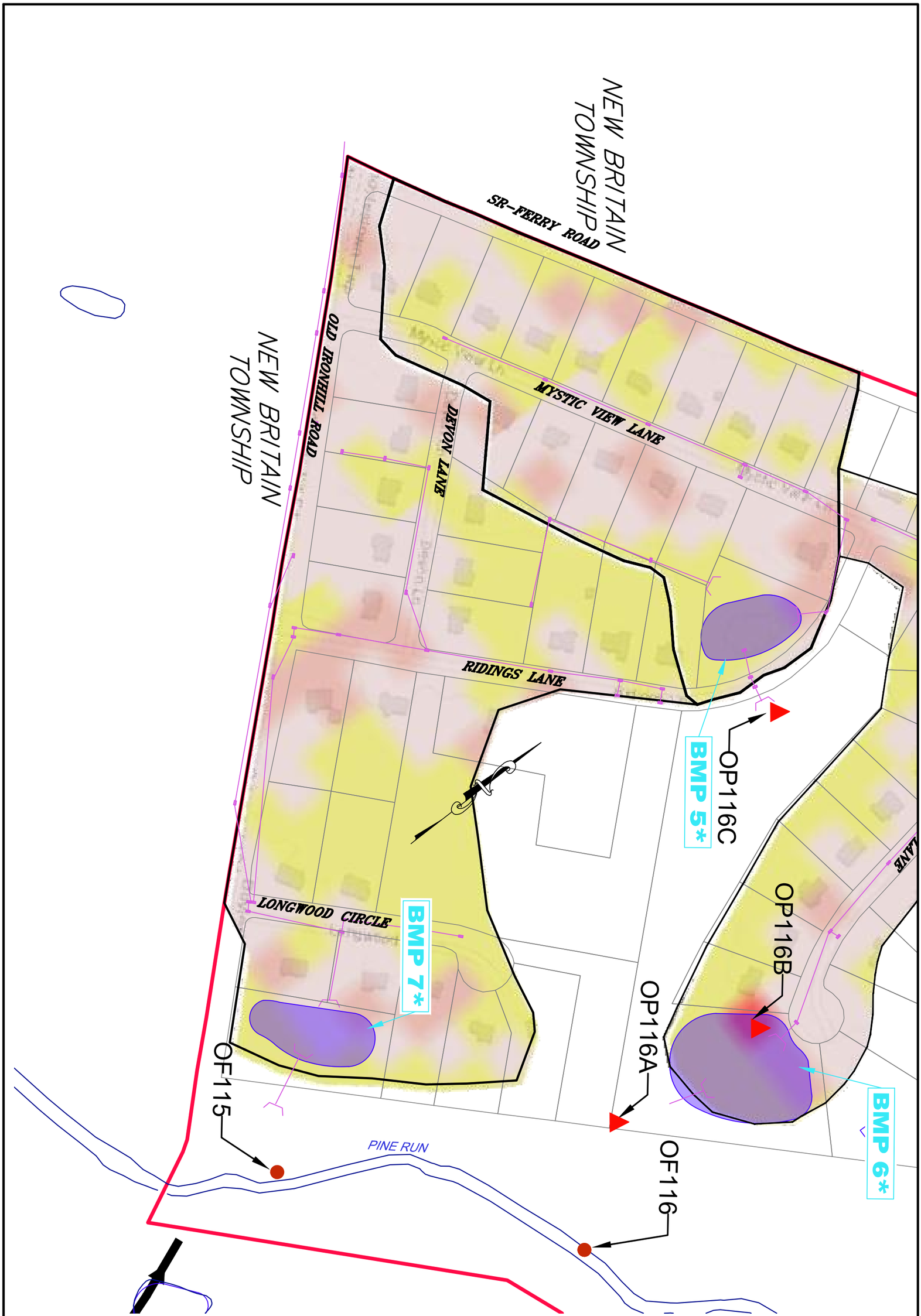

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP G

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
SCALE:	1"=100'
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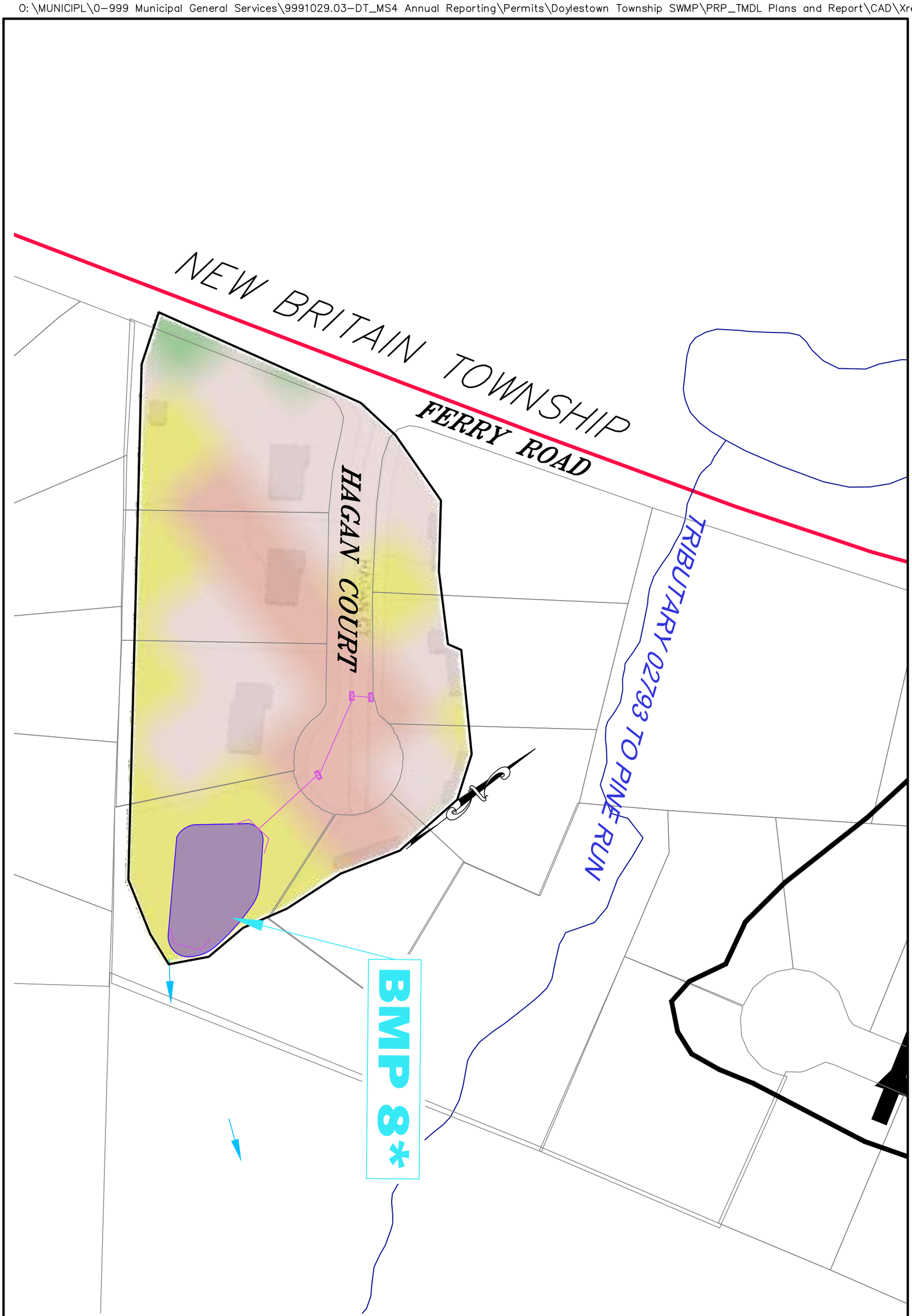

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SCALE IN FEET

PROPOSED BMPS
DOYLESTOWN PRP/TMDL
PROPOSED BMP H
DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT
DATE: 09/10/2024
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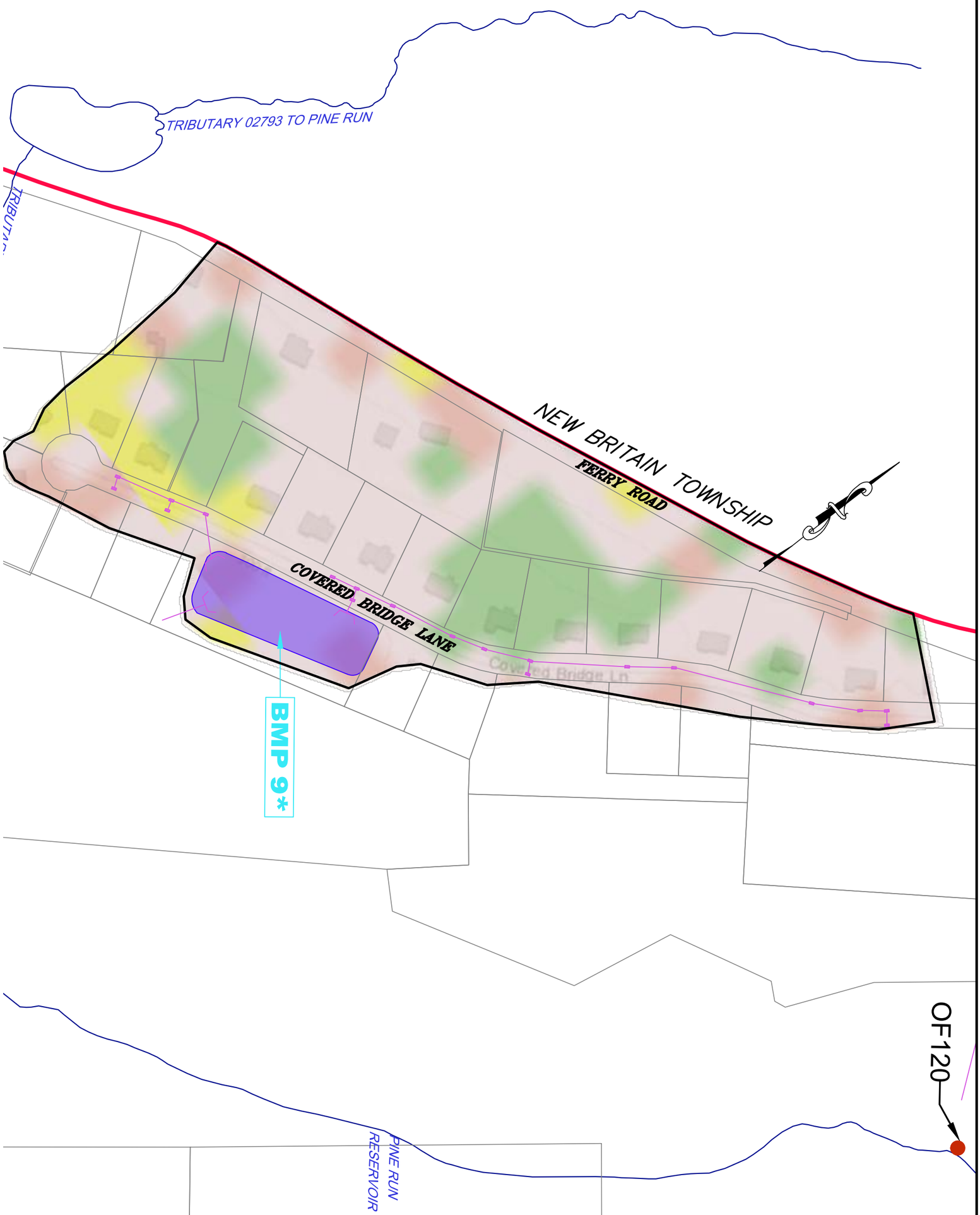

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP I

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
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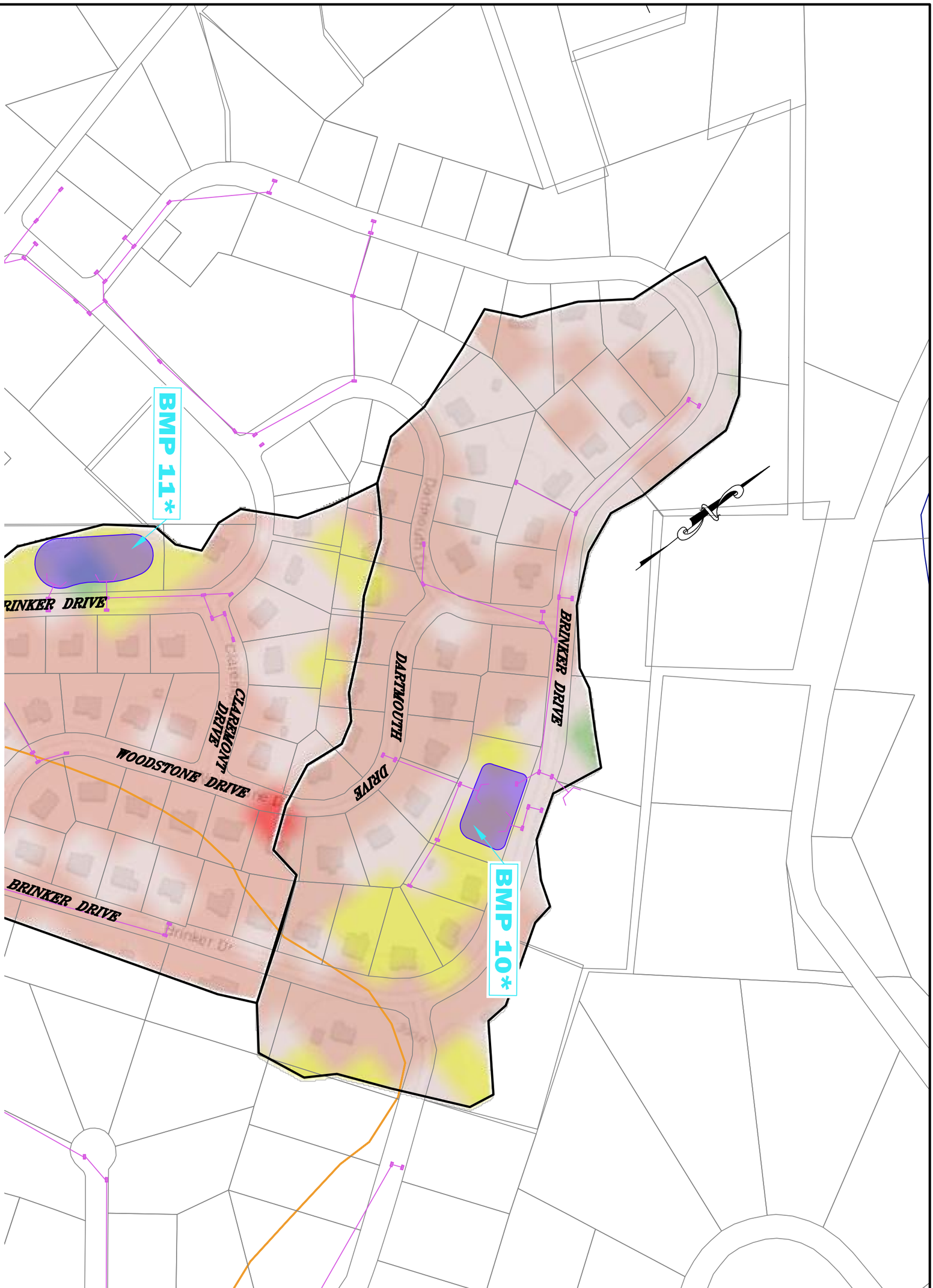

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP J

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
SCALE:	1"=200'

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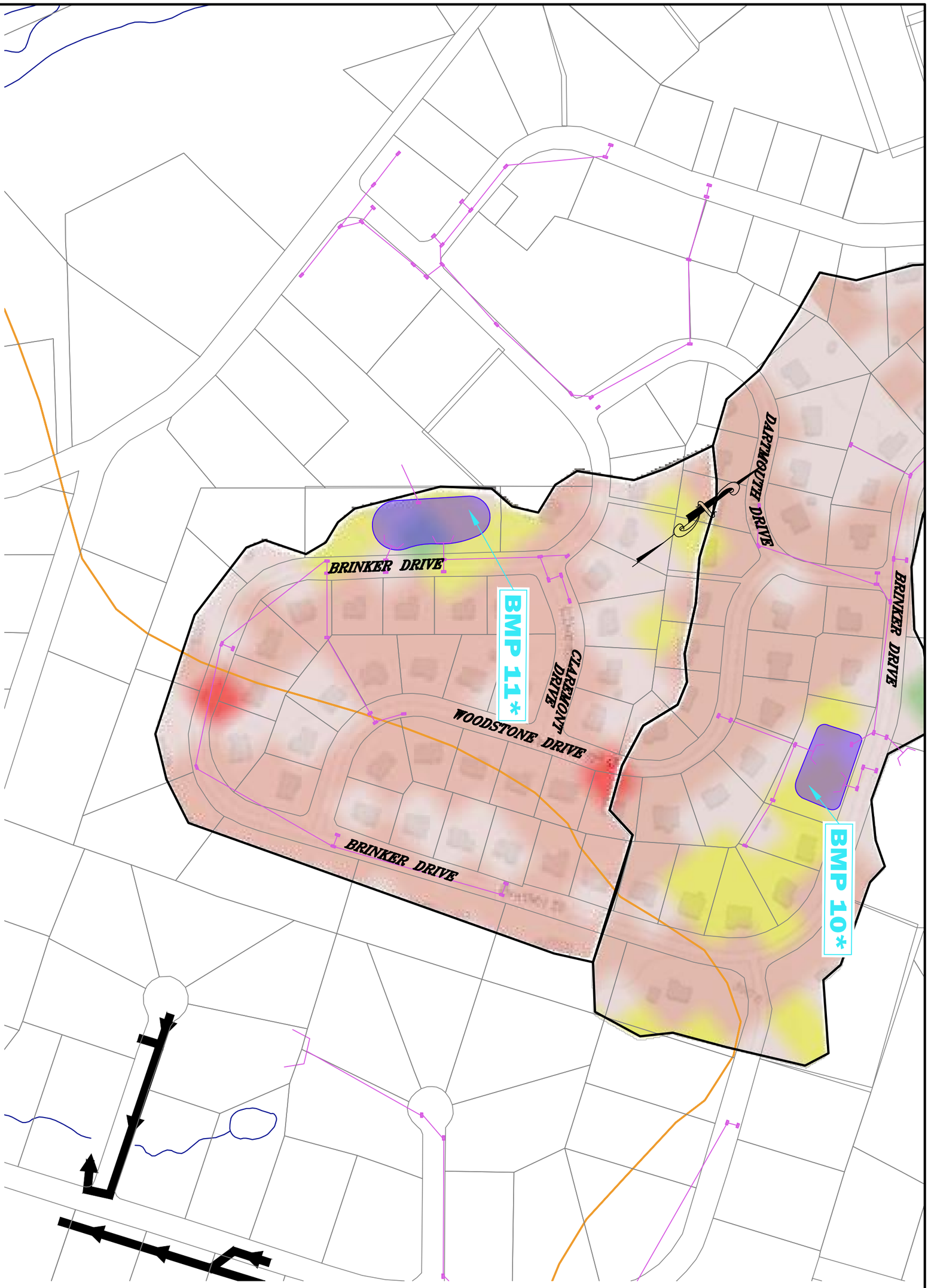

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SCALE IN FEET

PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP K

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT

DATE: 09/10/2024

SCALE: 1"=200'

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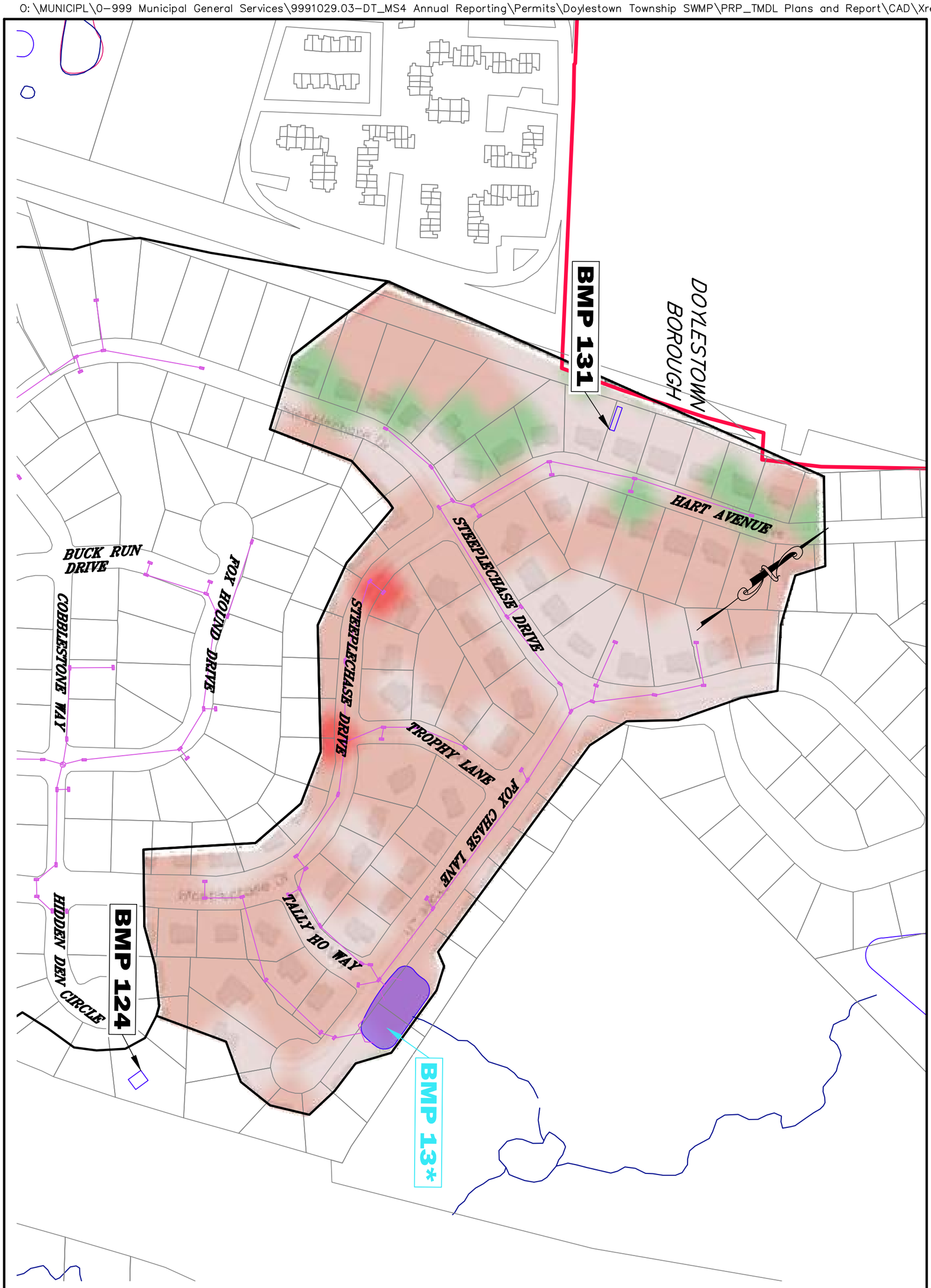

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP L

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
SCALE:	1"=200'

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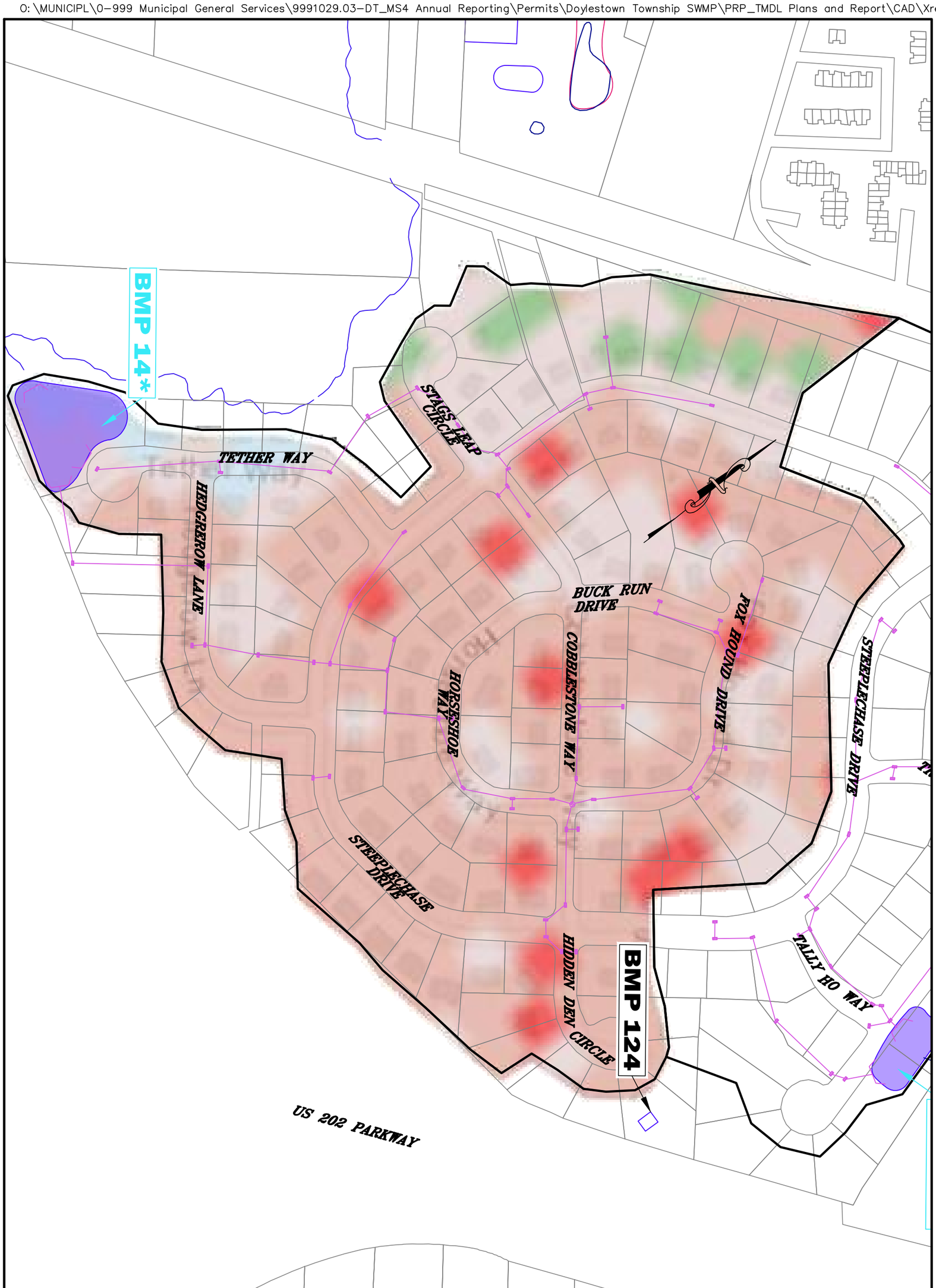

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP M

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT

DATE: 09/10/2024

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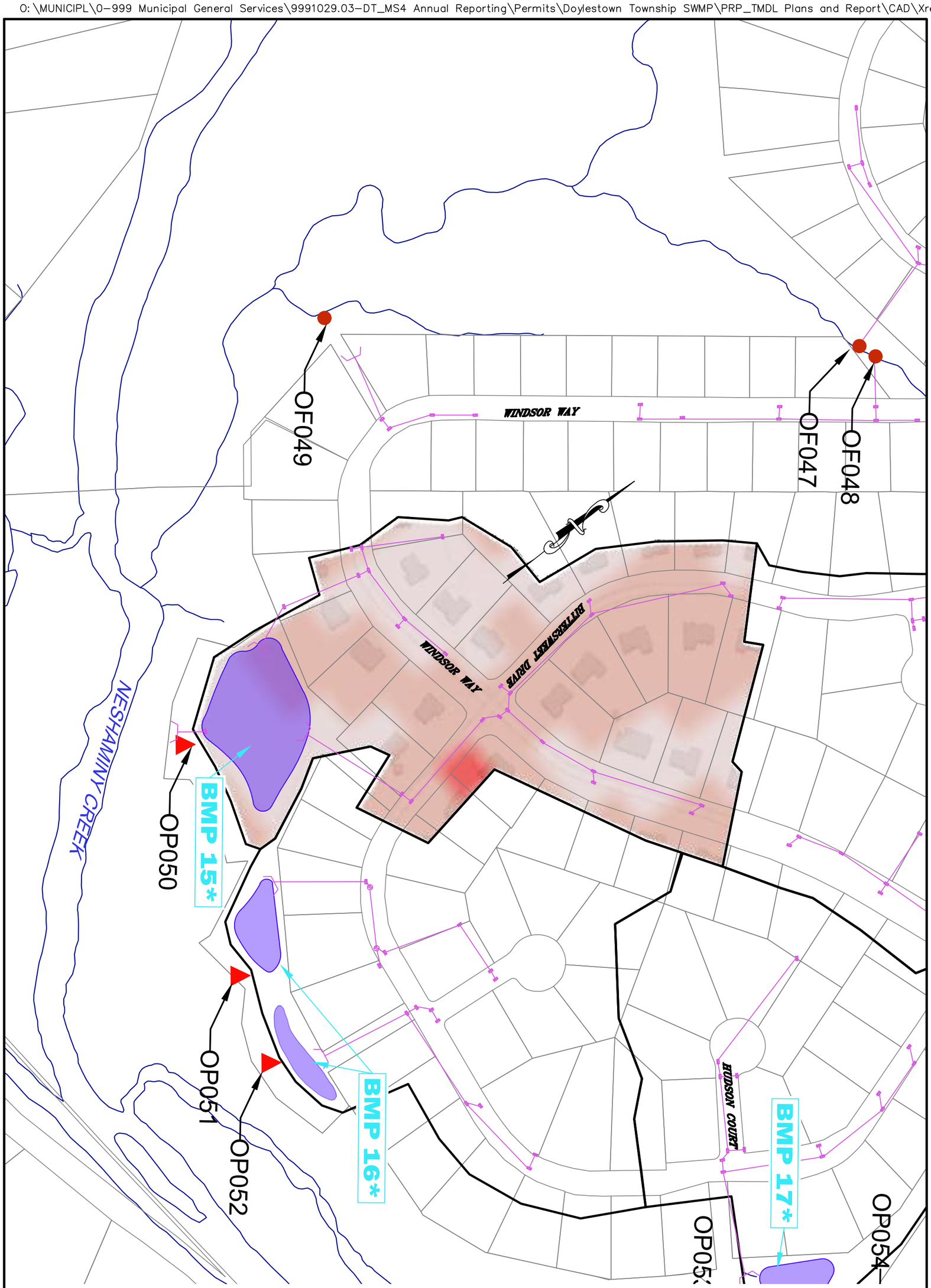

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP N

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
SCALE:	1"=200'

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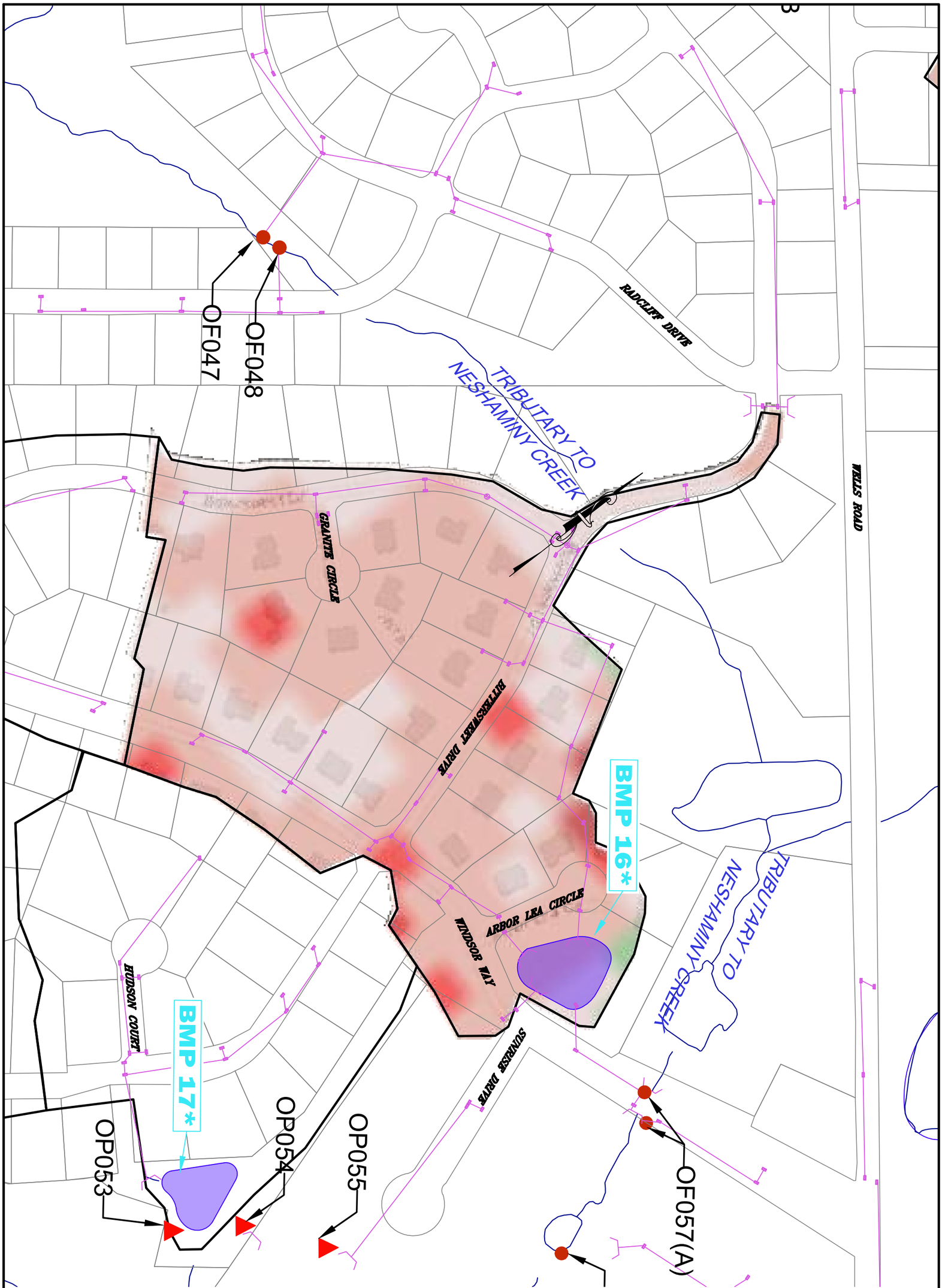

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP 0

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
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SCALE IN FEET

PROPOSED BMPS
DOYLESTOWN PRP/TMDL
PROPOSED BMP P
DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT
DATE: 09/10/2024
SCALE: 1"=100'

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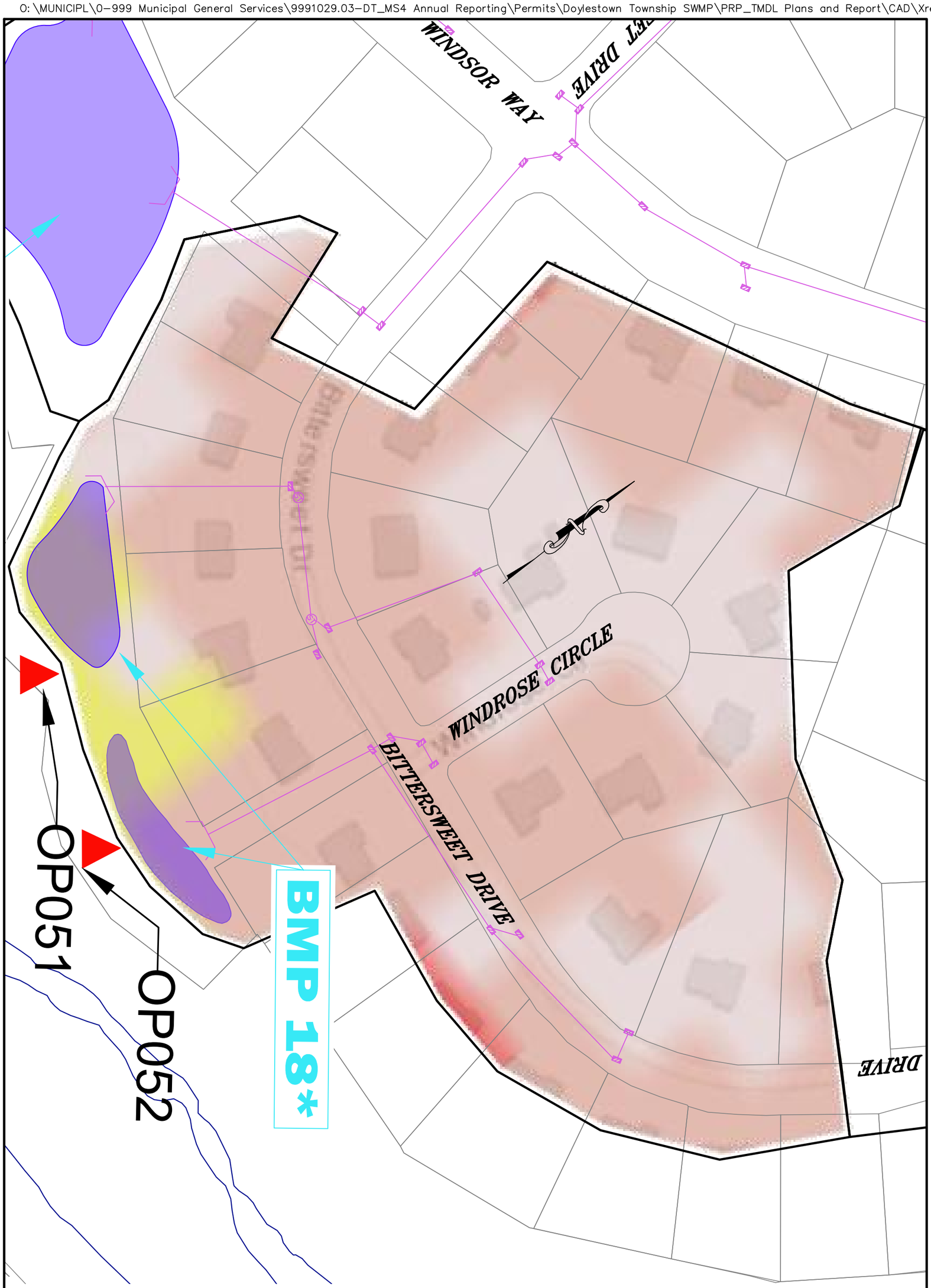

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SCALE IN FEET

PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP Q

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT

DATE: 09/10/2024

SCALE: 1"=100'

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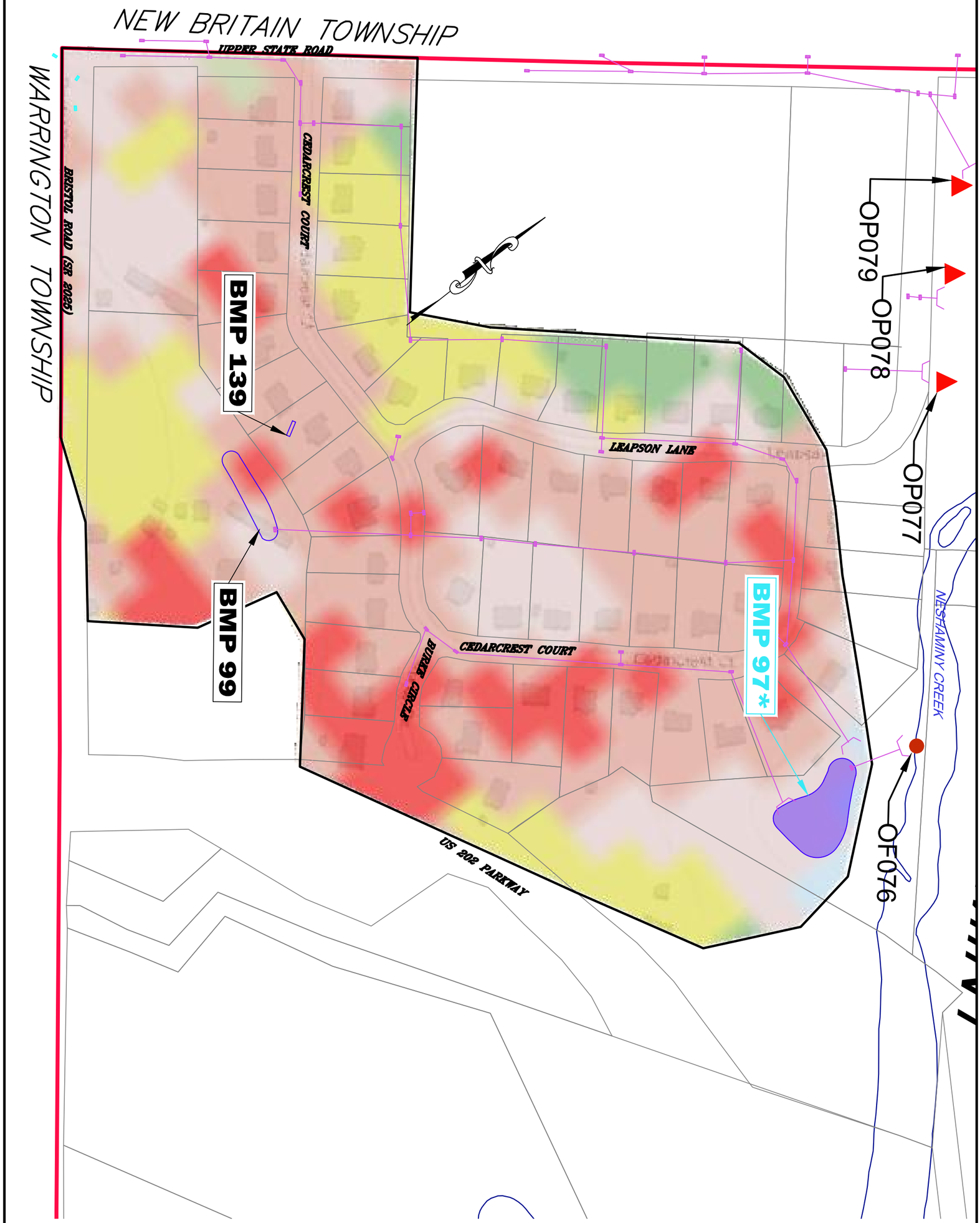

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP R

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.: 2009078PLN_DT

DATE: 09/10/2024

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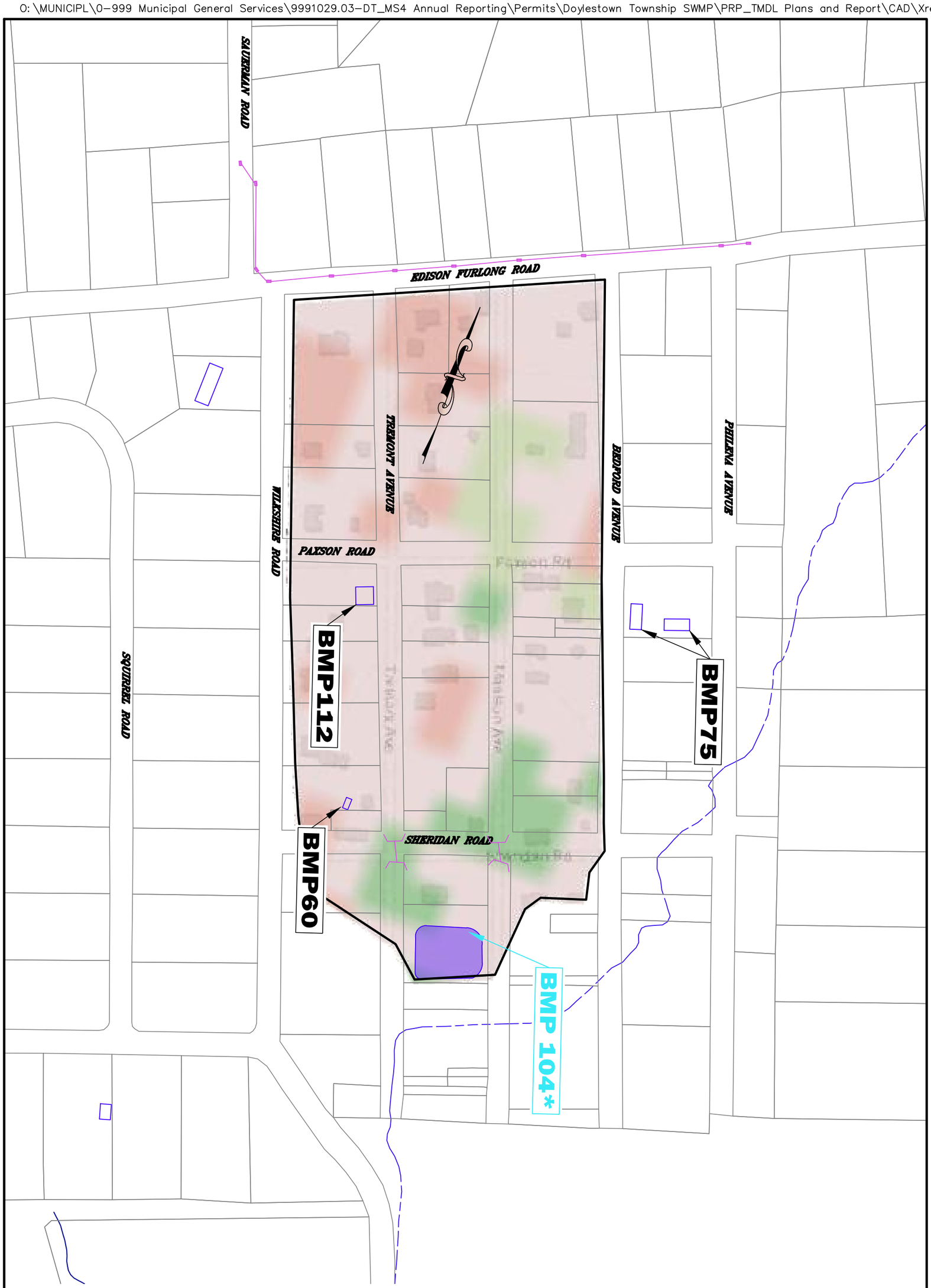

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PROPOSED BMPS

DOYLESTOWN PRP/TMDL

PROPOSED BMP S

DOYLESTOWN TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

JOB NO.:	2009078PLN_DT
DATE:	09/10/2024
SCALE:	1"=200'

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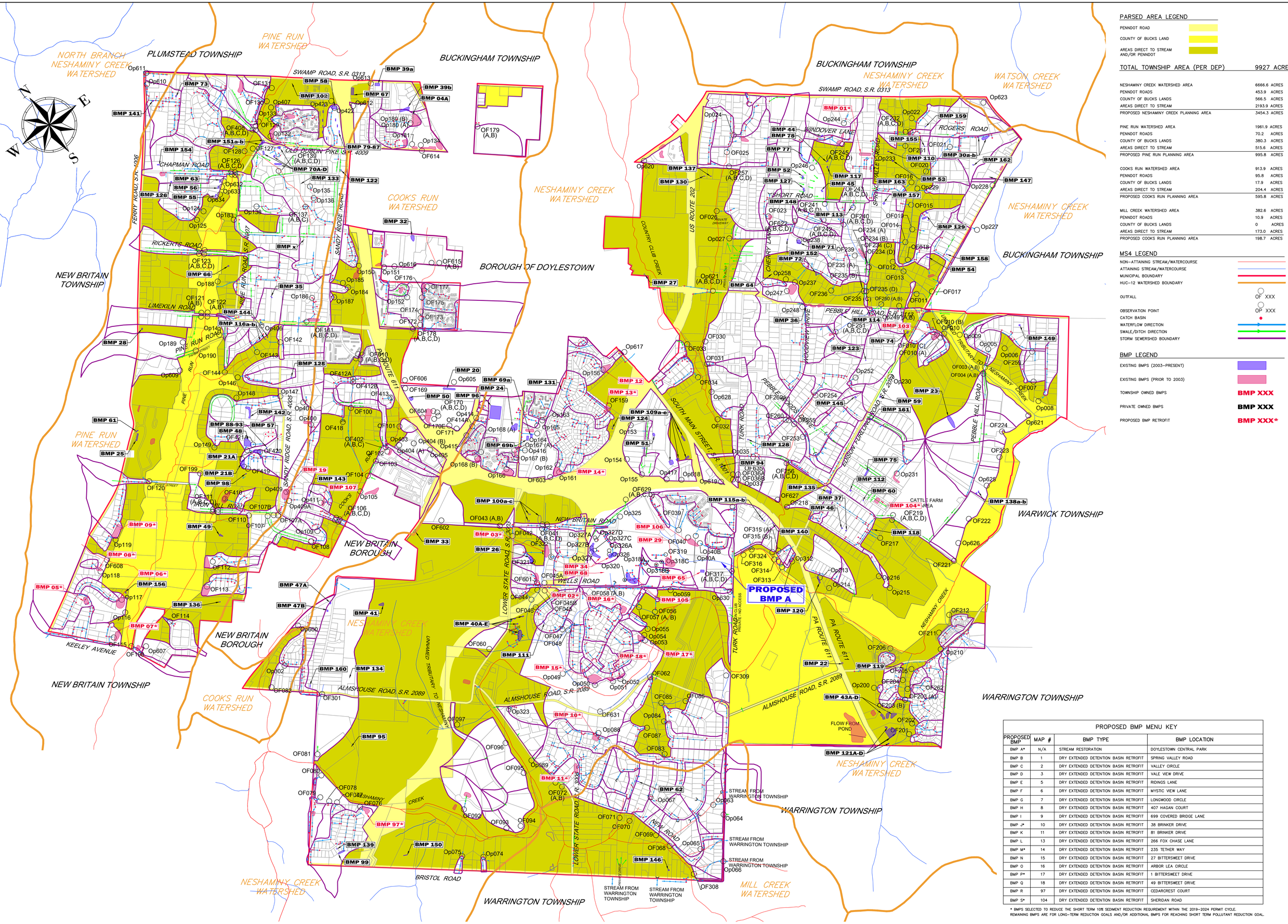
Appendix C:

Map



PARSED AREA LEGEND

- PENNDOT ROAD
- COUNTY OF BUCKS LAND
- AREAS DIRECT TO STREAM AND/OR PENNDOT

TOTAL TOWNSHIP AREA (PER DEP) 9927 ACRES

NESHAMINY CREEK WATERSHED AREA	6666.6 ACRES
PENNDOT ROADS	453.9 ACRES
COUNTY OF BUCKS LANDS	566.5 ACRES
AREAS DIRECT TO STREAM	2193.9 ACRES
PROPOSED NESHAMINY CREEK PLANNING AREA	3454.3 ACRES
PINE RUN WATERSHED AREA	1961.9 ACRES
PENNDOT ROADS	70.2 ACRES
COUNTY OF BUCKS LANDS	380.3 ACRES
AREAS DIRECT TO STREAM	515.6 ACRES
PROPOSED PINE RUN PLANNING AREA	995.8 ACRES
COOKS RUN WATERSHED AREA	913.9 ACRES
PENNDOT ROADS	95.8 ACRES
COUNTY OF BUCKS LANDS	17.9 ACRES
AREAS DIRECT TO STREAM	204.4 ACRES
PROPOSED COOKS RUN PLANNING AREA	595.8 ACRES
MILL CREEK WATERSHED AREA	382.6 ACRES
PENNDOT ROADS	10.9 ACRES
COUNTY OF BUCKS LANDS	0 ACRES
AREAS DIRECT TO STREAM	173.0 ACRES
PROPOSED COOKS RUN PLANNING AREA	198.7 ACRES

MS4 LEGEND

- NON-ATTAINING STREAM/WATERCOURSE
- ATTAINING STREAM/WATERCOURSE
- MUNICIPAL BOUNDARY
- HUC-12 WATERSHED BOUNDARY
- OUTFALL — OF XXX
- OBSERVATION POINT — OP XXX
- CATCH BASIN
- WATERFLOW DIRECTION
- SWALE/DITCH DIRECTION
- STORM SEWERSHED BOUNDARY

BMP LEGEND

- EXISTING BMPS (2003-PRESENT)
- EXISTING BMPS (PRIOR TO 2003)
- TOWNSHIP OWNED BMPS — BMP XXX
- PRIVATE OWNED BMPS — BMP XXX
- PROPOSED BMP RETROFIT — BMP XXX*

PROPOSED BMP MENU KEY

PROPOSED BMP	MAP #	BMP TYPE	BMP LOCATION
BMP A*	N/A	STREAM RESTORATION	DOYLESTOWN CENTRAL PARK
BMP B	1	DRY EXTENDED DETENTION BASIN RETROFIT	SPRING VALLEY ROAD
BMP C	2	DRY EXTENDED DETENTION BASIN RETROFIT	VALLEY CIRCLE
BMP D	3	DRY EXTENDED DETENTION BASIN RETROFIT	VALE VIEW DRIVE
BMP E	5	DRY EXTENDED DETENTION BASIN RETROFIT	RIDINGS LANE
BMP F	6	DRY EXTENDED DETENTION BASIN RETROFIT	MYSTIC VIEW LANE
BMP G	7	DRY EXTENDED DETENTION BASIN RETROFIT	LONGWOOD CIRCLE
BMP H	8	DRY EXTENDED DETENTION BASIN RETROFIT	407 HAGAN COURT
BMP I	9	DRY EXTENDED DETENTION BASIN RETROFIT	699 COVERED BRIDGE LANE
BMP J*	10	DRY EXTENDED DETENTION BASIN RETROFIT	38 BRINKER DRIVE
BMP K	11	DRY EXTENDED DETENTION BASIN RETROFIT	81 BRINKER DRIVE
BMP L	13	DRY EXTENDED DETENTION BASIN RETROFIT	266 FOX CHASE LANE
BMP M*	14	DRY EXTENDED DETENTION BASIN RETROFIT	235 TETHER WAY
BMP N	15	DRY EXTENDED DETENTION BASIN RETROFIT	27 BITTERSWEET DRIVE
BMP O	16	DRY EXTENDED DETENTION BASIN RETROFIT	ARBOR LEA CIRCLE
BMP P*	17	DRY EXTENDED DETENTION BASIN RETROFIT	1 BITTERSWEET DRIVE
BMP Q	18	DRY EXTENDED DETENTION BASIN RETROFIT	49 BITTERSWEET DRIVE
BMP R	97	DRY EXTENDED DETENTION BASIN RETROFIT	CEDARCREST COURT
BMP S*	104	DRY EXTENDED DETENTION BASIN RETROFIT	SHERIDAN ROAD

* BMPS SELECTED TO REDUCE THE SHORT TERM 10% SEDIMENT REDUCTION REQUIREMENT WITHIN THE 2019-2024 PERMIT CYCLE. REMAINING BMPS ARE FOR LONG-TERM REDUCTION GOALS AND/OR ADDITIONAL BMPS FOR REACHING SHORT TERM POLLUTANT REDUCTION GOAL.

No.	Description	Date
1	REVISED PER PRP/TMDL PLAN ADDENDUM AND UPDATES TO BMPS	10/10/24

800 400 0 800 1600

1 INCH = 800 FEET

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
CORPORATE HEADQUARTERS
65 EAST BUTLER AVENUE, SUITE 100, NEW BRITAIN, PA 18901 • (215) 345-4330 • www.gilmore-assoc.com

DOYLESTOWN TOWNSHIP
POLLUTANT REDUCTION & TMDL PLANS
PARSED AREA MAP