STORMWATER POLLUTION PREVENTION PLAN

for

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Prepared For:

Highland 201 Solar LLC
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Prepared By:

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Revised November 21, 2024

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Project No.: 190107801

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Preparer of the SWPPP

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the SPDES General Permit for Stormwater Discharges from Construction Activity. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil or administrative proceedings.

Name: Michael Finan, PE, LEED-AP

Date: November 21, 2024

WARNING: It is a violation of the NYS Education Law Article 145 for any person, unless they are acting under the direction of a licensed professional engineer, land surveyor or geologist, to alter this item in any way.

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1 Executive Summary

This Stormwater Pollution Prevention Plan (SWPPP) and accompanying project plans have been prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (General Permit) latest revision, the *New York State Stormwater Management Design Manual* (*Design Manual*) latest revision, and the *New York State Standards and Specifications for Erosion and Sediment Control* latest revision. The Applicant, Highland Solar is proposing to develop ±78.0-acre property at 206 Milton Turnpike, in the Town of Marlborough, Ulster County, New York. The project, Highland Solar, is a large-scale solar energy system that consists of solar racks, gravel road, perimeter fencing, and grass filer strip. Access to the site is provided by a 20-foot-wide gravel road. The project will maintain existing drainage patterns as much as practical; therefore, no changes in hydrology are expected.

Coverage under the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (General Permit) latest revision will be required (see Appendix A), since the project involves soil disturbance of 1 or more acres. The proposed project is also in a municipal separate storm sewer system (MS4); therefore, the Town of Marlborough will review and accept the SWPPP. The Notice of Intent (NOI) form and signed "MS4 SWPPP Acceptance" form will be submitted to the NYSDEC before construction begins to obtain coverage under the SPDES General Permit. The forms have been provided in Appendix B.

The pre- and post-development conditions were analyzed using the USDA Soil Conservation Service Publication Technical Release (TR-55) "Urban Hydrology for Small Watersheds", which provides procedures for estimating runoff and peak discharges in small watersheds. The analysis is based upon the watershed areas, land coverage, soil group types, curve numbers (CN), times of concentration (Tc), rainfall distribution type, and rainfall amount for the design storm events. The pre- and post-development peak discharge rates of runoff have been evaluated utilizing stormwater modeling software. An overall comparison of the pre- and post-development peak discharge rates for each of the design storms analyzed is provided in the table below.

Table 1-1: Comparison of Pre- & Post-Development Peak Discharge Rates with Basin

Storm Event	Pre (cfs)	Post (cfs)	Diff (cfs)
1-year	21.14	19.96	-1.18
10-year	84.49	78.66	-5.83
100-year	181.52	163.63	-17.89

The overall comparison of the pre- and post-development stormwater runoff peak discharge rates demonstrates no significant adverse impacts to the design points analyzed. In addition, the erosion control, sediment control, pollution-prevention, and stormwater management measures to be implemented during construction as outlined in this SWPPP and project drawings will minimize soil erosion and control sediment transport off site, and after construction will control the water quality and quantity of stormwater runoff.

2 Project Information

2.1 Project Summary

The Applicant is proposing to develop a property in the Town of Marlborough, Ulster County, New York (see Figure 1). Below is a summary of the project information:

Table 2-1: Project Summary

Project Name:	Highland Solar, LLC
Project Location:	206 Milton Turnpike Marlborough, New York
Property Tax ID No.:	Section 95.4, Block 3 Lot 7.11, 7.21, 7.22
Property Acreage:	78.0 acres
Municipality:	Town of Marlborough, which is an municipal separate storm sewer system (MS4)
Project Description:	Ground-mounted solar facility accessed by a gravel road and enclosed by a chain link fence.
Estimated Disturbed Area:	±28.3 acres, which does require coverage under the SPDES General Permit
Existing Site Conditions:	Woods (fair condition), grass (fair condition), impervious area (gravel, pavement, and buildings), pasture (farmland) and water. ±1.50 acres of existing impervious area
Proposed Site Conditions:	Woods (fair condition), grass (fair condition), impervious area (gravel, pavement, building, and equipment pads), pasture (farmland), Meadow, gravel road (pervious) and water. ±1.52 acres of proposed impervious area
Stormwater Management Practices:	Grass filter strips, dry detention basin
Construction Duration:	From Spring 2025 to Spring 2026, including planned winter shutdowns.

2.2 Site Conditions

The site is bounded by Mahoney Road and agricultural properties to the north; agricultural properties to the east; Milton Turnpike to the south; and agricultural properties to the west (see Figure 1).

Site Soils

The United States Department of Agriculture (USDA) Soil Conservation Service Soil Survey for Ulster County has been reviewed. The surficial soil conditions are shown in Figure 2 and are summarized in the table below.

Table 2-2: USDA Soil Data

Map Symbol	Description	Depth to Groundwater (ft)	Depth to Bedrock (in)	Hydrologic Soil Group
At	Atherton silt loam	0.0 – 0.5 (Nov-June)	>60	D
BgC	Bath gravelly silt loam 8% to 15% slopes	2.0 - 4.0 (Nov-Mar)	>60	C
BgD	Bath gravelly silt loam 15% to 25% slopes	2.0 - 4.0 (Nov-Mar)	>60	C
BnC	Bath-Nassau complex, 8% to 25% slopes	2.0 - 4.0 (Nov-Mar)	40	C
BOD	Bath-Nassau-Rock outcrop complex, hilly	2.0 - 4.0 (Nov-Mar)	40	C
Cd	Canandaigua silt loam, till substratum	0 – 1.0 (Nov – May)	>60	C
CgA	Castile gravelly silt loam, 0% to 3% slopes	1.5 – 2.0 (Mar-May)	>60	D
MdB	Mardin gravelly silt loam, 3% to 8% slopes	1.5 – 2.0 (Nov – Apr)	>60	D
MgB	Mardin-Nassau complex, 3% to 8% slopes	Varies[1]	Varies[2]	D
VoB	Volusia gravelly silt loam, 3% to 8% slopes	0.5 – 1.5 (Dec-May)	>60	D
VoC	Volusia gravelly silt loam, 8% to 15% slopes	0.5 – 1.5 (Dec-May)	>60	D

1. The depth to groundwater for the Mardin component is 1.5 feet to 2.0 feet (November to April) and Nassau component is greater than 6.0 feet.
2. The depth to bedrock for the Mardin component is 40 inches and Nassau component is 10 inches to 20 inches.

Water Resources

A wetland and waterbody delineation were conducted on May 3, 2024. Four Palustrine wetlands were identified within the total property area. All four wetlands are potential USACE jurisdictional and are identified on the plans as wetlands W-1, W-2, W-3, & W-4. Wetland area 4 has the potential to be non-jurisdictional as it is not hydrologically connected with any of the other wetland areas, or off site WOTUS. In addition to the four wetlands, one intermittent stream, and one open water farm pond were identified within the total property area. The stream, identified as stream S-1, is under a potential USACE jurisdiction. Stream S-1 is classified by the NYSDEC as a Class C waterbody. Stream S-1, the Class C waterbody, is therefore under NYSDEC jurisdiction in addition to USACE jurisdiction. Stream S-1, the Class C waterbody, does not have a setback requirement because although it is classified by the NYSDEC, Class C waterbodies are not regulated by the NYSDEC.

Aquifer mapping was reviewed to determine whether the site is over a sole source, primary or principal aquifer. According to the Environmental Protection Agency "Sole Source Aquifers" map, the site is not over a sole-source aquifer. According to the NYSDEC "Primary and Principal Aquifers in New York State" map, the site is not over a primary aquifer or a principal aquifer.

Floodplains

The Flood Insurance Rate Map (FIRM) Community Panel Number 36111C0790E with an effective date of September 25, 2009 was reviewed. According to Panel 790 of 910, the property is within Zone X (see Figure 3). Zone X is defined as "areas determined to be outside the 0.2% annual chance floodplain."

Cultural Resources

According to the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) Cultural Resource Information System (CRIS), the property is not within an archaeological sensitive area; not listed or eligible for listing on the state or national registers of historic places; and not adjacent to a place listed or eligible for listing on the state or national registers of historic places (see Figure 4).

3 Stormwater Management Plan

3.1 Site Planning

3.1.1 Preservation of Natural Features and Conservation

Preservation of natural features includes techniques to identify and preserve natural areas that can be used to protect water, habitat and vegetative resources. Conservation includes designing elements of the development in a way that the site design takes advantage of a site's natural features, preserves sensitive areas and identifies constraints and opportunities to prevent or reduce negative effects of a development. An evaluation of the preservation of natural features and conservation planning practices is provided in the table below.

Table 3-1: Preservation of Natural Features and Conservation

Practice	Incorporated	Reason
Preservation of Undisturbed Areas	N/A	
Preservation of Buffers	Considered and Applied	None
Reduction of Clearing and Grading	Considered and Applied	None
Locating Development in Less Sensitive Areas	Considered and Applied	None
Open Space Design	N/A	
Soil Restoration	Considered and Applied	None

3.1.2 Reduction of Impervious Cover

Reduction of impervious cover includes methods to reduce the amount of rooftops, parking lots, roadways, sidewalks, and other surfaces that do not allow rain to infiltrate into the soil. An evaluation of the reduction of impervious cover techniques is provided in the table below.

Table 3-2: Reduction of Impervious Cover

Practice	Incorporated	Reason
Roadway Reduction	N/A	
Sidewalk Reduction	N/A	
Driveway Reduction	Considered and Applied	The driveway width is the minimum width allowed for emergency service access
Cul-de-sac Reduction	N/A	
Building Footprint Reduction	N/A	
Parking Reduction	N/A	

3.1.3 Runoff Reduction Techniques

Green infrastructure techniques use the natural features of the site and promote runoff reduction through micromanaging runoff, promoting groundwater recharge, increasing losses through evapotranspiration, and emulating the existing hydrology. An evaluation of the runoff reduction practices is provided in the table below.

Table 3-3: Runoff-Reduction Practices

Practice	Incorporated	Reason
Conservation of Natural Areas	Considered and Applied	None
Sheet flow to Riparian Buffers or Filter Strips	Considered and Applied	None
Vegetated Open Swale	Considered and Not Applied	A different runoff reduction practice is being used.
Tree Planting/ Tree Box	Considered and Not Applied	Trees cannot be planted in the fence perimeter of the solar facility since it could cause shading of the racks.
Disconnection of Rooftop Runoff	N/A	
Stream Daylighting for Redevelopment Projects	N/A	
Rain Garden	Considered and Not Applied	A different runoff reduction practice in combination with a dry detention basin will be used.
Green Roof	N/A	
Stormwater Planter	N/A	
Rain Tank/Cistern	N/A	
Porous Pavement	Considered and Not Applied	The driveway is proposed to be constructed of gravel.

3.1.4 Standard Stormwater Management Practices

Standard stormwater management practices (SMPs) are structural practices that are designed to capture and treat the water quality volume. Some of the standard SMPs can also provide runoff reduction or water quantity controls. An evaluation of the standard SMPs is provided in the table below.

Table 3-4: Standard Stormwater Management Practices

Practice	Incorporated	Reason
Stormwater Ponds	Considered and Not Applied	Practice does not provide runoff reduction. A runoff reduction practice in combination with a dry detention basin will be used.
Stormwater Wetlands	Considered and Not Applied	Practice does not provide runoff reduction. A runoff reduction practice in combination with a dry detention basin will be used.
Stormwater Infiltration	Considered and Not Applied	This practice would take up a larger footprint than the proposed filter strips and dry detention basins will be used for water quantity controls.
Underground Infiltration System	Considered and Not Applied	This practice would take up a larger footprint than the proposed filter strips and dry detention basins will be used for water quantity controls.
Stormwater Filtering Systems – Sand or Organic	Considered and Not Applied	Practice does not provide runoff reduction. A runoff reduction practice in combination with a dry detention basin will be used.
Stormwater Filtering Systems – Bioretention	Considered and Not Applied	A different runoff reduction practice in combination with a dry detention basin will be used.
Stormwater Open Channel Systems – Dry Swale	Considered and Applied	None
Stormwater Open Channel Systems – Wet Swale	Considered and Not Applied	Practice does not provide runoff reduction. A runoff reduction practice in combination with a dry detention basin will be used.

3.2 Dry Detention Basin

The Town expressed concerns of downstream impacts due to potential runoff from the project. The best practice to mitigate downstream impact from a project is to first control impervious cover, followed by minimizing the quantity of stormwater runoff introduced off site. Due to the concerns of the Town, an oversized dry detention basin has been included to help minimize and mitigate downstream impact from the proposed project. Refer to the Hydrologic Analysis below for more information.

3.3 Hydrologic Analysis

3.3.1 Stormwater Modeling

The USDA Soil Conservation Service Publication Technical Release (TR-55) "Urban Hydrology for Small Watersheds" has been used to analyze the pre- and post-development rainfall runoff rates and volumes. Watershed areas, curve numbers (CN), and times of concentration (T_C) were calculated for the contributing watershed. The curve number is a land-sensitive coefficient that dictates the relationship between total rainfall depth and direct storm runoff. Based on the land coverage and soil group types, the average CN has been determined for both the pervious and impervious area of each watershed for both the existing and proposed conditions.

The T_C is defined as the time for runoff to travel from the hydraulically most distant point in the watershed to a Design Point (DP). Values of the time of concentration were determined for both the pervious and impervious area of each watershed for both the existing and proposed conditions based on land cover and slope of the flow path using methods outlined in TR-55. As per TR-55, the minimum T_C used in 0.1 hours (for 6 minutes).

An overall watershed boundary was developed for the pre- and post-development conditions (see Figure 5 and Figure 6, respectively). The overall watershed was broken down into smaller watersheds, or subcatchments to allow for analysis of runoff conditions at several locations. Each of these locations is defined as a Design Point (DP) to compare the proposed development to the existing conditions. Descriptions of each of the selected design points are provided below:

- Design Point 1: Twin 30" CMP to the adjacent property's pond.

Rainfall data used in the modeling and analysis was obtained from the isohyet maps provided in the *New York State Stormwater Management Design Manual* and the Northeast Regional Climate Center (NRCC). A Type III rainfall distribution was used to evaluate the pre- and post-development stormwater runoff conditions for the 1-, 10-, and 100-year 24-hour storm events. The rainfall data used in the stormwater management design and analysis is provided in the table below.

Table 3-5: Rainfall Data

Storm Event	24-Hour Rainfall
90th Percentile(1,2)	1.50 inches
1-year	2.61 inches
2-year(3)	3.16 inches
10-year	4.67 inches
100-year	8.18 inches

1. The 90th percentile 24-hour rainfall value was taken from the *New York State Stormwater Management Design Manual*. The other 24-hour rainfall values are taken from NRCC.
2. The 90th percentile 24-hour rainfall amount was used to calculate the required total water quality volume.
3. The 2-year 24-hour rainfall amount was used to calculate the sheet flow component in the time of concentration.

The rainfall data used in the stormwater management design and analysis is provided in Appendix C. The results of the computer modeling used to analyze the pre- and post-development watershed conditions are provided in Appendix D and Appendix E, respectively.

3.3.2 Water Quality Control

Treatment of stormwater runoff is important because most runoff-related water quality contaminants are transported during the initial stages of storms. The water quality volumes have been determined based on the methodology described in the Design Manual. The total water quality volume is provided in the table below.

Table 3-6: Total Water Quality Volume

Subcatchment	Area (ac)	Impervious Area (ac)	WQ_v (cf)
1	0.06	0.02	113
2	0.06	0.02	113
3	0.23	0.15	787
4	0.20	0.11	608
5	0.23	0.10	559
6	1.71	0.60	3,402
Total	**2.48**	**1.00**	**5,582**

Detailed design calculations have been provided in Appendix C.

Panels on Slopes Over 10%

In order to maintain sheet flow throughout the racking area, a series of gravel diaphragms and permanent earthen level spreaders are proposed at intervals of 100 feet or less. Based on correspondence with NYSDEC, if sheet flow is maintained by installing measures across the site, like gravel diaphragms, the measures should be sized to hold the WQv for the areas associated with panels on slopes over 10%. The panels on slopes steeper than 10% can be considered pervious if the separation between panel rows is equal to or greater than panel width. As shown on the accompanying project plans, panel row spacing shall be a minimum of the panel width. Therefore, the panels are not considered impervious, and WQv for the areas associated with the panels has been determined with respect to the pervious ground beneath the panels. The water quality volume for the Eastern and Western arrays is provided in the table below.

Table 3-7: Water Quality Volume for Panels on Slopes Over 10%

Subcatchment	Area (ac)	Impervious Area (ac)	Panel Area on Slopes Greater than 10% (ac)	WQ_v (cf)
North Array	8.21	0.00	1.06	2,234
South Array	8.55	0.00	0.16	2,327
Total	**16.75**	**0.00**	**1.21**	**4,561**

Detailed design calculations have been provided in Appendix C and NYSDEC correspondence has been provided in Appendix I.

3.3.3 Runoff Reduction Volume

Runoff reduction is achieved by infiltration, groundwater recharge, reuse, recycle, evaporation and evapotranspiration of 100 percent of the post-development water quality volumes to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, and minimizing concentrated flow by using runoff-control techniques to provide treatment in a distributed manner before runoff reaches the collection system. The runoff-reduction-volume techniques that were used to reduce the total required water quality volume are in the table below.

Table 3-8: Implemented Runoff Reduction Volume Techniques

Techniques/ Practices	RRv Reduction Method	Reduction Amount
Bioretention	Standard SMP with RRv capacity	40% of the WQv provided by practice (with underdrains)
Dry Swale	Standard SMP with RRv capacity	20% of the WQv provided by practice (Type C and D soils)

After applying the runoff-reduction-volume techniques, the total required water quality volume was not reduced 100 percent. The minimum required runoff reduction volume was determined to confirm that at least the minimum percent of the total water quality volume has been reduced. The total provided runoff reduction volume was greater than the minimum required runoff reduction volume. Therefore, the minimum required runoff-reduction volume has been met. Detailed design calculations have been provided in Appendix C.

3.3.4 Water Quantity Control

The project was designed to minimize any changes to the hydrology that would result in an increase in the discharge rate. Since 100% of the runoff reduction has been reduced the channel protection volume requirement is being waived.

A comparison of the pre- and post-development peak discharge rates is provided in the table below.

Table 3-9: Summary of Pre- & Post-Development Peak Discharge Rates

Storm Event	Design Point	Pre (cfs)	Post (cfs)	Diff (cfs)
1-year	1	21.14	21.12	-0.02
10-year	1	84.49	84.42	-0.07
100-year	1	181.52	175.78	-5.74

Per NYSDEC requirements, the project would not require a stormwater detention basin or other form of quantity reductions; however, the Town has expressed concerns over potential downstream impacts. As a result, a dry detention basin has been included as a mitigation measure. A comparison of the pre- and post-development peak discharge rates, with the dry detention basin modeled as proposed, is provided in the table below.

Table 3-10: Summary of Pre- & Post-Development Peak Discharge Rates with Basin

Storm Event	Design Point	Pre (cfs)	Post (cfs)	Diff (cfs)
1-year	1	21.14	19.96	-1.18
10-year	1	84.49	78.66	-5.83
100-year	1	181.52	163.63	-17.89

Comparison of the peak discharge rates for pre- and post-development watershed conditions demonstrates that the peak rate of runoff from the proposed development will not be increased. The pre- and post-development stormwater models have been provided in Appendix D and Appendix E, respectively.

4 Erosion and Sediment Control Plan

This SWPPP and accompanying project plans identify erosion and sediment control measures to be implemented during and after construction to minimize erosion and sediment impacts. The erosion and sediment control measures have been designed in accordance with the *New York State Standards and Specifications for Erosion and Sediment Control*, latest revision.

4.1 Construction Sequencing Schedule and Phasing

The project will be completed in phases and the general construction sequencing is provided on the accompanying project plans.

4.2 Erosion and Sediment Control Measures

Temporary erosion and sediment control measures to be used during construction generally include the following:

- **Stabilized Construction Access** - Before construction, the stabilized construction access shall be installed to reduce the tracking of sediment onto adjacent roadways. Construction traffic must enter and exit the site at the stabilized construction access. The stabilized construction access shall be maintained in good condition to control tracking of sediment onto rights-of-way or streets. When necessary, the placement of additional aggregate atop the filter fabric shall be done to maintain the minimum thickness. Sediments and soils spilled, dropped, or washed onto the public rights-of-way shall be removed immediately.

- **Dust Control** - Water trucks or other approved water source shall be used, as needed, during construction to reduce dust generated on the site. Dust control shall be provided by the general contractor to a degree acceptable to the owner/operator, and in compliance with the applicable local and state dust control requirements.

- **Temporary Soil Stockpile** - Materials, such as topsoil, shall be temporarily stockpiled (if necessary) on site during construction. Stockpiles shall be located away from storm drainage, water bodies or courses, and shall be properly protected from erosion in accordance with the NYSDEC standard detail.

- **Silt Fencing** - Before initiation of and during construction, silt fencing shall be established along the perimeter of areas to be disturbed as a result of the construction up gradient of water courses or adjacent properties. These barriers may extend into non-impact areas to adequately protect adjacent lands. Clearing and grubbing shall be performed only as necessary for the installation of the sediment control barrier. To maximize effectiveness of the silt fencing, daily inspections shall be performed by site personnel. Maintenance of the fence shall be performed as needed and when directed by the Qualified Inspector.

- **Temporary Seeding** - Within seven days after construction ceases on any particular area of the site, all disturbed areas where there shall be no construction for longer than 14 days shall be temporarily seeded and mulched to minimize erosion and sediment loss. Other stabilization methods maybe approved by the Qualified Inspector.

- **Dewatering** - Dewatering, if required, must not be discharged directly into wetlands, water courses, water bodies, and storm sewer systems without appropriate protection or authorizations. Proper methods and devices shall be used to the extent permitted by law, such as pumping water into temporary sediment basins, providing surge protection at the inlet and outlet of pumps, floating the intake of the pump, or other methods to minimize and retain the suspended solids.

Permanent erosion and sediment control measures to be used after construction generally include the following:

- **Establish Permanent Vegetation** - Disturbed areas not covered by impervious surfaces shall be seeded in accordance with the accompanying plans. The type of seed, mulch, and maintenance measures shall be followed. All areas at final grade shall be seeded and mulched within 14 days after completion of the major construction. All seeded areas shall be protected with mulch or hay. Final site stabilization is achieved when soil-disturbing activities have been completed and a uniform, perennial vegetative cover with a density of 80 percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on the disturbed unpaved areas and areas not covered by permanent structures.

- **Rock Outlet Protection** - Rock outlet protection shall be installed at the locations as shown on the accompanying plans. The installation of rock outlet protection will reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving water course or water body.

Specific erosion and sediment control measures, inspection frequency, and remediation procedures are provided in the subsequent sections and on the accompanying project plans.

4.3 Pollution Prevention Controls

Good housekeeping practices are designed to maintain a clean and orderly work environment. Good housekeeping measures shall be maintained throughout the construction process by those parties involved with the direct care and development of the site. The following measures shall be implemented to control the possible exposure of harmful substances and materials to stormwater runoff:

1. Material resulting from the clearing and grubbing operation shall be stockpiled away from storm drainage, water bodies or watercourses and surrounded with adequate erosion and sediment control measures. Soil stockpile locations shall be exposed no longer than 14 days before seeding.

2. Equipment maintenance areas shall be protected from stormwater flows and shall be supplied with appropriate waste receptacles for spent chemicals, solvents, oils, greases, gasoline, and any pollutants that might contaminate the surrounding habitat or water supply. Equipment wash-down zones shall be within areas draining to sediment control devices.

3. The use of detergents for large-scale (e.g., vehicles, buildings, pavement surfaces) washing is prohibited.

4. Material storage locations and facilities (e.g., covered storage areas, storage sheds) shall be on-site and shall be stored according to the manufacturer's standards in a dedicated staging area. Chemicals, paints, solvents, fertilizers, and other toxic material shall be stored in waterproof containers. Runoff containing such materials shall be collected, removed from the site, treated and disposed of at an approved solid waste or chemical disposal facility.

5. Hazardous spills shall be immediately contained to prevent pollutants from entering the surrounding habitat or water supply. Spill Kits shall be provided on site and shall be displayed in a prominent location for ease of access and use. Spills greater than 5 gallons shall be reported to the NYSDEC Response Unit at 1-800-457-7362. In addition, a record of the incidents or notifications shall be documented and attached to the SWPPP.

6. Portable sanitary waste facilities shall be provided on site for workers and shall be properly maintained.

7. Dumpsters or debris containers shall be on site and shall be of adequate size to manage respective materials. Regular collection and disposal of wastes must occur as required.

8. Temporary concrete washout facilities shall be a minimum of 50 feet from storm drain inlets, open drainage facilities, and watercourses. Each facility should be away from construction traffic or access areas to prevent disturbance or tracking. A sign shall be installed adjacent to each washout facility to inform concrete equipment operators to use the proper facilities. When temporary concrete washout facilities are no longer required for the work, the hardened concrete shall be removed and disposed of. Materials used to construct the temporary concrete washout facilities shall be removed and disposed of. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled or repaired, seeded, and mulched for final stabilization. Wastewater discharges from washout of concrete is prohibited.

9. Non-stormwater components of site discharge shall be clean water. Water used for construction, which discharges from the site, must originate from a public water supply or approved private well. Water used for construction that does not originate from an approved public supply must not discharge from the site.

10. Discharges from dewatering activities, including discharges from dewatering trenches and excavations, shall be managed by appropriate control measures.

11. Wastewater discharges from washout and cleanout of stucco, paint, form-release oils, curing compounds, and other construction materials is prohibited.

4.4 Soil Stabilization and Restoration

Stabilization

In areas where soil disturbance has temporarily or permanently ceased, the application of soil stabilization measures shall be initiated by the end of the next business day and completed within 14 days from the date the current soil disturbance ceased. The soil-stabilization measures shall

be in conformance with the *New York State Standards and Specifications for Erosion and Sediment Control*, latest edition.

Restoration

Soil restoration shall be performed in the disturbed areas. The soils shall be restored in accordance with the table below.

Table 4-1: Soil Restoration

Type of Soil Disturbance	Soil Restoration Requirement
No Soil Disturbance (e.g., preservation of natural features)	Restoration not required.
Minimal Soil Disturbance (e.g., clearing and grubbing)	Restoration not required.
Areas where top soil is stripped only (e.g., no change in grade)	Aerate and apply 4 inches of topsoil.
Areas of cut or fill	Aerate and apply 4 inches of topsoil.
Heavy traffic areas on site (especially in 5 to 25 feet around buildings, but not within a 5-foot perimeter around foundation walls)	Apply full soil restoration (see below).
Areas where runoff reduction or infiltration practices are applied	Restoration not required, but can be applied to enhance soil infiltration.

Full Soil Restoration

Before applying full soil restoration, all construction, including construction equipment and material storage, site cleanup and trafficking, should be finished and the site closed to further disturbance. Full soil restoration should be performed with a heavy-duty agricultural-grade deep ripper, deep angled-leg subsoiler, or equivalent machinery to achieve de-compaction.

Full soil restoration is implemented in a two-phase process:

1. Deep rip the affected thickness of exposed subsoil, aggressively fracturing it before the protected topsoil is reapplied on the site.
2. De-compact simultaneously through the restored topsoil layer and upper half of the affected subsoil.

Low to Moderate Subsoil Moisture

The disturbed soils are returned to rough grade and the following is applied:

1. Apply 3 inches of compost over the subsoil.
2. Till compost a minimum of 12 inches into the subsoil using a cat-mounted ripper, tractor-mounted disc, or tiller mixing and circulating air and compost into subsoils.
3. Rock-pick until uplifted stone and rock of 4 inches or larger size are cleaned off the site. All construction material and foreign debris and existing root masses shall be removed from proposed planting areas.

4. Apply 6 inches of topsoil. Newly installed planting soils shall be mixed with existing soils where they meet in order to create a transitional gradient to allow for proper drainage.
5. Install plants and vegetation in accordance with the Landscaping Plan.

5 Stormwater Pollution Prevention Plan Implementation

5.1 Certification Statements

Before starting construction, the owner/operator, contractors, and subcontractors are required to sign the certification statements provided in Appendix F.

The owner/operator must sign a copy of the Owner's/Operator's certification before submitting the Notice of Intent. The owner/operator acknowledges that the SWPPP has been developed and will be implemented as the first element of construction and agrees to comply with the terms and conditions of the general permit for which the Notice of Intent is being submitted.

The owner/operator must identify the contractors and subcontractors that will be responsible for installing, constructing, repairing, replacing, inspecting, and maintaining the erosion and sediment control practices; and constructing the post-construction stormwater management practices included in the SWPPP. The contractors and subcontractors must identify at least one trained individual from their company who will be responsible for implementation of the SWPPP. This person will be known as the trained contractor. At least one trained contractor will be on site daily when soil disturbing activities are being performed. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has begun, they must also sign the certification statement and identify their responsibilities.

5.2 Pre-Construction Meeting

Before beginning construction, the owner/operator must set up a pre-construction meeting with the Town representative, qualified professional, qualified inspector, contractors, and subcontractors. The primary purpose of the pre-construction meeting is to discuss the responsibilities of each party as they relate to the implementation of the SWPPP and to clarify any questions.

5.3 Construction Site Log

The owner/operator must maintain a copy of the following, including but not limited to: General Permit, signed NOI, signed MS4 Acceptance form, NOI Acknowledgement Letter, SWPPP, signed certification statements, and inspections reports. The documents must be maintained in a secure location onsite. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

5.4 Construction Inspections and Maintenance

5.4.1 Contractor Maintenance Inspection Requirements

The trained contractor must inspect the erosion and sediment control practices and pollution-prevention measures to verify that they are being maintained in effective operating condition. The inspections will be conducted as follows:

- For construction sites where soil disturbance is on-going, the trained contractor must inspect the measures within the active work area daily. If deficiencies are identified, the contractor will begin implementing corrective actions within one business day and must complete the corrective actions by the end of the day.

- For construction sites where soil disturbance activities have been temporarily suspended (e.g., winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the trained contractor can stop conducting the maintenance inspections. The trained contractor must conduct the daily maintenance inspections as soil disturbance resumes.

- For construction sites where soil disturbance has been shut down with partial project completion, the trained contractor can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed part of the project have been constructed in conformance with the SWPPP and are operational.

5.4.2 Qualified Inspector Inspection Requirements

The owner/operator must have a Qualified Inspector conduct site inspections to verify the stability and effectiveness of protective measures and practices employed during construction. The site inspections will be conducted as follows:

- For construction sites where soil disturbance is ongoing, the Qualified Inspector must conduct a site inspection at least once every seven days.

- For construction sites where soil disturbance activities have been temporarily suspended (e.g., winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the Qualified Inspector must conduct a site inspection at least once every 30 days. The owner/operator must notify the NYSDEC or MS4 in writing before reducing the frequency of the inspections.

- For construction sites where soil disturbance activities have been shut down with partial project completion, the Qualified Inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices are operational. The owner/operator must notify the NYSDEC or the MS4 in writing before the shutdown.

All erosion and sediment control inspections shall be performed in accordance with this SWPPP, accompanying project plans, latest revision of *New York State Standards and Specifications for*

Erosion and Sediment Control, and procedures outlined in Appendix H of the latest revision of the *New York State Stormwater Management Design Manual*. Inspection reports must identify and document the maintenance of the erosion and sediment control measures. An example inspection report has been provided in Appendix G.

Specific maintenance components, schedule frequency, inspection parameters and remediation procedures are provided on the accompanying project plans. Any adjustments or modifications to the maintenance plan shall be noted in the inspection reports and submitted to the Town for approval.

6 Termination of Coverage

The owner/operator may terminate coverage when:

a. Total project completion has occurred.
b. A planned shutdown with partial project completion has occurred.
c. Property ownership changes or when there is a change in operational control over the construction plans and specifications; and the new owner/operator has obtained coverage under the SPDES General Permit.
d. Coverage under an alternative SPDES general permit or an individual SPDES permit has been obtained.

The completed NOT must be submitted to the NYSDEC to cancel coverage. A blank copy of the NOT has been provided in Appendix B.

7 Post-Construction Requirements

7.1 Record Retention

Following construction, the owner/operator must retain a copy of the signed NOI, signed MS4 SWPPP Acceptance, NOI Acknowledgement Letter, SWPPP, project plans, and any inspection reports that were prepared in conjunction with the General Permit for at least five years from the date that the NYSDEC receives a complete NOT.

7.2 Inspection and Maintenance

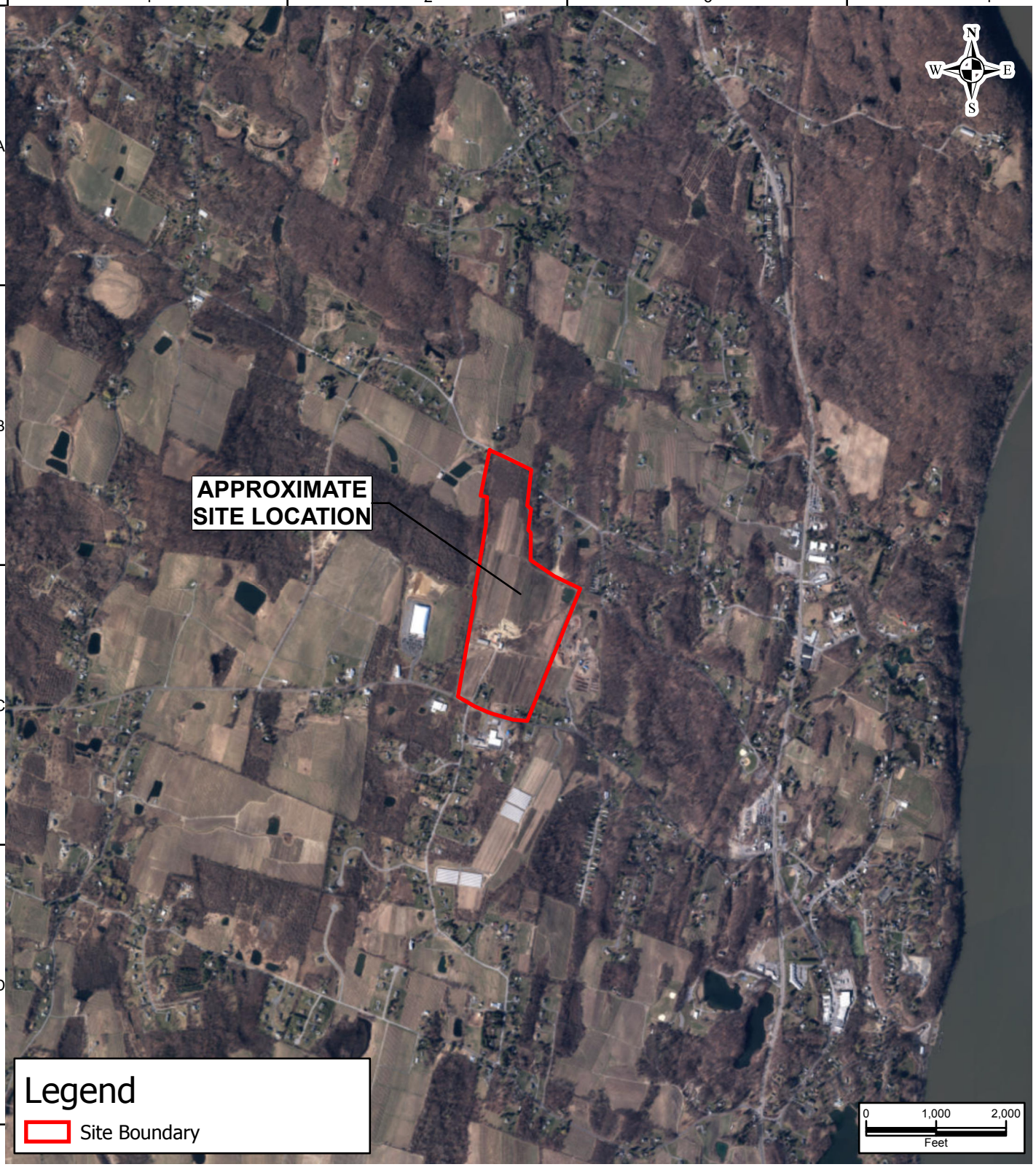
Post-construction inspections and maintenance will be performed by Highland Solar. Inspections and maintenance for the various site components and stormwater management facilities shall be performed in accordance with the accompanying project plans and this SWPPP. Detailed post-construction inspections and maintenance procedures are provided in Appendix H.

8 Conclusion

This Stormwater Pollution Prevention Plan has been developed in accordance with the requirements of the Town of Marlborough and the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) Phase II technical guidelines. This SWPPP identifies the erosion control, sediment control, pollution-prevention, and stormwater management measures to be implemented during construction to minimize soil erosion and control sediment transport off site, and after construction to control and treat stormwater runoff from the developed site.

In the opinion of the SWPPP preparer, the proposed project will not have adverse impacts if the measures for erosion control, sediment control, pollution prevention, and stormwater management measures are properly constructed and maintained in accordance with the requirements outlined herein and on the accompanying project plans.

Figures



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Langan International
Collectively known as Langan

Project
HIGHLAND SOLAR
TOWN OF MARLBOROUGH
ULSTER COUNTY NEW YORK

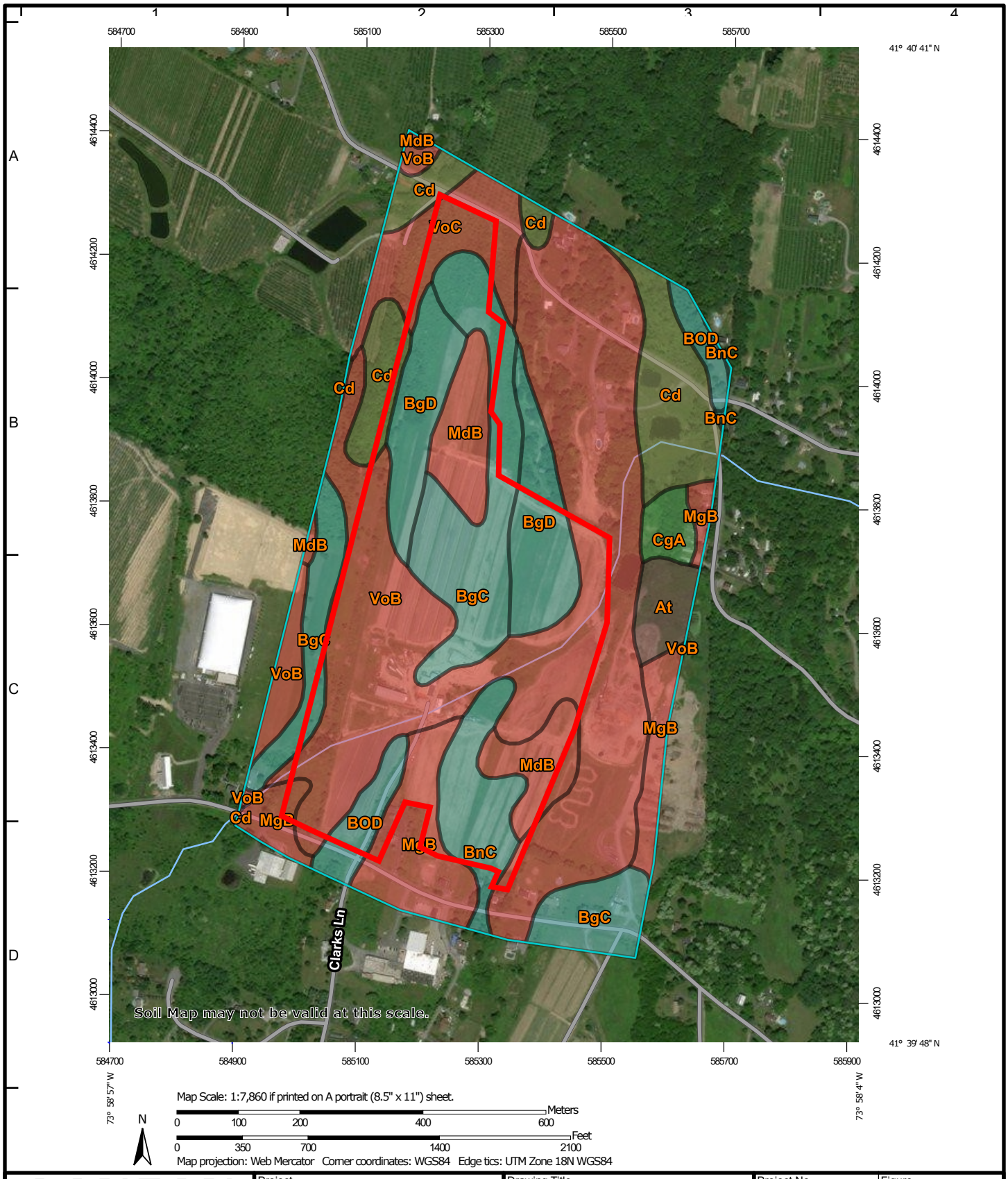
Drawing Title
SITE LOCATION MAP

Project No.	190056901
Date	2/6/2020
Scale	1:2,000
Drawn By	Site Analyzer
Submission Date	02/06/2020

Figure **1**

SHEET 1 OF 1

Spatial Reference: NAD 1983 StatePlane New York East FIPS 3101 Feet



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Project
HIGHLAND SOLAR
TOWN OF MARLBOROUGH
ULSTER COUNTY NEW YORK

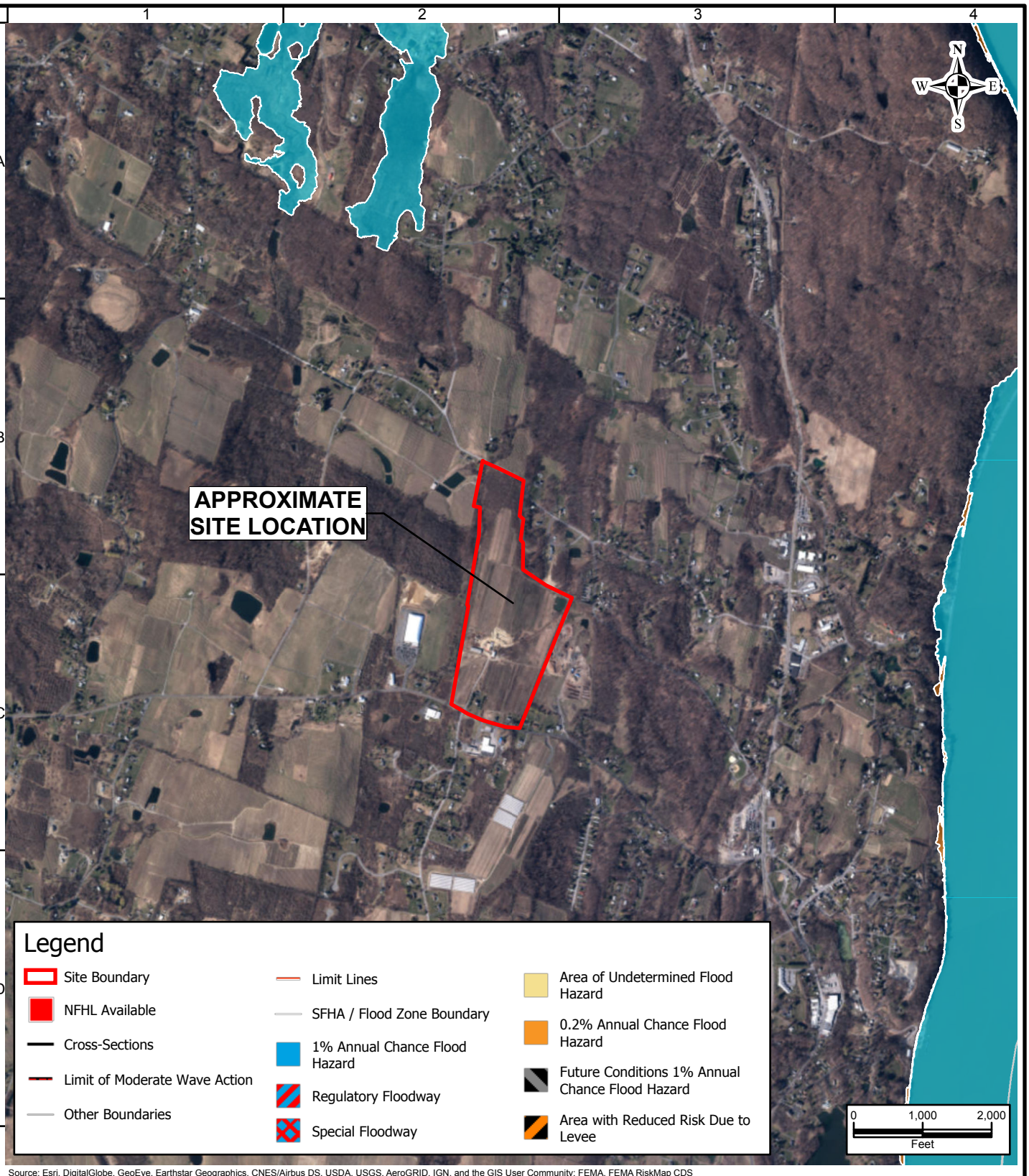
Drawing Title
SOILS MAP

Project No.	190056901
Date	2/6/2020
Scale	1:2,000
Drawn By	Site Analyzer
Submission Date	02/06/2020

Figure **2**

SHEET 1 OF 1

Spatial Reference: NAD 1983 StatePlane New York East FIPS 3101 Feet



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; FEMA, FEMA RiskMap CDS

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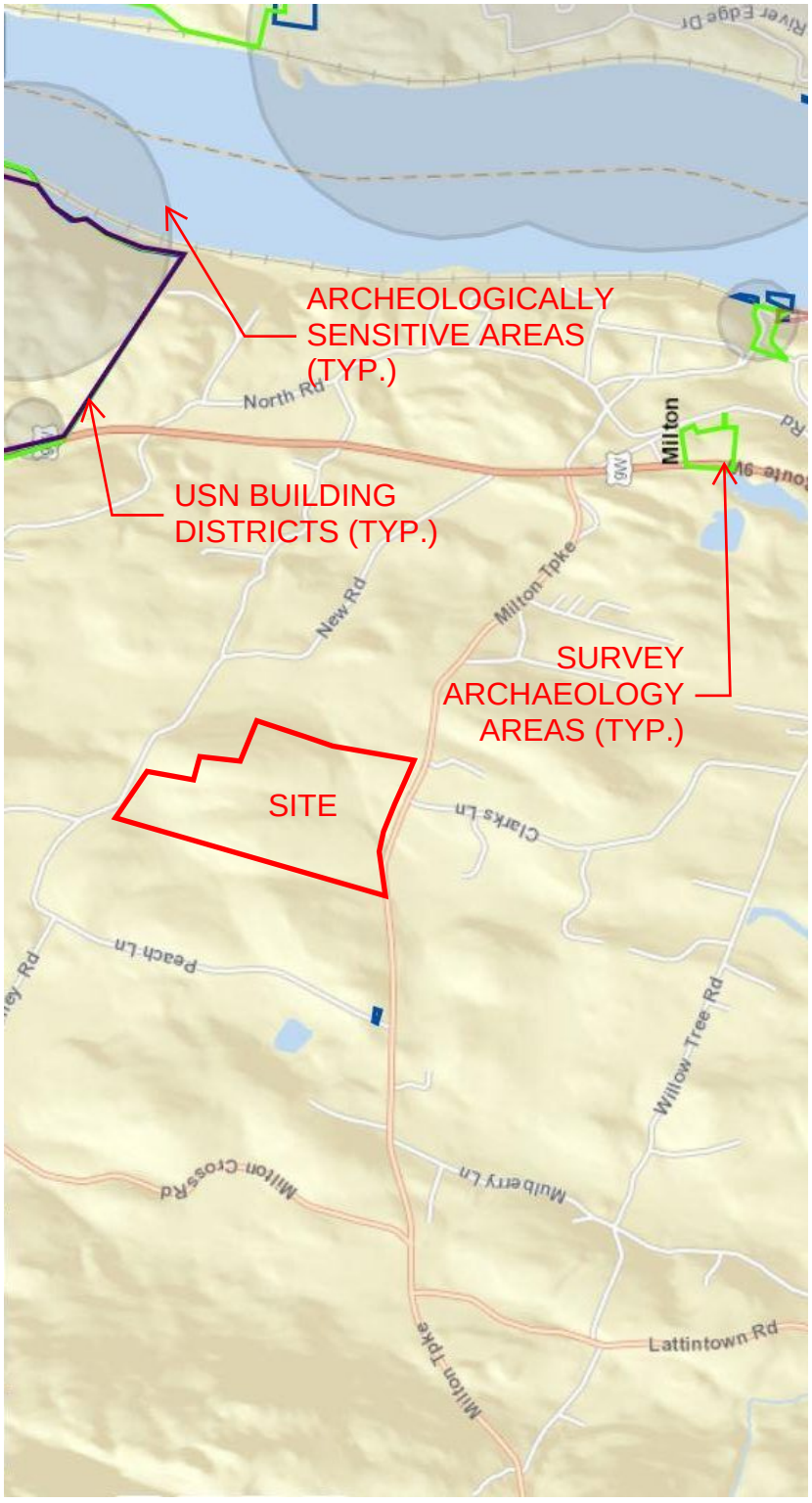
Project	HIGHLAND SOLAR TOWN OF MARLBOROUGH ULSTER COUNTY NEW YORK
Drawing Title	FLOOD INSURANCE RATE MAP
Project No.	190056901
Date	2/6/2020
Scale	1:2,000
Drawn By	Site Analyzer
Submission Date	02/06/2020
Figure	3
	SHEET 1 OF 1

Spatial Reference: NAD 1983 StatePlane New York East FIPS 3101 Feet



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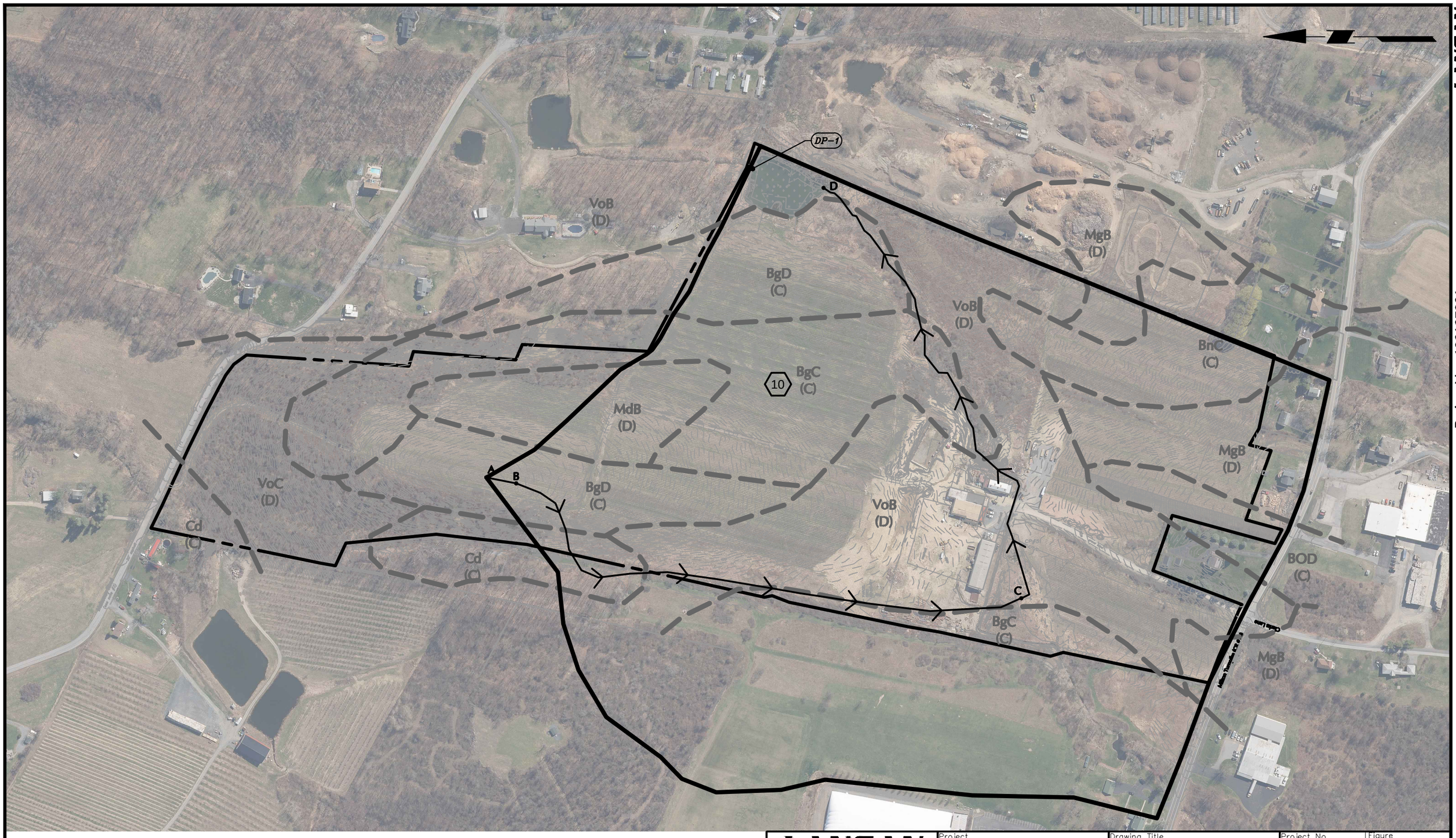
Project
HIGHLAND SOLAR
TOWN OF MARLBOROUGH
ULSTER COUNTY NEW YORK

Drawing Title
CULTURAL RESOURCES

Project No.	190056901
Date	2/6/2020
Scale	1:2,000
Drawn By	Site Analyzer
Submission Date	02/06/2020

Figure **4**

SHEET 1 OF 1



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Date	Description	No.
11/15/2024	REVISED PER TOWN COMMENTS & UCDPW SUBMITTAL	1

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Project

HIGHLAND SOLAR

SECTION 95.4, BLOCK 3, LOT 7.110, 7.210, & 7.220
TOWN OF MARLBOROUGH
ULSTER COUNTY NEW YORK

Drawing Title

PRE-DEVELOPMENT WATERSHED MAP

Project No. 190107801
Date AUGUST 23, 2024
Drawn By LC
Checked By CZ

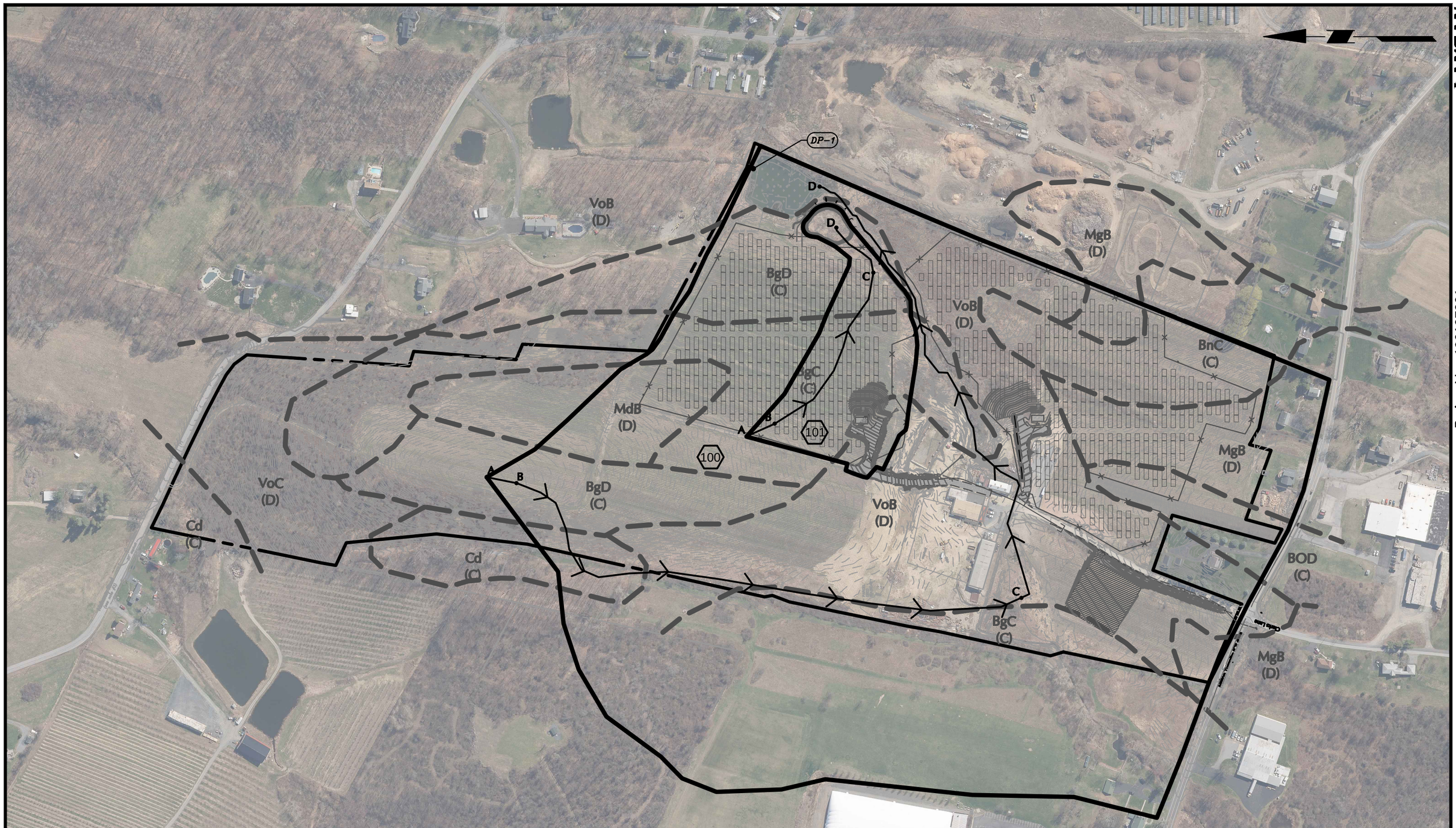
Figure

FG05

LANGAN

Project No. 190107801

Date: 11/20/2024 Time: 11:45 User: lcaserta Style Table: Langan.stb Layout: FG05 Document Code: FG05-190107801-0201-CA101-0101



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No.	Description	Date
1	REVISED PER TOWN COMMENTS & UCDPW SUBMITTAL	11/15/2024

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Project

HIGHLAND SOLAR

SECTION 95.4, BLOCK 3, LOT 7.110, 7.210, & 7.220
TOWN OF MARLBOROUGH
ULSTER COUNTY NEW YORK

Drawing Title

POST-DEVELOPMENT WATERSHED MAP

Project No. 190107801
Date AUGUST 23, 2024
Drawn By LC
Checked By CZ

Figure

FG06

Date: 11/20/2024 Time: 11:27 User: lcaserta Style Table: Langan.stb Layout: FG05 Document Code: FG02-190107801-0201-CA101-0101

LANGAN

Project No. 190107801

LANGAN

Project No. 190107801

LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. One North Broadway, Suite 910 White Plains, NY 10601 T: 914.323.7400 F: 914.323.7401 www.langan.com	Project HIGHLAND SOLAR SECTION 95.4, BLOCK 3, LOT 7.110, 7.210, & 7.220 TOWN OF MARLBOROUGH ULSTER COUNTY NEW YORK	Drawing Title POST-DEVELOPMENT SUBCATCHMENT WATERSHED MAP	Project No. 190107801 Date NOVEMBER 15, 2024 Drawn By LC Checked By CZ	Figure FG07

Date: 11/19/2024 Time: 11:16 User: lcaserta Style Table: Langan.stb Layout: FG05 Document Code: FG07-190107801-0201-CA101-0101

Appendix A: NYSDEC SPDES General Permit

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP- 0-20-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2020

Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator

1-23-20

Authorized Signature

Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a *point source* and therefore, pursuant to ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Table of Contents

Part 1. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* (“SWPPP”) the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s;

   (ii) Control stormwater *discharge*s, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharge*s from the site;

   (vi) Provide and maintain *natural buffer*s around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

   (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments

listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharges*.** The following *discharge*s are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. Sizing Criteria for New Development

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.

For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume ("Cpv"): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site discharges directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria ("Qp"): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria ("Qf"): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be

calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

c. Sizing Criteria for Redevelopment Activity

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or

(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or

(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or

(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) *Overbank* Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

d. Sizing Criteria for Combination of Redevelopment Activity and New Development

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharge*s from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

operator has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

(i) No Affect
(ii) No Adverse Affect
(iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharge*s from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. PERMIT COVERAGE

A. How to Obtain Coverage

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a regulated, traditional land use control MS4 must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the “MS4 SWPPP Acceptance” form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.

3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4* . This exemption does not apply to *construction activities* subject to the New York City Administrative Code.

B. Notice of Intent (NOI) Submittal

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

C. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621), or the equivalent from another New York State agency, have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits

must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

c. the final SWPPP has been prepared, and

d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

   a. For *construction activities* that are <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4*:

      (i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

      (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has <u>not</u> been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

      (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

D. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination ("NOT") has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor's or subcontractor's certification statement (see Part III.A.6.), and all documentation necessary to demonstrate eligibility with this permit at the *construction site* until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land*

use control MS4, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site-specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements or consistent with Part VII.K..

5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

regulated, traditional land use control MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

E. Permit Coverage for Discharges Authorized Under GP-0-15-002

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of *a construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

F. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4,* the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.

2. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.B.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

3. Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or*

operator was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP, including construction drawings:

    a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*;

c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority; and

d. to document the final construction conditions.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   "I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with

the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection

schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the *construction site*; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. A Stormwater Modeling and Analysis Report that includes:
   (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

   (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

   (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

   (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

   (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

   (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall

begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- New York State Erosion and Sediment Control Certificate Program holder
- Registered Landscape Architect, or
- someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:

   a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located

in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* and all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.B.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site*, and all points of *discharge* from the *construction site*.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This shall include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.D.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.F. of this permit.

d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

   a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water

Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field,

superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall

include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the owner’s or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A – Acronyms and Definitions

Acronyms

APO – Agency Preservation Officer
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
Cpv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DOW – Division of Water
EAF – Environmental Assessment Form
ECL - Environmental Conservation Law
EPA – U. S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review
SEQRA - State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property –means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "*Construction Activity(ies)*" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Construction Site – means the land area where *construction activity(ies)* will occur. See definition for "*Commence (Commencement of) Construction Activities"* and "*Larger Common Plan of Development or Sale" also.*

Dewatering – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a *construction site* by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system

and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or *point source*.

Embankment –means an earthen or rock slope that supports a road/highway.

Endangered or Threatened Species – see 6 NYCRR Part 182 of the Department's rules and regulations for definition of terms and requirements.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a *combined sewer*; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

Natural Buffer –means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Nonpoint Source - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's

SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Streambank – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and *nonpoint source*s. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for *point source* discharges, load allocations (LAs) for *nonpoint source*s, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed

training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1
Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other *agricultural building*, silo, stock yard or pen.

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Pond construction
- Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover
- Cross-country ski trails and walking/hiking trails
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development;
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path.
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics

Table 1 (Continued) CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established, and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

Table 2

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River **-** Figure 1
- Onondaga Lake Watershed **-** Figure 2
- Greenwood Lake Watershed **-**Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

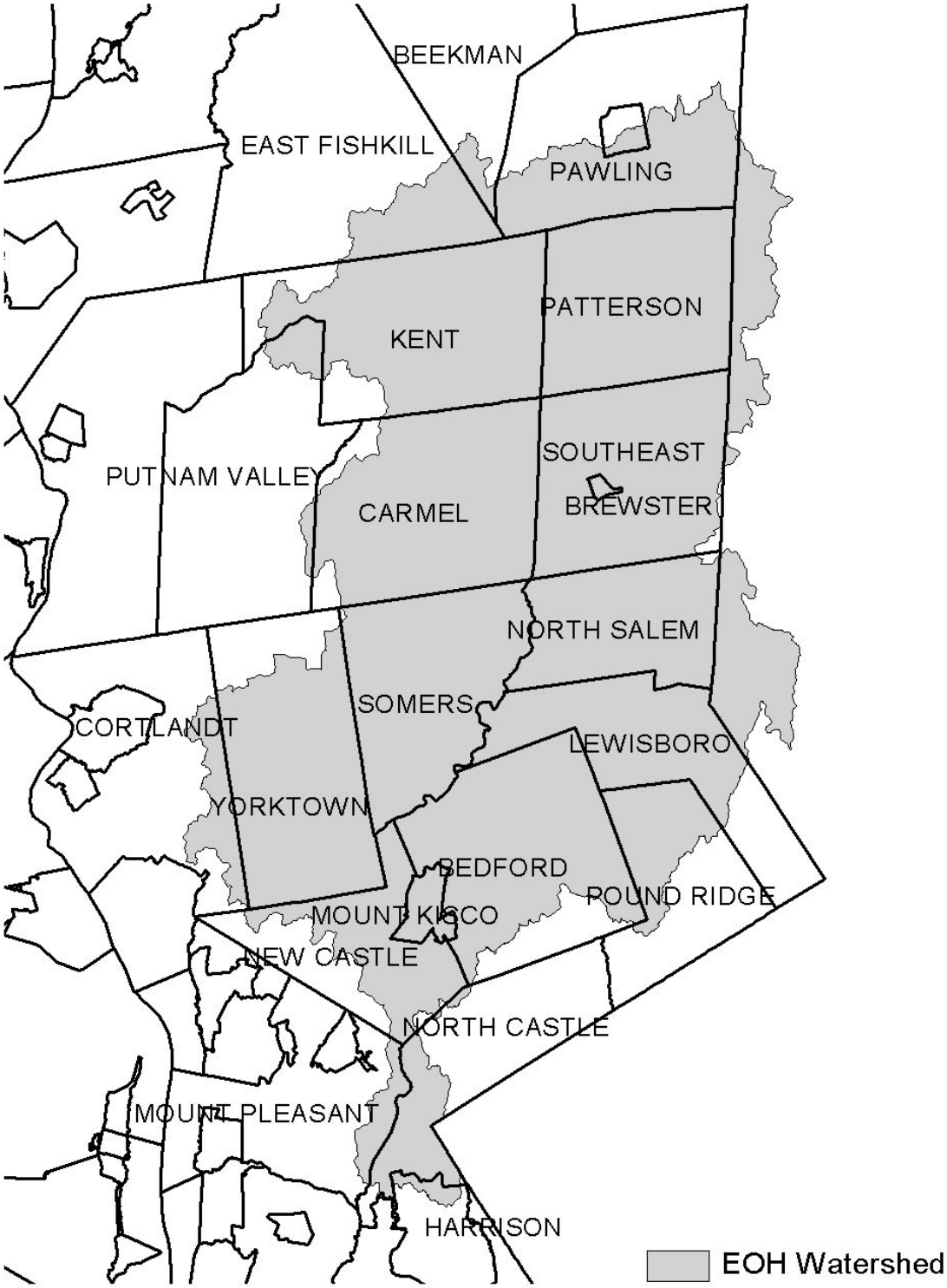


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

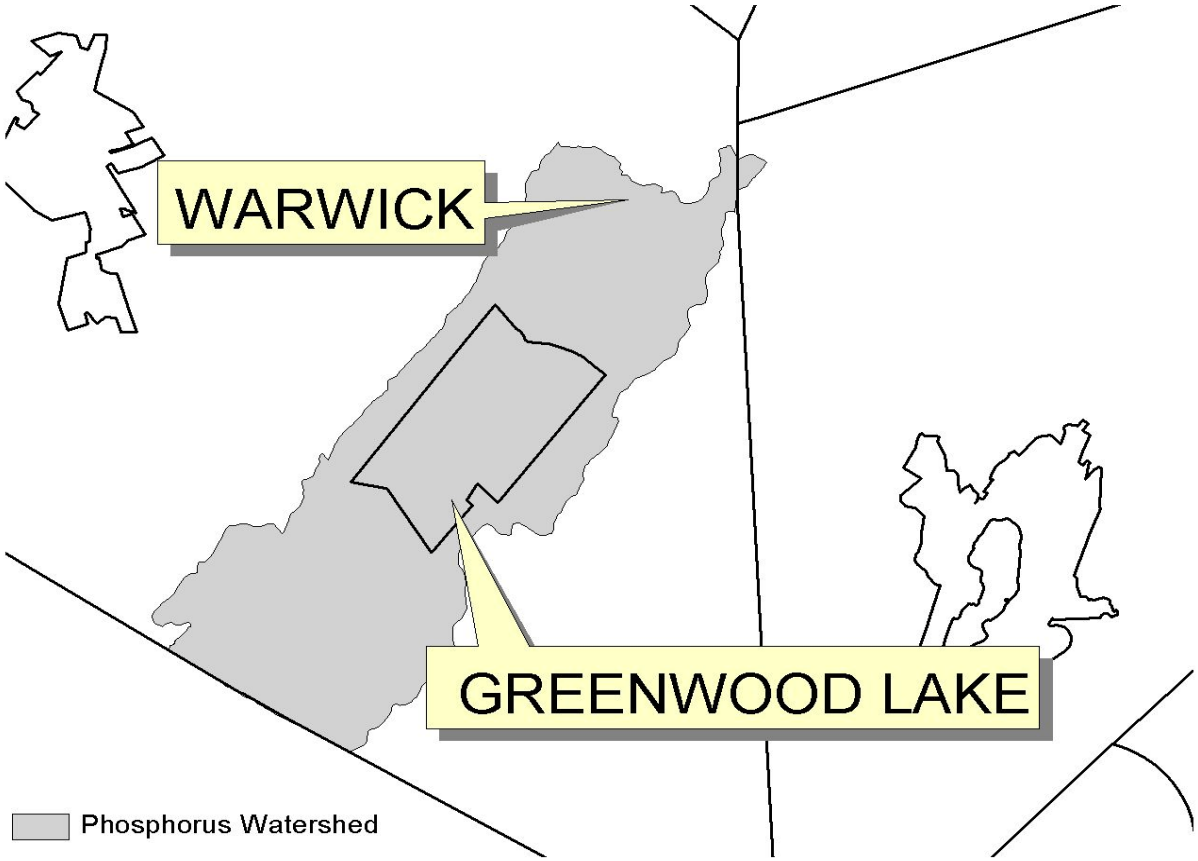


Figure 4 - Oscawana Lake Watershed

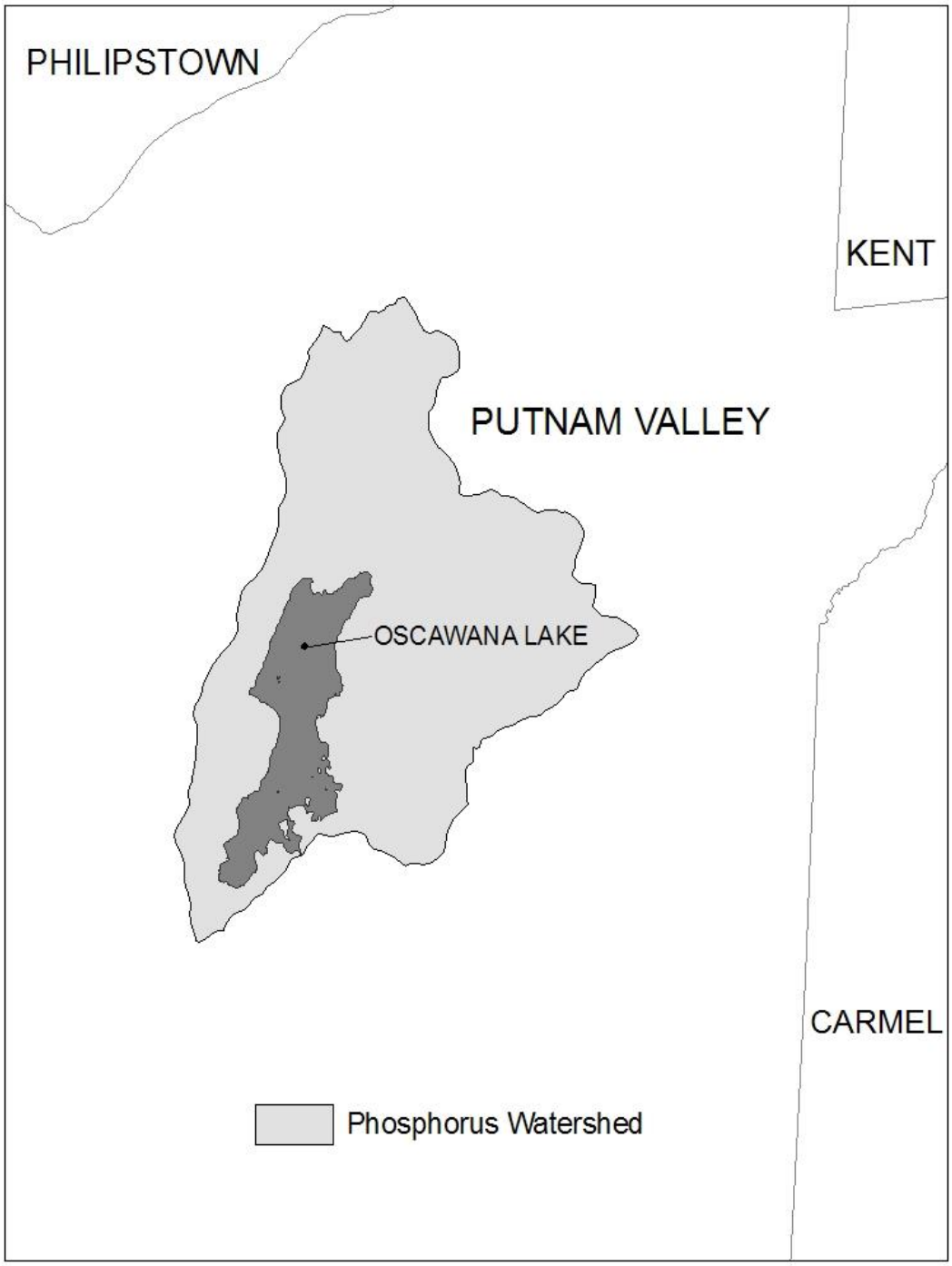
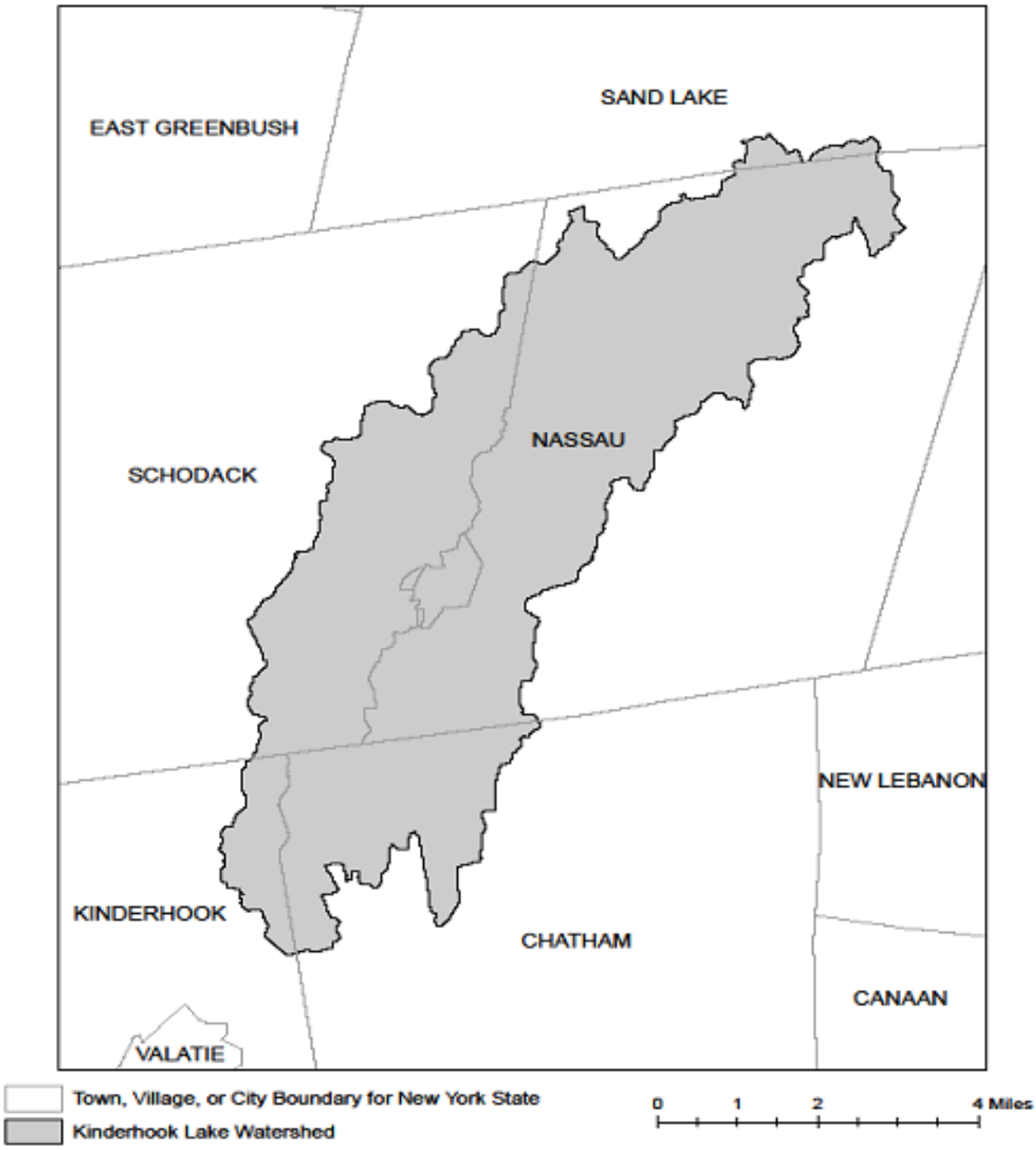


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Watersheds with Lower Disturbance Threshold

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River **-** See Figure 1 in Appendix C

APPENDIX E – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using "The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy" dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	Nutrients

APPENDIX F – List of NYS DEC Regional Offices

Region	Covering the following counties:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) Permit Administrators	DIVISION OF WATER (DOW) Water (SPDES) Program
1	Nassau and Suffolk	50 Circle Road Stony Brook, NY 11790 Tel. (631) 444-0365	50 Circle Road Stony Brook, NY 11790-3409 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	100 Hillside Avenue, Suite 1w White Plains, NY 10603 Tel. (914) 428 - 2505
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1150 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	1115 State Route 86, Po Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Golf Course Road Warrensburg, NY 12885-1172 Tel. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070

Appendix B: NYSDEC SPDES General Permit Forms

0644089821

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State ☐☐ Zip ☐☐☐☐☐ - ☐☐☐☐

Phone (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Fax (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Email (Owner/Operator)

FED TAX ID ☐☐ - ☐☐☐☐☐☐☐ (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street
○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street
○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing) 4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	**Total Area To Be Disturbed**	**Existing Impervious Area To Be Disturbed**	**Future Impervious Area Within Disturbed Area**
.	.	.	.

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ○ **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	**B**	**C**	**D**
%	%	%	%

7. Is this a phased project? ○ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date / / - **End Date** / /

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ○ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ○ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ○ **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ○ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ○ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ○ Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ○ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ○ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ○ **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- ○ All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

			.			
			.			**acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1)	___.___	and/or	___.___
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	___.___	and/or	___.___
○ Tree Planting/Tree Pit (RR-3)	___.___	and/or	___.___
○ Disconnection of Rooftop Runoff (RR-4)	___.___	and/or	___.___
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			___.___
○ Infiltration Basin (I-2)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ Wet Extended Detention (P-3)			___.___
○ Multiple Pond System (P-4)			___.___
○ Pocket Pond (P-5)			___.___
○ Surface Sand Filter (F-1)			___.___
○ Underground Sand Filter (F-2)			___.___
○ Perimeter Sand Filter (F-3)			___.___
○ Organic Filter (F-4)			___.___
○ Shallow Wetland (W-1)			___.___
○ Extended Detention Wetland (W-2)			___.___
○ Pond/Wetland System (W-3)			___.___
○ Pocket Wetland (W-4)			___.___
○ Wet Swale (O-2)			___.___

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
○ **Hydrodynamic**	
○ **Wet Vault**	
○ **Media Filter**	
○ **Other**	

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name

Manufacturer

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

. **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

. **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

[ ][ ][ ].[ ][ ][ ] **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). [ ][ ][ ].[ ][ ][ ]

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

[ ][ ][ ].[ ][ ][ ] **acre-feet**

CPv Provided

[ ][ ][ ].[ ][ ][ ] **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

[ ][ ][ ].[ ][ ][ ] **CFS**

Post-development

[ ][ ][ ].[ ][ ][ ] **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

[ ][ ][ ].[ ][ ][ ] **CFS**

Post-development

[ ][ ][ ].[ ][ ][ ] **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP [N][Y][R][ ][ ][ ][ ][ ][ ]
- ○ Other [ ]
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. [ ][ ][ ][ ][ ].[ ]

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ○ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. [N][Y][R][ ][ ][ ][ ][ ][ ]

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date / /

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges From Construction Activity (GP-0-20-001)

Project Site Information

Project/Site Name

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First name | MI | Last Name

Signature | Date

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Owner/Operator Certification Form

SPDES General Permit For Stormwater Discharges From Construction Activity (GP-0-20-001)

Project/Site Name: _____

eNOI Submission Number: _____

eNOI Submitted by: ☐ **Owner/Operator** ☐ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Owner/Operator First Name M.I. Last Name

_____

Signature

_____

Date

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Appendix C: Design Calculations

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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	New York
Location	New York, United States
Latitude	41.669 degrees North
Longitude	73.975 degrees West
Elevation	110 feet
Date/Time	Thu Aug 22 2024 16:34:50 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.32	0.49	0.60	0.79	0.99	1.23	1yr	0.85	1.16	1.41	1.74	2.13	2.61	2.96	1yr	2.31	2.85	3.32	3.97	4.58	1yr
2yr	0.38	0.58	0.73	0.96	1.20	1.50	2yr	1.04	1.39	1.72	2.12	2.59	3.16	3.56	2yr	2.80	3.43	3.92	4.62	5.25	2yr
5yr	0.45	0.70	0.88	1.18	1.50	1.89	5yr	1.30	1.72	2.17	2.67	3.26	3.94	4.49	5yr	3.49	4.32	4.94	5.71	6.46	5yr
10yr	0.51	0.80	1.01	1.37	1.78	2.25	10yr	1.53	2.02	2.60	3.19	3.87	4.67	5.36	10yr	4.13	5.15	5.90	6.70	7.56	10yr
25yr	0.59	0.95	1.20	1.67	2.22	2.84	25yr	1.92	2.50	3.28	4.03	4.88	5.83	6.76	25yr	5.16	6.50	7.45	8.29	9.32	25yr
50yr	0.68	1.09	1.40	1.96	2.63	3.38	50yr	2.27	2.95	3.92	4.81	5.80	6.90	8.07	50yr	6.11	7.76	8.91	9.75	10.92	50yr
100yr	0.77	1.25	1.62	2.29	3.13	4.04	100yr	2.70	3.47	4.69	5.74	6.90	8.18	9.64	100yr	7.24	9.27	10.64	11.46	12.80	100yr
200yr	0.89	1.45	1.87	2.69	3.71	4.83	200yr	3.21	4.09	5.60	6.86	8.22	9.69	11.52	200yr	8.58	11.08	12.73	13.48	15.01	200yr
500yr	1.07	1.77	2.30	3.34	4.68	6.11	500yr	4.04	5.08	7.09	8.67	10.34	12.14	14.58	500yr	10.74	14.02	16.15	16.73	18.54	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.88	1.04	1yr	0.76	1.01	1.21	1.53	1.93	2.39	2.52	1yr	2.12	2.43	3.05	3.58	4.09	1yr
2yr	0.37	0.57	0.70	0.94	1.16	1.37	2yr	1.01	1.34	1.55	1.99	2.51	3.06	3.48	2yr	2.70	3.34	3.82	4.55	5.17	2yr
5yr	0.41	0.64	0.79	1.09	1.38	1.60	5yr	1.19	1.57	1.81	2.33	2.91	3.67	4.15	5yr	3.25	3.99	4.66	5.39	6.12	5yr
10yr	0.46	0.71	0.88	1.22	1.58	1.79	10yr	1.36	1.75	2.03	2.61	3.24	4.18	4.74	10yr	3.70	4.56	5.36	6.10	6.94	10yr
25yr	0.53	0.81	1.01	1.44	1.89	2.06	25yr	1.63	2.01	2.34	2.91	3.73	4.96	5.65	25yr	4.39	5.43	6.41	7.20	8.21	25yr
50yr	0.60	0.91	1.13	1.62	2.18	2.28	50yr	1.88	2.23	2.63	3.23	4.17	5.65	6.44	50yr	5.00	6.19	7.31	8.16	9.33	50yr
100yr	0.67	1.02	1.27	1.84	2.52	2.55	100yr	2.18	2.49	2.95	3.59	4.66	6.44	7.35	100yr	5.70	7.06	8.34	9.24	10.62	100yr
200yr	0.76	1.15	1.46	2.11	2.94	2.83	200yr	2.54	2.77	3.31	4.00	5.20	7.34	8.38	200yr	6.50	8.05	9.50	10.48	12.07	200yr
500yr	0.92	1.36	1.75	2.55	3.62	3.28	500yr	3.13	3.21	3.87	4.61	6.04	8.75	9.97	500yr	7.74	9.59	11.31	12.38	14.36	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.35	0.54	0.66	0.88	1.09	1.31	1yr	0.94	1.28	1.48	1.89	2.36	2.88	3.23	1yr	2.55	3.11	3.64	4.23	4.91	1yr
2yr	0.40	0.61	0.75	1.02	1.26	1.50	2yr	1.08	1.47	1.70	2.19	2.75	3.28	3.70	2yr	2.90	3.56	4.06	4.71	5.35	2yr
5yr	0.49	0.75	0.93	1.28	1.63	1.92	5yr	1.41	1.88	2.22	2.83	3.58	4.25	4.87	5yr	3.76	4.69	5.25	6.08	6.83	5yr
10yr	0.58	0.89	1.10	1.54	1.99	2.34	10yr	1.72	2.29	2.71	3.48	4.38	5.22	6.03	10yr	4.62	5.80	6.44	7.39	8.23	10yr
25yr	0.73	1.10	1.37	1.96	2.58	3.05	25yr	2.23	2.98	3.57	4.72	5.75	6.87	8.01	25yr	6.08	7.70	8.49	9.61	10.55	25yr
50yr	0.86	1.31	1.63	2.34	3.15	3.73	50yr	2.72	3.64	4.39	5.85	7.05	8.45	9.95	50yr	7.48	9.57	10.48	11.73	12.75	50yr
100yr	1.02	1.55	1.94	2.80	3.84	4.57	100yr	3.31	4.46	5.40	7.27	8.66	10.42	12.37	100yr	9.22	11.89	12.96	14.34	15.40	100yr
200yr	1.21	1.83	2.31	3.35	4.67	5.57	200yr	4.03	5.45	6.66	9.02	10.63	12.84	15.37	200yr	11.36	14.78	16.06	17.55	18.60	200yr
500yr	1.53	2.28	2.93	4.26	6.06	7.28	500yr	5.23	7.12	8.77	12.02	13.97	16.92	20.53	500yr	14.97	19.74	21.37	22.95	23.94	500yr

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Total Required Water Quality Volume Calculation Worksheet

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....							
Design Point(s):	DP1			*Manually enter the information below.*			
P=	1.50	*inch*					
Breakdown of Subcatchments							
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**
1	1	0.06	0.02	36%	0.38	113	Bioretention
2	2	0.06	0.02	36%	0.38	113	Bioretention
3	3	0.23	0.15	63%	0.62	787	Dry Swale
4	4	0.20	0.11	56%	0.56	608	Dry Swale
5	5	0.23	0.10	45%	0.45	559	Dry Swale
6	6	1.71	0.60	35%	0.37	3,402	Dry Swale
7							
8							
9							
10							
Subtotal		2.48	1.00	40%	0.41	5,582	Subtotal 1
Total		**2.48**	**1.00**	**40%**	**0.41**	**5,582**	**Initial WQv**

Identify Runoff Reduction Techniques By Area			
Technique	**Total Contributing Area** *(Acre)*	**Contributing Impervious Area** *(Acre)*	**Notes**
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to*
Filter Strips	0.00	0.00	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected*
Total	**0.00**	**0.00**	

Recalculate WQv after application of Area Reduction Techniques					
	Total Area *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient Rv**	**WQv** *(ft^3)*
Initial WQv	2.48	1.00	40%	0.41	5,582
Subtract Area	0.00	0.00	--	--	--
WQv adjusted after Area Reductions	**2.48**	**1.00**	40%	0.41	5,582
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	2.48	1.00	40%	0.41	**5,582**
WQv reduced by Area Reduction techniques					0

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Runoff Reduction Summary Table Worksheet

Runoff Reduction Volume and Treated Volumes						
Runoff Reduction Techniques/Standard SMPs			Total Contributing Area (acres)	Total Contributing Impervious Area (acres)	WQv Reduced (RRv) cf	WQv Treated cf
Area Reduction	Conservation of Natural Areas	RR-1	0.00	0.00		
	Sheet flow to Riparian Buffers	RR-2	0.00	0.00		
	Sheet flow to Filter Strips		0.00	0.00		
	Tree Planting/Tree Pit	RR-3	0.00	0.00		
	Disconnection of Rooftop Runoff	RR-4		0.00		
Volume Reduction	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rain Barrel/Cistern	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Intensive)	RR-10	0.00	0.00	0	
	Green Roof (Extensive)		0.00	0.00	0	
Standard SMPs w/RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4	0.00	0.00	0	0
	Bioretention	F-5	0.11	0.04	114	112
	Infiltration Bioretention		0.00	0.00	0	0
	Dry swale	O-1	2.37	0.96	1,071	4,285
Standard SMPs	Micropool Extended Detention Pond	P-1	0.00	0.00		0
	Wet Pond	P-2	0.00	0.00		0
	Wet Extended Detention Pond	P-3	0.00	0.00		0
	Multiple Pond system	P-4	0.00	0.00		0
	Pocket Pond	P-5	0.00	0.00		0
	Surface Sand Filter	F-1	0.00	0.00		0
	Underground Sand Filter	F-2	0.00	0.00		0
	Perimeter Sand Filter	F-3	0.00	0.00		0
	Organic Filter	F-4	0.00	0.00		0
	Shallow Wetland	W-1	0.00	0.00		0
	Extended Detention Shallow Wetland	W-2	0.00	0.00		0
	Pond/Wetland System	W-3	0.00	0.00		0
	Pocket Wetland	W-4	0.00	0.00		0
	Wet Swale	O-2	0.00	0.00		0
Totals by Area Reduction →			0.00	0.00	0	
Totals by Volume Reduction →			0.00	0.00	0	
Totals by Standard SMP w/RRV →			2.48	1.00	1,186	4,397
Totals by Standard SMP →			0.00	0.00		0
Totals (Area + Volume + all SMPs) →			**2.48**	**1.00**	**1,186**	**4,397**

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Minimum Runoff Reduction Volume Worksheet

Minimum Runoff Reduction Volume

1. Construction activities that cannot achieve 100% reduction of the total water quality volume due to site limitation shall direct runoff from all newly constructed impervious areas to a runoff reduction technique or standard stormwater management practice with runoff reduction volume capacity unless infeasible.
2. In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the minimum runoff reduction (RRv_{min}).
3. The minimum runoff reduction volume is calculated as follows:

$$RRv_{min} = \frac{P * \bar{R}v * Aic * S}{12}$$

Where:

RRv_{min} = Minimum runoff reduction required from impervious area

$\bar{R}v$ = 0.05 + 0.009 (I), where I is 100% impervious

Aic = Total area of new impervious cover

S = Hydrologic Soil Group Specific Reduction Factor

Enter the Soils Data for the site

Soil Group	Acres	S	
A	0.00	55%	*(new impervious area in Type A Soils)*
B	0.00	40%	*(new impervious area in Type B Soils)*
C	0.81	30%	*(new impervious area in Type C Soils)*
D	0.19	20%	*(new impervious area in Type D Soils)*
Total Area	**1.00**		

Calculate the Minimum RRv

Soil Group Speific Reduction Factor (S)	**0.28**		*(weighted average)*
Total Area of New Impervious Cover (Aic)	1.00	*acre*	
Precipitation (P)	1.50	*in*	
Rv	0.95		
Minimum RRv	**1,457**	***ft3***	*(P * Rv x Aic * S)/12*
	0.03	af	

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Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

Af=WQv*(df)/[k*(hf+df)(tf)]

where:

Af	Required Surface Area (ft^2)
WQv	Water Quality Volume (ft^3)
df	Depth of the Soil Medium (ft)
hf	Average height of water above the planter bed (ft)
tf	The Design Time to Filter the Treatment Volume Through the Filter Media (days)
k	Hydraulic conductivity (ft/day)

Design Point(s):	**DP1**

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	1	0.06	0.02	0.36	0.38	113	1.50	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops			0.00	36%	0.38	113	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						0	*ft^3*	

Soil Information		
Soil Group	C	
Using Underdrains?	*yes*	*Okay*

Pretreatment			
WQv	113	*ft^3*	
Pretreatment Sizing	25%	*of WQv*	
Required Pretreatment Volume	28	*ft^3*	
Pretreatment Provided	28	*ft^3*	
Pretreatment techniques utilized	*Other*		*Gravel Diaphragm*

Calculate the Minimum Filter Area				
WQv		113	*ft^3*	
Media Type	--	Bioretention Soil		
Depth of Soil Media	*df*	2.5	*ft*	*2.5 ft to 4 ft*
Hydraulic Conductivity	*k*	0.5	*ft/day*	
Average Height of Ponding	*hf*	0.25	*ft*	*typically 0.25 ft*
Filter Time	*tf*	2.00	*days*	
Required Filter Area	***Af***	**103**	***ft^2***	

Determine Actual Bioretention Area			
Filter Width	--	*ft*	
Filter Length	--	*ft*	
Filter Area	130	*ft^2*	*OK*
Actual Volume Provided	143	*ft^3*	

Determine Underdrain			
Underdrain Gravel Bed With	3	*ft*	
Required length of underdrain	4	*ft*	
Provided length of underdain	34	*ft*	*OK*

Determine Runoff Reduction			
Percent Reduction	40%		
Runoff Reduction	**57**	***ft^3***	***This is 40% of the storage provided or WQv, whichever is smaller.***
Volume Treated	**56**	***ft^3***	***This is the portion of the WQv that is not reduced in the practice.***
Is the Bioretention contributing flow to another practice?		*no*	Select Practice
Volume Directed to Another Practice	0	*ft^3*	This volume is directed another practice

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Bioretention Worksheet

Design Point(s):	DP1

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	2	0.06	0.02	0.36	0.38	113	1.50	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops				36%	0.38	113	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.							*ft^3*	

Soil Information		
Soil Group	C	
Using Underdrains?	*yes*	*Okay*

Pretreatment			
WQv	113	*ft^3*	
Pretreatment Sizing	25%	*of WQv*	
Required Pretreatment Volume	28	*ft^3*	
Pretreatment Provided	28	*ft^3*	
Pretreatment techniques utilized	*Other*		*Gravel Diaphragm*

Calculate the Minimum Filter Area				
WQv		113	*ft^3*	
Media Type	--	Bioretention Soil		
Depth of Soil Media	*df*	2.5	*ft*	*2.5 ft to 4 ft*
Hydraulic Conductivity	*k*	0.5	*ft/day*	
Average Height of Ponding	*hf*	0.25	*ft*	*typically 0.25 ft*
Filter Time	*tf*	2.00	*days*	
Required Filter Area	***Af***	**103**	***ft^2***	

Determine Actual Bioretention Area			
Filter Width	--	*ft*	
Filter Length	--	*ft*	
Filter Area	130	*ft^2*	*OK*
Actual Volume Provided	143	*ft^3*	

Determine Underdrain			
Underdrain Gravel Bed With	3	*ft*	
Required length of underdrain	4	*ft*	
Provided length of underdain	34	*ft*	*OK*

Determine Runoff Reduction			
Percent Reduction	40%		
Runoff Reduction	**57**	***ft^3***	***This is 40% of the storage provided or WQv, whichever is smaller.***
Volume Treated	**56**	***ft^3***	***This is the portion of the WQv that is not reduced in the practice.***
Is the Bioretention contributing flow to another practice?			Select Practice
Volume Directed to Another Practice	0	*ft^3*	This volume is directed another practice

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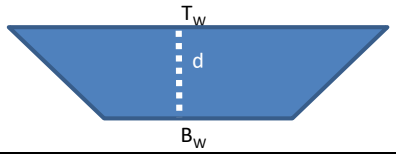
Dry Swale Worksheet

Design Point(s):	DP1

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
3	3	0.23	0.15	0.63	0.62	787	1.50	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops				63%	0.62	787	<<WQv after adjusting for Disconnected Rooftops	

Soil Information		
Soil Group (HSG)	D	

Pretreatment			
Pretreatment (10% of WQv)	79	*ft^3*	
Pretreatment Method	Other		

Calculate Available Storage Capacity			
Bottom Width	2	*ft*	*Design with a bottom width no greater than 8 feet to avoid potential gullying and channel braiding, but no less than 2 feet*
Side Slope (X:1)	3	*Okay*	*Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope*
Longitudinal Slope	5.3%		*Check dams will be used to retain the water quality volume in the swale*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	11	*ft*	
Area	9.75	*sf*	
Minimum Length	73	*ft*	
Actual Length	208	*ft*	
Mid Point Depth check	1.00	*ft*	*A maximum depth of 12" at the mid point of the channel (for storage of the WQv)*
End Point Depth check	1.50	*ft*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	2,107	*ft^3*	*Okay*

Conveyance			
Velocity for 2-yr storm	2.09	*fps*	*Peak velocity must be non-erosive (i.e., 3.5 to 5.0 fps)*
Flow Depth for 10-yr storm	0.14	*ft*	*Must Safely convey the 10-yr storm with a minimum of 6" of freeboard*
Flow Depth for 10-yr storm with 6" of freeboard	0.64	*ft*	*Okay*

Runoff Reduction			
Percent Reduction	20%		
Runoff Reduction	**157**	***ft^3***	**Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	**630**	***ft^3***	**This is the difference between the WQv calculated and the runoff reduction achieved in the swale**
Is the Dry Swale contributing flow to another practice?		*no*	Select Practice
Volume Directed to Another Practice	0	*ft^3*	This volume is directed another practice

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Dry Swale Worksheet

Design Point(s):	DP1

Enter Site Data For Drainage Area to be Treated by Practice

Subcatchment Number	Subcatchment Model Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
4	4	0.20	0.11	0.56	0.56	608	1.50	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops				56%	0.56	608	<<WQv after adjusting for Disconnected Rooftops	

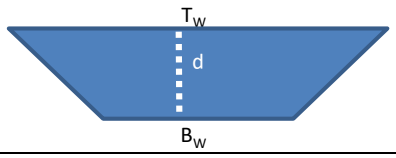
Soil Information

Soil Group (HSG)	C	

Pretreatment

Pretreatment (10% of WQv)	61	ft^3
Pretreatment Method	Other	

Calculate Available Storage Capacity

Bottom Width	2	*ft*	*Design with a bottom width no greater than 8 feet to avoid potential gullying and channel braiding, but no less than 2 feet*
Side Slope (X:1)	3	*Okay*	*Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope*
Longitudinal Slope	9.5%		*Check dams will be used to retain the water quality volume in the swale*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	11	*ft*	
Area	9.75	*sf*	
Minimum Length	56	*ft*	
Actual Length	158	*ft*	
Mid Point Depth check	1.00	*ft*	*A maximum depth of 12" at the mid point of the channel (for storage of the WQv)*
End Point Depth check	1.50	*ft*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,601	ft^3	*Okay*

Conveyance

Velocity for 2-yr storm	2.34	*fps*	*Peak velocity must be non-erosive (i.e., 3.5 to 5.0 fps)*
Flow Depth for 10-yr storm	0.11	*ft*	*Must Safely convey the 10-yr storm with a minimum of 6" of freeboard*
Flow Depth for 10-yr storm with 6" of freeboard	0.61	*ft*	*Okay*

Runoff Reduction

Percent Reduction	20%		
Runoff Reduction	**122**	ft^3	**Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	**486**	ft^3	**This is the difference between the WQv calculated and the runoff reduction achieved in the swale**
Is the Dry Swale contributing flow to another practice?		*no*	Select Practice
Volume Directed to Another Practice	0	ft^3	This volume is directed another practice

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Dry Swale Worksheet

Design Point(s):	DP1

Enter Site Data For Drainage Area to be Treated by Practice

Subcatchment Number	Subcatchment Model Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
5	5	0.23	0.10	0.45	0.45	559	1.50	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops				45%	0.45	559	<<WQv after adjusting for Disconnected Rooftops	

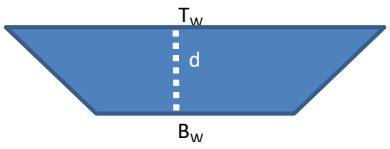
Soil Information

Soil Group (HSG)	C	

Pretreatment

Pretreatment (10% of WQv)	56	*ft^3*	
Pretreatment Method	Other		

Calculate Available Storage Capacity

Bottom Width	2	*ft*	*Design with a bottom width no greater than 8 feet to avoid potential gullying and channel braiding, but no less than 2 feet*
Side Slope (X:1)	3	*Okay*	*Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope*
Longitudinal Slope	8.1%		*Check dams will be used to retain the water quality volume in the swale*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	11	*ft*	
Area	9.75	*sf*	
Minimum Length	52	*ft*	
Actual Length	197	*ft*	
Mid Point Depth check	1.00	*ft*	*A maximum depth of 12" at the mid point of the channel (for storage of the WQv)*
End Point Depth check	1.50	*ft*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,977	*ft^3*	*Okay*

Conveyance

Velocity for 2-yr storm	2.25	*fps*	*Peak velocity must be non-erosive (i.e., 3.5 to 5.0 fps)*
Flow Depth for 10-yr storm	0.12	*ft*	*Must Safely convey the 10-yr storm with a minimum of 6" of freeboard*
Flow Depth for 10-yr storm with 6" of freeboard	0.62	*ft*	*Okay*

Runoff Reduction

Percent Reduction	20%		
Runoff Reduction	**112**	***ft^3***	**Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	**447**	***ft^3***	**This is the difference between the WQv calculated and the runoff reduction achieved in the swale**
Is the Dry Swale contributing flow to another practice?	*no*	Select Practice	
Volume Directed to Another Practice	0	*ft^3*	This volume is directed another practice

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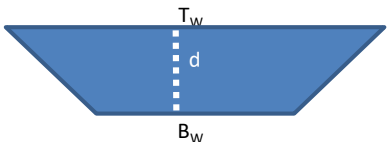
Dry Swale Worksheet

Design Point(s):	DP1

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
6	6	1.71	0.60	0.35	0.37	3,402	1.50	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops			0.00	35%	0.37	3,402	<<WQv after adjusting for Disconnected Rooftops	

Soil Information		
Soil Group (HSG)	C	

Pretreatment			
Pretreatment (10% of WQv)	340	*ft^3*	
Pretreatment Method	Other		

Calculate Available Storage Capacity			
Bottom Width	2	*ft*	*Design with a bottom width no greater than 8 feet to avoid potential gullying and channel braiding, but no less than 2 feet*
Side Slope (X:1)	3	*Okay*	*Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope*
Longitudinal Slope	4.8%		
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	11	*ft*	
Area	9.75	*sf*	
Minimum Length	314	*ft*	
Actual Length	414	*ft*	
Mid Point Depth check	1.00	*ft*	*A maximum depth of 12" at the mid point of the channel (for storage of the WQv)*
End Point Depth check	1.50	*ft*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	4,377	*ft^3*	*Okay*

Conveyance			
Velocity for 2-yr storm	3.23	*fps*	*Peak velocity must be non-erosive (i.e., 3.5 to 5.0 fps)*
Flow Depth for 10-yr storm	0.36	*ft*	*Must Safely convey the 10-yr storm with a minimum of 6" of freeboard*
Flow Depth for 10-yr storm with 6" of freeboard	0.86	*ft*	*Okay*

Runoff Reduction			
Percent Reduction	20%		
Runoff Reduction	**680**	***ft^3***	**Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	**2,722**	***ft^3***	**This is the difference between the WQv calculated and the runoff reduction achieved in the swale**
Is the Dry Swale contributing flow to another practice?		*no*	Select Practice
Volume Directed to Another Practice	0	*ft^3*	This volume is directed another practice

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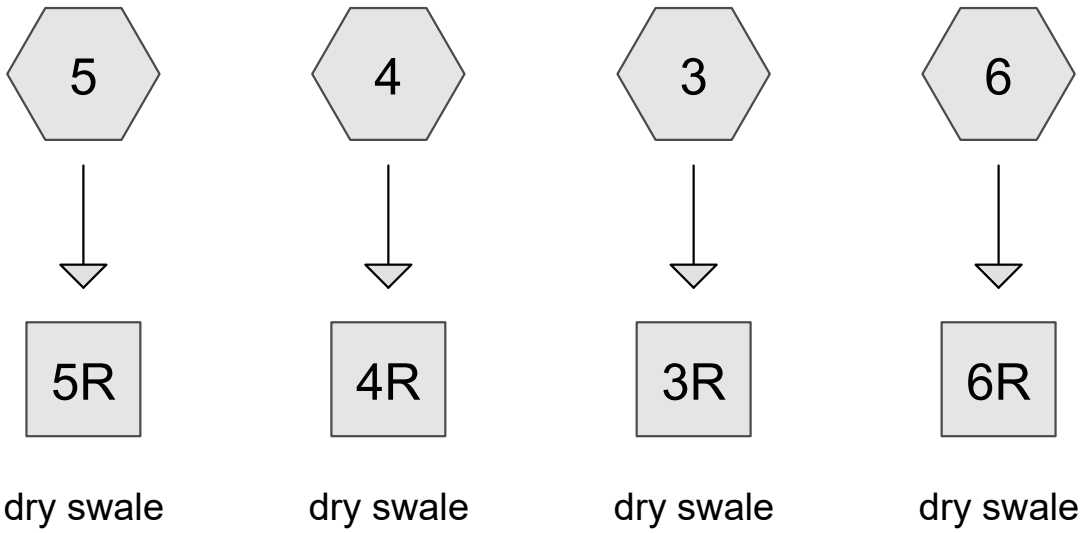


Subcat Reach Pond Link

Routing Diagram for 2024-08-12 HIghland Solar swales
Prepared by Langan Engineering, Printed 8/30/2024

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3: Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=1.63"
Tc=6.0 min CN=90 Runoff=0.43 cfs 0.031 af

Subcatchment4: Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=88 Runoff=0.34 cfs 0.025 af

Subcatchment5: Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=1.33"
Tc=6.0 min CN=86 Runoff=0.35 cfs 0.026 af

Subcatchment6: Runoff Area=1.710 ac 15.79% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=80 Runoff=1.85 cfs 0.138 af

Reach 3R: dry swale Avg. Flow Depth=0.09' Max Vel=2.09 fps Inflow=0.43 cfs 0.031 af
n=0.030 L=208.0' S=0.0529 '/' Capacity=99.56 cfs Outflow=0.40 cfs 0.031 af

Reach 4R: dry swale Avg. Flow Depth=0.07' Max Vel=2.34 fps Inflow=0.34 cfs 0.025 af
n=0.030 L=158.0' S=0.0949 '/' Capacity=133.40 cfs Outflow=0.32 cfs 0.025 af

Reach 5R: dry swale Avg. Flow Depth=0.07' Max Vel=2.25 fps Inflow=0.35 cfs 0.026 af
n=0.030 L=197.0' S=0.0812 '/' Capacity=123.39 cfs Outflow=0.33 cfs 0.026 af

Reach 6R: dry swale Avg. Flow Depth=0.21' Max Vel=3.23 fps Inflow=1.85 cfs 0.138 af
n=0.030 L=414.0' S=0.0483 '/' Capacity=95.16 cfs Outflow=1.72 cfs 0.138 af

Total Runoff Area = 2.370 ac Runoff Volume = 0.219 af Average Runoff Depth = 1.11"
88.61% Pervious = 2.100 ac 11.39% Impervious = 0.270 ac

Summary for Subcatchment 3:

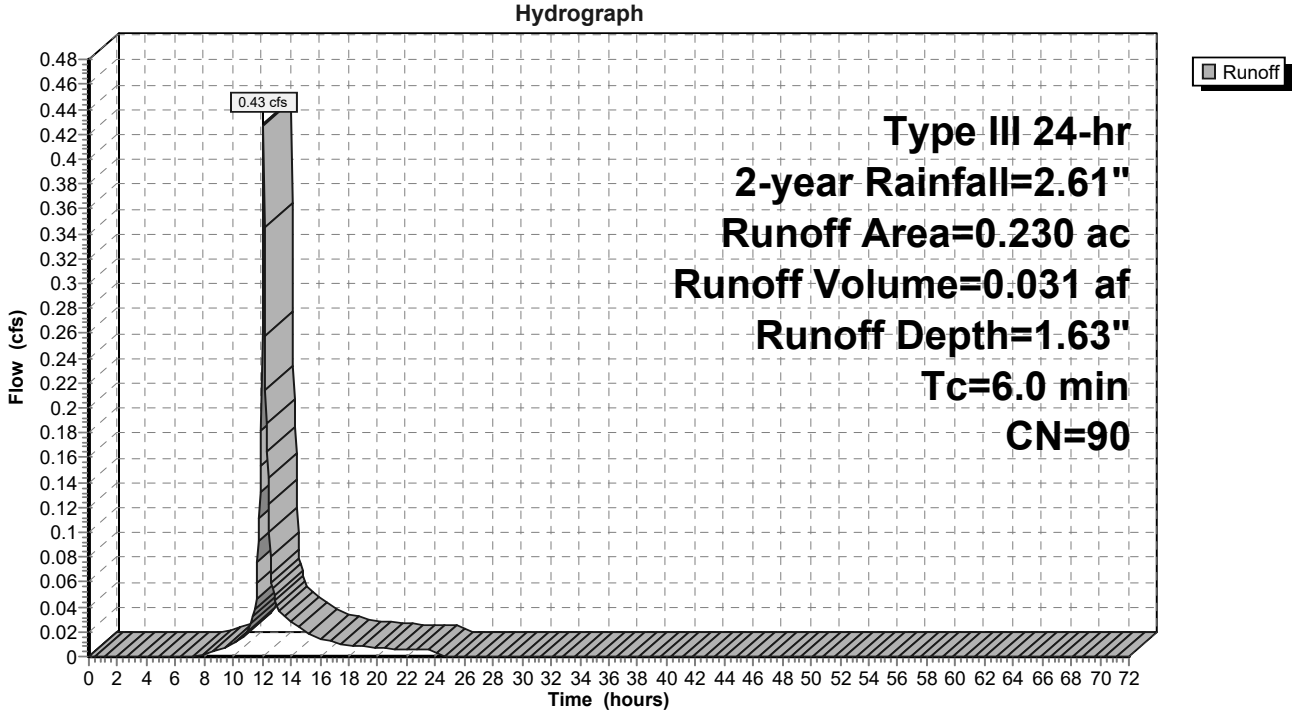
Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 1.63"
Routed to Reach 3R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=2.61"

Area (ac)	CN	Description
0.150	96	Gravel surface, HSG D
0.080	78	Meadow, non-grazed, HSG D
0.230	90	Weighted Average
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3:



Summary for Subcatchment 4:

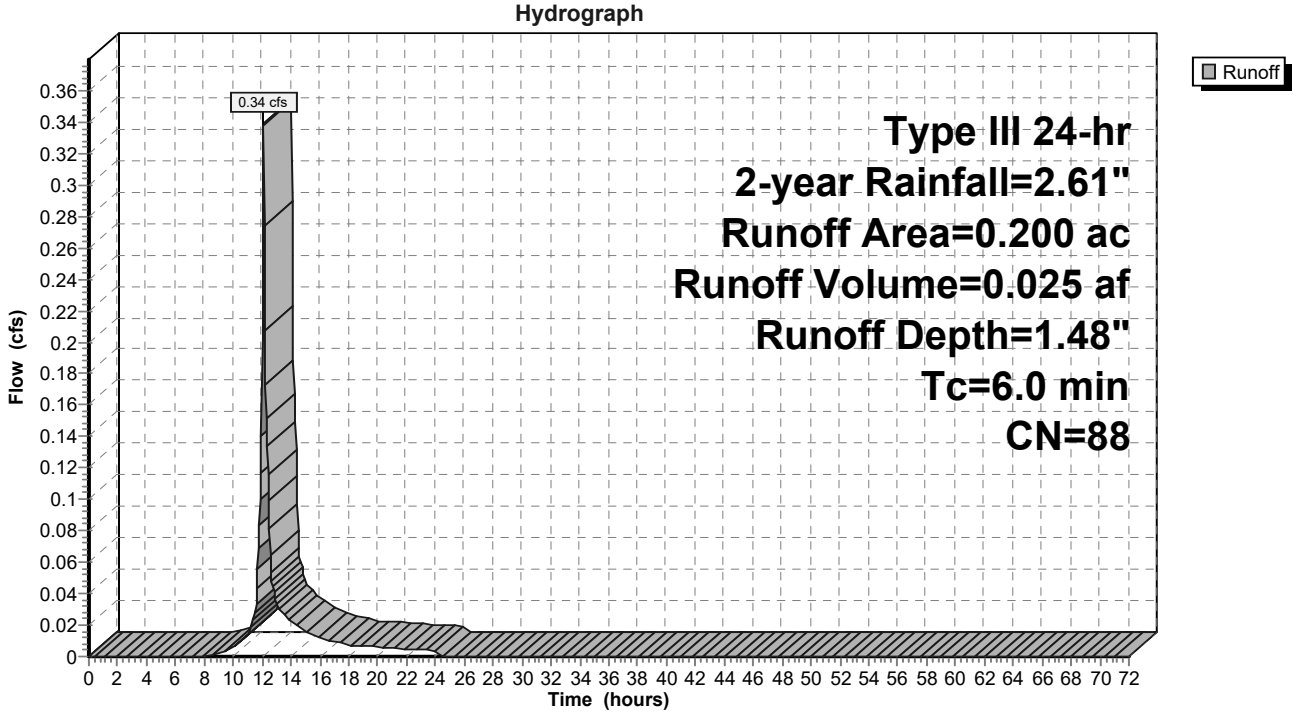
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 1.48"
Routed to Reach 4R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=2.61"

Area (ac)	CN	Description
0.110	96	Gravel surface, HSG D
0.090	78	Meadow, non-grazed, HSG D
0.200	88	Weighted Average
0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4:



Summary for Subcatchment 5:

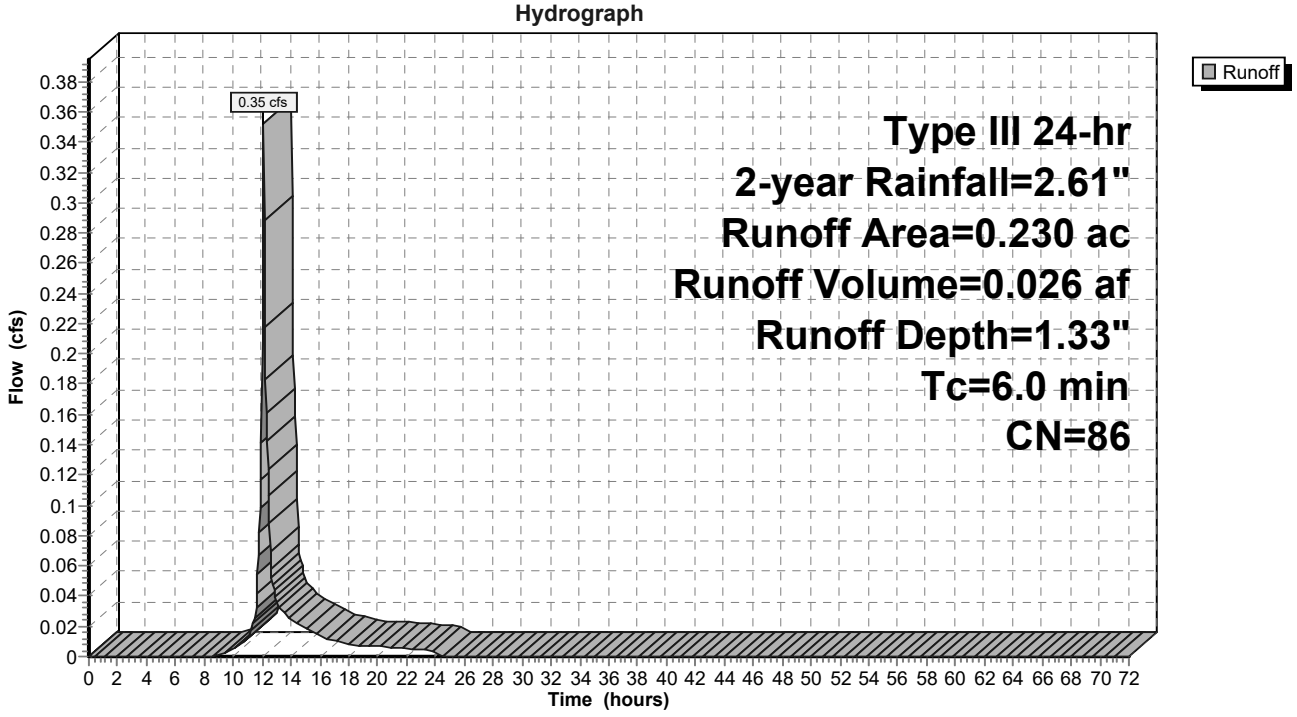
Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 1.33"
Routed to Reach 5R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=2.61"

Area (ac)	CN	Description
0.100	96	Gravel surface, HSG D
0.130	78	Meadow, non-grazed, HSG D
0.230	86	Weighted Average
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5:



Summary for Subcatchment 6:

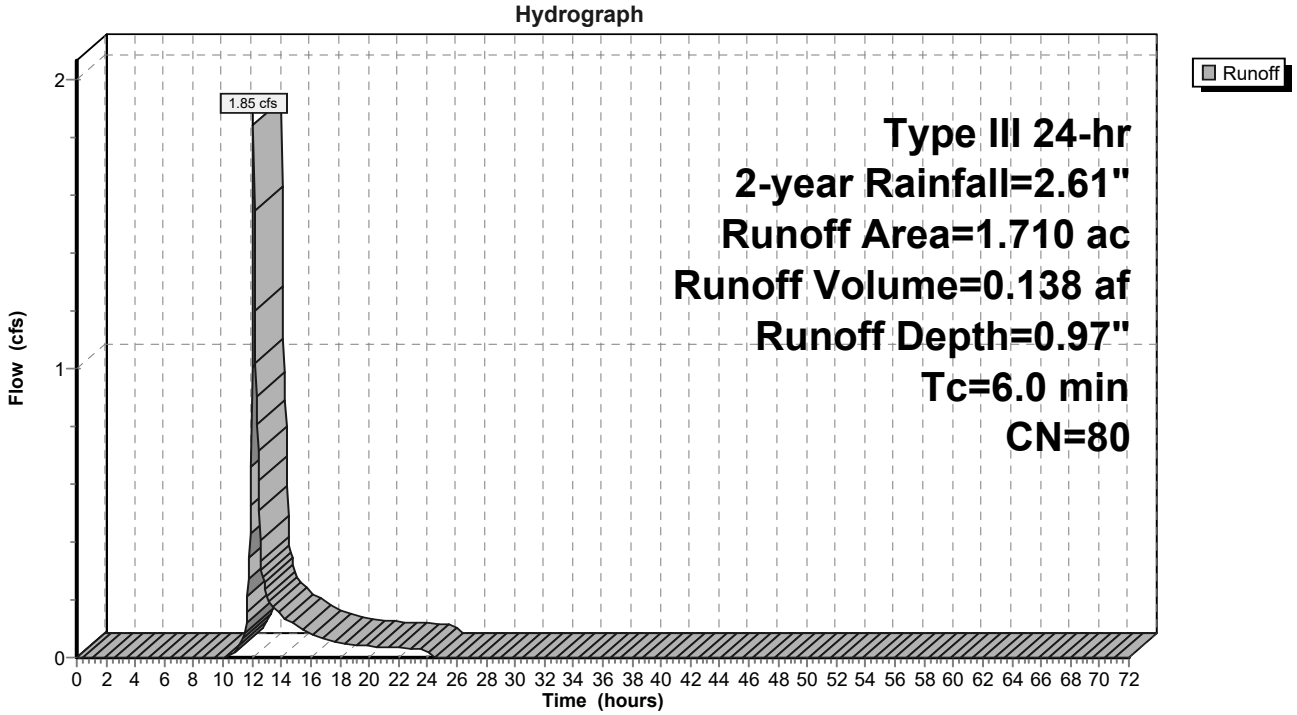
Runoff = 1.85 cfs @ 12.10 hrs, Volume= 0.138 af, Depth= 0.97"
Routed to Reach 6R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=2.61"

Area (ac)	CN	Description
0.330	96	Gravel surface, HSG C
0.270	98	Paved parking, HSG C
1.110	71	Meadow, non-grazed, HSG C
1.710	80	Weighted Average
1.440		84.21% Pervious Area
0.270		15.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6:



Summary for Reach 3R: dry swale

Inflow Area = 0.230 ac, 0.00% Impervious, Inflow Depth = 1.63" for 2-year event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.40 cfs @ 12.14 hrs, Volume= 0.031 af, Atten= 6%, Lag= 3.0 min

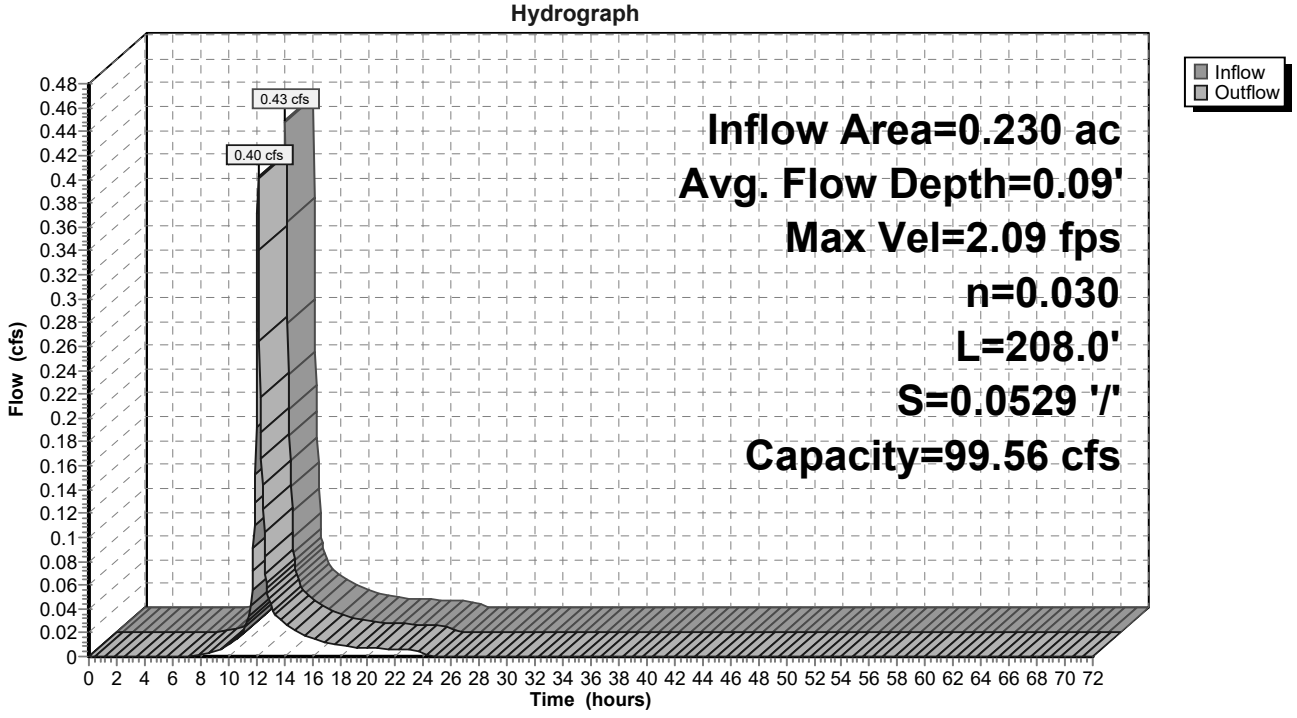
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.09 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 4.6 min

Peak Storage= 42 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 2.53'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 99.56 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 208.0' Slope= 0.0529 '/'
Inlet Invert= 389.00', Outlet Invert= 378.00'

‡

Reach 3R: dry swale



Summary for Reach 4R: dry swale

Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth = 1.48" for 2-year event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.32 cfs @ 12.12 hrs, Volume= 0.025 af, Atten= 5%, Lag= 1.8 min

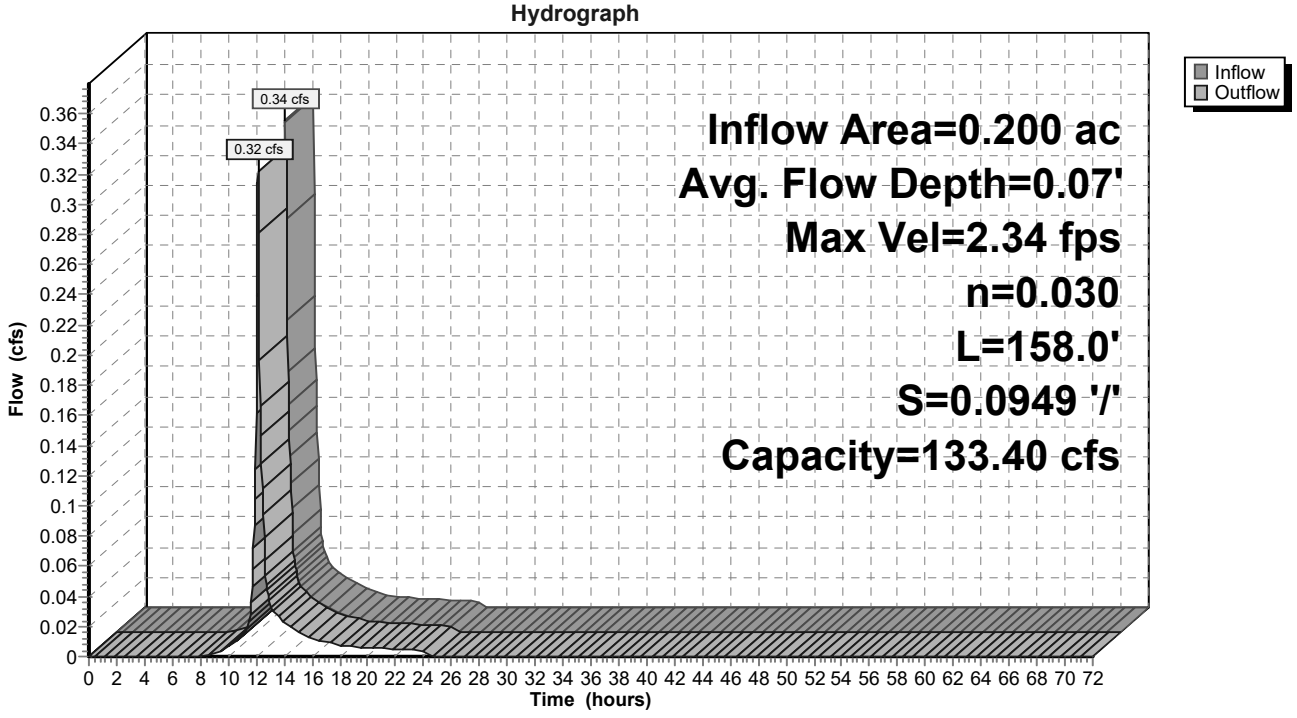
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 2.7 min

Peak Storage= 23 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 2.39'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 133.40 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 158.0' Slope= 0.0949 '/'
Inlet Invert= 407.00', Outlet Invert= 392.00'

‡

Reach 4R: dry swale



Summary for Reach 5R: dry swale

Inflow Area = 0.230 ac, 0.00% Impervious, Inflow Depth = 1.33" for 2-year event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af
Outflow = 0.33 cfs @ 12.14 hrs, Volume= 0.026 af, Atten= 6%, Lag= 2.7 min

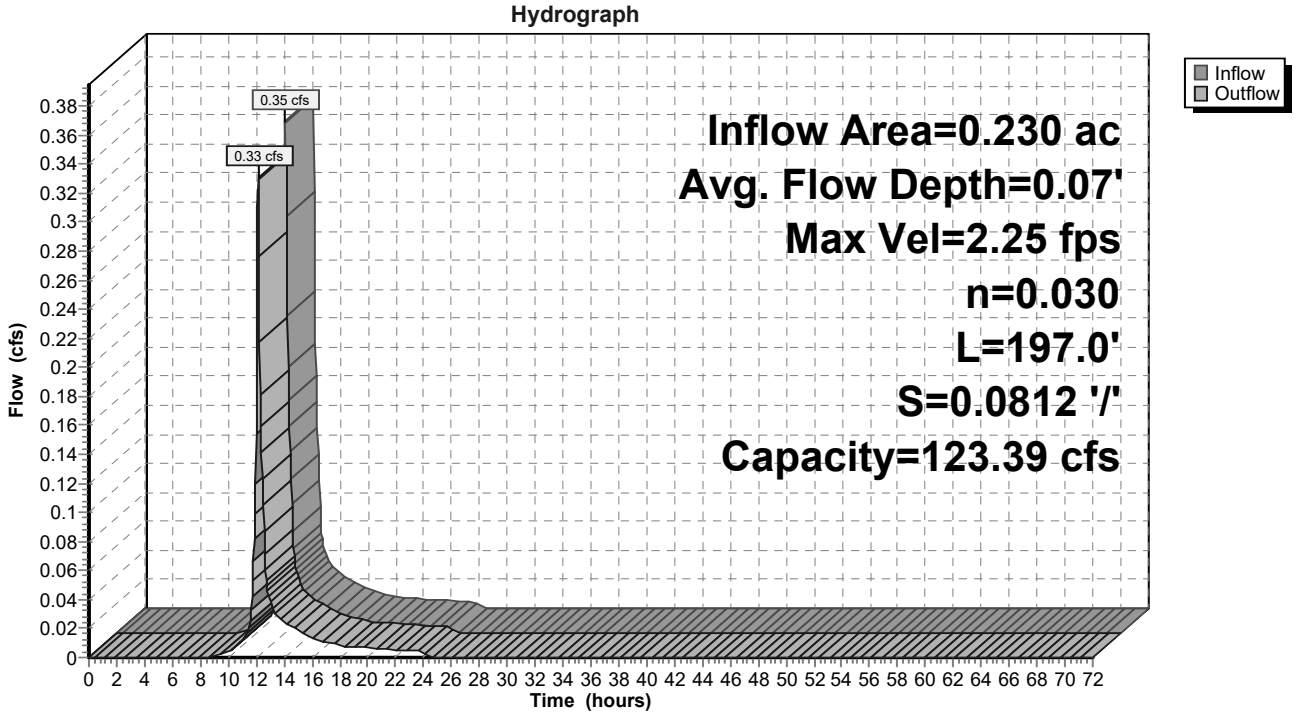
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.25 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 3.6 min

Peak Storage= 30 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 2.42'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 123.39 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 197.0' Slope= 0.0812 '/'
Inlet Invert= 408.00', Outlet Invert= 392.00'

‡

Reach 5R: dry swale



Summary for Reach 6R: dry swale

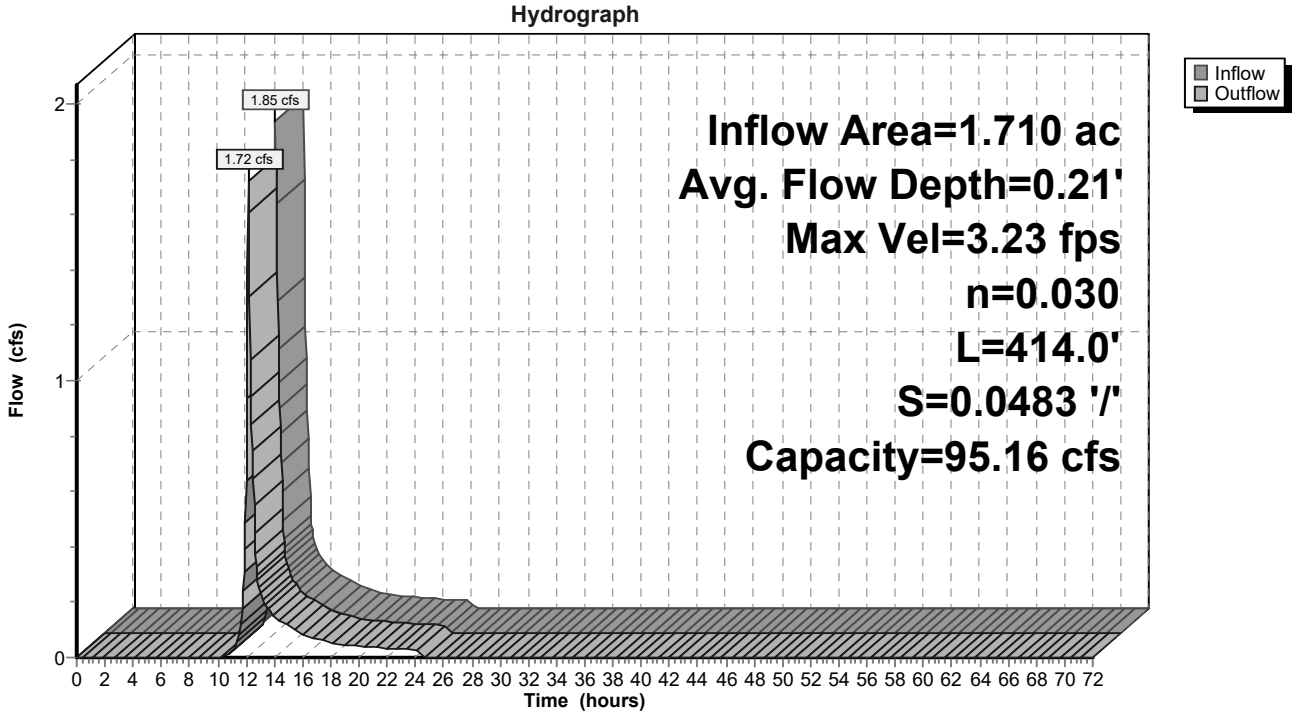
Inflow Area = 1.710 ac, 15.79% Impervious, Inflow Depth = 0.97" for 2-year event
Inflow = 1.85 cfs @ 12.10 hrs, Volume= 0.138 af
Outflow = 1.72 cfs @ 12.16 hrs, Volume= 0.138 af, Atten= 7%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 6.4 min

Peak Storage= 224 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 3.24'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 95.16 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 414.0' Slope= 0.0483 '/'
Inlet Invert= 427.00', Outlet Invert= 407.00'

‡



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3: Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=3.56"
Tc=6.0 min CN=90 Runoff=0.91 cfs 0.068 af

Subcatchment4: Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=88 Runoff=0.75 cfs 0.056 af

Subcatchment5: Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=3.16"
Tc=6.0 min CN=86 Runoff=0.82 cfs 0.061 af

Subcatchment6: Runoff Area=1.710 ac 15.79% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=80 Runoff=5.12 cfs 0.372 af

Reach 3R: dry swale Avg. Flow Depth=0.14' Max Vel=2.71 fps Inflow=0.91 cfs 0.068 af
n=0.030 L=208.0' S=0.0529 '/' Capacity=99.56 cfs Outflow=0.85 cfs 0.068 af

Reach 4R: dry swale Avg. Flow Depth=0.11' Max Vel=3.10 fps Inflow=0.75 cfs 0.056 af
n=0.030 L=158.0' S=0.0949 '/' Capacity=133.40 cfs Outflow=0.73 cfs 0.056 af

Reach 5R: dry swale Avg. Flow Depth=0.12' Max Vel=3.03 fps Inflow=0.82 cfs 0.061 af
n=0.030 L=197.0' S=0.0812 '/' Capacity=123.39 cfs Outflow=0.79 cfs 0.061 af

Reach 6R: dry swale Avg. Flow Depth=0.36' Max Vel=4.44 fps Inflow=5.12 cfs 0.372 af
n=0.030 L=414.0' S=0.0483 '/' Capacity=95.16 cfs Outflow=4.80 cfs 0.372 af

Total Runoff Area = 2.370 ac Runoff Volume = 0.556 af Average Runoff Depth = 2.82"
88.61% Pervious = 2.100 ac 11.39% Impervious = 0.270 ac

Summary for Subcatchment 3:

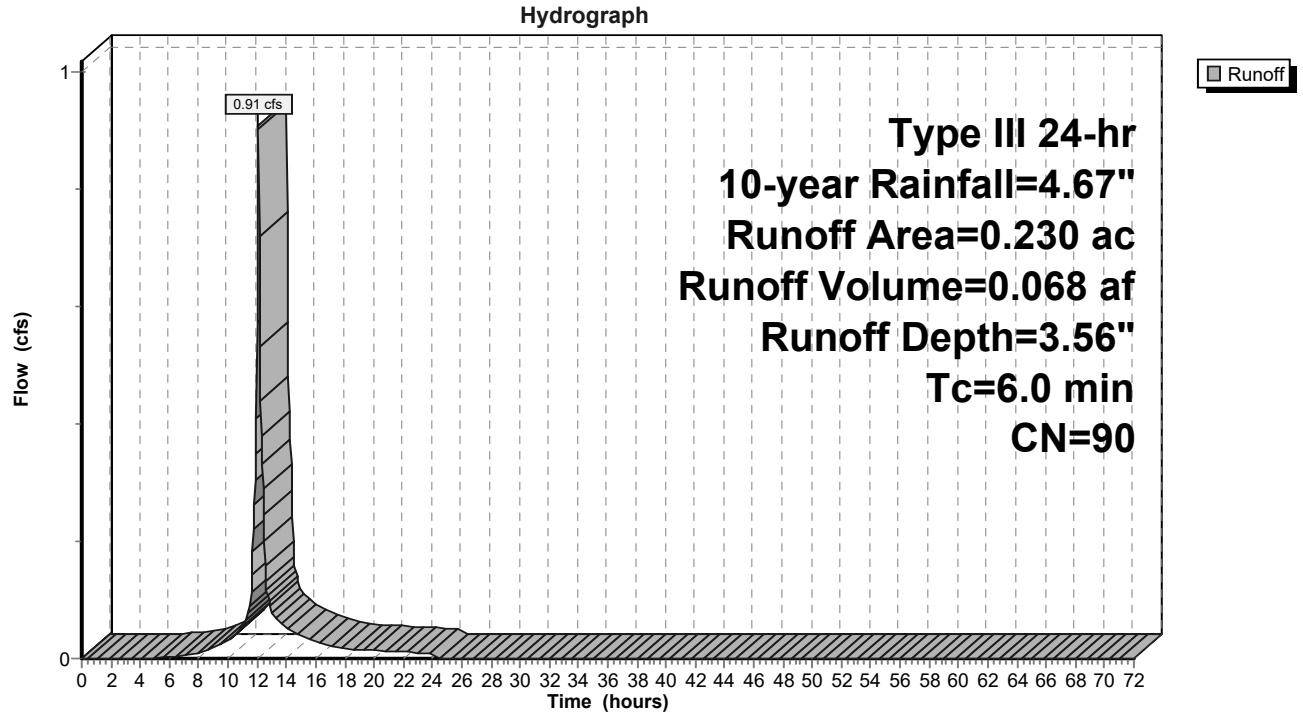
Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.068 af, Depth= 3.56"
Routed to Reach 3R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

Area (ac)	CN	Description
0.150	96	Gravel surface, HSG D
0.080	78	Meadow, non-grazed, HSG D
0.230	90	Weighted Average
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3:



Summary for Subcatchment 4:

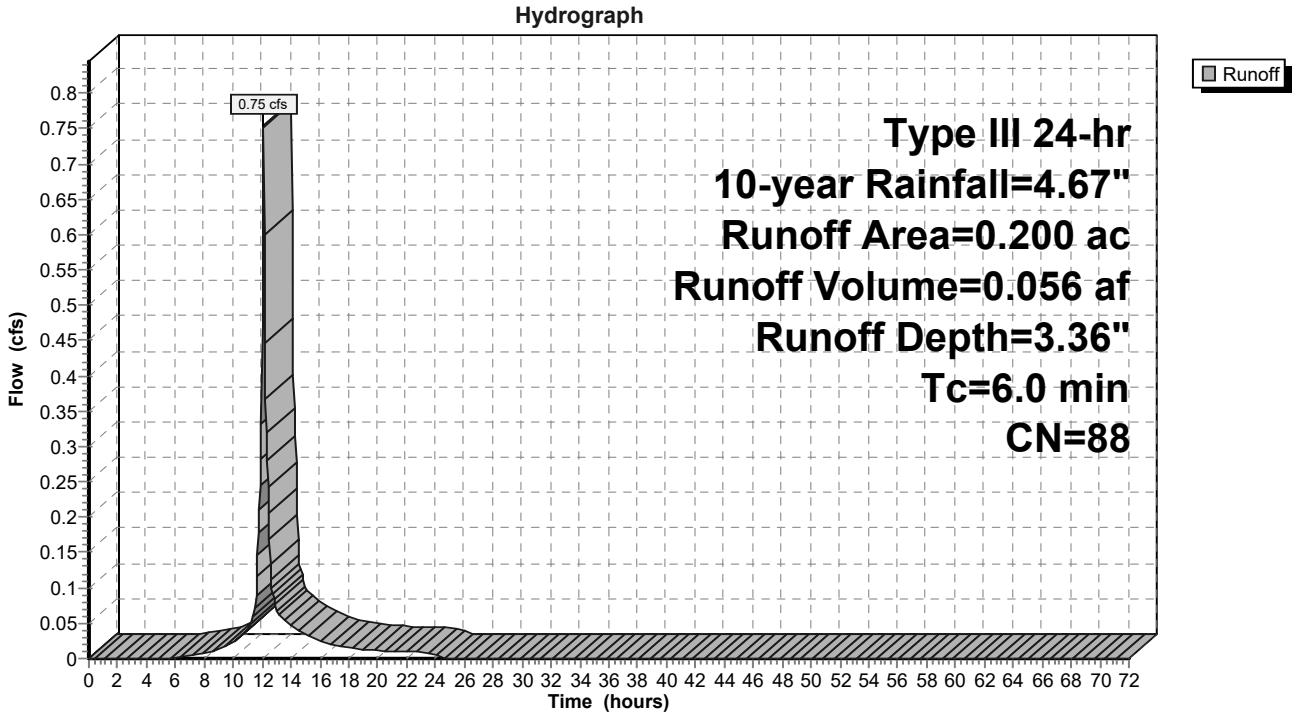
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 3.36"
Routed to Reach 4R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

Area (ac)	CN	Description
0.110	96	Gravel surface, HSG D
0.090	78	Meadow, non-grazed, HSG D
0.200	88	Weighted Average
0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4:



Summary for Subcatchment 5:

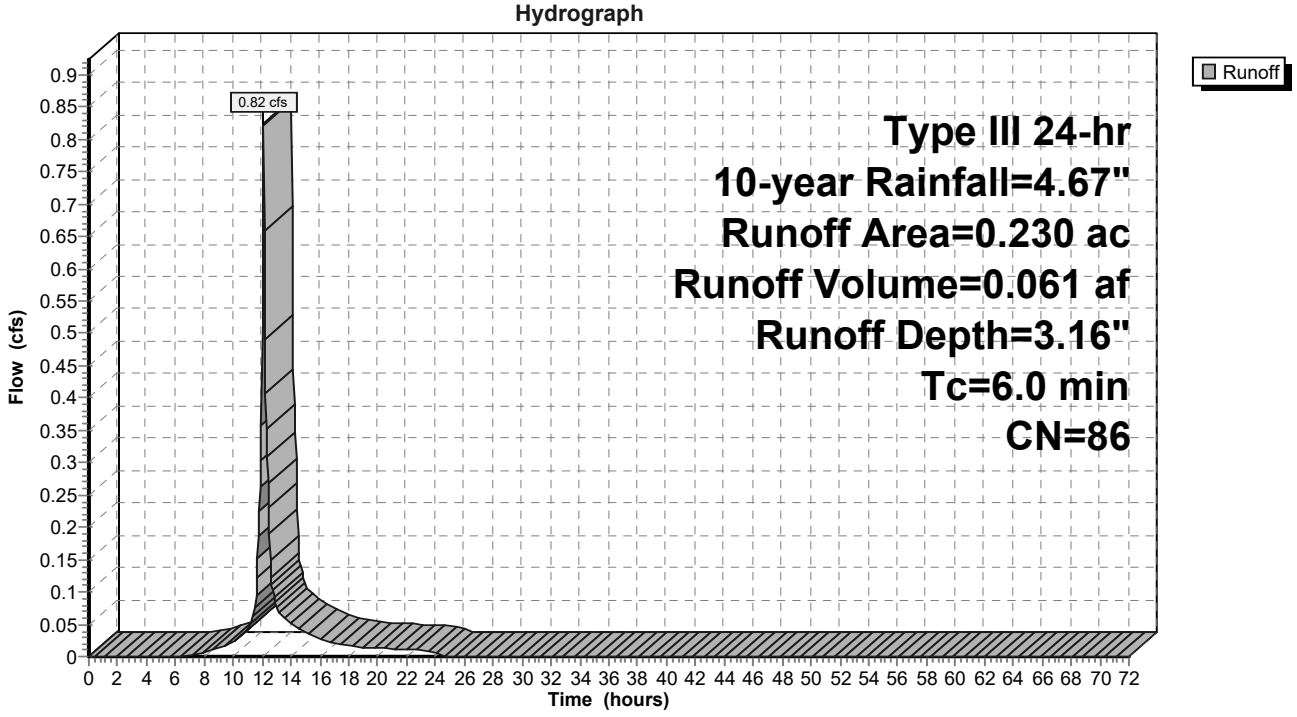
Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 3.16"
Routed to Reach 5R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

Area (ac)	CN	Description
0.100	96	Gravel surface, HSG D
0.130	78	Meadow, non-grazed, HSG D
0.230	86	Weighted Average
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5:



Summary for Subcatchment 6:

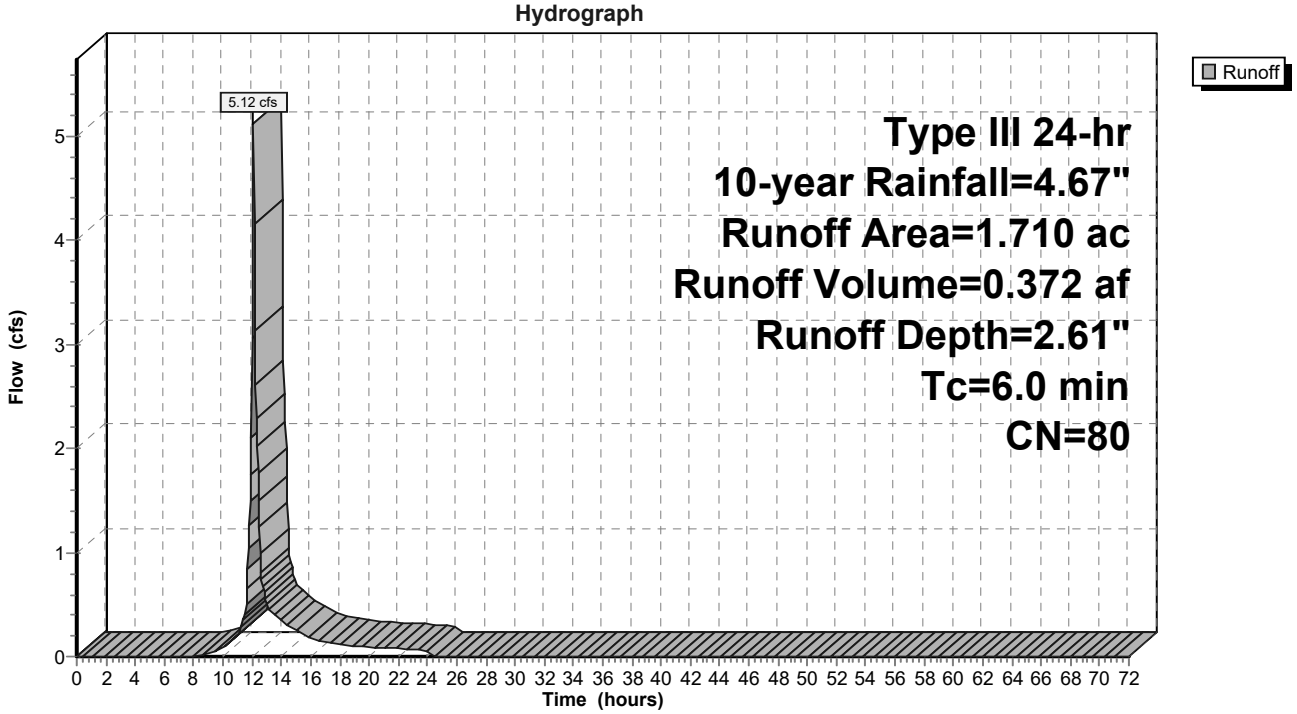
Runoff = 5.12 cfs @ 12.09 hrs, Volume= 0.372 af, Depth= 2.61"
Routed to Reach 6R : dry swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

Area (ac)	CN	Description
0.330	96	Gravel surface, HSG C
0.270	98	Paved parking, HSG C
1.110	71	Meadow, non-grazed, HSG C
1.710	80	Weighted Average
1.440		84.21% Pervious Area
0.270		15.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6:



Summary for Reach 3R: dry swale

Inflow Area = 0.230 ac, 0.00% Impervious, Inflow Depth = 3.56" for 10-year event
Inflow = 0.91 cfs @ 12.09 hrs, Volume= 0.068 af
Outflow = 0.85 cfs @ 12.13 hrs, Volume= 0.068 af, Atten= 6%, Lag= 2.2 min

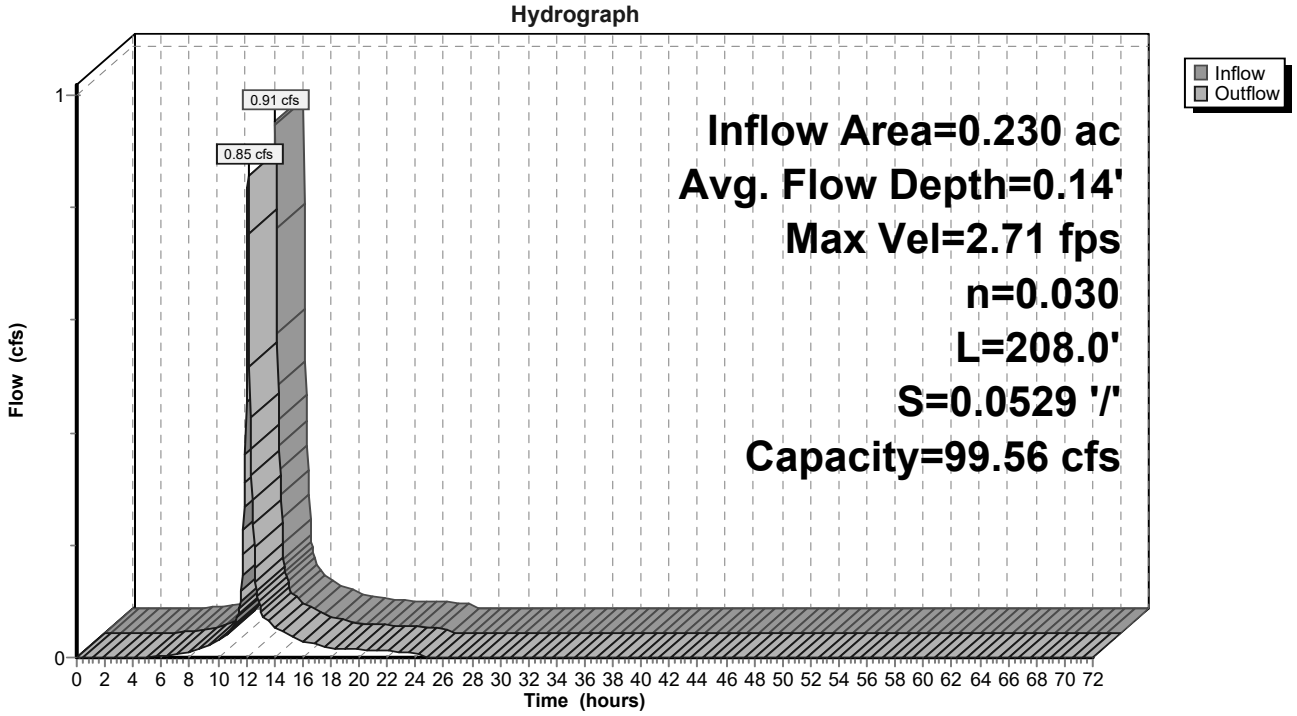
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.71 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 4.2 min

Peak Storage= 69 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 2.83'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 99.56 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 208.0' Slope= 0.0529 '/'
Inlet Invert= 389.00', Outlet Invert= 378.00'

‡

Reach 3R: dry swale



Summary for Reach 4R: dry swale

Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth = 3.36" for 10-year event
Inflow = 0.75 cfs @ 12.09 hrs, Volume= 0.056 af
Outflow = 0.73 cfs @ 12.11 hrs, Volume= 0.056 af, Atten= 4%, Lag= 1.3 min

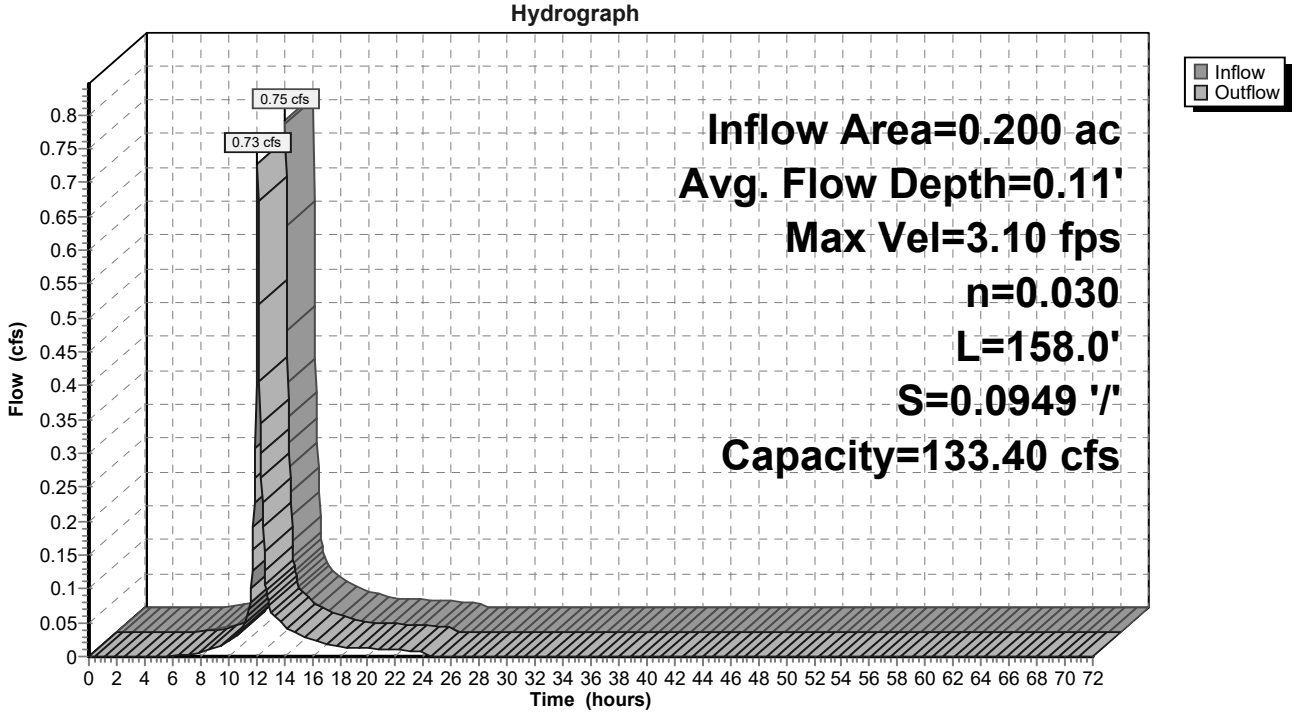
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.10 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 2.6 min

Peak Storage= 38 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 2.63'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 133.40 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 158.0' Slope= 0.0949 '/'
Inlet Invert= 407.00', Outlet Invert= 392.00'

‡

Reach 4R: dry swale



Summary for Reach 5R: dry swale

Inflow Area = 0.230 ac, 0.00% Impervious, Inflow Depth = 3.16" for 10-year event
Inflow = 0.82 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.79 cfs @ 12.12 hrs, Volume= 0.061 af, Atten= 5%, Lag= 1.8 min

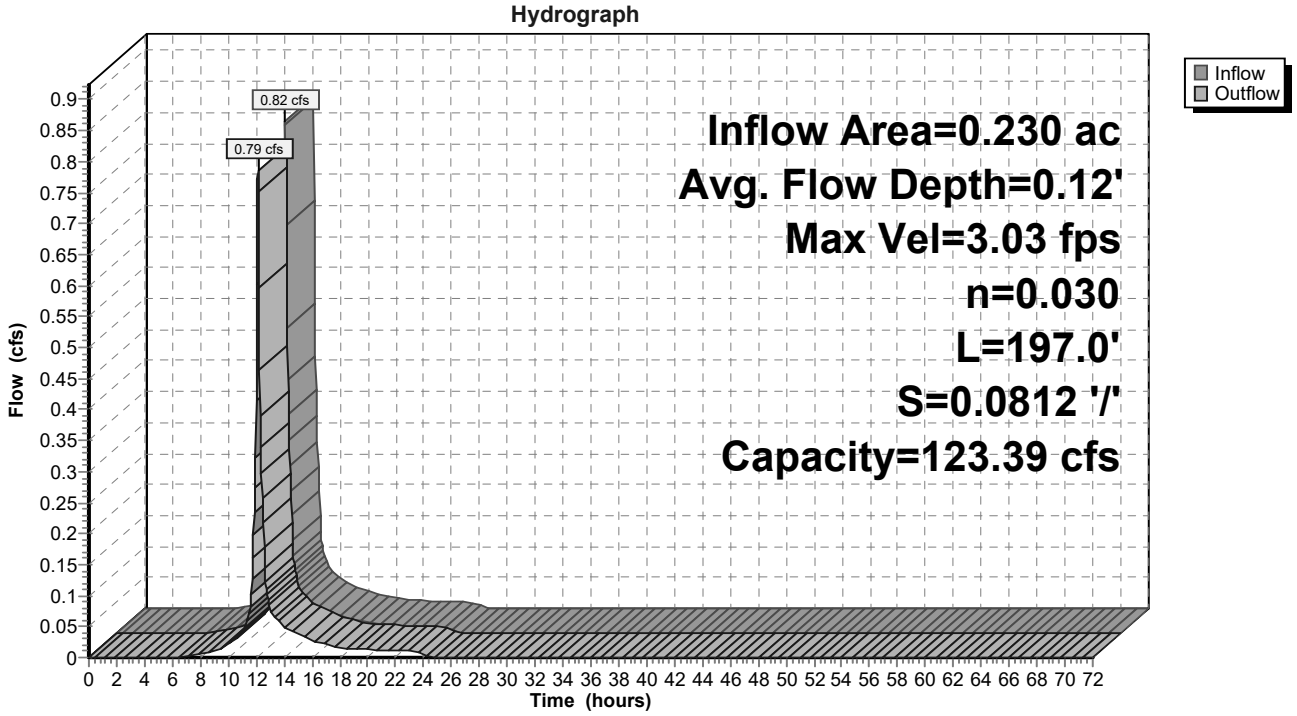
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.03 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 3.3 min

Peak Storage= 53 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 2.69'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 123.39 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 197.0' Slope= 0.0812 '/'
Inlet Invert= 408.00', Outlet Invert= 392.00'

‡

Reach 5R: dry swale



Summary for Reach 6R: dry swale

Inflow Area = 1.710 ac, 15.79% Impervious, Inflow Depth = 2.61" for 10-year event
Inflow = 5.12 cfs @ 12.09 hrs, Volume= 0.372 af
Outflow = 4.80 cfs @ 12.14 hrs, Volume= 0.372 af, Atten= 6%, Lag= 2.9 min

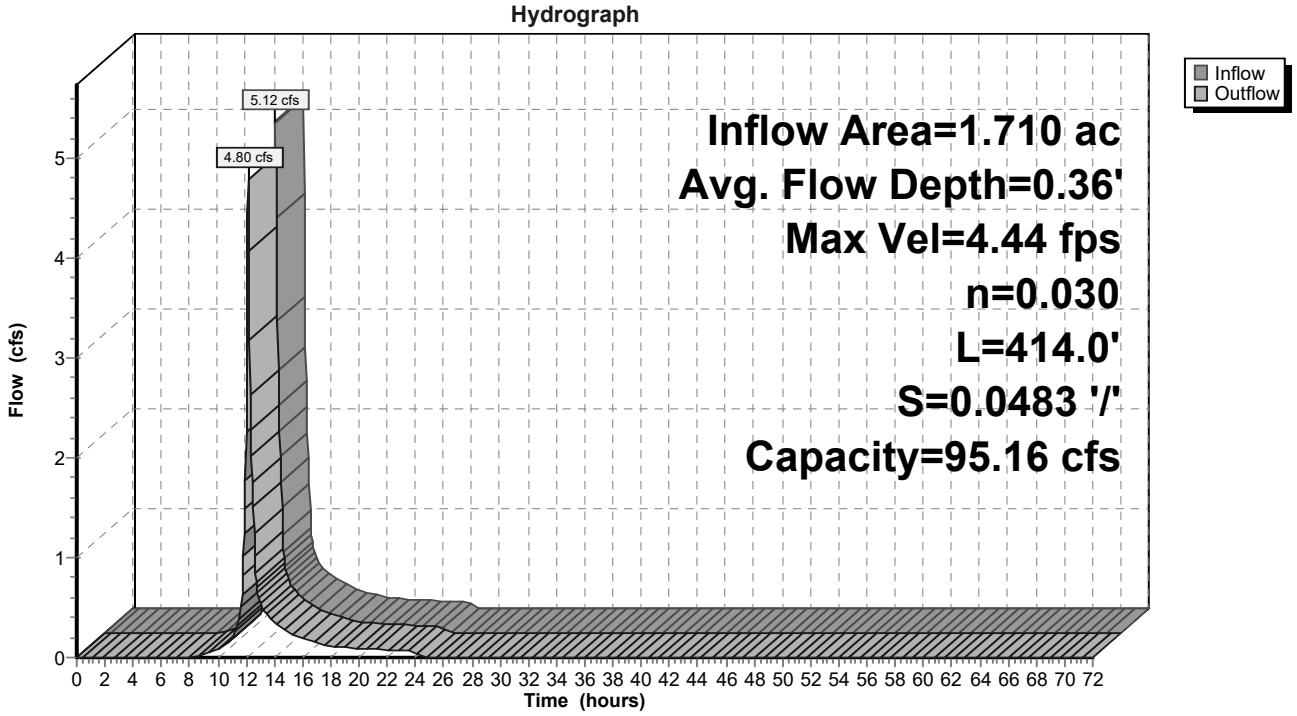
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.44 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 4.9 min

Peak Storage= 466 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 4.18'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 95.16 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 414.0' Slope= 0.0483 '/'
Inlet Invert= 427.00', Outlet Invert= 407.00'

‡

Reach 6R: dry swale



Gravel Diaphragm Worksheet

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....							*no*
Design Point(s):	1			*Manually enter the information below.*			
P=	1.50	*inch*					

Breakdown of Subcatchments

Subcatchment Number	Subcatchment Model Number	Panel Area on Slopes Greater than 10% *(Acres)*
1	North Array	1.06
2	South Array	0.16
Total		1.21

Breakdown of Subcatchments Assuming Panels are Considered Pervious

Subcatchment Number	Subcatchment Model Number	Total Area *(Acres)* (1)	Impervious Area *(Acres)* (2)	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	North Array	8.21	0.00	0%	0.05	2,234	Gravel Diaphragm
2	South Array	8.55	0.00	0%	0.05	2,327	Gravel Diaphragm
Total		16.75	0.00	0%	0.05	4,561	Total

Breakdown of Subcatchments Assuming Panels are Considered Impervious

Subcatchment Number	Subcatchment Model Number	Total Area *(Acres)* (1)	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	North Array	8.21	1.06	13%	0.17	7,422	Gravel Diaphragm
2	South Array	8.55	0.16	2%	0.07	3,091	Gravel Diaphragm
Total		16.75	1.21	7%	0.12	10,514	Total

(1) The total area is the area of the panels plus the grass area between the panels. Refer to Figure 6 for a boundary delineation.

(2) There is no impervious area, since a combination of gravel diaphragms and eathern level spreaders are used to maintain sheet flow throughout the array area. The gravel diaphragms are spaced a maximum of 100 feet apart with earthen level spreaders in between.

Gravel Diaphragm Worksheet

Design Point(s):	1

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	North Array	8.21	0.00	0.00	0.05	2,234	1.50	Gravel Diaphragm
Enter Impervious Area Reduced by Disconnection of Rooftops			0.00	0%	0.05	2,234	<<WQv after adjusting for Disconnected Rooftops	

Size the Gravel Diaphragm Ap = Vw / (ndt)				
Design Volume	Vw	2,234	ft^3	
Porosity	n	0.4	--	*assume 0.4*
Design Depth	dt	2.0	*ft*	
Required Surface Area	Ar	2,793	ft^2	
Surface Area Provided	Ap	12,382	ft^2	
Volume Provided	Vp	9,906	ft^3	

Breakdown of	1

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	South Array	8.55	0.00	0.00	0.00	2,327	1.50	Gravel Diaphragm
Enter Impervious Area Reduced by Disconnection of Rooftops			0.00	0%	0.05	2,327	<<WQv after adjusting for Disconnected Rooftops	

Size the Gravel Diaphragm Ap = Vw / (ndt)				
Design Volume	Vw	2,327	ft^3	
Porosity	n	0.4	--	*assume 0.4*
Design Depth	dt	2.0	*ft*	
Required Surface Area	Ar	2,908	ft^2	
Surface Area Provided	Ap	15,738	ft^2	
Volume Provided	Vp	12,590	ft^3	

Gravel Diaphragm Worksheet

Design Point(s):	1

Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	North Array	8.21	1.06	0.13	0.17	7,422	1.50	Gravel Diaphragm
Enter Impervious Area Reduced by Disconnection of Rooftops			0.00	13%	0.17	7,422	<<WQv after adjusting for Disconnected Rooftops	

Size the Gravel Diaphragm Ap = Vw / (ndt)				
Design Volume	Vw	7,422	ft^3	
Porosity	n	0.4	--	*assume 0.4*
Design Depth	dt	2.0	*ft*	
Required Surface Area	Ar	9,278	ft^2	
Surface Area Provided	Ap	12,382	ft^2	
Volume Provided	Vp	9,906	ft^3	

Design Point(s):	1

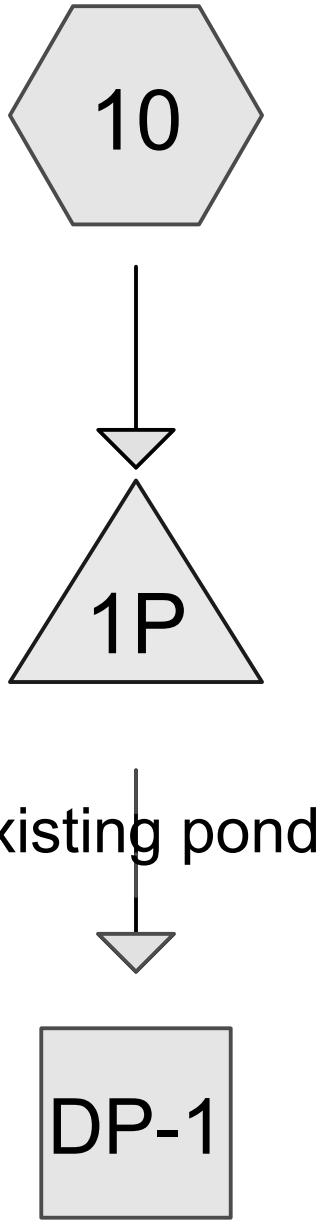
Enter Site Data For Drainage Area to be Treated by Practice								
Subcatchment Number	**Subcatchment Model Number**	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	South Array	8.55	0.16	0.02	0.07	3,091	1.50	Gravel Diaphragm
Enter Impervious Area Reduced by Disconnection of Rooftops			0.00	2%	0.07	3,091	<<WQv after adjusting for Disconnected Rooftops	

Size the Gravel Diaphragm Ap = Vw / (ndt)				
Design Volume	Vw	3,091	ft^3	
Porosity	n	0.4	--	*assume 0.4*
Design Depth	dt	2.0	*ft*	
Required Surface Area	Ar	3,864	ft^2	
Surface Area Provided	Ap	15,738	ft^2	
Volume Provided	Vp	12,590	ft^3	

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Appendix D: Pre-Development Stormwater Analysis

LANGAN



Subcat Reach Pond Link

Routing Diagram for 2024-11-19 Highland Solar Existing
Prepared by Langan Engineering, Printed 11/21/2024

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment10: Runoff Area=90.310 ac 6.16% Impervious Runoff Depth=0.76"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=33.79 cfs 5.735 af

Reach DP-1: Inflow=21.14 cfs 5.723 af
Outflow=21.14 cfs 5.723 af

Pond 1P: existing pond Peak Elev=327.57' Storage=57,046 cf Inflow=33.79 cfs 5.735 af
Primary=21.14 cfs 5.723 af Secondary=0.00 cfs 0.000 af Outflow=21.14 cfs 5.723 af

Total Runoff Area = 90.310 ac Runoff Volume = 5.735 af Average Runoff Depth = 0.76"
93.84% Pervious = 84.750 ac 6.16% Impervious = 5.560 ac

Summary for Subcatchment 10:

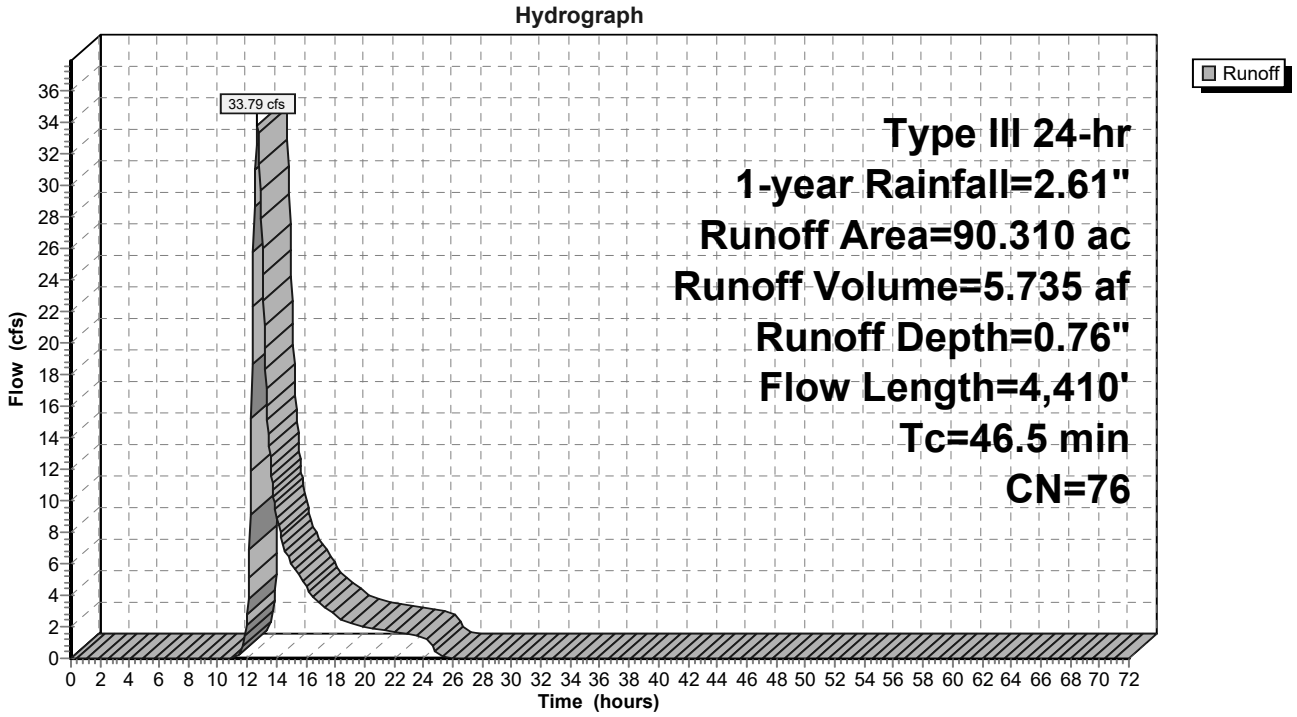
Runoff = 33.79 cfs @ 12.70 hrs, Volume= 5.735 af, Depth= 0.76"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.61"

	Area (ac)	CN	Description
*	26.330	71	Medow, Non Graised, HSG C (On Site)
*	22.500	71	Medow, Non Graised, HSG C (Off Site)
*	27.500	78	Medow, Non Graised HSG D (On Site)
*	4.950	78	Medow, Non Graised HSG D (Off Site)
*	0.740	98	Existing buildings
*	0.500	96	Existing Road
	1.560	98	Paved parking, HSG D
	1.000	89	Dirt roads, HSG D
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fair, HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.180	98	Water Surface, HSG D
*	1.080	98	Water Surface, HSG C
	90.310	76	Weighted Average
	84.750		93.84% Pervious Area
	5.560		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 10:

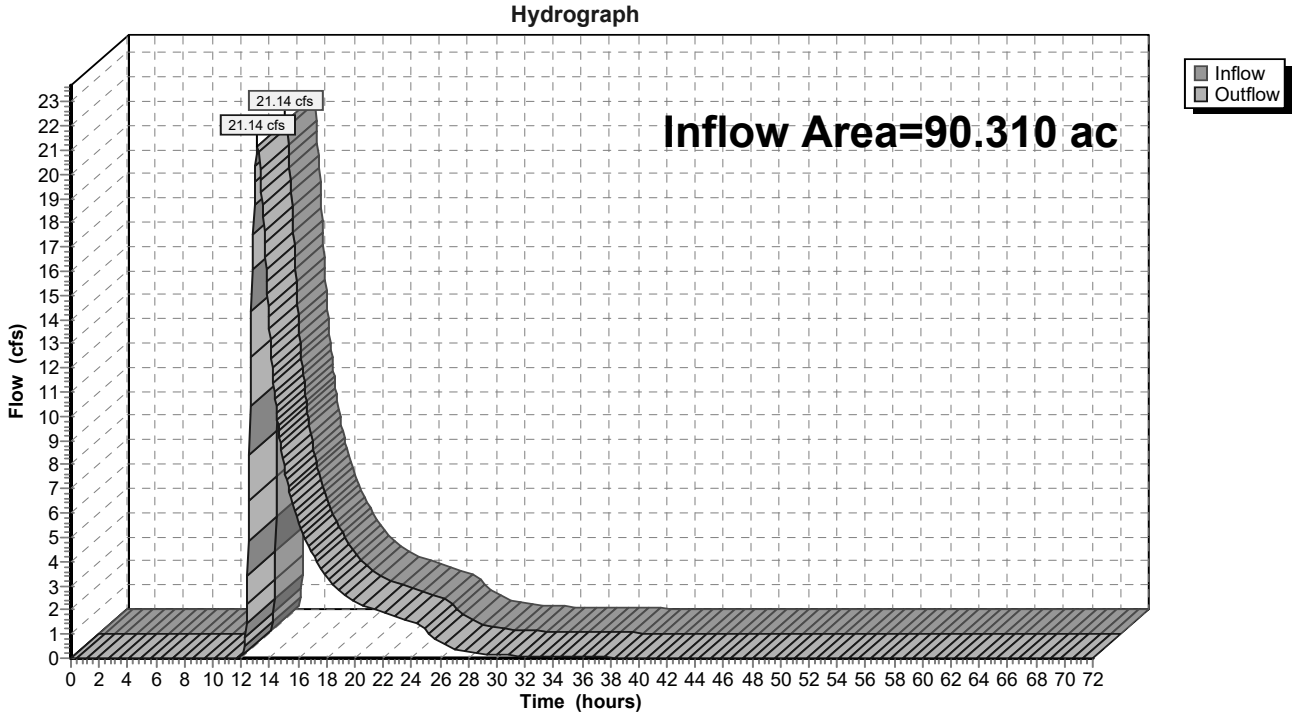


Summary for Reach DP-1:

Inflow Area = 90.310 ac, 6.16% Impervious, Inflow Depth > 0.76" for 1-year event
Inflow = 21.14 cfs @ 13.15 hrs, Volume= 5.723 af
Outflow = 21.14 cfs @ 13.15 hrs, Volume= 5.723 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1P: existing pond

Inflow Area = 90.310 ac, 6.16% Impervious, Inflow Depth = 0.76" for 1-year event
Inflow = 33.79 cfs @ 12.70 hrs, Volume= 5.735 af
Outflow = 21.14 cfs @ 13.15 hrs, Volume= 5.723 af, Atten= 37%, Lag= 27.0 min
Primary = 21.14 cfs @ 13.15 hrs, Volume= 5.723 af
Routed to Reach DP-1 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 327.57' @ 13.15 hrs Surf.Area= 37,365 sf Storage= 57,046 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 84.9 min calculated for 5.719 af (100% of inflow)
Center-of-Mass det. time= 85.4 min (991.4 - 906.0)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

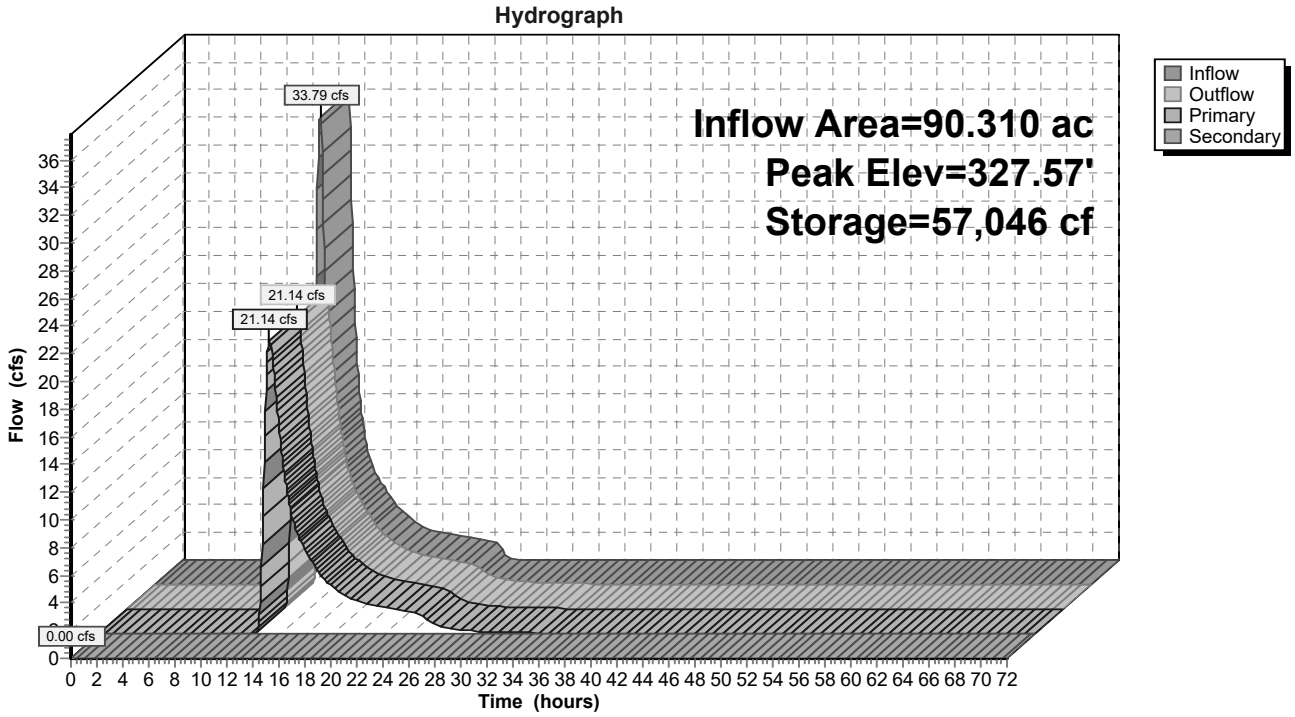
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=21.13 cfs @ 13.15 hrs HW=327.57' (Free Discharge)
└**1=East Pipe** (Barrel Controls 10.98 cfs @ 4.23 fps)
└**2=West Pipe** (Barrel Controls 10.15 cfs @ 3.91 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=325.83' (Free Discharge)
└**3=Overflow Weir** (Controls 0.00 cfs)

Pond 1P: existing pond



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment10: Runoff Area=90.310 ac 6.16% Impervious Runoff Depth=2.27"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=108.56 cfs 17.056 af

Reach DP-1: Inflow=84.49 cfs 17.044 af
Outflow=84.49 cfs 17.044 af

Pond 1P: existing pond Peak Elev=329.60' Storage=150,742 cf Inflow=108.56 cfs 17.056 af
Primary=59.27 cfs 15.993 af Secondary=25.22 cfs 1.051 af Outflow=84.49 cfs 17.044 af

Total Runoff Area = 90.310 ac Runoff Volume = 17.056 af Average Runoff Depth = 2.27"
93.84% Pervious = 84.750 ac 6.16% Impervious = 5.560 ac

Summary for Subcatchment 10:

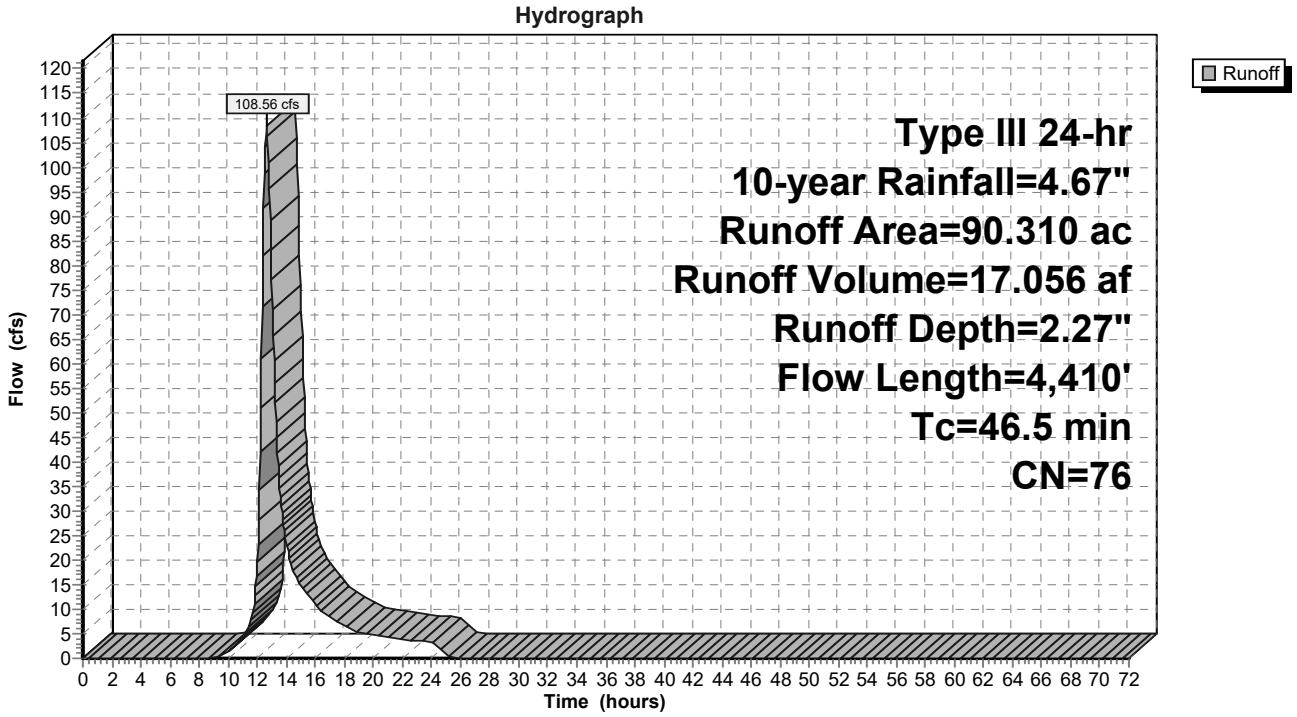
Runoff = 108.56 cfs @ 12.65 hrs, Volume= 17.056 af, Depth= 2.27"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

	Area (ac)	CN	Description
*	26.330	71	Medow, Non Graised, HSG C (On Site)
*	22.500	71	Medow, Non Graised, HSG C (Off Site)
*	27.500	78	Medow, Non Graised HSG D (On Site)
*	4.950	78	Medow, Non Graised HSG D (Off Site)
*	0.740	98	Existing buildings
*	0.500	96	Existing Road
	1.560	98	Paved parking, HSG D
	1.000	89	Dirt roads, HSG D
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fair, HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.180	98	Water Surface, HSG D
*	1.080	98	Water Surface, HSG C
	90.310	76	Weighted Average
	84.750		93.84% Pervious Area
	5.560		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 10:

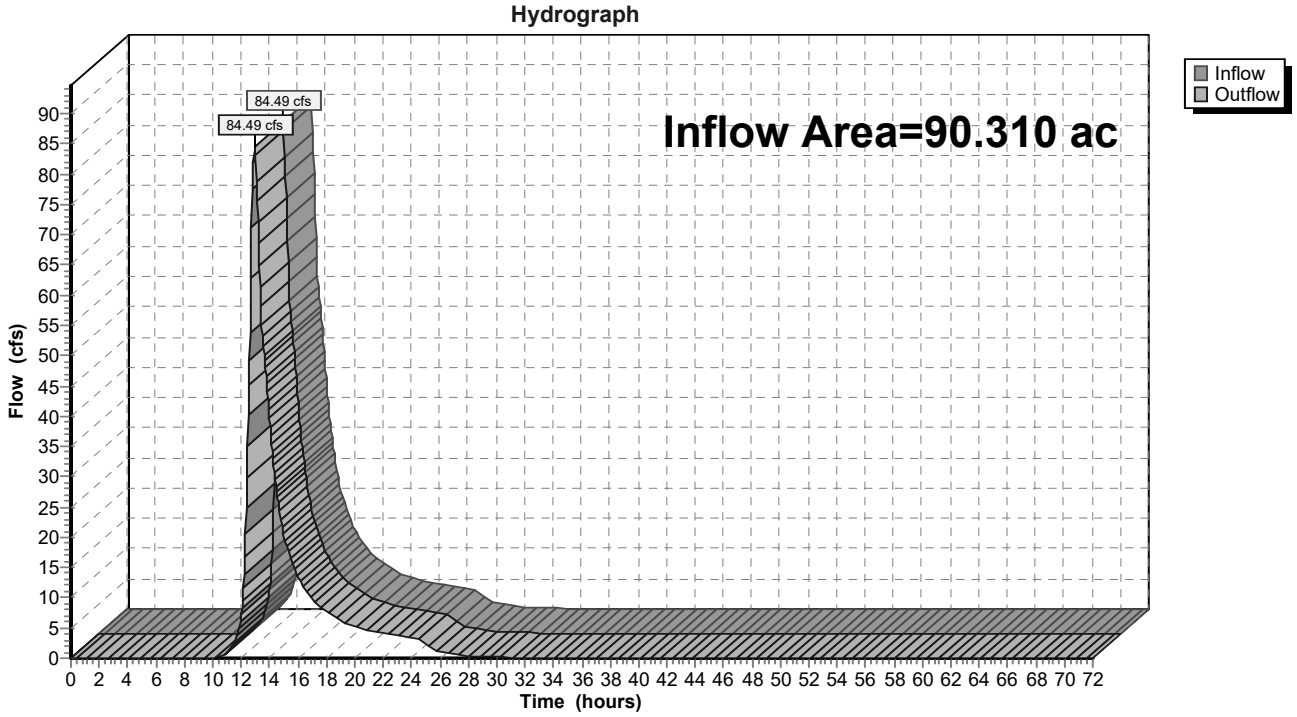


Summary for Reach DP-1:

Inflow Area = 90.310 ac, 6.16% Impervious, Inflow Depth = 2.26" for 10-year event
Inflow = 84.49 cfs @ 12.94 hrs, Volume= 17.044 af
Outflow = 84.49 cfs @ 12.94 hrs, Volume= 17.044 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1P: existing pond

Inflow Area = 90.310 ac, 6.16% Impervious, Inflow Depth = 2.27" for 10-year event
Inflow = 108.56 cfs @ 12.65 hrs, Volume= 17.056 af
Outflow = 84.49 cfs @ 12.94 hrs, Volume= 17.044 af, Atten= 22%, Lag= 17.2 min
Primary = 59.27 cfs @ 12.94 hrs, Volume= 15.993 af
Routed to Reach DP-1 :
Secondary = 25.22 cfs @ 12.94 hrs, Volume= 1.051 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 329.60' @ 12.94 hrs Surf.Area= 58,625 sf Storage= 150,742 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 54.1 min calculated for 17.044 af (100% of inflow)
Center-of-Mass det. time= 53.6 min (926.7 - 873.1)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

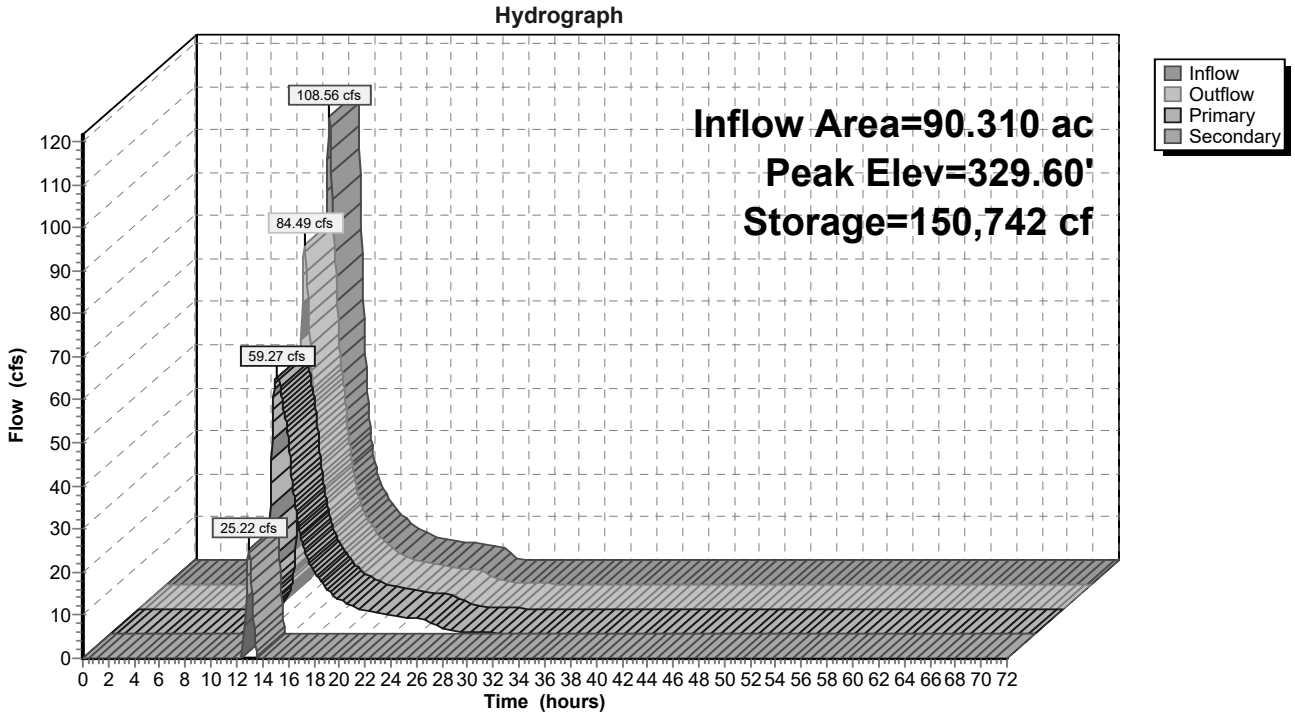
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=59.26 cfs @ 12.94 hrs HW=329.60' (Free Discharge)
└**1=East Pipe** (Inlet Controls 29.63 cfs @ 6.04 fps)
└**2=West Pipe** (Inlet Controls 29.63 cfs @ 6.04 fps)

Secondary OutFlow Max=25.18 cfs @ 12.94 hrs HW=329.60' (Free Discharge)
└**3=Overflow Weir** (Weir Controls 25.18 cfs @ 2.09 fps)

Pond 1P: existing pond



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment10: Runoff Area=90.310 ac 6.16% Impervious Runoff Depth=5.32"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=255.47 cfs 40.052 af

Reach DP-1: Inflow=181.52 cfs 36.009 af
Outflow=181.52 cfs 36.009 af

Pond 1P: existing pond Peak Elev=330.64' Storage=175,360 cf Inflow=255.47 cfs 40.052 af
Primary=70.43 cfs 28.429 af Secondary=111.09 cfs 7.581 af Outflow=181.52 cfs 36.009 af

Total Runoff Area = 90.310 ac Runoff Volume = 40.052 af Average Runoff Depth = 5.32"
93.84% Pervious = 84.750 ac 6.16% Impervious = 5.560 ac

Summary for Subcatchment 10:

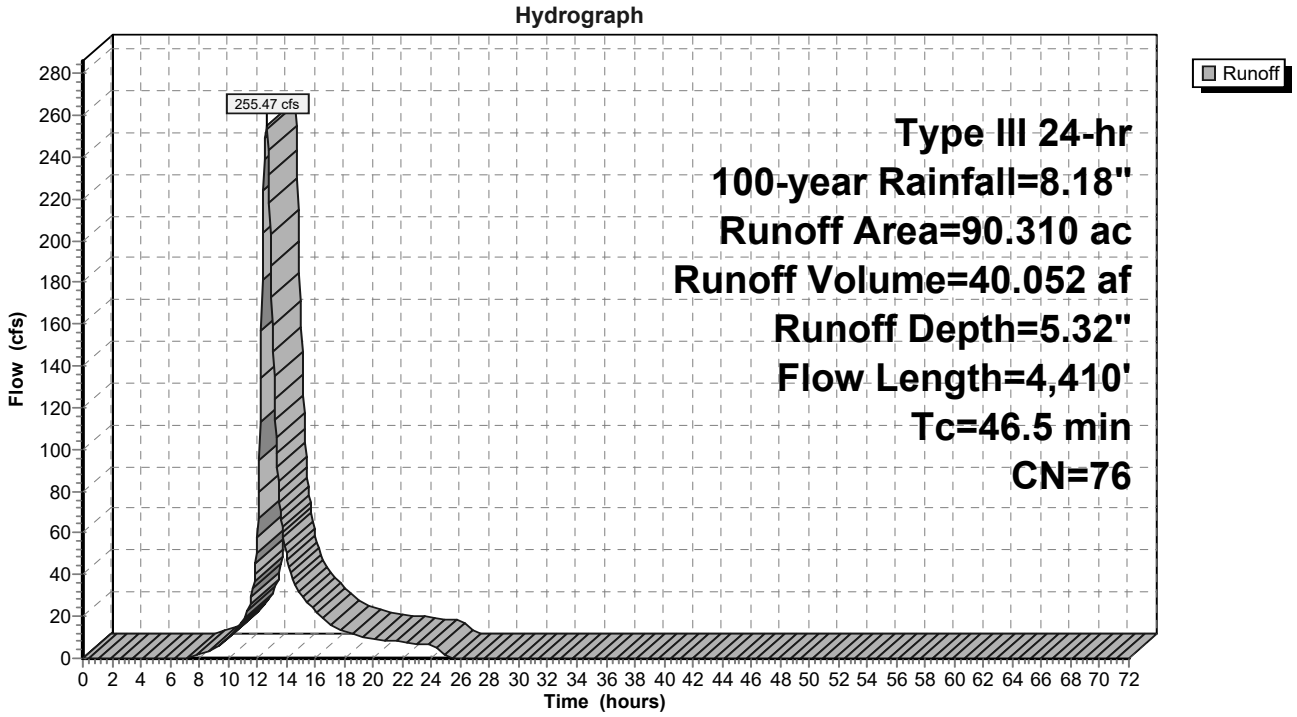
Runoff = 255.47 cfs @ 12.63 hrs, Volume= 40.052 af, Depth= 5.32"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.18"

	Area (ac)	CN	Description
*	26.330	71	Medow, Non Graised, HSG C (On Site)
*	22.500	71	Medow, Non Graised, HSG C (Off Site)
*	27.500	78	Medow, Non Graised HSG D (On Site)
*	4.950	78	Medow, Non Graised HSG D (Off Site)
*	0.740	98	Existing buildings
*	0.500	96	Existing Road
	1.560	98	Paved parking, HSG D
	1.000	89	Dirt roads, HSG D
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fair, HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.180	98	Water Surface, HSG D
*	1.080	98	Water Surface, HSG C
	90.310	76	Weighted Average
	84.750		93.84% Pervious Area
	5.560		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 10:

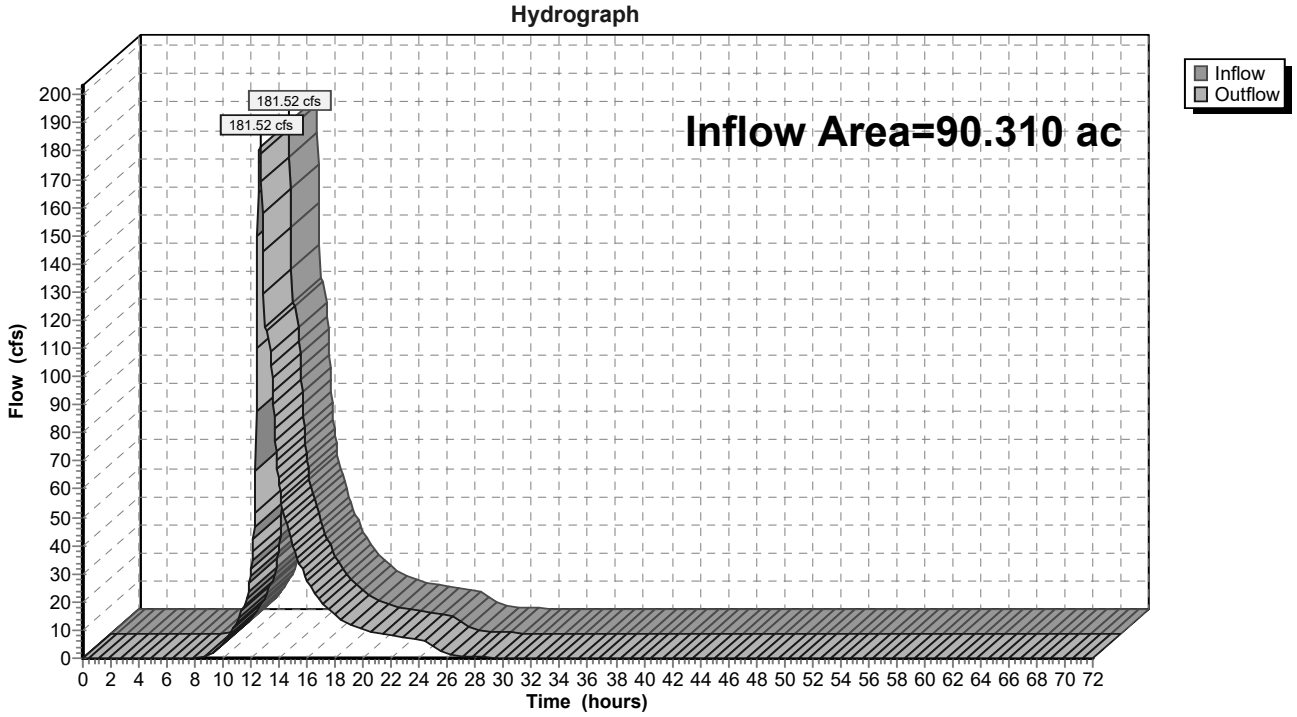


Summary for Reach DP-1:

Inflow Area = 90.310 ac, 6.16% Impervious, Inflow Depth = 4.78" for 100-year event
Inflow = 181.52 cfs @ 12.63 hrs, Volume= 36.009 af
Outflow = 181.52 cfs @ 12.63 hrs, Volume= 36.009 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1P: existing pond

Inflow Area = 90.310 ac, 6.16% Impervious, Inflow Depth = 5.32" for 100-year event
Inflow = 255.47 cfs @ 12.63 hrs, Volume= 40.052 af
Outflow = 181.52 cfs @ 12.63 hrs, Volume= 36.009 af, Atten= 29%, Lag= 0.0 min
Primary = 70.43 cfs @ 12.63 hrs, Volume= 28.429 af
Routed to Reach DP-1 :
Secondary = 111.09 cfs @ 12.63 hrs, Volume= 7.581 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 330.64' @ 12.63 hrs Surf.Area= 65,310 sf Storage= 175,360 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 96.9 min calculated for 35.984 af (90% of inflow)
Center-of-Mass det. time= 49.2 min (897.9 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

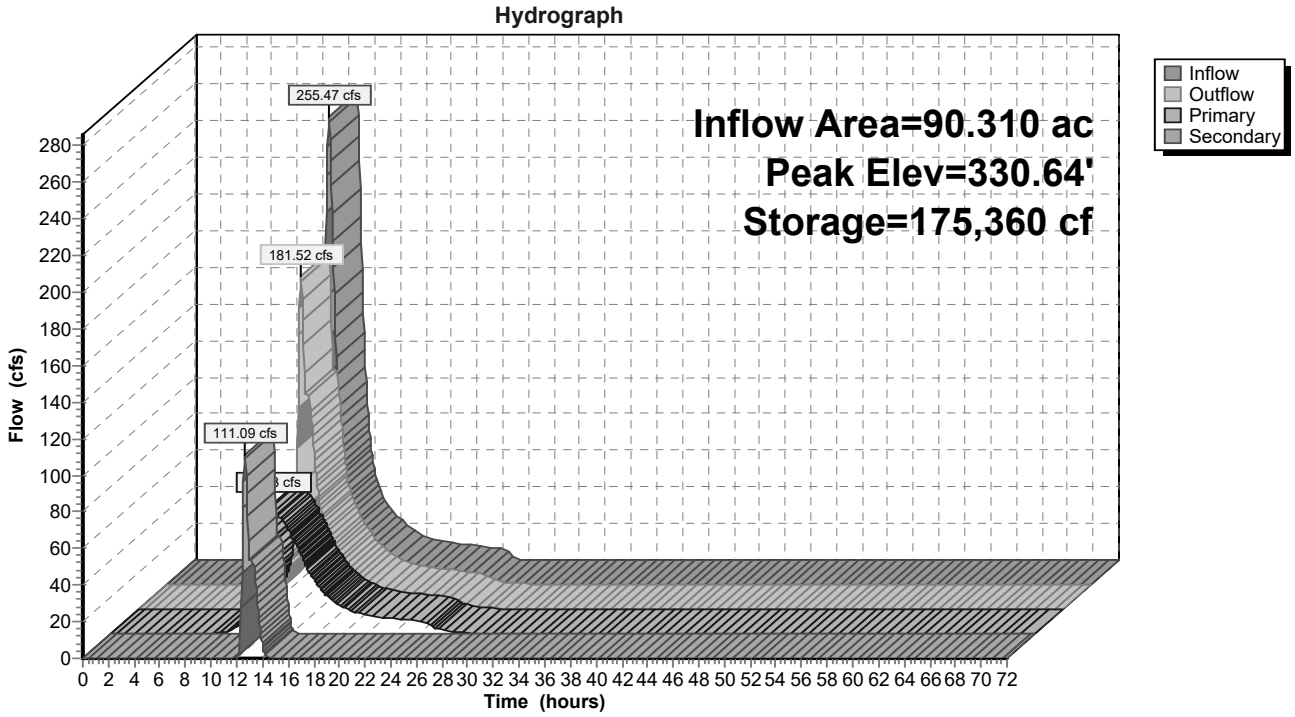
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=70.38 cfs @ 12.63 hrs HW=330.64' (Free Discharge)
└**1=East Pipe** (Inlet Controls 35.19 cfs @ 7.17 fps)
└**2=West Pipe** (Inlet Controls 35.19 cfs @ 7.17 fps)

Secondary OutFlow Max=110.56 cfs @ 12.63 hrs HW=330.64' (Free Discharge)
└**3=Overflow Weir** (Weir Controls 110.56 cfs @ 3.38 fps)

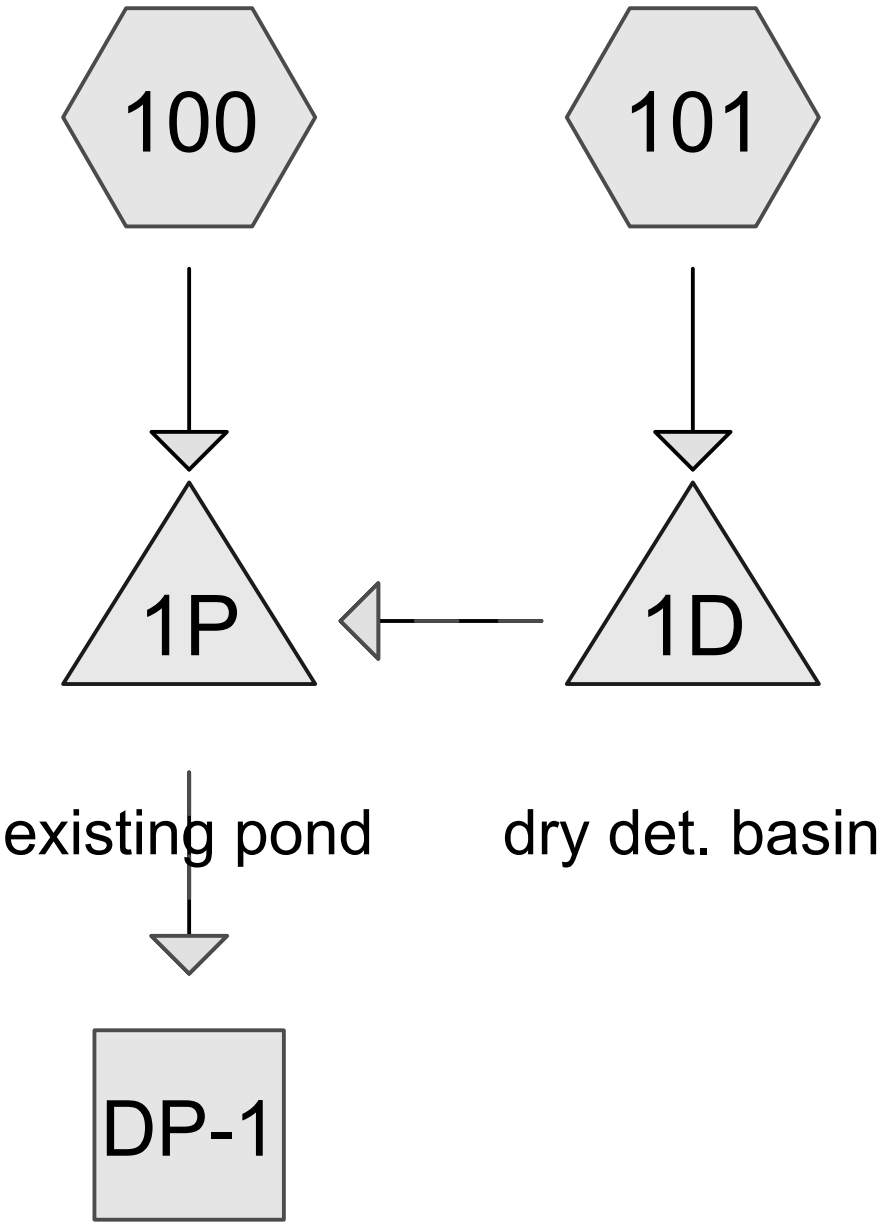
Pond 1P: existing pond



Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Appendix E: Post-Development Stormwater Analysis

LANGAN



Subcat Reach Pond Link

Routing Diagram for 2024-11-19 Highland Solar Proposed
Prepared by Langan Engineering, Printed 11/21/2024

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment100: Runoff Area=84.760 ac 6.60% Impervious Runoff Depth=0.76"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=31.72 cfs 5.383 af

Subcatchment101: Runoff Area=5.680 ac 0.35% Impervious Runoff Depth=0.59"
Flow Length=921' Tc=14.2 min CN=72 Runoff=2.51 cfs 0.278 af

Reach DP-1: Inflow=19.96 cfs 5.642 af
Outflow=19.96 cfs 5.642 af

Pond 1D: dry det. basin Peak Elev=328.95' Storage=4,466 cf Inflow=2.51 cfs 0.278 af
Primary=0.42 cfs 0.275 af Secondary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.275 af

Pond 1P: existing pond Peak Elev=327.51' Storage=54,906 cf Inflow=32.09 cfs 5.658 af
Primary=19.96 cfs 5.642 af Secondary=0.00 cfs 0.000 af Outflow=19.96 cfs 5.642 af

Total Runoff Area = 90.440 ac Runoff Volume = 5.660 af Average Runoff Depth = 0.75"
93.80% Pervious = 84.830 ac 6.20% Impervious = 5.610 ac

Summary for Subcatchment 100:

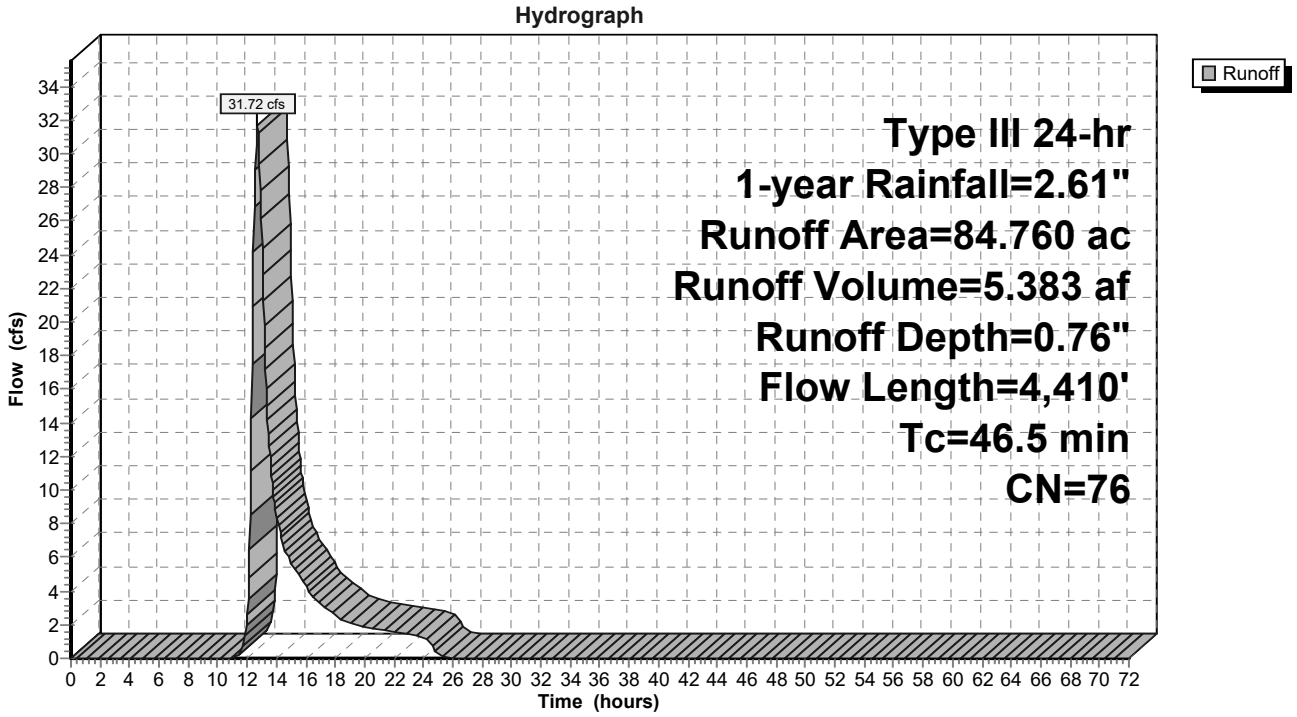
Runoff = 31.72 cfs @ 12.70 hrs, Volume= 5.383 af, Depth= 0.76"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.61"

	Area (ac)	CN	Description
*	20.830	71	Medow, Non Graised, HSG, C (On Site)
*	22.500	71	Medow, Non Graised, HSG, C (Off Site)
*	27.000	78	Medow, Non Graised, HSG, D (On Site)
*	4.950	78	Medow, Non Graised, HSG, D (Off Site)
*	0.825	96	Proposed Laydown area
*	0.430	96	Propsed Gravel Road
*	0.500	96	Existing Road
*	0.740	98	Existing Buildings
*	1.560	98	Existing Paved Parking & Road
	0.165	89	Dirt roads, HSG D
	0.000	87	Dirt roads, HSG C
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fairm HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.190	98	Water Surface, HSG D
*	0.020	98	concrete pads
*	1.080	98	Water surface, HSG C
	84.760	76	Weighted Average
	79.170		93.40% Pervious Area
	5.590		6.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 100:



Summary for Subcatchment 101:

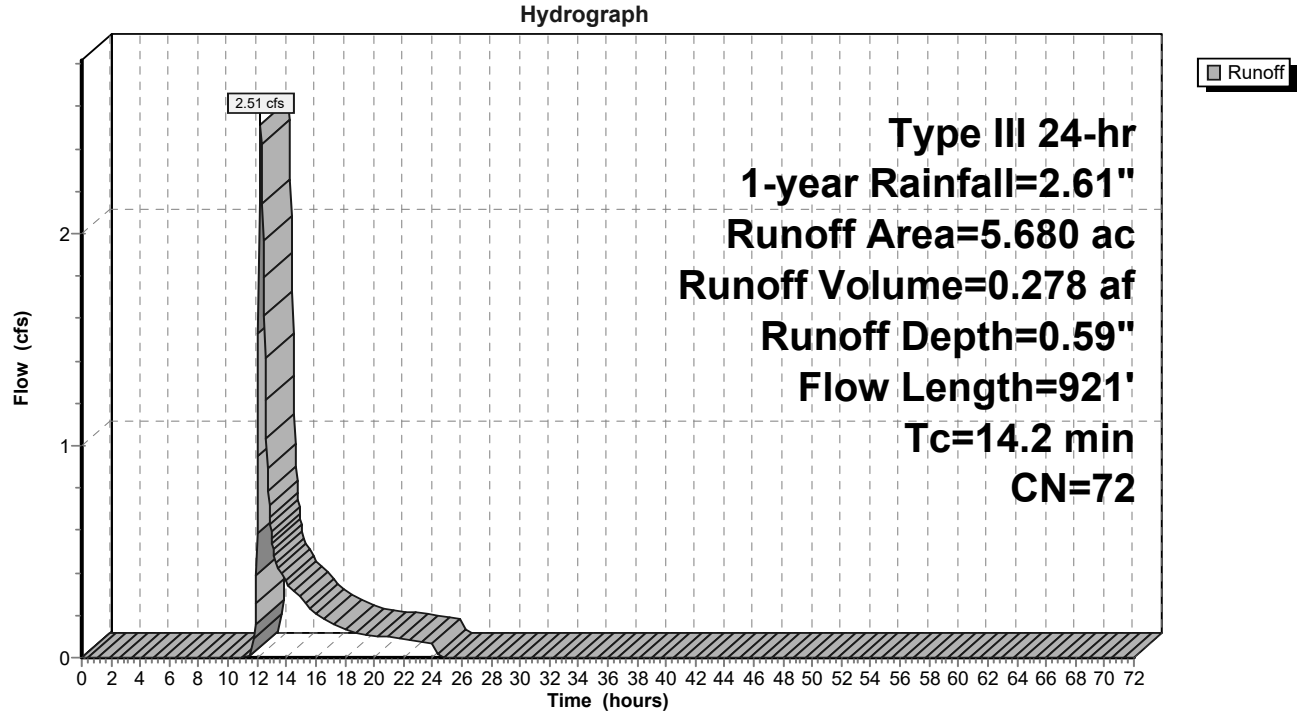
Runoff = 2.51 cfs @ 12.23 hrs, Volume= 0.278 af, Depth= 0.59"
Routed to Pond 1D : dry det. basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.61"

	Area (ac)	CN	Description
	5.490	71	Meadow, non-grazed, HSG C
*	0.170	96	Propsed Gravel Road
*	0.020	98	concrete pads
	5.680	72	Weighted Average
	5.660		99.65% Pervious Area
	0.020		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
4.0	620	0.1370	2.59		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.7	201	0.0320	1.25		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
14.2	921	Total			

Subcatchment 101:

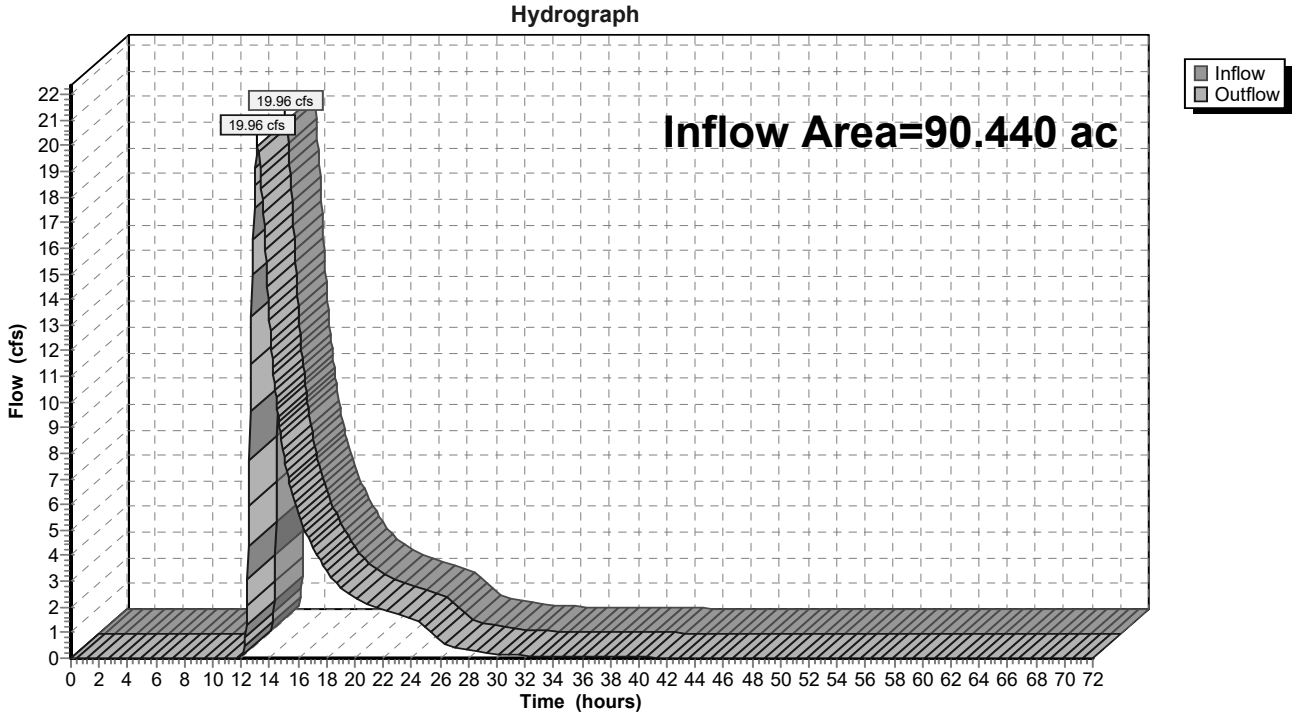


Summary for Reach DP-1:

Inflow Area = 90.440 ac, 6.20% Impervious, Inflow Depth > 0.75" for 1-year event
Inflow = 19.96 cfs @ 13.16 hrs, Volume= 5.642 af
Outflow = 19.96 cfs @ 13.16 hrs, Volume= 5.642 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1D: dry det. basin

Inflow Area = 5.680 ac, 0.35% Impervious, Inflow Depth = 0.59" for 1-year event
Inflow = 2.51 cfs @ 12.23 hrs, Volume= 0.278 af
Outflow = 0.42 cfs @ 13.47 hrs, Volume= 0.275 af, Atten= 83%, Lag= 74.7 min
Primary = 0.42 cfs @ 13.47 hrs, Volume= 0.275 af
Routed to Pond 1P : existing pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : existing pond

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 328.95' @ 13.47 hrs Surf.Area= 10,216 sf Storage= 4,466 cf
Flood Elev= 332.00' Surf.Area= 13,985 sf Storage= 41,272 cf

Plug-Flow detention time= 253.9 min calculated for 0.275 af (99% of inflow)
Center-of-Mass det. time= 249.0 min (1,140.8 - 891.8)

Volume	Invert	Avail.Storage	Storage Description
#1	328.50'	41,272 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

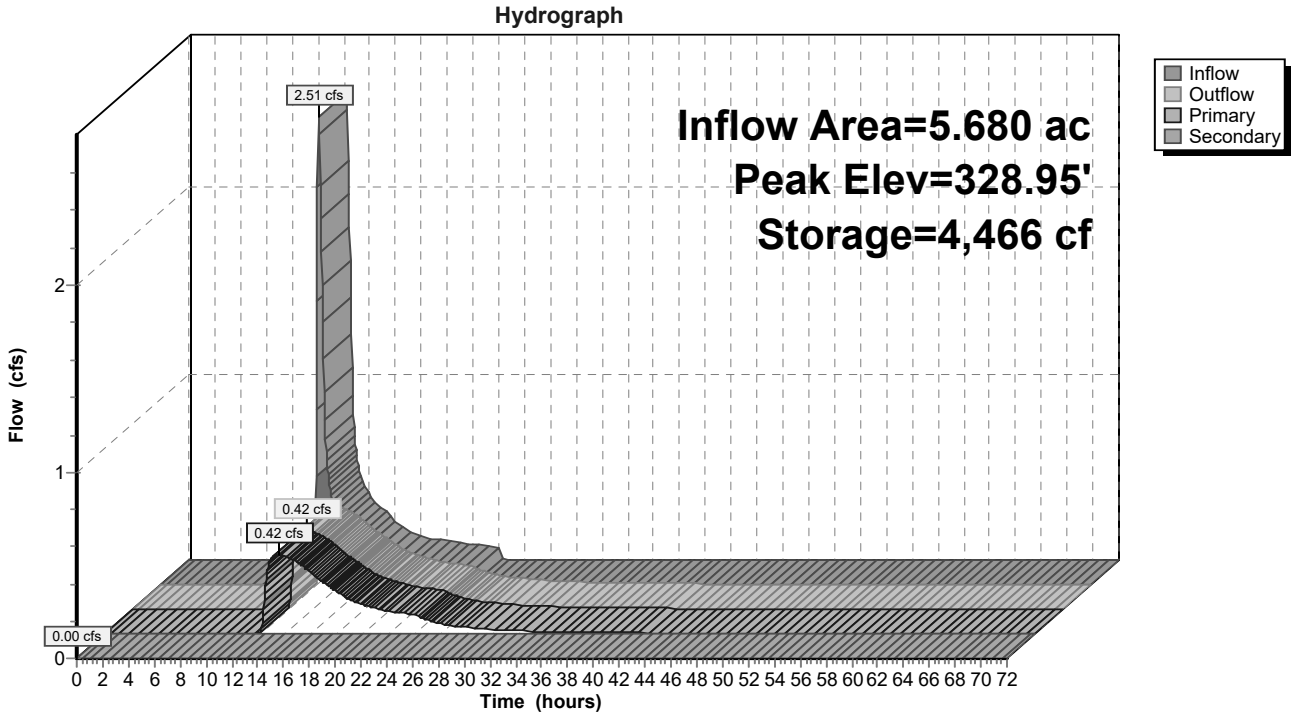
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
328.50	9,706	0	0
329.00	10,275	4,995	4,995
330.00	11,455	10,865	15,860
331.00	12,692	12,074	27,934
332.00	13,985	13,339	41,272

Device	Routing	Invert	Outlet Devices
#1	Primary	328.50'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 328.50' / 328.30' S= 0.0087 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	328.50'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	330.50'	**48.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	331.00'	**162.0 deg x 15.0' long x 1.00' rise overflow weir** Cv= 2.47 (C= 3.09)

Primary OutFlow Max=0.42 cfs @ 13.47 hrs HW=328.95' (Free Discharge)
└**1=Culvert** (Passes 0.42 cfs of 0.65 cfs potential flow)
├**2=Orifice** (Orifice Controls 0.42 cfs @ 2.28 fps)
└**3=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=328.50' (Free Discharge)
└**4=overflow weir** (Controls 0.00 cfs)

Pond 1D: dry det. basin



Summary for Pond 1P: existing pond

Inflow Area = 90.440 ac, 6.20% Impervious, Inflow Depth = 0.75" for 1-year event
Inflow = 32.09 cfs @ 12.70 hrs, Volume= 5.658 af
Outflow = 19.96 cfs @ 13.16 hrs, Volume= 5.642 af, Atten= 38%, Lag= 27.6 min
Primary = 19.96 cfs @ 13.16 hrs, Volume= 5.642 af
Routed to Reach DP-1 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 327.51' @ 13.16 hrs Surf.Area= 36,895 sf Storage= 54,906 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 90.6 min calculated for 5.642 af (100% of inflow)
Center-of-Mass det. time= 86.1 min (1,003.5 - 917.4)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

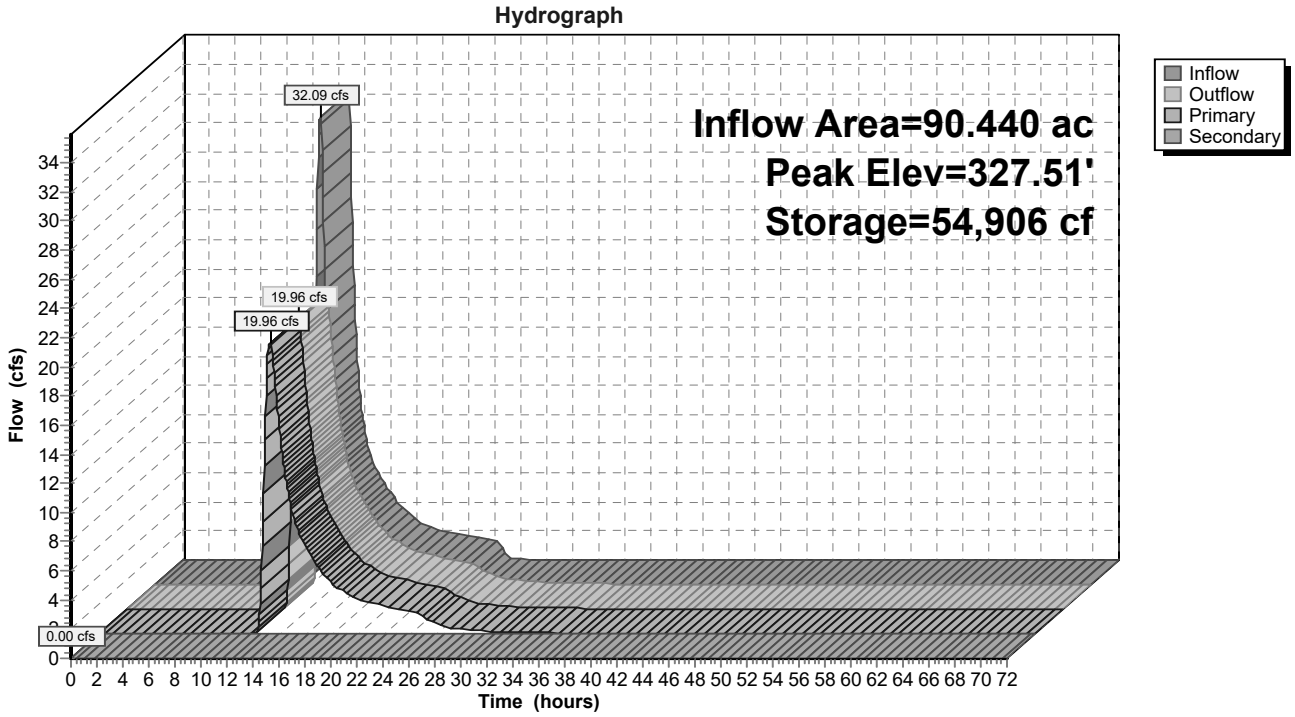
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=19.95 cfs @ 13.16 hrs HW=327.51' (Free Discharge)
└**1=East Pipe** (Barrel Controls 10.38 cfs @ 4.17 fps)
└**2=West Pipe** (Barrel Controls 9.57 cfs @ 3.85 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=325.83' (Free Discharge)
└**3=Overflow Weir** (Controls 0.00 cfs)

Pond 1P: existing pond



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment100: Runoff Area=84.760 ac 6.60% Impervious Runoff Depth=2.27"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=101.89 cfs 16.007 af

Subcatchment101: Runoff Area=5.680 ac 0.35% Impervious Runoff Depth=1.95"
Flow Length=921' Tc=14.2 min CN=72 Runoff=9.78 cfs 0.922 af

Reach DP-1: Inflow=78.66 cfs 16.907 af
Outflow=78.66 cfs 16.907 af

Pond 1D: dry det. basin Peak Elev=330.24' Storage=18,677 cf Inflow=9.78 cfs 0.922 af
Primary=1.16 cfs 0.919 af Secondary=0.00 cfs 0.000 af Outflow=1.16 cfs 0.919 af

Pond 1P: existing pond Peak Elev=329.53' Storage=146,351 cf Inflow=102.99 cfs 16.926 af
Primary=58.38 cfs 16.107 af Secondary=20.29 cfs 0.801 af Outflow=78.66 cfs 16.907 af

Total Runoff Area = 90.440 ac Runoff Volume = 16.929 af Average Runoff Depth = 2.25"
93.80% Pervious = 84.830 ac 6.20% Impervious = 5.610 ac

Summary for Subcatchment 100:

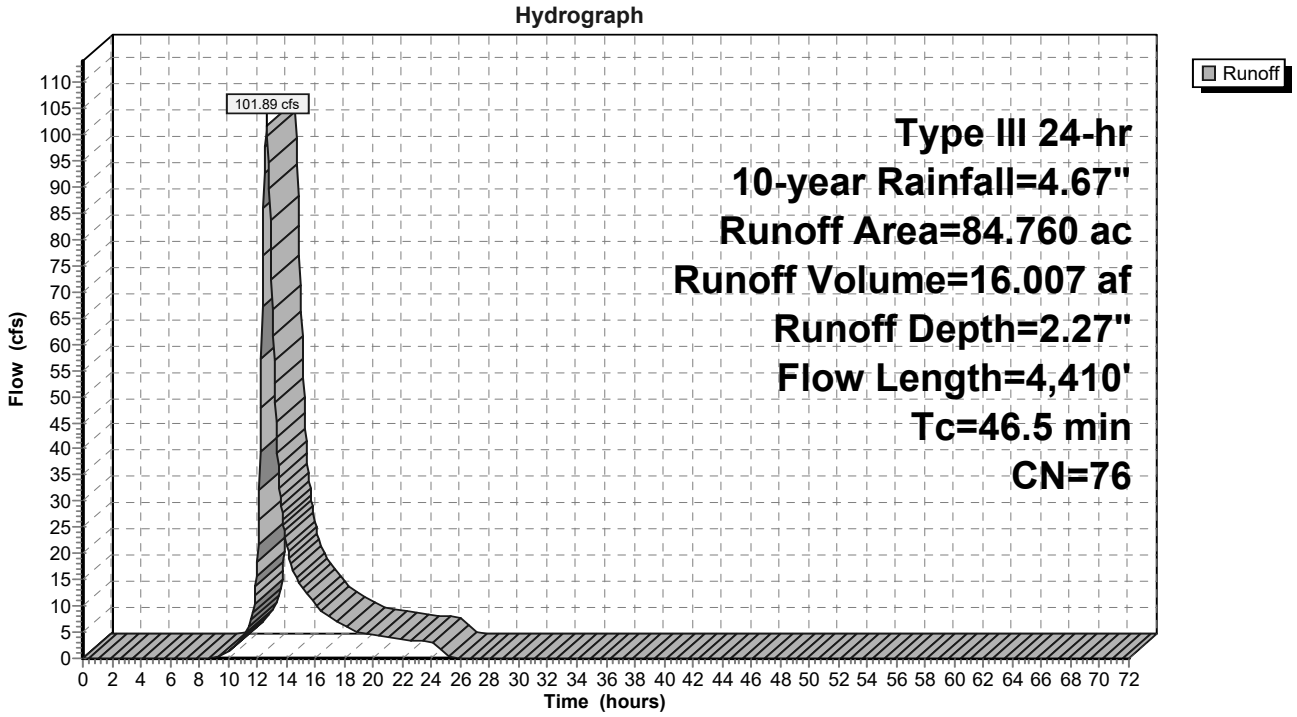
Runoff = 101.89 cfs @ 12.65 hrs, Volume= 16.007 af, Depth= 2.27"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

	Area (ac)	CN	Description
*	20.830	71	Medow, Non Graised, HSG, C (On Site)
*	22.500	71	Medow, Non Graised, HSG, C (Off Site)
*	27.000	78	Medow, Non Graised, HSG, D (On Site)
*	4.950	78	Medow, Non Graised, HSG, D (Off Site)
*	0.825	96	Proposed Laydown area
*	0.430	96	Propsed Gravel Road
*	0.500	96	Existing Road
*	0.740	98	Existing Buildings
*	1.560	98	Existing Paved Parking & Road
	0.165	89	Dirt roads, HSG D
	0.000	87	Dirt roads, HSG C
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fairm HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.190	98	Water Surface, HSG D
*	0.020	98	concrete pads
*	1.080	98	Water surface, HSG C
	84.760	76	Weighted Average
	79.170		93.40% Pervious Area
	5.590		6.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 100:



Summary for Subcatchment 101:

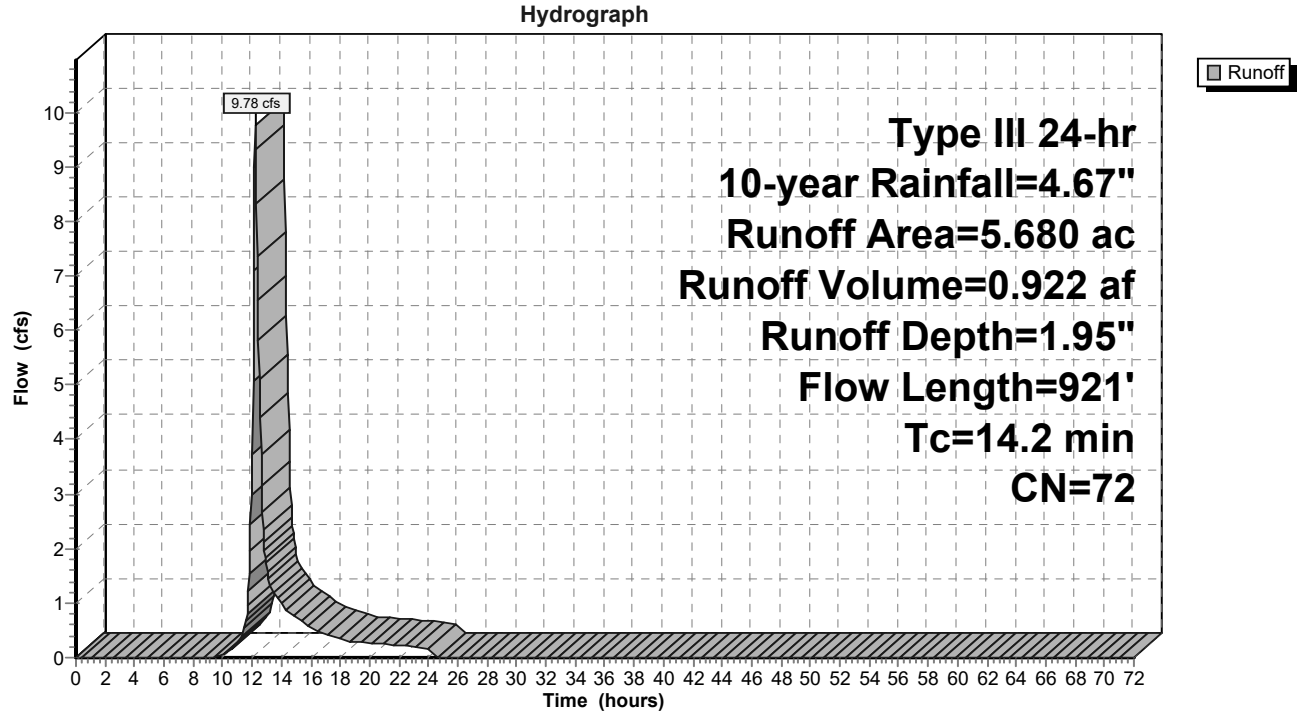
Runoff = 9.78 cfs @ 12.21 hrs, Volume= 0.922 af, Depth= 1.95"
Routed to Pond 1D : dry det. basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

	Area (ac)	CN	Description
	5.490	71	Meadow, non-grazed, HSG C
*	0.170	96	Propsed Gravel Road
*	0.020	98	concrete pads
	5.680	72	Weighted Average
	5.660		99.65% Pervious Area
	0.020		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
4.0	620	0.1370	2.59		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.7	201	0.0320	1.25		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
14.2	921	Total			

Subcatchment 101:

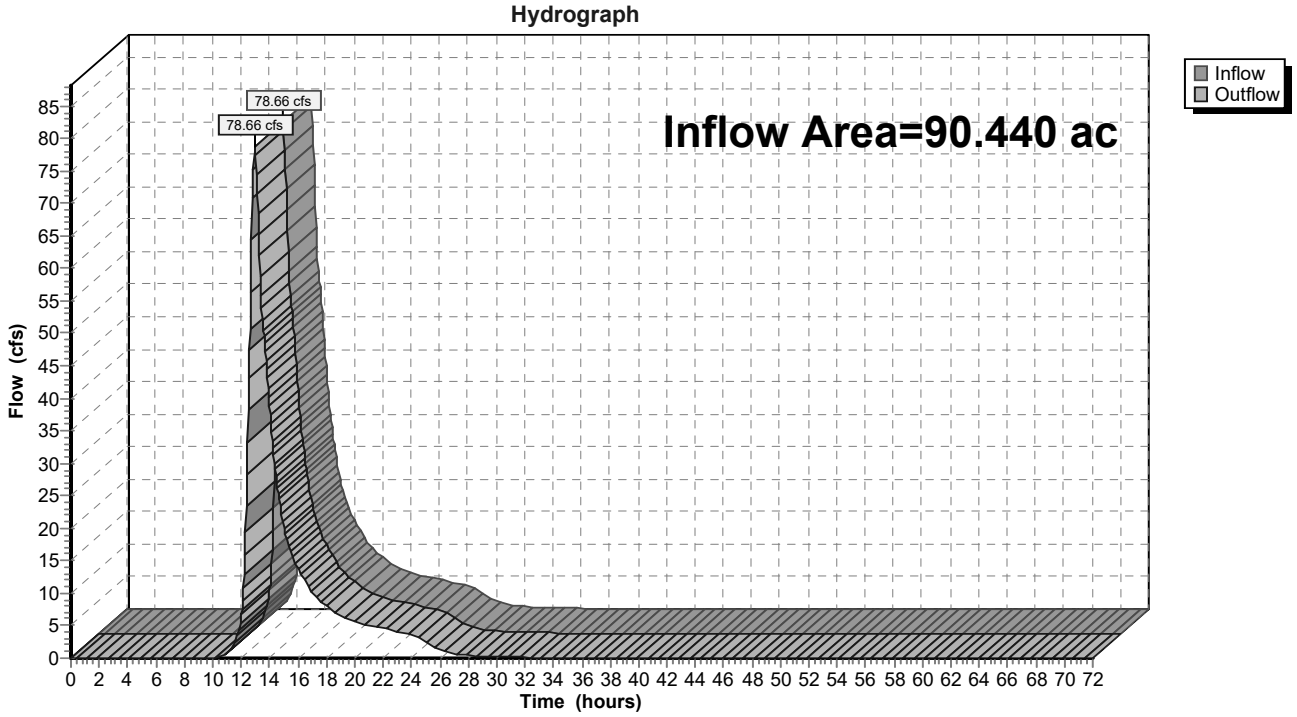


Summary for Reach DP-1:

Inflow Area = 90.440 ac, 6.20% Impervious, Inflow Depth = 2.24" for 10-year event
Inflow = 78.66 cfs @ 12.96 hrs, Volume= 16.907 af
Outflow = 78.66 cfs @ 12.96 hrs, Volume= 16.907 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1D: dry det. basin

Inflow Area = 5.680 ac, 0.35% Impervious, Inflow Depth = 1.95" for 10-year event
Inflow = 9.78 cfs @ 12.21 hrs, Volume= 0.922 af
Outflow = 1.16 cfs @ 13.56 hrs, Volume= 0.919 af, Atten= 88%, Lag= 81.1 min
Primary = 1.16 cfs @ 13.56 hrs, Volume= 0.919 af
Routed to Pond 1P : existing pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : existing pond

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 330.24' @ 13.56 hrs Surf.Area= 11,755 sf Storage= 18,677 cf
Flood Elev= 332.00' Surf.Area= 13,985 sf Storage= 41,272 cf

Plug-Flow detention time= 241.6 min calculated for 0.919 af (100% of inflow)
Center-of-Mass det. time= 239.8 min (1,093.5 - 853.7)

Volume	Invert	Avail.Storage	Storage Description
#1	328.50'	41,272 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

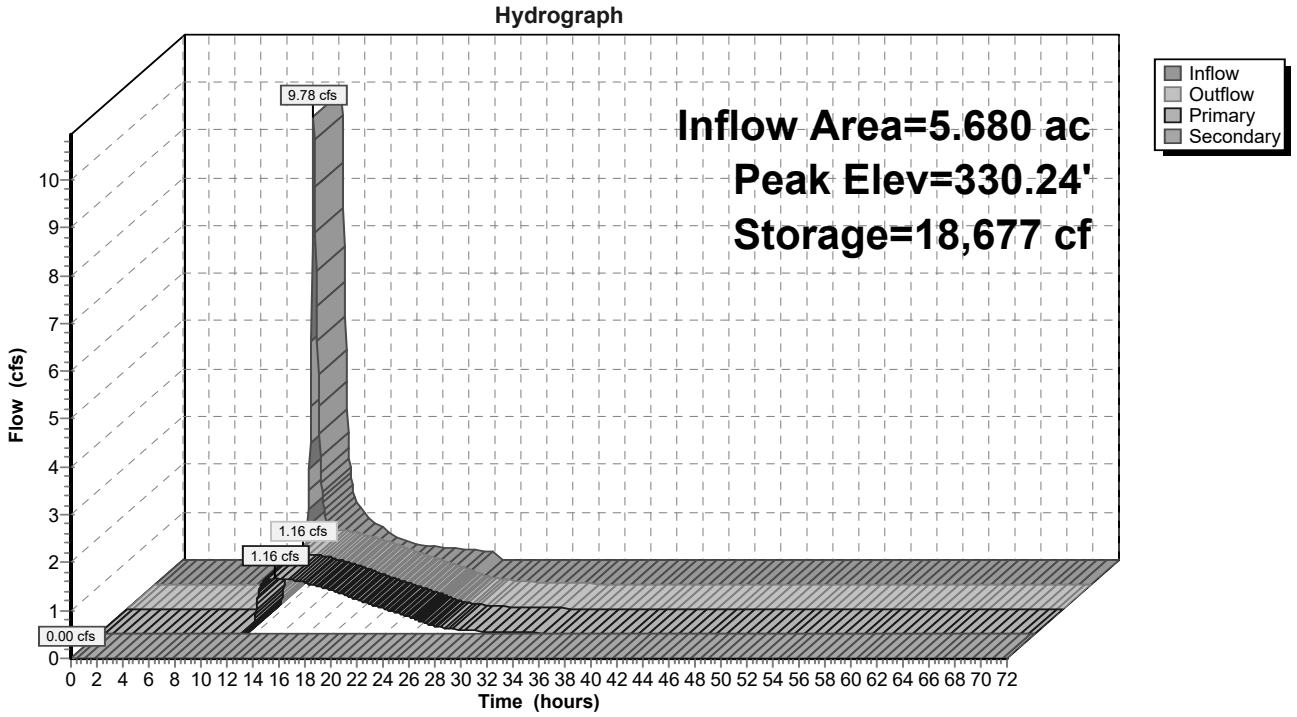
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
328.50	9,706	0	0
329.00	10,275	4,995	4,995
330.00	11,455	10,865	15,860
331.00	12,692	12,074	27,934
332.00	13,985	13,339	41,272

Device	Routing	Invert	Outlet Devices
#1	Primary	328.50'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 328.50' / 328.30' S= 0.0087 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	328.50'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	330.50'	**48.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	331.00'	**162.0 deg x 15.0' long x 1.00' rise overflow weir** Cv= 2.47 (C= 3.09)

Primary OutFlow Max=1.16 cfs @ 13.56 hrs HW=330.24' (Free Discharge)
└**1=Culvert** (Passes 1.16 cfs of 4.11 cfs potential flow)
├**2=Orifice** (Orifice Controls 1.16 cfs @ 5.88 fps)
└**3=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=328.50' (Free Discharge)
└**4=overflow weir** (Controls 0.00 cfs)

Pond 1D: dry det. basin



Summary for Pond 1P: existing pond

Inflow Area = 90.440 ac, 6.20% Impervious, Inflow Depth = 2.25" for 10-year event
Inflow = 102.99 cfs @ 12.65 hrs, Volume= 16.926 af
Outflow = 78.66 cfs @ 12.96 hrs, Volume= 16.907 af, Atten= 24%, Lag= 18.1 min
Primary = 58.38 cfs @ 12.96 hrs, Volume= 16.107 af
Routed to Reach DP-1 :
Secondary = 20.29 cfs @ 12.96 hrs, Volume= 0.801 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 329.53' @ 12.96 hrs Surf.Area= 57,351 sf Storage= 146,351 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 54.8 min calculated for 16.896 af (100% of inflow)
Center-of-Mass det. time= 54.4 min (939.4 - 885.1)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

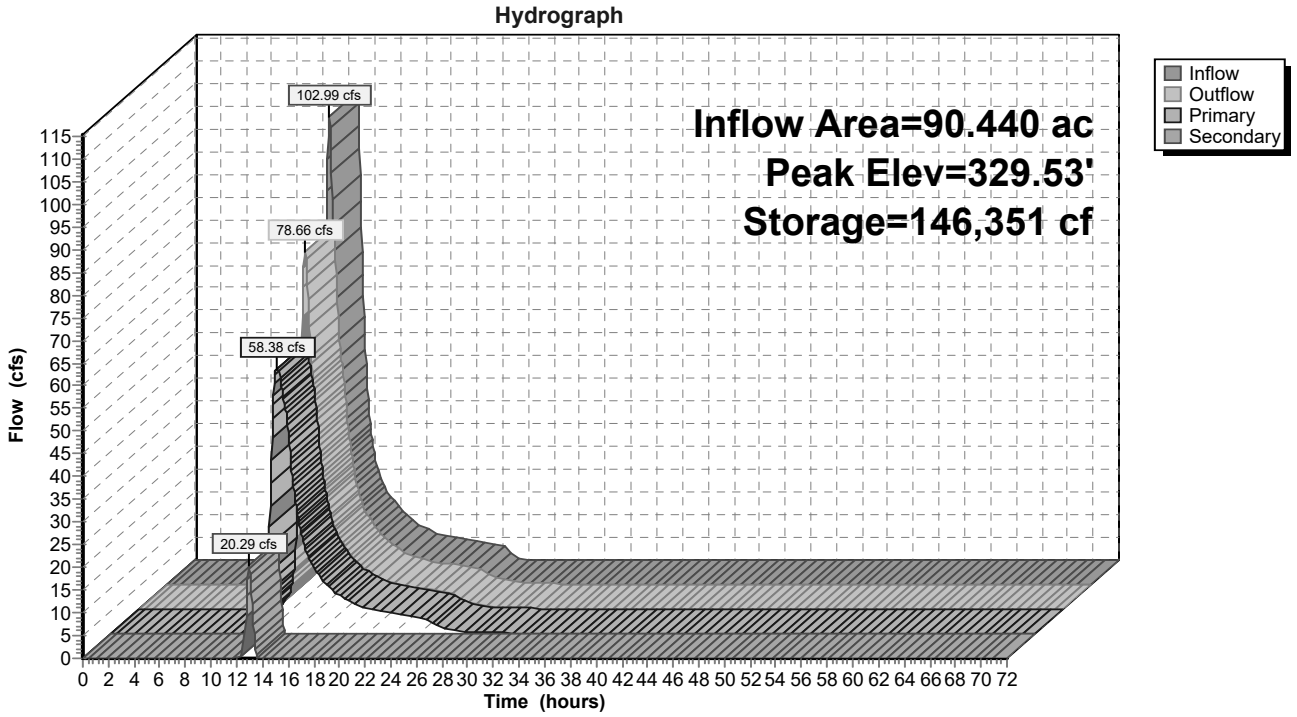
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=58.37 cfs @ 12.96 hrs HW=329.53' (Free Discharge)
└**1=East Pipe** (Inlet Controls 29.18 cfs @ 5.95 fps)
└**2=West Pipe** (Inlet Controls 29.18 cfs @ 5.95 fps)

Secondary OutFlow Max=20.21 cfs @ 12.96 hrs HW=329.53' (Free Discharge)
└**3=Overflow Weir** (Weir Controls 20.21 cfs @ 1.92 fps)

Pond 1P: existing pond



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment100: Runoff Area=84.760 ac 6.60% Impervious Runoff Depth=5.32"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=239.77 cfs 37.591 af

Subcatchment101: Runoff Area=5.680 ac 0.35% Impervious Runoff Depth=4.85"
Flow Length=921' Tc=14.2 min CN=72 Runoff=24.82 cfs 2.297 af

Reach DP-1: Inflow=163.63 cfs 35.460 af
Outflow=163.63 cfs 35.460 af

Pond 1D: dry det. basin Peak Elev=331.34' Storage=32,388 cf Inflow=24.82 cfs 2.297 af
Primary=5.79 cfs 1.996 af Secondary=10.48 cfs 0.298 af Outflow=16.27 cfs 2.294 af

Pond 1P: existing pond Peak Elev=330.47' Storage=175,360 cf Inflow=250.13 cfs 39.885 af
Primary=68.72 cfs 28.557 af Secondary=94.90 cfs 6.903 af Outflow=163.63 cfs 35.460 af

Total Runoff Area = 90.440 ac Runoff Volume = 39.888 af Average Runoff Depth = 5.29"
93.80% Pervious = 84.830 ac 6.20% Impervious = 5.610 ac

Summary for Subcatchment 100:

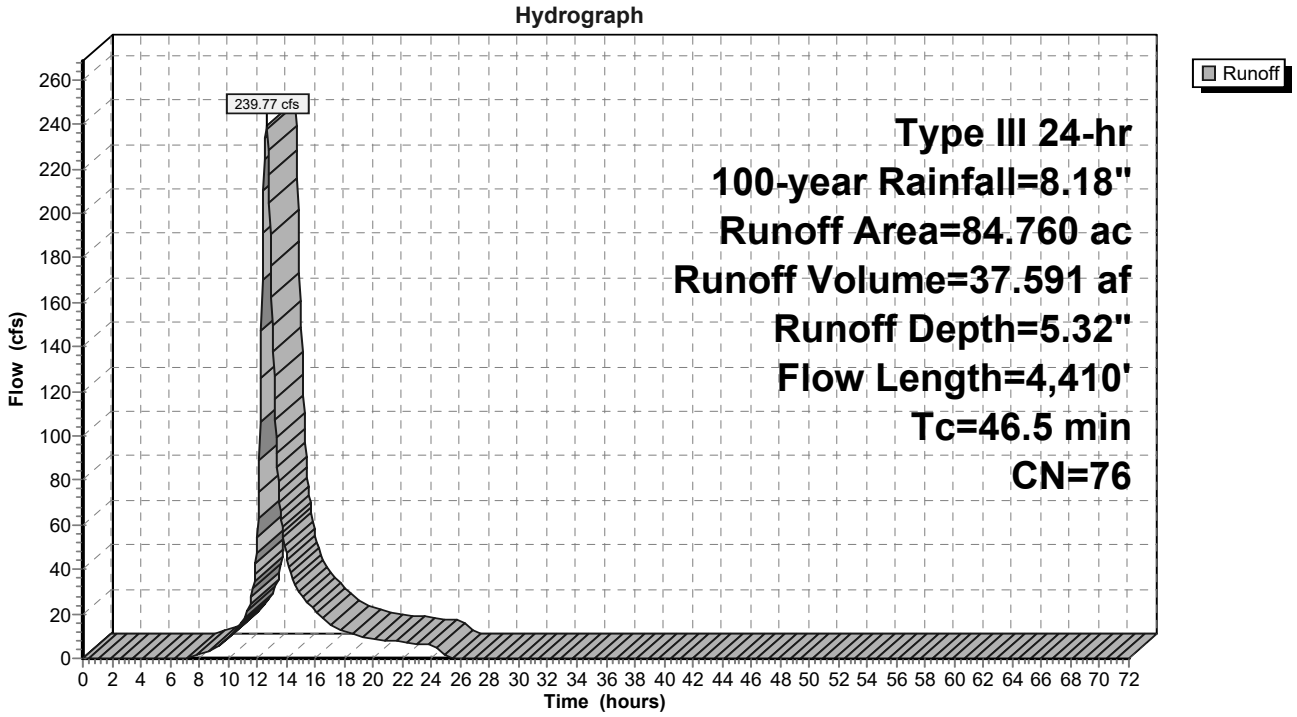
Runoff = 239.77 cfs @ 12.63 hrs, Volume= 37.591 af, Depth= 5.32"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.18"

	Area (ac)	CN	Description
*	20.830	71	Medow, Non Graised, HSG, C (On Site)
*	22.500	71	Medow, Non Graised, HSG, C (Off Site)
*	27.000	78	Medow, Non Graised, HSG, D (On Site)
*	4.950	78	Medow, Non Graised, HSG, D (Off Site)
*	0.825	96	Proposed Laydown area
*	0.430	96	Propsed Gravel Road
*	0.500	96	Existing Road
*	0.740	98	Existing Buildings
*	1.560	98	Existing Paved Parking & Road
	0.165	89	Dirt roads, HSG D
	0.000	87	Dirt roads, HSG C
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fairm HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.190	98	Water Surface, HSG D
*	0.020	98	concrete pads
*	1.080	98	Water surface, HSG C
	84.760	76	Weighted Average
	79.170		93.40% Pervious Area
	5.590		6.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 100:



Summary for Subcatchment 101:

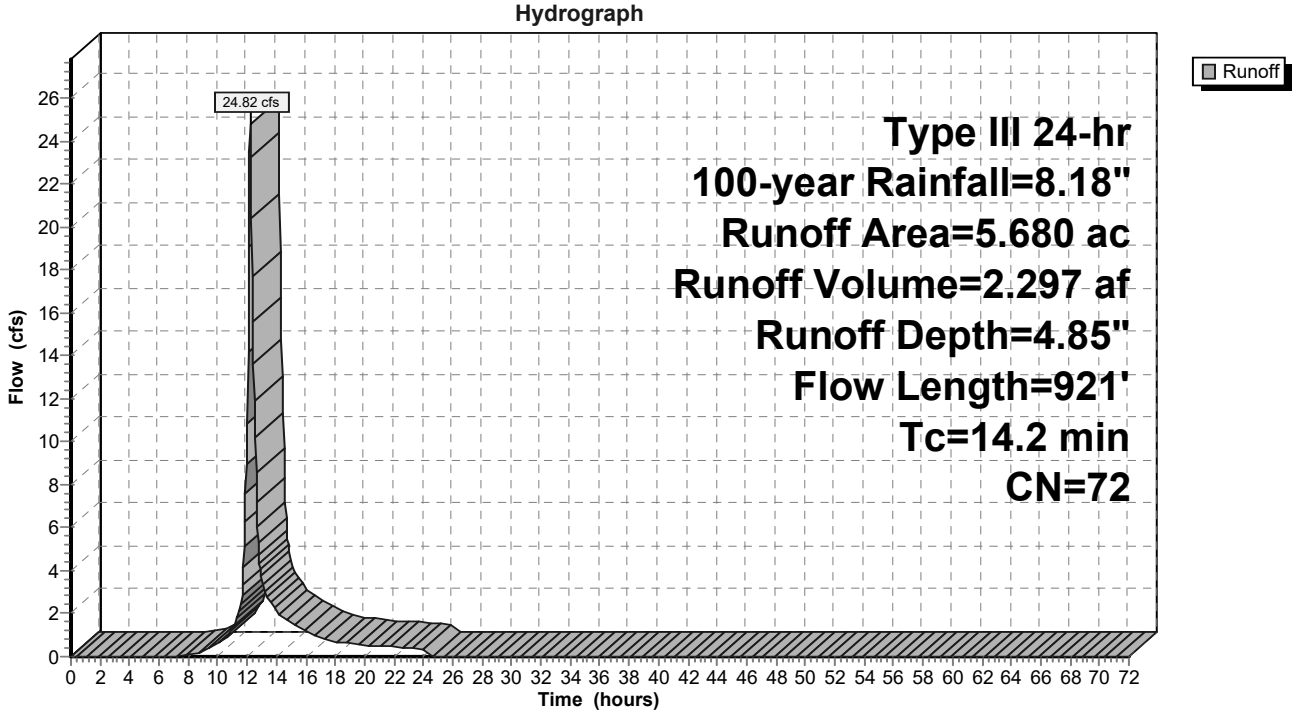
Runoff = 24.82 cfs @ 12.20 hrs, Volume= 2.297 af, Depth= 4.85"
Routed to Pond 1D : dry det. basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.18"

	Area (ac)	CN	Description
	5.490	71	Meadow, non-grazed, HSG C
*	0.170	96	Propsed Gravel Road
*	0.020	98	concrete pads
	5.680	72	Weighted Average
	5.660		99.65% Pervious Area
	0.020		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
4.0	620	0.1370	2.59		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.7	201	0.0320	1.25		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
14.2	921	Total			

Subcatchment 101:

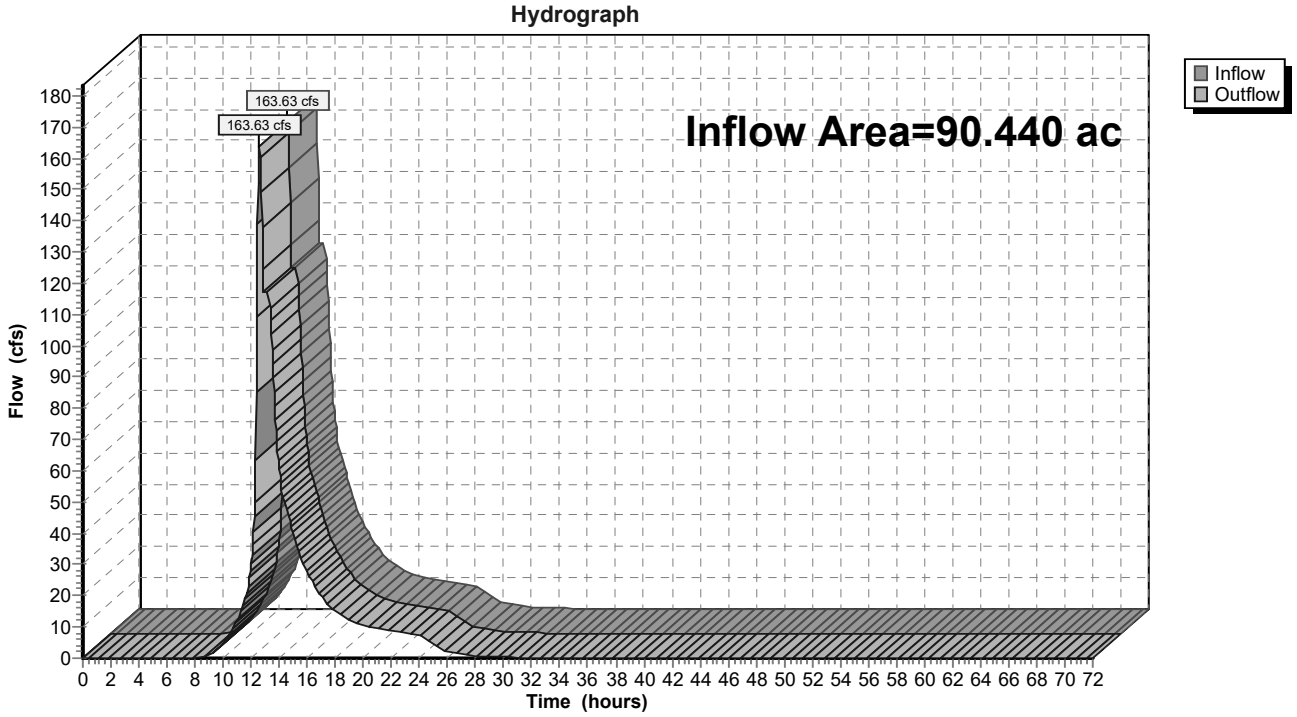


Summary for Reach DP-1:

Inflow Area = 90.440 ac, 6.20% Impervious, Inflow Depth = 4.71" for 100-year event
Inflow = 163.63 cfs @ 12.62 hrs, Volume= 35.460 af
Outflow = 163.63 cfs @ 12.62 hrs, Volume= 35.460 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1D: dry det. basin

Inflow Area = 5.680 ac, 0.35% Impervious, Inflow Depth = 4.85" for 100-year event
Inflow = 24.82 cfs @ 12.20 hrs, Volume= 2.297 af
Outflow = 16.27 cfs @ 12.39 hrs, Volume= 2.294 af, Atten= 34%, Lag= 11.6 min
Primary = 5.79 cfs @ 12.39 hrs, Volume= 1.996 af
Routed to Pond 1P : existing pond
Secondary = 10.48 cfs @ 12.39 hrs, Volume= 0.298 af
Routed to Pond 1P : existing pond

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 331.34' @ 12.39 hrs Surf.Area= 13,138 sf Storage= 32,388 cf
Flood Elev= 332.00' Surf.Area= 13,985 sf Storage= 41,272 cf

Plug-Flow detention time= 162.2 min calculated for 2.292 af (100% of inflow)
Center-of-Mass det. time= 163.0 min (990.3 - 827.2)

Volume	Invert	Avail.Storage	Storage Description
#1	328.50'	41,272 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

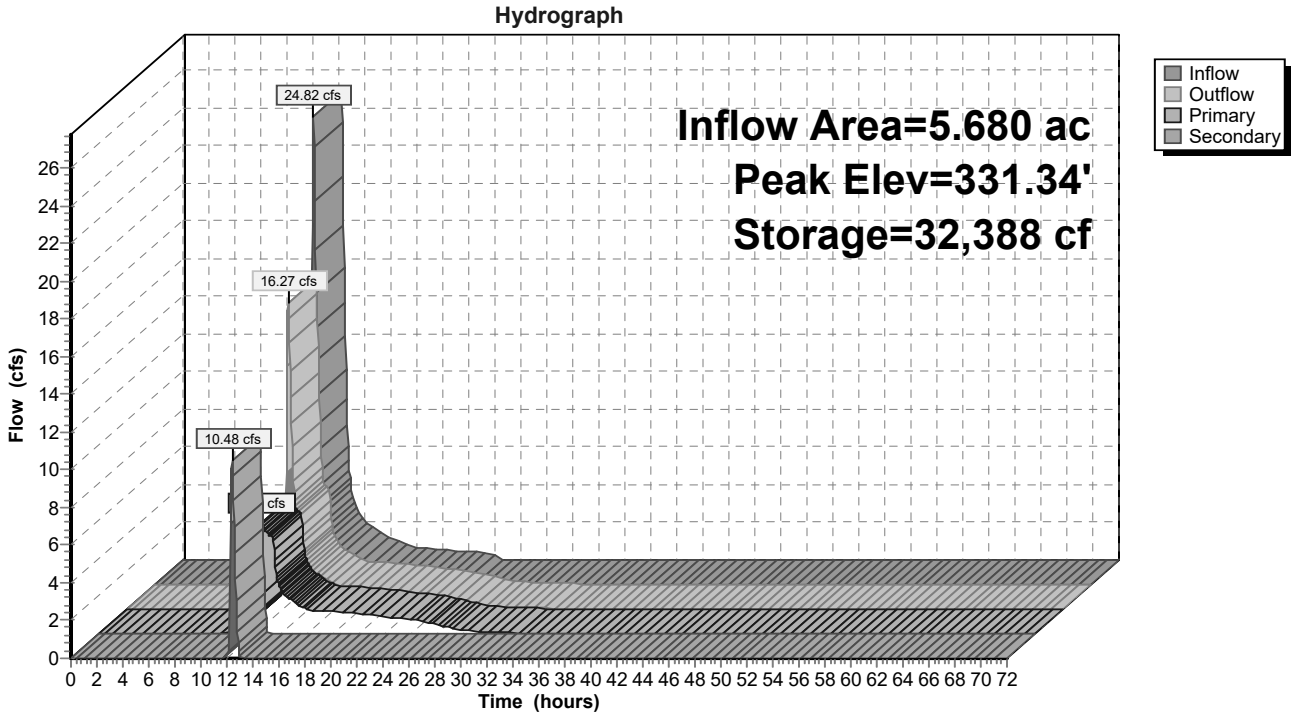
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
328.50	9,706	0	0
329.00	10,275	4,995	4,995
330.00	11,455	10,865	15,860
331.00	12,692	12,074	27,934
332.00	13,985	13,339	41,272

Device	Routing	Invert	Outlet Devices
#1	Primary	328.50'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 328.50' / 328.30' S= 0.0087 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	328.50'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	330.50'	**48.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	331.00'	**162.0 deg x 15.0' long x 1.00' rise overflow weir** Cv= 2.47 (C= 3.09)

Primary OutFlow Max=5.79 cfs @ 12.39 hrs HW=331.34' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.79 cfs @ 7.37 fps)
├**2=Orifice** (Passes < 1.52 cfs potential flow)
└**3=Grate** (Passes < 32.91 cfs potential flow)

Secondary OutFlow Max=10.38 cfs @ 12.39 hrs HW=331.34' (Free Discharge)
└**4=overflow weir** (Weir Controls 10.38 cfs @ 1.76 fps)

Pond 1D: dry det. basin



Summary for Pond 1P: existing pond

Inflow Area = 90.440 ac, 6.20% Impervious, Inflow Depth = 5.29" for 100-year event
Inflow = 250.13 cfs @ 12.62 hrs, Volume= 39.885 af
Outflow = 163.63 cfs @ 12.62 hrs, Volume= 35.460 af, Atten= 35%, Lag= 0.0 min
Primary = 68.72 cfs @ 12.62 hrs, Volume= 28.557 af
Routed to Reach DP-1 :
Secondary = 94.90 cfs @ 12.62 hrs, Volume= 6.903 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 330.47' @ 12.62 hrs Surf.Area= 65,310 sf Storage= 175,360 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 106.6 min calculated for 35.436 af (89% of inflow)
Center-of-Mass det. time= 52.5 min (909.2 - 856.8)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

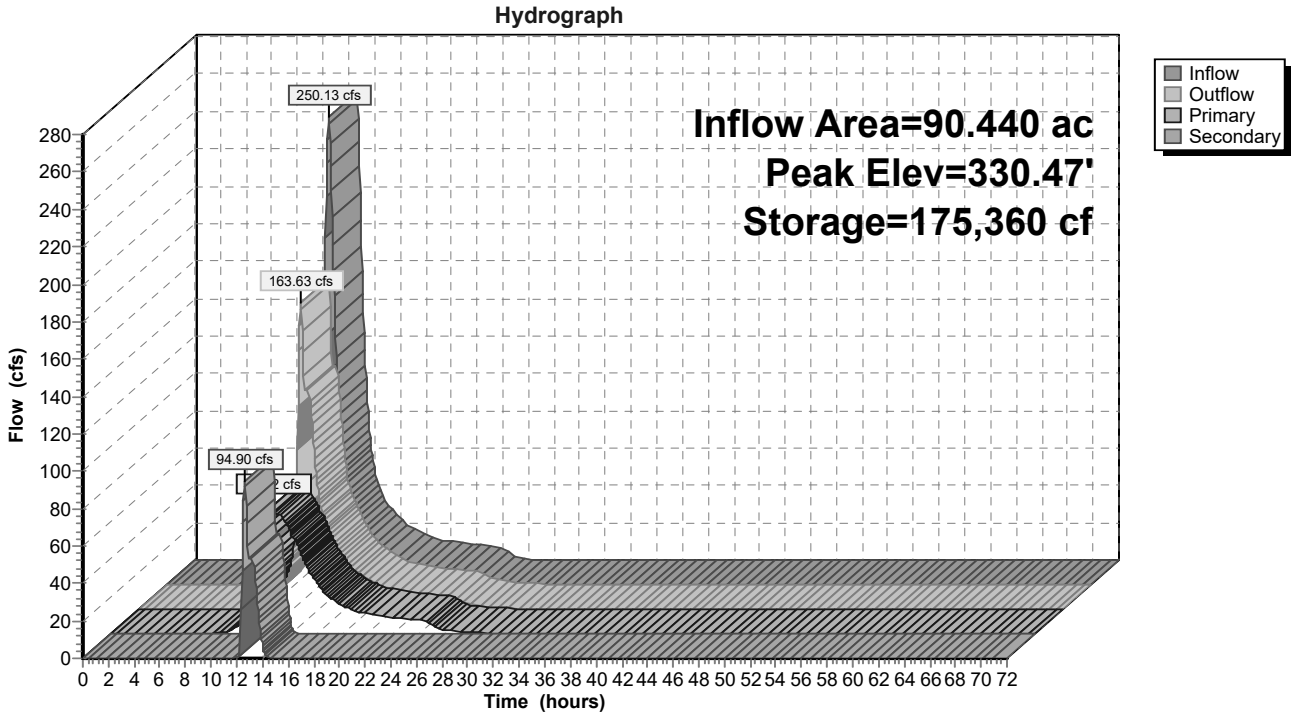
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

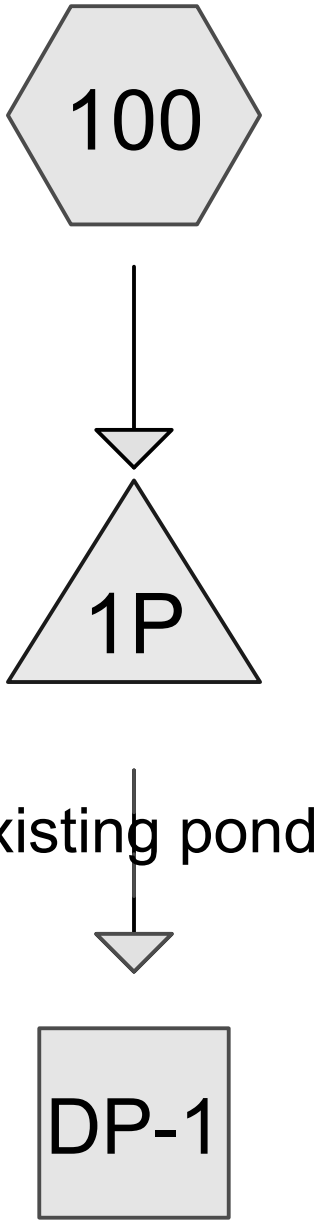
Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=68.68 cfs @ 12.62 hrs HW=330.47' (Free Discharge)
└**1=East Pipe** (Inlet Controls 34.34 cfs @ 7.00 fps)
└**2=West Pipe** (Inlet Controls 34.34 cfs @ 7.00 fps)

Secondary OutFlow Max=94.54 cfs @ 12.62 hrs HW=330.47' (Free Discharge)
└**3=Overflow Weir** (Weir Controls 94.54 cfs @ 3.22 fps)

Pond 1P: existing pond





Subcat Reach Pond Link

Routing Diagram for 2024-11-20 Highland Solar Proposed w.o basin
Prepared by Langan Engineering, Printed 11/21/2024

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment100: Runoff Area=90.250 ac 6.19% Impervious Runoff Depth=0.76"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=33.77 cfs 5.731 af

Reach DP-1: Inflow=21.12 cfs 5.719 af
Outflow=21.12 cfs 5.719 af

Pond 1P: existing pond Peak Elev=327.57' Storage=57,017 cf Inflow=33.77 cfs 5.731 af
Primary=21.12 cfs 5.719 af Secondary=0.00 cfs 0.000 af Outflow=21.12 cfs 5.719 af

Total Runoff Area = 90.250 ac Runoff Volume = 5.731 af Average Runoff Depth = 0.76"
93.81% Pervious = 84.660 ac 6.19% Impervious = 5.590 ac

Summary for Subcatchment 100:

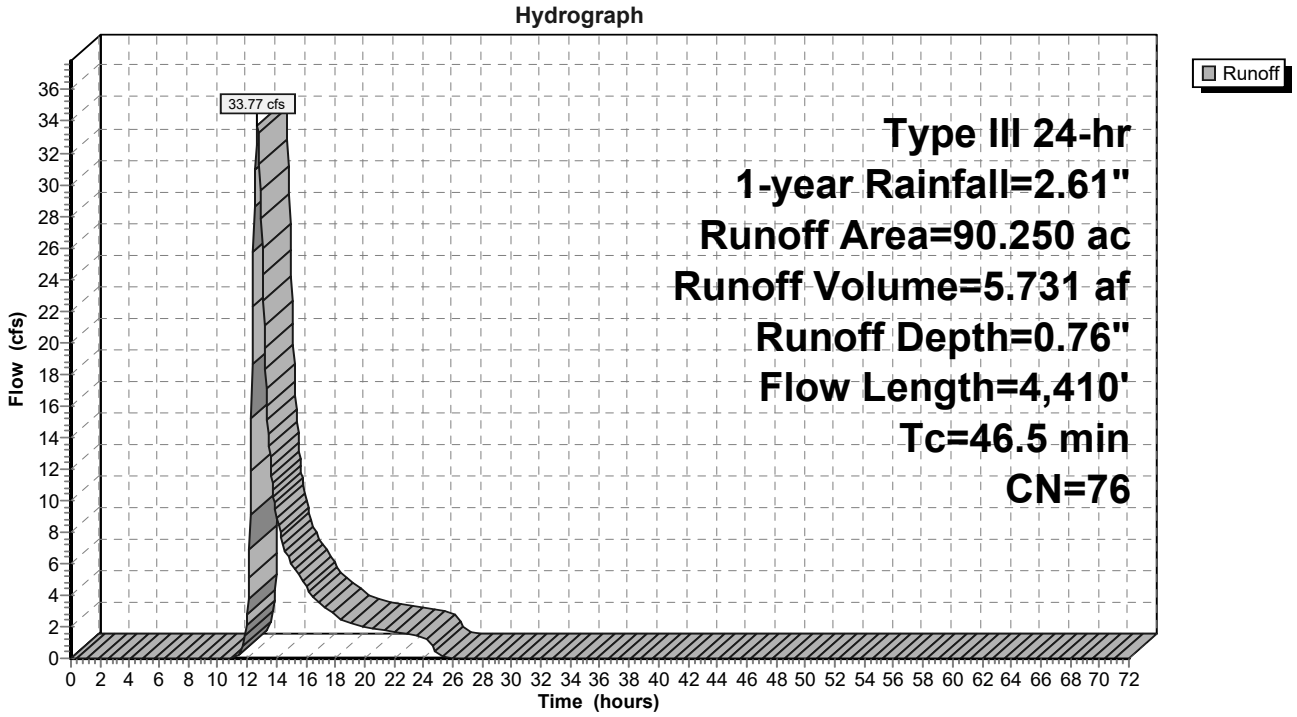
Runoff = 33.77 cfs @ 12.70 hrs, Volume= 5.731 af, Depth= 0.76"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-year Rainfall=2.61"

	Area (ac)	CN	Description
*	26.320	71	Medow, Non Graised, HSG, C (On Site)
*	22.500	71	Medow, Non Graised, HSG, C (Off Site)
*	27.000	78	Medow, Non Graised, HSG, D (On Site)
*	4.950	78	Medow, Non Graised, HSG, D (Off Site)
*	0.825	96	Proposed Laydown area
*	0.430	96	Propsed Gravel Road
*	0.500	96	Existing Road
*	0.740	98	Existing Buildings
*	1.560	98	Existing Paved Parking & Road
	0.165	89	Dirt roads, HSG D
	0.000	87	Dirt roads, HSG C
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fairm HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.190	98	Water Surface, HSG D
*	0.020	98	concrete pads
*	1.080	98	Water surface, HSG C
	90.250	76	Weighted Average
	84.660		93.81% Pervious Area
	5.590		6.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 100:

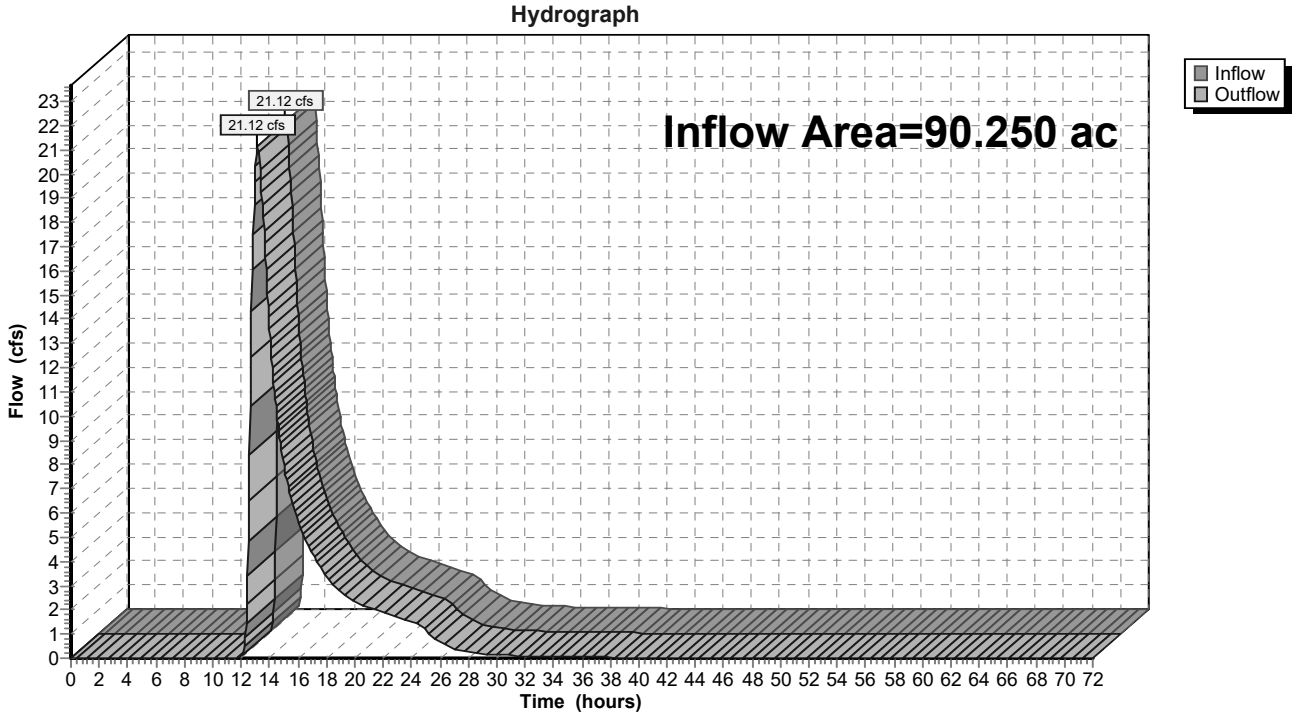


Summary for Reach DP-1:

Inflow Area = 90.250 ac, 6.19% Impervious, Inflow Depth > 0.76" for 1-year event
Inflow = 21.12 cfs @ 13.15 hrs, Volume= 5.719 af
Outflow = 21.12 cfs @ 13.15 hrs, Volume= 5.719 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1P: existing pond

Inflow Area = 90.250 ac, 6.19% Impervious, Inflow Depth = 0.76" for 1-year event
Inflow = 33.77 cfs @ 12.70 hrs, Volume= 5.731 af
Outflow = 21.12 cfs @ 13.15 hrs, Volume= 5.719 af, Atten= 37%, Lag= 27.1 min
Primary = 21.12 cfs @ 13.15 hrs, Volume= 5.719 af
Routed to Reach DP-1 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 327.57' @ 13.15 hrs Surf.Area= 37,359 sf Storage= 57,017 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 84.9 min calculated for 5.715 af (100% of inflow)
Center-of-Mass det. time= 85.4 min (991.4 - 906.0)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

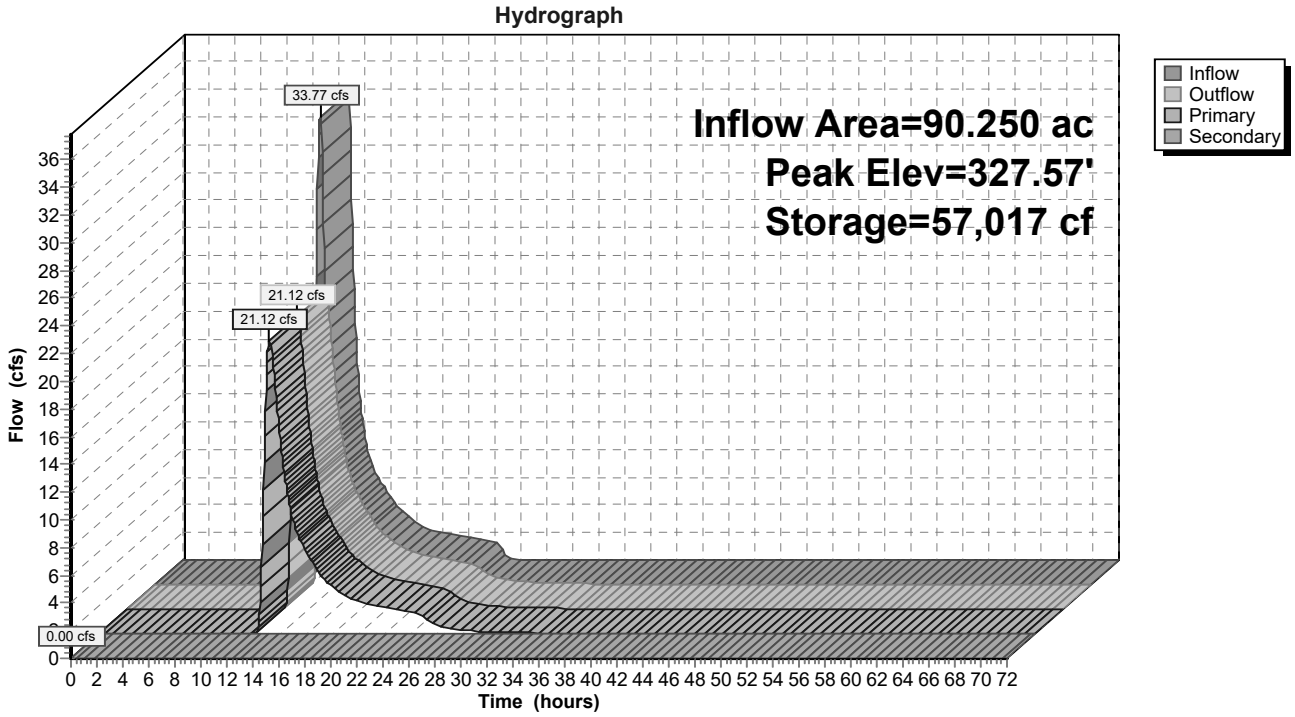
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=21.12 cfs @ 13.15 hrs HW=327.57' (Free Discharge)
└**1=East Pipe** (Barrel Controls 10.98 cfs @ 4.23 fps)
└**2=West Pipe** (Barrel Controls 10.14 cfs @ 3.91 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=325.83' (Free Discharge)
└**3=Overflow Weir** (Controls 0.00 cfs)

Pond 1P: existing pond



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment100: Runoff Area=90.250 ac 6.19% Impervious Runoff Depth=2.27"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=108.49 cfs 17.044 af

Reach DP-1: Inflow=84.42 cfs 17.033 af
Outflow=84.42 cfs 17.033 af

Pond 1P: existing pond Peak Elev=329.60' Storage=150,685 cf Inflow=108.49 cfs 17.044 af
Primary=59.26 cfs 15.986 af Secondary=25.15 cfs 1.047 af Outflow=84.42 cfs 17.033 af

Total Runoff Area = 90.250 ac Runoff Volume = 17.044 af Average Runoff Depth = 2.27"
93.81% Pervious = 84.660 ac 6.19% Impervious = 5.590 ac

Summary for Subcatchment 100:

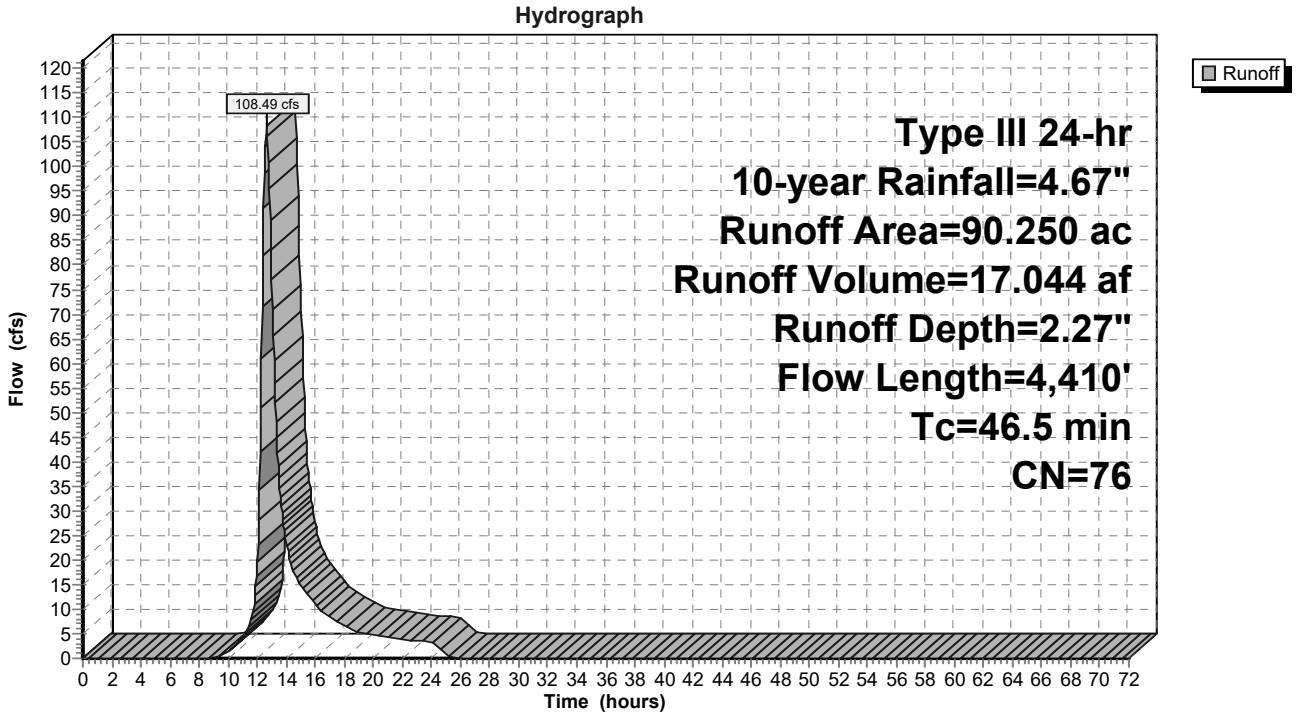
Runoff = 108.49 cfs @ 12.65 hrs, Volume= 17.044 af, Depth= 2.27"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.67"

	Area (ac)	CN	Description
*	26.320	71	Medow, Non Graised, HSG, C (On Site)
*	22.500	71	Medow, Non Graised, HSG, C (Off Site)
*	27.000	78	Medow, Non Graised, HSG, D (On Site)
*	4.950	78	Medow, Non Graised, HSG, D (Off Site)
*	0.825	96	Proposed Laydown area
*	0.430	96	Propsed Gravel Road
*	0.500	96	Existing Road
*	0.740	98	Existing Buildings
*	1.560	98	Existing Paved Parking & Road
	0.165	89	Dirt roads, HSG D
	0.000	87	Dirt roads, HSG C
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fairm HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.190	98	Water Surface, HSG D
*	0.020	98	concrete pads
*	1.080	98	Water surface, HSG C
	90.250	76	Weighted Average
	84.660		93.81% Pervious Area
	5.590		6.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 100:

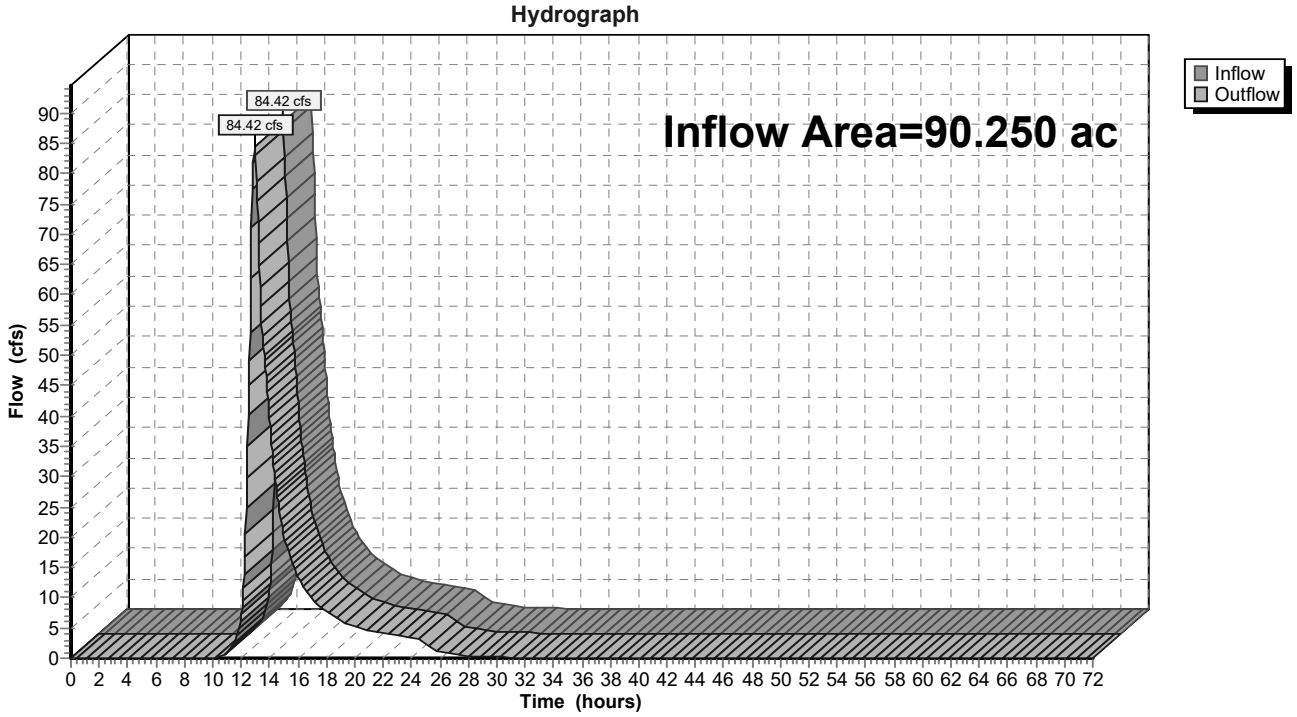


Summary for Reach DP-1:

Inflow Area = 90.250 ac, 6.19% Impervious, Inflow Depth = 2.26" for 10-year event
Inflow = 84.42 cfs @ 12.94 hrs, Volume= 17.033 af
Outflow = 84.42 cfs @ 12.94 hrs, Volume= 17.033 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1P: existing pond

Inflow Area = 90.250 ac, 6.19% Impervious, Inflow Depth = 2.27" for 10-year event
Inflow = 108.49 cfs @ 12.65 hrs, Volume= 17.044 af
Outflow = 84.42 cfs @ 12.94 hrs, Volume= 17.033 af, Atten= 22%, Lag= 17.2 min
Primary = 59.26 cfs @ 12.94 hrs, Volume= 15.986 af
Routed to Reach DP-1 :
Secondary = 25.15 cfs @ 12.94 hrs, Volume= 1.047 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 329.60' @ 12.94 hrs Surf.Area= 58,609 sf Storage= 150,685 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 54.1 min calculated for 17.033 af (100% of inflow)
Center-of-Mass det. time= 53.6 min (926.7 - 873.1)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

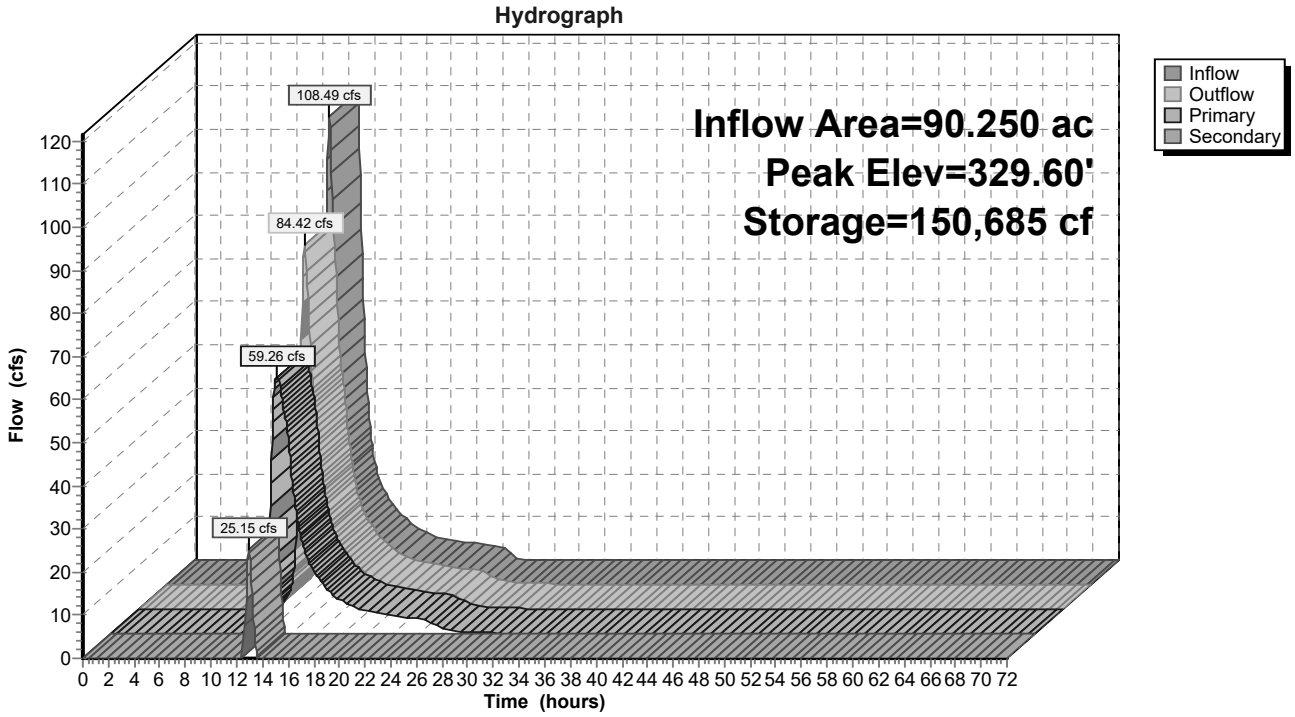
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=59.25 cfs @ 12.94 hrs HW=329.60' (Free Discharge)
└**1=East Pipe** (Inlet Controls 29.62 cfs @ 6.03 fps)
└**2=West Pipe** (Inlet Controls 29.62 cfs @ 6.03 fps)

Secondary OutFlow Max=25.12 cfs @ 12.94 hrs HW=329.60' (Free Discharge)
└**3=Overflow Weir** (Weir Controls 25.12 cfs @ 2.09 fps)

Pond 1P: existing pond



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment100: Runoff Area=90.250 ac 6.19% Impervious Runoff Depth=5.32"
Flow Length=4,410' Tc=46.5 min CN=76 Runoff=255.30 cfs 40.026 af

Reach DP-1: Inflow=175.78 cfs 35.757 af
Outflow=175.78 cfs 35.757 af

Pond 1P: existing pond Peak Elev=330.59' Storage=175,360 cf Inflow=255.30 cfs 40.026 af
Primary=69.91 cfs 28.393 af Secondary=105.87 cfs 7.364 af Outflow=175.78 cfs 35.757 af

Total Runoff Area = 90.250 ac Runoff Volume = 40.026 af Average Runoff Depth = 5.32"
93.81% Pervious = 84.660 ac 6.19% Impervious = 5.590 ac

Summary for Subcatchment 100:

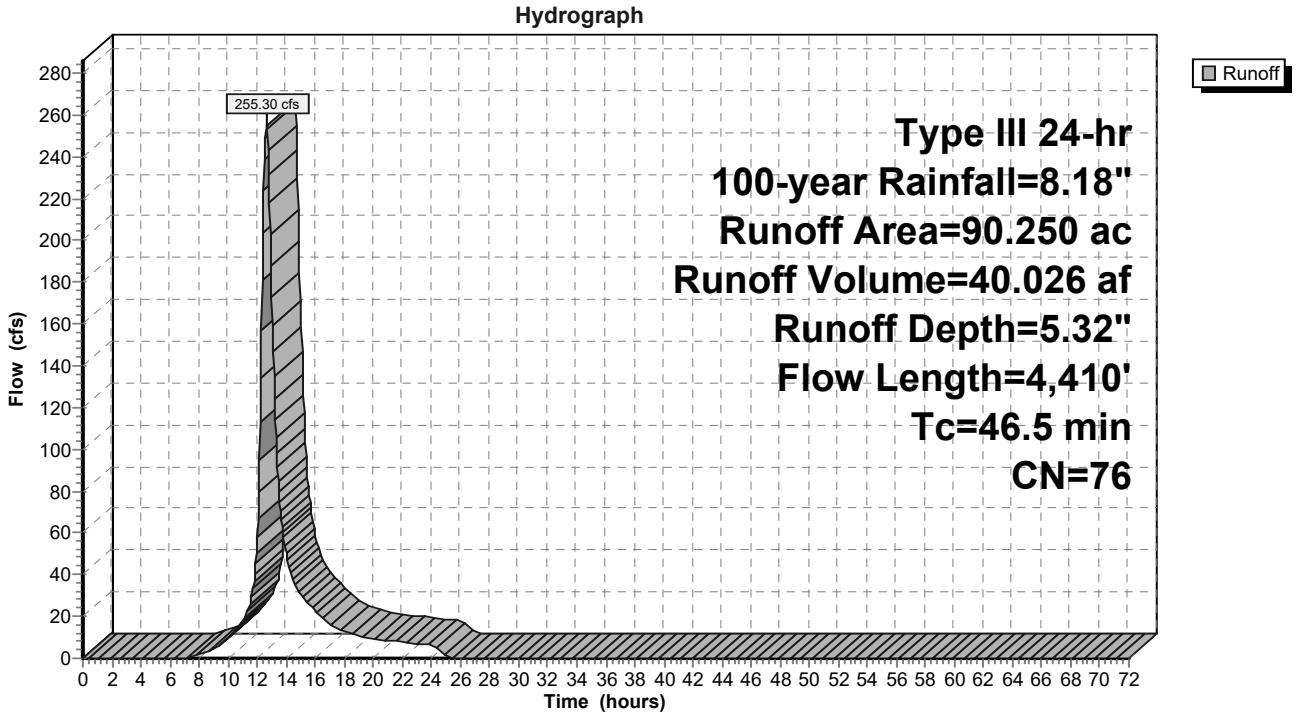
Runoff = 255.30 cfs @ 12.63 hrs, Volume= 40.026 af, Depth= 5.32"
Routed to Pond 1P : existing pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.18"

	Area (ac)	CN	Description
*	26.320	71	Medow, Non Graised, HSG, C (On Site)
*	22.500	71	Medow, Non Graised, HSG, C (Off Site)
*	27.000	78	Medow, Non Graised, HSG, D (On Site)
*	4.950	78	Medow, Non Graised, HSG, D (Off Site)
*	0.825	96	Proposed Laydown area
*	0.430	96	Propsed Gravel Road
*	0.500	96	Existing Road
*	0.740	98	Existing Buildings
*	1.560	98	Existing Paved Parking & Road
	0.165	89	Dirt roads, HSG D
	0.000	87	Dirt roads, HSG C
	1.000	73	Woods, Fair, HSG C
*	0.000	79	Woods, Fairm HSG D
*	0.000	79	Woods, Fair, HSG D (off-site)
*	0.970	73	Woods, Fair, HSG C (off-site)
*	2.190	98	Water Surface, HSG D
*	0.020	98	concrete pads
*	1.080	98	Water surface, HSG C
	90.250	76	Weighted Average
	84.660		93.81% Pervious Area
	5.590		6.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.16"
22.0	1,850	0.0400	1.40		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.1	1,800	0.0400	27.98	11,333.04	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=4.50' D=18.00' Z= 1.0 '/' Top.W=40.50' n= 0.040 Earth, cobble bottom, clean sides
9.0	660	0.0600	1.22		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
46.5	4,410	Total			

Subcatchment 100:

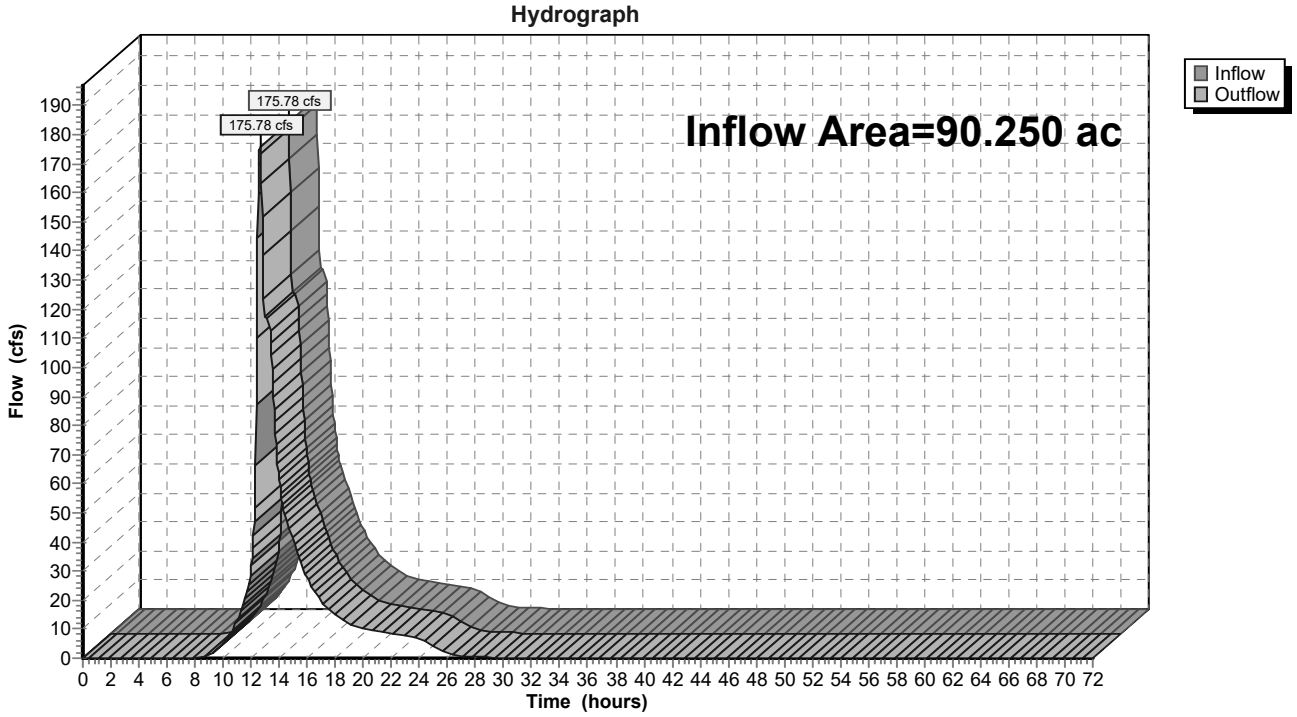


Summary for Reach DP-1:

Inflow Area = 90.250 ac, 6.19% Impervious, Inflow Depth = 4.75" for 100-year event
Inflow = 175.78 cfs @ 12.63 hrs, Volume= 35.757 af
Outflow = 175.78 cfs @ 12.63 hrs, Volume= 35.757 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1:



Summary for Pond 1P: existing pond

Inflow Area = 90.250 ac, 6.19% Impervious, Inflow Depth = 5.32" for 100-year event
Inflow = 255.30 cfs @ 12.63 hrs, Volume= 40.026 af
Outflow = 175.78 cfs @ 12.63 hrs, Volume= 35.757 af, Atten= 31%, Lag= 0.0 min
Primary = 69.91 cfs @ 12.63 hrs, Volume= 28.393 af
Routed to Reach DP-1 :
Secondary = 105.87 cfs @ 12.63 hrs, Volume= 7.364 af
Routed to Reach DP-1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 330.59' @ 12.63 hrs Surf.Area= 65,310 sf Storage= 175,360 cf
Flood Elev= 330.00' Surf.Area= 65,310 sf Storage= 175,360 cf

Plug-Flow detention time= 99.8 min calculated for 35.732 af (89% of inflow)
Center-of-Mass det. time= 50.1 min (898.7 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	325.83'	175,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

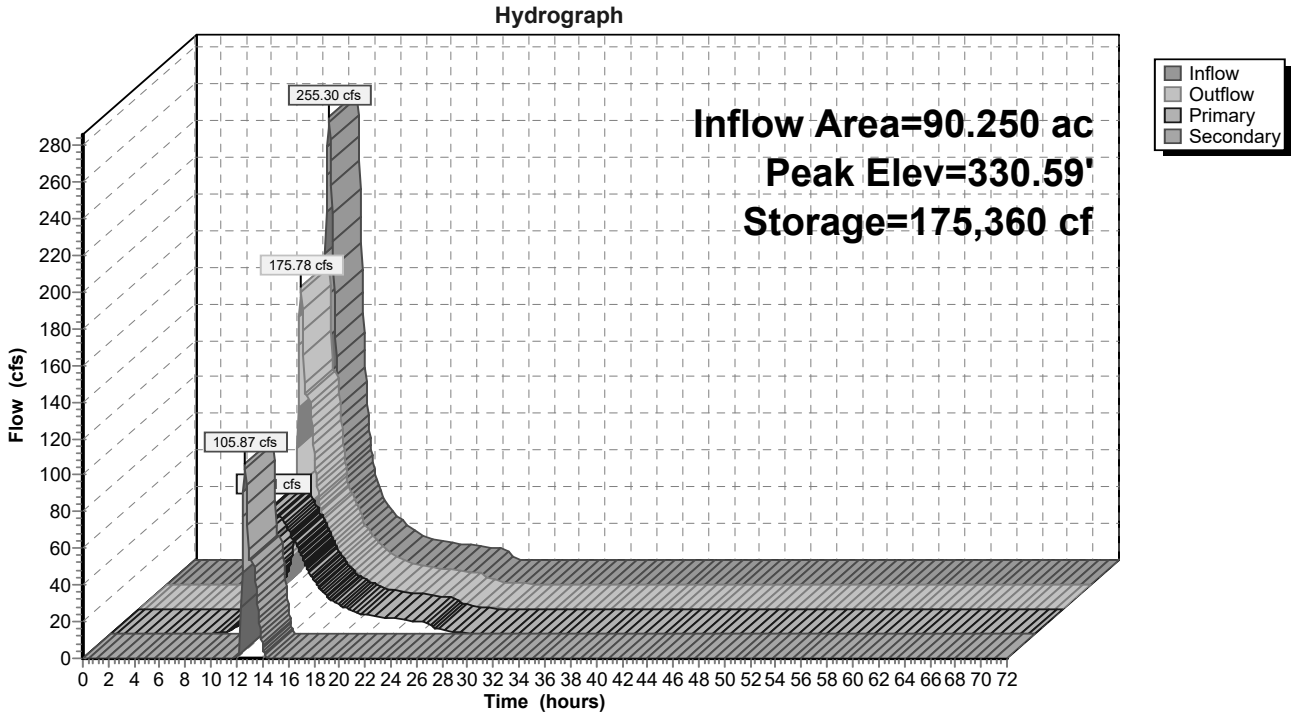
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.83	30,172	0	0
326.00	30,937	5,194	5,194
327.00	32,702	31,820	37,014
328.00	40,857	36,780	73,793
329.00	48,483	44,670	118,463
330.00	65,310	56,897	175,360

Device	Routing	Invert	Outlet Devices
#1	Primary	325.83'	**30.0" Round East Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	325.83'	**30.0" Round West Pipe** L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 325.83' / 325.74' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	329.00'	**20.0' long x 10.0' breadth Overflow Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=69.86 cfs @ 12.63 hrs HW=330.58' (Free Discharge)
└**1=East Pipe** (Inlet Controls 34.93 cfs @ 7.12 fps)
└**2=West Pipe** (Inlet Controls 34.93 cfs @ 7.12 fps)

Secondary OutFlow Max=105.33 cfs @ 12.63 hrs HW=330.58' (Free Discharge)
└**3=Overflow Weir** (Weir Controls 105.33 cfs @ 3.33 fps)

Pond 1P: existing pond



Appendix F: Certification Statements

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Owner's/Operator's Certification

"I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted."

Name (please print) _____

Title _____ **Date** _____

Address _____

Phone _____ **Email** _____

Signature _____

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Contractor's Certification

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

Contracting Firm Name _____

Address _____

Phone _____ **Fax** _____

Name (please print) _____

Title _____ **Date** _____

Signature _____

SWPPP Responsibilities _____

_____

_____

_____

Trained Individual Name (please print) _____

Title _____ **Date** _____

Signature _____

SWPPP Responsibilities _____

_____

_____

Note: All Contractors involved with Stormwater related activities shall sign a Contractor's Certification.

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Subcontractor's Certification

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

Subcontracting Firm Name _____

Address _____

Phone _____ **Fax** _____

Name (please print) _____

Title _____ **Date** _____

Signature _____

SWPPP Responsibilities _____

_____

_____

_____

Trained Individual Name (please print) _____

Title _____ **Date** _____

Signature _____

SWPPP Responsibilities _____

_____

_____

Note: All subcontractors involved with Stormwater related activities shall sign a Subcontractor's Certification.

Appendix G: Example Inspection Form

EXAMPLE EROSION CONTROL REPORT

PROJECT NO: _____ PROJECT NAME: _____ DATE: _____

MUNICIPALITY: _____ LOCATION: _____

CONTRACTOR: _____ OWNER: _____

DATE OF PREVIOUS INSPECTION: _____ INSPECTOR'S NAME: _____

DATE OF MOST RECENT STORM 0.5" OR GREATER: _____ DATE OF INSPECTION: _____

LAST RAIN EVENT: _____ DEPTH: _____

WEATHER: _____ TEMPERATURE: _____ °F

SPECIAL NOTES: _____

EROSION CONTROL CHECKLIST

ADDITIONAL ACTION REQUIRED BY PROJECT MANAGER OR PROJECT ENGINEER ☐ YES ☐ NO

PHOTOS OR SKETCHES ATTACHED ☐ ADDITIONAL REMARKS ATTACHED ☐

_____ _____

Inspector (print name) **Inspection Date**

_____ _____

Qualified Professional (print name) **Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes	No	NA	
☐	☐	☐	Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
☐	☐	☐	Is there residue from oil and floating substances, visible oil film, or globules of grease?
☐	☐	☐	All disturbance is within the limits of the approved plans.
☐	☐	☐	Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes	No	NA	
☐	☐	☐	Is construction site litter and debris appropriately managed?
☐	☐	☐	Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
☐	☐	☐	Is construction impacting the adjacent properties?
☐	☐	☐	Is dust adequately controlled?

2. Temporary Stream Crossing

Yes	No	NA	
☐	☐	☐	Maximum diameter pipes necessary to span creek without dredging are installed.
☐	☐	☐	Installed non-woven geotextile fabric beneath approaches
☐	☐	☐	Is fill composed of aggregate (no earth or soil)?
☐	☐	☐	Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering

Yes	No	NA	
☐	☐	☐	Upstream and downstream berms (sandbags, inflatable damns, etc.) are installed per plan.
☐	☐	☐	Clean water from upstream pool is being pumped to the downstream pool.
☐	☐	☐	Sediment laden water from work area is being discharged to a silt-trapping device.
☐	☐	☐	Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader

Yes	No	NA	
☐	☐	☐	Installed per plan.
☐	☐	☐	Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
☐	☐	☐	Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes	No	NA	
☐	☐	☐	Installed per plan with minimum side slopes 2H:1V or flatter.
☐	☐	☐	Stabilized by geotextile fabric, seed, or mulch with no erosion occuring.
☐	☐	☐	Sediment-laden runoff directed to sediment trapping structure.

4. Stone Check Dam

Yes	No	NA	
☐	☐	☐	Is channel stable? (flow is not eroding soil underneath or around the structure).
☐	☐	☐	Check is in good condition (rocks in place and no permanent pools behind the structure).
☐	☐	☐	Has accumulated sediment been removed?

5. Rock Outlet Protection

Yes	No	NA	
☐	☐	☐	Installed per plan.
☐	☐	☐	Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes	No	NA	
☐	☐	☐	Stockpiles are stabilized with vegetation and/or mulch.
☐	☐	☐	Sediment control is installed at the toe of the slope.

2. Revegetation

Yes	No	NA	
☐	☐	☐	Temporary seedings and mulch have been applied to idle areas.
☐	☐	☐	4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Stabilized Construction Entrance

Yes	No	NA	
☐	☐	☐	Stone is clean enough to effectively remove mud from vehicles.
☐	☐	☐	Installed per standards and specifications?
☐	☐	☐	Does all traffic use the stabilized entrance to enter and leave the site?
☐	☐	☐	Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes	No	NA	
☐	☐	☐	Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
☐	☐	☐	Joints constructed by wrapping the two ends together for continuous support.
☐	☐	☐	Fabric buried 6 inches minimum.
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ____% of design capacity.

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)

Yes	No	NA	
☐	☐	☐	Installed concrete blocks lengthwise so open ends face outward, not upward.
☐	☐	☐	Place wire screen between No. 3 crushed stone and concrete blocks.
☐	☐	☐	Drainage area is 1 acre or less.
☐	☐	☐	Excavated area is 900 cubic feet.
☐	☐	☐	Excavated side slopes should be 2:1.
☐	☐	☐	2" x 4" frame is constructed and structurally sound.
☐	☐	☐	Posts 3-foot maximum spacing between posts.
☐	☐	☐	Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ____% of design capacity.

4. Temporary Sediment Trap

Yes	No	NA	
☐	☐	☐	Outlet structure is constructed per the approved plan or drawing.
☐	☐	☐	Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is ____% of design capacity.

5. Temporary Sediment Basin

Yes	No	NA	
☐	☐	☐	Basin and outlet structure constructed per the approved plan.
☐	☐	☐	Basin side slopes are stablized with seed/mulch.
☐	☐	☐	Drainage structure is flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is ____% of design capacity.

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Appendix H: Post-Construction Inspection & Maintenance

LANGAN

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Post Construction Inspection and Maintenance Site Checklist

	Yes	No	NA
1. Steep Slopes (any slope 3:1 or steeper) (Frequency: Annual)			
a. Vegetation and ground cover adequate.	☐	☐	☐
i. Minimum 80% ground cover. *Maintenance: Topsoil, rake and seed bare areas. Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.*	☐	☐	☐
ii. Excessively tall grass (greater than 6" in height) *Maintenance: Mow slopes 3:1 or flatter to have a grass height of 4" to 6". Increase mowing frequency as necessary. Steep slopes planted with meadow mix as shown on the approved plans do not have to be mowed.*	☐	☐	☐
iii. Unauthorized plants. *Maintenance: Remove any unauthorized plants, including roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.*	☐	☐	☐
b. Slope erosion.	☐	☐	☐
i. Small bare areas (min. 50 square feet). *Maintenance: Topsoil, rake and seed bare areas.*	☐	☐	☐
ii. Ruts less than 12" wide. *Maintenance: Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work occurring. Backfill ruts and compact soil. Topsoil, rake and seed bare areas. Alternatively, hydroseeding can be used to seed the slope.*	☐	☐	☐
iii. Ruts greater than 12" wide. *Maintenance: Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work occurring. Re-grade, backfill ruts and compact soil. Install erosion control mats on slopes 3:1 or steeper to protect the re-graded slope. Topsoil, rake and seed bare areas. Inspect on a weekly basis until 80% ground cover is achieved. Alternatively, hydroseeding can be used to seed the slope.*	☐	☐	☐
c. Uneven settling *Maintenance: Visually inspect for uneven settling. Classify the settling based upon the categories below.*	☐	☐	☐
i. Greater than 0" but less than 2" of settling. *Maintenance: No immediate action required. Re-inspect in 6 months.*	☐	☐	☐
ii. Greater than 2" but less than 4" of settling. *Maintenance: Immediately repair. Re-grade and compact the soil. Topsoil, rake and seed the area. Re-inspect in 6 months.*	☐	☐	☐

	Yes	No	NA
iii. Greater than 4" of settling. *Maintenance: Immediately stabilize the area and consult a NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.*	☐	☐	☐

2. Swales (Frequency: Annual)	**Yes**	**No**	**NA**
a. Inflow Points	☐	☐	☐
i. Vegetation and ground cover adequate. *Maintenance: Reseed bare areas. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area by their removal.*	☐	☐	☐
ii. Free from erosion/undercutting. *Maintenance: Immediately stabilize and repair any areas where erosion around has occurred. Rake and seed the area. Seed mixture shall meet the seed mixture requirements specified on the approved plans.*	☐	☐	☐
iii. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
iv. No evidence of sediment buildup. *Maintenance: Remove and properly dispose of any accumulated sediment when the depth is 20% of swale design depth.*	☐	☐	☐
b. Check Dams	☐	☐	☐
i. No evidence of sediment buildup. *Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.*	☐	☐	☐
ii. Stone in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
iii. No evidence of erosion *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.*	☐	☐	☐
c. Energy Dissipaters	☐	☐	☐
i. No evidence of sediment buildup. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
ii. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
iii. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.*	☐	☐	☐

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3. Culverts (Frequency: Annual)	**Yes**	**No**	**NA**
a. Headwalls or End sections	☐	☐	☐
i. In good condition, no need for repairs.	☐	☐	☐
a. Cracks or displacement. *Maintenance: Repair any minor cracks. If minor displacement is observed, re-inspect in 6 months. Replace structure if major cracks or significant displacement is observed.*	☐	☐	☐
b. Minor spalling (<1"). *Maintenance: Repair any minor spalling.*	☐	☐	☐
c. Major spalling (rebars exposed). *Maintenance: Replace structure.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment.*	☐	☐	☐
iii. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
b. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
c. Pipes free from damage, corrosion, and sediment. *Maintenance: Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.*	☐	☐	☐

Notes:

1. The site must be returned to the approved conditions when any repairs are made.
2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.

Comments:

_____
_____
_____
_____

Actions to be taken:

_____
_____
_____
_____

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Post Construction Inspection and Maintenance Checklist
Dry Detention Basin

	Yes	No	NA
1. Embankment (Frequency: Annual)			
a. Vegetation and ground cover adequate.	☐	☐	☐
i. Minimum 80% ground cover.	☐	☐	☐
Maintenance: Topsoil, rake and seed bare areas. Replace dead and dying plants.			
ii. Excessively tall grass (greater than 6" in height)	☐	☐	☐
Maintenance: Mow grass to have a height of 4" to 6". Increase mowing frequency as necessary.			
iii. Unauthorized plants.	☐	☐	☐
Maintenance: Remove any unauthorized plants, including roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.			
b. Slope erosion.	☐	☐	☐
i. Small bare areas (min. 50 square feet).	☐	☐	☐
Maintenance: Topsoil, rake and seed bare areas.			
ii. Ruts less than 12" wide.	☐	☐	☐
Maintenance: Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work occurring. Backfill ruts and compact soil. Topsoil, rake and seed bare areas. Alternatively, hydroseeding can be used to seed the slope.			
iii. Ruts greater than 12" wide.	☐	☐	☐
Maintenance: Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work occurring. Re-grade, backfill ruts and compact soil. Install erosion control mats on slopes 3:1 or steeper to protect the re-graded slope. Topsoil, rake and seed bare areas. Inspect on a weekly basis until 80% ground cover is achieved. Alternatively, hydroseeding can be used to seed the slope.			
c. Uneven settling	☐	☐	☐
Maintenance: Install permanent benchmarks or other permanent reference point in each practice to be used with as-built elevations to measure uneven settling.			
i. Greater than 0" but less than 2" of settling.	☐	☐	☐
Maintenance: No immediate action required. Re-inspect in 6 months.			
ii. Greater than 2" but less than 4" of settling.	☐	☐	☐
Maintenance: Immediately repair. Re-grade and compact the soil. Topsoil, rake and seed the area. Re-inspect in 6 months.			

	Yes	No	NA
iii. Greater than 4" of settling. *Maintenance: Immediately stabilize the area and consult a NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.*	☐	☐	☐
d. Animal burrows. *Maintenance: Fill animal burrows with similar material to the existing material and compact. Topsoil, rake and seed the area.*	☐	☐	☐
e. Cracking, bulging, or sliding of slope.	☐	☐	☐
i. Upstream face.	☐	☐	☐
ii. Downstream face.	☐	☐	☐
iii. At or beyond downstream toe.	☐	☐	☐
iv. At or beyond upstream toe.	☐	☐	☐
v. Emergency spillway. *Maintenance: Immediately stabilize the slope and consult an NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.*	☐	☐	☐
f. Seeps/leaks at downstream face. *Maintenance: Look for changes in the color of the vegetation, plant species and their density to help locate the leak source.*	☐	☐	☐
g. Rip rap slope protection failure. *Maintenance: Stabilize slope, re-grade and compact the soil. Replace stone, as necessary.*	☐	☐	☐
i. Emergency spillway clear of any obstructions or debris. *Maintenance: Remove and properly dispose of any trash and debris. Remove any unauthorized plants, or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the area disturbed by their removal.*	☐	☐	☐

2. Inflow Points

(Frequency: Annual)	Yes	No	NA
a. Vegetation and ground cover adequate. *Maintenance: Reseed bare areas. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the area disturbed by their removal.*	☐	☐	☐
b. Free from erosion/undercutting. *Maintenance: Immediately stabilize and repair any areas where erosion around has occurred. Topsoil, rake and seed the area.*	☐	☐	☐
c. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
d. Pipes free from damage, corrosion, and sediment. *Maintenance: Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.*	☐	☐	☐

3. Outlet Structure/Overflow Spillway

(Frequency: Annual)	**Yes**	**No**	**NA**
a. Riser pipe	☐	☐	☐
i. In good condition, no need for repairs.	☐	☐	☐
Maintenance: Repair any minor damages. Replace structure if significant damages are observed.			
ii. Clear of sediment.	☐	☐	☐
Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of sump height.			
iii. Clear of debris and trash.	☐	☐	☐
Maintenance: Remove and properly dispose of any debris and trash.			
b. Concrete outlet structure	☐	☐	☐
i. In good condition, no need for repairs.	☐	☐	☐
a. Cracks or displacement.	☐	☐	☐
Maintenance: Repair any minor cracks. If minor displacement is observed, re-inspect in 6 months. Replace structure if major cracks or significant displacement is observed.			
b. Minor spalling (<1").	☐	☐	☐
Maintenance: Repair any minor spalling.			
c. Major spalling (rebars exposed).	☐	☐	☐
Maintenance: Replace structure.			
d. Joint failures.	☐	☐	☐
Maintenance: Replace structure.			
e. Water tightness.	☐	☐	☐
Maintenance: Reseal structure for water tightness if minor leaks are observed. Replace structure if significant leaks are observed.			
ii. Clear of sediment.	☐	☐	☐
Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of sump height.			
iii. Clear of debris and trash.	☐	☐	☐
Maintenance: Remove and properly dispose of any debris and trash.			
iv. Pipes free from damage, corrosion, and sediment.	☐	☐	☐
Maintenance: Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.			
c. Low flow orifice is unobstructed.	☐	☐	☐
Maintenance: Remove and properly dispose of any debris and trash.			

	Yes	No	NA
d. Low flow trash rack.	☐	☐	☐
i. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
ii. Clear of any corrosion. *Maintenance: If significant corrosion is observed, replace trash rack.*	☐	☐	☐
e. Weir trash rack.	☐	☐	☐
i. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
ii. Clear of any corrosion. *Maintenance: If significant corrosion is observed, replace trash rack.*	☐	☐	☐
f. Control valve operational. *Maintenance: Replace if not functioning or operational.*	☐	☐	☐
g. Pond valve operational, chained and locked. *Maintenance: Replace valve if not functioning or operational.*	☐	☐	☐
h. Overflow spillway	☐	☐	☐
i. In good condition, no need for repairs. *Maintenance: Replace any dislodged stone with the same stone type.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
iii. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
iv. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
v. No evidence of erosion at downstream toe of drop structure or weir spillway. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐

4. Sediment Forebay

(Frequency: Monthly)	**Yes**	**No**	**NA**
a. Free of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.*	☐	☐	☐

	Yes	No	NA
b. No evidence of erosion. *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Topsoil, rake and seed the area.*	☐	☐	☐
c. Overflow Spillway.	☐	☐	☐
i. In good working condition, no need for repairs. *<u>Maintenance</u>: Replace stone, as necessary.*	☐	☐	☐
ii. Clear of sediment. *<u>Maintenance</u>: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
iii. Clear of trash and debris. *<u>Maintenance</u>: Remove and properly dispose of any debris and trash.*	☐	☐	☐
iv. No evidence of erosion. *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
v. No evidence of erosion at downstream toe of drop structure or weir spillway. *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐

5. Dry Pond Areas

(Frequency: Monthly)	Yes	No	NA
a. Vegetation adequate. *<u>Maintenance</u>: Topsoil, rake and seed the area.*	☐	☐	☐
b. Undesirable vegetative growth. *<u>Maintenance</u>: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.*	☐	☐	☐
c. Undesirable woody vegetation. *<u>Maintenance</u>: Remove any undesirable woody vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.*	☐	☐	☐
d. Low flow channels clear of obstructions. *<u>Maintenance</u>: Remove and properly dispose of any debris and trash.*	☐	☐	☐
e. Standing water or wet spots. *<u>Maintenance</u>: Re-grade areas to ensure positive drainage. Topsoil, rake and seed the area.*	☐	☐	☐
f. Sediment and trash accumulation. *<u>Maintenance</u>: Remove and properly dispose of any accumulated sediment and trash.*	☐	☐	☐

6. Vegetation **(Frequency: Annual)**	**Yes**	**No**	**NA**
a. Vegetation health and growing. *Maintenance: Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.*	☐	☐	☐
b. Evidence of invasive species. *Maintenance: Remove invasive species, including roots. Do not use herbicides. Install additional wetland plants as necessary.*	☐	☐	☐
c. Accumulated sediment reducing volume significantly. *Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.*	☐	☐	☐

7. Miscellaneous **(Frequency: Monthly)**	**Yes**	**No**	**NA**
a. Encroachment on pond or easement area. *Maintenance: Remove any encroachments into the pond or easement area.*	☐	☐	☐
b. Maintenance access routes in good condition. *Maintenance: Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.*	☐	☐	☐
c. Signs of hydrocarbon build-up. *Maintenance: Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.*	☐	☐	☐
d. Fence in good condition. *Maintenance: Replace any damaged sections of fence.*	☐	☐	☐
e. Safety signs are installed. *Maintenance: Replace any missing signs.*	☐	☐	☐

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Notes:

1. The site must be returned to the approved conditions when any repairs are made.
2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.
5. Replaced stone shall meet the stone requirements specified on the approved plans.

Comments:

Actions to be taken:

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Post Construction Inspection and Maintenance Checklist
Open Channels

	Yes	No	NA
1. Inflow Points			
(Frequency: Annual)			
a. Vegetation and ground cover adequate. *Maintenance: Reseed bare areas. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area by their removal.*	☐	☐	☐
b. Free from erosion/undercutting. *Maintenance: Immediately stabilize and repair any areas where erosion around has occurred. Rake and seed the area. Seed mixture shall meet the seed mixture requirements specified on the approved plans.*	☐	☐	☐
c. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
d. Pipes free from damage, corrosion, and sediment. *Maintenance: Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.*	☐	☐	☐
2. Overflow Spillway			
(Frequency: Annual)			
a. Overflow spillway	☐	☐	☐
i. In good condition, no need for repairs. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
iii. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
iv. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
v. No evidence of erosion at downstream toe of drop structure or weir spillway. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.*	☐	☐	☐

3. Check Dams/Energy Dissipaters/Swales (Frequency: Annual)	**Yes**	**No**	**NA**
a. Check Dams	☐	☐	☐
i. No evidence of sediment buildup. *Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.*	☐	☐	☐
ii. Stone in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
iii. No evidence of erosion *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.*	☐	☐	☐
b. Energy Dissipaters	☐	☐	☐
i. No evidence of sediment buildup. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
ii. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
iii. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.*	☐	☐	☐
c. Swales	☐	☐	☐
i. No evidence of sediment buildup. *Maintenance: Remove and properly dispose of any accumulated sediment when the depth is 20% of swale design depth.*	☐	☐	☐
ii. No evidence of erosion. *Maintenance: Immediately stabilize. Backfill any ruts and compact the soil. Topsoil, rake and seed the area.*	☐	☐	☐

4. Sediment Forebay (Frequency: Monthly)	**Yes**	**No**	**NA**
a. Free of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.*	☐	☐	☐
b. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Topsoil, rake and seed the area.*	☐	☐	☐
c. Overflow Spillway.	☐	☐	☐
i. In good working condition, no need for repairs. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐

	Yes	No	NA
iii. Clear of trash and debris. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
iv. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
v. No evidence of erosion at downstream toe of drop structure or weir spillway. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐

5. Debris Cleanout

(Frequency: Monthly)	Yes	No	NA
a. Contributing areas clean of debris. *Maintenance: Remove and properly dispose of any trash and debris.*	☐	☐	☐
b. No dumping of yard wastes into practice. *Maintenance: Remove any yard wastes. Remind any maintenance personnel, landscapers, etc. to properly dispose of any yard wastes.*	☐	☐	☐
c. Clear of debris and litter. *Maintenance: Remove and properly dispose of any trash and debris.*	☐	☐	☐

6. Vegetation

(Frequency: Monthly)	Yes	No	NA
a. Plant height not less than design water depth of 3". *Maintenance: Remove any plants that have heights less than 3". Replace with plants specified on the approved plans that have a minimum height of 3".*	☐	☐	☐
b. Plant composition according to approved plans. *Maintenance: Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.*	☐	☐	☐
c. No placement of unapproved plants. *Maintenance: Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides.*	☐	☐	☐
d. Grass height not greater than 6". *Maintenance: Mow grass. Increase frequency of mowing as necessary to keep grass heights less than 6".*	☐	☐	☐

	Yes	No	NA
e. Sparse or bare vegetation in more than 10% of bioretention area. *Maintenance: Install replacement plants, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
f. Nuisance weeds or vegetation taking over more than 25% of the basin. *Maintenance: Remove any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area*	☐	☐	☐

7. Dewatering

(Frequency: Monthly)	Yes	No	NA
a. Dewaters between storms. *Maintenance: Remove accumulated sediment.*	☐	☐	☐
b. No evidence of standing water 48 or more hours after a rainfall. *Maintenance: Flush underdrain system to remove any trapped sediment. Recheck after next rainfall event. If still not dewatering fully, remove entire permeable soil material and check the gravel drainage layer for clogging. Replace permeable soil material and gravel drainage layer with new material. If problem persists, contact a NYS licensed Professional Engineer.*	☐	☐	☐
c. Underdrain present and no evidence of standing water 48 or more hours after a rainfall. *Maintenance: Flush underdrain system to remove any trapped sediment. Recheck after next rainfall event. If still not dewatering fully, remove entire permeable soil material and check the gravel drainage layer for clogging. Replace permeable soil material and gravel drainage layer with new material. If problem persists, contact a NYS licensed Professional Engineer.*	☐	☐	☐

Notes:

1. The site must be returned to the approved conditions when any repairs are made.
2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.
5. Replaced stone shall meet the stone requirements specified on the approved plans.
6. Replaced permeable soil media shall meet the permeable soil media requirements specified on the approved plans.
7. Replaced gravel drainage layer shall meet the gravel drainage layer requirements specified on the approved plans.

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Comments:

Actions to be taken:

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Post Construction Inspection and Maintenance Checklist
Bioretention/Rain Gardens

1. Embankment

(Frequency: Annual)	**Yes**	**No**	**NA**
a. Vegetation and ground cover adequate.	☐	☐	☐
i. Minimum 80% ground cover.	☐	☐	☐
Maintenance: Topsoil, rake and seed bare areas. Replace dead and dying plants.			
ii. Excessively tall grass (greater than 6" in height)	☐	☐	☐
Maintenance: Mow grass to have a height of 4" to 6". Increase mowing frequency as necessary.			
iii. Unauthorized plants.	☐	☐	☐
Maintenance: Remove any unauthorized plants, including roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.			
b. Slope erosion.	☐	☐	☐
i. Small bare areas (min. 50 square feet).	☐	☐	☐
Maintenance: Topsoil, rake and seed bare areas.			
ii. Ruts less than 12" wide.	☐	☐	☐
Maintenance: Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work occurring. Backfill ruts and compact soil. Topsoil, rake and seed bare areas. Alternatively, hydroseeding can be used to seed the slope.			
iii. Ruts greater than 12" wide.	☐	☐	☐
Maintenance: Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work occurring. Re-grade, backfill ruts and compact soil. Install erosion control mats on slopes 3:1 or steeper to protect the re-graded slope. Topsoil, rake and seed bare areas. Inspect on a weekly basis until 80% ground cover is achieved. Alternatively, hydroseeding can be used to seed the slope.			
c. Uneven settling	☐	☐	☐
Maintenance: Install permanent benchmarks or other permanent reference point in each practice to be used with as-built elevations to measure uneven settling.			
i. Greater than 0" but less than 2" of settling.	☐	☐	☐
Maintenance: No immediate action required. Re-inspect in 6 months.			
ii. Greater than 2" but less than 4" of settling.	☐	☐	☐
Maintenance: Immediately repair. Re-grade and compact the soil. Topsoil, rake and seed the area. Re-inspect in 6 months.			

	Yes	No	NA
iii. Greater than 4" of settling. *Maintenance: Immediately stabilize the area and consult a NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.*	☐	☐	☐
d. Animal burrows. *Maintenance: Fill animal burrows with similar material to the existing material and compact. Rake and seed the area.*	☐	☐	☐
e. Cracking, bulging, or sliding of slope.	☐	☐	☐
i. Upstream face.	☐	☐	☐
ii. Downstream face.	☐	☐	☐
iii. At or beyond downstream toe.	☐	☐	☐
iv. At or beyond upstream toe.	☐	☐	☐
v. Emergency spillway. *Maintenance: Immediately stabilize the slope and consult an NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.*	☐	☐	☐
f. Seeps/leaks at downstream face. *Maintenance: Look for changes in the color of the vegetation, plant species and their density to help locate the leak source.*	☐	☐	☐
g. Rip rap slope protection failure. *Maintenance: Stabilize slope, re-grade and compact the soil. Replace stone as necessary.*	☐	☐	☐
i. Emergency spillway clear of any obstructions or debris. *Maintenance: Remove and properly dispose of any trash and debris. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area by their removal.*	☐	☐	☐

2. Inflow Points

(Frequency: Annual)	Yes	No	NA
a. Vegetation and ground cover adequate. *Maintenance: Reseed bare areas. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area by their removal.*	☐	☐	☐
b. Free from erosion/undercutting. *Maintenance: Immediately stabilize and repair any areas where erosion around has occurred. Rake and seed the area. Seed mixture shall meet the seed mixture requirements specified on the approved plans.*	☐	☐	☐
c. Rip rap in good condition. *Maintenance: Replace stone, as necessary.*	☐	☐	☐

	Yes	No	NA
d. Pipes free from damage, corrosion, and sediment. *Maintenance: Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.*	☐	☐	☐

3. Outlet Structure/Overflow Spillway

(Frequency: Annual)	**Yes**	**No**	**NA**
a. Outlet structure in good condition.	☐	☐	☐
i. In good condition, no need for repairs.	☐	☐	☐
a. Cracks or displacement *Maintenance: Repair any minor cracks or displacement. Replace structure if major cracks or displacement is observed.*	☐	☐	☐
b. Minor spalling (<1"). *Maintenance: Repair any minor spalling observed.*	☐	☐	☐
c. Major spalling (rebars exposed). *Maintenance: Replace structure.*	☐	☐	☐
d. Joint failures. *Maintenance: Replace structure.*	☐	☐	☐
e. Water tightness. *Maintenance: Reseal structure for water tightness if minor leaks are observed. Replace structure if significant leaks are observed.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of sump height.*	☐	☐	☐
iii. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
iv. Pipes free from damage, corrosion, and sediment. *Maintenance: Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.*	☐	☐	☐
b. Overflow spillway	☐	☐	☐
i. In good condition, no need for repairs. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
iii. Clear of debris and trash. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐

	Yes	No	NA
iv. No evidence of erosion. *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
v. No evidence of erosion at downstream toe of drop structure or weir spillway. *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.*	☐	☐	☐

4. Check Dams/Energy Dissipaters/Swales

(Frequency: Annual)	**Yes**	**No**	**NA**
a. Check Dams	☐	☐	☐
i. No evidence of sediment buildup. *<u>Maintenance</u>: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.*	☐	☐	☐
ii. Stone in good condition. *<u>Maintenance</u>: Replace stone, as necessary.*	☐	☐	☐
iii. No evidence of erosion *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.*	☐	☐	☐
b. Energy Dissipaters	☐	☐	☐
i. No evidence of sediment buildup. *<u>Maintenance</u>: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
ii. Rip rap in good condition. *<u>Maintenance</u>: Replace stone, as necessary.*	☐	☐	☐
iii. No evidence of erosion. *<u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.*	☐	☐	☐
c. Swales	☐	☐	☐
i. No evidence of sediment buildup. *<u>Maintenance</u>: Remove and properly dispose of any accumulated sediment when the depth is 20% of swale design depth.*	☐	☐	☐
ii. No evidence of erosion. *<u>Maintenance</u>: Immediately stabilize. Backfill any ruts and compact the soil. Topsoil, rake and seed the area.*	☐	☐	☐

5. Sediment Forebay

(Frequency: Monthly)	**Yes**	**No**	**NA**
a. Free of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.*	☐	☐	☐
b. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Topsoil, rake and seed the area.*	☐	☐	☐
c. Overflow Spillway.	☐	☐	☐
i. In good working condition, no need for repairs. *Maintenance: Replace stone, as necessary.*	☐	☐	☐
ii. Clear of sediment. *Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.*	☐	☐	☐
iii. Clear of trash and debris. *Maintenance: Remove and properly dispose of any debris and trash.*	☐	☐	☐
iv. No evidence of erosion. *Maintenance: Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
v. No evidence of erosion at downstream toe of drop structure or weir spillway. *Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐

6. Debris Cleanout

(Frequency: Monthly)	**Yes**	**No**	**NA**
a. Contributing areas clean of debris. *Maintenance: Remove and properly dispose of any trash and debris.*	☐	☐	☐
b. No dumping of yard wastes into practice. *Maintenance: Remove any yard wastes. Remind any maintenance personnel, landscapers, etc. to properly dispose of any yard wastes.*	☐	☐	☐
c. Clear of debris and litter. *Maintenance: Remove and properly dispose of any trash and debris.*	☐	☐	☐

7. Bioretention Basin Vegetation

(Frequency: Monthly)	**Yes**	**No**	**NA**
a. Plant height not less than design water depth of 3". *Maintenance: Remove any plants that have heights less than 3". Replace with plants specified on the approved plans that have a minimum height of 3".*	☐	☐	☐
b. Plant composition according to approved plans. *Maintenance: Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.*	☐	☐	☐
c. No placement of unapproved plants. *Maintenance: Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides.*	☐	☐	☐
d. Grass height not greater than 6". *Maintenance: Mow grass. Increase frequency of mowing as necessary to keep grass heights less than 6".*	☐	☐	☐
e. Sparse or bare vegetation in more than 10% of bioretention area. *Maintenance: Install replacement plants, as necessary. Topsoil, rake and seed the area.*	☐	☐	☐
f. Nuisance weeds or vegetation taking over more than 25% of the basin. *Maintenance: Remove any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area*	☐	☐	☐
g. Mulch is in good condition and the appropriate thickness. *Maintenance: Replace decomposed mulch to the thickness shown on the approved plans.*	☐	☐	☐

8. Bioretention Basin Dewatering

(Frequency: Monthly)	**Yes**	**No**	**NA**
a. Dewaters between storms. *Maintenance: If filter bed is clogged or draining poorly, remove top few inches of discolored filter media. Rake the remaining material and replace the removed filter bed media.*	☐	☐	☐
b. No evidence of standing water 48 or more hours after a rainfall. *Maintenance: If standing water covers more than 15% of the planting bed 48 hours after a rainfall, remove top few inches of planting bed media. Rake the filter bed media to loosen the soil. Recheck after next rainfall event. If still not dewatering fully after 48 hours, remove and replace the entire filter bed media. If problem persists, contact a NYS licensed Professional Engineer.*	☐	☐	☐

	Yes	No	NA
c. Underdrain present and no evidence of standing water 48 or more hours after a rainfall. *Maintenance: Flush underdrain system to remove any trapped sediment. If no sediment is present, remove top few inches of planting bed media. Rake the filter bed media to loosen the soil. Recheck after next rainfall event. If still not dewatering fully after 48 hours, remove entire filter bed material and check the gravel drainage layer for clogging. Replace filter bed media and gravel drainage layer with new material. If problem persists, contact a NYS licensed Professional Engineer.*	☐	☐	☐

9. Bioretention Basin Filter Bed Integrity

(Frequency: Annual)	Yes	No	NA
a. Filter bed has not been blocked or filled inappropriately. *Maintenance: Remove all blockages and inappropriate fill. Restore filter bed to elevation shown on the approved plans.*	☐	☐	☐
b. Filter bed flat and level. *Maintenance: Remove all blockages, inappropriate fill, or accumulated sediment if present. Check embankment for differential settlement. If differential settlement is noted, refer to Item 1.c for maintenance procedures. If no differential settlement is noted, rake and level the planting bed media so that it is flat and level.*	☐	☐	☐
c. Uneven ponding. *Maintenance: Remove all blockages, inappropriate fill, or accumulated sediment if present. Check embankment for differential settlement. If differential settlement is noted, refer to Item 1.c for maintenance procedures. If no differential settlement is noted, rake and level the planting bed media so that it is flat and level.*	☐	☐	☐

Notes:

1. The site must be returned to the approved conditions when any repairs are made.
2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.
5. Replaced stone shall meet the stone requirements specified on the approved plans.
6. Replaced filter bed media shall meet the filter bed media requirements specified on the approved plans.
7. Replaced gravel drainage layer shall meet the gravel drainage layer requirements specified on the approved plans.

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Comments:

Actions to be taken:

Highland Solar
206 Milton Turnpike
Town of Marlborough, New York

Appendix I: New York State DEC Correspondence for Panels on Slopes Greater than 10%

LANGAN

Christina Zolezi

From: Melancon, Julie E (DEC) <julie.melancon@dec.ny.gov>
Sent: Wednesday, August 7, 2024 8:28 AM
To: Christina Zolezi
Cc: Fiorese, Ben A (DEC)
Subject: RE: [External] RE: Solar Guidance on Steep Slopes

That's right Christina.
If you maintain sheet flow, they are considered pervious. Once sheet flow is off the table, they are impervious. Please note that especially in downstate areas we have noticed that engineers are trying to push the limits of sheet flow on steep slopes, and it can result in downstream impacts from not mitigating the post-construction flow changes if they're not conservative enough. Please use your best professional judgement.
Have a great day.
Julie

Julie Melançon, CPESC
(she/her/hers)
Environmental Program Specialist 3
Chief, Green Energy Management Section
Bureau of Water Compliance, Division of Water
NEW YORK STATE | Department of Environmental Conservation
New York State Department of Environmental Conservation
5786 Widewaters Parkway, Syracuse, NY 13214-1867
P: (315) 426-7550| F: (315) 426-7459 | julie.melancon@dec.ny.gov
www.dec.ny.gov |

From: Christina Zolezi <czolezi@langan.com>
Sent: Tuesday, August 6, 2024 7:25 PM
To: Melancon, Julie E (DEC) <julie.melancon@dec.ny.gov>
Cc: Fiorese, Ben A (DEC) <ben.fiorese@dec.ny.gov>
Subject: Re: [External] RE: Solar Guidance on Steep Slopes

Hi Julie,
This is very helpful. If we're able to maintain sheet flow on the areas that are steeper than 10%, would the panels still be considered pervious?

Thanks.
Christina

Christina M. Zolezi, PE
Senior Project Engineer

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On Aug 6, 2024, at 9:37 AM, Melancon, Julie E (DEC) <julie.melancon@dec.ny.gov> wrote:

Hi Christina.

We are actually getting away from recommending water bars because they are really conveyances that channel water to a discharge point that would need to be managed. Also, on some sites, they are creating ponded areas and are getting traversed by construction equipment that create their own set of challenges. We generally recommend the stone diaphragm design in the Maryland Guidance associated with the DEC solar guidance or flow spreaders as seen in the Blue Book for slopes between 5% and 10%.

If the panels are on areas with more than 10% slope,

1. If you maintain sheet flow by installing measures across the site, like gravel diaphragms, those should be sized to hold the WQv.
2. If you do not maintain sheet flow, but the panels are generally parallel to the slope, you just have to treat for quality (WQv/RRv) for the portion on steep slopes.
3. If you do not maintain sheet flow and the panels are not generally along the slope, you would need to provide both quantity and quality for the areas of steep slope.

I hope this helps.
Julie

Julie Melançon, CPESC
(she/her/hers)
Environmental Program Specialist 3
Chief, Green Energy Management Section
Bureau of Water Compliance, Division of Water
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From: Christina Zolezi <czolezi@langan.com>
Sent: Wednesday, July 31, 2024 6:17 PM
To: Melancon, Julie E (DEC) <julie.melancon@dec.ny.gov>
Subject: Solar Guidance on Steep Slopes

Hi Julie,
I received your voicemail. Hopefully you enjoy the rest of your vacation this week.

We're working on several solar sites where we have slopes over 10%. The spacing between the solar panels are a minimum of panel width to help maintain sheet flow. We have been using permanent water bars on site where the slopes are 5-10%. In order to maintain the sheet flow on the steeper than 10% slopes, we are looking to incorporate redundant measures like level spreaders and water bars spaced at a closer. With these redundant measures would stormwater management controls be required if we maintain the sheet flow? If we're unable to maintain the sheet flow, would we then have to incorporate stormwater management measures?

Thanks.
Christina

Christina M. Zolezi, PE
Senior Project Engineer

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