SOLAR PROJECT
HAWTHORN SOLAR

HOOSICK, NY

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MAY, 2023
REVISED JULY 2023

STORMWATER POLLUTION
PREVENTION PLAN
for
CONSTRUCTION ACTIVITIES
at

HAWTHORN SOLAR – SOLAR PROJECT
TOWN OF HOOSICK, NY

Prepared for

HAWTHORN SOLAR, LLC
2045 LINCOLN HIGHWAY
Edison, NJ 08817

Prepared by
The Environmental Design Partnership, LLP
900 Route 146
Clifton Park, NY 12065
Telephone: (518) 371-7621
Facsimile: (518) 371-9540

MAY, 2023
REVISED JULY, 2023

NOI Permittee: HAWTHORN SOLAR, LLC
HAWTHORN SOLAR FARM

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SECTION 1

Written Stormwater Pollution Prevention Plan

I. SCOPE

A. **PURPOSE:** HAWTHORN SOLAR, LLC intends to implement the appropriate Stormwater Pollution Prevention Plan measures in accordance with the SPDES general permit governing stormwater discharges during construction, and in accordance with erosion control practices. This section provides a descriptive explanation of the means by which HAWTHORN SOLAR, LLC will comply with the National Stormwater Pollution Prevention Program.

B. **NPDES GENERAL PERMITS FOR STORMWATER DISCHARGE FROM CONSTRUCTION SITES:** Regulations promulgated by the New York State Department of Environmental Conservation (NYSDEC) regulate the discharge of storm water from construction activities on sites where one (1) or more acres of soil is disturbed. One of the ways to comply with these regulations for affected sites is to request coverage under the General Permit for Construction Activities. (Copy enclosed herewith) In order to be authorized to discharge under the General Permit, a Stormwater Pollution Prevention Plan (SWPPP) for the site must be prepared in accordance with all applicable requirements of this permit and followed during the construction activities. If the construction activity is **not** subject to the requirements of a regulated, traditional land use control MS4 a Notice of Intent (NOI) form must be completed and received by the New York State Department of Environmental Conservation at least 5-days prior to any earth-disturbing activities. If the construction activity is subject to the requirements of a regulated, traditional land use control MS4, then the owner/operator must have its SWPPP reviewed and accepted by the MS4 prior to submitting the NOI to the Department. The owner/operator shall have the "MS4 SWPPP Acceptance" form signed and then submit that form along with the NOI to the Department.

C. **RESPONSIBILITIES OF CONTRACTOR REGARDING THE GENERAL PERMIT:** The CONTRACTOR shall manage the discharge of stormwater from the site in accordance with the SPDES General Permit for Construction Activities conditions and the following provisions of this section of the specifications. The CONTRACTOR shall be responsible for conducting the stormwater management practices in accordance with the permit. The CONTRACTOR shall be responsible for providing qualified inspectors to conduct the inspections required by the SWPPP. The CONTRACTOR shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the CONTRACTOR'S failure to comply with the permit provisions. It shall be the responsibility of the CONTRACTOR to make any changes to the SWPPP necessary when the CONTRACTOR or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The CONTRACTOR should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

D. **NOTICE OF INTENT:** The NOI Permittee petitions the New York State Department of Environmental Conservation for the stormwater discharges during construction at this site to be covered by the SPDES General Permit for Construction Activity for the State of New York. A Notice of Intent (NOI) (using the form required by the NYSDEC) to be covered under this permit will be filed after the project is approved. An Erosion and Sediment Control Plan has been prepared and is attached herewith.

E. **CONTRACTOR RESPONSIBILITIES**: The SWPPP and associated Erosion and Sediment Control Plans represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. HAWTHORNE SOLAR, LLC, and the CONTRACTOR understand that additional erosion and sediment control measures may be necessary during construction. It will be the responsibility of the CONTRACTOR to implement additional erosion and sediment control measures as necessary to protect the site during construction. HAWTHORN SOLAR, LLC, and the CONTRACTOR shall designate a Project Manager prior to commencing construction. The Project Manager will ensure that all construction managers and sub-contractors are appropriately assigned and understand the importance of the following topics:

- Erosion and Sedimentation Control for Water Quality Protection
- Implementation of the Erosion and Sedimentation Control Plan
- The Importance to Proper Installation of Erosion and Sedimentation Control Measures
- Regular Inspection by qualified personnel of Erosion and Sedimentation Control Measures
- Diligent Maintenance of Erosion and Sedimentation Control Measures
- Contemporaneous preparation of accurate and complete records regarding inspection and maintenance of Erosion and Sedimentation Control Measures
- Record Keeping for Inspections and Maintenance activities

F. **REQUIREMENTS FOR THE CONTRACTOR AND SUBCONTRACTOR(S):** The *SWPPP Ledger* shall provide a “Contractor’s Certification Log” **(Form 2)**, identifying the Company Name, Business Address and Telephone Number along with the Responsible Person for the CONTRACTOR and all subcontractors’ who will implement the measures identified in the SWPPP. Each of the entities identified on **Form 2** shall sign a “Contractor’s Certification” **(Form 3)**, verifying they have been instructed and fully understand the requirements of the New York State Department of Environmental Conservation and SWPPP. **This certification must be signed, by a fully qualified individual on behalf of each entity, prior to the beginning of any construction activities and shall be filed in the project’s *SWPPP* Ledger.**

Additionally, the “Trained Contractor” must be identified on Form 3 and his/her credentials should be kept on-site in the SWPPP ledger.

G. **STORMWATER POLLUTION PREVENTION PROGRAM LOCATION REQUIREMENTS:** The *SWPPP Ledger* is meant to be a working document that shall be maintained at the site of the Construction Activities at all times throughout the project, shall be readily available upon request by the NOI Permittee’s personnel or New York State Department of Environmental Conservation or any other agency with regulatory authority over stormwater issues, and shall be kept on-site until the site complies with the Final Stabilization section of this document. Refer to Part VII., F., Duty to Provide Information, of the General Permit for additional public viewing requirements.

H. **SWPPP LEDGER:** The SWPPP Ledger shall be a 3-ring Binder, tabbed and indexed for the following sections:

SECTION 1:
- **Written SWPPP**

SECTION 2:
- **Site Map and General Location Map**
- **Erosion and Sediment Control Plan(s)**
- **Phasing Plan (As needed)**

SECTION 3:
- **New York State Notice of Intent**
- **New York State NOI Acknowledgement Letter - *Pending***
- **New York State Notice of Termination**

SECTION 4:

- **NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-20-001.**

SECTION 5:

- **NOI Permittee's Certification (Form 1)**
- **Contractor's/Subcontractor's Certification Log (Form 2)**
- **Contractor's Certification for each contractor listed on Form 2 (Form 3)**
- **Inspection Report (Form 4)**
- **Modification Report (Form 5)**
- **Record of Stabilization and Construction Activities Report (Form 6)**
- **Record of Temporary Erosion and Sediment Control Practices (Form 6A)**
- **Project Rainfall Log (Form 7)**
- **Final Stabilization/Termination Checklist (Form 8)**
- **Long Term Operation and Maintenance Checklists**

SECTION 6:

- **Supplemental Information**
  - **Stormwater Management Narrative**
  - **NYS DEC Environmental Resource Mapper**
  - **SHPO Correspondence –** ***Pending, by others***
  - **USFWS Ipac**
  - **FEMA Flood Mapping**
  - **USDA Web Soil Survey Results**
  - **Wetland Delineation Report –** ***by others***

SECTION 7:

- **Completed Inspection Forms**

The Project Manager must review and evaluate for compliance the *SWPPP Ledger* at each Project Review meeting. All Inspection and Maintenance Forms (*Forms 4 - 7*) will be initialed by the Project Manager at each reporting interval.

I. **INSPECTIONS AND RECORD KEEPING:** Inspections are required at least weekly by a "Qualified Inspector". Sites that have a waiver to disturb greater than five (5) acres require two (2) inspections every seven (7) days with at least two (2) days between inspections. Inspections shall continue until the site complies with the "Final Stabilization" section of this document and a Notice of Termination (NOT) has been filed with the NYSDEC. Each inspection must be followed up by a report documenting the inspector's findings and request the required maintenance and/or repair for the erosion and sedimentation control measures. The inspector shall notify the Project Manager within one day of the inspection of any deficiencies. Within one day of this notification the Project Manager must commence with corrective measures. It is imperative that the Project Manager documents the Inspection and Maintenance of all erosion and sedimentation control measures as soon as possible after the inspection and/or maintenance is completed. These records are used to prove that the required inspection and maintenance were performed and shall be placed in the *SWPPP Ledger*. In addition to inspection and maintenance reports, records should be kept of the Construction Activities that occur on the site. The Project Sponsor shall retain copies of the SWPPP, all reports and data for a minimum of five (5) years after the project is complete. The following list identifies the **required** Inspection and Maintenance documentation that must be maintained by the Project Manager under this SWPPP.

- **Form 4** **Inspection Report for SWPPP**
- **Form 5** **Requested Changes to the SWPPP (Modification Report)**
- **Form 6** **Record of Stabilization and Construction Activities**
- **Form 6A** **Record of Temporary Erosion and Sediment Control Practices**
- **Form 7** **Project Rainfall Log**

J. **SWPPP MODIFICATIONS:** The inspection report should also identify if any revisions to the SWPPP are warranted due to unexpected conditions. The SWPPP is meant to be a dynamic working guide that is to be kept current and amended whenever the design, construction, operation, or maintenance of the site changes in a way which significantly affects the potential for the discharge of pollutants or when the plan proves to be ineffective in eliminating or significantly minimizing pollutant discharges. Any such changes to the SWPPP must be made in writing on the Modification Report Form **(Form 5)** within 7 days of the date such modification or amendment is made. The CONTRACTOR'S failure to monitor or report deficiencies to the NOI Permittee will result in the CONTRACTOR being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

K. **FINAL STABILIZATION AND TERMINATION OF PERMIT COVERAGE:** The site will be considered finally stabilized when all soil disturbing activities have been completed and a uniform perennial vegetative cover for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been established and the development area no longer discharges stormwater associated with construction activities and a Notice of Termination (NOT) form filed by the NOI Permittee with the New York State Department of Environmental Conservation. This filing terminates coverage under the General Permit and terminates the CONTRACTOR'S responsibility to implement the SWPPP. Requirements of the SWPPP, including periodic inspections, must be continued until the NOT is filed.

II. SITE DESCRIPTION

A. PROJECT NAME AND LOCATION

The HAWTHORN SOLAR PROJECT site is geographically situated at Latitude N 43° 20' 35.3", Longitude W 73° 36' 24.9" in the Town of HOOSICK, RENSSELAER COUNTY, NEW YORK. The site is located on the north side of PINE VALLEY ROAD, adjacent to FORDS ROAD. The project spans three separate parcels covering approximately 431± acres of land. The overall disturbance area is 135.0± acres. The project is bounded on the SOUTH by PINE VALLEY ROAD, on the north, east, and west by COUNTY-OWNED LANDS and PRIVATE PROPERTY. Access to the project will be from FORDS ROAD and PINE VALLEY ROAD. The entire parcel will remain privately owned and maintained. Approximately 4.75± acres of impervious surfaces, including impervious gravel access roads, solar equipment pads, and a transformer/substation pad will be constructed. Reclamation of disturbed areas will be conducted on an ongoing basis as construction progresses.

B. NOI PERMITTEE'S NAME AND ADDRESS

HAWTHORN SOLAR, LLC
2045 LINCOLN HIGHWAY
EDISON, NJ 08817

C. PROJECT DESCRIPTION

This project will involve the construction of a solar photovoltaic facility, construction of gravel access roads, eight equipment pads, associated utilities, and stormwater management facilities as approved by the Town of HOOSICK. The estimated time for completion of the construction project is approximately three years. Soil disturbing activities will include:

1. Construction of stabilized construction access points
2. Clearing and grubbing
3. Construction of roadways/stormwater infrastructure, site grading
4. Construction of solar infrastructure on site
5. Construction of concrete equipment pads and transformer pad

D. SOILS, AND RAINFALL INFORMATION

Soils within the project area consist of poorly drained silty loams that fall into hydrologic soil groups A, C, and D, as described by the USDA Natural Resources Conservation Service Soil Survey.

The site is in RENSSELAER County, which receives an average of 43 inches of rainfall annually with the highest amounts of rainfall received in the months of May and October.

E. INDIAN COUNTRY LANDS

The site is not located on any known current or previously designated Indian Country lands.

F. ENDANGERED OR THREATENED SPECIES

A review of the New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper (http://www.dec.ny.gov/imsmaps/ERM/viewer.htm) does not indicate the presence of any endangered or threatened species on the project site.

A review of the United States Fish and Wildlife Services (USFWS) IPaC database conducted in April, 2023, indicates the potential presence of the federally endangered Indiana Bat and the presence of the candidate species, the Monarch Butterfly, at the project site. Mitigation measures for the Indiana Bat will include limiting tree clearing to November 1st through March 31st. No mitigation measures will be required for the Monarch Butterfly as it is classified as a candidate species. A request has been directed to USFWS for a more accurate determination. Once their response has been received, any required mitigation strategies will be implemented and their response will be included in Section 6.

G. HISTORIC PLACES

The coordination with the NYS Historic Preservation Office is being handled by others.

III. CONTROLS

A. EROSION AND SEDIMENT CONTROLS

The following section describes the anticipated Erosion and Sediment Controls required for use during construction of the proposed site. These controls represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. **Additional erosion and sediment control measures may be necessary during construction.** It will be the responsibility of the NOI permittee to authorize the CONTRACTOR to implement all additional erosion and sediment control measures necessary to protect the site during construction.

1. Stabilization practices include (but not limited to):
   a) Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed
   b) Frequent watering of excavation and fill areas to minimize wind erosion during construction.
   c) Use of stabilization fabric for all slopes having a slope of 1V:3H or greater.
   d) Seeding and planting of all unpaved areas
      - Temporary seedings must be made initiated by the end of the next business day and completed within 14 days from the date the current soil disturbing activity ceased. If not, the soil must be scarified prior to seeding.
      - Broadcasting or hydroseeding may be used as seeding methods.
      - Seeding mixtures should be as follows
        a) Ryegrass (annual or perennial) applied at 30 lbs. per acre (0.7 lbs./1000 sq. ft.)

    b) Certified "Aroostook" winter rye (cereal rye) applied at 100 lbs. per acre (2.5 lbs./1000 sq. ft.) *Winter rye shall be used if seeding in October/November.

e) Deep-Ripping and Decompaction
- Scarify all compact, slowly permeable, medium and fine textured subsoil areas. Scarify at approximately right angles to the slope direction in soil areas that are steeper than 5 percent.
- Remove refuse, woody plant parts, stones over 3 inches in diameter, and other liter.
- Topsoil material shall have at least 2 percent by weight of fine textured stable organic material, and no greater than 6 percent.
- Topsoil shall have no less than 20 percent fine textured material (passing the No. 200 sieve) and not more than 15 percent clay.
- Topsoil shall not be placed when it is partly frozen, muddy, or on frozen slopes or over ice, snow, or standing water.
- Refer to latest version of NYSDEC Deep-Ripping and Decompaction.

f) Mulching
- For grass / legume establishment apply straw mulch applied at 2 ton/acre (90 lbs./1000 sq. ft.) and anchor with wood fiber mulch (hydromulch) at 500-750 lbs./acre (11 – 17 lbs./1000 sq. ft.)

g) Protecting Vegetation During Construction
- Limit soil placement over existing tree and shrub roots to a maximum of 3 inches.
- Use retaining walls and terraces to protect roots of trees and shrubs when grades are lowered. Lowered grades should start no closer than the dripline of the tree.
- Avoid trenching within the dripline of the tree.
- Construction limits should be identified and clearly marked to exclude equipment.

2. Structural practices include (but not limited to):

a) Inlet protection and outlet protection using filter socks or silt fence
- See detail on Erosion and Sediment Control Plans

b) Perimeter protection using filter socks or silt fence

c) Stabilized construction exit points
- Aggregate size shall be 2-inch stone or reclaimed / recycled concrete equivalent
- Thickness shall be not less than 6 inches
- Width to be the full width of the access point, but not less than 12 ft
- Length shall be as required, but not less than 50 ft.
- Filter fabric shall be applied over the entire area to be covered with aggregate.
- The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way.

d) Stone Check Dam
- Use graded stone 2 to 15 inches in size
- Sediment accumulated behind the check dam shall be removed as needed to allow drainage through the check dam and prevent large flows from carrying sediment over the dam.

3. Sequence of Major Activities

The CONTRACTOR will be responsible for implementing erosion and sediment control measures outlined in the SWPPP and any additional erosion and sediment control measures required to stabilize the site. The CONTRACTOR may designate these tasks to certain subcontractors as appropriate, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the CONTRACTOR. The order of activities will be as follows (refer to Stormwater Pollution Prevention Plan Sheet contained in this SWPPP for additional details):

a) Construct temporary construction exits at locations shown on the SWPPP plan sheet. Install gravel access roads as needed.

b) Delineate the limits of disturbance for each project section and development phase. Refer to the Phasing Plan.

c) Install perimeter filter socks or silt fence, sediment basins and other necessary erosion control features.

d) Begin clearing and grubbing operations. Clearing and grubbing shall be done only in areas where earthwork will be performed and only in areas where building is planned to commence within 7 days after clearing and grubbing. Clearing and grubbing operations shall be limited so that no more than 5 acres of disturbed soil exists at any one time without prior written approval from the NYS DEC.

e) Frequent watering of the excavation and fill areas shall be done to minimize wind erosion.

f) Installation of gravel access roads. Commence site grading and installation of storm water management features.

g) 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 with seven (7) days from the date the current soil disturbance activity ceased.

h) Trenching for underground conduits.

i) Construction of installation of equipment pad.

j) Pile installation of solar racking system and solar panels.

k) Installation of above-ground wiring.

l) Topsoil replacement, final grading and seeding and planting.

m) Installation of fencing and required signage.

n) Removal of filter socks and stabilized construction entrances

o) Each 5 acre disturbed area should be completed and stabilized per the SWPPP by the Town prior to the commencement of the next phase of development.

4. Stormwater Management

The proposed stormwater management system was designed by The Environmental Design Partnership. The following paragraphs summarize the stormwater management measures to be incorporated on the site to control pollutants in stormwater discharges after construction is completed. A copy of the Stormwater Management Report is enclosed under Section 6 – Supplemental Information.

Sixteen (16) stormwater management areas, including an infiltration basin, an infiltration trench, and pocket ponds, will be constructed to provide sufficient volume to treat and attenuate all storm events up to and including the 100-Year storm event to below predevelopment flows. The pocket ponds will have an overflow spillway area to provide a safe overland flow path for storm events greater than the 1-Year storm event. Vegetated swales, the infiltration trench, and the pocket pond will provide the required "Water Quality Volume" and “Runoff Reduction Volume”, as specified by the NYS DEC Stormwater Design Manual.

5. Post-Construction Maintenance of the Stormwater Management System

Post construction maintenance and protection of the Stormwater Management System shall be performed in accordance with Section VI. LONG TERM OPERATION AND MAINTENANCE PROCEDURES of the SWPPP.

B. OTHER CONTROLS

1. Waste Disposal

All waste materials will be collected and stored in a securely lidded metal dumpster rented from a local waste management company which must be a solid waste management company licensed to do business in New York State. The dumpster will comply with all local and state solid waste management regulations.

All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as often as necessary, and the trash will be hauled to a landfill approved by New York State and the local government authority. No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedures for waste disposal. Notices stating these practices will be posted in the job site construction office trailer, and the job site superintendent will be responsible for seeing that these procedures are followed.

2. Sanitary Waste

All sanitary waste will be collected from the portable units a minimum of two times per week by a licensed portable facility provider in complete compliance with local and state regulations.

3. Off-Site Vehicle Tracking

A stabilized construction exit will be provided to help reduce vehicle tracking of sediments. The paved streets adjacent to the site entrance will be inspected daily and swept as necessary to remove any excess mud, dirt, or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin. The job site superintendent will be responsible for seeing that these procedures are followed.

4. Concrete Waste From Concrete Trucks

a) Emptying of excess concrete and/or washout from concrete delivery trucks will be allowed on the job site, but only in specifically designated diked areas which have been prepared to prevent contact between the concrete and/or washout and stormwater which will be discharged from the site or in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

b) The hardened residue from the concrete washout diked areas will be disposed of in accordance with the procedures given in the Spill Prevention Control and Countermeasures (SPCC) Plan and in accordance with applicable state and federal regulations. The job site superintendent will be responsible for seeing that these procedures are followed.

5. Contaminated Soils

a) Any contaminated soils (resulting from spills of materials with hazardous properties) which may result from construction activities will be contained and cleaned up immediately in accordance with the procedures given in the Spill Prevention Control and Countermeasures (SPCC) Plan and in accordance with applicable state and federal regulations.

b) The job site superintendent will be responsible for seeing that these procedures are followed.

IV. COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

A. The CONTRACTOR will obtain copies of all local and state regulations that are applicable to stormwater management, erosion control, and pollution minimization at this job site and will comply fully with such regulations. The CONTRACTOR will submit written evidence of such compliance if requested by any agent of a regulatory body. The CONTRACTOR will comply with all conditions of the New York State Department of Environmental Conservation SPDES General Permit for Construction Activities, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records in order to determine compliance.

V. MAINTENANCE/INSPECTION PROCEDURES DURING CONSTRUCTION

A. Erosion and Sediment Control and Stabilization Measures Maintenance and Inspection Practices

1. The following is a list of erosion and sediment controls to be used on this site during construction practice.

   a) Stabilization practices for this site include:
      - Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed
      - Frequent watering of excavation and fill areas to minimize wind erosion during construction.
      - Use of stabilization fabric for all slopes having a slope of 1V:3H or greater.
      - Permanent seeding and planting of all unpaved areas using the hydromulching grass seeding technique. To be applied prior to the implementation of deep-ripping and decompaction and permanent revegetation.

   b) Structural practices for this site include:
      - Perimeter protection using filter socks or silt socks
      - Stabilized construction exit points
      - Sediment Traps
      - Check Dams

2. The following inspection and maintenance practices will be used to maintain erosion and sediment controls and stabilization measures.

   a) All control measures will be inspected once every seven (7) days by a qualified inspector as described in Part IV, Section C of the SPDES Permit for Construction Activity No. GP-0-20-001. Sites that have a waiver to disturb greater than five (5) acres require two (2) inspections every seven (7) days with at least two (2) days between inspections.
   b) All measures will be maintained in good working order; if repairs are found to be necessary, they will be initiated within 24 hours of report.
   c) Built up sediment will be removed from filter socks or silt fence when it has reached one-half the height of the sock or fence.
   d) Filter socks and silt fence will be inspected for depth of sediment, dislodgement, breaks, tears, etc. Damaged or dislodged filter socks shall be repaired or replaced immediately.
   e) Temporary and permanent seeding and all other stabilization measures will be inspected for bare spots, washouts, and healthy growth.

f) Sediment basins will be inspected for depth of sediment. Built up sediment will be removed when it reaches 50 percent of the capacity.
g) Check Dams will be inspected for depth of sediment, washout, etc. Built up sediment will be removed from the check dam when it reaches one-third of the height of the check dam.
h) A maintenance inspection report will be made after each inspection. Copies of the report forms to be completed by the inspector are included in this SWPPP. Upon completion, copies of the reports shall be submitted to the Town.
i) The job site superintendent will be responsible for selecting and training the individuals who will be responsible for these inspections, maintenance and repair activities, and filling out inspection and maintenance reports. All personnel performing inspections must meet the requirements described in Part IV, Section C of the SPDES Permit for Construction Activity No. GP-0-20-001.
j) Personnel selected for the inspection and maintenance responsibilities will receive appropriate instruction from the job site superintendent. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls that are used onsite in good working order. They will also be trained in the completion of, initiation of actions required by, and the filing of the inspection forms. Documentation of this personnel training will be kept on site with the SWPPP. All personnel performing inspections must meet the requirements described in Part IV, Section C of the SPDES Permit for Construction Activity No. GP-0-20-001.
k) Disturbed areas and material storage areas will be inspected for evidence of or potential for pollutants entering stormwater systems.
l) Report to the NYS Department of Environmental Conservation within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event.

B. Inspection and Maintenance Report Forms

Once installation of any required or optional erosion control device or measure has been implemented, weekly inspections of each measure shall be performed by the CONTRACTOR'S inspection personnel. The Inspection and Maintenance Reports found in this SWPPP shall be used by the inspectors to inventory and report the condition of each measure to assist in maintaining the erosion and sediment control measures in good working order.

These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the NOI Permittee's Engineer, and the NOI Permittee for review upon request during visits to the project site. In addition, copies of the reports shall be provided to any of these persons, upon request, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the NOI Permittee for five years following the final stabilization of the site.

C. Other Record-Keeping Requirements

The CONTRACTOR shall keep the following records related to construction activities at the site:
- Dates when major grading activities occur and the areas that were graded
- Dates and details concerning the installation of structural controls
- Dates when construction activities cease in an area
- Dates when areas are stabilized, either temporarily or permanently
- Dates of rainfall and the amount of rainfall
- Dates and descriptions of the character and amount of any spills of petroleum materials or hydraulic fluids greater than five gallons
- Records of reports filed with regulatory agencies if reportable quantities of petroleum materials are spilled

At least one (1) DEC Endorsed Trainee with current trainee card must be present at all times of activity on the site. Proof of all trainee certifications must be maintained in the SWPPP onsite.

D. Winter Operations

The following is a list of erosion and sediment controls and inspection and maintenance practices for winter operations for this site.

a) **Prior to November 1st of any given year all exposed soil areas must be covered with:**
   - Mulch
   - Seed and mulch
   - Geotextile
   - Erosion control matting
   - Rock or
   - Other approved mulch to prevent soil from eroding

b) Install sediment barriers (filter socks or drop inlet protection) at ALL necessary perimeter and sensitive locations BEFORE SOIL FREEZES.

c) Slopes and Stockpiles:
   - Protect slopes and stockpiles with anchored straw or mulch, rolled erosion control product or other durable covering.
   - Sediment barrier must be installed around piles and at slope toes to prevent soil transport from the pile or slope.
   - Stabilize exposed areas BEFORE snow covers them.

d) All entrance/exit locations must be properly stabilized and maintained to accommodate snow management.

e) Inspections:
   - If soil disturbance is COMPLETELY suspended AND site is PROPERLY STABILIZED, qualified inspection frequency may be reduced with written notification to NYSDEC or MS4.
   - Additionally, the operator must provide the municipality with a written request for temporary winter shutdown inspections.
   - Confirmation must be received from NYSDEC and the municipality prior to reducing inspection frequency.
   - Monthly inspections must be performed at a minimum.
   - Sediment control measures should be checked after rain or snowmelt events.
   - Regular inspections must resume by March 15th.

VI. LONG TERM OPERATION AND MAINTENANCE PROCEDURES

The proposed HAWTHORN SOLAR PROJECT will be PRIVATELY OWNED and the operation and maintenance requirements will be the responsibility of the private owner.

The entire Stormwater Management System shall be inspected on a yearly basis to ensure that the system operates in the manner originally intended. Specific components of the system shall require additional attention as described below. Additional maintenance guidance referencing the NYSDEC MAINTENANCE GUIDANCE STORMWATER MANAGMENT PRACTICES dated March 31, 2017 and the NYSDEC STORMWATER MANAGEMENT PRACTICES INSPECTION CHECKLIST are contained in Section 6.

1. Vegetated Swale
   a. Vegetated Swales shall be inspected annually and following major storm events to ensure the system is operating as intended.
   b. Fertilize and Lime as needed to maintain dense vegetation
   c. Mow as required during growing season to maintain grass heights at 4 to 6 inches

d. Remove any sediment or debris buildup by hand if possible in the bottom of the channel when the depth reaches 2 inches
e. Inspect for pools of standing water. Regrade to restore design grade and revegetate.
f. Repair rills in channel bottom with compacted topsoil, anchored with mesh or filter fabric. Seed and mulch.
g. Use of heavy equipment for mowing and removing plants/debris should be avoided to minimize soil compaction. Disturbed areas should be stabilized with seed and mulch, or revetment, as necessary.

2. Open Channels/Infiltration Trench
   a. Open channels/Infiltration Trenches shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended.
   b. Removal of sediment build-up within the bottom of the channel or trench shall be required when 25% of the channel/trench volume has been exceeded.
   c. Open Channels shall be mowed to maintain a grass height of 4" to 6".

3. Pocket Ponds
   a. Ponds shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended. The inspection should include, but not be limited to, the following components; all outlet orifices, embankment, emergency spillway, drain, accumulation of sediment, and general erosion control measures.
   b. Special attention should be provided to ensure the low flow outlet orifice continues to function properly with the base Pocket Pond elevation maintained at the elevation of the low flow outlet orifice.
   c. Re-grading and re-vegetation shall be performed as necessary and rip-rap shall be replaced as necessary.
   d. Embankments shall be mowed a minimum of twice per year to discourage woody growth and control weeds.
   e. Debris and litter shall be removed from basins during regular mowing operations or more frequently as necessary.
   f. Accumulated sediment shall be removed from the wet pond area when 10 percent of the pond capacity has been lost due to sedimentation or at a minimum of every 10 to 20 years.
   g. Accumulated sediment in the forebay shall occur every five to six years or after 50% of the total forebay capacity has been filled.

4. Infiltration Basin
   a. Basins shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended. The inspection should include, but not be limited to, the following components; all outlet orifices, embankment, emergency spillway, drain, accumulation of sediment, and general erosion control measures.
   b. Re-grading and re-vegetation shall be performed as necessary and rip-rap shall be replaced as necessary.
   c. Embankments shall be mowed a minimum of twice per year to discourage woody growth and control weeds.
   d. Debris and litter shall be removed from basins during regular mowing operations or more frequently as necessary.
   e. Accumulated sediment shall be removed from the fore bay areas when 10 percent of the basin capacity has been lost due to sedimentation or at a minimum of every 10 to 20 years.

5. Soil Restoration
   a. Soil restoration has been called for throughout the site in accordance with Chapter 5 of the NYS Stormwater Management Design Manual. The soils on the site are classified as HSG D, therefore aeration and topsoil are needed in areas of topsoil stripping where grades are not altered. In areas that have experienced construction traffic within the solar farm are to be

considered “high traffic areas” and thus areas that have experienced construction disturbance should received full soil restoration (decompaction and compost enhancement). The soils shall be fully restored by tilling compost into the sub-soils prior to applying topsoil and vegetating. By applying these methods to the soils on the site the original properties and porosity of the soils will be recovered, which will allow for an improvement in the soil infiltration as well as lawn and landscaping sustainability.

STORMWATER POLLUTION PREVENTION PLAN
SUMMARY OF EROSION AND SEDIMENT CONTROL AND STABILIZATION MEASURES
MAINTENANCE/INSPECTION PROCEDURES

- ☐ All control measures will be inspected at least once every seven (7) days. Sites that have a waiver to disturb greater than five (5) acres require two (2) inspections every seven (7) days with at least two (2) days between inspections.
- ☐ All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of report.
- ☐ Built-up sediment will be removed from filter socks when it has reached one-half the height of the fence.
- ☐ Filter socks will be inspected for depth of sediment, dislodgement, breaks, tears, etc.
- ☐ Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 50% of the design capacity or at the end of the job.
- ☐ Diversion dikes, if present, will be inspected and any breaches promptly repaired.
- ☐ Temporary and permanent seeding and planting and other stabilization measures will be inspected for bare spots, washouts, and healthy growth.
- ☐ A maintenance inspection report will be made after each inspection. Copies of the report forms to be used are included in this SWPPP.
- ☐ The site job superintendent will select the individuals who will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance reports.
- ☐ Personnel selected for inspection and maintenance responsibilities will receive training from the site job superintendent. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.
- ☐ Disturbed areas and materials storage areas will be inspected for evidence of or potential for pollutants entering stormwater systems.
- ☐ Report to The Department of Environmental Conservation within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event.

STORMWATER POLLUTION PREVENTION PLAN

CONSTRUCTION/IMPLEMENTATION CHECKLIST

1. Maintain Records (Project Manager) of Construction Activities, including:

   - ☐ Dates when major grading activities occur
   - ☐ Dates when construction activities temporarily cease on a portion of the site
   - ☐ Dates when construction activities permanently cease on a portion of the site
   - ☐ Dates when stabilization measures are initiated on the site
   - ☐ Dates of rainfall and the amount of rainfall
   - ☐ Dates and descriptions of the character and amount of any spills of hazardous materials
   - ☐ Records of reports filed with regulatory agencies if reportable quantities of hazardous materials spilled

2. Prepare Inspection Reports (Qualified Inspector) summarizing:

   - ☐ Name of inspector
   - ☐ Qualifications of inspector
   - ☐ Measures/areas inspected
   - ☐ Observed conditions
   - ☐ Changes necessary to the SWPPP

3. Report Releases of Reportable Quantities of Oil, Hydraulic Fluids or Petroleum Materials (Project Manager, if they occur):

   - ☐ Notify National Response Center (1-800-424-8802) immediately
   - ☐ Notify permitting authority in writing within 14 days
   - ☐ Modify the pollution prevention plan to include:

     - the date of release
     - circumstances leading to the release
     - steps taken to prevent reoccurrence of the release

4. Modify Pollution Prevention Plan (per Qualified Inspector) as necessary to:

   - ☐ Comply with the minimum permit requirements when notified by The Department of Environmental Conservation that the plan does not comply
   - ☐ Address a change in design, construction operation, or maintenance that has an effect on the potential for discharge of pollutants
   - ☐ Prevent reoccurrence of reportable quantity releases of a hazardous material or oil

VII. SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN

A. MATERIALS COVERED

The following materials or substances with known hazardous properties are expected to be present onsite during construction:

Concrete
Concrete additives
Petroleum based products
Hydraulic Fluids
Fertilizers
Soil stabilization additives

B. MATERIAL MANAGEMENT PRACTICES

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

1. Good Housekeeping

The following good housekeeping practices will be followed onsite during the construction project.

a) An effort will be made to store only enough product required to do the job.

b) All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or other enclosure.

c) Products will be kept in their original containers with the original manufacturer's label in legible condition.

d) Substances will not be mixed with one another unless recommended by the manufacturer.

e) Whenever possible, all of a product will be used up before disposing of the container.

f) Manufacturer's recommendations for proper use and disposal will be followed.

g) The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

2. Product Specific Practices

The following product specific practices will be followed on the job site.

a) Petroleum Products

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any petroleum storage tanks used onsite will have a dike or berm containment structure constructed around it to contain any spills that may occur. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

b) Fertilizers

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked in the soil to limit exposure to stormwater. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

c) Concrete Trucks

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in either (1) specifically designated diked areas which have been prepared to prevent contact between the concrete and/or washout and stormwater which will be discharged from the site or (2) in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

The hardened residue from the concrete washout diked areas will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the CONTRACTOR. The job site superintendent will be responsible for seeing that these procedures are followed.

4. Spill Prevention Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup.

a) Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

b) Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite in spill control and containment kit (containing, for example, absorbent such as kitty litter or sawdust, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.).

c) All spills will be cleaned up immediately after discovery.

d) The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.

e) Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 302 list and oil) will be immediately reported to the EPA National Response Center, telephone 1-800-424-8802. Reportable Quantities of some substances which may be used at the job site are as follows:

oil - appearance of a film or sheen on water

pesticides - usually 1 lb.

solvents, flammable - 100 lb.

f) The SPCC plan will be adjusted to include measures to prevent this type of spill from recurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included. If the spill exceeds a Reportable Quantity, all federal regulations regarding reports of the incident will be complied with.

g) The job site superintendent will be the spill prevention and cleanup coordinator. He will designate the individuals who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of these personnel will be posted in the material storage area and in the office trailer onsite.

VIII. CONTROL OF ALLOWABLE NON-STORMWATER DISCHARGES

A. Certain types of discharges are allowable under the NYS Department of Environmental Conservation SPDES General Permit for Construction Activity, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures, which have been outlined previously in this SWPPP, will be strictly followed to ensure that no contamination of these non-stormwater discharges takes place. The following allowable non-stormwater discharges that may occur from the job site include:

a) Discharges from fire fighting activities

b) Fire hydrant flushings (see note below)

c) Waters used to wash vehicles or control dust in order to minimize offsite sediment tracking

d) Potable water sources such as waterline flushings (see note below), irrigation drainage from watering vegetation, routine exterior building washdown (without detergents present) (See Note below)

e) Pavement washwaters where spills or leaks of hazardous materials have not occurred or detergents have not been used

f) Springs and other uncontaminated groundwater, including dewatering ground water infiltration

g) Foundation or footing drains where no contamination with process materials such as solvents is present

NOTE: CONTRACTOR shall neutralize any super-chlorinated water from water distribution pipes before releasing it into the environment. Neutralization techniques are available from the Operator’s Engineer.

IX. CERTIFICATION AND NOTIFICATION

A. The NYS Department of Environmental Conservation requires that certifications of knowledge of the contents of this SWPPP and agreement to follow the SWPPP be made by the NOI Permittee and the CONTRACTOR. The terms of the General Permit also require that each CONTRACTOR sign the SWPPP plan, (Form 3) thereby making them co-permittees and acknowledging their responsibility for certain operational aspects of the plan. These certifications should be signed before the CONTRACTOR begins activities and should be filed with the site's SWPPP at the jobsite. These certifications are provided within this document, see Table of Contents for location.

STORMWATER POLLUTION PREVENTION PLAN
NOI PERMITTEE'S CERTIFICATION

FORM 1

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

STORMWATER POLLUTION PREVENTION PLAN DATED May, 2023

NOI PERMITTEE'S CERTIFICATION:

> "I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

NOI Permittee's
Designated Project Manager: ________________________

Signed: ____

Printed Name: ____________________________________

Position: ____

Date: ____

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR'S CERTIFICATION LOG

FORM 2

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Designated Project Manager____________________

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR'S/SUBCONTRACTOR'S CERTIFICATION
FORM 3

This form to be completed for each contractor listed on Form 2. Reproduce as needed

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

CONSTRUCTION POLLUTION PREVENTION PROGRAM
DATED MAY, 2023

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."

The Contractor/Subcontractor further understands that the SWPPP and associated Erosion and Sediment Control Plans represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. Additional erosion and sediment control measures will be necessary during construction. It will be the responsibility of Contractor/Subcontractor to implement all additional erosion and sediment control measures necessary to protect the site during construction.

CONTRACTOR:	**SUB**CONTRACTOR:
Name (Print): ____________________	Name (Print): ____________________
Signature: ____________________	Signature: ____________________
Date: ____________________	Date: ____________________
Title: ____________________	Title: ____________________
Company Name: ____________________	Company Name: ____________________
Address: ____________________	Address: ____________________
____________________	____________________
Phone: ____________________	Phone: ____________________

Elements of SWPPP Contractor/Subcontractor responsible for: ____________________

Name of Trained Contractor Responsible for SWPPP Implementation: ____________________

Title of Trained Contractor Responsible for SWPPP Implementation: ____________________

FORM 4
HAWTHORN SOLAR, LLC – HAWTHORN SOLAR PROJECT
SWPPP # __________

This form to be completed by Contractor's designated inspector at least weekly. Reproduce as needed.

SWPPP INSPECTION REPORTS

Page 1 of _______
Date ___________

Weather and Soil Conditions
Weather Conditions: ____
Soil Conditions: Dry [ ] Wet [ ] Saturated [ ] Snow Covered [ ] Frozen [ ]

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 or 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 property?
[ ] [ ] [ ] 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 and prevent sediment from entering stream during high flow.

Runoff Control Practices
1. Excavation Dewatering
Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, 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. Water Bar
Yes No NA
[ ] [ ] [ ] Installed per plan with vehicle crossings stabilized with gravel.
[ ] [ ] [ ] Outlet located on undisturbed soil or lined with riprap.
[ ] [ ] [ ] Bar height is 12-inch minimum from bottom of channel with minimum base width of 6-foot.

3. Interceptor Dikes and Swales
Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 1V:3H or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure.

SWPPP INSPECTION REPORT

Date ___________

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.

<u>Soil Stabilization</u>
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.
[ ] [ ] [ ] Four inches minimum of topsoil has been applied under permanent seedings.

<u>Sediment Control Practices</u>
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 site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence
Yes No NA
[ ] [ ] [ ] Installed on Contour, ten feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried six 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.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is one 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 three-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at maximum eight inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation _____% of design capacity.

SWPPP INSPECTION REPORT

Date ___________

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 stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
Sediment accumulation is _____% of design capacity.

Dust Control Practices
1. Haul Road and Current Work Areas
Yes No NA
[ ] [ ] [ ] Are all traffic surface areas sufficiently treated to prevent fugitive dust?
[ ] [ ] [ ] Are any areas of site's non-traffic and work area experiencing wind erosion?
[ ] [ ] [ ] Are there any disturbed areas in need of temporary seed and mulch to protect surface from wind erosion?
[ ] [ ] [ ] Is watering truck on-site?
[ ] [ ] [ ] Is dust visible in air at any location of the site?

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site-specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

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

____

____

____

Description of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection (see Page 5 for Sketch). ____

____

____

____

SWPPP INSPECTION REPORT

Page 4 of _______
Date ___________

ADDITIONAL COMMENTS*:

____

____

____

____

____

____

____

____

____

____

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____

____

___________________________________ ___________________________________
Inspector (print name and title) Date and Time of Inspection

____ ____
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.

***Attach photographs of practices identified as needing corrective actions.**

NOTE: IN ACCORDANCE WITH PART IV.C.4 OF THE SPDES GENERAL PERMIT (GP-0-20-001), THE QUALIFIED INSPECTOR MUST NOTIFY THE OWNER OR OPERATOR AND APPROPRIATE CONTRACTOR OF ANY CORRECTIVE ACTIONS THAT NEED TO BE TAKEN. THE CONTRACTOR SHALL BEGIN IMPLEMENTING THE CORRECTIVE ACTIONS WITHIN ONE (1) BUSINESS DAY OF THIS NOTIFICATION AND SHALL COMPLETE THE CORRECTIVE ACTIONS IN A REASONABLE TIME FRAME.

STORMWATER POLLUTION PREVENTION PLAN
MODIFICATION REPORT
FORM 5

This form to be used only when Contractor's designated inspector believes changes to the SWPPP and/or Erosion and Sediment control plans is warranted. For example, additional erosion control measures needed or removal of specific control measures can be done without adverse impact. This form must be approved by Designated Project Manager prior to implementation.

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

CHANGES REQUIRED FOR STORMWATER POLLUTION PREVENTION PLAN

To:	**Designated Project Manager**	**Date:**	
Address:			
Telephone:			
Facsimile:			
Sent Via:	☐ **Facsimile**	☐ **E-mail**	☐ **US Mail**

INSPECTOR: _DATE:________________
(Print)

____
(Signature)

QUALIFICATIONS OF INSPECTOR:____

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN: ____________________
____
____

REASONS FOR CHANGES: ____
____
____

TO BE PERFORMED BY: ON OR BEFORE: ____________________

APPROVED BY DESIGNATED PROJECT MANAGER________________________ DATE: _____________

STORMWATER POLLUTION PREVENTION PLAN
RECORD OF STABILIZATION AND CONSTRUCTION ACTIVITIES
FORM 6

Construction Site

HAWTHORN SOLAR FARM

Town of HOOSICK, RENSSELAER County, New York

A record of dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained until final site stabilization is achieved and the Notice of Termination is filed. *Reproduce copies of this form as needed.*

MAJOR GRADING, CONSTRUCTION, OR STABILIZATION ACTIVITIES

Description of Activity: ____________________

Begin Date: Site Contractor: ____________________

Location: ____________________

End Date: ____________________

Description of Activity: ____________________

Begin Date: Site Contractor: ____________________

Location: ____________________

End Date: ____________________

Description of Activity: ____________________

Begin Date: Site Contractor: ____________________

Location: ____________________

End Date: ____________________

Description of Activity: ____________________

Begin Date: Site Contractor: ____________________

Location: ____________________

End Date: ____________________

Description of Activity: ____________________

Begin Date: Site Contractor: ____________________

Location: ____________________

End Date: ____________________

Designated Project Manager____________________

STORMWATER POLLUTION PREVENTION PLAN
RECORD OF TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES
FORM 6A

Construction Site

HAWTHORN SOLAR FARM

Town of HOOSICK, RENSSELAER County, New York

A record of the timing of temporary erosion and sediment control practices to be implemented, including the timing of initial placement and the duration that each practice should remain in place. The record may reflect the actual date of planned installation or the specific construction activity with which it will be associated. The timing of removal may reflect an actual date or the length of time over which the practice will be implemented.

TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ____

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ____

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ____

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ____

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ____

Location: ____

Projected Date/Timing of Removal: ____

Designated Project Manager________________________

YEAR 20___ | STORMWATER POLLUTION PREVENTION PLAN | FORM 7

PROJECT RAINFALL LOG (to be completed by Contractor)

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Day												
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PM Initials												

STORMWATER POLLUTION PREVENTION PLAN

FINAL STABILIZATION CERTIFICATION /NOTICE OF TERMINATION CHECKLIST

FORM 8

This form is to be completed by Contractor and submitted to Designated Project Manager for approval only after Contractor believes all work regulated by SWPPP is complete.

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

1. ☐ **All soil disturbing activities are complete.**
2. ☐ **Temporary Erosion and Sediment Control Measures have been removed or will be removed at the appropriate time.**
3. ☐ **All areas of the Construction Site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 85% or equivalent measures have been employed.**

CONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that all storm water discharges associated with industrial activity from the identified project that are authorized by NPDES general permit have been eliminated and that all disturbed areas and soils at the construction site have achieved Final Stabilization and all temporary erosion and sediment control measures have been removed or will be removed at the appropriate time."

Company Name ______________________________

Name (Print) ______________________________

Signature ______________________________

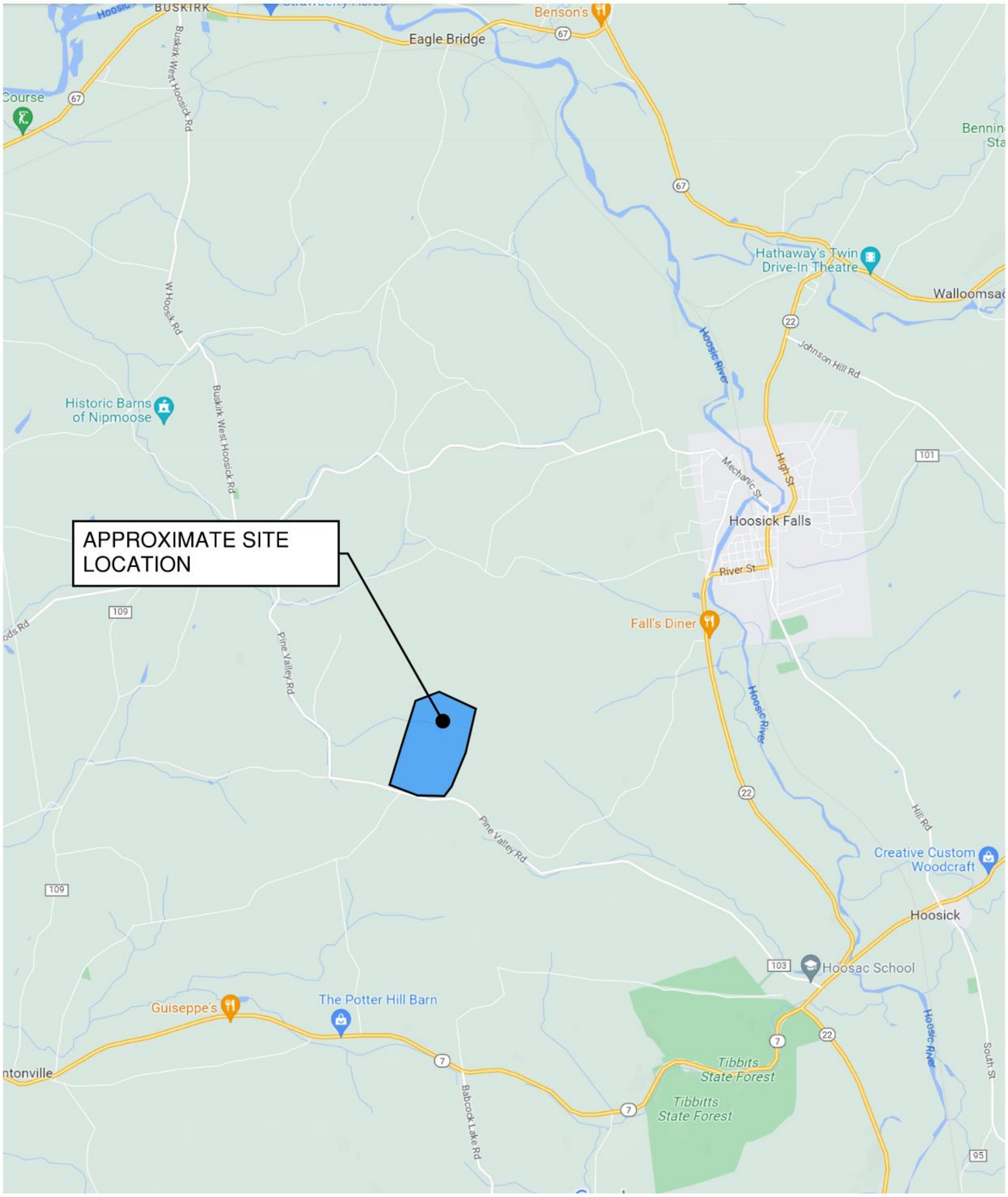
Date ______________________________

APPROVED BY DESIGNATED PROJECT MANAGER________________________ DATE: _________

SECTION 2

Erosion and Sedimentation Control Plans

Site Map and General Location Map



900 Route 146, Clifton Park, New York 12065
phone (518) 371-7621

ERNST SOLAR FARM SEED MIX			
Quantity	SPECIES	COMMON	APPLICATION RATE
35%	FESTUCA RUBRA	CREEPING RED FESCUE	6 LB PER 1,000 SF
35%	FESTUCA RUBRA SSP. COMMUTATA	CHEWING FESCUE	
10%	FESTUCA BREVIPILA, 'BEACON'	HARD FESCUE 'BEACON'	
10%	FESTUCA OVINA VAR, DURIUSCULA 'JETTY'	HARD FESCUE 'JETTY'	
5%	POA PRATENSIS 'BLUE ANGEL'	KENTUCKY BLUE GRASS 'BLUE ANGEL'	
5%	POA PRATENSIS 'VOLT'	KENTUCKY BLUE GRASS 'VOLT'	

EROSION AND SEDIMENT CONTROL NOTES:

1. PERMEABLE AREAS BETWEEN AND UNDERNEATH SOLAR PANELS TO BE SEEDED WITH ERNST SOLAR FARM SEED MIX AS SPECIFIED, THIS SHEET, AND REBEL TALL FESCUE CHEWINGS FESCUE OR HARD FESCUE (5LBS/1,000 SF), OR OWNER APPROVED EQUALS AT THE RATE SPECIFIED ON THIS SHEET.
2. AREAS OUTSIDE OF SOLAR ARRAY TO BE SEEDED WITH ERNMX-179 BUTTERFLY & HUMMINGBIRD GARDEN MIX AT A RATE OF 30 LBS/ACRE.
3. ON SEEDED SLOPES OVER 20%, CONTRACTOR SHALL ADD GEOPERM BONDED FIBER MATRIX TO SEED MIXES AT A RATE OF 6 LB/ACRE.
4. STORMWATER MANAGEMENT AREAS AND VEGETATED SWALES TO BE SEEDED AS SPECIFIED ON RESPECTIVE DETAILS, TYP.
5. PROPOSED UTILITY AND CUSTOMER POLE LOCATIONS ARE SUBJECT TO UTILITY APPROVAL AND MAY CHANGE. CONTRACTOR TO VERIFY FINAL POLE LOCATIONS WITH OWNER PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION.
6. AREAS RECEIVING DISTURBANCE CONSTRUCTION TRAFFIC SHOULD RECEIVE DEEP-RIPPING AND DECOMPACTION.

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

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REVISION	DATE	BY
REVISIONS PER CLIENT COMMENT	4/28/23	STA
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE: 1" = 200'

NOT FOR CONSTRUCTION

SHEET TITLE: OVERALL EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-300

FOR MUNICIPAL APPROVAL ONLY - NOT INTENDED FOR CONSTRUCTION

EROSION, LAYOUT, AND MATERIALS PLAN LEGEND

- EXISTING GRADE
- GRAVEL ACCESS ROAD
- USACE WETLAND AREAS
- TEMPOARAY EROSION CONTROL BLANKET (ON SLOPES GREATER THAN OR EQUAL TO 33%) — 2 / C-500
- FIXED KNOT FARM FENCE — 4 / C-501
- SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 10 / C-502
- MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 2 / C-502
- UNDERGROUND ELECTRIC TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 3 / C-502
- PROPOSED CONTOUR
- PROPOSED SILT FENCE — 4 / C-500
- PROPOSED CHECK DAM — 10 / C-500
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN
- CONCRETE WASHOUT FACILITY — 1 / C-500
- LIMITS OF DISTURBANCE

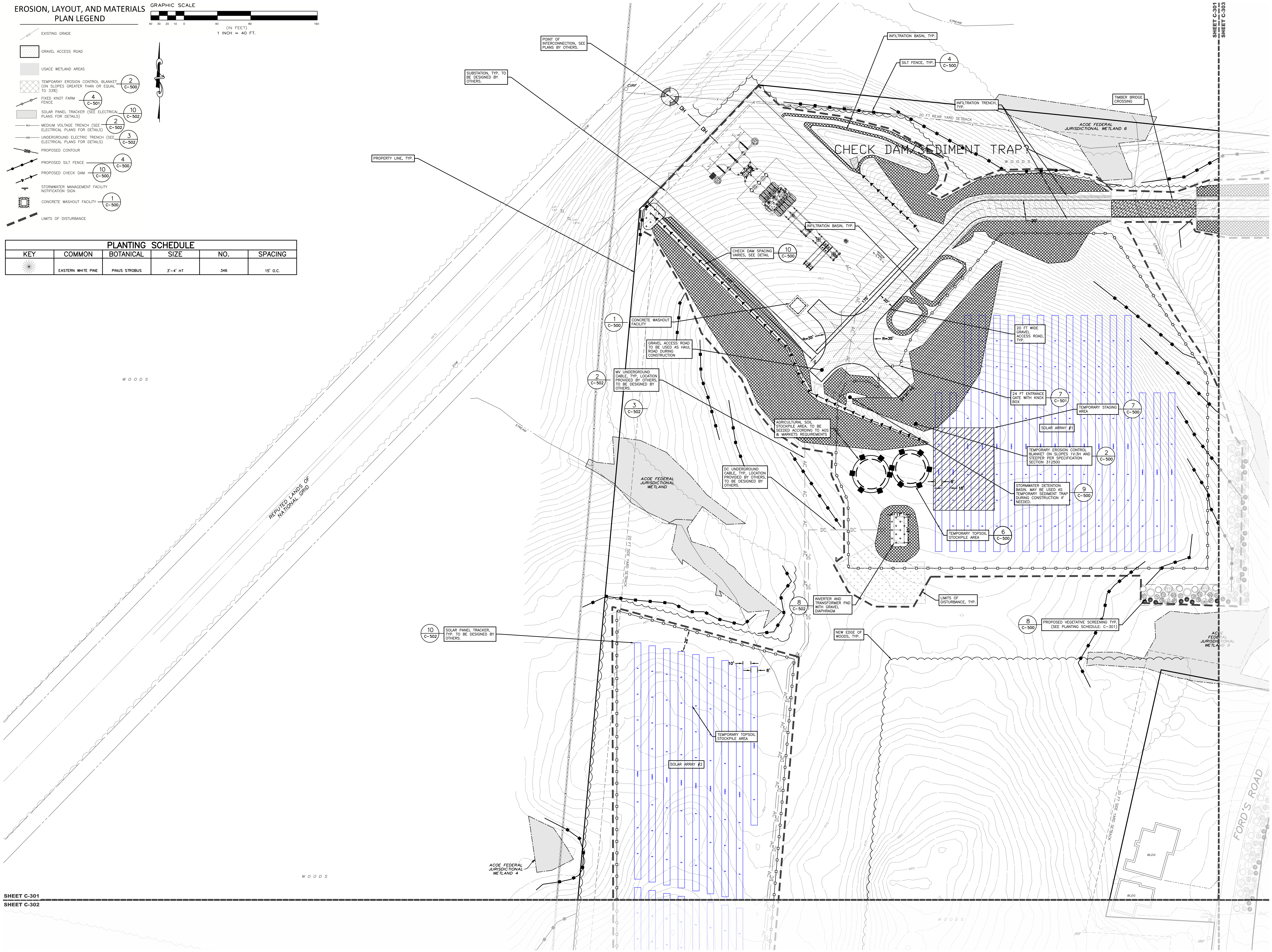
GRAPHIC SCALE

40 30 20 10 0 40 80 160

(IN FEET)

1 INCH = 40 FT.

PLANTING SCHEDULE					
KEY	COMMON	BOTANICAL	SIZE	NO.	SPACING
	EASTERN WHITE PINE	PINUS STROBUS	3'-4' HT	346	15' O.C.



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

DRAWN BY	FR
CHECKED BY	STA
EDP PROJECT NUMBER	13651

REVISION	DATE	BY
REVISIONS PER CLIENT COMMENT	4/28/23	STA
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

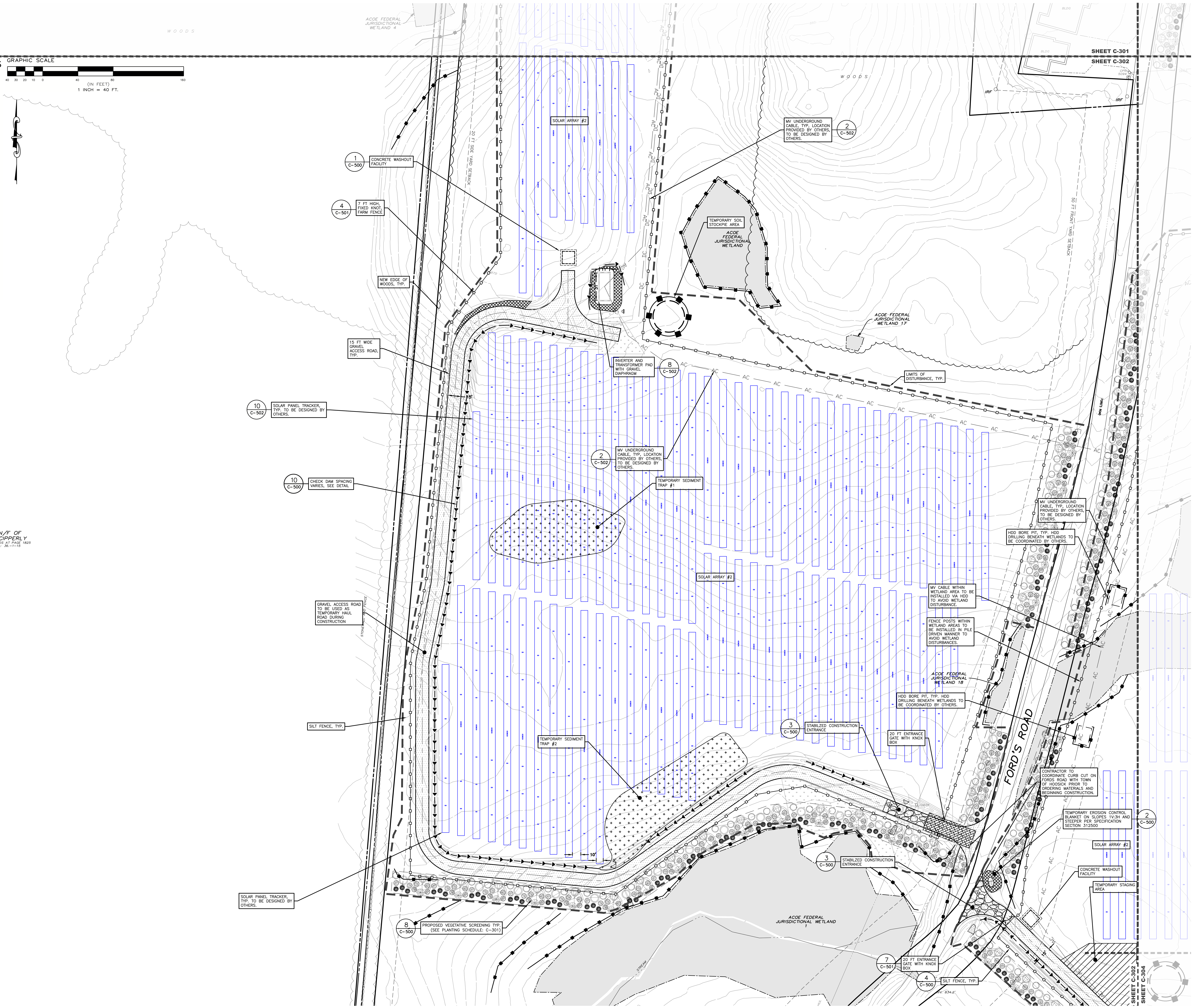
SHEET: C-301

Jul 28, 2023 03:11:46PM,

EROSION, LAYOUT, AND MATERIALS PLAN LEGEND

- EXISTING GRADE
- GRAVEL ACCESS ROAD
- USACE WETLAND AREAS
- TEMPOARAY EROSION CONTROL BLANKET (ON SLOPES GREATER THAN OR EQUAL TO 33%) — 2 / C-500
- FIXED KNOT FARM FENCE — 4 / C-501
- SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 10 / C-502
- MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 2 / C-502
- UNDERGROUND ELECTRIC TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 3 / C-502
- PROPOSED CONTOUR
- PROPOSED SILT FENCE — 4 / C-500
- PROPOSED CHECK DAM — 10 / C-500
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN
- CONCRETE WASHOUT FACILITY — 1 / C-500
- LIMITS OF DISTURBANCE

GRAPHIC SCALE
40 30 20 10 0 40 80 160
(IN FEET)
1 INCH = 40 FT.



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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EDP PROJECT NUMBER	13651

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REVISIONS PER CLIENT COMMENT	4/28/23	STA
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

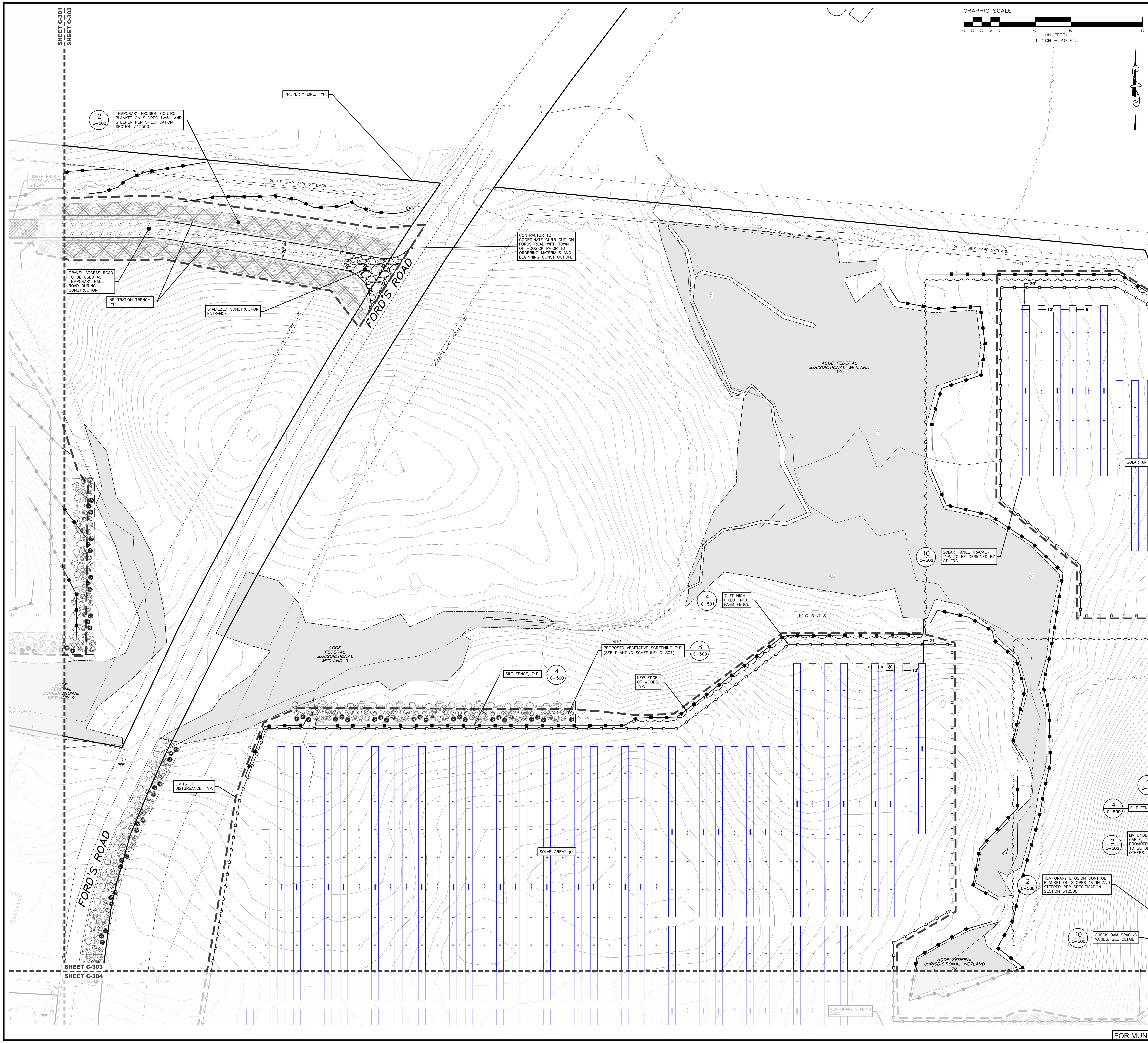
SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-302

C-302.dwg Jul 28, 2023 03:12:10PM



EROSION, LAYOUT, AND MATERIALS PLAN LEGEND

- EXISTING GRADE
- GRAVEL ACCESS ROAD
- USACE WETLAND AREAS
- TEMPOARAY EROSION CONTROL BLANKET (ON SLOPES 33% AND OVER) — 2 / C-500
- FIXED KNOT FARM FENCE — 4 / C-501
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- MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 2 / C-502
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- PROPOSED CHECK DAM — 10 / C-500
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- CONCRETE WASHOUT FACILITY — 1 / C-500
- LIMITS OF DISTURBANCE

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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR HAWTHORN SOLAR FARM

HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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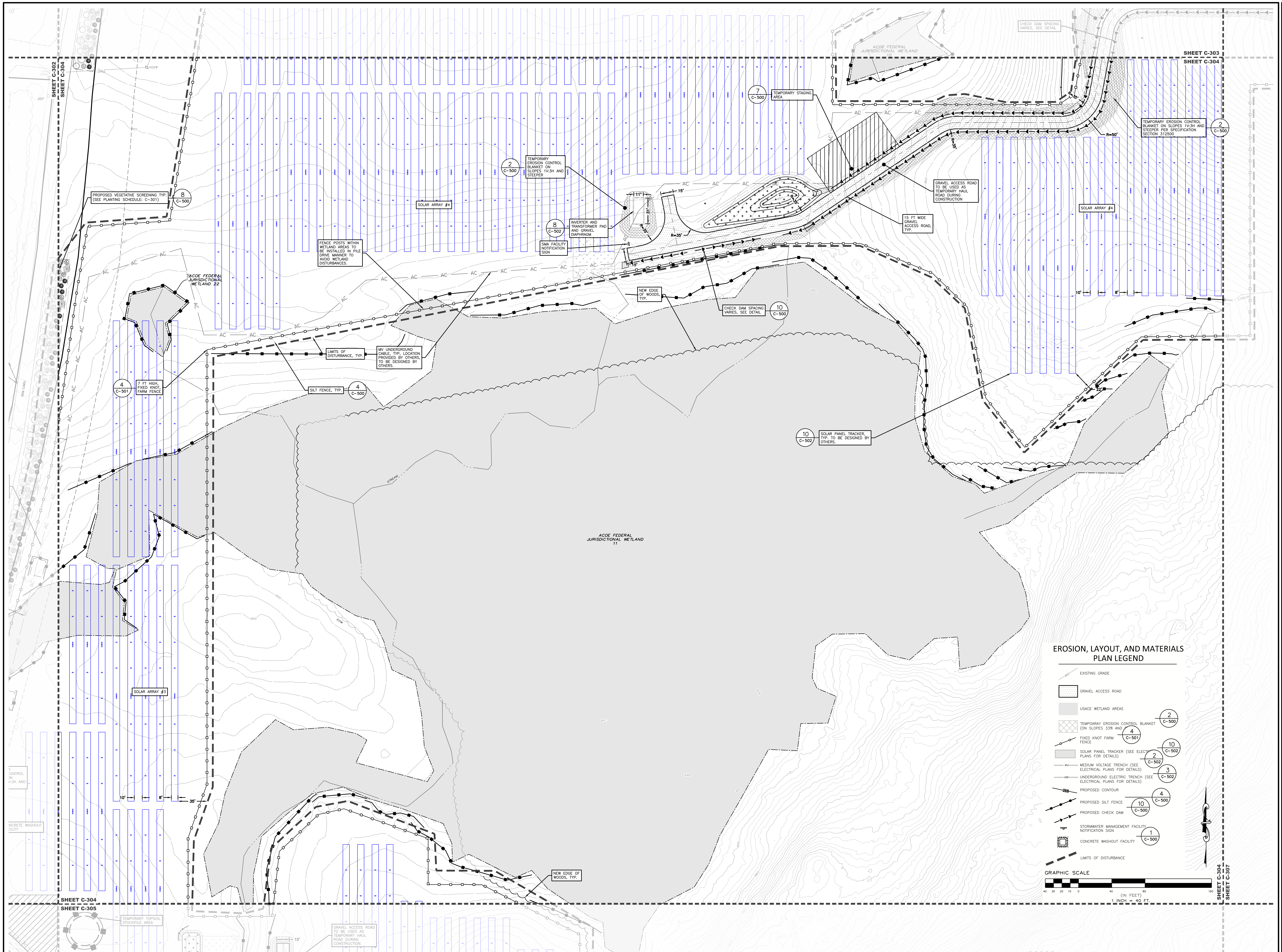
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-303



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC
FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

REVISION	DATE	BY
REVISIONS PER CLIENT COMMENT	4/28/23	STA
REVISIONS PER CLIENT COMMENT	5/16/23	[illegible]

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-304

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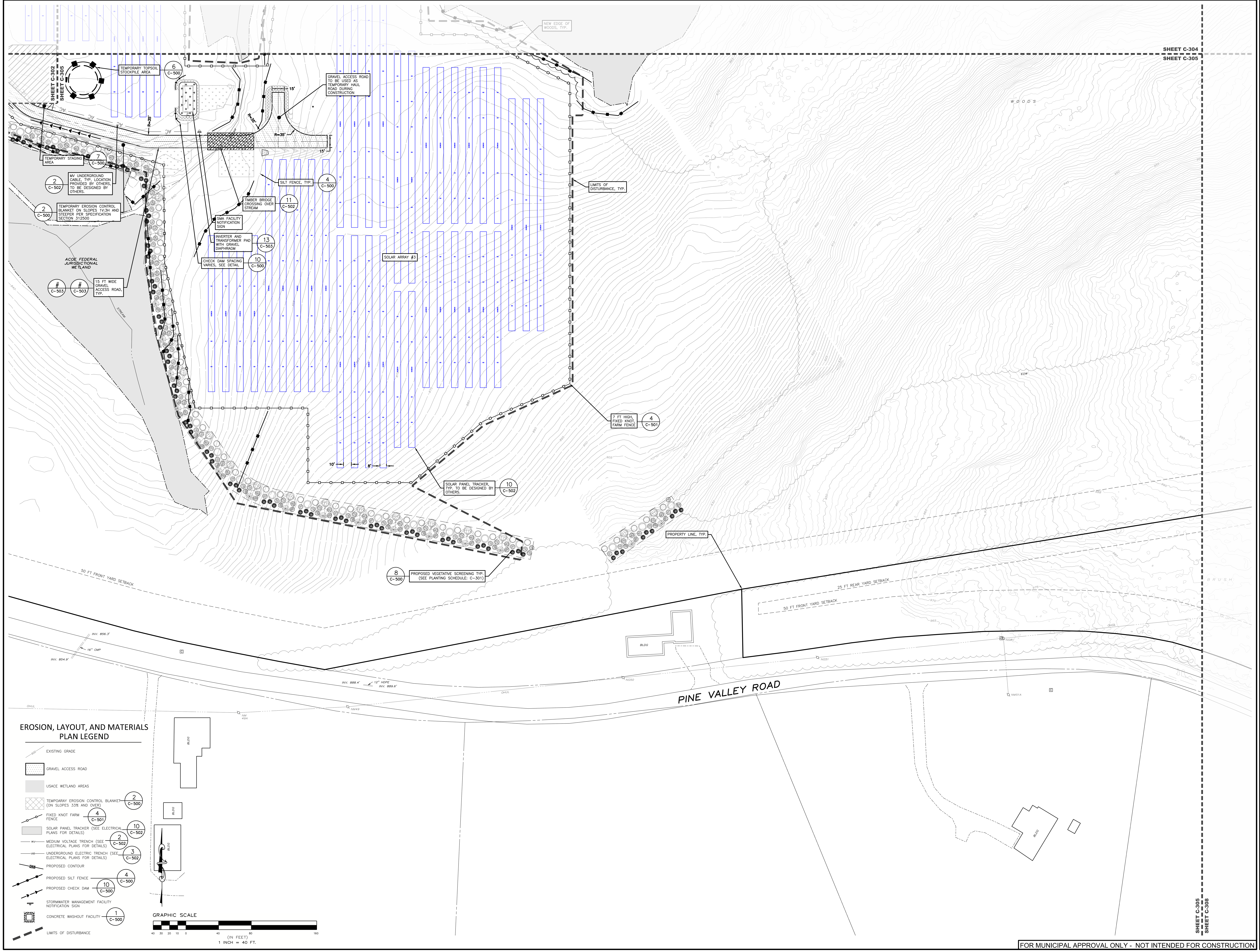

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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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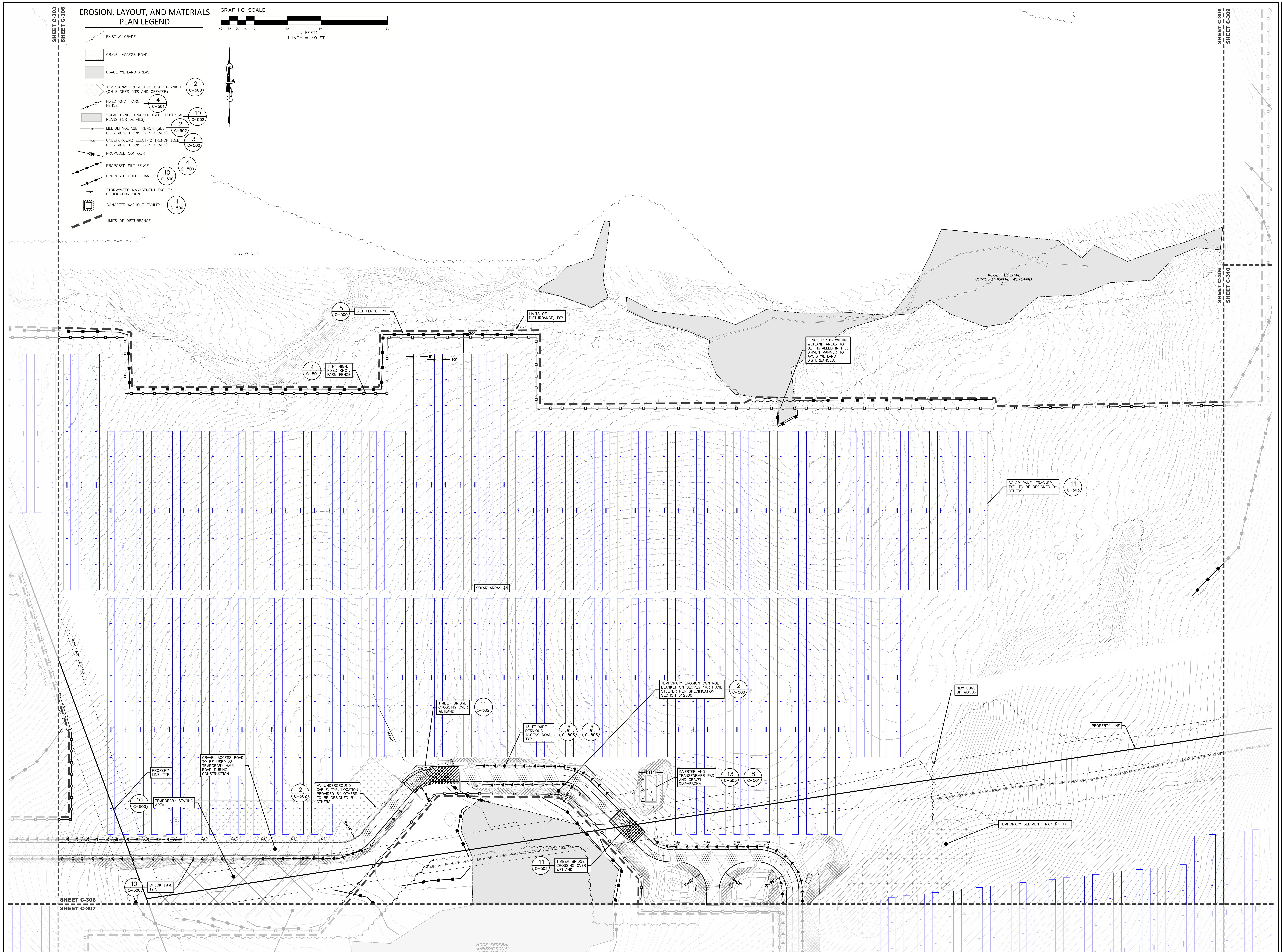
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE:
1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE:
EROSION, LAYOUT, AND MATERIALS PLAN

SHEET:
C-305



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR HAWTHORN SOLAR FARM

HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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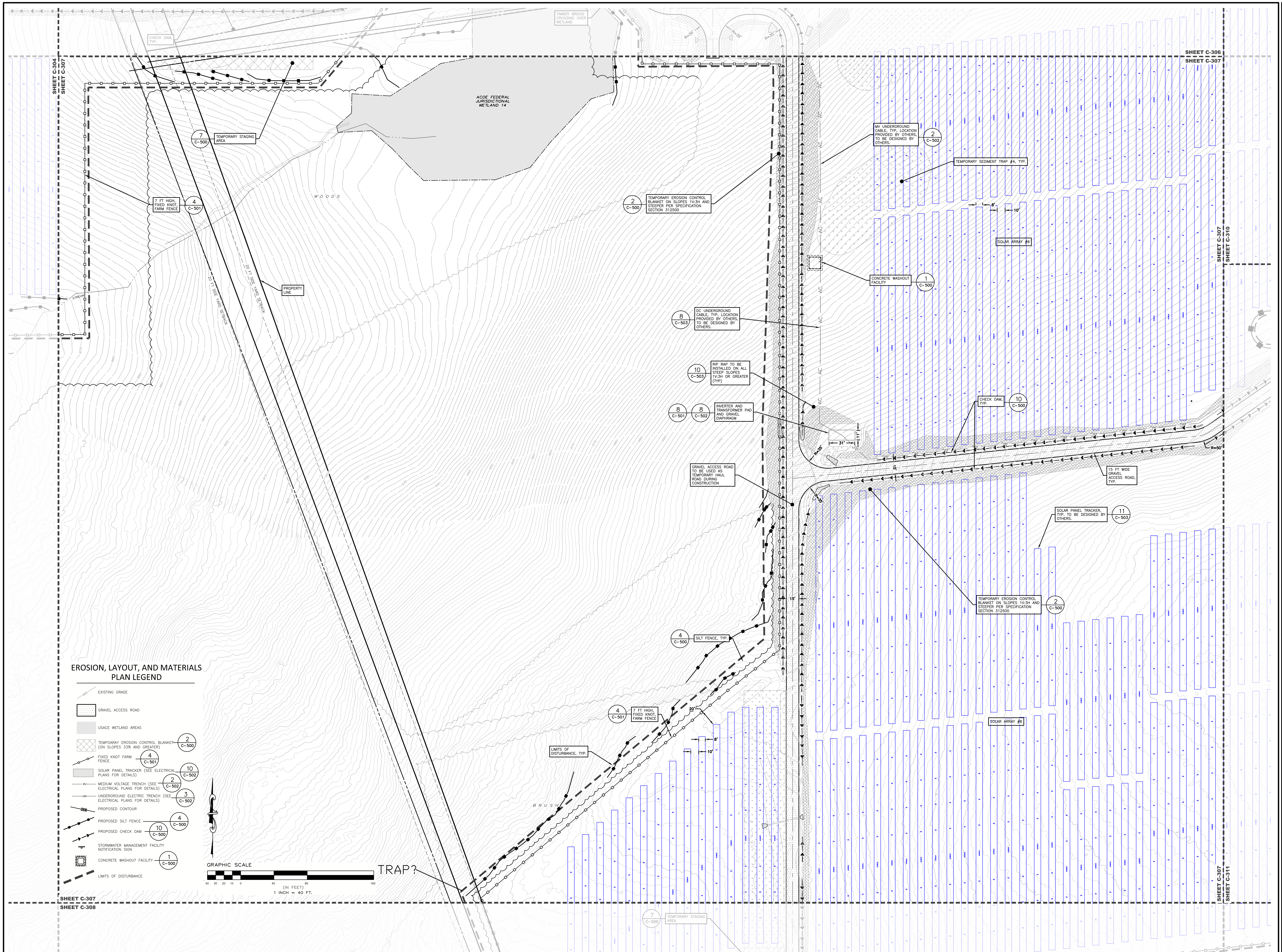
SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-306

C-306 - C-308.dwg Jul 28, 2023 03:13:46PM,



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR HAWTHORN SOLAR FARM

HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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REVISIONS PER CLIENT COMMENT	4/28/23	STA
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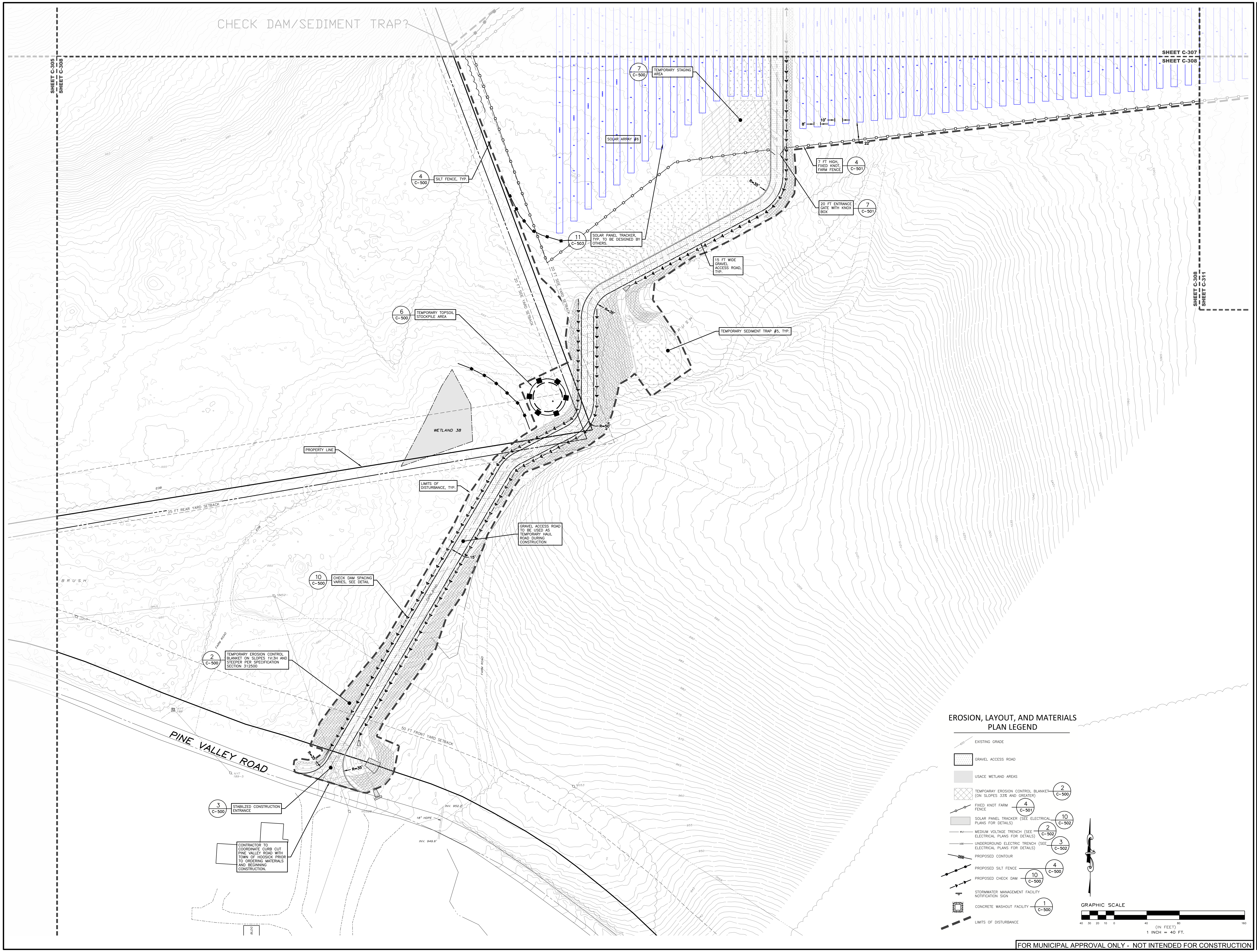
SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-307



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR HAWTHORN SOLAR FARM

HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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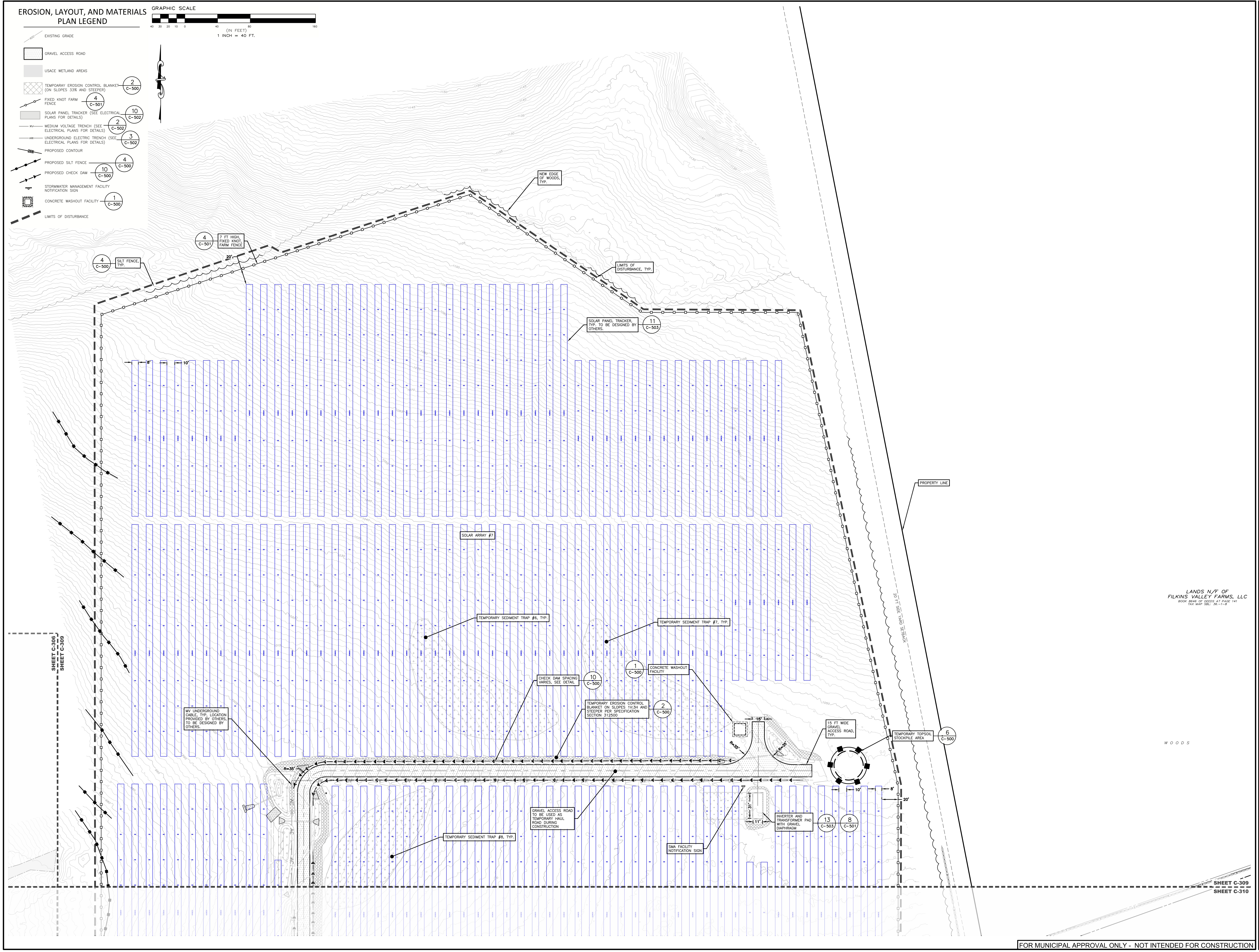
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-308



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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CHECKED BY	STA
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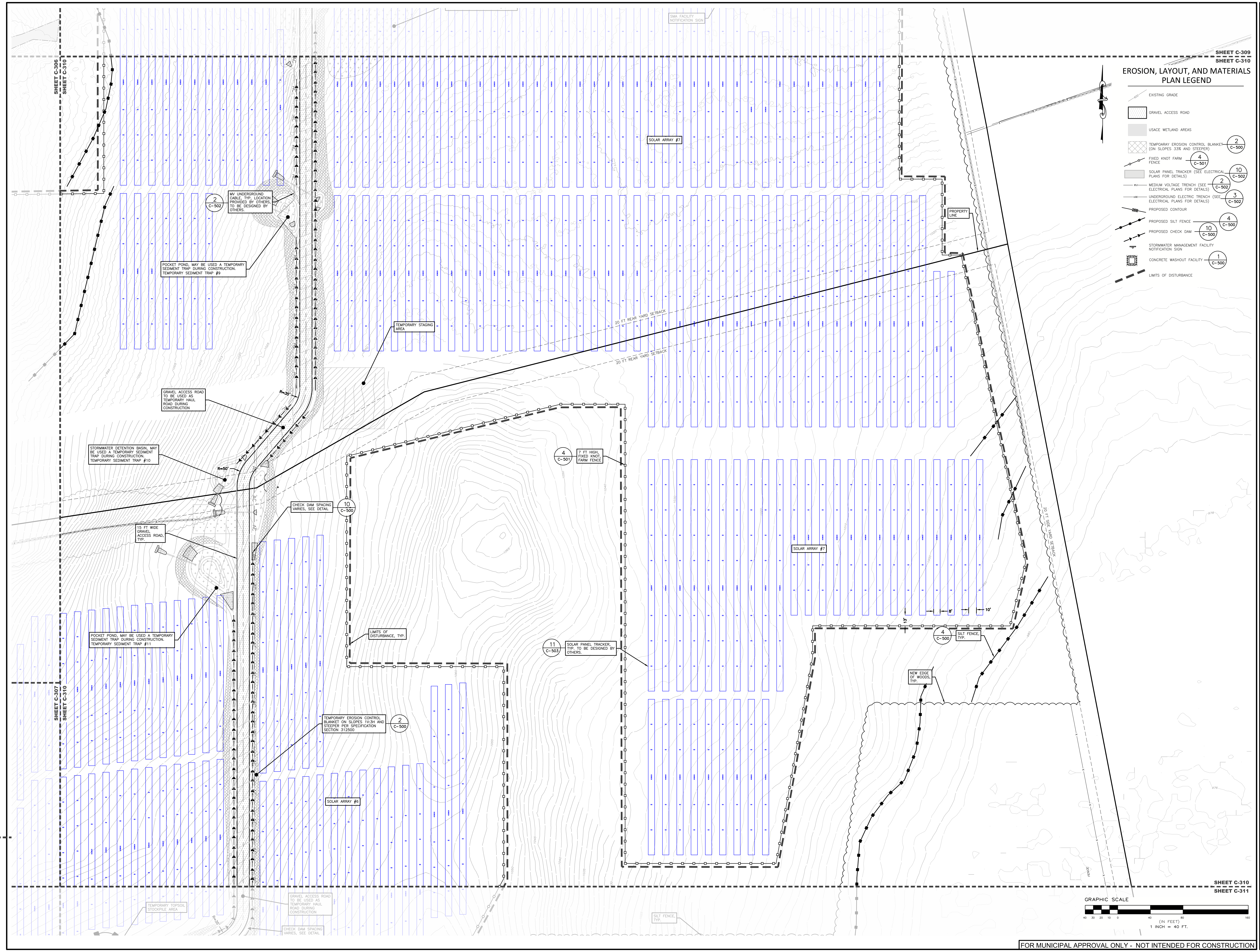
REVISIONS PER CLIENT COMMENT	4/28/23	STA
REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-309



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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REVISIONS PER CLIENT COMMENT	5/16/23	BMW

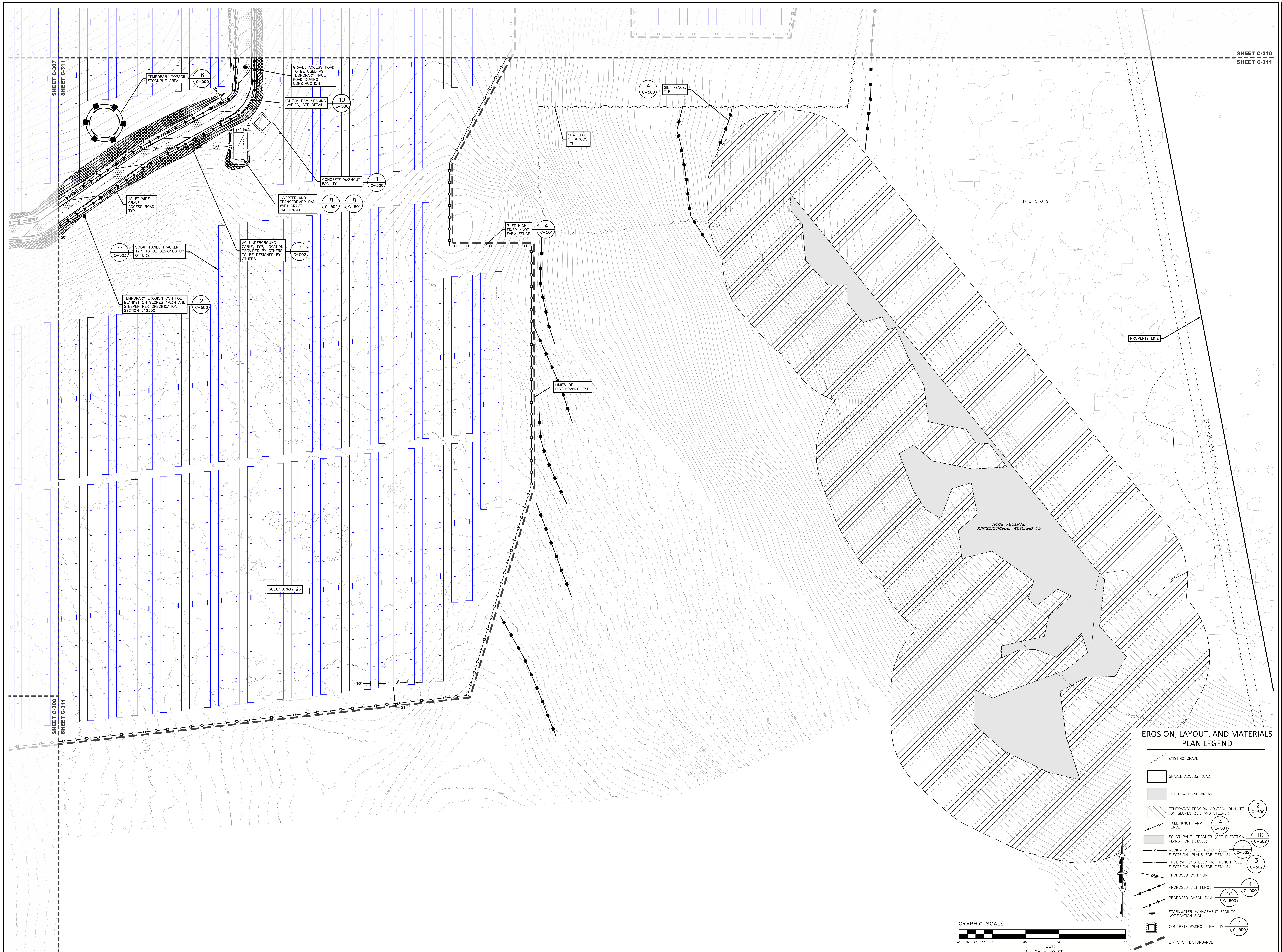
SCALE:
1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE:
EROSION, LAYOUT, AND MATERIALS PLAN

SHEET:
C-310

Jul 28, 2023 03:14:43PM,



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1
MARCH 22, 2023

PROPOSED SITE PLAN FOR HAWTHORN SOLAR FARM

HAWTHORN SOLAR, LLC

FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

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REVISIONS PER CLIENT COMMENT	5/16/23	BMW

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SHEET TITLE: EROSION, LAYOUT, AND MATERIALS PLAN

SHEET: C-311

C:\WORKFILES\Environmental Design Partnership\SharePoint Site - Documents\0 A-Z\RENSSELAER\HOOSICK\Fords Road\Hawthorn Solar\05 - Dwg\Details\SHEETS\C-309 - C-311.dwg Jul 28, 2023 03:14:52PM,

SECTION 3

Federal, State or Local Notice of Intent (NOI)

NYSDEC NOI Acknowledgement Letter - *Pending*

NYSDEC NOT Acknowledgement Form

NOI for coverage under Stormwater General Permit for Construction Activity

version 1.35

(Submission #: HPT-83XK-NBJN3, version 1)

Details

Submission Alias	Hawthorn Solar
Originally Started By	Brandon Ferguson
Alternate Identifier	Hawthorn Solar
Submission ID	HPT-83XK-NBJN3
Submission Reason	New
Status	Draft

Form Input

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)
Hawthorn Solar, LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Ezell

Owner/Operator Contact Person First Name
Sage

Owner/Operator Mailing Address
2045 Lincoln Hwy

City
Edison

State
New Jersey

Zip
08817

Phone
6174295212

Email
sezell@csenergy.com

Federal Tax ID
82-0895936

Project Location

Project/Site Name
Hawthorn Solar

Street Address (Not P.O. Box)
Fords Road

Side of Street
West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Hoosick

State
NY

Zip
12090

DEC Region
4

County
RENSSELAER

Name of Nearest Cross Street
Pine Valley Road

Distance to Nearest Cross Street (Feet)
0

Project In Relation to Cross Street
North

Tax Map Numbers Section-Block-Parcel
36.-1-

Tax Map Numbers
-11.1,-9.2,-10.1

1. Coordinates

Provide the Geographic Coordinates for the project site. The two methods are:
- Navigate to the project location on the map (below) and click to place a marker and obtain the XY coordinates.
- The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates.

Navigate to your location and click on the map to get the X,Y coordinates
42.8796292,-73.39937619999999

Project Details

2. What is the nature of this project?
New Construction

3. Select the predominant land use for both pre and post development conditions.

Pre-Development Existing Landuse
Cultivated Land

Post-Development Future Land Use
Other: Solar Energy Facility

3a. If Single Family Subdivision was selected in question 3, enter the number of subdivision lots.
NONE PROVIDED

---

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area.

*** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)
431.18

Total Area to be Disturbed (acres)
135

Existing Impervious Area to be Disturbed (acres)
0.00

Future Impervious Area Within Disturbed Area (acres)
4.75

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

---

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

A (%)
0

B (%)
0

C (%)
25

D (%)
75

7. Is this a phased project?
Yes

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

Start Date
04/01/2024

End Date
08/07/2026

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

9a. Type of waterbody identified in question 9?
Wetland/Federal Jurisdiction On Site (Answer 9b)

Other Waterbody Type Off Site Description
NONE PROVIDED

9b. If "wetland" was selected in 9A, how was the wetland identified?
Delineated by Consultant

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

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

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?
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 D (provided the map unit name is inclusive of slopes greater than 25%), E or F on the USDA Soil Survey?
No

If Yes, what is the acreage to be disturbed?
NONE PROVIDED

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

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?
Yes

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

17. Does any runoff from the site enter a sewer classified as a Combined Sewer?
Unknown

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

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

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

Required SWPPP Components

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

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

If you answered No in question 22, skip question 23 and the Post-construction Criteria and Post-construction SMP Identification sections.

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

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

SWPPP Preparer
The Environmental Design Partnership, LLP

Contact Name (Last, Space, First)
Alessandrini, , Stephanie

Mailing Address
900 Route 146

City
Clifton Park

State
NY

Zip
12065

Phone
5183717621

Email
salessandrini@edpllp.com

Download SWPPP Preparer Certification Form
Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form

2) The certified SWPPP preparer should sign this form
3) Scan the signed form
4) Upload the scanned document
[Download SWPPP Preparer Certification Form]

Please upload the SWPPP Preparer Certification

> NONE PROVIDED
> **Comment**
> NONE PROVIDED

Erosion & Sediment Control Criteria

25. Has a construction sequence schedule for the planned management practices been prepared?
Yes

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
Sediment Basin
Silt Fence
Stabilized Construction Entrance
Storm Drain Inlet Protection
Temporary Swale

Biotechnical
None

Vegetative Measures
Mulching
Protecting Vegetation
Seeding

Permanent Structural
Land Grading
Riprap Slope Protection

Other
NONE PROVIDED

Post-Construction Criteria

*** 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 Area
Preservation of Buffers
Reduction of Clearing and Grading
Locating Development in Less Sensitive Areas
Roadway 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).

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)
0.402

29. Post-construction SMP Identification
Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity that were used to reduce the Total WQv Required (#28).

Identify the SMPs to be used by providing 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 the Post-Construction SMP Identification section 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.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)
0.164

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28)?
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)] (acre-feet)
0.082

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

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; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. SMPs
Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30).

Also, provide the total impervious area that contributes runoff to each practice selected.

NOTE: Use the Post-construction SMP Identification section 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. (acre-feet)
2.307

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 - 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).
2.50

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

If Yes, go to question 36.

If No, sizing criteria has not been met; therefore, 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)
NONE PROVIDED

CPv Provided (acre-feet)
NONE PROVIDED

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

Overbank Flood Control Criteria (Qp)

Pre-Development (CFS)
553.42

Post-Development (CFS)
438.97

Total Extreme Flood Control Criteria (Qf)

Pre-Development (CFS)
987.38

Post-Development (CFS)
848.14

37a. The need to meet the Qp and Qf criteria has been waived because:
NONE PROVIDED

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?
Yes

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

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.
"...This site utilizes Scenario 1 of the NYSDEC DOW guidance for Solar Projects. Post construction stormwater management has been provided for the proposed impervious surfaces (concrete equipment pads), per the Item 5 note in the guidance..."

Poor on-site soils, steep topography, groundwater, and shallow bedrock make it impossible to meet 100% RRv reduction.

Post-Construction SMP Identification

Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs
Identify the Post-construction SMPs to be used by providing 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.

RR Techniques (Area Reduction)

Round to the nearest tenth

Total Contributing Acres for Conservation of Natural Area (RR-1)
0.00

Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)
0.00

Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
0.62

Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
0.62

Total Contributing Acres for Tree Planting/Tree Pit (RR-3)
0.00

Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)
0.00

Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)
0.00

RR Techniques (Volume Reduction)

Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)
0.00

Total Contributing Impervious Acres for Vegetated Swale (RR-5)
0.00

Total Contributing Impervious Acres for Rain Garden (RR-6)
0.00

Total Contributing Impervious Acres for Stormwater Planter (RR-7)
0.00

Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8)
0.00

Total Contributing Impervious Acres for Porous Pavement (RR-9)
0.00

Total Contributing Impervious Acres for Green Roof (RR-10)
0.00

Standard SMPs with RRv Capacity

Total Contributing Impervious Acres for Infiltration Trench (I-1)
0.36

Total Contributing Impervious Acres for Infiltration Basin (I-2)
1.45

Total Contributing Impervious Acres for Dry Well (I-3)
0.00

Total Contributing Impervious Acres for Underground Infiltration System (I-4)
0.00

Total Contributing Impervious Acres for Bioretention (F-5)
0.00

Total Contributing Impervious Acres for Dry Swale (O-1)
0.00

Standard SMPs

Total Contributing Impervious Acres for Micropool Extended Detention (P-1)
0.00

Total Contributing Impervious Acres for Wet Pond (P-2)
0.00

Total Contributing Impervious Acres for Wet Extended Detention (P-3)
0.00

Total Contributing Impervious Acres for Multiple Pond System (P-4)
0.00

Total Contributing Impervious Acres for Pocket Pond (P-5)
2.27

Total Contributing Impervious Acres for Surface Sand Filter (F-1)
0.00

Total Contributing Impervious Acres for Underground Sand Filter (F-2)
0.00

Total Contributing Impervious Acres for Perimeter Sand Filter (F-3)
0.00

Total Contributing Impervious Acres for Organic Filter (F-4)
0.00

Total Contributing Impervious Acres for Shallow Wetland (W-1)
0.00

Total Contributing Impervious Acres for Extended Detention Wetland (W-2)
0.00

Total Contributing Impervious Acres for Pond/Wetland System (W-3)
0.00

Total Contributing Impervious Acres for Pocket Wetland (W-4)
0.00

Total Contributing Impervious Acres for Wet Swale (O-2)
0.00

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

Total Contributing Impervious Area for Hydrodynamic
0.00

Total Contributing Impervious Area for Wet Vault
0.00

Total Contributing Impervious Area for Media Filter
0.00

"Other" Alternative SMP?
N/A

Total Contributing Impervious Area for "Other"
0.00

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

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.

Manufacturer of Alternative SMP
N/A

Name of Alternative SMP
N/A

Other Permits

40. Identify other DEC permits, existing and new, that are required for this project/facility.
None

If SPDES Multi-Sector GP, then give permit ID
NONE PROVIDED

If Other, then identify
NONE PROVIDED

41. Does this project require a US Army Corps of Engineers Wetland Permit?
No

If "Yes," then indicate Size of Impact, in acres, to the nearest tenth
NONE PROVIDED

42. 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.
NONE PROVIDED

MS4 SWPPP Acceptance

43. Is this project subject to the requirements of a regulated, traditional land use control MS4?
Yes - Please attach the MS4 Acceptance form below

If No, skip question 44

44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?
NONE PROVIDED

MS4 SWPPP Acceptance Form Download
Download form from the link below. Complete, sign, and upload.
MS4 SWPPP Acceptance Form

MS4 Acceptance Form Upload

> NONE PROVIDED
> **Comment**
> NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download
Download the certification form by clicking the link below. Complete, sign, scan, and upload the form.
Owner/Operator Certification Form (PDF, 45KB)

Upload Owner/Operator Certification Form

NONE PROVIDED

Comment

NONE PROVIDED

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)

SECTION 4

NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-20-001

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

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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 discharges*;

(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 *Discharge*s.** 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 **<u>not</u>** 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 <u>all</u> 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 not 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 not 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*, <u>in writing,</u> 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 <u>not</u> 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 <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> 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; <u>and</u> all areas of disturbance have achieved *final stabilization*; <u>and</u> all temporary, structural erosion and sediment control measures have been removed; <u>and</u> 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

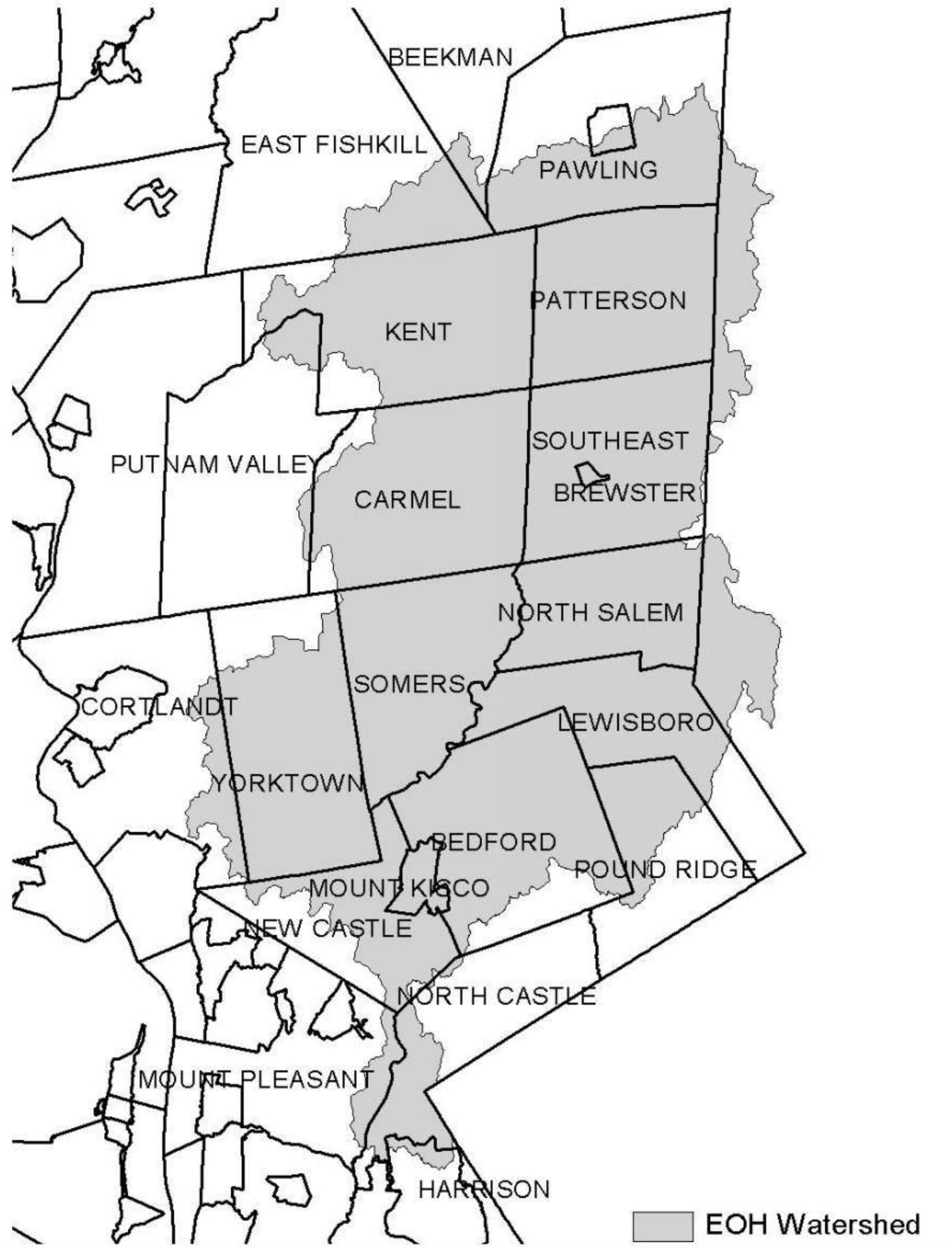


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

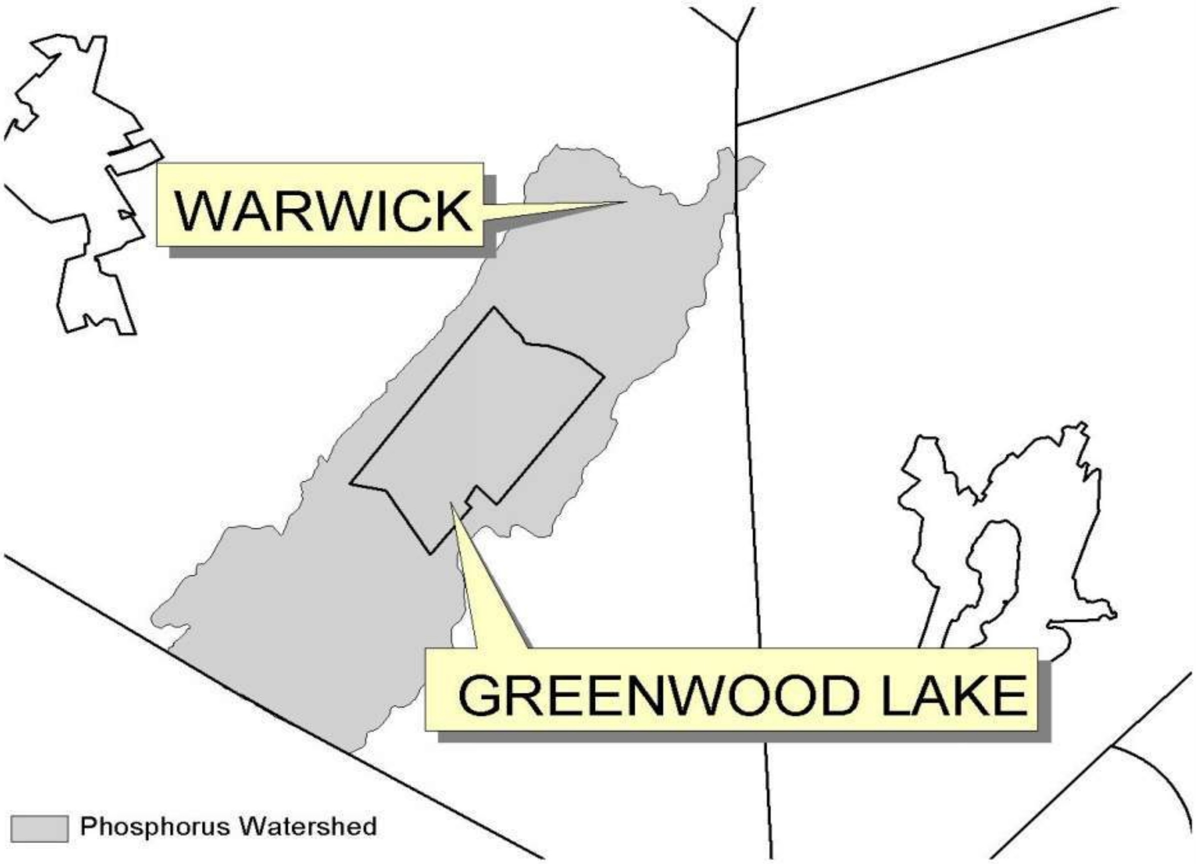


Figure 4 - Oscawana Lake Watershed

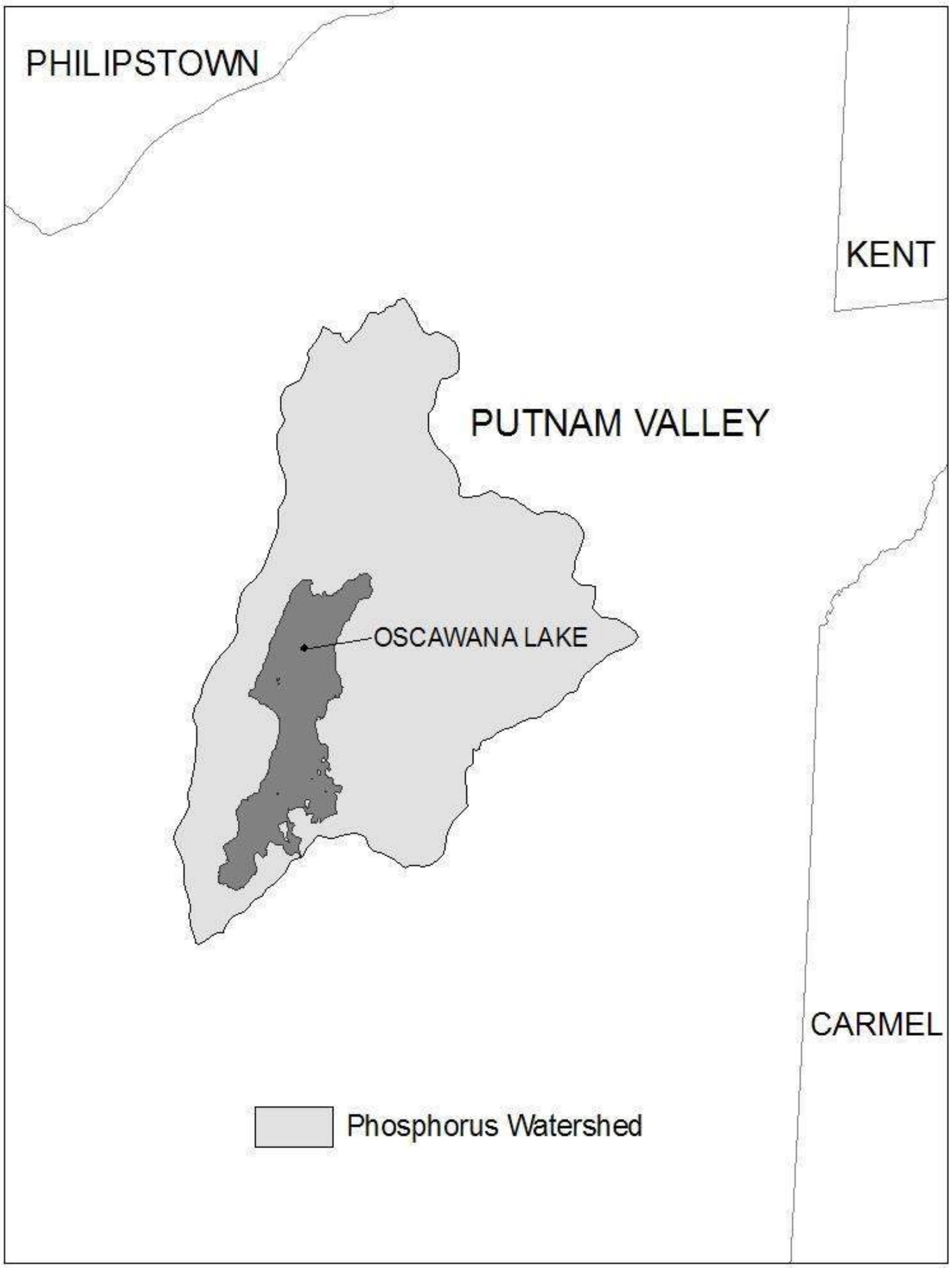
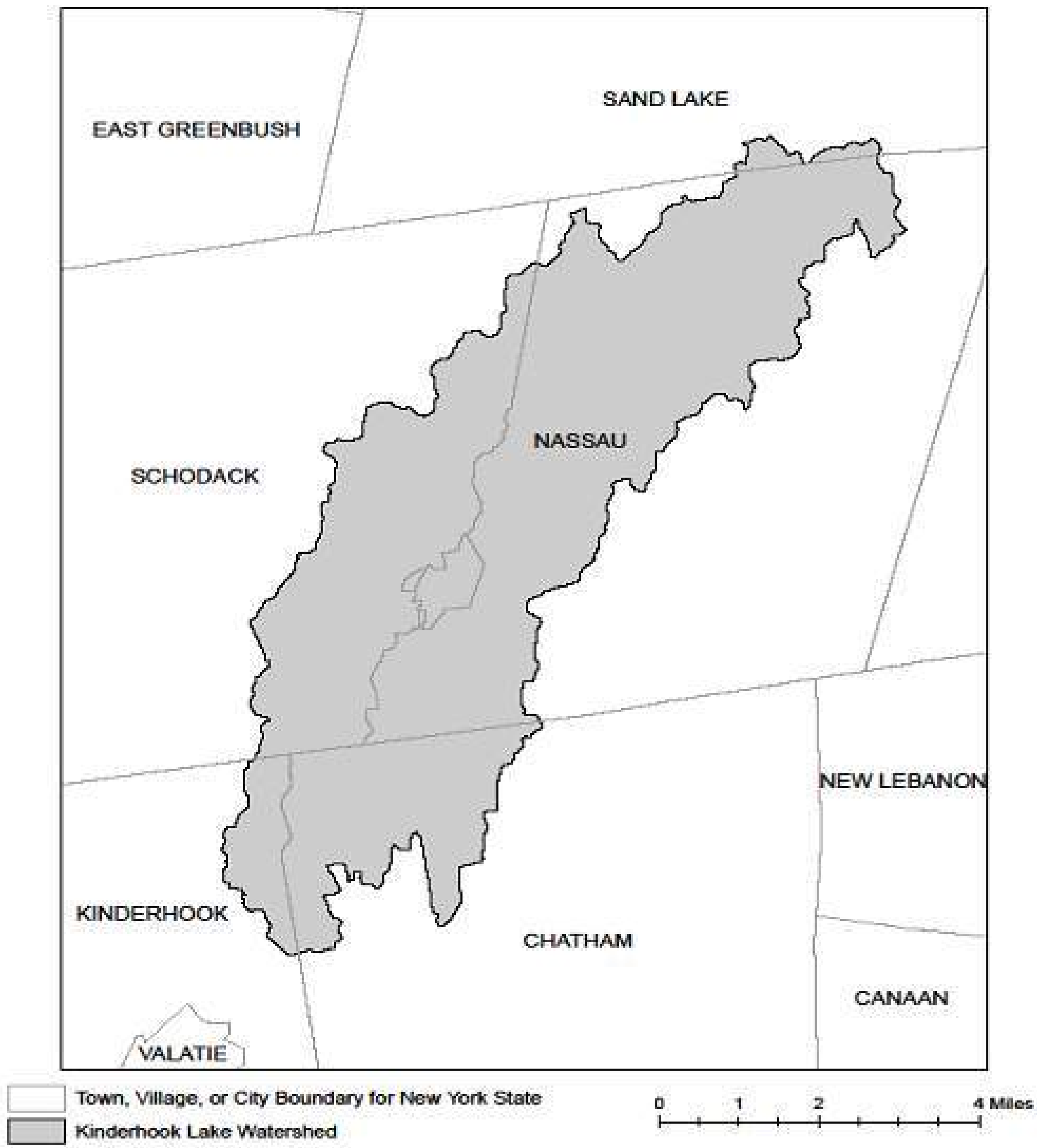


Figure 5 - Kinderhook Lake Watershed



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

SECTION 5

Certifications, Forms, Reports, Daily Logs And Long-Term Operation and Maintenance Inspection Checklists

STORMWATER POLLUTION PREVENTION PLAN

NOI PERMITTEE’S CERTIFICATION

FORM 1

Construction Site

HAWTHORN SOLAR FARM

Town of HOOSICK, RENSSELAER County, New York

STORMWATER POLLUTION PREVENTION PLAN DATED May, 2023

NOI PERMITTEE’S CERTIFICATION:

> "I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

NOI Permittee’s
Designated Project Manager: ________________________

Signed: ____

Printed Name: ____________________________________

Position: ____

Date: ____

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR'S CERTIFICATION LOG

FORM 2

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Designated Project Manager____________________

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR'S/SUBCONTRACTOR'S CERTIFICATION
FORM 3

This form to be completed for each contractor listed on Form 2. Reproduce as needed

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

CONSTRUCTION POLLUTION PREVENTION PROGRAM
DATED MAY, 2023

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."

The Contractor/Subcontractor further understands that the SWPPP and associated Erosion and Sediment Control Plans represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. Additional erosion and sediment control measures will be necessary during construction. It will be the responsibility of Contractor/Subcontractor to implement all additional erosion and sediment control measures necessary to protect the site during construction.

CONTRACTOR:	**SUB**CONTRACTOR:
Name (Print): ______________________________	Name (Print): ______________________________
Signature: ______________________________	Signature: ______________________________
Date: ______________________________	Date: ______________________________
Title: ______________________________	Title: ______________________________
Company Name: ______________________________	Company Name: ______________________________
Address: ______________________________	Address: ______________________________
______________________________	______________________________
Phone: ______________________________	Phone: ______________________________

Elements of SWPPP Contractor/Subcontractor responsible for: ______________________________

Name of Trained Contractor Responsible for SWPPP Implementation: ______________________________

Title of Trained Contractor Responsible for SWPPP Implementation: ______________________________

FORM 4
HAWTHORN SOLAR, LLC – HAWTHORN SOLAR PROJECT
SWPPP # __________

This form to be completed by Contractor's designated inspector at least weekly. Reproduce as needed.

SWPPP INSPECTION REPORTS

Page 1 of _______
Date ___________

Weather and Soil Conditions

Weather Conditions: ____

Soil Conditions: Dry [ ] Wet [ ] Saturated [ ] Snow Covered [ ] Frozen [ ]

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 or 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 property?
[ ] [ ] [ ] 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 and prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, 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. Water Bar

Yes No NA

[ ] [ ] [ ] Installed per plan with vehicle crossings stabilized with gravel.
[ ] [ ] [ ] Outlet located on undisturbed soil or lined with riprap.
[ ] [ ] [ ] Bar height is 12-inch minimum from bottom of channel with minimum base width of 6-foot.

3. Interceptor Dikes and Swales

Yes No NA

[ ] [ ] [ ] Installed per plan with minimum side slopes 1V:3H or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure.

SWPPP INSPECTION REPORT

Date ___________

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.
[ ] [ ] [ ] Four 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 site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence
Yes No NA
[ ] [ ] [ ] Installed on Contour, ten feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried six 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.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is one 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 three-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at maximum eight inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation _____% of design capacity.

This form to be completed by Contractor's designated inspector at least weekly. Reproduce as needed.

SWPPP INSPECTION REPORT

Date ___________

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 stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
Sediment accumulation is _____% of design capacity.

Dust Control Practices
1. Haul Road and Current Work Areas
Yes No NA
[ ] [ ] [ ] Are all traffic surface areas sufficiently treated to prevent fugitive dust?
[ ] [ ] [ ] Are any areas of site's non-traffic and work area experiencing wind erosion?
[ ] [ ] [ ] Are there any disturbed areas in need of temporary seed and mulch to protect surface from wind erosion?
[ ] [ ] [ ] Is watering truck on-site?
[ ] [ ] [ ] Is dust visible in air at any location of the site?

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site-specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

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

____

____

____

Description of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection (see Page 5 for Sketch). ____

____

____

____

FORM 4
HAWTHORN SOLAR, LLC – HAWTHORN SOLAR PROJECT
SWPPP # __________
This form to be completed by Contractor's designated inspector at least weekly. Reproduce as needed.

SWPPP INSPECTION REPORT

Date ___________

ADDITIONAL COMMENTS*:

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___________________________________ ___________________________________
Inspector (print name and title) Date and Time of Inspection

____ ____
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.

***Attach photographs of practices identified as needing corrective actions.**

NOTE: IN ACCORDANCE WITH PART IV.C.4 OF THE SPDES GENERAL PERMIT (GP-0-20-001), THE QUALIFIED INSPECTOR MUST NOTIFY THE OWNER OR OPERATOR AND APPROPRIATE CONTRACTOR OF ANY CORRECTIVE ACTIONS THAT NEED TO BE TAKEN. THE CONTRACTOR SHALL BEGIN IMPLEMENTING THE CORRECTIVE ACTIONS WITHIN ONE (1) BUSINESS DAY OF THIS NOTIFICATION AND SHALL COMPLETE THE CORRECTIVE ACTIONS IN A REASONABLE TIME FRAME.

STORMWATER POLLUTION PREVENTION PLAN
MODIFICATION REPORT
FORM 5

This form to be used only when Contractor's designated inspector believes changes to the SWPPP and/or Erosion and Sediment control plans is warranted. For example, additional erosion control measures needed or removal of specific control measures can be done without adverse impact. This form must be approved by Designated Project Manager prior to implementation.

Construction Site
HAWTHORN SOLAR FARM
<u>Town of HOOSICK, RENSSELAER County, New York</u>

CHANGES REQUIRED FOR STORMWATER POLLUTION PREVENTION PLAN

To:	**Designated Project Manager**	**Date:**	
Address:			
Telephone:			
Facsimile:			
Sent Via:	☐ **Facsimile**	☐ **E-mail**	☐ **US Mail**

INSPECTOR: _DATE:________________
(Print)

____
(Signature)

QUALIFICATIONS OF INSPECTOR:____

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN: ____________________
____
____

REASONS FOR CHANGES: ____
____
____

TO BE PERFORMED BY: ON OR BEFORE: ____________________

APPROVED BY DESIGNATED PROJECT MANAGER_________________________ DATE: _____________

STORMWATER POLLUTION PREVENTION PLAN
RECORD OF STABILIZATION AND CONSTRUCTION ACTIVITIES
FORM 6

Construction Site

HAWTHORN SOLAR FARM

Town of HOOSICK, RENSSELAER County, New York

A record of dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained until final site stabilization is achieved and the Notice of Termination is filed. *Reproduce copies of this form as needed.*

MAJOR GRADING, CONSTRUCTION, OR STABILIZATION ACTIVITIES

Description of Activity: ______________________________

Begin Date:_Site Contractor: ______________________________

Location: ______________________________

End Date: ______________________________

Description of Activity: ______________________________

Begin Date:_Site Contractor: ______________________________

Location: ______________________________

End Date: ______________________________

Description of Activity: ______________________________

Begin Date:_Site Contractor: ______________________________

Location: ______________________________

End Date: ______________________________

Description of Activity: ______________________________

Begin Date:_Site Contractor: ______________________________

Location: ______________________________

End Date: ______________________________

Description of Activity: ______________________________

Begin Date:_Site Contractor: ______________________________

Location: ______________________________

End Date: ______________________________

Designated Project Manager________________________

STORMWATER POLLUTION PREVENTION PLAN
RECORD OF TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES
FORM 6A

Construction Site

HAWTHORN SOLAR FARM

Town of HOOSICK, RENSSELAER County, New York

A record of the timing of temporary erosion and sediment control practices to be implemented, including the timing of initial placement and the duration that each practice should remain in place. The record may reflect the actual date of planned installation or the specific construction activity with which it will be associated. The timing of removal may reflect an actual date or the length of time over which the practice will be implemented.

TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ______________________________

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ______________________________

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ______________________________

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ______________________________

Location: ____

Projected Date/Timing of Removal: ____

Description of Practice: ____

Date/Timing of Initial Placement: Site Contractor: ______________________________

Location: ____

Projected Date/Timing of Removal: ____

Designated Project Manager________________________

YEAR 20___

STORMWATER POLLUTION PREVENTION PLAN
PROJECT RAINFALL LOG (to be completed by Contractor)

FORM 7

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
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STORMWATER POLLUTION PREVENTION PLAN

FINAL STABILIZATION CERTIFICATION /NOTICE OF TERMINATION CHECKLIST

FORM 8

This form is to be completed by Contractor and submitted to Designated Project Manager for approval only after Contractor believes all work regulated by SWPPP is complete.

Construction Site
HAWTHORN SOLAR FARM
Town of HOOSICK, RENSSELAER County, New York

1. ☐ **All soil disturbing activities are complete.**

2. ☐ **Temporary Erosion and Sediment Control Measures have been removed or will be removed at the appropriate time.**

3. ☐ **All areas of the Construction Site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 85% or equivalent measures have been employed.**

CONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that all storm water discharges associated with industrial activity from the identified project that are authorized by NPDES general permit have been eliminated and that all disturbed areas and soils at the construction site have achieved Final Stabilization and all temporary erosion and sediment control measures have been removed or will be removed at the appropriate time."

Company Name ______________________________

Name (Print) ______________________________

Signature ______________________________

Date ______________________________

APPROVED BY DESIGNATED PROJECT MANAGER________________________ DATE: _________

SECTION 6

Supplemental Information

1. **Stormwater Management Narrative**
2. **NYS DEC Environmental Resources Mapper**
3. **SHPO Correspondence, *Pending, by others***
4. **USFWS IPaC**
5. **FEMA Flood Mapping**
6. **USDA Web Soil Survey Results**
7. **Wetland Delineation Report*, by others***

Stormwater Management Narrative

HAWTHORN SOLAR, LLC

Fords Road

(Tax ID: 36.-1-10.0, 36.-1-11.1 and 36.-1-11.2)

Town of Hoosick

Rensselaer County, New York

Applicant:

Hawthorn Solar, LLC

2045 Lincoln Highway

Edison, NJ 08817

APRIL 2023

REVISED JULY 2023

Prepared By:

The Environmental Design Partnership, LLP

900 Route 146

Clifton Park, NY 12065

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Figure 2 – Pre-development Drainage Map

Figure 3 – Post-development Drainage Map

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Attachment A – NYS Green Infrastructure Worksheets

Attachment B – Stormwater Modeling Results

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phone (518) 371-7621

1.0 Introduction

Hawthorn Solar, LLC (a subsidiary of CS Energy, LLC) is proposing the development of a solar energy on three existing parcels of land totaling approximately 431± acres. The proposed project is located on the northern side of Pine Valley Road in the Town of Hoosick, New York. The proposed site development includes a solar energy facility which consists of approximately 123± acres of fenced area with solar panels spaced 17.5± feet center to center, the construction of approximately 9,200± linear feet (LF) of impervious access road, stormwater management areas, and eight-foot-high perimeter fencing. The total area of proposed disturbance is approximately 35.0± acres and 4.9± acres of impervious area will be added to the site.

A stormwater management system has been designed to provide pollutant removal, reduce channel erosion, prevent overbank flooding, and safely control extreme flood events in accordance with the NYS Stormwater Management Design Manual (Design Manual). The NYS Department of Environmental Conservation (NYSDEC) issued specific guidance in April 2018 relative to stormwater management design considerations for solar panel installations. The temporary erosion control measures and post-construction stormwater management systems for this project have been designed in accordance with those guidelines and subsequent discussions with the NYSDEC relative to their guidelines. Section 6.0 of this report addresses specific solar panel application guidance.

The proposed stormwater management system for the project will include infiltration basins, infiltration trenches, roadside swales, vegetated filter strips, and pocket ponds designed to attenuate and treat runoff from the proposed impervious access roads and solar equipment pads. The roadside swales will discharge to stormwater management devices depending on the longitudinal slope and cross slope of the road in respective areas of the site.

This narrative presents a review of the design concepts and parameters of the stormwater management system for the proposed solar energy facility, in accordance with NYSDEC solar application guidance, including the access roads and the equipment pads. The purpose of the stormwater management narrative is to assure that changes in the surface runoff characteristics, as a result of the proposed construction, will not adversely impact adjacent or downstream properties. On-site stormwater management will be implemented in accordance with the Design Manual and NYSDEC solar application guidance to accommodate both additional stormwater runoff and to provide water quality treatment according to the green infrastructure standards.

2.0 Existing Conditions

The site generally consists of open meadow, row crops, and wooded areas with some pockets of brushy areas. The topography of the land consists of a hillside and the site generally drains to the north. The typical slopes in the area of proposed development range from 0% to 20%, with

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localized areas over 20%. Elevations at the site vary between 820 and 1,065 feet above sea level.

2.1 Soil and Groundwater Conditions

The USDA Natural Resources Conservation Service Soil Survey identifies the soils on the site, in the area of proposed development, to consist of silty loams, which are somewhat poorly drained, and which are predominantly classified as Hydrologic Soil Group (HSG) C/D. The results from the USDA Natural Resources Conservation Soil Survey (Soil Survey) are included in Section 6 of the SWPPP.

Preliminary soil testing was performed on the project site in April, 2023. The results of the soil test pits were generally consistent with the results of the USDA Soil Survey. Groundwater varied between 38 inches to greater than 80 inches below the ground surface. Shale bedrock was present towards the western portion of the site at approximately 18” to 24” below the ground surface.

Infiltration testing was performed in the north-western corner of the project site. The stabilized infiltration rate was 18 inches per hour. A conservative rate of five inches per hour was assumed for all calculations.

3.0 Predevelopment Stormwater Analysis

The existing hydrologic conditions, in the area to be disturbed as a result of the proposed construction, were analyzed using Applied Microcomputer Systems’ “HydroCAD” computer modeling program. The HydroCAD stormwater modeling program employs the United States Department of Agriculture’s Soil Conservation Service (SCS) Technical Release 20 (TR-20) method for stormwater analysis. Using this modeling technique, the site is divided into “subcatchments” that represent specific areas contributing stormwater runoff to an existing, or proposed drainage feature. The subcatchments typically flow through “reaches” (i.e., swales, channels, or pipes) that convey the stormwater to storm basins or discharge areas.

A hydrologic model of the existing site was prepared using the Hydrocad program. Four (4) subcatchments were used to represent the existing drainage condition, see Figure 2.

The existing parameters of topography, vegetation, slope, and soil type are all incorporated into the predevelopment model.

Table 1 presents a summary of the pre-development stormwater peak discharge for the 1 year, 10 year and 100-year design storm events at the respective Design Points. As will be discussed in subsequent sections, the post development stormwater discharge rate has been limited to the predevelopment discharge rate for the 1-year, 10-year, and 100-year storm events.

Table 1: Pre-Development Runoff Rates

Storm Event	Design Point Discharge (cfs)				Total Discharge offsite (cfs)
	OFF#1	OFF#2	OFF#3	OFF#4	
1-Year (2.29")	6.65	85.43	67.81	51.79	211.68
10-Year (4.03")	22.08	220.46	181.60	129.28	553.42
100-Year (6.09")	43.22	390.70	327.76	225.70	987.38

The pre-development Curve Numbers (CN) for the existing ground covers are listed in Table 2.

Table 2: Pre-Development Ground Cover

Pre-Development Ground Cover Description	Curve Number
Woods, Good, HSG C	70
Woods, Good, HSG D	77
Row Crops, Contoured, Good, HSG A	65
Row Crops, Contoured, Good, HSG C	82
Row Crops, Contoured, Good, HSG D	86
Existing Gravel Surface	96

The weighted CN for the pre-development conditions for the site is approximately 83. The HydroCAD model results for the pre-development conditions are included within Attachment B.

Design Points OFF1, OFF2, OFF3 and OFF4 convey flows to wetland areas off site.

4.0 Stormwater Management Planning and Practice Selection

The site layout and stormwater design for this project was completed while taking into consideration the potential impacts on the existing site and downstream hydrology. Stormwater runoff from the existing site predominately sheet flows to the existing wetland areas to the east and west of the site. The stormwater management system will replicate similar practices.

Stormwater management on the site is designed to be treated with a combination of infiltration basins, infiltration trenches, pocket ponds, vegetated filter strips, and vegetated swales. These design methods were considered ideal on this site given the long, linear nature of the access roads, the variable nature of the onsite soils, and the variable site topography. Infiltration basins and infiltration trenches are considered standard stormwater management

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practices with 100% runoff reduction capacity. Vegetated swales and vegetated filter strips are considered green infrastructure techniques for runoff reduction by the Design Manual, while pocket ponds are considered acceptable stormwater management practices for water quality and quantity controls.

5.0 Post-Development Stormwater Analysis

The post-development conditions were analyzed using the HydroCAD computer modeling program.

Twenty-one (21) subcatchments were used to represent the post development drainage conditions of the site in the areas of the proposed development. Site improvements to the property will consist of a solar farm which will include 123± acres of fenced area with solar panels, approximately 9,200± LF of access road, eight equipment pads, one substation/transformer station, and chain link fencing. Also included, as permanent elements of the development, are the on-site stormwater management areas. Stormwater management practices have been designed to provide storage, treatment, and attenuation of stormwater runoff from the proposed impervious surfaces on the site.

Stormwater runoff from portions of the proposed impervious access roads will flow into roadside vegetated swales, where it will be conveyed to either the infiltration basins or pocket ponds. Generally, runoff from the solar equipment pads will flow to vegetated filter strips where it will receive treatment. Several solar equipment pads will flow to vegetated swales, which will then be conveyed to pocket ponds.

Runoff from the undeveloped site perimeter and solar array areas, outside of the stormwater management areas, will sheet flow off site, which is similar to predevelopment drainage patterns. In areas with slopes greater than 5% where solar panels will be installed, stormwater management controls will be put in place to promote sheet flow, such as overland flow dispersion devices or level spreaders. An alternate stormwater management solution may also be employed to promote sheet flow down the slows to aid in maintaining sheet flow patterns similar to predevelopment conditions. On slopes greater than 15% where solar panels will be installed, an appropriate engineered control will be put in place. This may consist of more frequently spaced level spreaders, overland flow dispersion devices, or an alternative practice. Any practice selected must be approved by the owner and verified by a New York State licensed professional engineer.

The post-development ground cover Curve Numbers (CN) are listed in Table 3.

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Table 3: Post-Development Ground Cover

Post-Development Ground Cover Description	Curve Number
Meadow, non-grazed, HSG C	71
Meadow, non-grazed, HSG D	78
Gravel Access Road	96
Woods, Good, HSG C	70
Woods, Good, HSG D	77

The weighted CN for the post-development conditions for the site is approximately 83. The HydroCAD model results for the post-development conditions are included within Attachment B. The contributing area to each stormwater management area is identified on Figure 3.

5.1 Stormwater Management Area #1 – Infiltration Basin

Stormwater Management Areas (SMA) #1 is designed as an infiltration basin. It will provide the primary detention and treatment of stormwater runoff from the site access roads and the inverter/transformer pad. Stormwater runoff contributing to SMA-1 will be collected in a vegetated swale located adjacent to the roadway.

Stormwater runoff contributing to SMA-1 will receive pretreatment through the vegetated swale that convey flows along the roadway prior to entering the proposed SMA. Additionally, pretreatment will be provided in the forebay within the infiltration basin. According to the Design Manual, a minimum pretreatment volume of 100% of the WQv must be provided prior to entry of the infiltration basin when the infiltration rates are 5 inches per hour or greater. Vegetated swales in HSG A soils allow for 20% pretreatment of the contributing WQv, when the appropriate soil modifications are made.

The total contributing area to SMA-1 is approximately 63,162± SF with approximately 63,162± SF of impervious area. The WQv contributing to SMA-1 is on the order of 5,485 CF; 20% of this volume is 1,097 CF.

The infiltration basin has been designed to attenuate storm events up to and including the 10-Year storm event without any discharge offsite.

Table 4: Infiltration Basin Summary Table

Stormwater Management Area Number	Contributing Area (Acres)	Volume
SMA-1	11.8	9,146 (cf)

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5.2 Stormwater Management Areas SMA-2 - SMA-17… – Pocket Ponds

SMA-2 - SMA-14 are designed as pocket ponds. They will provide the primary detention and treatment of stormwater runoff from the site access roads and the equipment pads.

Stormwater runoff contributing to SMA-2 - SMA-17 will be collected in vegetated swales located adjacent to the roadway.

Stormwater runoff contributing to SMA-2 - SMA-17 will receive pretreatment through the vegetated swales that convey flows along the roadway prior to entering the proposed SMAs. According to the Design Manual, a minimum pretreatment volume of 10% of the WQv must be provided. Vegetated swales in HSG D soils allow for 12% pretreatment of the contributing WQv, when the appropriate soil modifications are made.

Additionally, sediment forebays will be included within the proposed pocket ponds. The pocket ponds have been designed to provide a minimum pretreatment volume of 10% of the WQv.

Table 5: Pocket Pond Summary Table

Stormwater Management Area Number	Contributing Area (Acres)	Practice Storage Volume (CF)
SMA-2		1,537
SMA-3		382
SMA-4	2.0	7,166
SMA-5	0.1	3,544
SMA-6	0.6	5,345
SMA-7	7.1	2,513
SMA-8	13.7	504
SMA-9	0.3	2,004
SMA-10	0.4	741
SMA-11	5.2	784
SMA-12	0.2	3,920
SMA-13	10.3	3,006
SMA-14	0.7	218
SMA-15	0.2	1,220
SMA-16	7.6	7,405
SMA-17	0.1	1,002

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SMA-18	0.5	6,011

5.3 Stormwater Management Area #18 - 21 – Infiltration Trench

SMA-15 and SMA-16 are designed as infiltration trenches. The infiltration trenches will provide the primary detention and treatment of stormwater runoff from the north-eastern site access roads near the inverter/transformer pad. Stormwater runoff contributing to SMA #15 & 16 will be collected in the infiltration trenches located adjacent to the roadway.

Stormwater runoff contributing to SMA #15 and 16 will receive pretreatment through a surficial sand layer; stormwater runoff will filter through the sand layer prior to recharging into the infiltration trench and subsequently the ground. According to the Design Manual, a minimum pretreatment volume of 100% of the WQv must be provided prior to entry of the infiltration trench when the infiltration rates are 5 inches per hour or greater. All stormwater entering the infiltration trench will filter through the sand layer, which will provide the required pretreatment.

The infiltration trenches have been designed to attenuate storm events up to and including the 10-Year storm event without any discharge offsite.

Table 6: Infiltration Trench Summary Table

Stormwater Management Area Number	Contributing Area	Infiltration Trench Length (LF)
SMA-19	5,708	195
SMA-20	7,946	205
SMA-21	9,722	400
SMA-22	37,862	390

5.4 Stormwater Management Area #23 – 32– Vegetated Filter Strip

SMA-22 - SMA-31 are designed as vegetated filter strips. They will provide treatment of stormwater runoff from the site access roads and the equipment pads.

Stormwater runoff contributing to SMA-2 - SMA-14 will receive pretreatment through gravel diaphragms and overland flow dispersion devices that will re-establish sheet flow conditions in runoff.

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Table 7: Vegetated Filter Strip Summary Table

Stormwater Management Area Number	Contributing Area (SF)	Practice Area (SF)	Maximum Slope (%)
SMA-23	2,332	4,950	8.8
SMA-24	792	1,815	10.0
SMA-25	3,070	7,401	7.6
SMA-26	3,923	2,500	7.8
SMA-27	760	1,071	4.4
SMA-28	937	1,412	11.0
SMA-29	412	1,236	11.5
SMA-30	4,189	13,566	5.2
SMA-31	10,105	32,390	33.3
SMA-32	746	1,743	6.0
SMA-33	565	1,891	10.5

5.4 NYS Unified Stormwater Sizing Criteria

The post-development stormwater management system has been designed based on the Unified Stormwater Sizing Criteria as described in the following sections.

5.4.1 Water Quality (WQ_v)

In general, small storm events and the initial runoff from larger storm events are an environmental concern as this stormwater runoff typically contains roadway pollutants and thermal energy stored by the asphalt. In accordance with the Design Manual, this initial runoff is designated as the Water Quality Volume (WQ_v) and special attention is given to this volume of runoff to meet water quality objectives.

The water quality storage volume, WQ_v, is calculated as follows:

$$WQ_v = \frac{P \cdot R_v \cdot A}{12}$$

Where: WQ_v = water quality volume (acre-feet)

P = 90% rainfall event number

R_v = 0.05+0.009(I), where I is percent impervious cover

A = site area (acres), impervious area used with I = 100%

Refer to the Green Infrastructure worksheets for a summary of the WQv volumes and contributing areas.

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5.4.2 Runoff Reduction Volume (RRv)

The Design Manual specifies that runoff shall be reduced by 100% of the site WQv using standard SMPs with RRv capacity and green infrastructure techniques. The proposed project area is approximately 150.3± acres with a total proposed impervious area on the order of 4.6± acres. The resulting WQv for the site coverage is computed as 17,497± CF.

Site constraints, including poor soils, high groundwater, and steep topography prohibit the ability to meet 100% of the RRv reduction. The minimum RRv for the site has been calculated as 3,566 CF. See Attachment A for the minimum RRv calculations.

5.4.2.1 Green Infrastructure Practices

Portions of the access road and solar equipment pads will contribute to SMA #1 - SMA #16 via conveyance through vegetated swales. The swales have been designed to increase the time of concentration, reduce the peak discharge, and provide infiltration. The Design Manual allows for a RRv capacity of 12% of the contributing water quality volume in modified HSG “C” & “D” soils, and a RRv capacity of 20% of the contributing water quality volume in HSG “A” & “B” soils.

Portions of the access road and solar equipment pads will receive treatment via vegetated filter strips. The vegetated filter strips have been designed to have a maximum overall slope of 8% and gravel diaphragms. The Design Manual allows for a RRv capacity of 100% of the contributing water quality volume.

The runoff reduction for the vegetated filter strips is on the order of 2,022 CF. Attachment A contains the WQv and RRv calculations for this Green Infrastructure Practice.

Table 4 provides a summary of the runoff reduction provided.

Table 4: Runoff Reduction Volume Summary

Runoff Reduction Technique	RRv (cf)
Sheetflow to Filter Strips	2,022
SMA #1 (Infiltration Basin)	5,485
SMA #15-16 (Infiltration Trench)	1,355
Total Site Reduction	**7,151**
Minimum RRv	**3,566**
% of Min. RRv	**200%**

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Many of the green infrastructure practices recommended in the Design Manual were not applied to the stormwater management design on this site due to either site restrictions or the use of more feasible green infrastructure or standard SMP techniques in place of more restrictive and/or maintenance intensive practices. The following table discusses why the unused green infrastructure practices were not feasible.

Table 5: Non-Feasible Green Infrastructure Practices

Green Infrastructure Practice	Reason use is not feasible
Conservation of Natural Areas	Existing natural areas on site will be conserved to the greatest extent possible, solar facilities are considered temporary in nature, however the added reduction is minimal.
Porous Pavement	Porous Pavement is not economically feasible on this site.
Tree Planting/Tree box	Trees will be saved on the site as possible to conserve the natural areas. Trees will also be planted to maintain a buffer from the roadway and viewshed to the proposed site, though the resulting runoff reduction value for adding additional trees is minimal.
Disconnection of	No structures are proposed within the project area

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Rooftop Runoff	
Stream Daylighting	No streams exist on the project site.
Rain Gardens	Rain gardens are not recommended for commercial applications as well as not economically feasible.
Green Roofs	Rooftops are not present on the site.
Stormwater Planters	The proposed practices were deemed more economically feasible and effective as opposed to stormwater planters. Additionally, they require less maintenance.
Rain Barrels/Cisterns	Rain Barrels/Cisterns would require the ability to use the water between storm events which is not feasible for this project type.

5.4.3 Channel Protection (Cp_v)

In accordance with the Design Manual, stream channel protection, designed to protect stream channels from erosion, is accomplished by providing 24-hour extended detention of the one-year, 24-hour storm event. The Cp_v requirement is typically satisfied by providing additional storage above the water quality (WQ_v) volume.

Channel protection will be provided in the pocket ponds as additional storage above the low flow orifice to attenuate flows pre-development levels.

According to the Section 4.4 of the Design Manual, "…An individual orifice may not be required for CPv at sites where the resulting diameter of the ED orifice is too small, to prevent clogging. Alternatively, a minimum 3" orifice with a trash rack or 1" if the orifice is protected by a standpipe, having slots with an area less than the internal orifice are recommended…" In order to meet the full, 24-hour detention time requirement, the outlet orifice controlling the permanent pool of the proposed pocket ponds would need to be less than one inch in diameter, which may make it subject to clogging. Therefore, the proposed pocket ponds have been designed with outlet orifices of one inch in diameter. Standpipes will be included over the outlet orifice structures with ¾ inch perforations, as required by the Design Manual.

Channel protection is not required for the proposed infiltration practices.

5.4.4 Overbank Flood (Q_p)

Overbank Flood Control Criteria has been established to limit the frequency and magnitude of out-of-bank flooding generated through changes in runoff characteristics as a result of increased impervious surface area. In accordance with the Design Manual, providing sufficient storage volume to attenuate the post development 10-year, 24-hour peak discharge rate to the equivalent pre-development discharge rate controls overbank flooding.

The 10-year design storm event was analyzed using the HydroCAD stormwater modeling program (TR-20) under the post-development drainage conditions shown on Figure 3. Using a

10-year, 24-hour design storm of 4.03 inches, the stormwater management areas were designed with sufficient storage volume to limit the post-development 10-year, 24-hour peak discharge rate to the pre-development discharge rate. The following table presents the pre- and post-development discharge rates for the offsite discharge. According to the general permit, a change in pre- to post-development hydrology is considered to be an increase in discharge rates above five (5) percent. As indicated below, the post-development discharge rate is essentially equal to the pre-development rate as required.

Table 7: Overbank Flow Runoff Summary

Design Point	10-year (4.03”) runoff rate (cfs)	
	Predevelopment	Post-Development
OFF#1	22.08	20.15
OFF#2	220.46	186.08
OFF#3	181.60	129.75
OFF#4	129.28	102.99
T (TOTAL)	553.42	438.97

5.4.5 Extreme Storm (Q_f)

In accordance with the Design Manual, the stormwater management system must attenuate the post development 100-year, 24-hour peak discharge rate to the predevelopment rate while providing safe passage of this storm event.

The 100-year storm event was analyzed using the HydroCAD stormwater modeling program (TR-20) under the post-development drainage conditions shown in Figure 3. Using a 100-year, 24-hour design storm of 6.09 inches, the stormwater management areas were designed with sufficient storage volume to limit the post-development 100-year, 24-hour peak discharge rate to the predevelopment discharge rate. The following table presents the pre- and post-development discharge rates for the offsite discharge. According to the general permit, a change in pre- to post-development hydrology is considered to be an increase in discharge rates above five (5) percent. As indicated, the post-development discharge rate is less than the predevelopment rate as required.

Table 8: Extreme Storm Runoff Summary

Design Point	100-year (6.09”) runoff rate (cfs)

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	Predevelopment	Post-Development
OFF#1	43.22	40.80
OFF#2	390.70	357.74
OFF#3	327.76	246.15
OFF#4	225.70	203.45
T (TOTAL)	987.38	848.14

6.0 NYSDEC Solar Panel Construction Guidance Stormwater Analysis

Due to the increase in solar projects throughout New York State, the Department of Environmental Conservation (NYSDEC) released guidance for solar panel stormwater permitting and stormwater pollution prevention plans (SWPPP) in April 2018. The NYSDEC Solar Panel Construction Guidance (SPCG) classifies solar projects under two separate "Scenarios". Scenario 1 Solar Projects are considered *"…Land clearing and grading for the purposes of creating vegetated open space…".* These projects typically require a SWPPP that only addresses erosion and sediment controls. Solar projects are categorized as Scenario 1 if they are designed and constructed in accordance with a specific set of six criteria. Solar projects that aren't designed and constructed to meet these six (6) criteria are classified as Scenario 2 and require a SWPPP that addresses post-construction stormwater management practices which are designed in accordance with the sizing criteria in the Designed Manual. Table 9 provides an analysis of the six (6) criteria provided by the NYSDEC SPCG as they pertain to the Hawthorn Solar Energy Facility:

Table 9: NYSDEC Solar Panel Criteria

Scenario 1 Criteria	Proposed Solar Farm Design
1. Solar panels are constructed on post or rack systems and elevated off the ground surface.	Solar panels will be installed on mechanically driven posts with approximately 36 inches between the bottom of the panel and existing grade. The panels are part of a tracker system that follows the sun throughout the day
2. The panels are spaced apart so that rain water can flow off the down gradient side of the panel and continue to sheet flow across the ground surface*.	Panels are spaced 17.5± feet from center to center with 9.57± feet between the panel rows (adjacent edge of panel to adjacent edge of panel). The typical width of a solar panel rack is 7.93± feet. The panel spacing is greater than the panel width, therefore, sheet flow is maintained.
3. For solar panels constructed on slopes, the individual rows of solar panels are generally installed along the contour so rain	Panels are constructed generally along the contours to maintain sheet flow. In locations where panels are not along contours, and slopes are greater than 5%, a stormwater management control

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water sheet flows down slope*.	such as level spreaders, overland flow dispersion devices, or an alternative option will be selected to maintain sheet flow down slope in accordance with discussions with NYSDEC.
4. The ground surface below the panels consist of a well-established vegetative cover.	All ground surface below the panels will have well-established vegetative cover in accordance with the "Final Stabilization" noted in Appendix A of the SPDES Construction General Permit (see Section 4 of the SWPPP).
5. The project does not include the construction of any traditional imperious areas.	The proposed project does contain eight solar equipment pads, one transformer pad, and gravel access roads, all of which are considered impervious. **This project therefore falls under Scenario 2.**
6. Construction of the solar panels will not alter the hydrology from pre-to post development conditions.	Based on the analysis performed in this report, the project will create minor disturbance, and add impervious area however, the pre-to post development hydrology will be maintained.

Criteria 5 of the NYSDEC SPCG is not met as traditional impervious area will be added to the site, therefore, this project falls under Scenario 2 and will require post-construction stormwater management controls for impervious areas of the project (gravel access roads, equipment pads, and transformer pad). This interpretation is also included in the **Notes- Item 5 portion of the NYSDEC SPCG.

*The NYSDEC SPCG also references the Maryland Department of the Environment's (MDE) "Stormwater Design Guidance - Solar Panel Installations" memo for further guidance on panel installation. The MDE's memo provides guidance using two examples of solar panels to provide direction; Example 1 references solar panels which are installed on average slopes less than 5% and Example 2 references solar panels which are installed on average slopes between 5% and 10%.

<u>Example 1- Using Non-Rooftop Disconnection Where the Average Slope ≤ 5%</u>

MDE states that in order for solar panels to qualify as non-rooftop disconnect, the disconnection length must be greater than or equal to the solar panel width. The proposed solar panel project uses a rack system with a width of 7.93± feet and a disconnection length of 9.57± feet. The spacing between the panel rows is greater than the width of the solar racks, therefore, the solar panels meet the MDE requirements for runoff treatment under non-rooftop disconnection.

<u>Example 2- Using Non-Rooftop Disconnection Where the Average Slope ≥ 5% but ≤ 10%</u>

In this example, the MDE advises the use of level spreaders along the drip edge of the panels to maintain sheet flow and dissipate energy in addition to maintaining a disconnection length greater than or equal to the solar panel width. The MDE example uses fixed mount solar panels,

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which have a fixed drip edge. The proposed tracker panels will move throughout the day and therefore have a moving drip edge. Therefore, in areas where slopes are ≥ 5% but ≤ 10%, overland flow dispersion devices are proposed which are parallel to contours in ±100-foot intervals in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (Blue Book) requirements for level spreaders and discussions with NYSDEC representatives regarding the application of the NYSDEC SPCG for use with tracker style systems.

In accordance with the aforementioned guidance, post-construction stormwater management is required for all new impervious areas on the project site. Therefore, SMA #1 through SMA #16 have been designed in accordance with the Design Manual to treat the proposed gravel access roads, solar equipment pads, and transformer pad. Since this project has been designed in accordance with Criteria 1 through Criteria 4 of the NYSDEC SPCG Criteria, the WQv and RRv requirements for the solar panels do not need to be addressed.

7.0 Summary

Development of the proposed project site will slightly alter the stormwater drainage characteristics of the site; impervious area will be added in the form of a gravel access road and solar equipment pads. Changes to the stormwater drainage characteristics of the site have been evaluated in accordance with the Design Manual. The proposed stormwater management system has been designed to comply with the recommendations in the Design Manual and the NYSDEC SPCG as it relates to maintaining sheet flow, providing water quality/runoff reduction/channel protection volume, overbank flood control and extreme flood control for new development projects.

The proposed stormwater management system has been designed to attenuate and treat the stormwater runoff generated from the contributing areas for storm events to the pre-development rates, up to and including the 100-Year design storm event. The proposed stormwater management design includes the use of vegetated swales, vegetated filter strips, pocket ponds, infiltration trenches, and an infiltration basin. Stormwater modeling results indicate the ability to reduce the overall post-development discharge rate from the site as summarized in Table 10.

Table 10: Post Development Stormwater Peak Discharge Rates

Peak Discharge Rates in cfs	1-Year Storm	10-Year Storm	100-Year Storm
Pre-Development	211.68	553.42	987.38
Post-Development	127.86	438.97	848.14

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Overall Reduction (cfs)	83.82	114.45	139.24

Through the implementation of acceptable stormwater management practices, recommended by the NYS Stormwater Management Design Manual, the proposed project will not adversely affect adjacent or downstream properties.

Prepared by:

The Environmental Design Partnership, LLP

Stephanie Alessandrini, P.E.

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Figures

1. Site Location map
2. Pre-Development Drainage Map
3. Post Development Drainage Map

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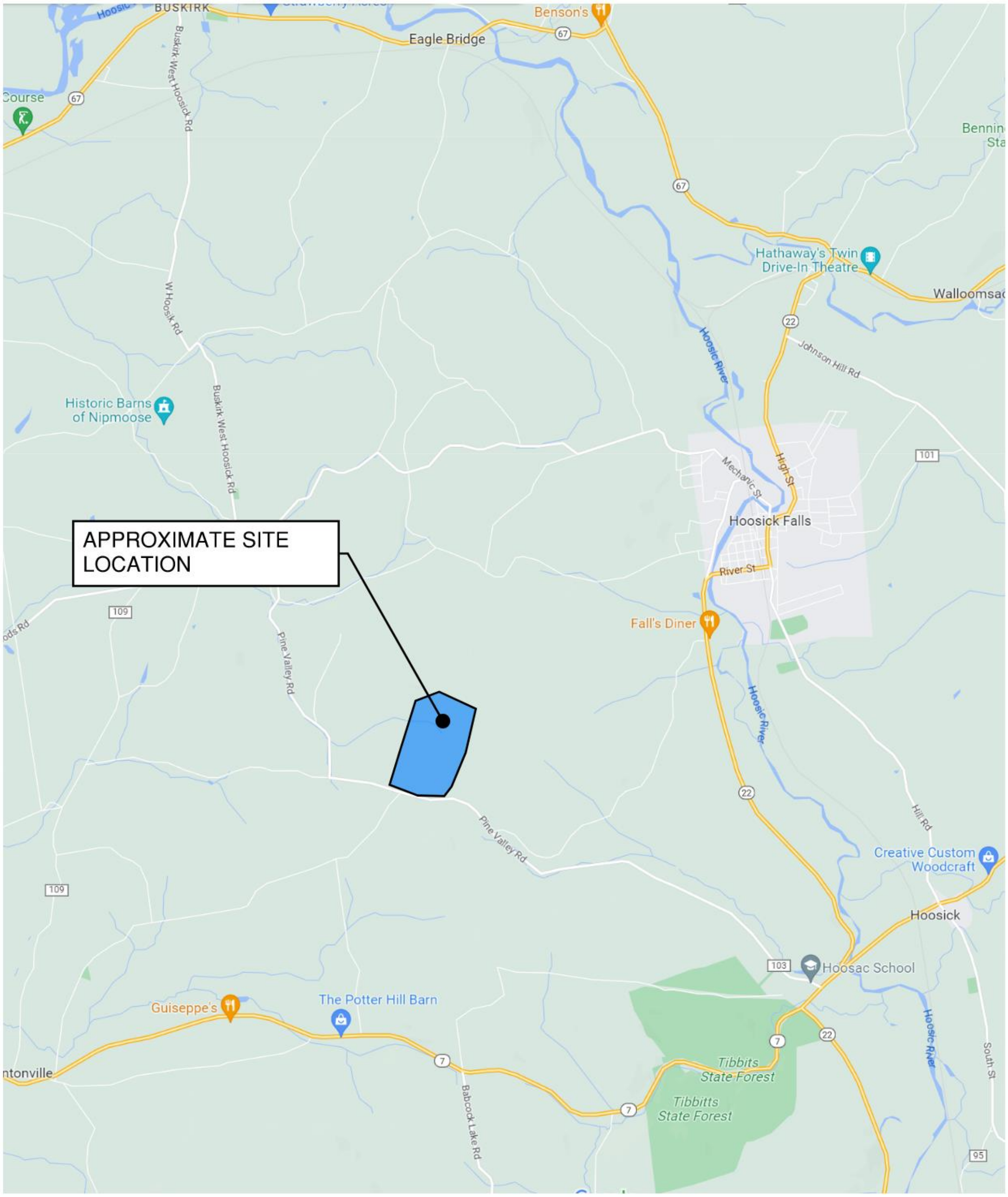

Figure 1: Site Location Map

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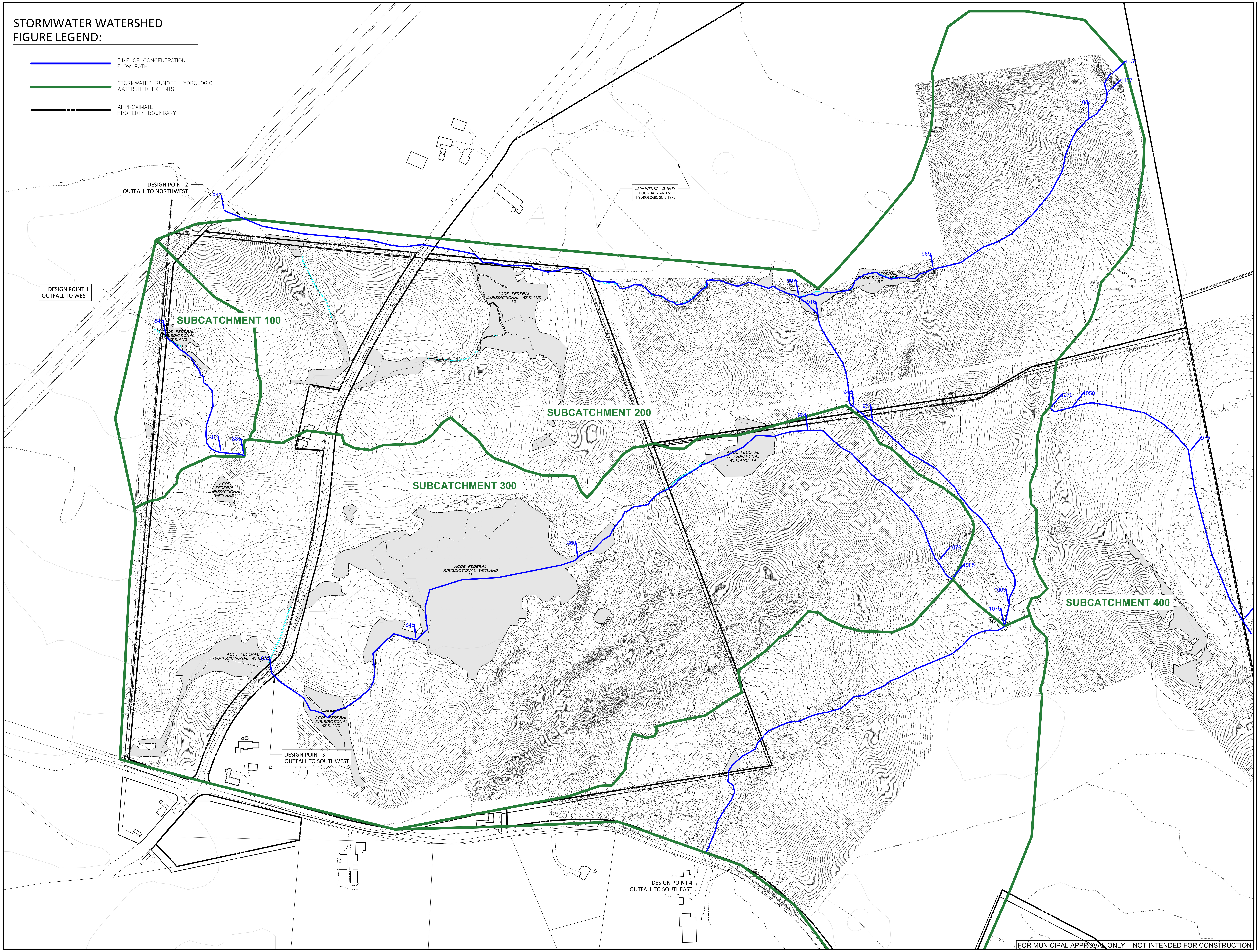

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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1

PROPOSED SITE PLAN FOR
HAWTHORN SOLAR FARM
HAWTHORN SOLAR, LLC
FORDS ROAD & PINE VALLEY ROAD
TOWN OF HOOSICK

DRAWN BY	FR
CHECKED BY	STA
EDP PROJECT NUMBER	1365

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REVISIONS PER CLIENT COMMENT	4/28/23
REVISIONS PER CLIENT COMMENT	5/16/23

SCALE:

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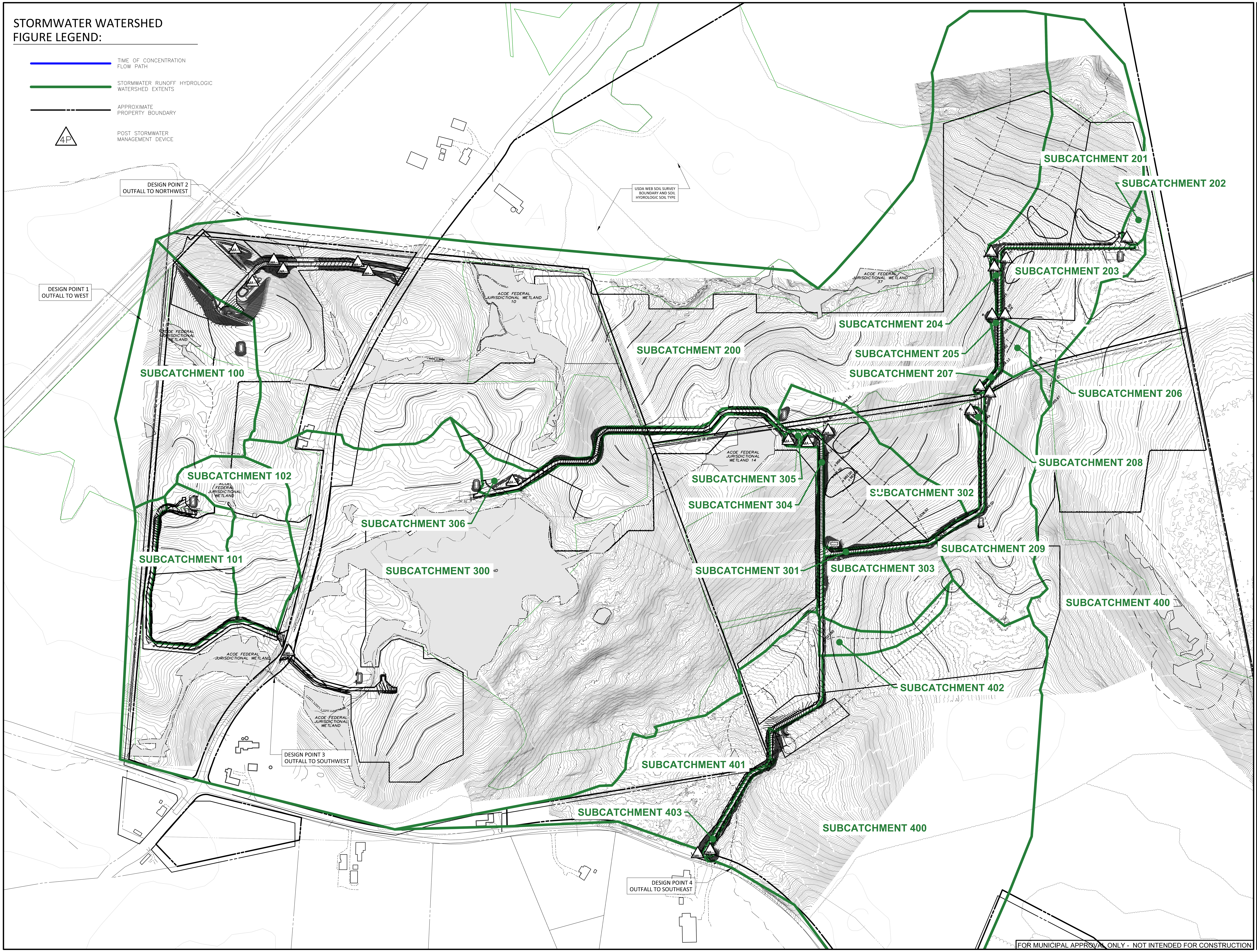
SHEET TITLE:

SHEET:



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TAX MAP No. 36.-1-11.1, 36.-1-9.2, 36.-1-10.1

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Attachment A

Water Quality Calculation

Runoff Reduction Calculation

900 Route 146, Clifton Park, New York 12065
phone (518) 371-7621

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

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:			
P=	1.10	*inch*	

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments								
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**		
1	0.26	0.26	100%	0.95	993			
2	0.01	0.01	100%	0.95	38	Filter Strips		
3	0.09	0.09	100%	0.95	350			
4	0.08	0.08	100%	0.95	302			
5	0.04	0.04	100%	0.95	158			
6	0.24	0.24	100%	0.95	902			
7	0.01	0.01	100%	0.95	38	Filter Strips		
8	0.16	0.16	100%	0.95	622			
9	0.33	0.33	100%	0.95	1,262			
10	0.09	0.09	100%	0.95	334			
Subtotal (1-30)	4.61	4.61	100%	0.95	**17,497**	**Subtotal 1**		
Total	4.61	4.61	100%	0.95	**17,497**	**Initial WQv**	**0.40**	**af**

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	0.08	0.08	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.54	0.54	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per tree*
Total	**0.6**		

Recalculate WQv after application of Area Reduction Techniques							
	Total Area *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient Rv**	**WQv** *(ft^3)*		
"<<Initial WQv"	4.61	4.61	100%	0.95	17,497		
Subtract Area	-0.62	-0.62					
WQv adjusted after Area Reductions	**3.99**	**3.99**	100%	0.95	15,136		
Disconnection of Rooftops		0.0					
Adjusted WQv after Area Reduction and Rooftop Disconnect	**3.99**	**3.99**	100%	0.95	**15,136**	**0.35**	**af**
WQv reduced by Area Reduction techniques					2,022	0.046	**af**

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

Additional Subcatchments						
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**
11	0.01	0.01	100%	0.95	38	Filter Strips
12	0.09	0.09	100%	0.95	349	
13	0.10	0.10	100%	0.95	388	Filter Strips
14	0.38	0.38	100%	0.95	1,447	
15	0.05	0.05	100%	0.95	171	Filter Strips
16	1.45	1.45	100%	0.95	5,485	Infiltration Basin
17	0.01	0.01	100%	0.95	38	Filter Strips
18	0.13	0.13	100%	0.95	494	Infiltration Trench
19	0.23	0.23	100%	0.95	861	Infiltration Trench
20	0.12	0.12	100%	0.95	469	Filter Strips
21	0.38	0.38	100%	0.95	1,447	
22	0.10	0.10	100%	0.95	361	Filter Strips
23	0.05	0.05	100%	0.95	184	
24	0.07	0.07	100%	0.95	247	
25	0.01	0.01	100%	0.95	38	
26	0.13	0.13	100%	0.95	481	Filter Strips
27						
28						
29						
30						
Subtotal	3.29	3.29	100%	0.95	**12,497**	**Subtotal**

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

All Subcatchments						
Catchment	**Total Area** *(Acres)*	**Impervious Cover** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient** *Rv*	**WQv** *(ft^3)*	**Description**
1	0.26	0.26	1.00	0.95	992.74	
2	0.01	0.01	1.00	0.95	38	Filter Strips
3	0.09	0.09	1.00	0.95	350.09	
4	0.08	0.08	1.00	0.95	302.35	
5	0.04	0.04	1.00	0.95	157.54	
6	0.24	0.24	1.00	0.95	901.65	
7	0.01	0.01	1.00	0.95	38.49	Filter Strips
8	0.16	0.16	1.00	0.95	622.12	
9	0.33	0.33	1.00	0.95	1262.36	
10	0.09	0.09	1.00	0.95	334.31	
11	0.01	0.01	1.00	0.95	38.41	Filter Strips
12	0.09	0.09	1.00	0.95	348.51	
13	0.10	0.10	1.00	0.95	387.66	Filter Strips
14	0.38	0.38	1.00	0.95	1446.54	
15	0.05	0.05	1.00	0.95	170.94	Filter Strips
16	1.45	1.45	1.00	0.95	5484.77	Infiltration Basin
17	0.01	0.01	1.00	0.95	38.49	Filter Strips
18	0.13	0.13	1.00	0.95	493.72	Infiltration Trench
19	0.23	0.23	1.00	0.95	861.00	Infiltration Trench
20	0.12	0.12	1.00	0.95	469.35	Filter Strips
21	0.38	0.38	1.00	0.95	1447.49	
22	0.10	0.10	1.00	0.95	360.57	Filter Strips
23	0.05	0.05	1.00	0.95	183.59	
24	0.07	0.07	1.00	0.95	247.16	
25	0.01	0.01	1.00	0.95	38.49	
26	0.13	0.13	1.00	0.95	480.57	Filter Strips
27						
28						
29						
30						

Runoff Reduction Volume and Treated volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**cf**	**cf**
Area/Volume Reduction	Conservation of Natural Areas	RR-1	0.00	0.00		
	Sheetflow to Riparian Buffers/Filter Strips	RR-2	0.62	0.62		
	Tree Planting/Tree Pit	RR-3	0.00	0.00		
	Disconnection of Rooftop Runoff	RR-4		0.00		
	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 & Extensive)	RR-10	0.00	0.00	0	
Standard SMPs w/RRv Capacity	Infiltration Trench	I-1	0.36	0.36	861	494
	Infiltration Basin	I-2	1.45	1.45	5485	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4				
	Bioretention & Infiltration Bioretention	F-5	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention (P-1)	P-1				
	Wet Pond (P-2)	P-2				
	Wet Extended Detention (P-3)	P-3				
	Multiple Pond system (P-4)	P-4				
	Pocket Pond (p-5)	P-5	2.27	2.27		100000
	Surface Sand filter (F-1)	F-1				
	Underground Sand filter (F-2)	F-2				
	Perimeter Sand Filter (F-3)	F-3				
	Organic Filter (F-4	F-4				
	Shallow Wetland (W-1)	W-1				
	Extended Detention Wetland (W-2	W-2				
	Pond/Wetland System (W-3)	W-3				
	Pocket Wetland (W-4)	W-4				
	Wet Swale (O-2)	O-2				
Totals by Area Reduction		→	0.62	0.62	805	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	1.80	1.80	6346	494
Totals by Standard SMP		→	2.27	2.27		100000

Totals (Area + Volume + all SMPs)		→	4.69	4.69	8,368	######
	Impervious Cover √	error				
	Total Area √	error				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A	5.00	55%
B	0.00	40%
C	0.00	30%
D	**455.00**	20%
Total Area	460	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	4.61	*acre*
Precipitation	1.1	*in*
Rv	0.95	
Minimum RRv	**3,566**	***ft3***
	0.08	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	17497	*0.402*
	Total RRV Provided	8,368	*0.164*
31	Is RRv Provided ≥WQv Required?	No	
32	Minimum RRv	3566	*0.082*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	100494	*2.307*
34	Sum of Volume Reduced & Treated	108862	*2.500*
34	Sum of Volume Reduced and Treated	108862	*2.500*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

Apply Peak Flow Attenuation			
36	Channel Protection	*Cpv*	
37	Overbank	*Qp*	
37	Extreme Flood Control	*Qf*	
	Are Quantity Control requirements met?	*Yes*	Plan Completed

Planning

Practice	Description	Application
Preservation of Undisturbed Areas	Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain.	Considered & Not Applied
Preservation of Buffers	Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.	Considered & Applied
Reduction of Clearing and Grading	Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.	Considered & Applied
Locating Development in Less Sensitive Areas	Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.	Considered & Applied
Open Space Design	Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.	Considered & Applied
Soil Restoration	Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post construction practices.	Considered & Applied
Roadway Reduction	Minimize roadway widths and lengths to reduce site impervious area	Considered & Applied
Sidewalk Reduction	Minimize sidewalk lengths and widths to reduce site impervious area	N/A
Driveway Reduction	Minimize driveway lengths and widths to reduce site impervious area	N/A
Cul-de-sac Reduction	Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.	N/A
Building Footprint Reduction	Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.	N/A
Parking Reduction	Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.	N/A

Filter Strip

Design Point:	

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Enter Site Data For Drainage Area to be Treated by Practice							
2	0.01	0.01	1.00	0.95	38.49	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*Yes*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*No*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Ex. Level contours		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	20	*ft*	*150 ft maximum*
Contributing Length of Impervious areas (IC)	17	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	133	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	60	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for Filter Strips in Section 5.3.2 met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.01**	***Acres from total Area***
Subtract	**0.01**	***Acres from total Impervious Area***

Filter Strip

TRUE

Design Point:	

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Enter Site Data For Drainage Area to be Treated by Practice							
7	0.01	0.01	1.00	0.95	38.49	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*No*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Grd level contour		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is used.*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	10	*ft*	*150 ft maximum*
Contributing Length of Impervious areas	17	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	133	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	60	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for filter strips in Section 5.3.2 met?	*Yes*		
Area Reduction Adjustments			
Subtract	**0.01**	***Acres from total Area***	
Subtract	**0.01**	***Acres from total Impervious Area***	

TRUE

Filter Strip

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
11	0.01	0.01	1.00	0.95	38.41	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*Yes*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Grd level contour		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	150	*ft*	*150 ft maximum*
Contributing Length of Impervious areas	75	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	75	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	100	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria in Section 5.3.2 (filter strips) met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.01**	***Acres from total Area***
Subtract	**0.01**	***Acres from total Impervious Area***

TRUE

Filter Strip

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
13	0.10	0.10	1.00	0.95	387.66	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*Yes*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Grd level contour		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	150	*ft*	*150 ft maximum*
Contributing Length of Impervious areas	75	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	75	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	100	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria in Section 5.3.2 (fitler strips) met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.10**	***Acres from total Area***
Subtract	**0.10**	***Acres from total Impervious Area***

TRUE

Filter Strip

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
15	0.05	0.05	1.00	0.95	170.94	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*Yes*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*No*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Ex. Level contours		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	25	*ft*	*150 ft maximum*
Contributing Length of Impervious areas (IC)	17	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	133	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	60	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for Filter Strips in Section 5.3.2 met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.05**	***Acres from total Area***
Subtract	**0.05**	***Acres from total Impervious Area***

Filter Strip

TRUE

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
17	0.01	0.01	1.00	0.95	38.49	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*No*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Grd level contour		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is used.*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	10	*ft*	*150 ft maximum*
Contributing Length of Impervious areas	17	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	133	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	60	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for filter strips in Section 5.3.2 met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.01**	***Acres from total Area***
Subtract	**0.01**	***Acres from total Impervious Area***

TRUE

Filter Strip

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
20	0.12	0.12	1.00	0.95	469.35	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*Yes*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Grd level contour		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	150	*ft*	*150 ft maximum*
Contributing Length of Impervious areas	75	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	75	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	100	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria in Section 5.3.2 (filter strips) met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.12**	***Acres from total Area***
Subtract	**0.12**	***Acres from total Impervious Area***

TRUE

Filter Strip

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
22	0.10	0.10	1.00	0.95	360.57	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*Yes*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Grd level contour		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	150	*ft*	*150 ft maximum*
Contributing Length of Impervious areas	75	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	75	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	100	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria in Section 5.3.2 (fitler strips) met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.10**	***Acres from total Area***
Subtract	**0.10**	***Acres from total Impervious Area***

TRUE

Filter Strip

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
26	0.13	0.13	1.00	0.95	480.57	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*Yes*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*No*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	Ex. Level contours		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	1	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	25	*ft*	*150 ft maximum*
Contributing Length of Impervious areas (IC)	17	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	133	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	60	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for Filter Strips in Section 5.3.2 met?	*Yes*		

Area Reduction Adjustments		
Subtract	**0.13**	***Acres from total Area***
Subtract	**0.13**	***Acres from total Impervious Area***

Filter Strip

Total Subtracted from Total Area	0.27
Total Subtracted from Total Impervious Area	0.27

Infiltration Basin Worksheet

Design Point:							
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
16	1.45	1.45	1.00	0.95	5484.77	1.10	Infiltration Basin
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	100%	0.95	5,485	<<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*	

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	5.00	*in/hour*	*Okay*
Pretreatment Sizing	100	*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume	5,485	*ft^3*	
Pretreatment Provided	5,485	*ft^3*	
Pretreatment Techniques utilized	*Plunge Pool*		

Size An Infiltration Basin			
Design Volume	5,485	*ft^3*	WQv
Basal Area Required	1,371	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided	5,485	*ft^2*	
Design Depth	4.00	*ft*	
Volume Provided	21,940	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*
Determine Runoff Reduction			
RRv	**5,485**	***ft^3***	***90% of the storage provided in the basin or WQv whichever is smaller***
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Infiltration Basin Worksheet

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Enter Impervious Area Reduced by Disconnection of Rooftops						<<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*	

Drainage Area exceeds the maximum allowable unless soil infiltration rate exceeds 5 in/hr

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate		*in/hour*	
Pretreatment Sizing		*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment Techniques utilized			

Size An Infiltration Basin			
Design Volume	0	*ft^3*	WQv
Basal Area Required	0	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided		*ft^2*	
Design Depth		*ft*	
Volume Provided	0	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	**0**	***ft^3***	***90% of the storage provided in the basin or WQv whichever is smaller***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Design Point:	

Infiltration Basin Worksheet

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Enter Impervious Area Reduced by Disconnection of Rooftops						<<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*	
Drainage Area exceeds the maximum allowable unless soil infiltration rate exceeds 5 in/hr							

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate		*in/hour*	
Pretreatment Sizing		*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment Techniques utilized			

Size An Infiltration Basin			
Design Volume	0	*ft^3*	WQv
Basal Area Required	0	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided		*ft^2*	
Design Depth		*ft*	
Volume Provided	0	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	**0**	***ft^3***	***90% of the storage provided in the basin or WQv whichever is smaller***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice

Infiltration Basin Worksheet

Catchment Number	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (ft^3)	Precipitation (in)	Description
Enter Impervious Area Reduced by Disconnection of Rooftops						<<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	
Drainage Area exceeds the maximum allowable unless soil infiltration rate exceeds 5 in/hr							
Pretreatment Techniques to Prevent Clogging							
Infiltration Rate			in/hour				
Pretreatment Sizing			% WQv	25% minimum; 50% if >2 in/hr 100% if >5in/hour			
Pretreatment Required Volume			ft^3				
Pretreatment Provided			ft^3				
Pretreatment Techniques utilized							
Size An Infiltration Basin							
Design Volume	0	ft^3	WQv				
Basal Area Required	0	ft^2	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*				
Basal Area Provided		ft^2					
Design Depth		ft					
Volume Provided	0	ft^3	*Storage Volume provided in infiltration basin area (not including pretreatment.*				
Determine Runoff Reduction							
RRv	**0**	ft^3	***90% of the storage provided in the basin or WQv whichever is smaller***				
Volume Treated		ft^3	*This is the portion of the WQv that is not reduced/infiltrated*				
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*				

Total RRV	5,484.77
Total Area	1.45

Infiltration Basin Worksheet

Total Impervious Area	1.45
Total Volume Treated	0.00
Rooftop Disconnect Impervious Area Total	0.00

Infiltration Trench Worksheet

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
18	0.13	0.13	1.00	0.95	494	1.10	Infiltration Trench
Enter Impervious Area Reduced by Disconnection of Rooftops			100%	0.95	494	<<WQv after adjusting for Disconnected Rooftops	

Design Elements
Pretreatment Techniques to Prevent Clogging

Infiltration Rate	5.00	*in/hr*	*Okay*
Pretreatment Sizing	50%	*of WQv*	*25% minimum* *50% if >2 in/hr;* *100% if >5in/hour*
Required Pretreatment Volume	247	*ft^3*	
Pretreatment Provided		*ft^3*	*Inadequate Pretreatment Provided*
Pretreatment techniques utilized			*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench
Ap = Vw / (ndt)

Design Volume	Vw	494	*ft^3*	
Porosity	n			
Design Depth	dt		*ft*	*maximum of four feet*
Depth to Groundwater			*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap		*ft^2*	
Width	W		*ft*	*Provide the dimensions here*
Length	L		*ft*	*Provide the dimensions here*
Surface Area Provided		0	*ft^2*	
Volume Provided		0	*ft^3*	*Storage Volume provided in infiltration trench not including pretreatment.*

Determine Runoff Reduction

RRv	**0**	***ft^3***	***90% of the storage provided***
Volume Treated	494	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
19	0.23	0.23	1.00	0.95	861.00	1.10	Infiltration Trench
Enter Impervious Area Reduced by Disconnection of Rooftops			100%	0.95	861	<<WQv after adjusting for Disconnected Rooftops	

Design Elements Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	5.00	*in/hr*	*Okay*
Pretreatment Sizing	50%	*of WQv*	*25% minimum 50% if >2 in/hr; 100% if >5in/hour*
Required Pretreatment Volume	431	*ft^3*	
Pretreatment Provided	431	*ft^3*	
Pretreatment techniques utilized	*Filter Strip*		*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench Ap = Vw / (ndt)				
Design Volume	Vw	861	*ft^3*	
Porosity	n	100		
Design Depth	dt	2.0	*ft*	*maximum of four feet*
Depth to Groundwater		5.0	*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap	4	*ft^2*	
Width	W	5	*ft*	*Provide the dimensions here*
Length	L	100	*ft*	*Provide the dimensions here*
Surface Area Provided		500	*ft^2*	*Okay*
Volume Provided		100,000	*ft^3*	*Storage Volume provided in infiltration trench not including pretreatment.*

Determine Runoff Reduction			
RRv	**861**	***ft^3***	***90% of the storage provided***
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Enter Impervious Area Reduced by Disconnection of Rooftops						<<WQv after adjusting for Disconnected Rooftops	
Exceeds Maximum Drainage Area							

Design Elements **Pretreatment Techniques to Prevent Clogging**			
Infiltration Rate		*in/hr*	
Pretreatment Sizing	25%	*of WQv*	*25% minimum* *50% if >2 in/hr;* *100% if >5in/hour*
Required Pretreatment Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment techniques utilized			*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench **Ap = Vw / (ndt)**				
Design Volume	Vw		*ft^3*	
Porosity	n			
Design Depth	dt		*ft*	*maximum of four feet*
Depth to Groundwater			*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap		*ft^2*	
Width	W		*ft*	*Provide the dimensions here*
Length	L		*ft*	*Provide the dimensions here*
Surface Area Provided		0	*ft^2*	
Volume Provided		0	*ft^3*	*Storage Volume provided in infiltration trench (not including pretreatment.*

Determine Runoff Reduction			
RRv	**0**	***ft^3***	***90% of the storage provided***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Design Point:	

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Enter Impervious Area Reduced by Disconnection of Rooftops						<<WQv after adjusting for Disconnected Rooftops	

Exceeds Maximum Drainage Area

Design Elements

Pretreatment Techniques to Prevent Clogging

Infiltration Rate		*in/hr*	
Pretreatment Sizing	25%	*of WQv*	*25% minimum* *50% if >2 in/hr;* *100% if >5in/hour*
Required Pretreatment Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment techniques utilized			*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench

Ap = Vw / (ndt)

Design Volume	Vw		*ft^3*	
Porosity	n			
Design Depth	dt		*ft*	*maximum of four feet*
Depth to Groundwater			*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap		*ft^2*	
Width	W		*ft*	*Provide the dimensions here*
Length	L		*ft*	*Provide the dimensions here*
Surface Area Provided		0	*ft^2*	
Volume Provided		0	*ft^3*	*Storage Volume provided in infiltration trench (not including pretreatment.*

Determine Runoff Reduction

RRv	**0**	***ft^3***	***90% of the storage provided***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

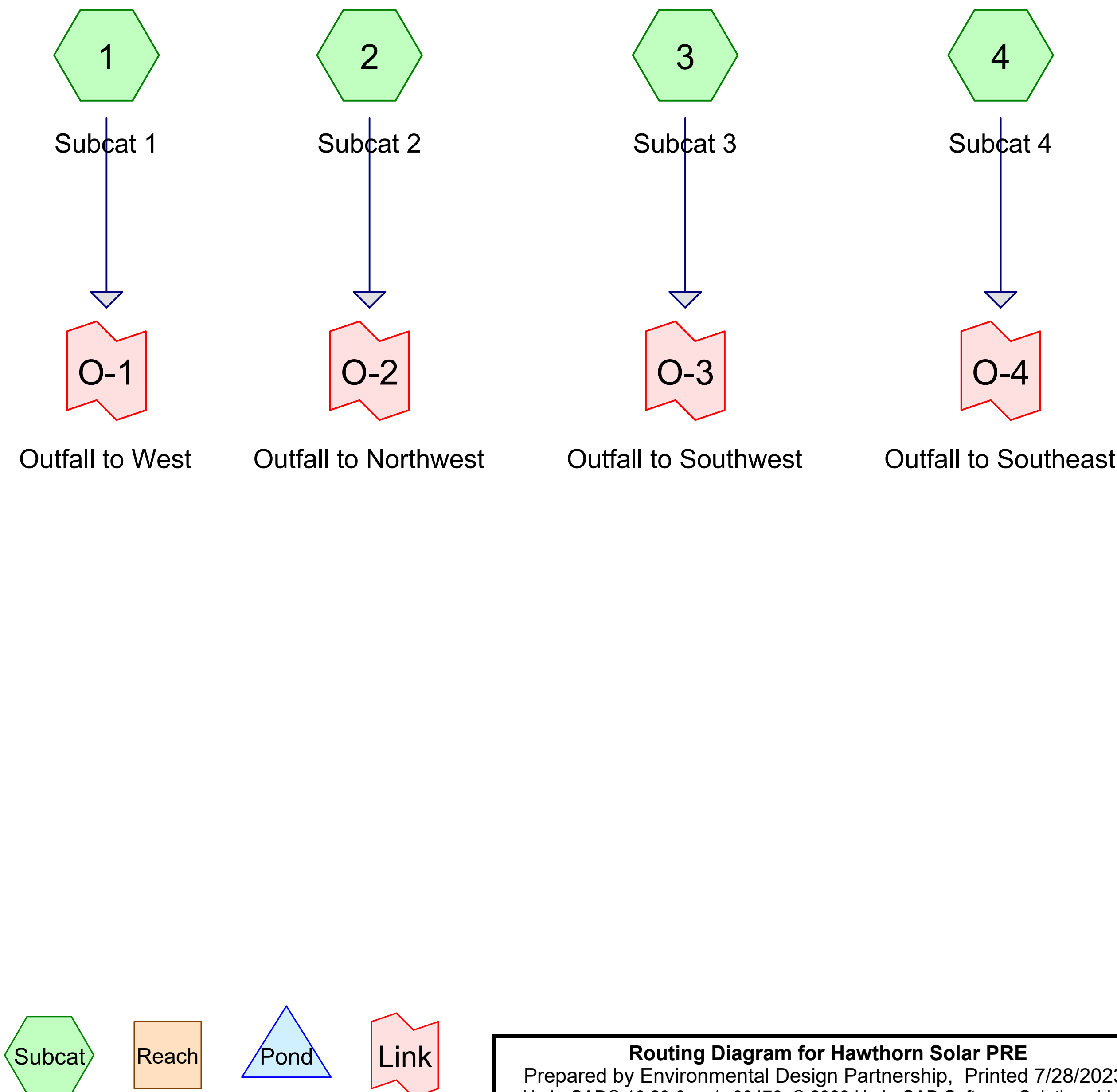
Infiltration Trench Worksheet

Total RRV	861.00
Total Area	0.36
Total Impervious Area	0.36
Total Volume Treated	493.72
Rooftop Disconnect Impervious Area Total	0.00

Attachment B

Stormwater Modeling Calculations

900 Route 146, Clifton Park, New York 12065
phone (518) 371-7621



Routing Diagram for Hawthorn Solar PRE
Prepared by Environmental Design Partnership, Printed 7/28/2023
HydroCAD® 10.20-3c s/n 00476 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YEAR, 24-HOUR	Type III 24-hr		Default	24.00	1	2.27	2
2	10-YEAR, 24-HOUR	Type III 24-hr		Default	24.00	1	3.82	2
3	100-YEAR, 24-HOUR	Type III 24-hr		Default	24.00	1	6.55	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.583	89	Gravel roads, HSG C (2, 3)
0.693	91	Gravel roads, HSG D (2, 3)
0.616	65	Row crops, contoured, Good, HSG A (2)
48.015	82	Row crops, contoured, Good, HSG C (1, 2, 3, 4)
186.308	86	Row crops, contoured, Good, HSG D (1, 2, 3, 4)
7.327	70	Woods, Good, HSG C (1, 2, 3)
55.411	77	Woods, Good, HSG D (1, 2, 3, 4)
298.954	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.616	HSG A	2
0.000	HSG B	
55.926	HSG C	1, 2, 3, 4
242.413	HSG D	1, 2, 3, 4
0.000	Other	
298.954		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.583	0.693	0.000	1.276	Gravel roads	2, 3
0.616	0.000	48.015	186.308	0.000	234.939	Row crops, contoured, Good	1, 2, 3, 4
0.000	0.000	7.327	55.411	0.000	62.739	Woods, Good	1, 2, 3, 4
0.616	**0.000**	**55.926**	**242.413**	**0.000**	**298.954**	**TOTAL AREA**	

Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1	Runoff Area=11.830 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=773' Tc=22.8 min CN=77 Runoff=4.75 cfs 0.592 af
Subcatchment2: Subcat 2	Runoff Area=110.393 ac 0.00% Impervious Runoff Depth=0.94" Flow Length=4,826' Tc=31.9 min CN=84 Runoff=65.63 cfs 8.653 af
Subcatchment3: Subcat 3	Runoff Area=119.376 ac 0.00% Impervious Runoff Depth=0.89" Flow Length=4,194' Tc=44.9 min CN=83 Runoff=55.86 cfs 8.809 af
Subcatchment4: Subcat 4	Runoff Area=57.355 ac 0.00% Impervious Runoff Depth=1.00" Flow Length=2,053' Tc=27.9 min CN=85 Runoff=38.63 cfs 4.771 af
Link O-1: Outfall to West	Inflow=4.75 cfs 0.592 af Primary=4.75 cfs 0.592 af
Link O-2: Outfall to Northwest	Inflow=65.63 cfs 8.653 af Primary=65.63 cfs 8.653 af
Link O-3: Outfall to Southwest	Inflow=55.86 cfs 8.809 af Primary=55.86 cfs 8.809 af
Link O-4: Outfall to Southeast	Inflow=38.63 cfs 4.771 af Primary=38.63 cfs 4.771 af

Total Runoff Area = 298.954 ac Runoff Volume = 22.825 af Average Runoff Depth = 0.92"
100.00% Pervious = 298.954 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

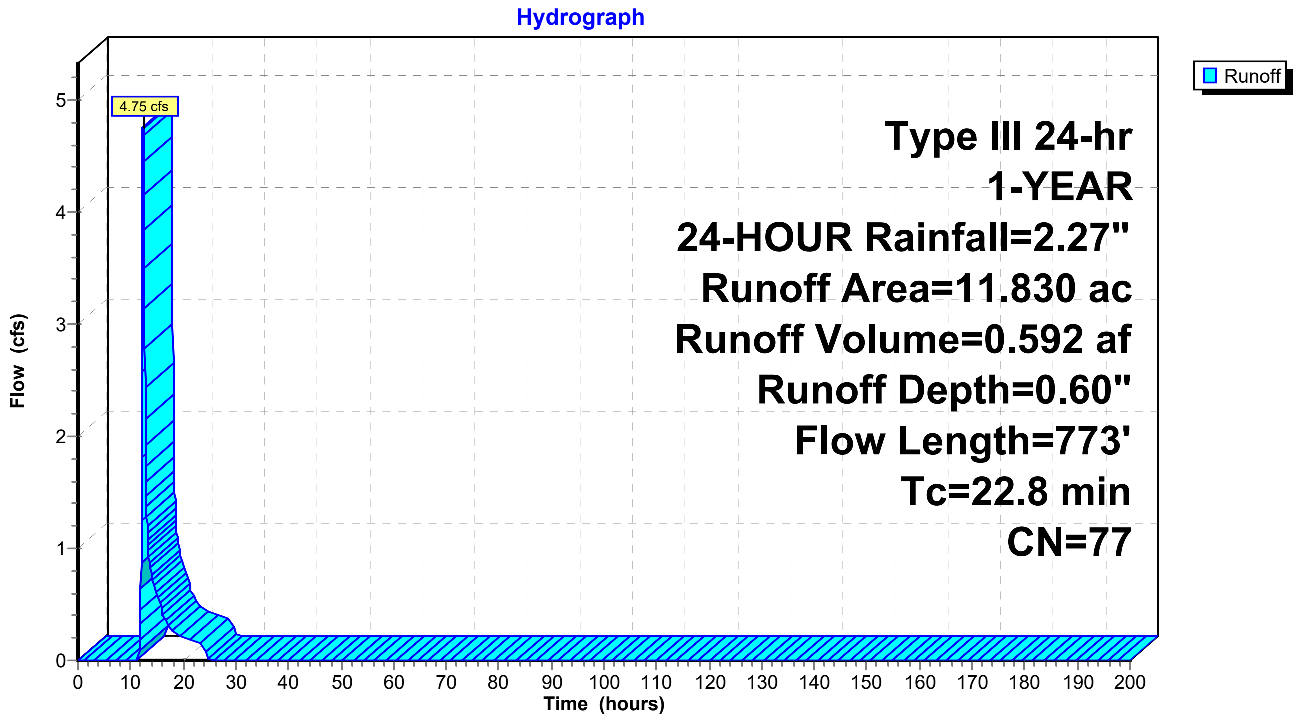
Runoff = 4.75 cfs @ 12.36 hrs, Volume= 0.592 af, Depth= 0.60"
Routed to Link O-1 : Outfall to West

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.831	82	Row crops, contoured, Good, HSG C
2.123	86	Row crops, contoured, Good, HSG D
3.343	70	Woods, Good, HSG C
5.533	77	Woods, Good, HSG D
11.830	77	Weighted Average
11.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
11.7	673	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.8	773	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

[47] Hint: Peak is 192% of capacity of segment #5

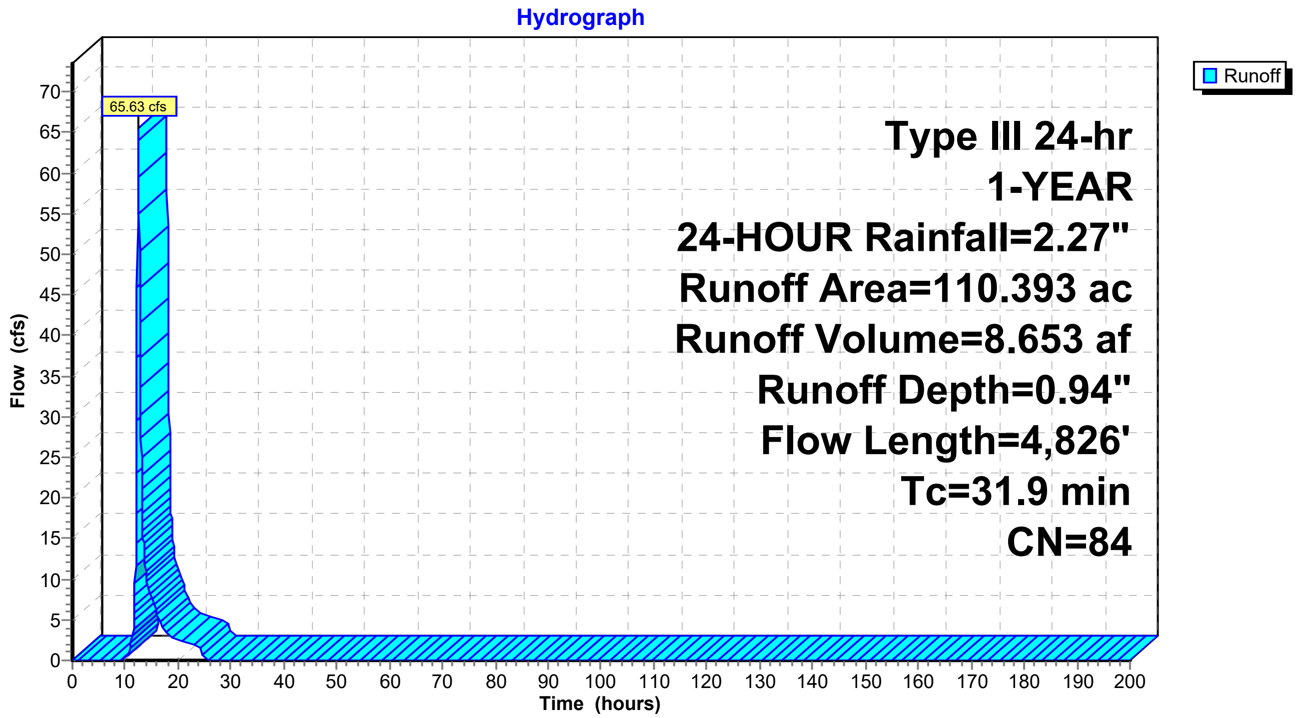
Runoff = 65.63 cfs @ 12.47 hrs, Volume= 8.653 af, Depth= 0.94"
Routed to Link O-2 : Outfall to Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.221	89	Gravel roads, HSG C
0.250	91	Gravel roads, HSG D
0.616	65	Row crops, contoured, Good, HSG A
14.410	82	Row crops, contoured, Good, HSG C
72.214	86	Row crops, contoured, Good, HSG D
0.226	70	Woods, Good, HSG C
22.457	77	Woods, Good, HSG D
110.393	84	Weighted Average
110.393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.2700	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
1.4	153	0.1240	1.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.3	1,048	0.1330	3.28		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.5	680	0.0910	1.51		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	2,845	0.0340	5.14	34.26	**Parabolic Channel,** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.040 Winding stream, pools & shoals
31.9	4,826	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

[47] Hint: Peak is 371% of capacity of segment #4

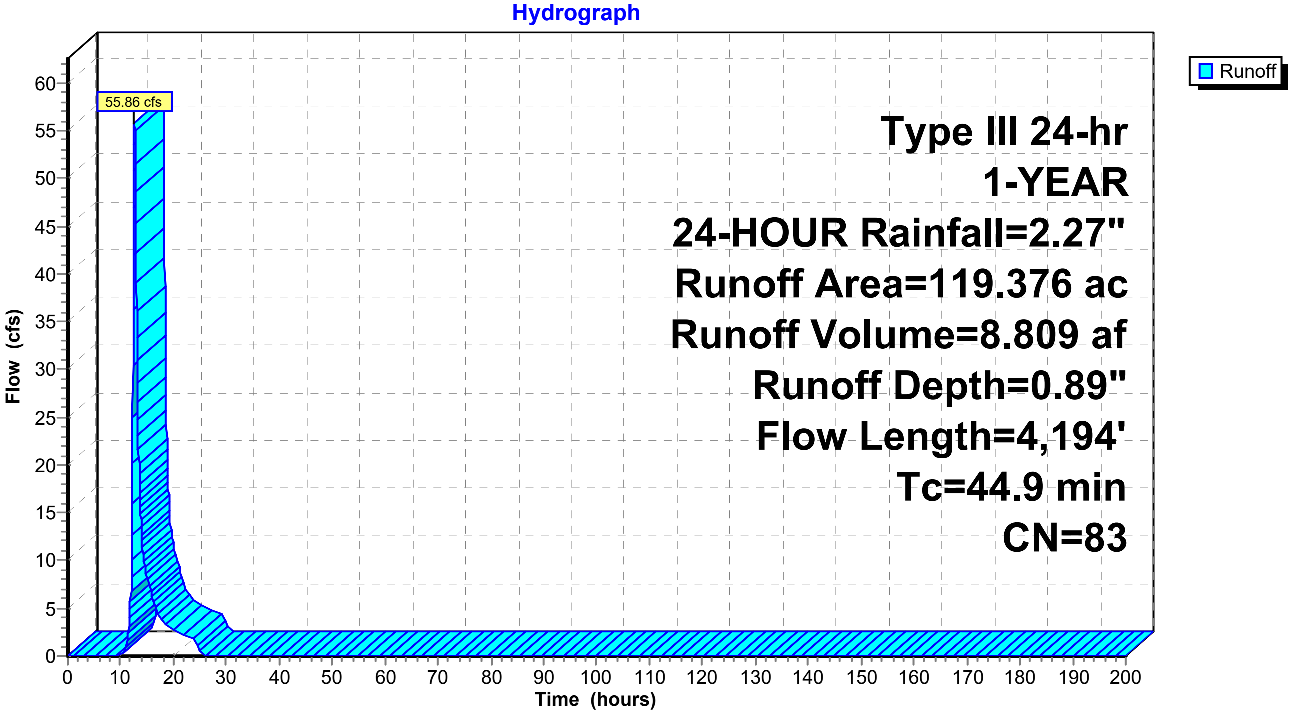
Runoff = 55.86 cfs @ 12.65 hrs, Volume= 8.809 af, Depth= 0.89"
Routed to Link O-3 : Outfall to Southwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.363	89	Gravel roads, HSG C
0.442	91	Gravel roads, HSG D
21.764	82	Row crops, contoured, Good, HSG C
65.719	86	Row crops, contoured, Good, HSG D
3.758	70	Woods, Good, HSG C
27.330	77	Woods, Good, HSG D
119.376	83	Weighted Average
119.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1500	0.31		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.53"
4.7	887	0.1230	3.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.0	1,270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.6	955	0.0160	0.90	15.06	**Parabolic Channel,** W=50.00' D=0.50' Area=16.7 sf Perim=50.0' n= 0.100
2.2	982	0.0120	7.51	500.40	**Parabolic Channel,** W=25.00' D=4.00' Area=66.7 sf Perim=26.6' n= 0.040 Winding stream, pools & shoals
44.9	4,194	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[47] Hint: Peak is 138% of capacity of segment #3

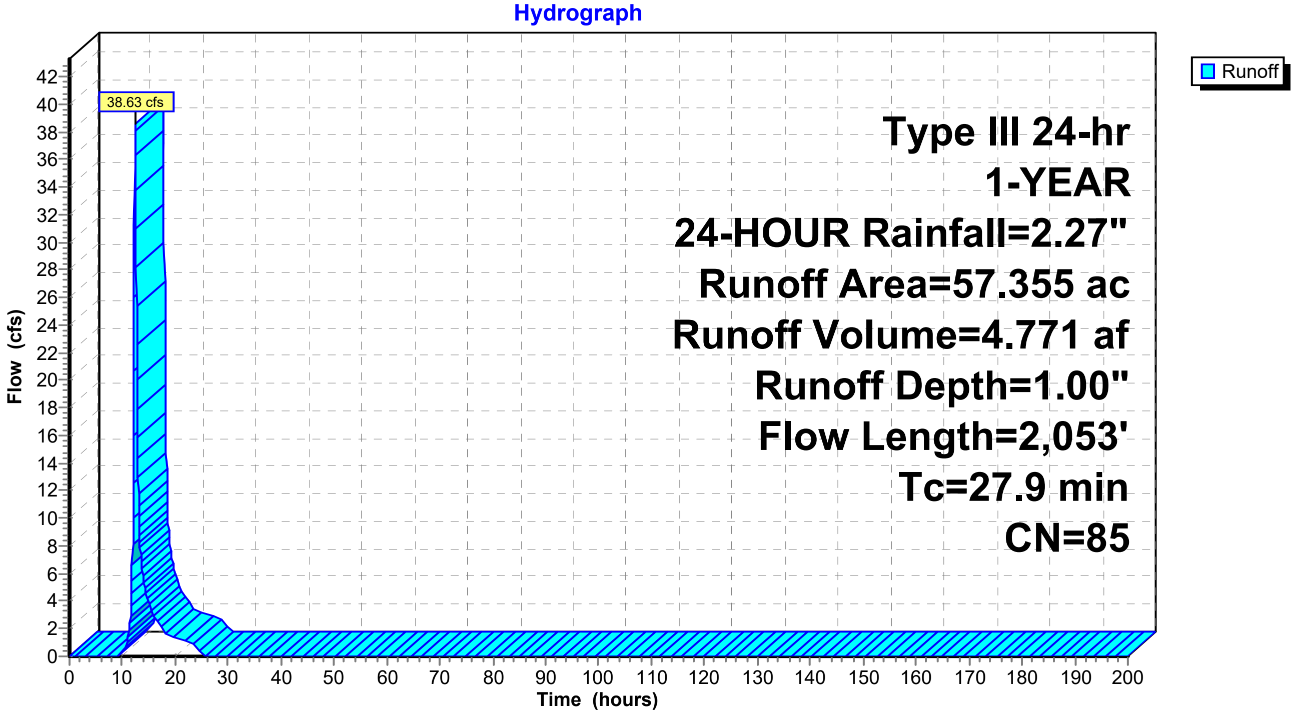
Runoff = 38.63 cfs @ 12.40 hrs, Volume= 4.771 af, Depth= 1.00"
Routed to Link O-4 : Outfall to Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
11.010	82	Row crops, contoured, Good, HSG C
46.252	86	Row crops, contoured, Good, HSG D
0.092	77	Woods, Good, HSG D
57.355	85	Weighted Average
57.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.2000	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
10.2	1,050	0.1180	1.72		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.1	903	0.0080	1.87	28.00	**Parabolic Channel,** W=15.00' D=1.50' Area=15.0 sf Perim=15.4' n= 0.070 Sluggish weedy reaches w/pools
27.9	2,053	Total			

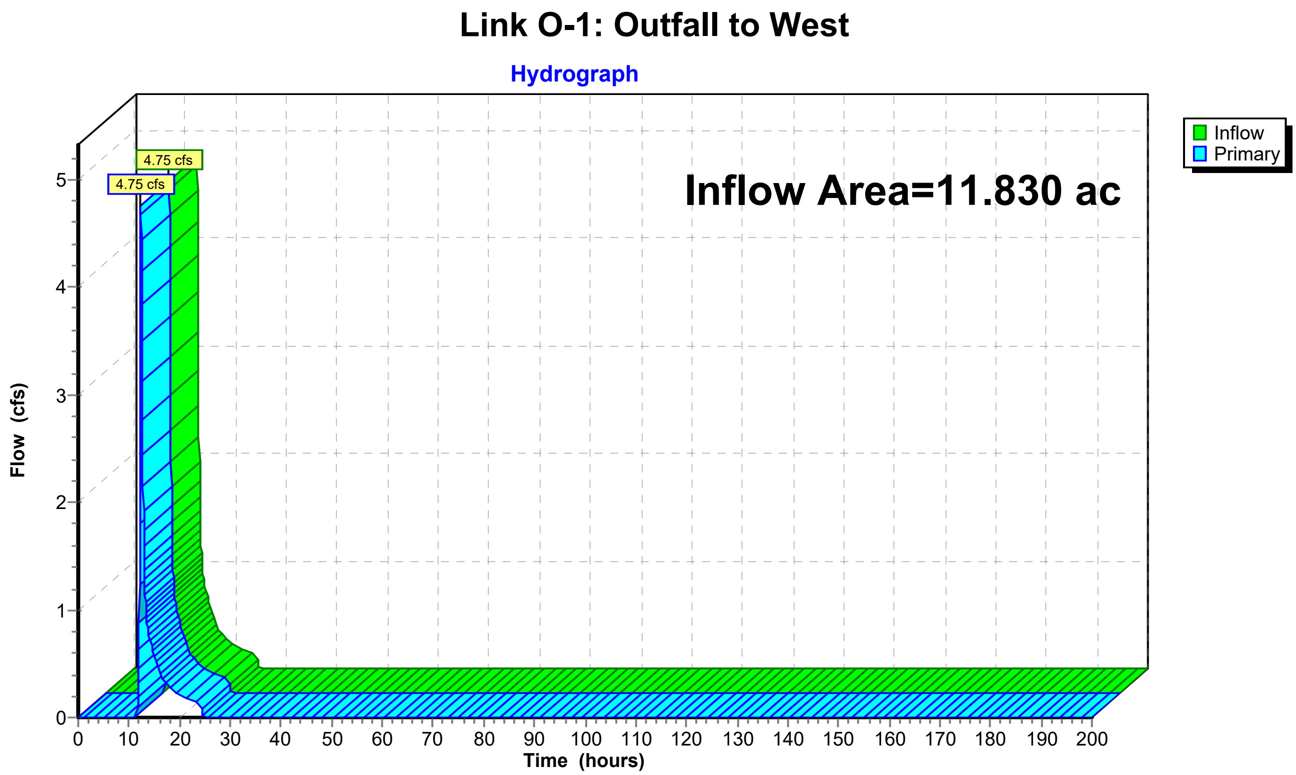
Subcatchment 4: Subcat 4



Summary for Link O-1: Outfall to West

Inflow Area = 11.830 ac, 0.00% Impervious, Inflow Depth = 0.60" for 1-YEAR, 24-HOUR event
Inflow = 4.75 cfs @ 12.36 hrs, Volume= 0.592 af
Primary = 4.75 cfs @ 12.36 hrs, Volume= 0.592 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

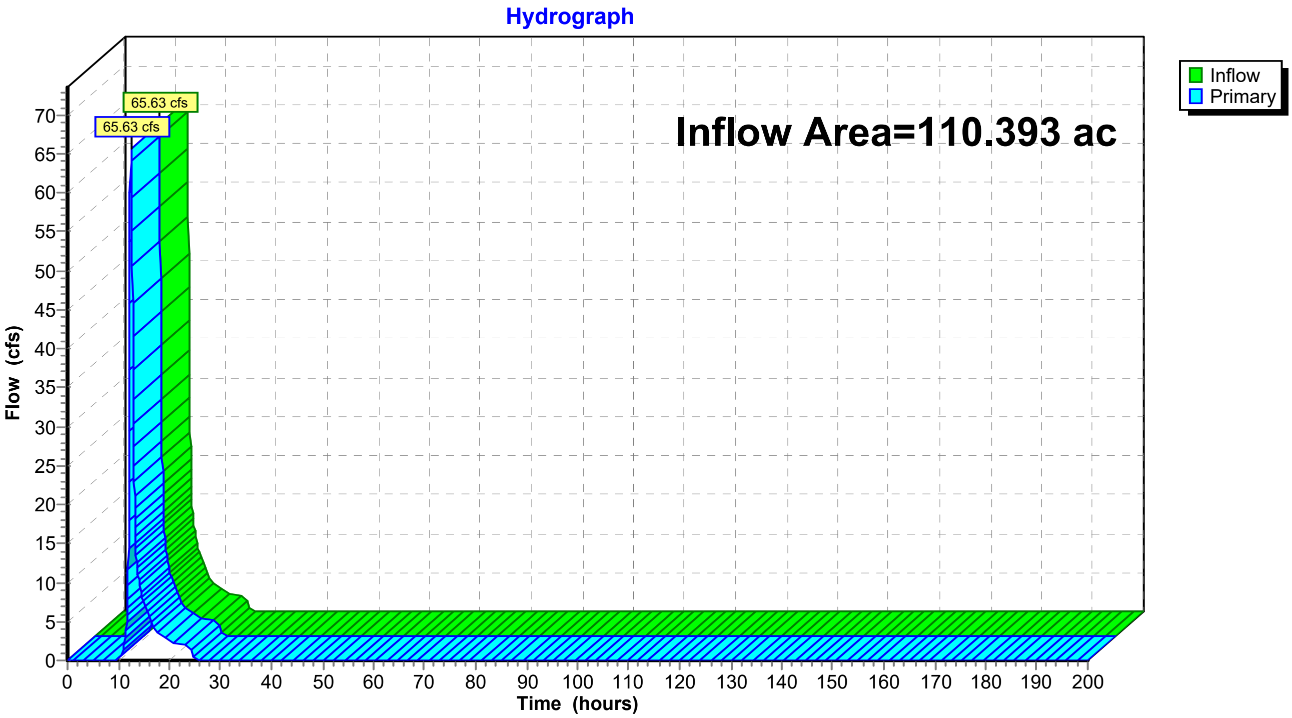


Summary for Link O-2: Outfall to Northwest

Inflow Area = 110.393 ac, 0.00% Impervious, Inflow Depth = 0.94" for 1-YEAR, 24-HOUR event
Inflow = 65.63 cfs @ 12.47 hrs, Volume= 8.653 af
Primary = 65.63 cfs @ 12.47 hrs, Volume= 8.653 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-2: Outfall to Northwest

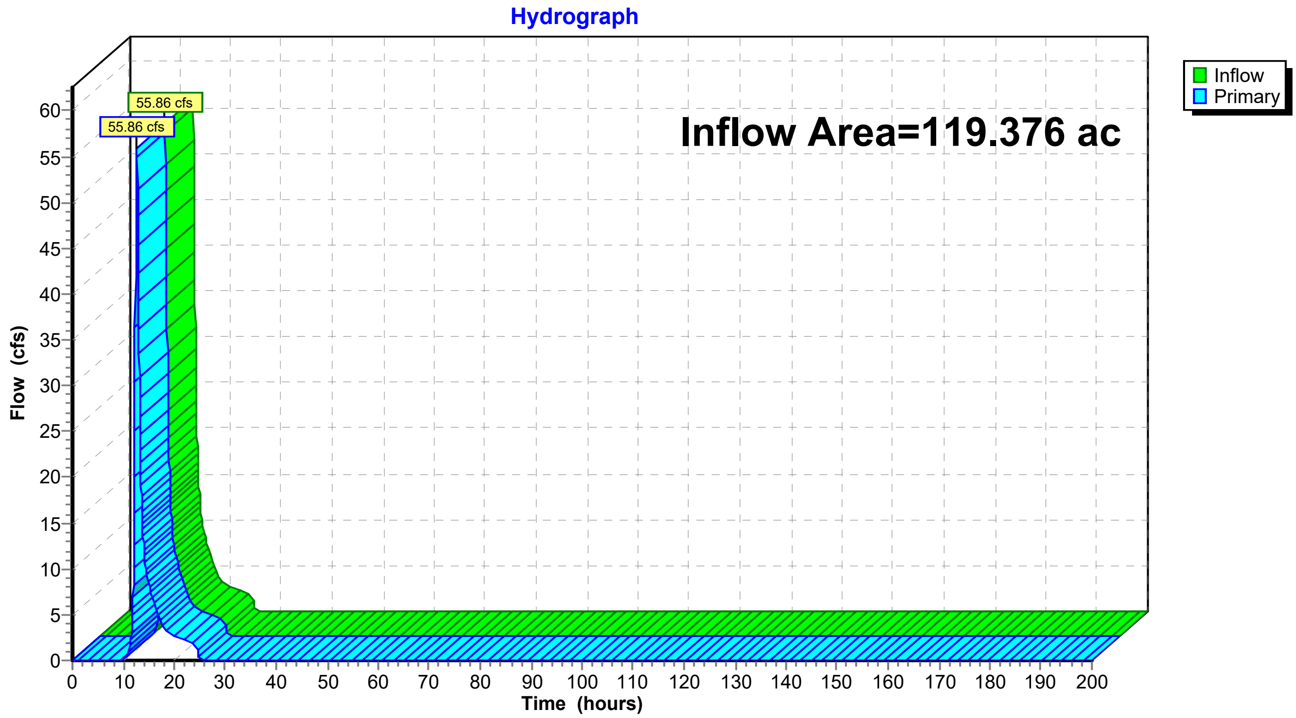


Summary for Link O-3: Outfall to Southwest

Inflow Area = 119.376 ac, 0.00% Impervious, Inflow Depth = 0.89" for 1-YEAR, 24-HOUR event
Inflow = 55.86 cfs @ 12.65 hrs, Volume= 8.809 af
Primary = 55.86 cfs @ 12.65 hrs, Volume= 8.809 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-3: Outfall to Southwest

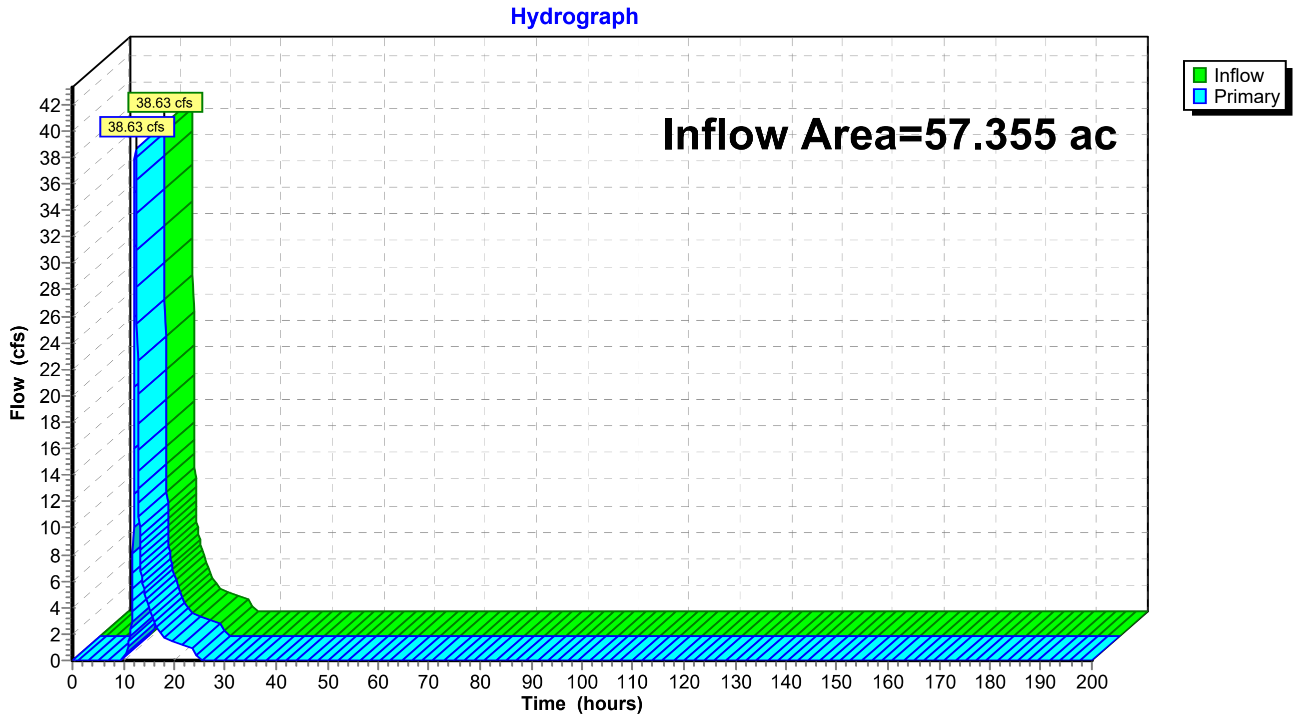


Summary for Link O-4: Outfall to Southeast

Inflow Area = 57.355 ac, 0.00% Impervious, Inflow Depth = 1.00" for 1-YEAR, 24-HOUR event
Inflow = 38.63 cfs @ 12.40 hrs, Volume= 4.771 af
Primary = 38.63 cfs @ 12.40 hrs, Volume= 4.771 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-4: Outfall to Southeast



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.830 ac 0.00% Impervious Runoff Depth=1.67"
Flow Length=773' Tc=22.8 min CN=77 Runoff=14.54 cfs 1.649 af

Subcatchment2: Subcat 2 Runoff Area=110.393 ac 0.00% Impervious Runoff Depth=2.21"
Flow Length=4,826' Tc=31.9 min CN=84 Runoff=157.34 cfs 20.360 af

Subcatchment3: Subcat 3 Runoff Area=119.376 ac 0.00% Impervious Runoff Depth=2.13"
Flow Length=4,194' Tc=44.9 min CN=83 Runoff=138.22 cfs 21.196 af

Subcatchment4: Subcat 4 Runoff Area=57.355 ac 0.00% Impervious Runoff Depth=2.30"
Flow Length=2,053' Tc=27.9 min CN=85 Runoff=90.04 cfs 10.981 af

Link O-1: Outfall to West Inflow=14.54 cfs 1.649 af
Primary=14.54 cfs 1.649 af

Link O-2: Outfall to Northwest Inflow=157.34 cfs 20.360 af
Primary=157.34 cfs 20.360 af

Link O-3: Outfall to Southwest Inflow=138.22 cfs 21.196 af
Primary=138.22 cfs 21.196 af

Link O-4: Outfall to Southeast Inflow=90.04 cfs 10.981 af
Primary=90.04 cfs 10.981 af

Total Runoff Area = 298.954 ac Runoff Volume = 54.187 af Average Runoff Depth = 2.18"
100.00% Pervious = 298.954 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

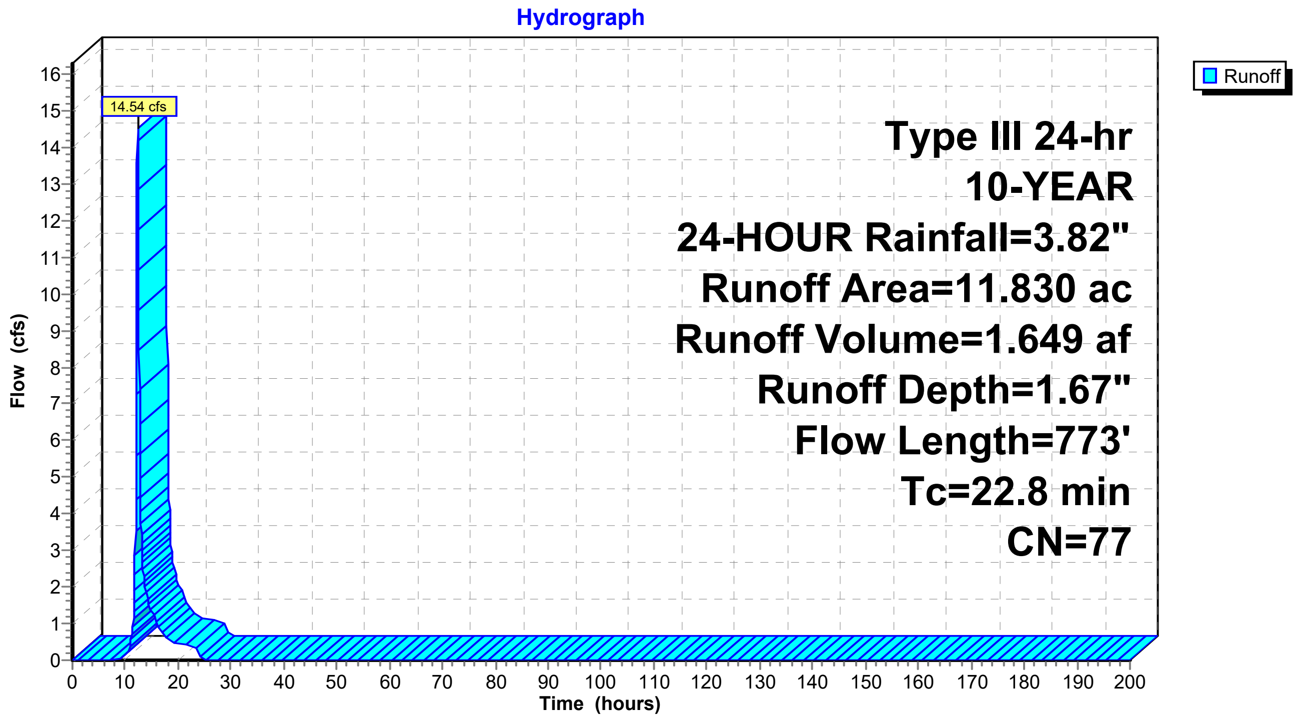
Runoff = 14.54 cfs @ 12.33 hrs, Volume= 1.649 af, Depth= 1.67"
Routed to Link O-1 : Outfall to West

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.831	82	Row crops, contoured, Good, HSG C
2.123	86	Row crops, contoured, Good, HSG D
3.343	70	Woods, Good, HSG C
5.533	77	Woods, Good, HSG D
11.830	77	Weighted Average
11.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
11.7	673	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.8	773	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

[47] Hint: Peak is 459% of capacity of segment #5

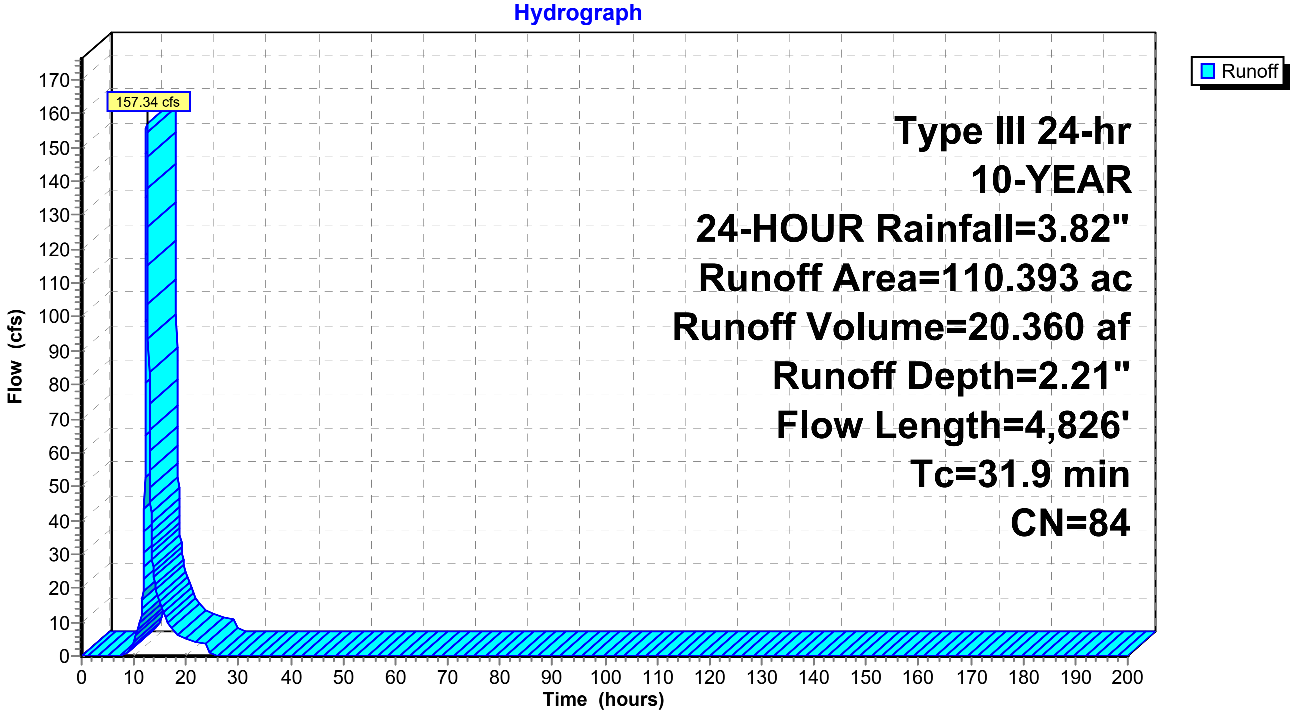
Runoff = 157.34 cfs @ 12.45 hrs, Volume= 20.360 af, Depth= 2.21"
Routed to Link O-2 : Outfall to Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.221	89	Gravel roads, HSG C
0.250	91	Gravel roads, HSG D
0.616	65	Row crops, contoured, Good, HSG A
14.410	82	Row crops, contoured, Good, HSG C
72.214	86	Row crops, contoured, Good, HSG D
0.226	70	Woods, Good, HSG C
22.457	77	Woods, Good, HSG D
110.393	84	Weighted Average
110.393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.2700	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
1.4	153	0.1240	1.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.3	1,048	0.1330	3.28		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.5	680	0.0910	1.51		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	2,845	0.0340	5.14	34.26	**Parabolic Channel,** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.040 Winding stream, pools & shoals
31.9	4,826	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

[47] Hint: Peak is 918% of capacity of segment #4

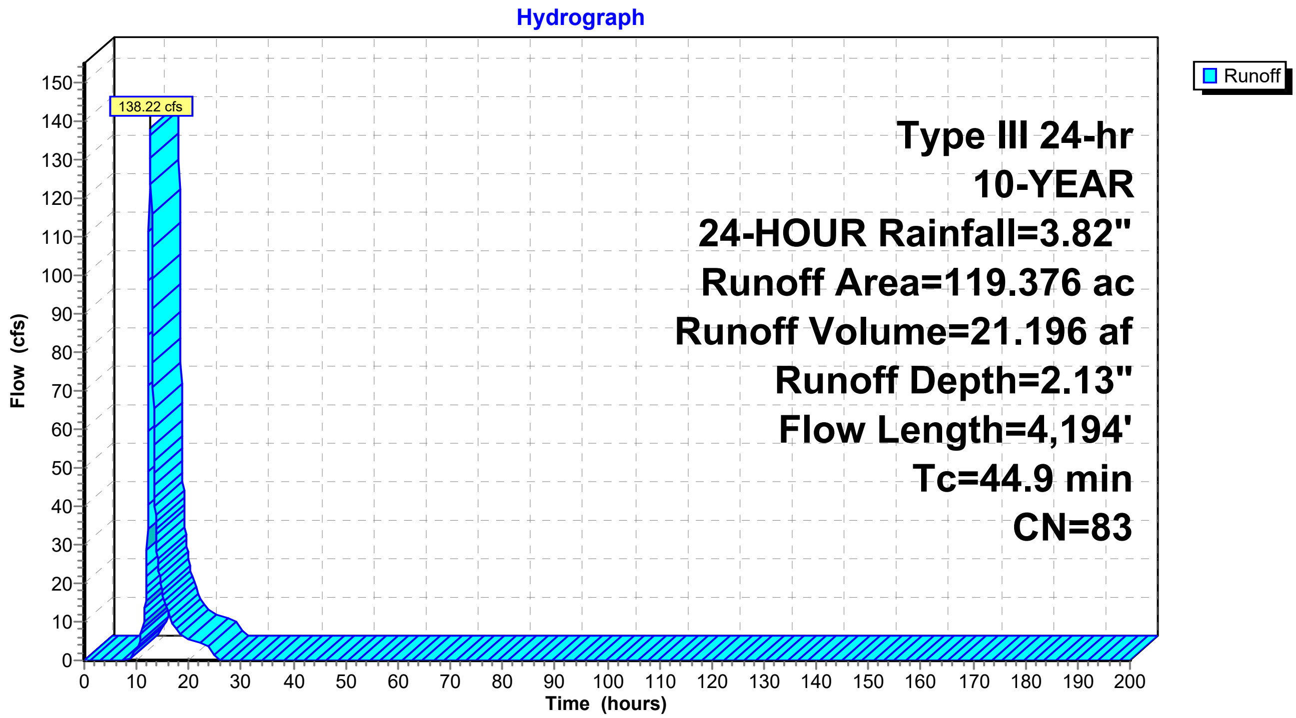
Runoff = 138.22 cfs @ 12.62 hrs, Volume= 21.196 af, Depth= 2.13"
Routed to Link O-3 : Outfall to Southwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.363	89	Gravel roads, HSG C
0.442	91	Gravel roads, HSG D
21.764	82	Row crops, contoured, Good, HSG C
65.719	86	Row crops, contoured, Good, HSG D
3.758	70	Woods, Good, HSG C
27.330	77	Woods, Good, HSG D
119.376	83	Weighted Average
119.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1500	0.31		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.53"
4.7	887	0.1230	3.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.0	1,270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.6	955	0.0160	0.90	15.06	**Parabolic Channel,** W=50.00' D=0.50' Area=16.7 sf Perim=50.0' n= 0.100
2.2	982	0.0120	7.51	500.40	**Parabolic Channel,** W=25.00' D=4.00' Area=66.7 sf Perim=26.6' n= 0.040 Winding stream, pools & shoals
44.9	4,194	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[47] Hint: Peak is 322% of capacity of segment #3

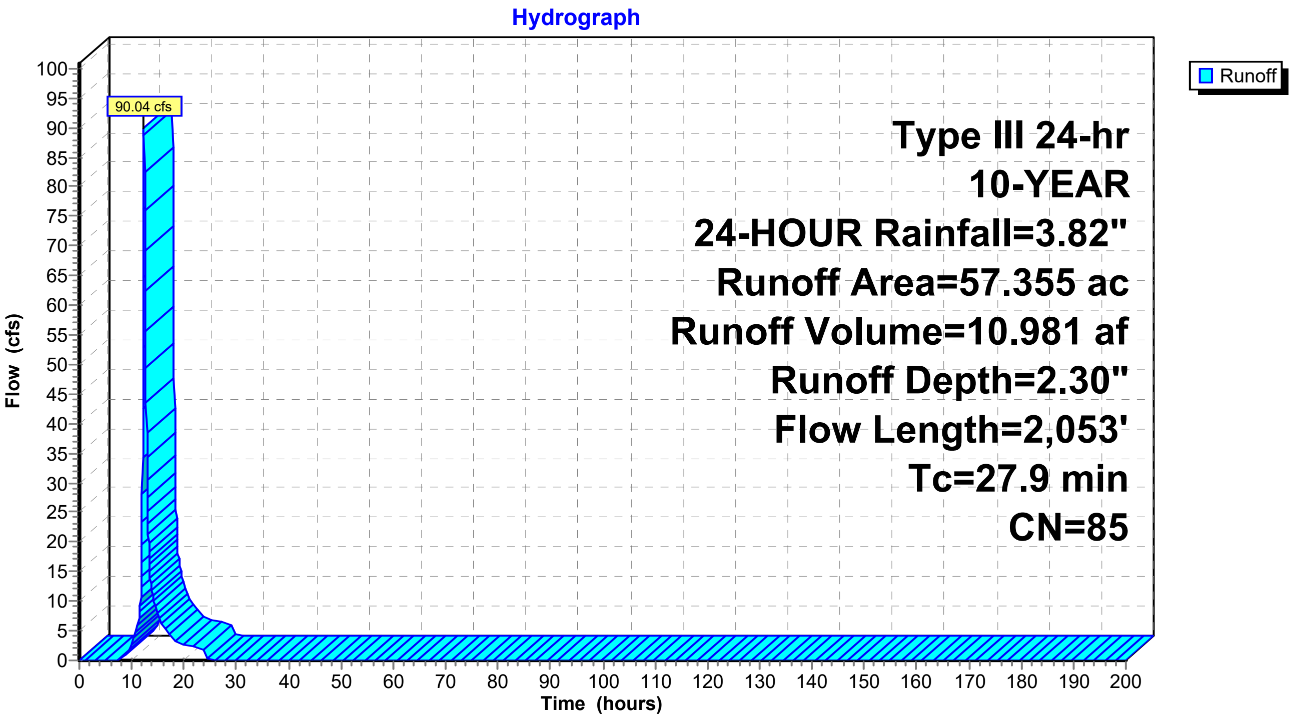
Runoff = 90.04 cfs @ 12.39 hrs, Volume= 10.981 af, Depth= 2.30"
Routed to Link O-4 : Outfall to Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
11.010	82	Row crops, contoured, Good, HSG C
46.252	86	Row crops, contoured, Good, HSG D
0.092	77	Woods, Good, HSG D
57.355	85	Weighted Average
57.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.2000	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
10.2	1,050	0.1180	1.72		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.1	903	0.0080	1.87	28.00	**Parabolic Channel,** W=15.00' D=1.50' Area=15.0 sf Perim=15.4' n= 0.070 Sluggish weedy reaches w/pools
27.9	2,053	Total			

Subcatchment 4: Subcat 4

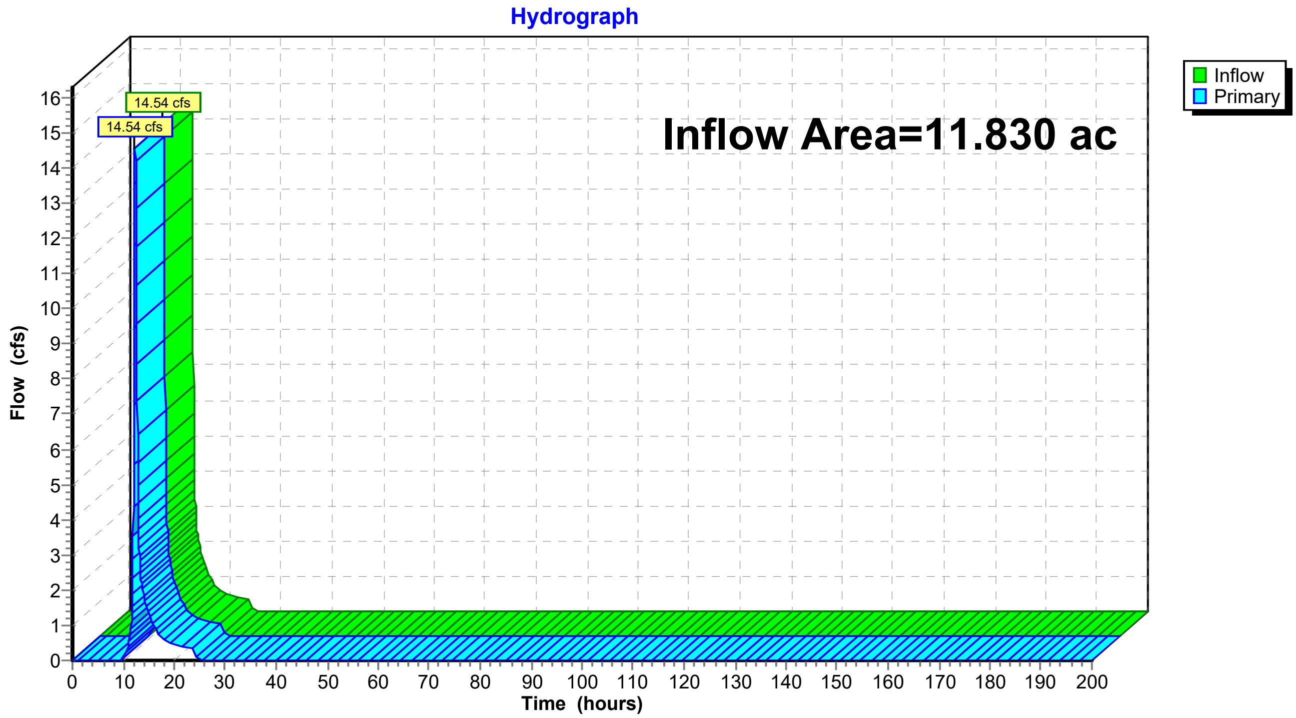


Summary for Link O-1: Outfall to West

Inflow Area = 11.830 ac, 0.00% Impervious, Inflow Depth = 1.67" for 10-YEAR, 24-HOUR event
Inflow = 14.54 cfs @ 12.33 hrs, Volume= 1.649 af
Primary = 14.54 cfs @ 12.33 hrs, Volume= 1.649 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-1: Outfall to West

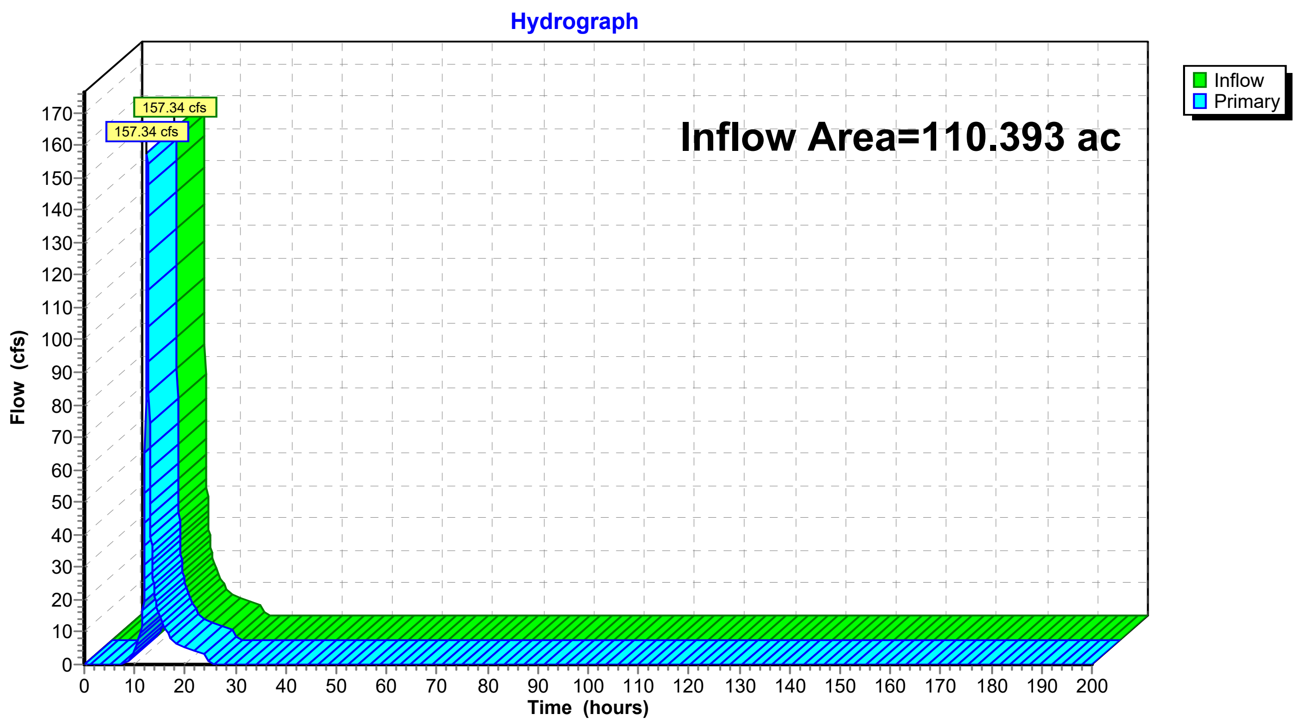


Summary for Link O-2: Outfall to Northwest

Inflow Area = 110.393 ac, 0.00% Impervious, Inflow Depth = 2.21" for 10-YEAR, 24-HOUR event
Inflow = 157.34 cfs @ 12.45 hrs, Volume= 20.360 af
Primary = 157.34 cfs @ 12.45 hrs, Volume= 20.360 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-2: Outfall to Northwest

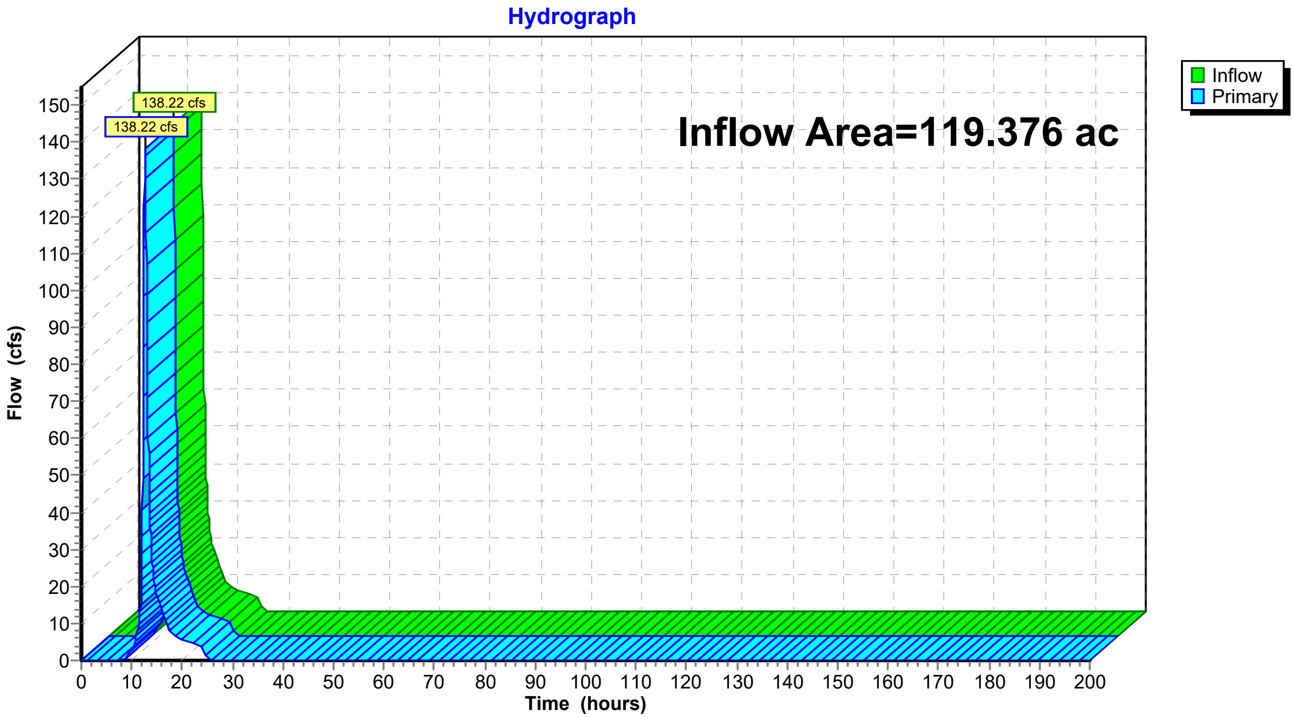


Summary for Link O-3: Outfall to Southwest

Inflow Area = 119.376 ac, 0.00% Impervious, Inflow Depth = 2.13" for 10-YEAR, 24-HOUR event
Inflow = 138.22 cfs @ 12.62 hrs, Volume= 21.196 af
Primary = 138.22 cfs @ 12.62 hrs, Volume= 21.196 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-3: Outfall to Southwest

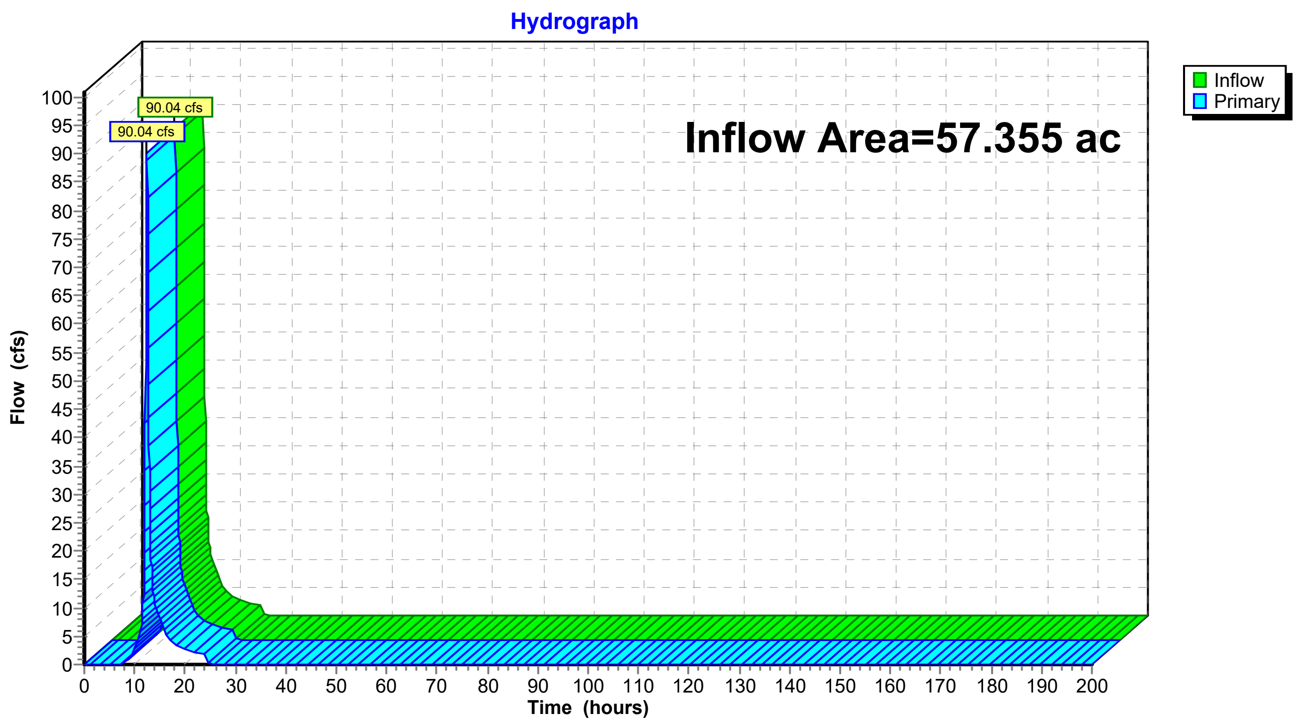


Summary for Link O-4: Outfall to Southeast

Inflow Area = 57.355 ac, 0.00% Impervious, Inflow Depth = 2.30" for 10-YEAR, 24-HOUR event
Inflow = 90.04 cfs @ 12.39 hrs, Volume= 10.981 af
Primary = 90.04 cfs @ 12.39 hrs, Volume= 10.981 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-4: Outfall to Southeast



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.830 ac 0.00% Impervious Runoff Depth=3.96"
Flow Length=773' Tc=22.8 min CN=77 Runoff=35.00 cfs 3.908 af

Subcatchment2: Subcat 2 Runoff Area=110.393 ac 0.00% Impervious Runoff Depth=4.71"
Flow Length=4,826' Tc=31.9 min CN=84 Runoff=330.07 cfs 43.363 af

Subcatchment3: Subcat 3 Runoff Area=119.376 ac 0.00% Impervious Runoff Depth=4.60"
Flow Length=4,194' Tc=44.9 min CN=83 Runoff=295.62 cfs 45.805 af

Subcatchment4: Subcat 4 Runoff Area=57.355 ac 0.00% Impervious Runoff Depth=4.82"
Flow Length=2,053' Tc=27.9 min CN=85 Runoff=185.88 cfs 23.054 af

Link O-1: Outfall to West Inflow=35.00 cfs 3.908 af
Primary=35.00 cfs 3.908 af

Link O-2: Outfall to Northwest Inflow=330.07 cfs 43.363 af
Primary=330.07 cfs 43.363 af

Link O-3: Outfall to Southwest Inflow=295.62 cfs 45.805 af
Primary=295.62 cfs 45.805 af

Link O-4: Outfall to Southeast Inflow=185.88 cfs 23.054 af
Primary=185.88 cfs 23.054 af

Total Runoff Area = 298.954 ac Runoff Volume = 116.130 af Average Runoff Depth = 4.66"
100.00% Pervious = 298.954 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

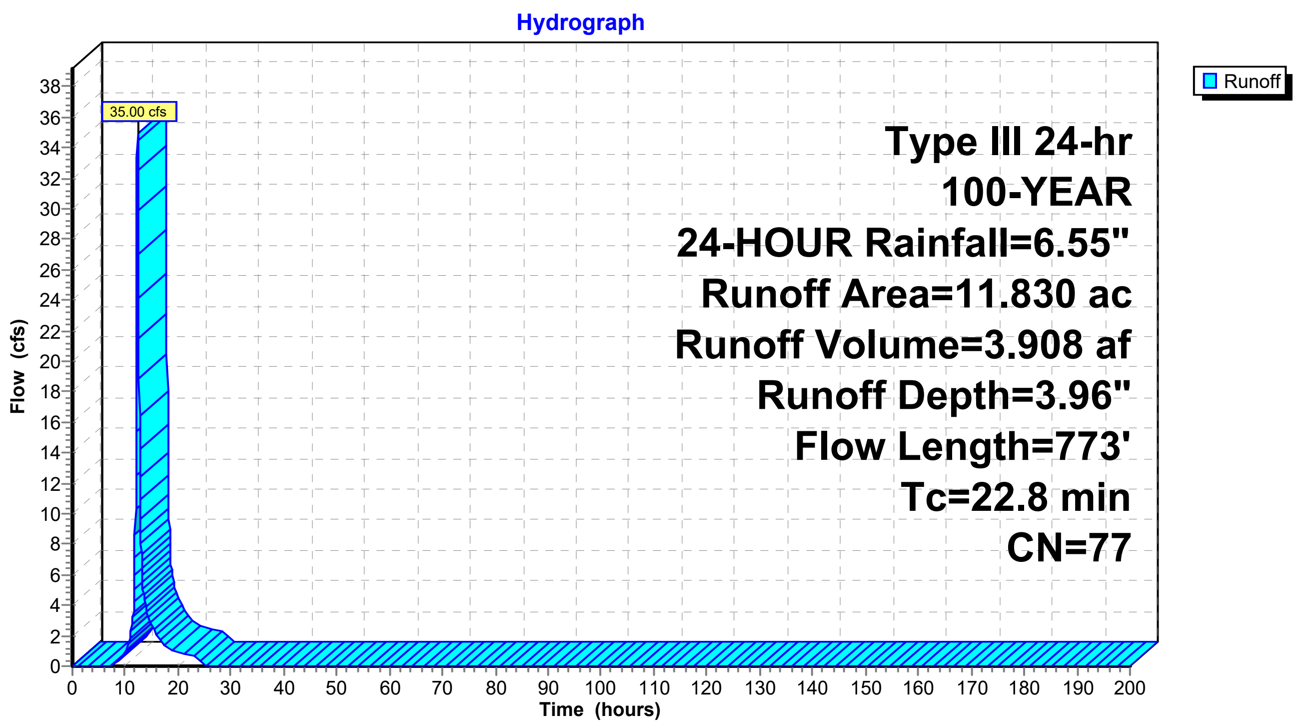
Runoff = 35.00 cfs @ 12.31 hrs, Volume= 3.908 af, Depth= 3.96"
Routed to Link O-1 : Outfall to West

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.831	82	Row crops, contoured, Good, HSG C
2.123	86	Row crops, contoured, Good, HSG D
3.343	70	Woods, Good, HSG C
5.533	77	Woods, Good, HSG D
11.830	77	Weighted Average
11.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
11.7	673	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.8	773	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

[47] Hint: Peak is 963% of capacity of segment #5

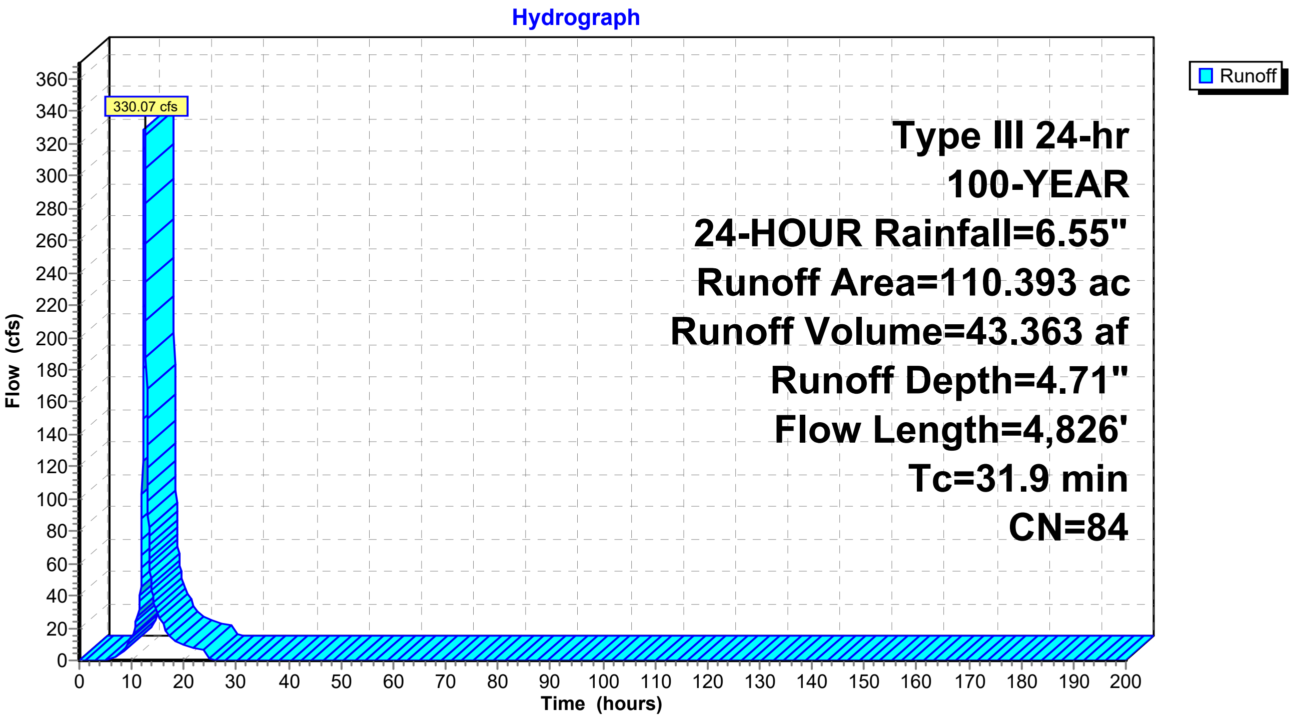
Runoff = 330.07 cfs @ 12.43 hrs, Volume= 43.363 af, Depth= 4.71"
Routed to Link O-2 : Outfall to Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.221	89	Gravel roads, HSG C
0.250	91	Gravel roads, HSG D
0.616	65	Row crops, contoured, Good, HSG A
14.410	82	Row crops, contoured, Good, HSG C
72.214	86	Row crops, contoured, Good, HSG D
0.226	70	Woods, Good, HSG C
22.457	77	Woods, Good, HSG D
110.393	84	Weighted Average
110.393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.2700	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
1.4	153	0.1240	1.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.3	1,048	0.1330	3.28		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
7.5	680	0.0910	1.51		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	2,845	0.0340	5.14	34.26	**Parabolic Channel,** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.040 Winding stream, pools & shoals
31.9	4,826	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

[47] Hint: Peak is 1963% of capacity of segment #4

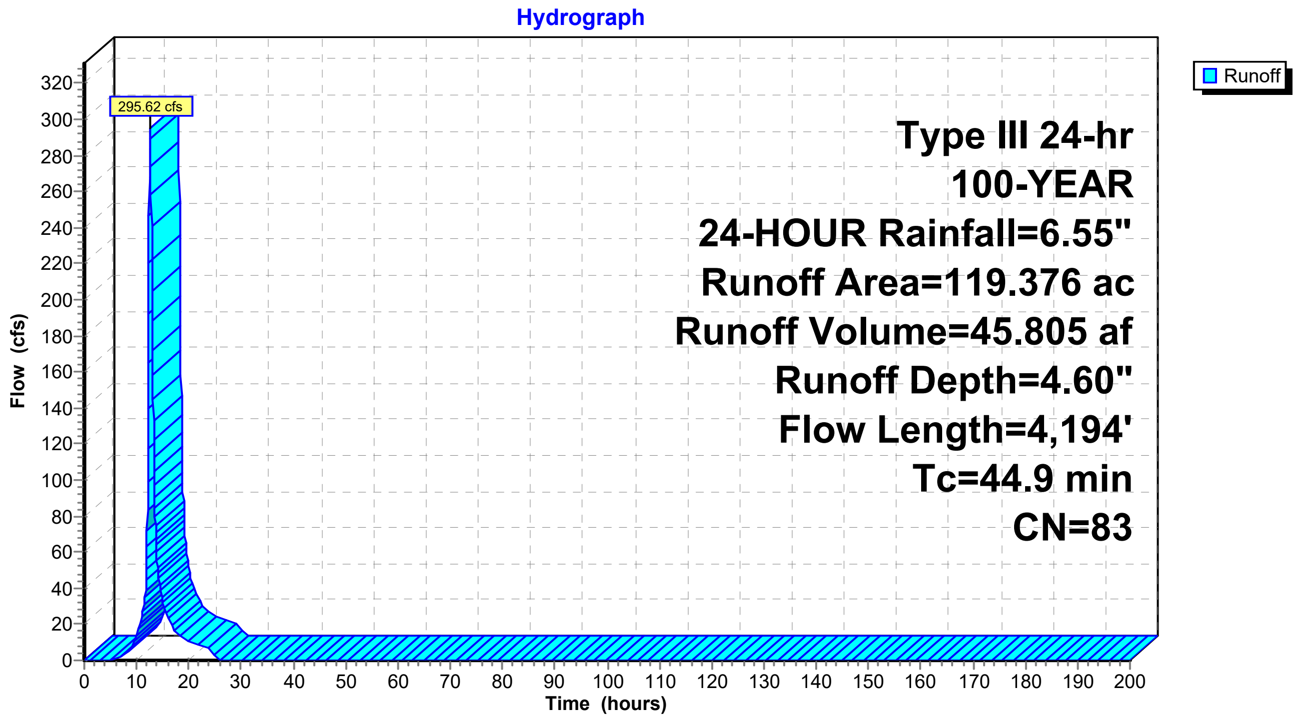
Runoff = 295.62 cfs @ 12.60 hrs, Volume= 45.805 af, Depth= 4.60"
Routed to Link O-3 : Outfall to Southwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.363	89	Gravel roads, HSG C
0.442	91	Gravel roads, HSG D
21.764	82	Row crops, contoured, Good, HSG C
65.719	86	Row crops, contoured, Good, HSG D
3.758	70	Woods, Good, HSG C
27.330	77	Woods, Good, HSG D
119.376	83	Weighted Average
119.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1500	0.31		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.53"
4.7	887	0.1230	3.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.0	1,270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.6	955	0.0160	0.90	15.06	**Parabolic Channel,** W=50.00' D=0.50' Area=16.7 sf Perim=50.0' n= 0.100
2.2	982	0.0120	7.51	500.40	**Parabolic Channel,** W=25.00' D=4.00' Area=66.7 sf Perim=26.6' n= 0.040 Winding stream, pools & shoals
44.9	4,194	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[47] Hint: Peak is 664% of capacity of segment #3

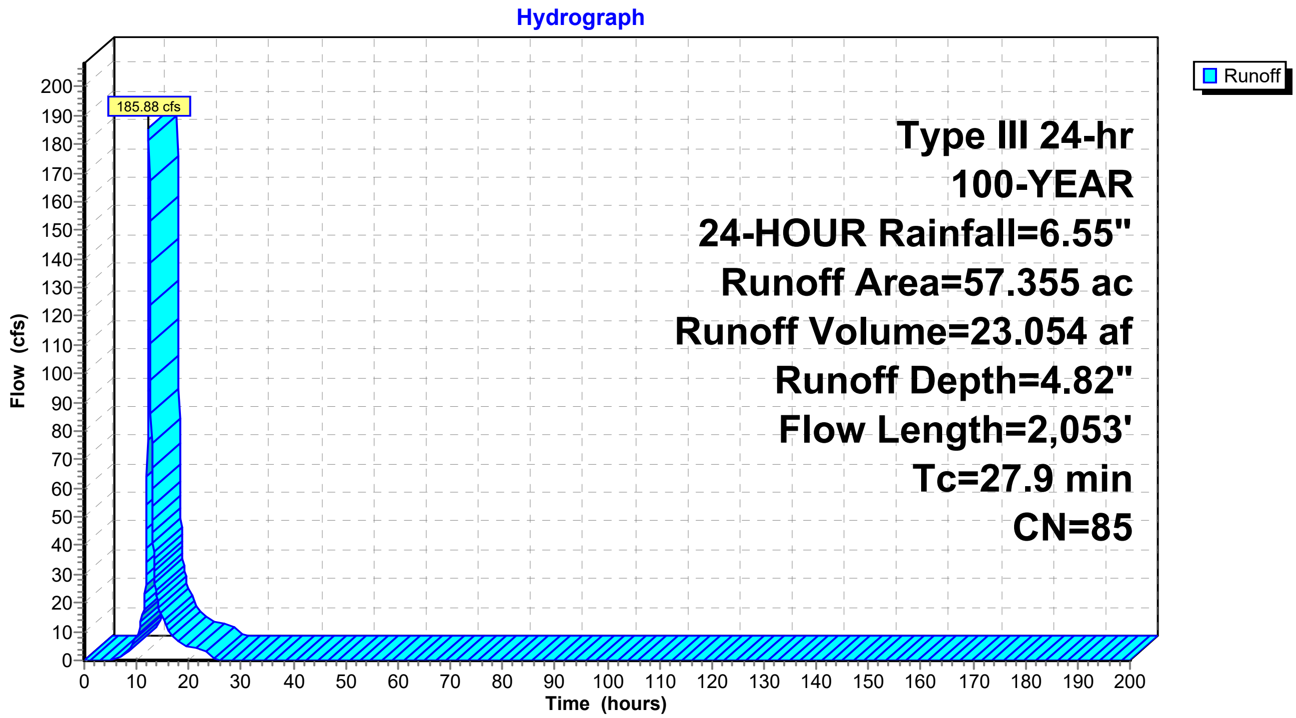
Runoff = 185.88 cfs @ 12.37 hrs, Volume= 23.054 af, Depth= 4.82"
Routed to Link O-4 : Outfall to Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
11.010	82	Row crops, contoured, Good, HSG C
46.252	86	Row crops, contoured, Good, HSG D
0.092	77	Woods, Good, HSG D
57.355	85	Weighted Average
57.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.2000	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
10.2	1,050	0.1180	1.72		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.1	903	0.0080	1.87	28.00	**Parabolic Channel,** W=15.00' D=1.50' Area=15.0 sf Perim=15.4' n= 0.070 Sluggish weedy reaches w/pools
27.9	2,053	Total			

Subcatchment 4: Subcat 4

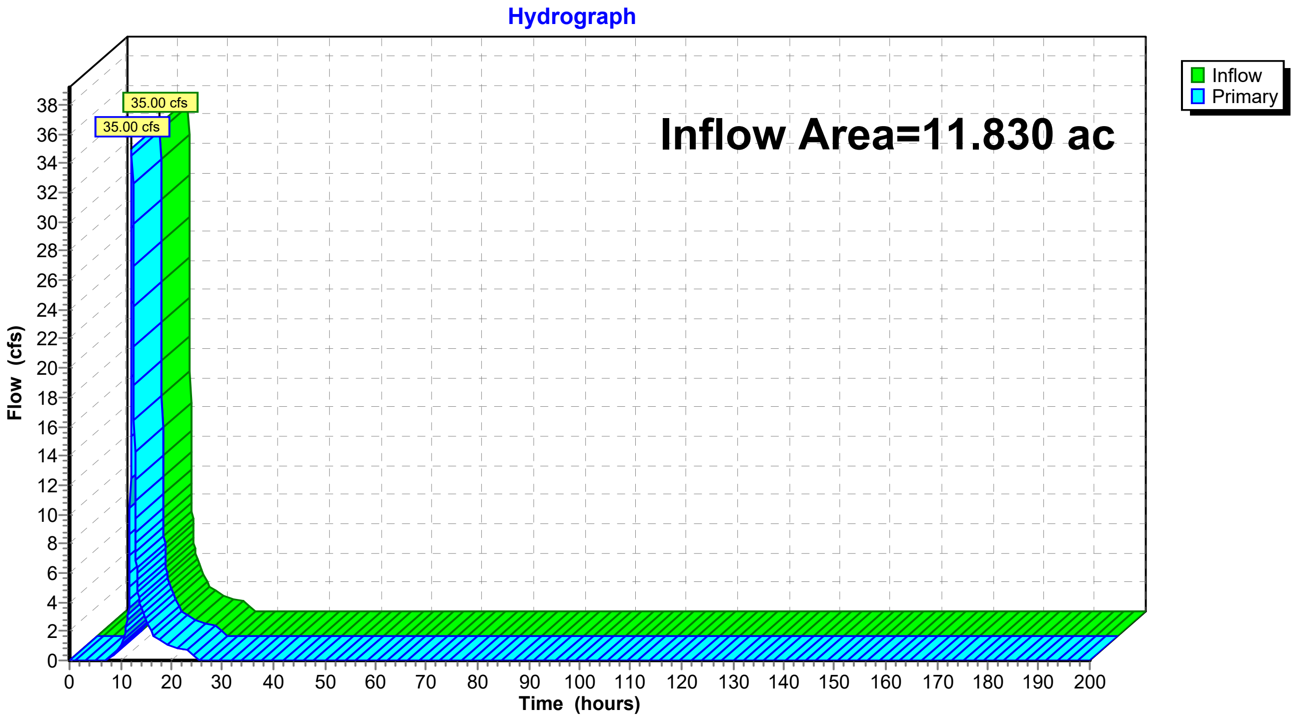


Summary for Link O-1: Outfall to West

Inflow Area = 11.830 ac, 0.00% Impervious, Inflow Depth = 3.96" for 100-YEAR, 24-HOUR event
Inflow = 35.00 cfs @ 12.31 hrs, Volume= 3.908 af
Primary = 35.00 cfs @ 12.31 hrs, Volume= 3.908 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-1: Outfall to West

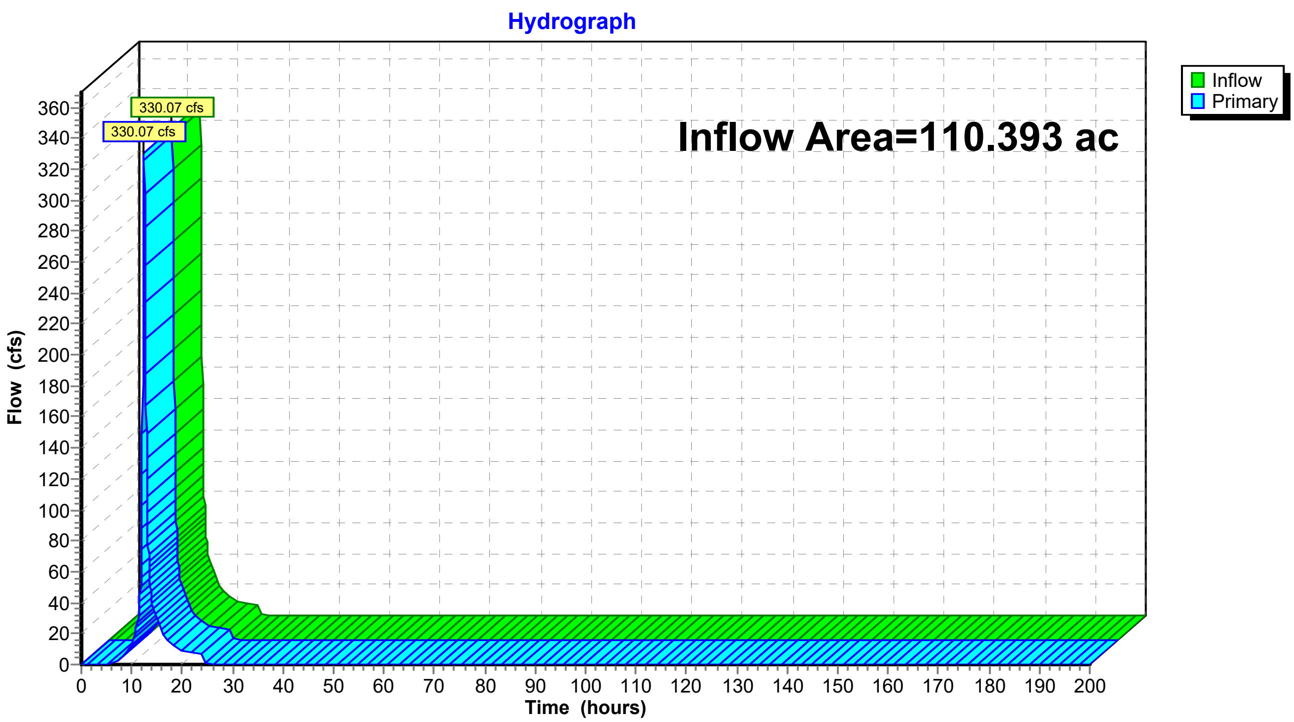


Summary for Link O-2: Outfall to Northwest

Inflow Area = 110.393 ac, 0.00% Impervious, Inflow Depth = 4.71" for 100-YEAR, 24-HOUR event
Inflow = 330.07 cfs @ 12.43 hrs, Volume= 43.363 af
Primary = 330.07 cfs @ 12.43 hrs, Volume= 43.363 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-2: Outfall to Northwest

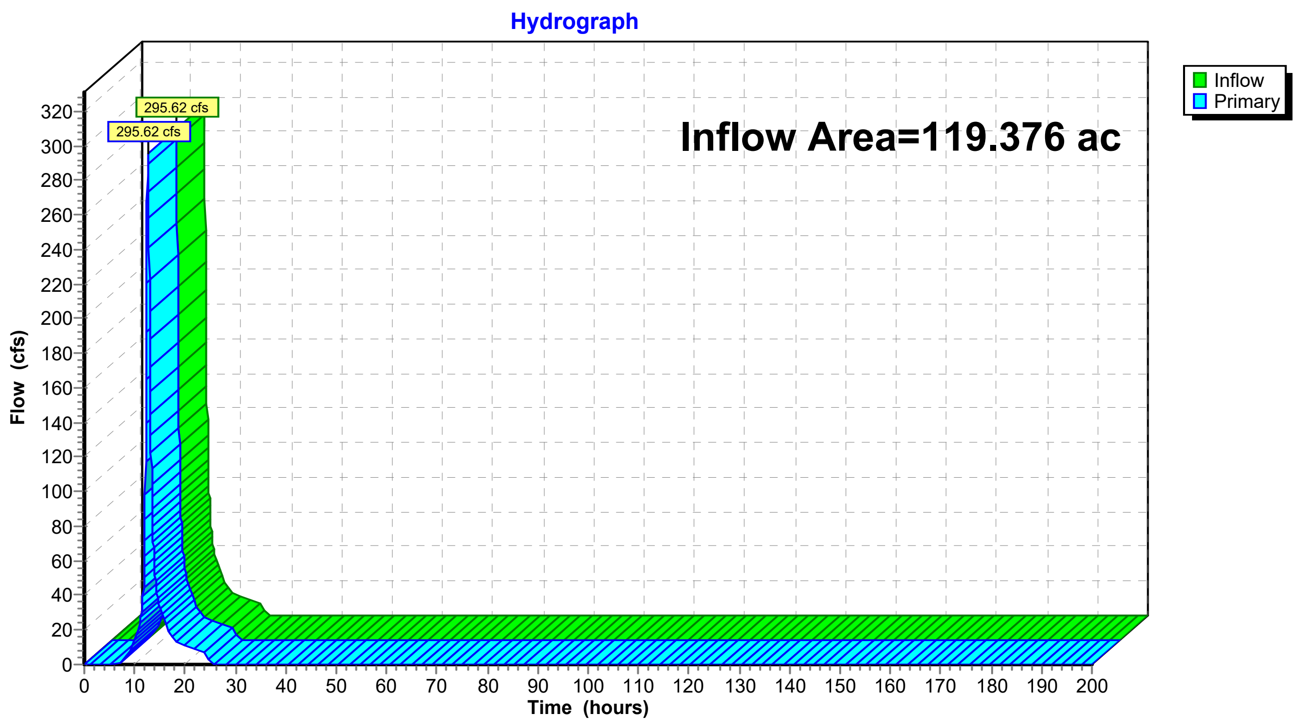


Summary for Link O-3: Outfall to Southwest

Inflow Area = 119.376 ac, 0.00% Impervious, Inflow Depth = 4.60" for 100-YEAR, 24-HOUR event
Inflow = 295.62 cfs @ 12.60 hrs, Volume= 45.805 af
Primary = 295.62 cfs @ 12.60 hrs, Volume= 45.805 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-3: Outfall to Southwest

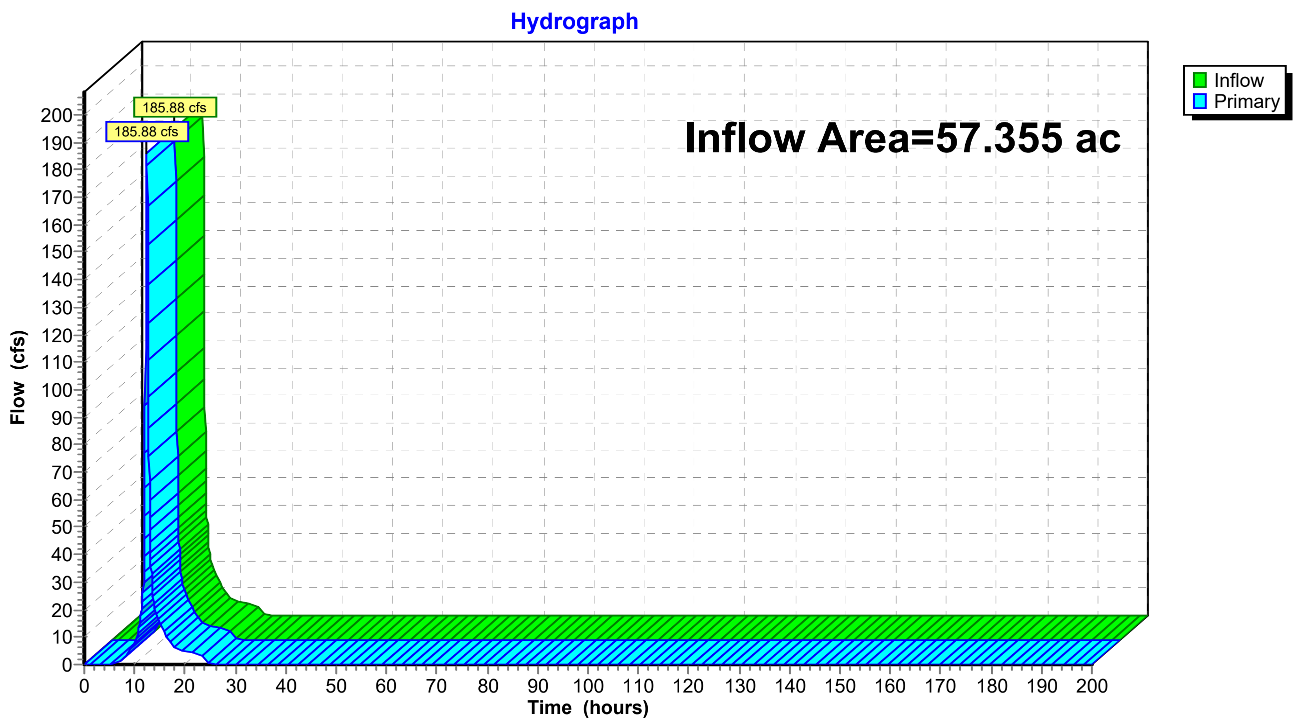


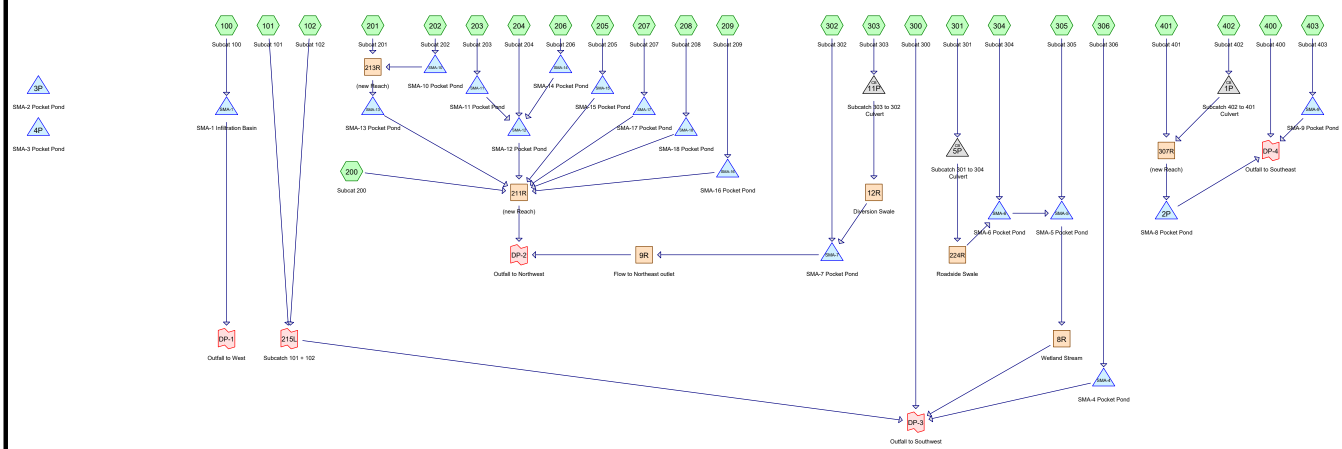
Summary for Link O-4: Outfall to Southeast

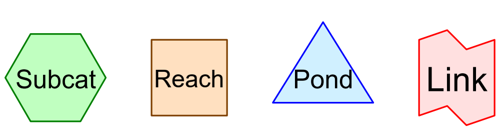
Inflow Area = 57.355 ac, 0.00% Impervious, Inflow Depth = 4.82" for 100-YEAR, 24-HOUR event
Inflow = 185.88 cfs @ 12.37 hrs, Volume= 23.054 af
Primary = 185.88 cfs @ 12.37 hrs, Volume= 23.054 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link O-4: Outfall to Southeast







Routing Diagram for Hawthorn Solar POST

Prepared by Environmental Design Partnership, Printed 7/28/2023

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YEAR, 24-HOUR	Type III 24-hr		Default	24.00	1	2.27	2
2	10-YEAR, 24-HOUR	Type III 24-hr		Default	24.00	1	3.82	2
3	100-YEAR, 24-HOUR	Type III 24-hr		Default	24.00	1	6.55	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.018	96	Gravel surface, HSG C (101, 200, 201, 202, 208, 300, 301, 400, 401, 403)
2.764	96	Gravel surface, HSG D (100, 101, 200, 201, 204, 205, 206, 207, 208, 209, 300, 301, 302, 303, 304, 305, 306, 400, 401, 402, 403)
23.474	71	Meadow, non-grazed, HSG C (100, 101, 102, 200, 201, 202, 203, 208, 209, 300, 301, 302, 400, 401, 403)
106.521	78	Meadow, non-grazed, HSG D (100, 101, 102, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 300, 301, 302, 303, 304, 305, 306, 400, 401, 402, 403)
0.616	65	Row crops, contoured, Good, HSG A (200)
25.130	82	Row crops, contoured, Good, HSG C (100, 200, 300, 400, 401, 403)
90.437	86	Row crops, contoured, Good, HSG D (100, 102, 200, 201, 300, 400, 401, 403)
0.308	98	Unconnected roofs, HSG C (100, 200)
0.824	98	Unconnected roofs, HSG D (100, 200)
6.400	70	Woods, Good, HSG C (100, 102, 200, 300)
42.315	77	Woods, Good, HSG D (100, 102, 200, 201, 300, 401)
299.806	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.616	HSG A	200
0.000	HSG B	
56.330	HSG C	100, 101, 102, 200, 201, 202, 203, 208, 209, 300, 301, 302, 400, 401, 403
242.860	HSG D	100, 101, 102, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 300, 301, 302, 303, 304, 305, 306, 400, 401, 402, 403
0.000	Other	
299.806		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.018	2.764	0.000	3.781	Gravel surface	100, 101, 200, 201, 202, 204, 205, 206, 207, 208, 209, 300, 301, 302, 303, 304, 305, 306, 400, 401, 402, 403
0.000	0.000	23.474	106.521	0.000	129.995	Meadow, non-grazed	100, 101, 102, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 300, 301, 302, 303, 304, 305, 306, 400, 401, 402, 403

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.616	0.000	25.130	90.437	0.000	116.183	Row crops, contoured, Good	100, 102, 200, 201, 300, 400, 401, 403
0.000	0.000	0.308	0.824	0.000	1.132	Unconnected roofs	100, 200
0.000	0.000	6.400	42.315	0.000	48.715	Woods, Good	100, 102, 200, 201, 300, 401
0.616	**0.000**	**56.330**	**242.860**	**0.000**	**299.806**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1P	0.00	0.00	25.0	0.0000	0.010	0.0	12.0	0.0	
2	2P	965.00	964.00	100.0	0.0100	0.010	0.0	12.0	0.0	
3	3P	846.00	845.00	25.0	0.0400	0.010	0.0	12.0	0.0	
4	4P	842.00	841.00	47.0	0.0213	0.010	0.0	12.0	0.0	
5	5P	0.00	0.00	25.0	0.0000	0.010	0.0	12.0	0.0	
6	11P	1,017.00	1,013.00	60.0	0.0667	0.010	0.0	12.0	0.0	
7	SMA-1	829.00	827.00	25.0	0.0800	0.010	0.0	12.0	0.0	
8	SMA-10	1,042.00	1,041.00	66.0	0.0152	0.012	0.0	12.0	0.0	
9	SMA-11	1,001.00	1,000.00	36.0	0.0278	0.012	0.0	12.0	0.0	
10	SMA-16	1,030.00	1,029.00	60.0	0.0167	0.012	0.0	12.0	0.0	
11	SMA-4	944.00	943.00	60.0	0.0167	0.012	0.0	12.0	0.0	
12	SMA-5	934.00	933.00	25.0	0.0400	0.010	0.0	12.0	0.0	
13	SMA-6	942.00	936.00	38.0	0.1579	0.010	0.0	12.0	0.0	
14	SMA-7	943.00	942.00	100.0	0.0100	0.010	0.0	12.0	0.0	

Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 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: Subcat 100 Runoff Area=11.830 ac 0.16% Impervious Runoff Depth=0.56"
Flow Length=773' Tc=22.8 min CN=76 Runoff=4.33 cfs 0.552 af

Subcatchment101: Subcat 101 Runoff Area=5.410 ac 0.00% Impervious Runoff Depth=0.45"
Flow Length=845' Tc=15.1 min CN=73 Runoff=1.69 cfs 0.202 af

Subcatchment102: Subcat 102 Runoff Area=5.431 ac 0.00% Impervious Runoff Depth=0.48"
Flow Length=1,119' Tc=24.2 min CN=74 Runoff=1.59 cfs 0.219 af

Subcatchment200: Subcat 200 Runoff Area=83.894 ac 1.33% Impervious Runoff Depth=0.69"
Flow Length=4,461' Tc=27.5 min UI Adjusted CN=79 Runoff=36.95 cfs 4.805 af

Subcatchment201: Subcat 201 Runoff Area=10.257 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=1,008' Tc=14.7 min CN=78 Runoff=5.35 cfs 0.550 af

Subcatchment202: Subcat 202 Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=260' Tc=7.7 min CN=75 Runoff=0.21 cfs 0.019 af

Subcatchment203: Subcat 203 Runoff Area=5.186 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=827' Tc=15.4 min CN=76 Runoff=2.21 cfs 0.242 af

Subcatchment204: Subcat 204 Runoff Area=0.186 ac 0.00% Impervious Runoff Depth=1.06"
Flow Length=175' Tc=0.4 min CN=86 Runoff=0.26 cfs 0.016 af

Subcatchment205: Subcat 205 Runoff Area=0.203 ac 0.00% Impervious Runoff Depth=1.06"
Flow Length=236' Tc=0.7 min CN=86 Runoff=0.28 cfs 0.018 af

Subcatchment206: Subcat 206 Runoff Area=0.678 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=489' Tc=15.4 min CN=78 Runoff=0.35 cfs 0.036 af

Subcatchment207: Subcat 207 Runoff Area=0.099 ac 0.00% Impervious Runoff Depth=1.06"
Flow Length=132' Tc=0.5 min CN=86 Runoff=0.14 cfs 0.009 af

Subcatchment208: Subcat 208 Runoff Area=0.475 ac 0.00% Impervious Runoff Depth=1.06"
Flow Length=681' Tc=2.7 min CN=86 Runoff=0.64 cfs 0.042 af

Subcatchment209: Subcat 209 Runoff Area=7.634 ac 0.00% Impervious Runoff Depth=0.60"
Flow Length=567' Tc=15.3 min CN=77 Runoff=3.57 cfs 0.382 af

Subcatchment300: Subcat 300 Runoff Area=96.162 ac 0.00% Impervious Runoff Depth=0.78"
Flow Length=4,194' Tc=45.6 min CN=81 Runoff=38.64 cfs 6.268 af

Subcatchment301: Subcat 301 Runoff Area=0.301 ac 0.00% Impervious Runoff Depth=1.26"
Flow Length=2,290' Tc=14.6 min CN=89 Runoff=0.34 cfs 0.032 af

Subcatchment302: Subcat 302 Runoff Area=7.050 ac 0.00% Impervious Runoff Depth=0.60"
Flow Length=878' Slope=0.1180 '/' Tc=13.3 min CN=77 Runoff=3.49 cfs 0.353 af

Subcatchment303: Subcat 303 Runoff Area=4.296 ac 0.00% Impervious Runoff Depth=0.64"
Tc=0.0 min CN=78 Runoff=3.42 cfs 0.230 af

Subcatchment304: Subcat 304 Runoff Area=0.604 ac 0.00% Impervious Runoff Depth=1.12"
Tc=0.0 min CN=87 Runoff=0.91 cfs 0.056 af

Subcatchment305: Subcat 305 Runoff Area=0.143 ac 0.00% Impervious Runoff Depth=1.06"
Tc=0.0 min CN=86 Runoff=0.20 cfs 0.013 af

Subcatchment306: Subcat 306 Runoff Area=1.961 ac 0.00% Impervious Runoff Depth=0.89"
Tc=0.0 min CN=83 Runoff=2.29 cfs 0.145 af

Subcatchment400: Subcat 400 Runoff Area=43.571 ac 0.00% Impervious Runoff Depth=0.94"
Flow Length=1,691' Tc=23.4 min CN=84 Runoff=29.63 cfs 3.415 af

Subcatchment401: Subcat 401 Runoff Area=12.329 ac 0.00% Impervious Runoff Depth=0.94"
Flow Length=1,337' Tc=18.7 min CN=84 Runoff=9.21 cfs 0.966 af

Subcatchment402: Subcat 402 Runoff Area=1.361 ac 0.00% Impervious Runoff Depth=0.69"
Flow Length=689' Tc=14.6 min CN=79 Runoff=0.77 cfs 0.078 af

Subcatchment403: Subcat 403 Runoff Area=0.298 ac 0.00% Impervious Runoff Depth=1.40"
Flow Length=562' Tc=2.0 min CN=91 Runoff=0.53 cfs 0.035 af

Reach 8R: Wetland Stream Avg. Flow Depth=0.04' Max Vel=0.82 fps Inflow=0.29 cfs 0.071 af
n=0.040 L=2,450.0' S=0.0392 '/' Capacity=238.28 cfs Outflow=0.18 cfs 0.071 af

Reach 9R: Flow to Northeast outlet Avg. Flow Depth=0.37' Max Vel=2.88 fps Inflow=5.01 cfs 0.583 af
n=0.040 L=2,500.0' S=0.0464 '/' Capacity=36.76 cfs Outflow=3.43 cfs 0.583 af

Reach 12R: Diversion Swale Avg. Flow Depth=0.24' Max Vel=5.04 fps Inflow=3.42 cfs 0.230 af
n=0.035 L=475.0' S=0.1368 '/' Capacity=266.51 cfs Outflow=3.06 cfs 0.230 af

Reach 211R: (new Reach) Inflow=46.38 cfs 5.977 af
Outflow=46.38 cfs 5.977 af

Reach 213R: (new Reach) Avg. Flow Depth=0.60' Max Vel=5.00 fps Inflow=5.52 cfs 0.569 af
n=0.035 L=500.0' S=0.0736 '/' Capacity=21.02 cfs Outflow=5.37 cfs 0.569 af

Reach 224R: Roadside Swale Avg. Flow Depth=0.06' Max Vel=2.34 fps Inflow=0.34 cfs 0.032 af
n=0.035 L=497.0' S=0.1328 '/' Capacity=262.54 cfs Outflow=0.32 cfs 0.032 af

Reach 307R: (new Reach) Avg. Flow Depth=0.57' Max Vel=4.96 fps Inflow=9.95 cfs 1.044 af
n=0.030 L=1,215.0' S=0.0568 '/' Capacity=6.96 cfs Outflow=9.44 cfs 1.044 af

Pond 1P: Subcatch 402 to 401 Culvert Peak Elev=0.64' Inflow=0.77 cfs 0.078 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0000 '/' Outflow=0.77 cfs 0.078 af

Pond 2P: SMA-8 Pocket Pond Peak Elev=976.83' Storage=504 cf Inflow=9.44 cfs 1.044 af
12.0" Round Culvert n=0.010 L=100.0' S=0.0100 '/' Outflow=10.05 cfs 1.044 af

Pond 3P: SMA-2 Pocket Pond Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.010 L=25.0' S=0.0400 '/' Primary=0.00 cfs 0.000 af

Pond 4P: SMA-3 Pocket Pond Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.010 L=47.0' S=0.0213 '/' Primary=0.00 cfs 0.000 af

Pond 5P: Subcatch 301 to 304 Culvert Peak Elev=0.42' Inflow=0.34 cfs 0.032 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0000 '/' Outflow=0.34 cfs 0.032 af

Pond 11P: Subcatch 303 to 302 Culvert Peak Elev=1,018.80' Inflow=3.42 cfs 0.230 af
12.0" Round Culvert n=0.010 L=60.0' S=0.0667 '/' Outflow=3.42 cfs 0.230 af

Pond SMA-1: SMA-1 Infiltration Basin Peak Elev=830.48' Storage=3,382 cf Inflow=4.33 cfs 0.552 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0800 '/' Outflow=2.96 cfs 0.552 af

Pond SMA-10: SMA-10 Pocket Pond Peak Elev=1,042.25' Storage=0.000 af Inflow=0.21 cfs 0.019 af
12.0" Round Culvert n=0.012 L=66.0' S=0.0152 '/' Outflow=0.21 cfs 0.019 af

Pond SMA-11: SMA-11 Pocket Pond Peak Elev=1,002.04' Storage=0.003 af Inflow=2.21 cfs 0.242 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/' Outflow=2.18 cfs 0.242 af

Pond SMA-12: SMA-12 Pocket Pond Peak Elev=1,001.35' Storage=0.034 af Inflow=2.62 cfs 0.294 af
Outflow=2.59 cfs 0.267 af

Pond SMA-13: SMA-13 Pocket Pond Peak Elev=1,001.54' Storage=0.056 af Inflow=5.37 cfs 0.569 af
Outflow=5.35 cfs 0.526 af

Pond SMA-14: SMA-14 Pocket Pond Peak Elev=1,017.13' Storage=0.001 af Inflow=0.35 cfs 0.036 af
Outflow=0.35 cfs 0.035 af

Pond SMA-15: SMA-15 Pocket Pond Peak Elev=1,017.07' Storage=0.006 af Inflow=0.28 cfs 0.018 af
Outflow=0.23 cfs 0.013 af

Pond SMA-16: SMA-16 Pocket Pond Peak Elev=1,031.19' Storage=0.065 af Inflow=3.57 cfs 0.382 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0167 '/' Outflow=2.49 cfs 0.360 af

Pond SMA-17: SMA-17 Pocket Pond Peak Elev=1,028.04' Storage=0.003 af Inflow=0.14 cfs 0.009 af
Outflow=0.06 cfs 0.006 af

Pond SMA-18: SMA-18 Pocket Pond Peak Elev=1,029.62' Storage=0.042 af Inflow=0.64 cfs 0.042 af
Outflow=0.00 cfs 0.000 af

Pond SMA-4: SMA-4 Pocket Pond Peak Elev=853.79' Storage=6,300 cf Inflow=2.29 cfs 0.145 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0167 '/' Outflow=0.00 cfs 0.000 af

Pond SMA-5: SMA-5 Pocket Pond Peak Elev=934.30' Storage=142 cf Inflow=0.30 cfs 0.071 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0400 '/' Outflow=0.29 cfs 0.071 af

Pond SMA-6: SMA-6 Pocket Pond Peak Elev=942.29' Storage=1,756 cf Inflow=1.01 cfs 0.088 af
12.0" Round Culvert n=0.010 L=38.0' S=0.1579 '/' Outflow=0.28 cfs 0.058 af

Pond SMA-7: SMA-7 Pocket Pond Peak Elev=946.31' Storage=2,513 cf Inflow=5.21 cfs 0.583 af
12.0" Round Culvert n=0.010 L=100.0' S=0.0100 '/' Outflow=5.01 cfs 0.583 af

Pond SMA-9: SMA-9 Pocket Pond Peak Elev=963.18' Storage=0.000 af Inflow=0.53 cfs 0.035 af
Outflow=0.54 cfs 0.035 af

Link 215L: Subcatch 101 + 102 Inflow=3.09 cfs 0.421 af
Primary=3.09 cfs 0.421 af

Link DP-1: Outfall to West Inflow=2.96 cfs 0.552 af
Primary=2.96 cfs 0.552 af

Link DP-2: Outfall to Northwest Inflow=47.93 cfs 6.560 af
Primary=47.93 cfs 6.560 af

Link DP-3: Outfall to Southwest Inflow=40.57 cfs 6.759 af
Primary=40.57 cfs 6.759 af

Link DP-4: Outfall to Southeast Inflow=39.82 cfs 4.494 af
Primary=39.82 cfs 4.494 af

Total Runoff Area = 299.806 ac Runoff Volume = 18.682 af Average Runoff Depth = 0.75"
99.62% Pervious = 298.674 ac 0.38% Impervious = 1.132 ac

Summary for Subcatchment 100: Subcat 100

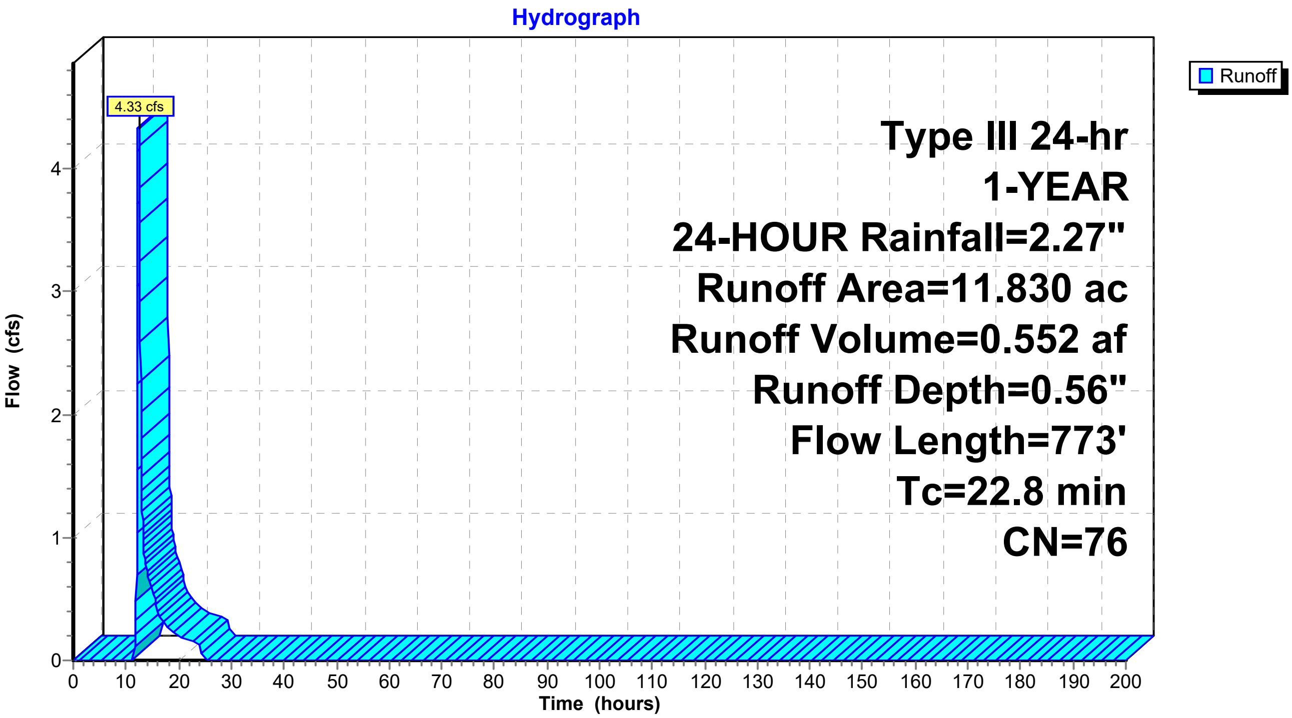
Runoff = 4.33 cfs @ 12.37 hrs, Volume= 0.552 af, Depth= 0.56"
Routed to Pond SMA-1 : SMA-1 Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.024	96	Gravel surface, HSG D
0.728	71	Meadow, non-grazed, HSG C
5.010	78	Meadow, non-grazed, HSG D
0.578	82	Row crops, contoured, Good, HSG C
0.501	86	Row crops, contoured, Good, HSG D
0.008	98	Unconnected roofs, HSG C
0.011	98	Unconnected roofs, HSG D
2.860	70	Woods, Good, HSG C
2.109	77	Woods, Good, HSG D
11.830	76	Weighted Average
11.811		99.84% Pervious Area
0.019		0.16% Impervious Area
0.019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
11.7	673	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.8	773	Total			

Subcatchment 100: Subcat 100



Summary for Subcatchment 101: Subcat 101

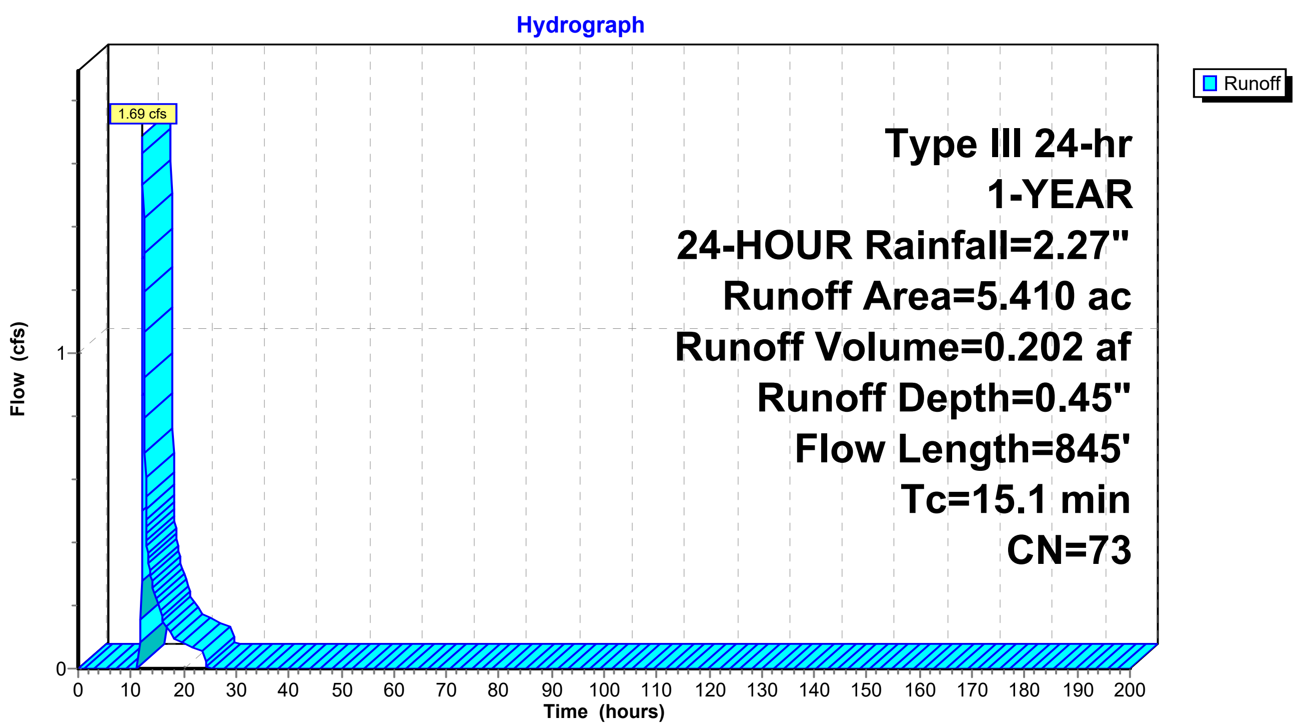
Runoff = 1.69 cfs @ 12.26 hrs, Volume= 0.202 af, Depth= 0.45"
Routed to Link 215L : Subcatch 101 + 102

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
0.104	96	Gravel surface, HSG D
4.400	71	Meadow, non-grazed, HSG C
0.903	78	Meadow, non-grazed, HSG D
5.410	73	Weighted Average
5.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1400	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
0.4	90	0.0560	3.81		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	655	0.0460	1.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.1	845	Total			

Subcatchment 101: Subcat 101



Summary for Subcatchment 102: Subcat 102

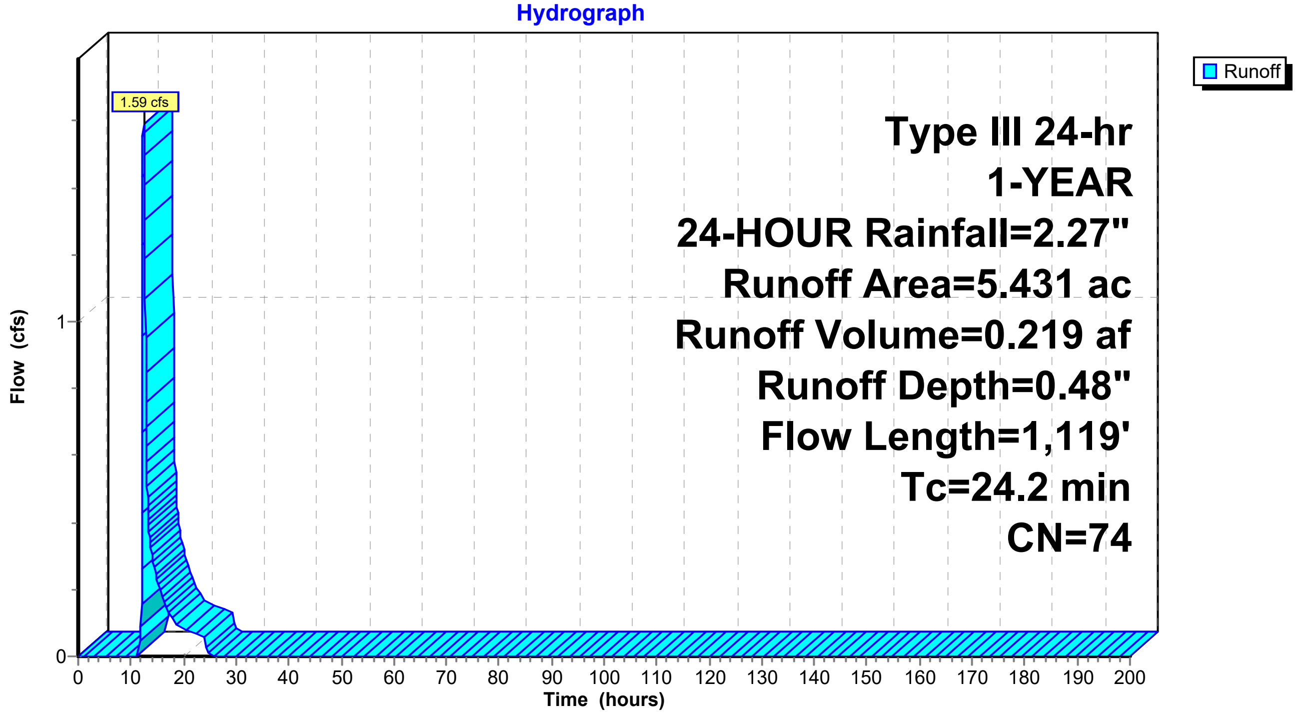
Runoff = 1.59 cfs @ 12.40 hrs, Volume= 0.219 af, Depth= 0.48"
Routed to Link 215L : Subcatch 101 + 102

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
2.103	71	Meadow, non-grazed, HSG C
1.832	78	Meadow, non-grazed, HSG D
0.041	86	Row crops, contoured, Good, HSG D
1.204	70	Woods, Good, HSG C
0.252	77	Woods, Good, HSG D
5.431	74	Weighted Average
5.431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
1.5	151	0.0330	1.63		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.5	133	0.0080	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	735	0.0340	1.29		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.2	1,119	Total			

Subcatchment 102: Subcat 102



Summary for Subcatchment 200: Subcat 200

[47] Hint: Peak is 275% of capacity of segment #5

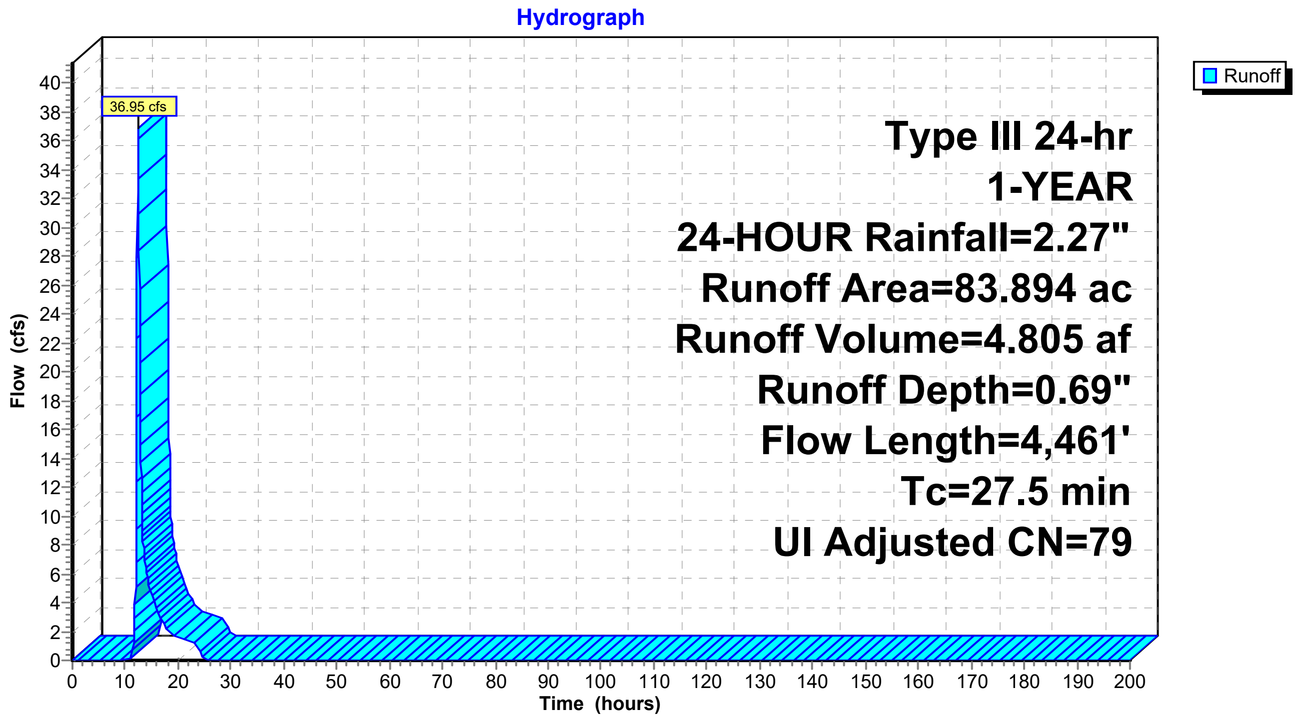
Runoff = 36.95 cfs @ 12.42 hrs, Volume= 4.805 af, Depth= 0.69"
Routed to Reach 211R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Adj	Description
0.215	96		Gravel surface, HSG C
0.337	96		Gravel surface, HSG D
2.936	71		Meadow, non-grazed, HSG C
44.017	78		Meadow, non-grazed, HSG D
0.616	65		Row crops, contoured, Good, HSG A
7.368	82		Row crops, contoured, Good, HSG C
13.931	86		Row crops, contoured, Good, HSG D
0.300	98		Unconnected roofs, HSG C
0.813	98		Unconnected roofs, HSG D
0.216	70		Woods, Good, HSG C
13.146	77		Woods, Good, HSG D
83.894	80	79	Weighted Average, UI Adjusted
82.781			98.67% Pervious Area
1.113			1.33% Impervious Area
1.113			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.2600	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
0.3	55	0.3090	2.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	690	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	330	0.2390	2.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.2	3,286	0.0300	4.47	13.42	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035 Earth, dense weeds
27.5	4,461	Total			

Subcatchment 200: Subcat 200



Summary for Subcatchment 201: Subcat 201

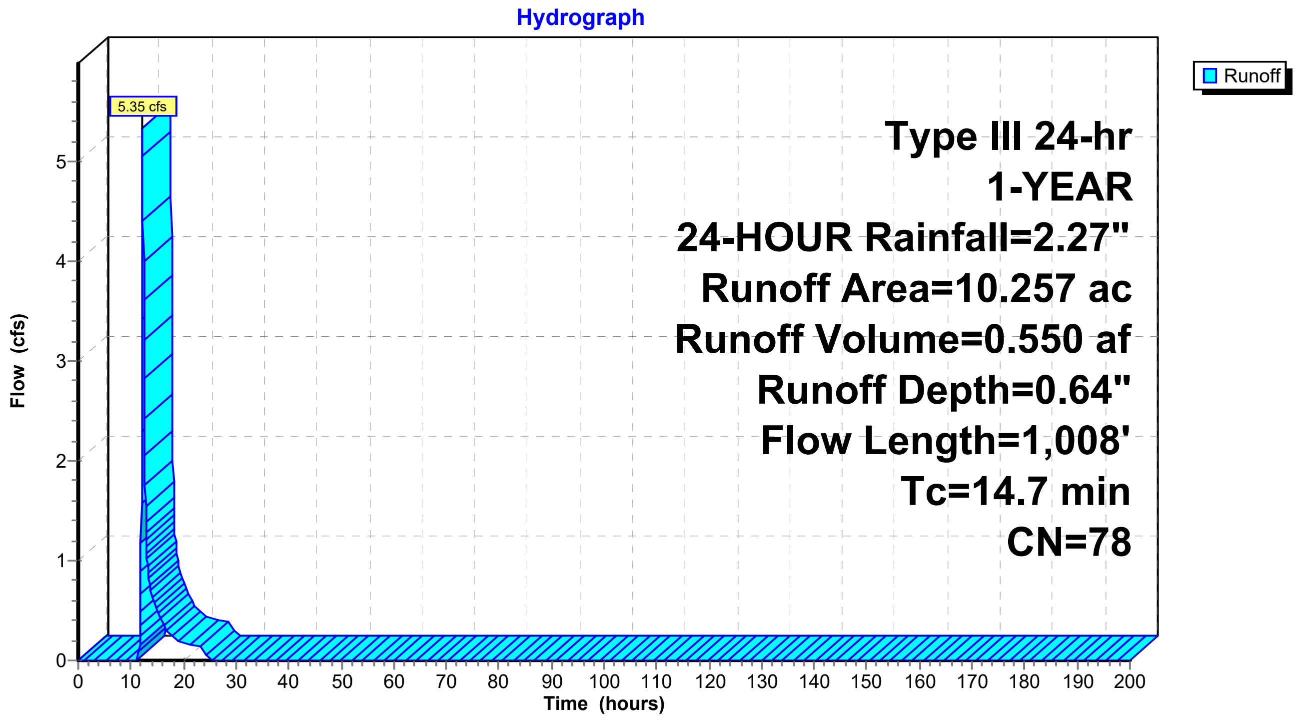
Runoff = 5.35 cfs @ 12.22 hrs, Volume= 0.550 af, Depth= 0.64"
Routed to Reach 213R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.128	96	Gravel surface, HSG C
0.146	96	Gravel surface, HSG D
1.009	71	Meadow, non-grazed, HSG C
5.521	78	Meadow, non-grazed, HSG D
0.249	86	Row crops, contoured, Good, HSG D
3.204	77	Woods, Good, HSG D
10.257	78	Weighted Average
10.257		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.2800	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
1.4	150	0.1270	1.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	758	0.1370	2.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.7	1,008	Total			

Subcatchment 201: Subcat 201



Summary for Subcatchment 202: Subcat 202

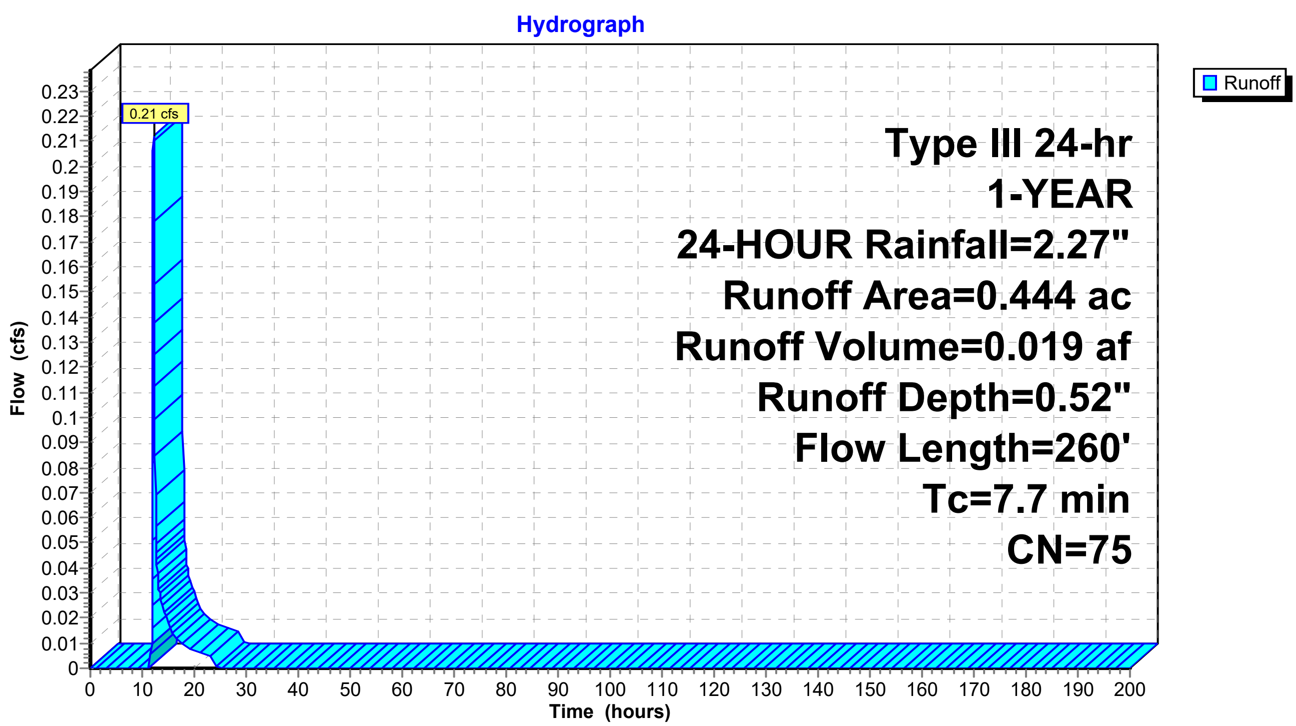
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 0.019 af, Depth= 0.52"
Routed to Pond SMA-10 : SMA-10 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG C
0.168	71	Meadow, non-grazed, HSG C
0.276	78	Meadow, non-grazed, HSG D
0.444	75	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	100	0.2000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
1.3	160	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	260	Total			

Subcatchment 202: Subcat 202



Summary for Subcatchment 203: Subcat 203

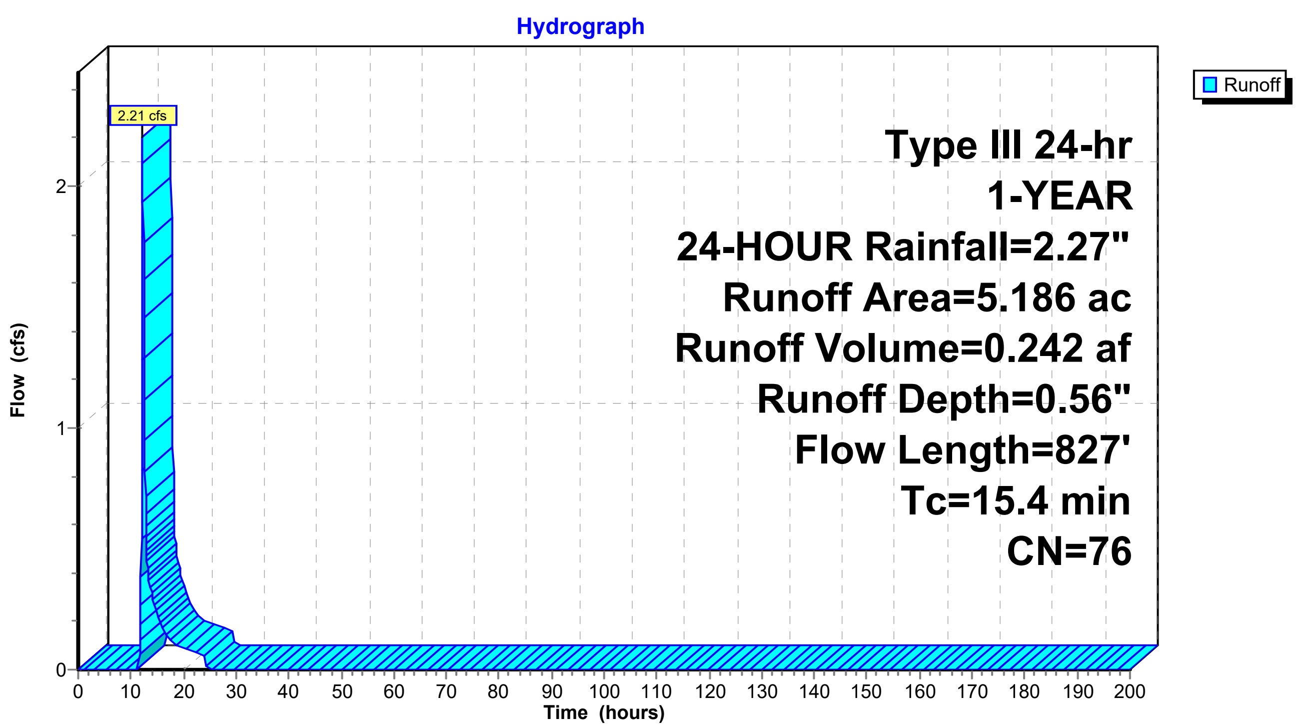
Runoff = 2.21 cfs @ 12.25 hrs, Volume= 0.242 af, Depth= 0.56"
Routed to Pond SMA-11 : SMA-11 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
1.673	71	Meadow, non-grazed, HSG C
3.513	78	Meadow, non-grazed, HSG D
5.186	76	Weighted Average
5.186		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
6.2	727	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.4	827	Total			

Subcatchment 203: Subcat 203



Summary for Subcatchment 204: Subcat 204

[49] Hint: Tc<2dt may require smaller dt

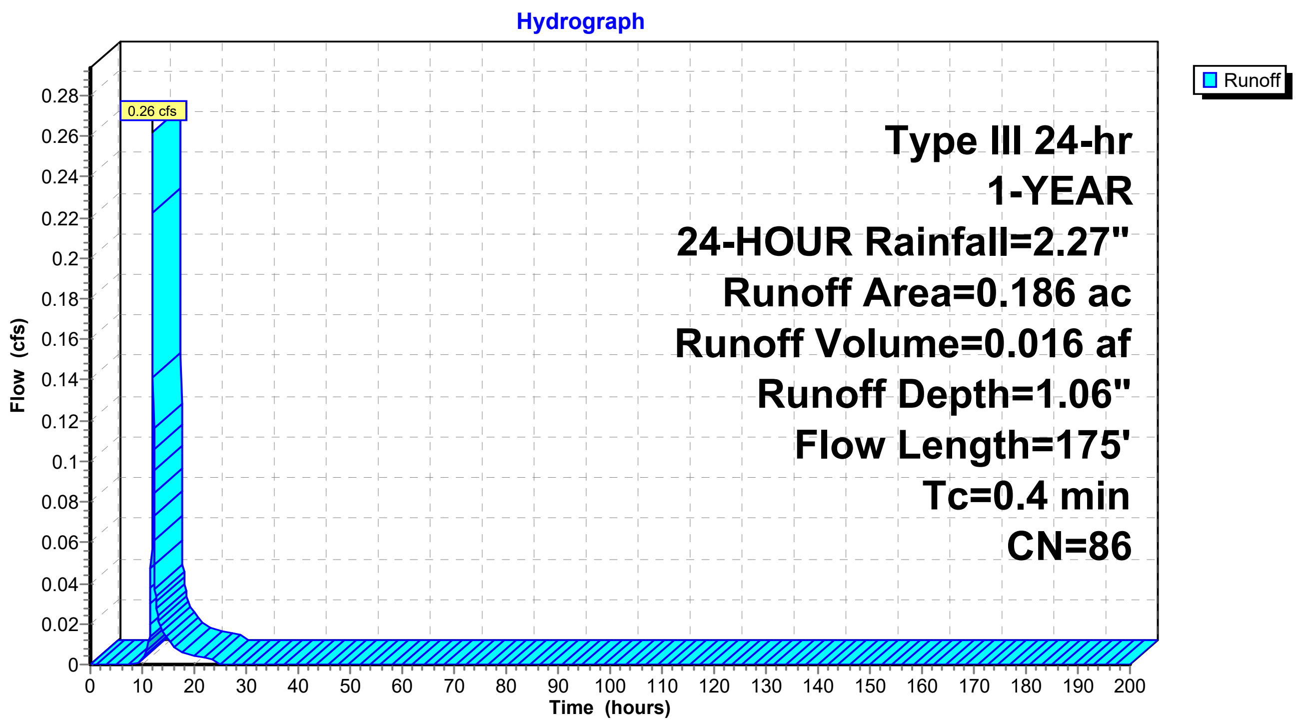
Runoff = 0.26 cfs @ 12.01 hrs, Volume= 0.016 af, Depth= 1.06"
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.085	96	Gravel surface, HSG D
0.102	78	Meadow, non-grazed, HSG D
0.186	86	Weighted Average
0.186		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	48	0.1250	5.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	127	0.0630	6.48	19.44	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.4	175	Total			

Subcatchment 204: Subcat 204



Summary for Subcatchment 205: Subcat 205

[49] Hint: Tc<2dt may require smaller dt

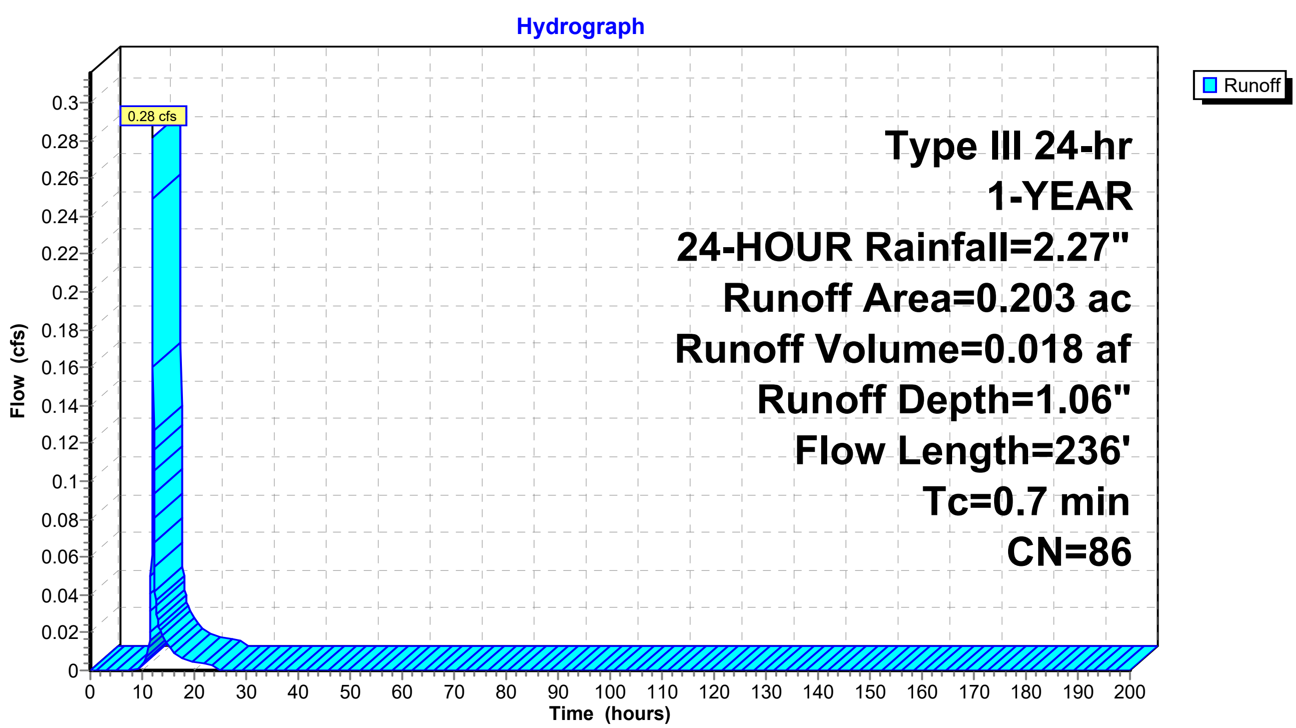
Runoff = 0.28 cfs @ 12.01 hrs, Volume= 0.018 af, Depth= 1.06"
Routed to Pond SMA-15 : SMA-15 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.086	96	Gravel surface, HSG D
0.117	78	Meadow, non-grazed, HSG D
0.203	86	Weighted Average
0.203		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	58	0.0520	3.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	178	0.0670	6.68	20.05	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.7	236	Total			

Subcatchment 205: Subcat 205



Summary for Subcatchment 206: Subcat 206

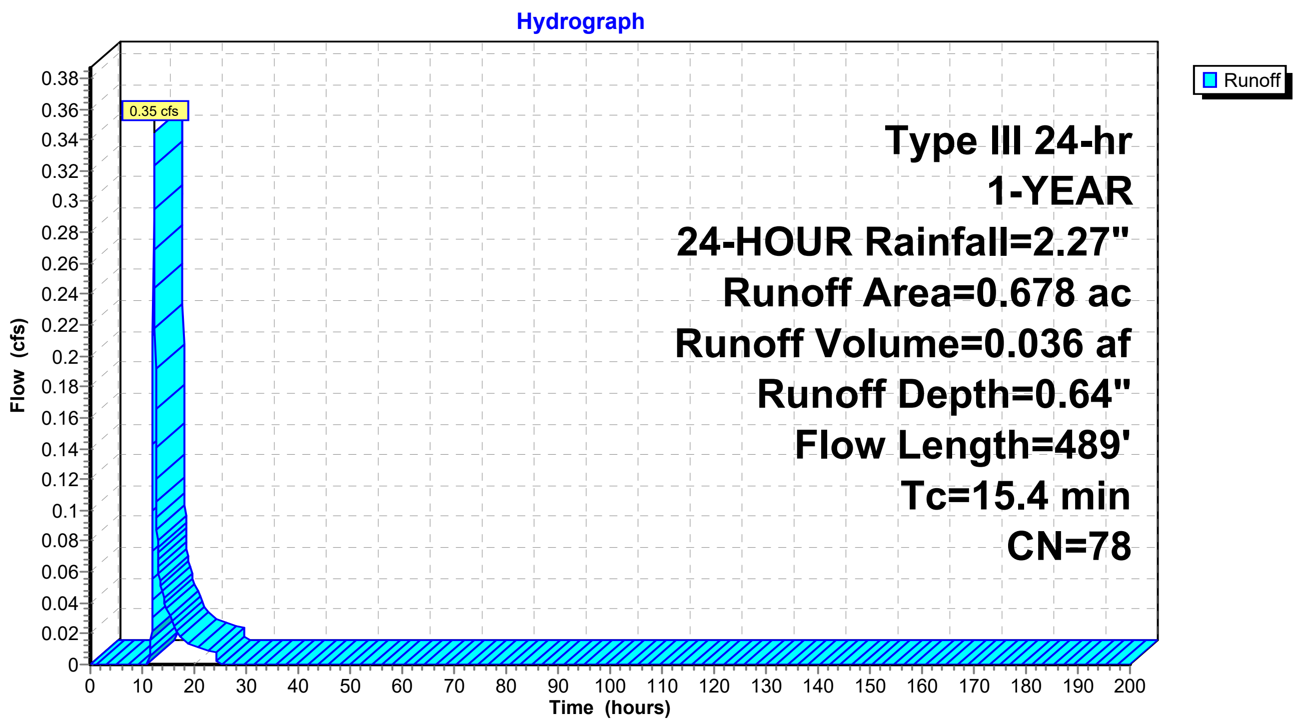
Runoff = 0.35 cfs @ 12.24 hrs, Volume= 0.036 af, Depth= 0.64"
Routed to Pond SMA-14 : SMA-14 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.001	96	Gravel surface, HSG D
0.677	78	Meadow, non-grazed, HSG D
0.678	78	Weighted Average
0.678		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
3.0	303	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	86	0.0580	6.22	18.66	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
15.4	489	Total			

Subcatchment 206: Subcat 206



Summary for Subcatchment 207: Subcat 207

[49] Hint: Tc<2dt may require smaller dt

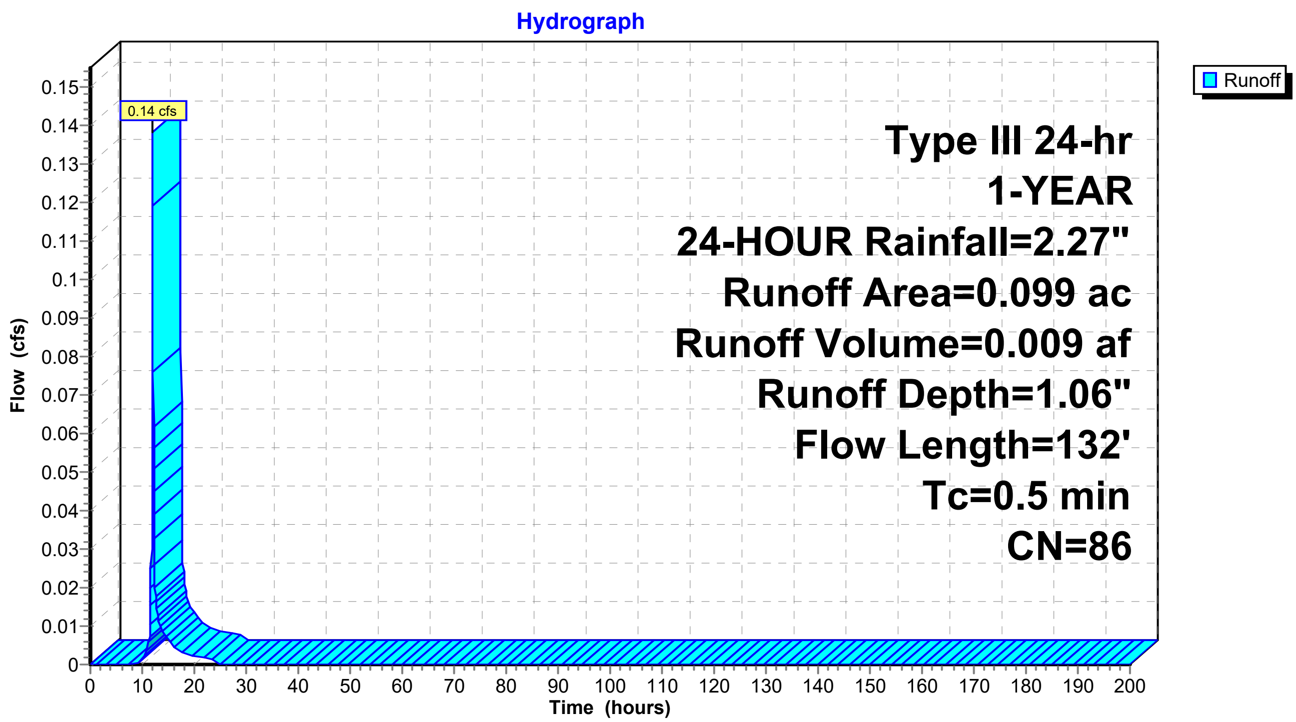
Runoff = 0.14 cfs @ 12.01 hrs, Volume= 0.009 af, Depth= 1.06"
Routed to Pond SMA-17 : SMA-17 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.046	96	Gravel surface, HSG D
0.053	78	Meadow, non-grazed, HSG D
0.099	86	Weighted Average
0.099		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.0330	2.92		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	102	0.0590	6.27	18.82	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.5	132	Total			

Subcatchment 207: Subcat 207



Summary for Subcatchment 208: Subcat 208

[49] Hint: Tc<2dt may require smaller dt

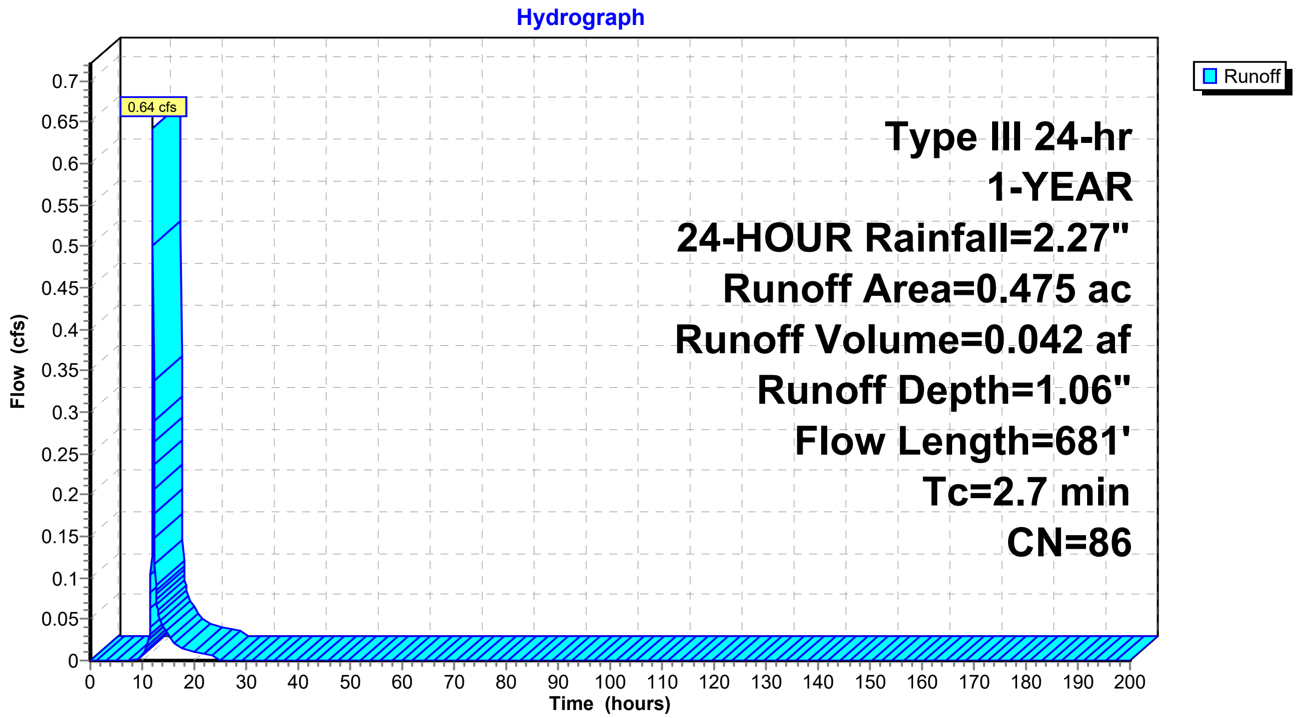
Runoff = 0.64 cfs @ 12.05 hrs, Volume= 0.042 af, Depth= 1.06"
Routed to Pond SMA-18 : SMA-18 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.103	96	Gravel surface, HSG C
0.132	96	Gravel surface, HSG D
0.066	71	Meadow, non-grazed, HSG C
0.173	78	Meadow, non-grazed, HSG D
0.475	86	Weighted Average
0.475		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	29	0.0340	2.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	652	0.0280	4.32	12.96	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
2.7	681	Total			

Subcatchment 208: Subcat 208



Summary for Subcatchment 209: Subcat 209

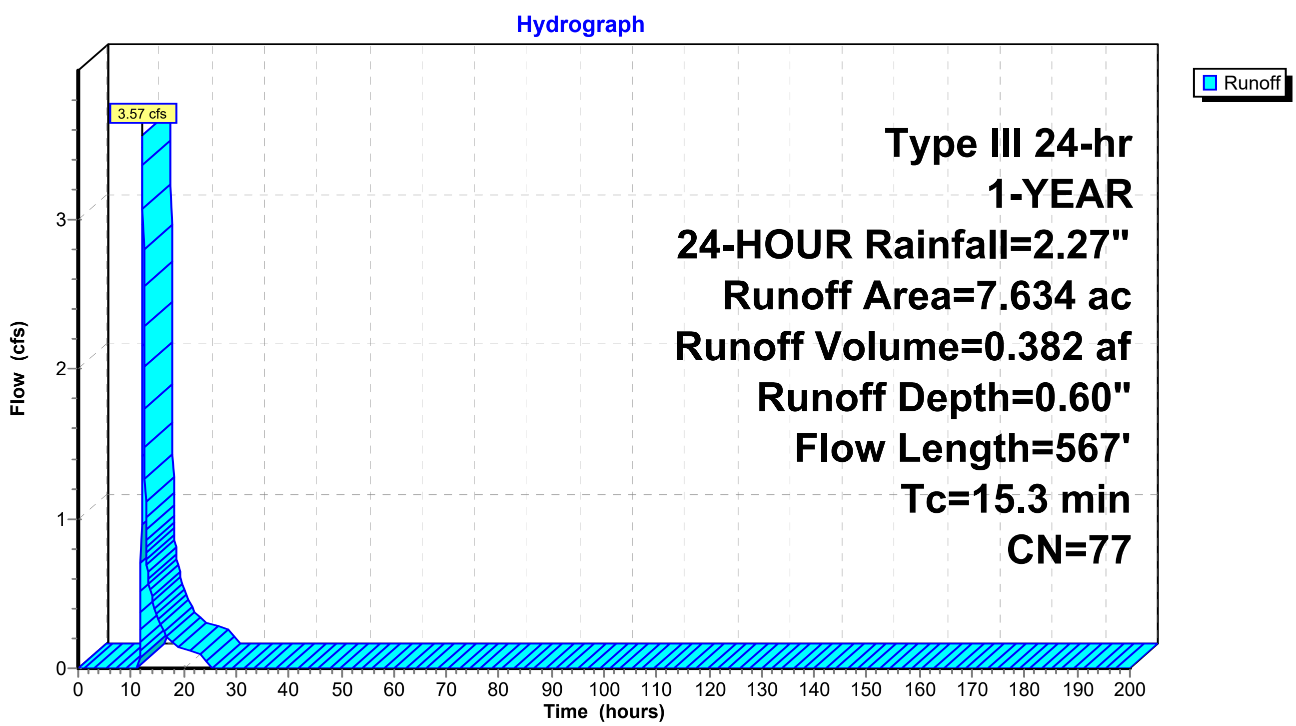
Runoff = 3.57 cfs @ 12.24 hrs, Volume= 0.382 af, Depth= 0.60"
Routed to Pond SMA-16 : SMA-16 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.001	96	Gravel surface, HSG D
1.096	71	Meadow, non-grazed, HSG C
6.537	78	Meadow, non-grazed, HSG D
7.634	77	Weighted Average
7.634		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
5.0	467	0.0490	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.3	567	Total			

Subcatchment 209: Subcat 209



Summary for Subcatchment 300: Subcat 300

[47] Hint: Peak is 257% of capacity of segment #4

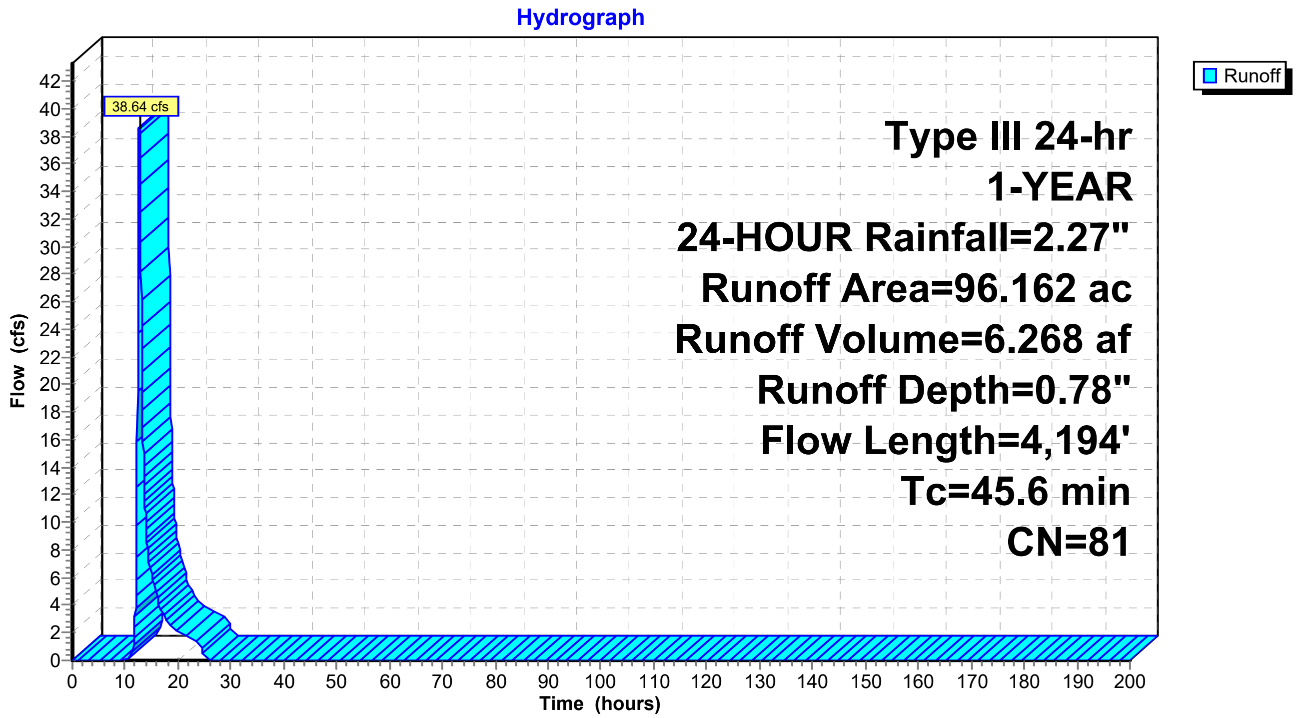
Runoff = 38.64 cfs @ 12.67 hrs, Volume= 6.268 af, Depth= 0.78"
Routed to Link DP-3 : Outfall to Southwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.494	96	Gravel surface, HSG C
0.247	96	Gravel surface, HSG D
7.922	71	Meadow, non-grazed, HSG C
16.281	78	Meadow, non-grazed, HSG D
6.324	82	Row crops, contoured, Good, HSG C
39.263	86	Row crops, contoured, Good, HSG D
2.120	70	Woods, Good, HSG C
23.512	77	Woods, Good, HSG D
96.162	81	Weighted Average
96.162		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1500	0.31		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.53"
4.7	887	0.1230	3.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.0	1,270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.6	955	0.0160	0.90	15.06	**Parabolic Channel,** W=50.00' D=0.50' Area=16.7 sf Perim=50.0' n= 0.100 Very weedy reaches w/pools
2.9	982	0.0120	5.66	203.60	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=3.00' Z= 3.0 '/' Top.W=21.00' n= 0.040 Winding stream, pools & shoals
45.6	4,194	Total			

Subcatchment 300: Subcat 300



Summary for Subcatchment 301: Subcat 301

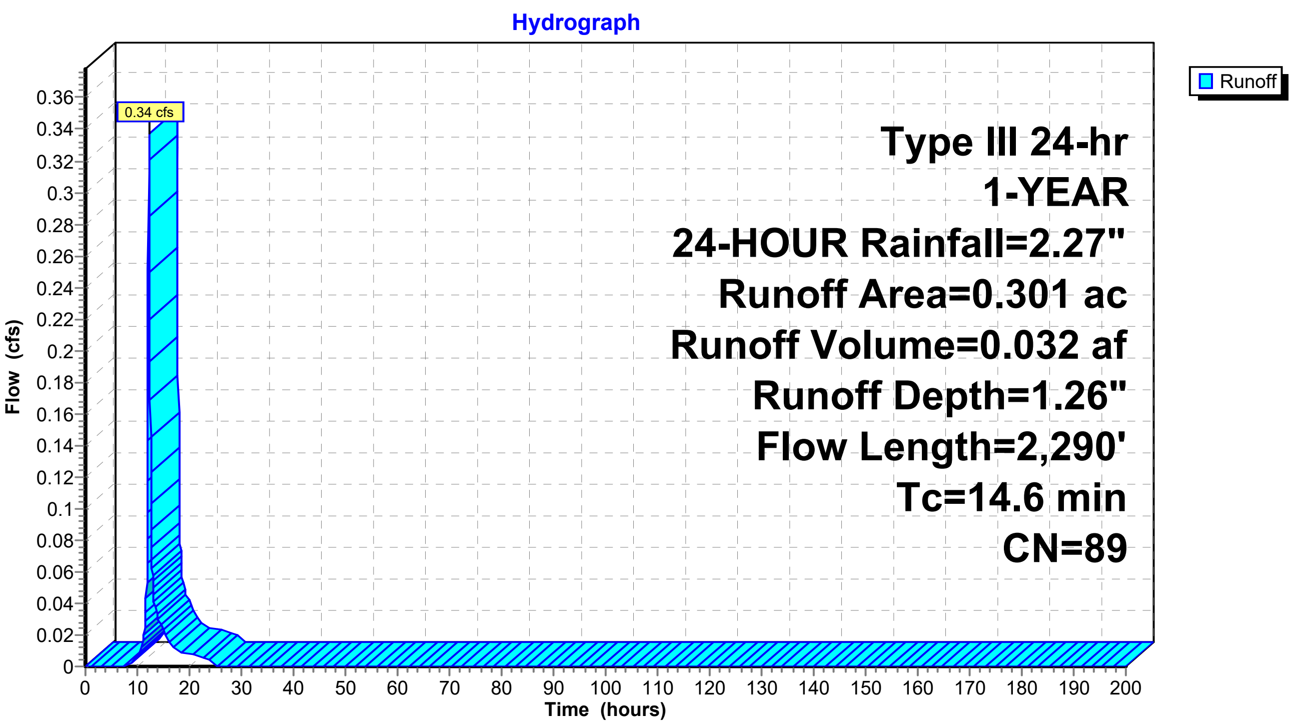
Runoff = 0.34 cfs @ 12.20 hrs, Volume= 0.032 af, Depth= 1.26"
Routed to Pond 5P : Subcatch 301 to 304 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
0.192	96	Gravel surface, HSG D
0.005	71	Meadow, non-grazed, HSG C
0.102	78	Meadow, non-grazed, HSG D
0.301	89	Weighted Average
0.301		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1400	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
2.5	435	0.1750	2.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.7	1,755	0.0580	6.22	18.66	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
14.6	2,290	Total			

Subcatchment 301: Subcat 301



Summary for Subcatchment 302: Subcat 302

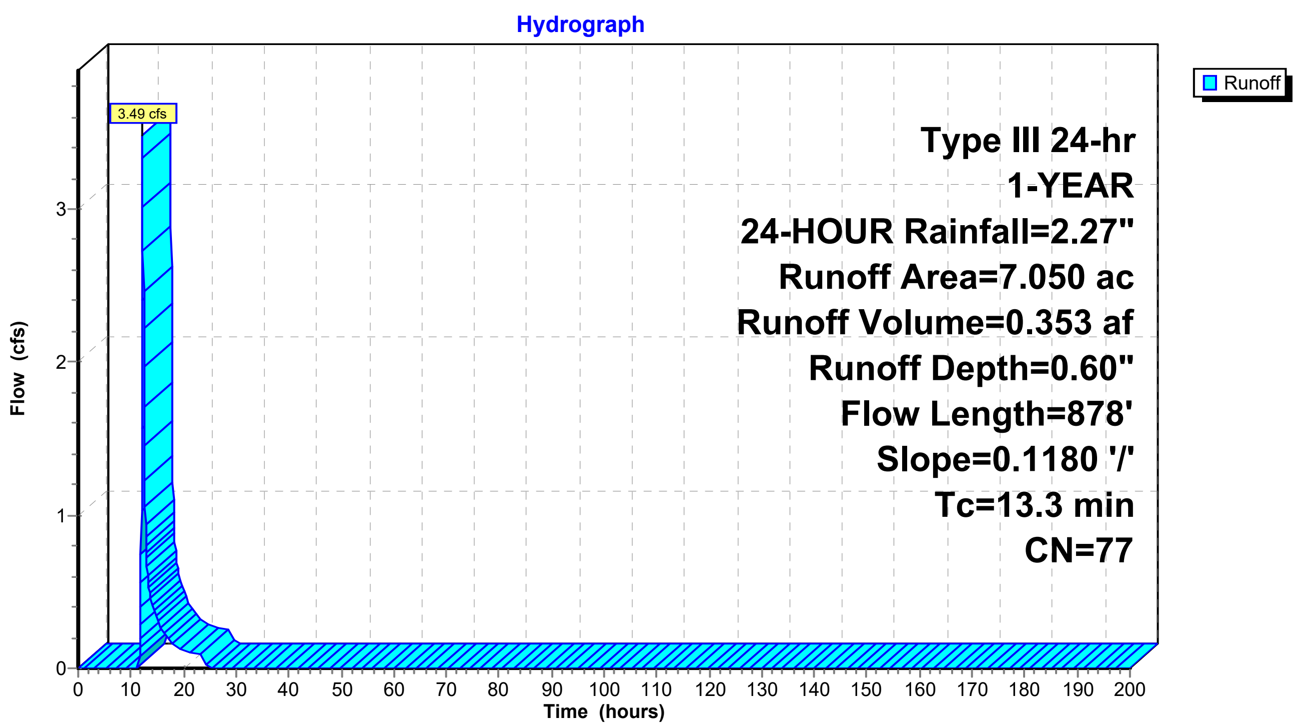
Runoff = 3.49 cfs @ 12.21 hrs, Volume= 0.353 af, Depth= 0.60"
Routed to Pond SMA-7 : SMA-7 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG D
1.290	71	Meadow, non-grazed, HSG C
5.758	78	Meadow, non-grazed, HSG D
7.050	77	Weighted Average
7.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.1180	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
5.4	778	0.1180	2.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.3	878	Total			

Subcatchment 302: Subcat 302



Summary for Subcatchment 303: Subcat 303

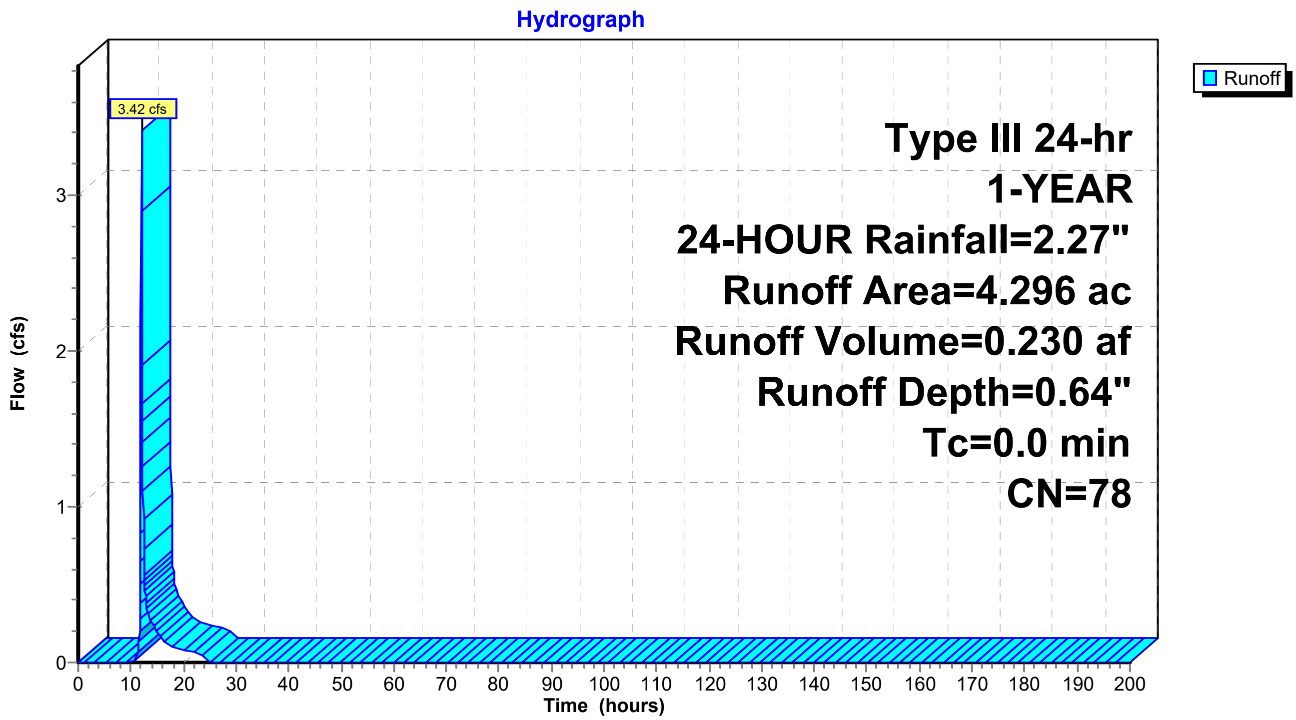
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 3.42 cfs @ 12.01 hrs, Volume= 0.230 af, Depth= 0.64"
Routed to Pond 11P : Subcatch 303 to 302 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG D
4.288	78	Meadow, non-grazed, HSG D
4.296	78	Weighted Average
4.296		100.00% Pervious Area

Subcatchment 303: Subcat 303



Summary for Subcatchment 304: Subcat 304

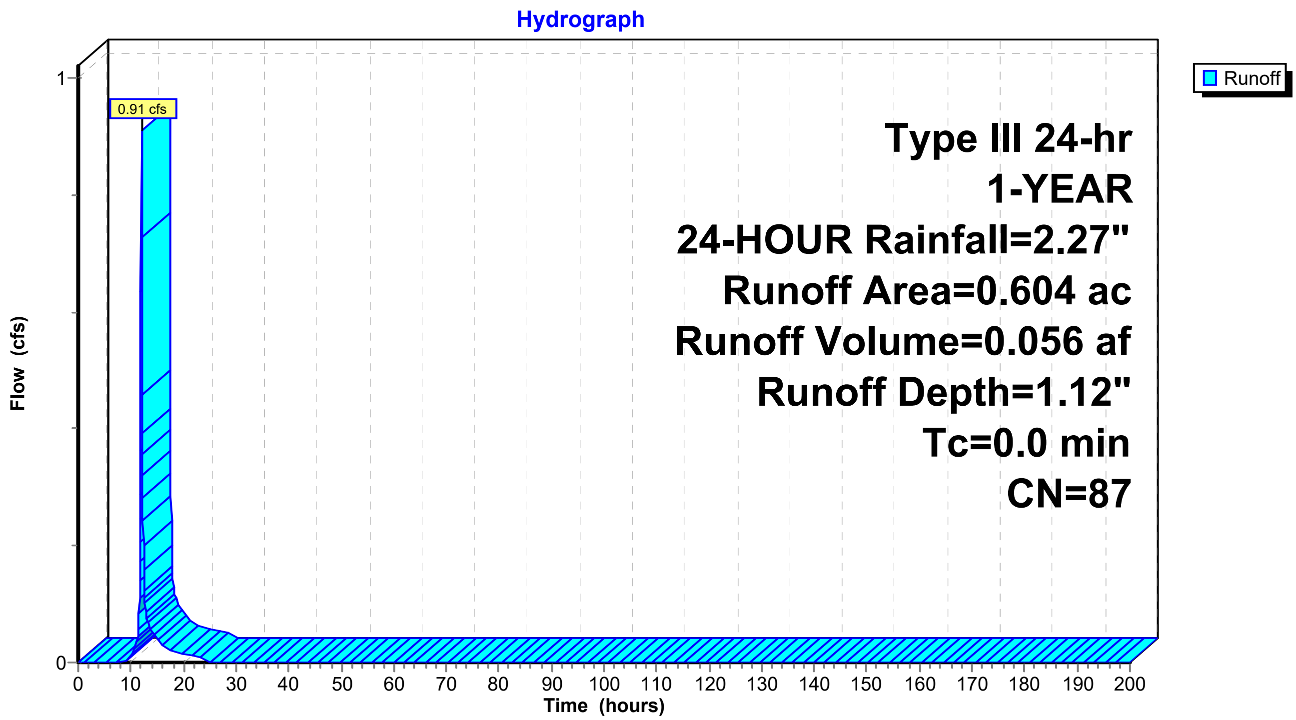
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.91 cfs @ 12.01 hrs, Volume= 0.056 af, Depth= 1.12"
Routed to Pond SMA-6 : SMA-6 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.315	96	Gravel surface, HSG D
0.289	78	Meadow, non-grazed, HSG D
0.604	87	Weighted Average
0.604		100.00% Pervious Area

Subcatchment 304: Subcat 304



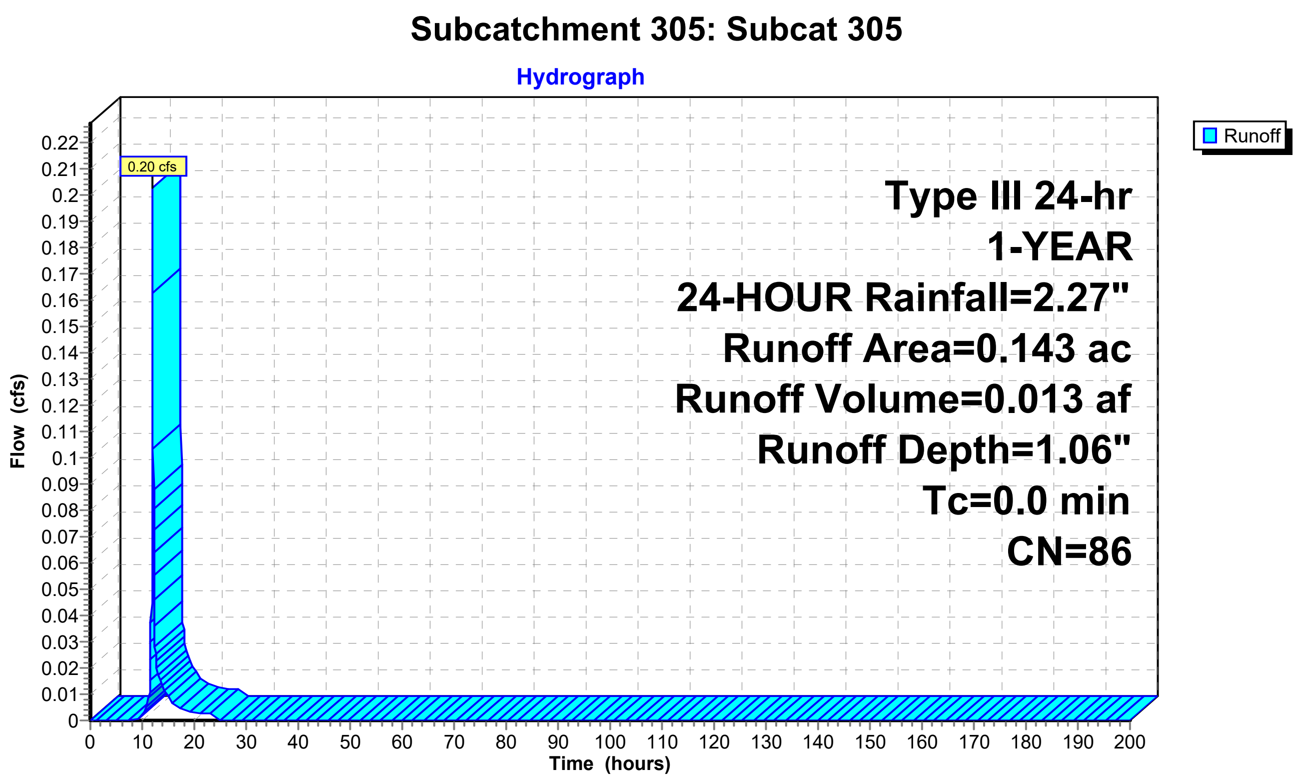
Summary for Subcatchment 305: Subcat 305

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.20 cfs @ 12.01 hrs, Volume= 0.013 af, Depth= 1.06"
Routed to Pond SMA-5 : SMA-5 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.066	96	Gravel surface, HSG D
0.077	78	Meadow, non-grazed, HSG D
0.143	86	Weighted Average
0.143		100.00% Pervious Area



Summary for Subcatchment 306: Subcat 306

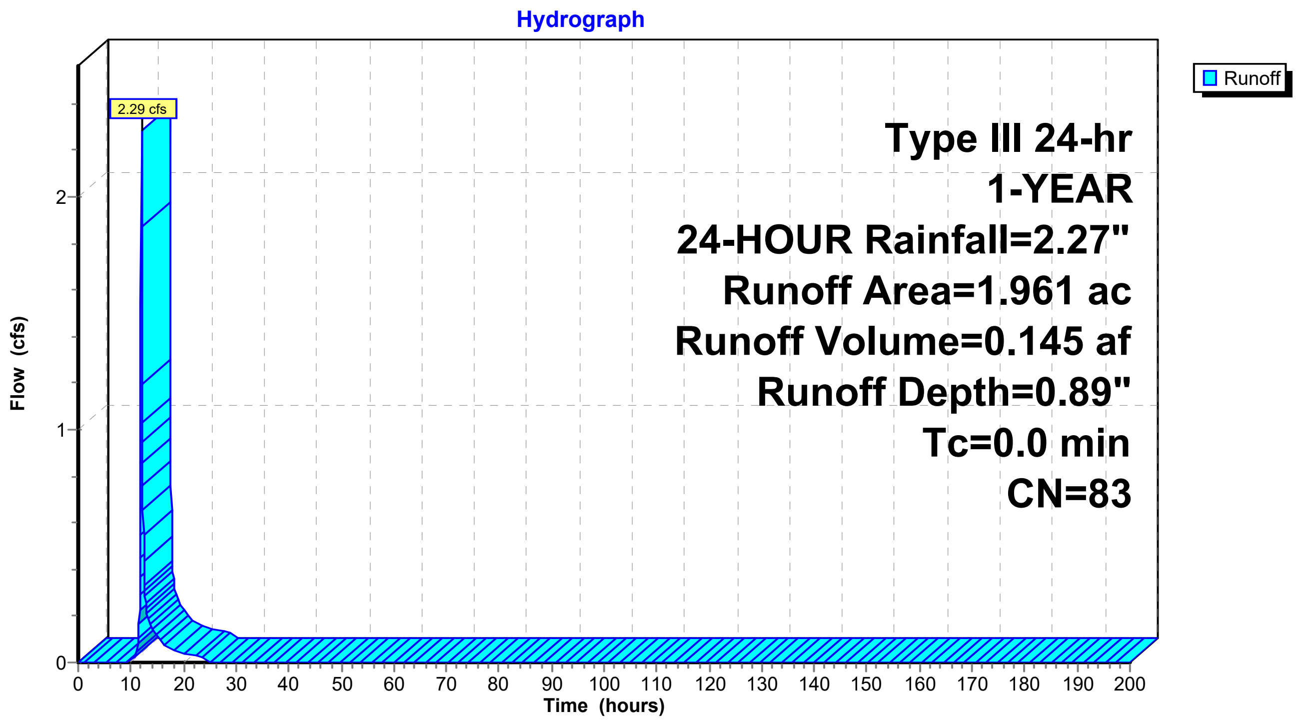
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 2.29 cfs @ 12.01 hrs, Volume= 0.145 af, Depth= 0.89"
Routed to Pond SMA-4 : SMA-4 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.580	96	Gravel surface, HSG D
1.382	78	Meadow, non-grazed, HSG D
1.961	83	Weighted Average
1.961		100.00% Pervious Area

Subcatchment 306: Subcat 306



Summary for Subcatchment 400: Subcat 400

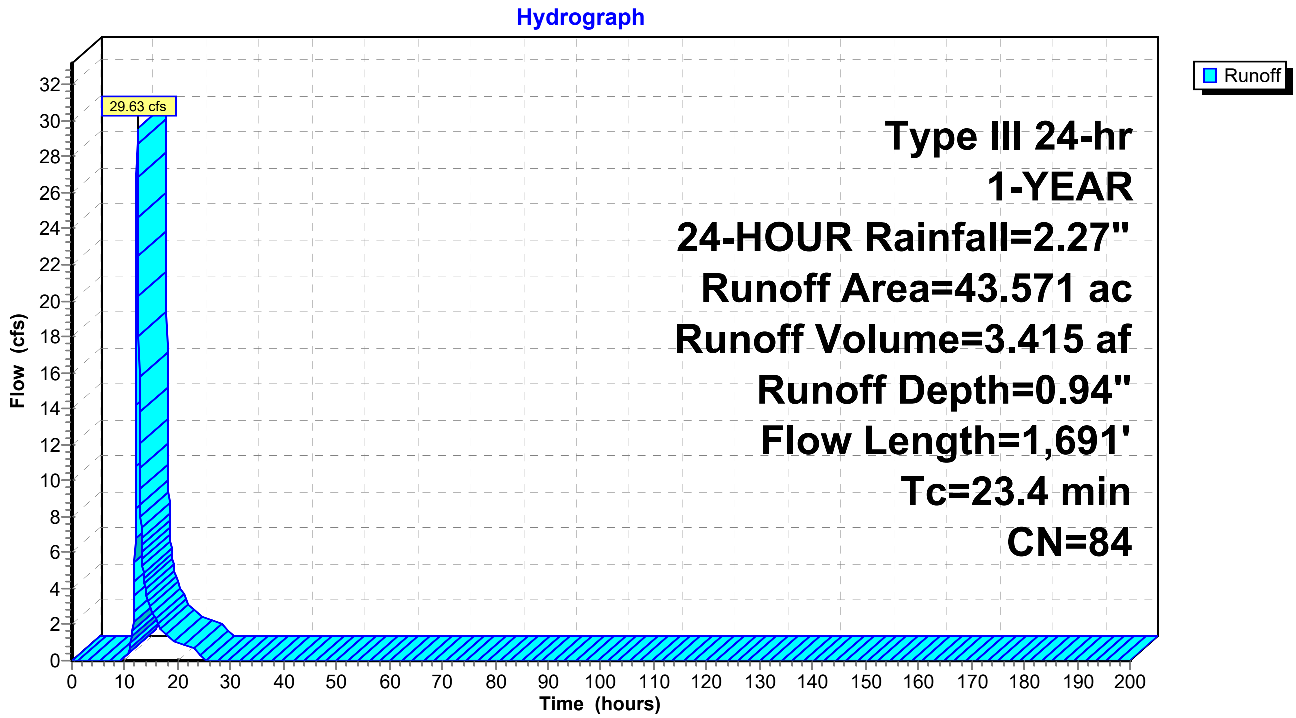
Runoff = 29.63 cfs @ 12.34 hrs, Volume= 3.415 af, Depth= 0.94"
Routed to Link DP-4 : Outfall to Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.029	96	Gravel surface, HSG C
0.022	96	Gravel surface, HSG D
0.007	71	Meadow, non-grazed, HSG C
5.593	78	Meadow, non-grazed, HSG D
10.592	82	Row crops, contoured, Good, HSG C
27.328	86	Row crops, contoured, Good, HSG D
43.571	84	Weighted Average
43.571		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
6.1	565	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	476	0.0970	2.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
5.3	550	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	1,691	Total			

Subcatchment 400: Subcat 400



Summary for Subcatchment 401: Subcat 401

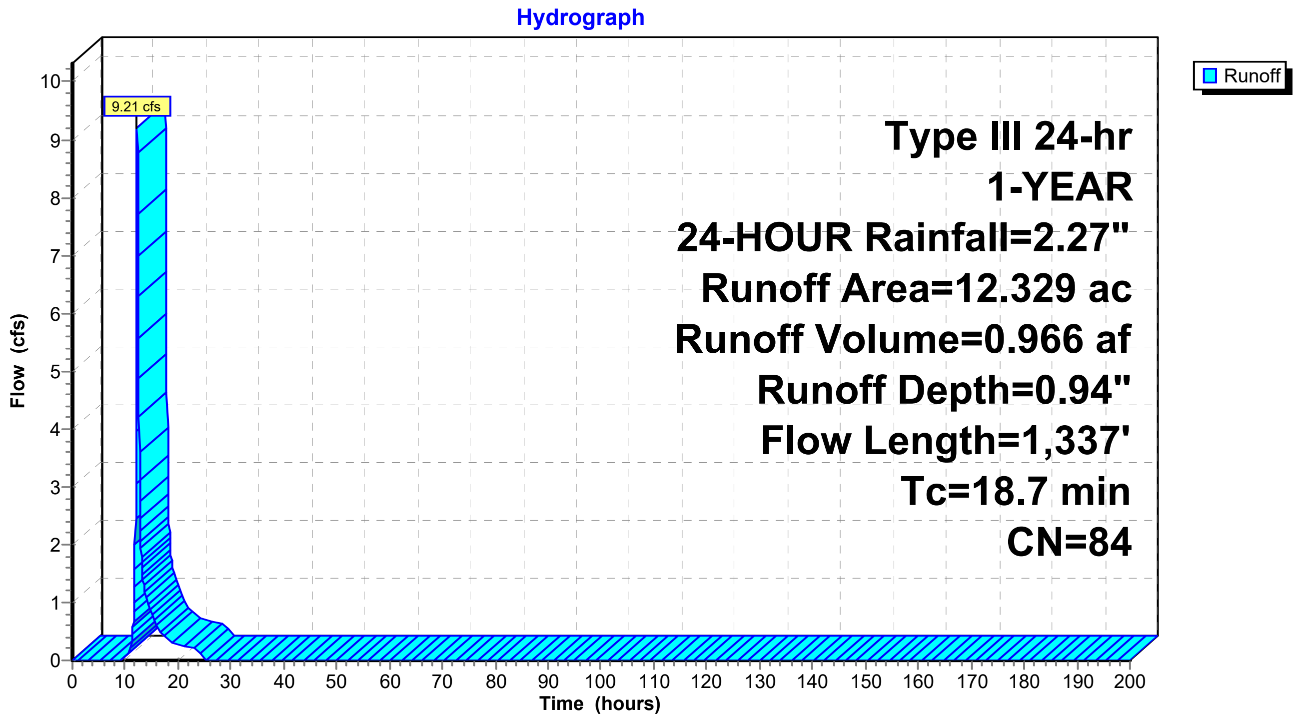
Runoff = 9.21 cfs @ 12.27 hrs, Volume= 0.966 af, Depth= 0.94"
Routed to Reach 307R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.009	96	Gravel surface, HSG C
0.153	96	Gravel surface, HSG D
0.057	71	Meadow, non-grazed, HSG C
2.681	78	Meadow, non-grazed, HSG D
0.258	82	Row crops, contoured, Good, HSG C
9.078	86	Row crops, contoured, Good, HSG D
0.092	77	Woods, Good, HSG D
12.329	84	Weighted Average
12.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
4.5	401	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	522	0.0610	2.22		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.1	314	0.0320	4.62	13.86	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
18.7	1,337	Total			

Subcatchment 401: Subcat 401



Summary for Subcatchment 402: Subcat 402

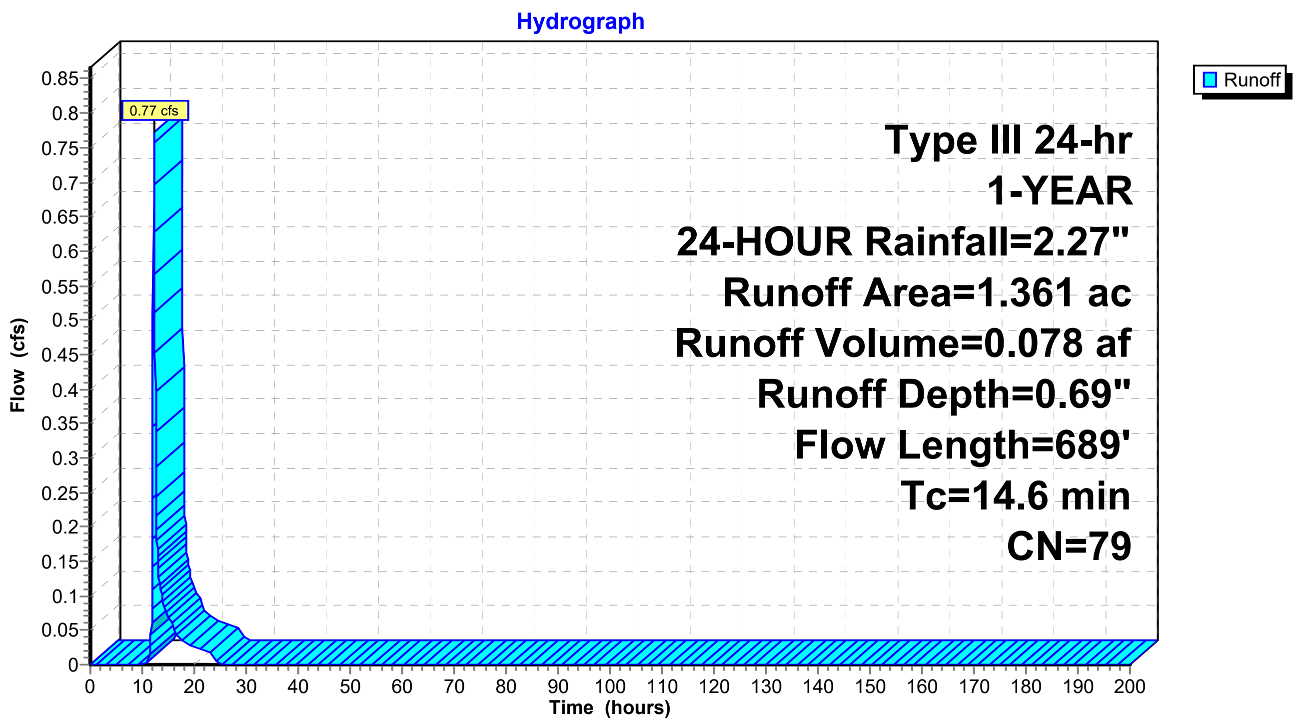
Runoff = 0.77 cfs @ 12.22 hrs, Volume= 0.078 af, Depth= 0.69"
Routed to Pond 1P : Subcatch 402 to 401 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.061	96	Gravel surface, HSG D
1.301	78	Meadow, non-grazed, HSG D
1.361	79	Weighted Average
1.361		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
4.9	589	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.6	689	Total			

Subcatchment 402: Subcat 402



Summary for Subcatchment 403: Subcat 403

[49] Hint: Tc<2dt may require smaller dt

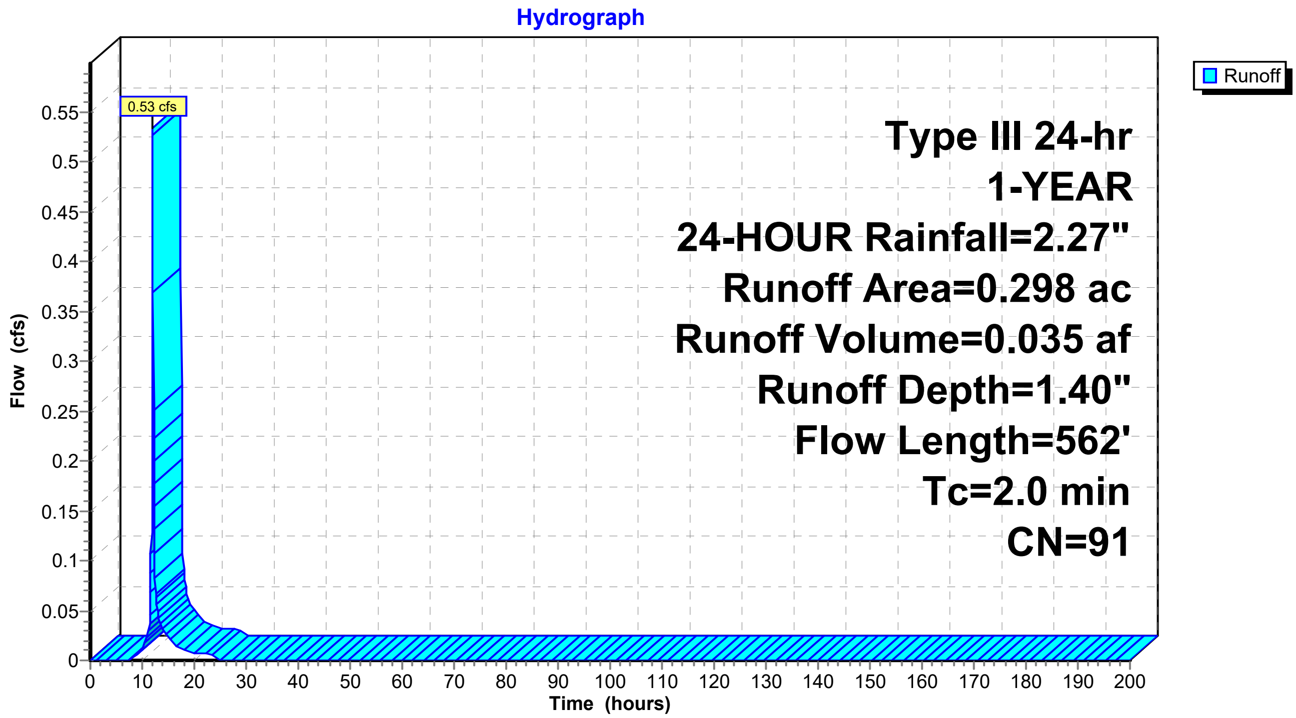
Runoff = 0.53 cfs @ 12.04 hrs, Volume= 0.035 af, Depth= 1.40"
Routed to Pond SMA-9 : SMA-9 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YEAR, 24-HOUR Rainfall=2.27"

Area (ac)	CN	Description
0.036	96	Gravel surface, HSG C
0.156	96	Gravel surface, HSG D
0.012	71	Meadow, non-grazed, HSG C
0.038	78	Meadow, non-grazed, HSG D
0.011	82	Row crops, contoured, Good, HSG C
0.045	86	Row crops, contoured, Good, HSG D
0.298	91	Weighted Average
0.298		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	522	0.0360	4.90	14.70	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
2.0	562	Total			

Subcatchment 403: Subcat 403



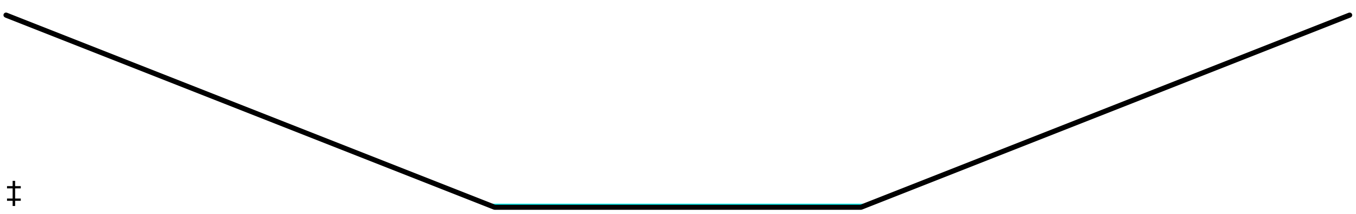
Summary for Reach 8R: Wetland Stream

Inflow Area = 1.049 ac, 0.00% Impervious, Inflow Depth = 0.81" for 1-YEAR, 24-HOUR event
Inflow = 0.29 cfs @ 12.71 hrs, Volume= 0.071 af
Outflow = 0.18 cfs @ 14.12 hrs, Volume= 0.071 af, Atten= 36%, Lag= 84.6 min
Routed to Link DP-3 : Outfall to Southwest

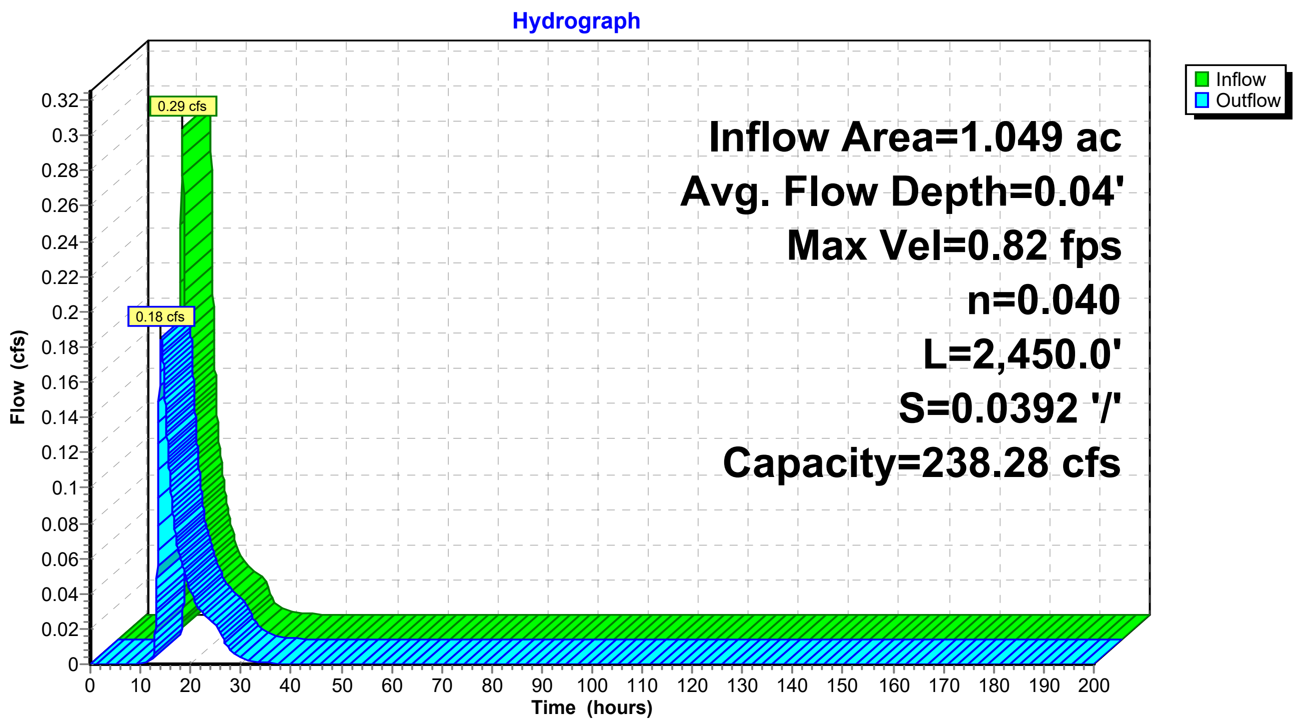
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.82 fps, Min. Travel Time= 50.0 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 73.4 min

Peak Storage= 553 cf @ 13.28 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 6.29'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 238.28 cfs

6.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 2,450.0' Slope= 0.0392 '/'
Inlet Invert= 932.00', Outlet Invert= 836.00'



Reach 8R: Wetland Stream



Summary for Reach 9R: Flow to Northeast outlet

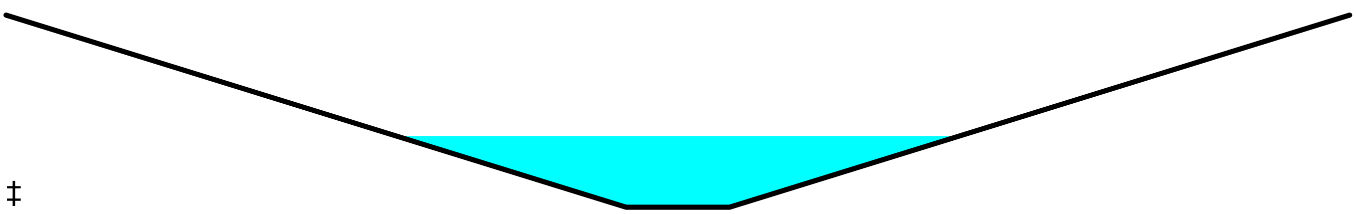
[81] Warning: Exceeded Pond SMA-7 by 2.00' @ 0.00 hrs

Inflow Area = 11.347 ac, 0.00% Impervious, Inflow Depth = 0.62" for 1-YEAR, 24-HOUR event
Inflow = 5.01 cfs @ 12.29 hrs, Volume= 0.583 af
Outflow = 3.43 cfs @ 12.78 hrs, Volume= 0.583 af, Atten= 32%, Lag= 29.1 min
Routed to Link DP-2 : Outfall to Northwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.88 fps, Min. Travel Time= 14.4 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 46.4 min

Peak Storage= 2,977 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 5.44'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.76 cfs

1.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 2,500.0' Slope= 0.0464 '/'
Inlet Invert= 945.00', Outlet Invert= 829.00'



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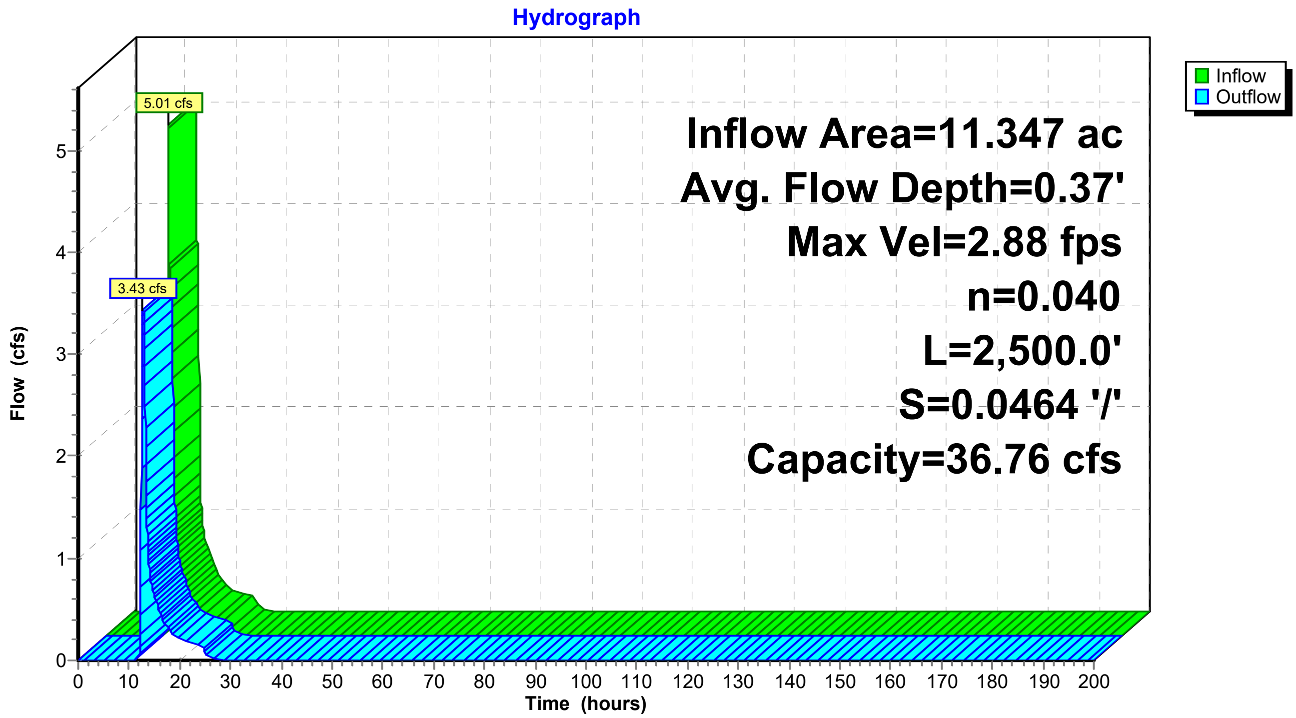
Reach 9R: Flow to Northeast outlet



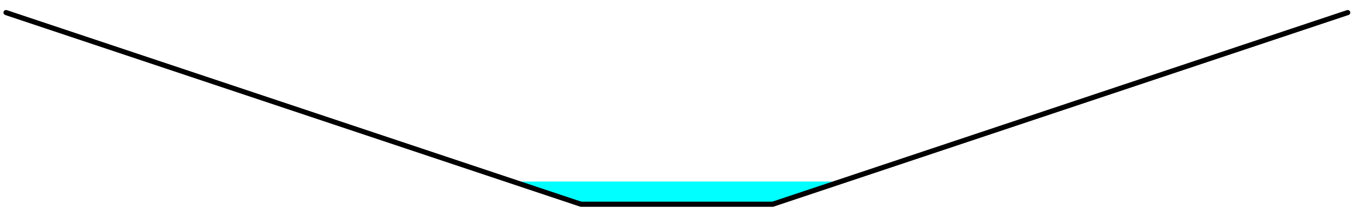
Summary for Reach 12R: Diversion Swale

Inflow Area = 4.296 ac, 0.00% Impervious, Inflow Depth = 0.64" for 1-YEAR, 24-HOUR event
Inflow = 3.42 cfs @ 12.01 hrs, Volume= 0.230 af
Outflow = 3.06 cfs @ 12.06 hrs, Volume= 0.230 af, Atten= 11%, Lag= 3.1 min
Routed to Pond SMA-7 : SMA-7 Pocket Pond

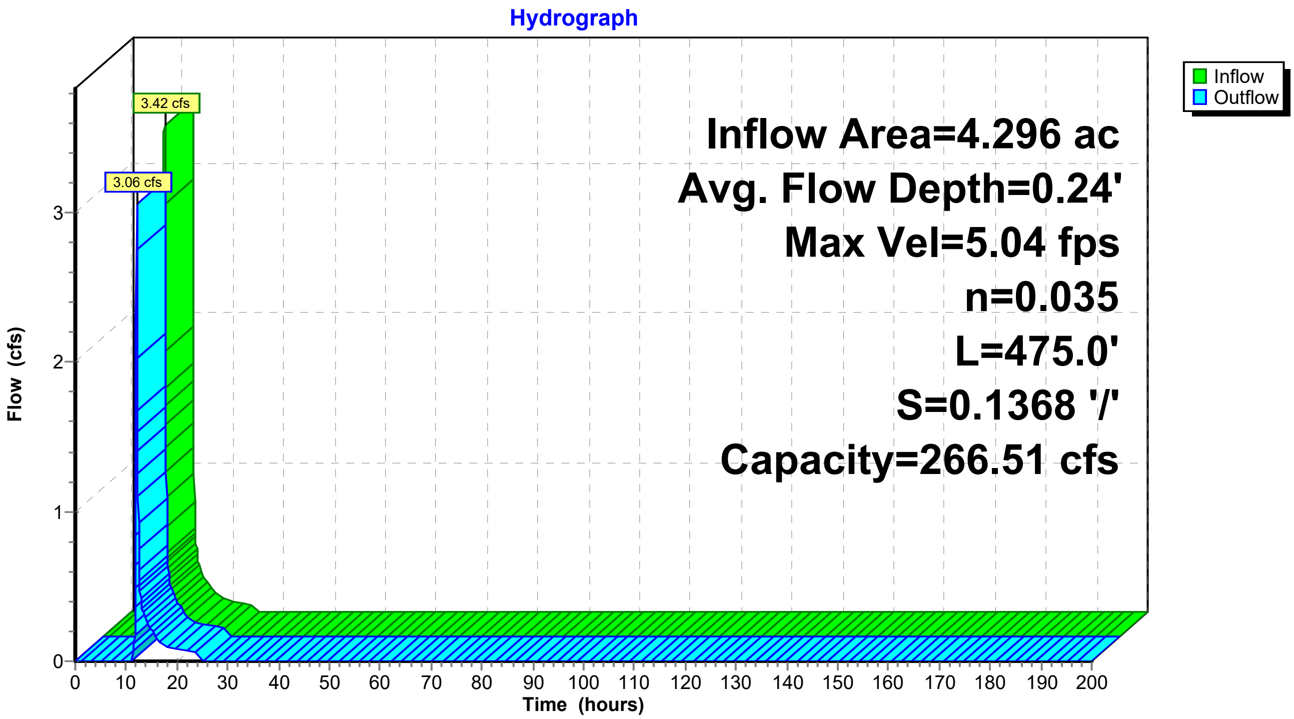
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.04 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 4.6 min

Peak Storage= 303 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 3.41'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 266.51 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 475.0' Slope= 0.1368 '/'
Inlet Invert= 1,012.00', Outlet Invert= 947.00'



Reach 12R: Diversion Swale



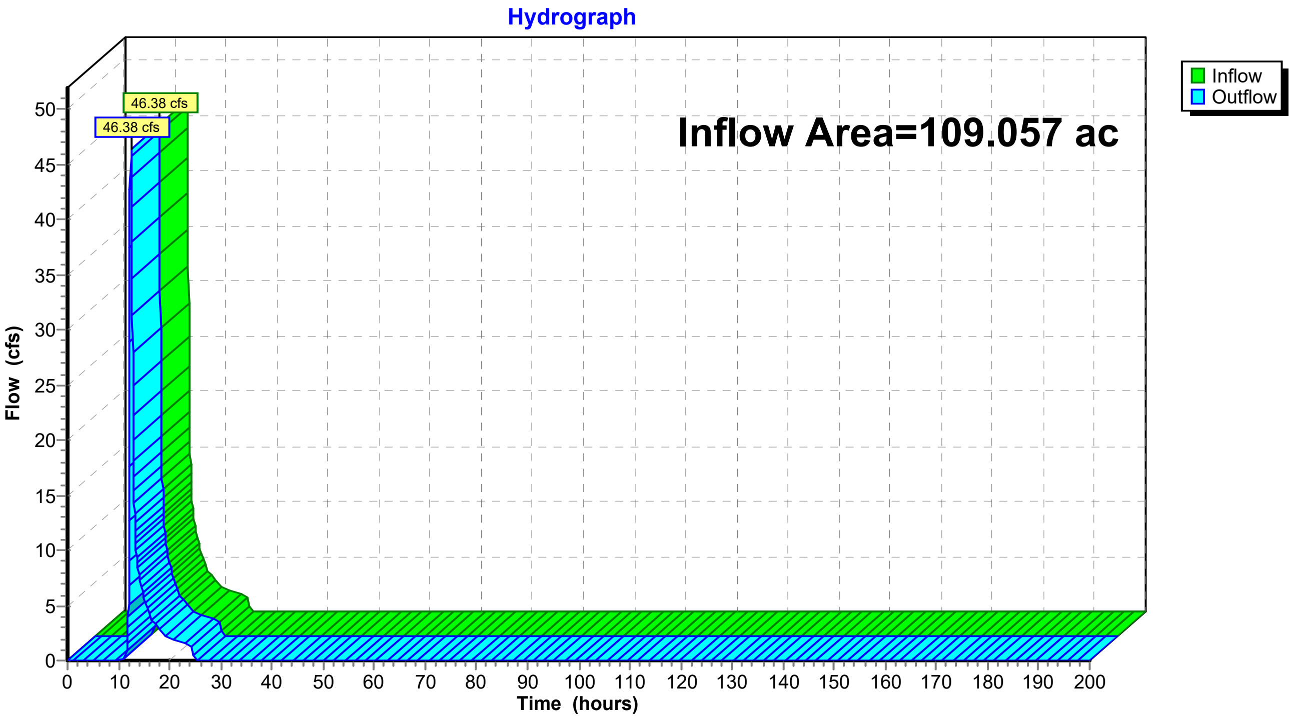
Summary for Reach 211R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 109.057 ac, 1.02% Impervious, Inflow Depth = 0.66" for 1-YEAR, 24-HOUR event
Inflow = 46.38 cfs @ 12.40 hrs, Volume= 5.977 af
Outflow = 46.38 cfs @ 12.40 hrs, Volume= 5.977 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-2 : Outfall to Northwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 211R: (new Reach)



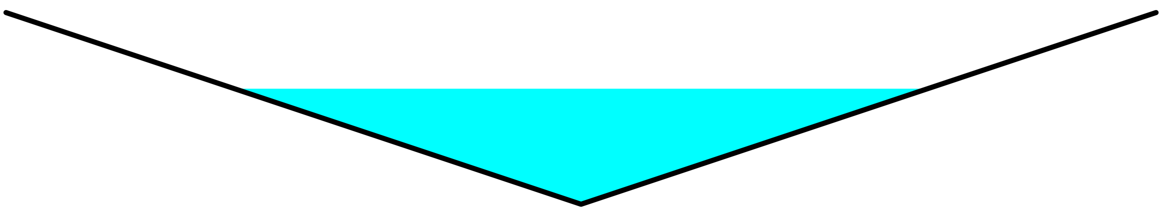
Summary for Reach 213R: (new Reach)

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth = 0.64" for 1-YEAR, 24-HOUR event
Inflow = 5.52 cfs @ 12.22 hrs, Volume= 0.569 af
Outflow = 5.37 cfs @ 12.28 hrs, Volume= 0.569 af, Atten= 3%, Lag= 3.3 min
Routed to Pond SMA-13 : SMA-13 Pocket Pond

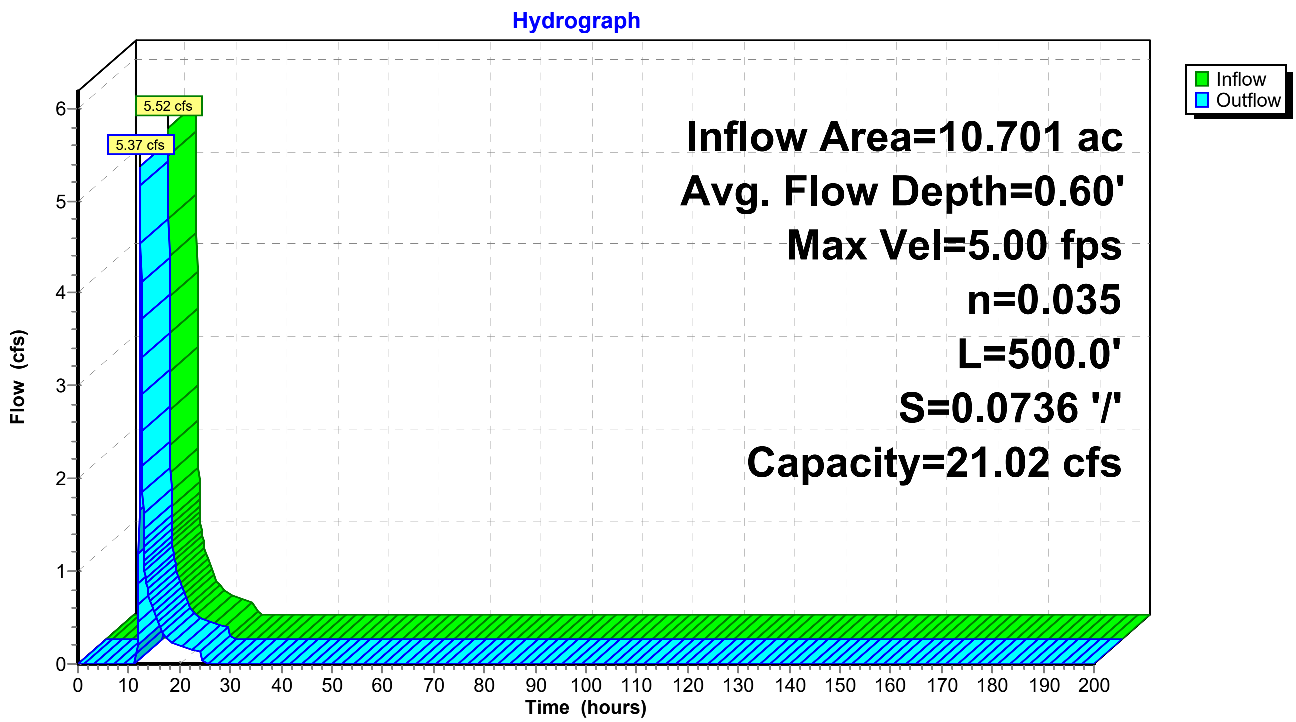
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.00 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 3.7 min

Peak Storage= 545 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.60' , Surface Width= 3.62'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 21.02 cfs

0.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 500.0' Slope= 0.0736 '/'
Inlet Invert= 1,040.30', Outlet Invert= 1,003.50'



Reach 213R: (new Reach)



Summary for Reach 224R: Roadside Swale

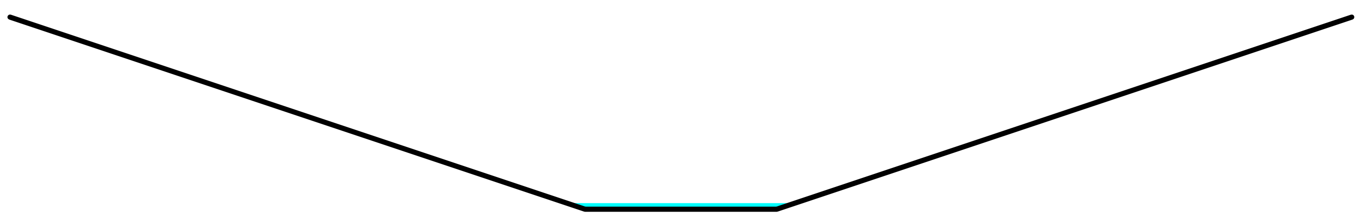
[81] Warning: Exceeded Pond 5P by 1,011.00' @ 24.85 hrs

Inflow Area = 0.301 ac, 0.00% Impervious, Inflow Depth = 1.26" for 1-YEAR, 24-HOUR event
Inflow = 0.34 cfs @ 12.20 hrs, Volume= 0.032 af
Outflow = 0.32 cfs @ 12.31 hrs, Volume= 0.032 af, Atten= 4%, Lag= 6.2 min
Routed to Pond SMA-6 : SMA-6 Pocket Pond

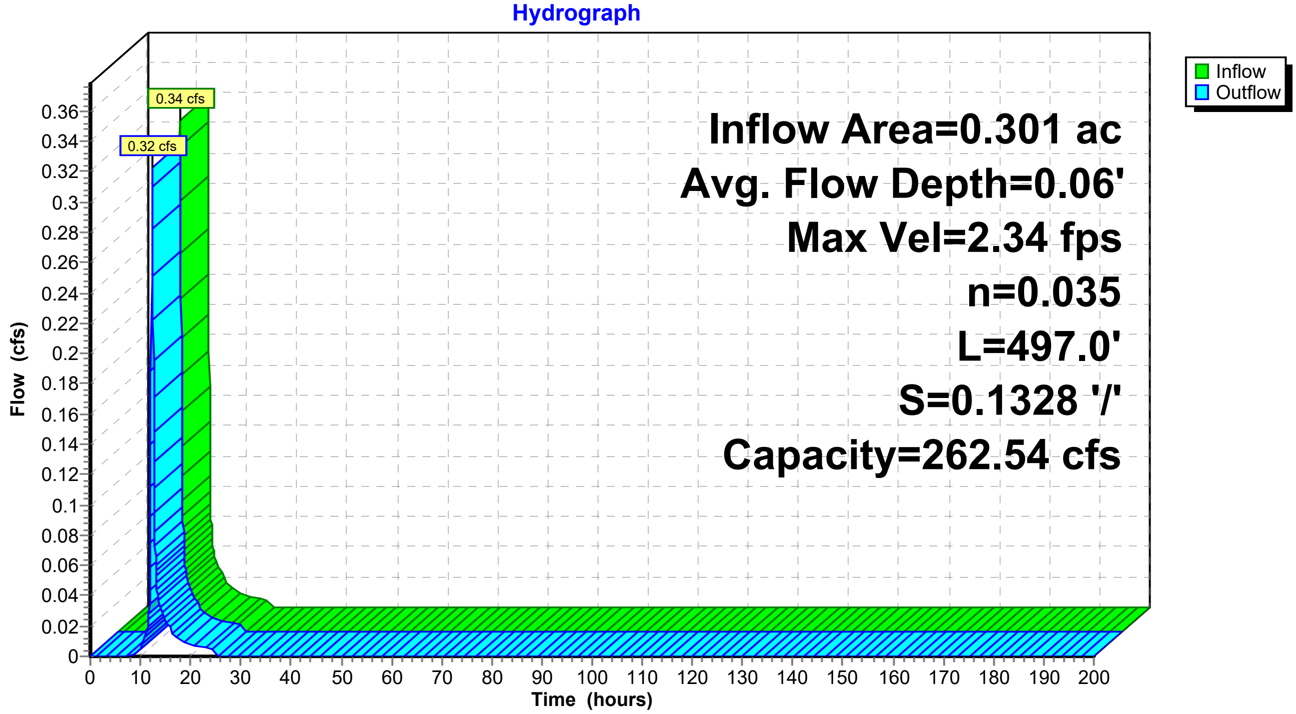
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 7.1 min

Peak Storage= 69 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 2.38'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 262.54 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 497.0' Slope= 0.1328 '/'
Inlet Invert= 1,011.00', Outlet Invert= 945.00'



Reach 224R: Roadside Swale



Summary for Reach 307R: (new Reach)

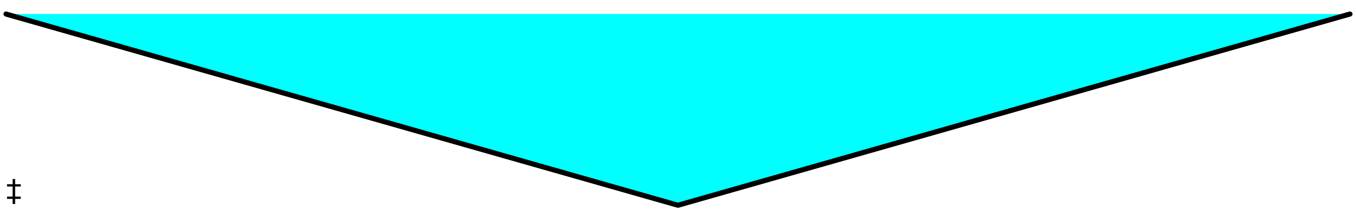
[91] Warning: Storage range exceeded by 0.07'
[55] Hint: Peak inflow is 143% of Manning's capacity
[81] Warning: Exceeded Pond 1P by 1,025.12' @ 10.80 hrs

Inflow Area = 13.690 ac, 0.00% Impervious, Inflow Depth = 0.92" for 1-YEAR, 24-HOUR event
Inflow = 9.95 cfs @ 12.27 hrs, Volume= 1.044 af
Outflow = 9.44 cfs @ 12.40 hrs, Volume= 1.044 af, Atten= 5%, Lag= 7.8 min
Routed to Pond 2P : SMA-8 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.96 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 10.4 min

Peak Storage= 2,328 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.57' , Surface Width= 6.84'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 6.96 cfs

0.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 6.0 '/' Top Width= 6.00'
Length= 1,215.0' Slope= 0.0568 '/'
Inlet Invert= 1,025.00', Outlet Invert= 956.00'



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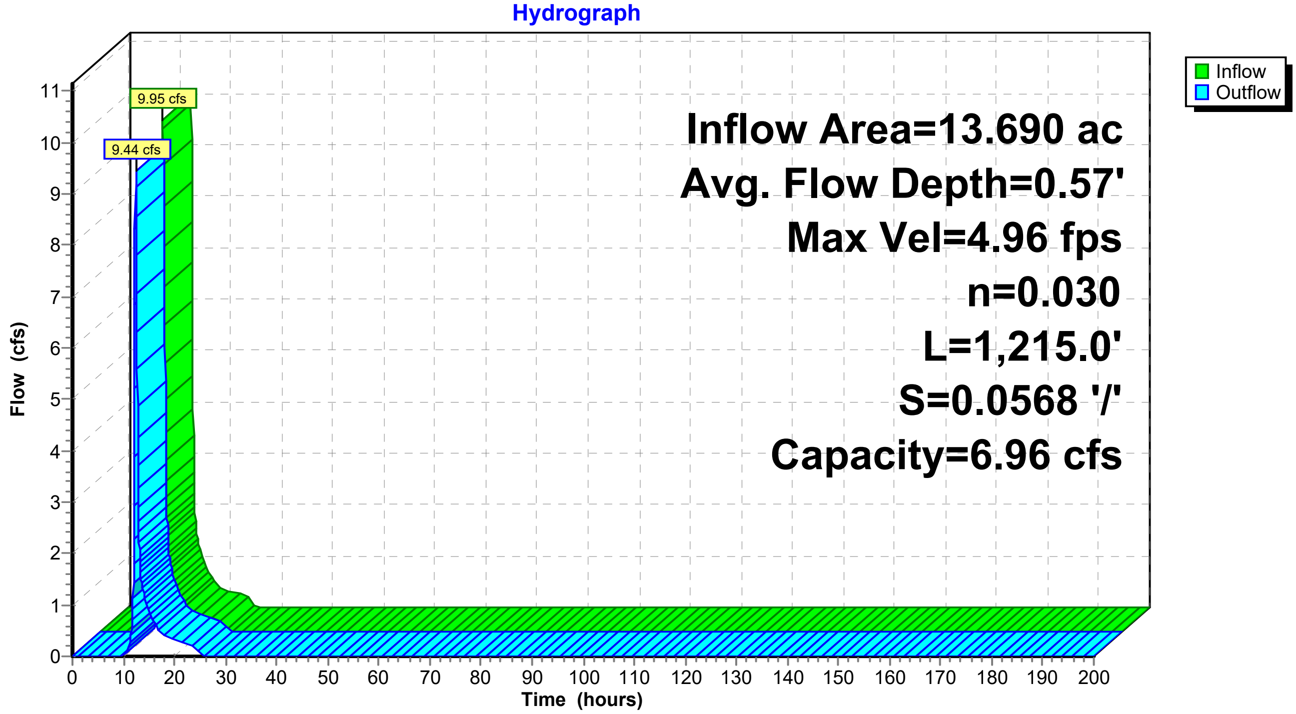
Reach 307R: (new Reach)



Summary for Pond 1P: Subcatch 402 to 401 Culvert

[57] Hint: Peaked at 0.64' (Flood elevation advised)

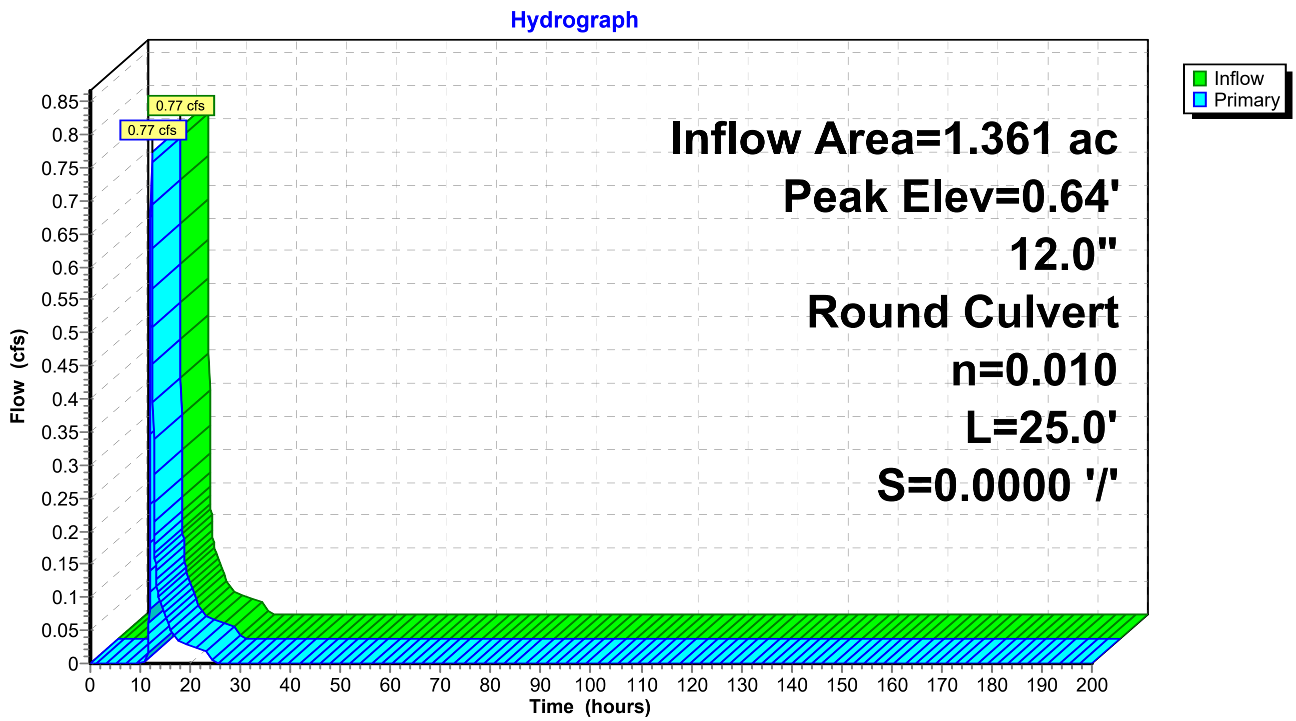
Inflow Area = 1.361 ac, 0.00% Impervious, Inflow Depth = 0.69" for 1-YEAR, 24-HOUR event
Inflow = 0.77 cfs @ 12.22 hrs, Volume= 0.078 af
Outflow = 0.77 cfs @ 12.22 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min
Primary = 0.77 cfs @ 12.22 hrs, Volume= 0.078 af
Routed to Reach 307R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 0.64' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.00' / 0.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.22 hrs HW=0.63' (Free Discharge)
1=Culvert (Barrel Controls 0.76 cfs @ 2.07 fps)

Pond 1P: Subcatch 402 to 401 Culvert



Summary for Pond 2P: SMA-8 Pocket Pond

[93] Warning: Storage range exceeded by 9.83'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)
[62] Hint: Exceeded Reach 307R OUTLET depth by 20.26' @ 12.35 hrs
[64] Warning: Exceeded Reach 307R outlet bank by 20.33' @ 12.35 hrs

Inflow Area = 13.690 ac, 0.00% Impervious, Inflow Depth = 0.92" for 1-YEAR, 24-HOUR event
Inflow = 9.44 cfs @ 12.40 hrs, Volume= 1.044 af
Outflow = 10.05 cfs @ 12.35 hrs, Volume= 1.044 af, Atten= 0%, Lag= 0.0 min
Primary = 10.05 cfs @ 12.35 hrs, Volume= 1.044 af
Routed to Link DP-4 : Outfall to Southeast

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 976.83' @ 12.35 hrs Surf.Area= 350 sf Storage= 504 cf

Plug-Flow detention time= 1.6 min calculated for 1.044 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (871.5 - 870.0)

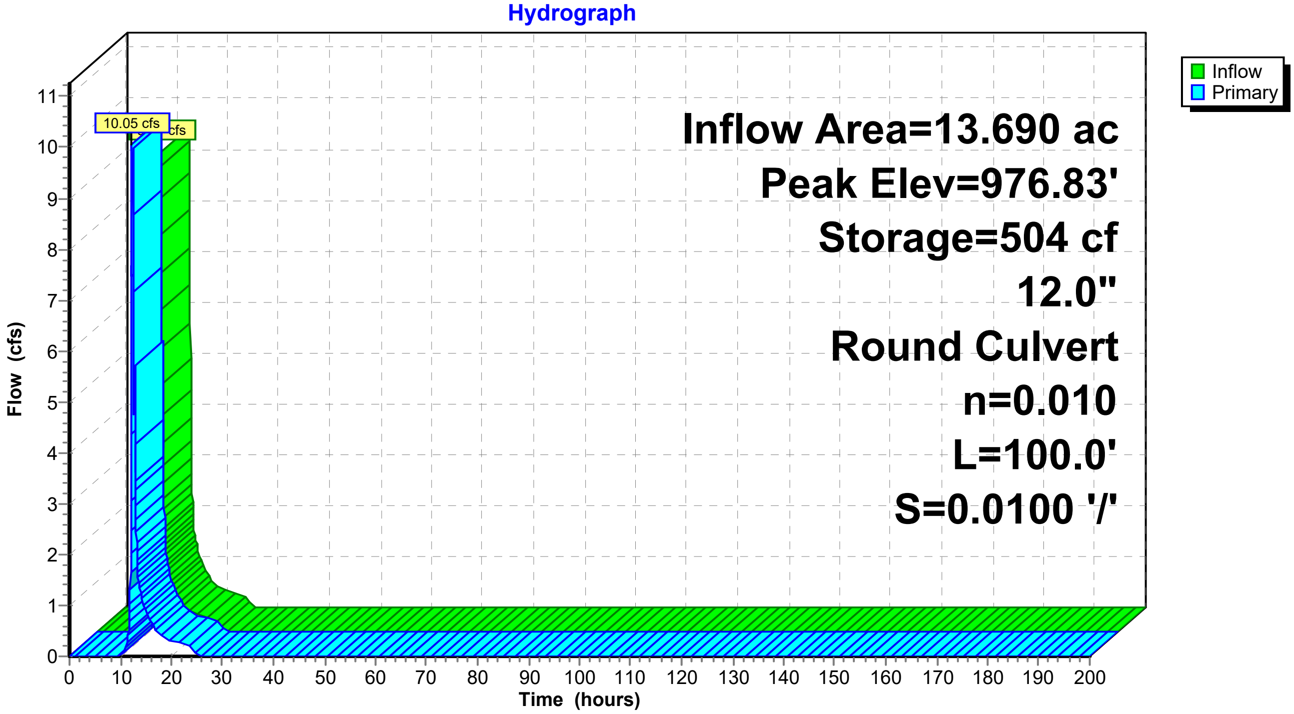
Volume	Invert	Avail.Storage	Storage Description
#1	965.00'	504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
965.00	98	0	0
966.00	280	189	189
967.00	350	315	504

Device	Routing	Invert	Outlet Devices
#1	Primary	965.00'	**12.0" Round Culvert** L= 100.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 965.00' / 964.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=10.05 cfs @ 12.35 hrs HW=976.83' (Free Discharge)
└─**1=Culvert** (Inlet Controls 10.05 cfs @ 12.80 fps)

Pond 2P: SMA-8 Pocket Pond



Summary for Pond 3P: SMA-2 Pocket Pond

[43] Hint: Has no inflow (Outflow=Zero)

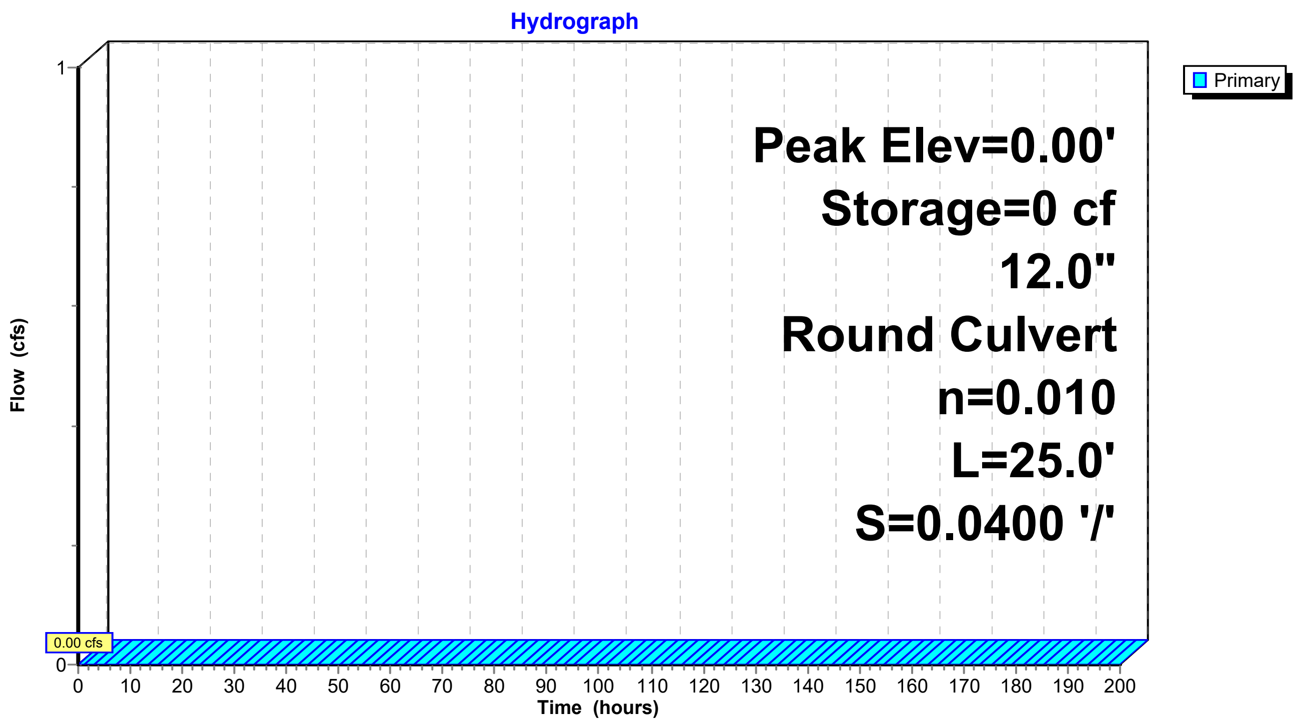
Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	1,537 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	1,459	0	0
846.10	849	115	115
847.00	1,958	1,263	1,379
847.10	1,204	158	1,537

Device	Routing	Invert	Outlet Devices
#1	Primary	846.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.00' / 845.00' S= 0.0400 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Pond 3P: SMA-2 Pocket Pond



Summary for Pond 4P: SMA-3 Pocket Pond

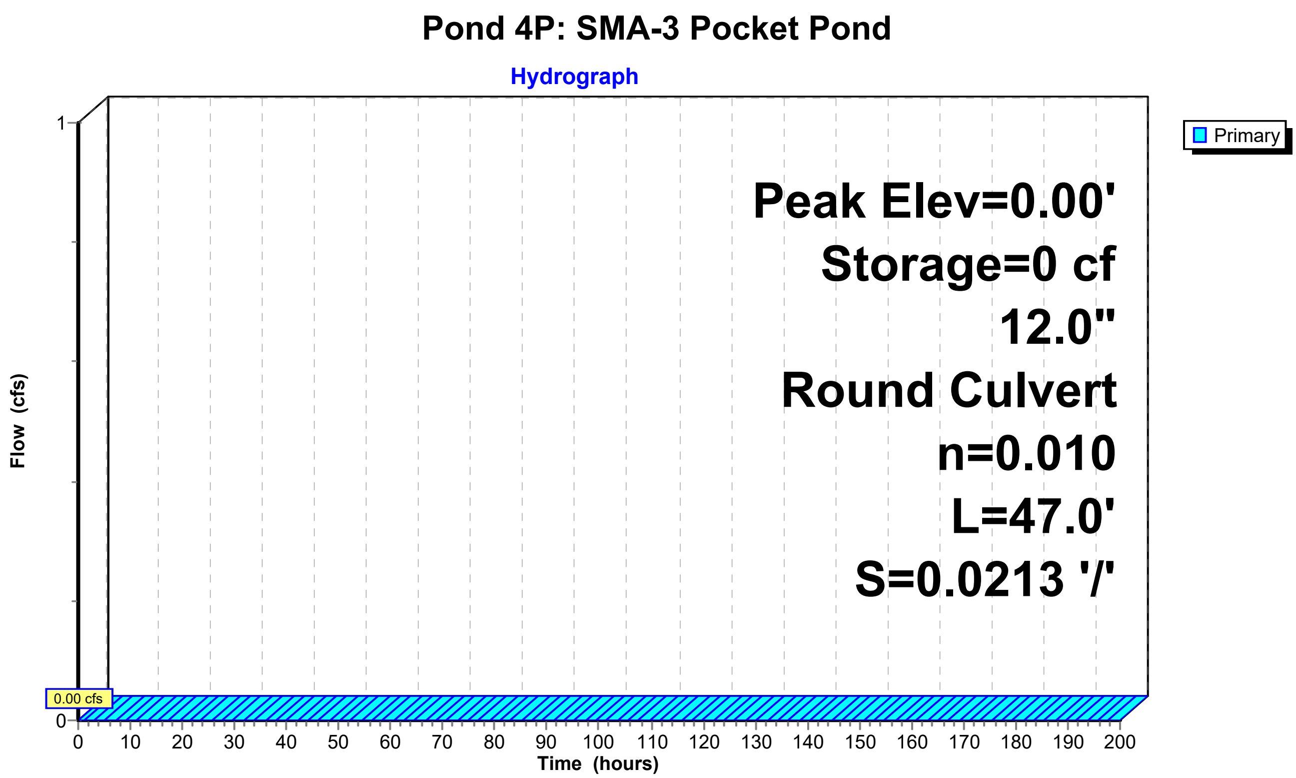
[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	842.00'	382 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
842.00	56	0	0
843.00	177	117	117
844.00	353	265	382

Device	Routing	Invert	Outlet Devices
#1	Primary	842.00'	**12.0" Round Culvert** L= 47.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 842.00' / 841.00' S= 0.0213 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)



Summary for Pond 5P: Subcatch 301 to 304 Culvert

[57] Hint: Peaked at 0.42' (Flood elevation advised)

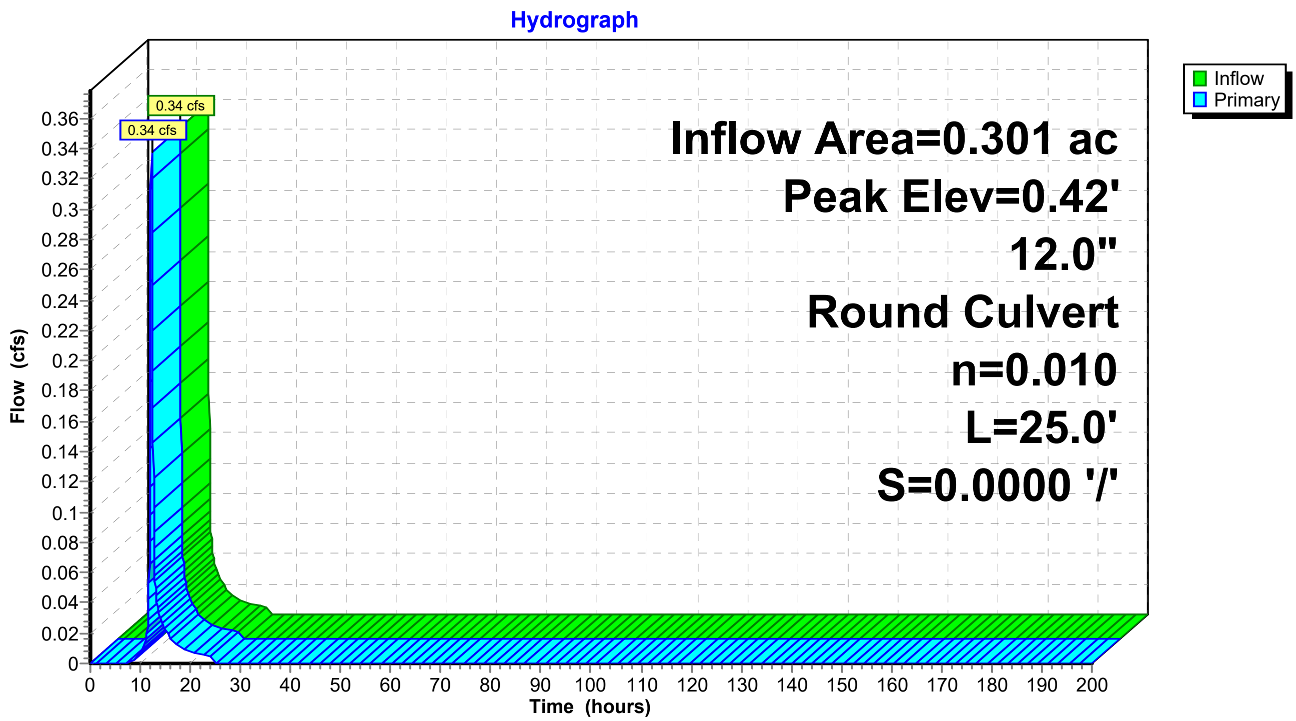
Inflow Area = 0.301 ac, 0.00% Impervious, Inflow Depth = 1.26" for 1-YEAR, 24-HOUR event
Inflow = 0.34 cfs @ 12.20 hrs, Volume= 0.032 af
Outflow = 0.34 cfs @ 12.20 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 12.20 hrs, Volume= 0.032 af
Routed to Reach 224R : Roadside Swale

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 0.42' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.00' / 0.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.20 hrs HW=0.42' (Free Discharge)
1=Culvert (Barrel Controls 0.34 cfs @ 1.60 fps)

Pond 5P: Subcatch 301 to 304 Culvert



Summary for Pond 11P: Subcatch 303 to 302 Culvert

[57] Hint: Peaked at 1,018.80' (Flood elevation advised)

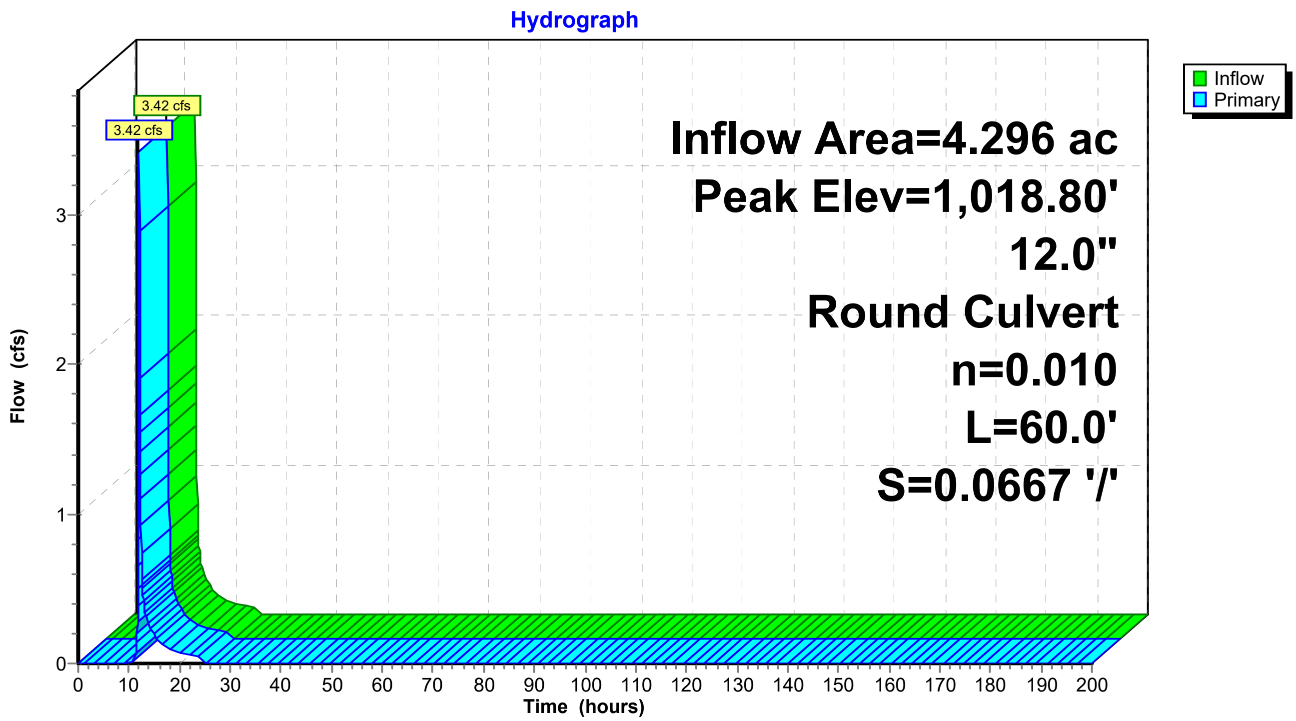
Inflow Area = 4.296 ac, 0.00% Impervious, Inflow Depth = 0.64" for 1-YEAR, 24-HOUR event
Inflow = 3.42 cfs @ 12.01 hrs, Volume= 0.230 af
Outflow = 3.42 cfs @ 12.01 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min
Primary = 3.42 cfs @ 12.01 hrs, Volume= 0.230 af
Routed to Reach 12R : Diversion Swale

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,018.80' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,017.00' / 1,013.00' S= 0.0667 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.28 cfs @ 12.01 hrs HW=1,018.71' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.28 cfs @ 4.18 fps)

Pond 11P: Subcatch 303 to 302 Culvert



Summary for Pond SMA-1: SMA-1 Infiltration Basin

Inflow Area = 11.830 ac, 0.16% Impervious, Inflow Depth = 0.56" for 1-YEAR, 24-HOUR event
Inflow = 4.33 cfs @ 12.37 hrs, Volume= 0.552 af
Outflow = 2.96 cfs @ 12.64 hrs, Volume= 0.552 af, Atten= 32%, Lag= 16.7 min
Primary = 2.96 cfs @ 12.64 hrs, Volume= 0.552 af
Routed to Link DP-1 : Outfall to West

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 830.48' @ 12.64 hrs Surf.Area= 3,001 sf Storage= 3,382 cf

Plug-Flow detention time= 23.8 min calculated for 0.552 af (100% of inflow)
Center-of-Mass det. time= 24.1 min (918.3 - 894.2)

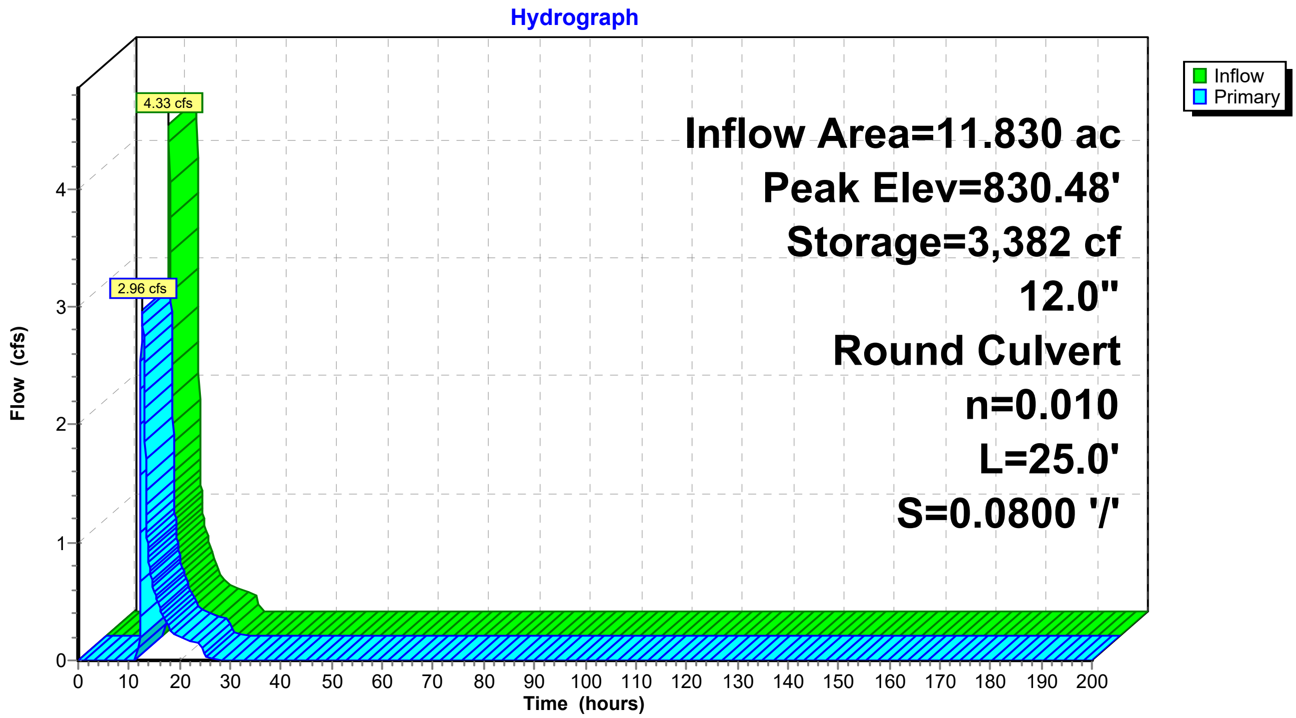
Volume	Invert	Avail.Storage	Storage Description
#1	829.00'	9,146 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
829.00	1,584	0	0
830.00	2,509	2,047	2,047
831.00	3,525	3,017	5,064
832.00	4,639	4,082	9,146

Device	Routing	Invert	Outlet Devices
#1	Primary	829.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 829.00' / 827.00' S= 0.0800 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.96 cfs @ 12.64 hrs HW=830.48' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.96 cfs @ 3.77 fps)

Pond SMA-1: SMA-1 Infiltration Basin



Summary for Pond SMA-10: SMA-10 Pocket Pond

Inflow Area = 0.444 ac, 0.00% Impervious, Inflow Depth = 0.52" for 1-YEAR, 24-HOUR event
Inflow = 0.21 cfs @ 12.13 hrs, Volume= 0.019 af
Outflow = 0.21 cfs @ 12.15 hrs, Volume= 0.019 af, Atten= 0%, Lag= 1.0 min
Primary = 0.21 cfs @ 12.15 hrs, Volume= 0.019 af
Routed to Reach 213R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,042.25' @ 12.15 hrs Surf.Area= 0.002 ac Storage= 0.000 af

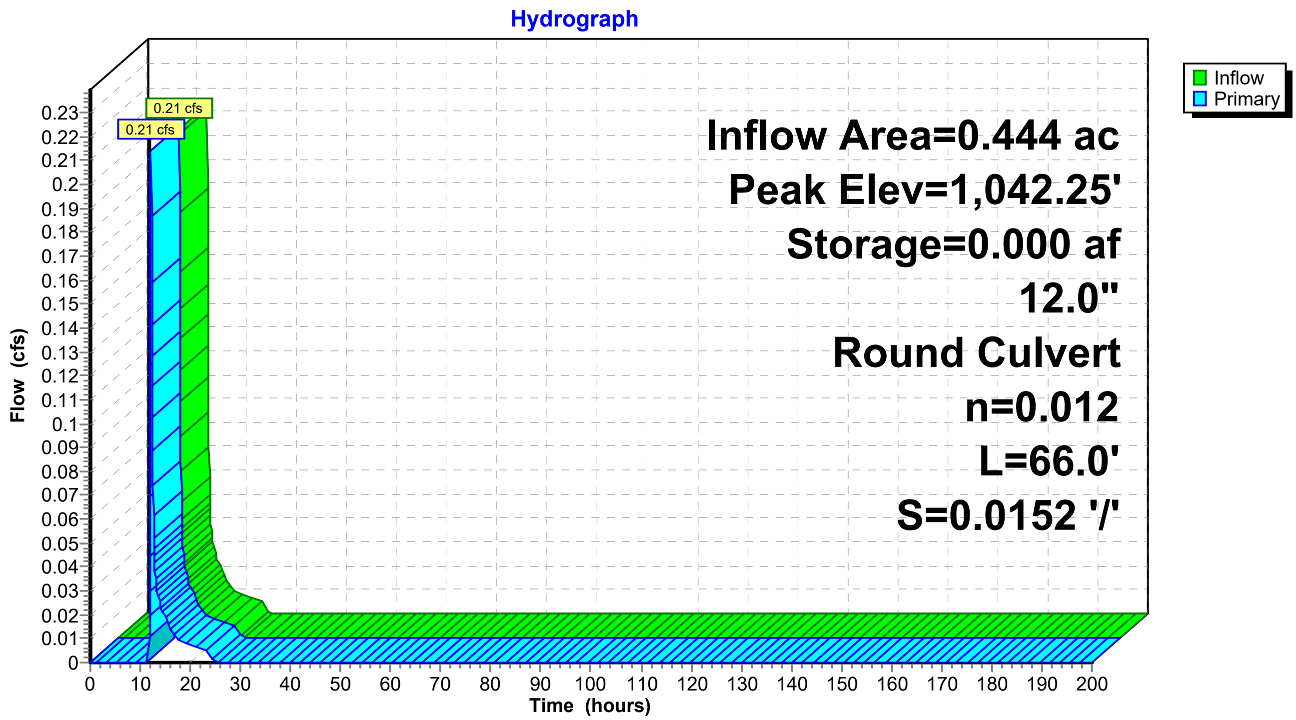
Plug-Flow detention time= 2.8 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 2.8 min (887.4 - 884.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,042.00'	0.017 af	**7.75'D x 3.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,042.00'	**12.0" Round Culvert** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,042.00' / 1,041.00' S= 0.0152 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.15 hrs HW=1,042.25' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.21 cfs @ 1.35 fps)

Pond SMA-10: SMA-10 Pocket Pond



Summary for Pond SMA-11: SMA-11 Pocket Pond

Inflow Area = 5.186 ac, 0.00% Impervious, Inflow Depth = 0.56" for 1-YEAR, 24-HOUR event
Inflow = 2.21 cfs @ 12.25 hrs, Volume= 0.242 af
Outflow = 2.18 cfs @ 12.27 hrs, Volume= 0.242 af, Atten= 1%, Lag= 1.4 min
Primary = 2.18 cfs @ 12.27 hrs, Volume= 0.242 af
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,002.04' @ 12.27 hrs Surf.Area= 0.004 ac Storage= 0.003 af

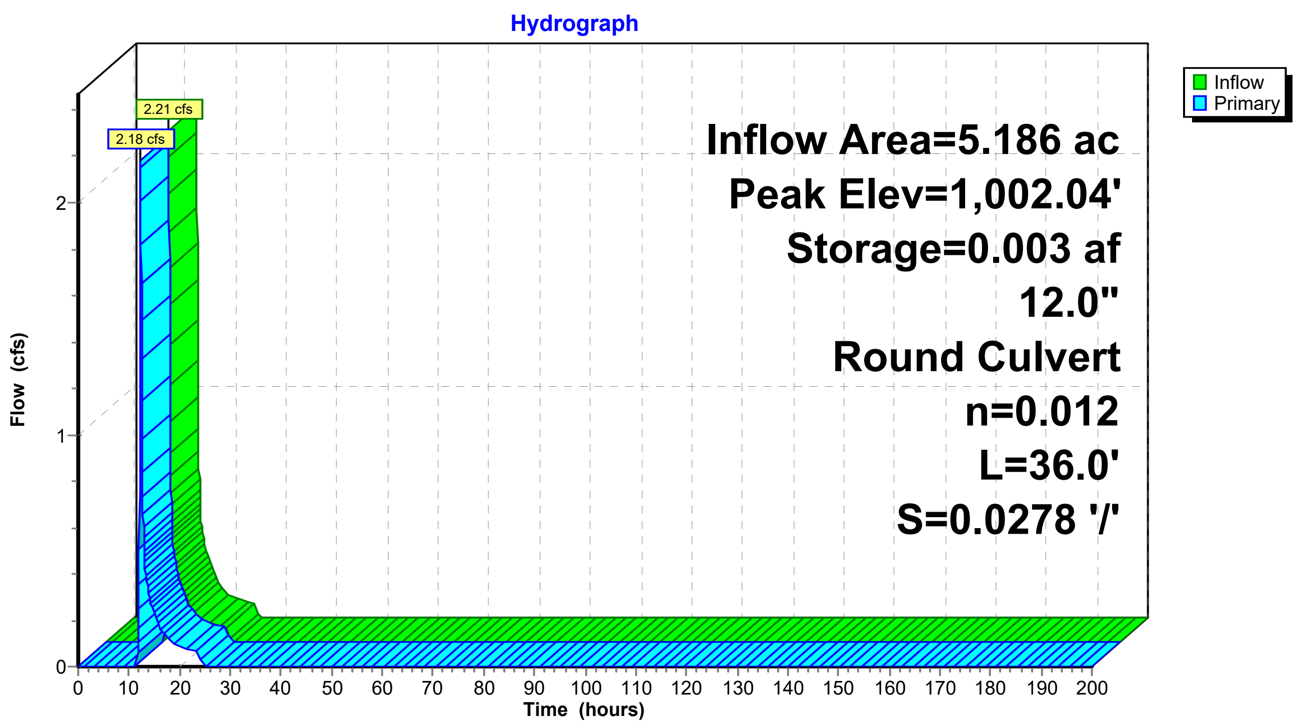
Plug-Flow detention time= 1.2 min calculated for 0.242 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (888.6 - 887.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,001.00'	0.018 af	**8.40'D x 3.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,001.00' / 1,000.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.16 cfs @ 12.27 hrs HW=1,002.03' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.16 cfs @ 2.75 fps)

Pond SMA-11: SMA-11 Pocket Pond



Summary for Pond SMA-12: SMA-12 Pocket Pond

[79] Warning: Submerged Pond SMA-11 Primary device # 1 INLET by 0.35'

Inflow Area = 6.050 ac, 0.00% Impervious, Inflow Depth = 0.58" for 1-YEAR, 24-HOUR event
Inflow = 2.62 cfs @ 12.26 hrs, Volume= 0.294 af
Outflow = 2.59 cfs @ 12.30 hrs, Volume= 0.267 af, Atten= 1%, Lag= 2.1 min
Primary = 2.59 cfs @ 12.30 hrs, Volume= 0.267 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,001.35' @ 12.30 hrs Surf.Area= 0.025 ac Storage= 0.034 af

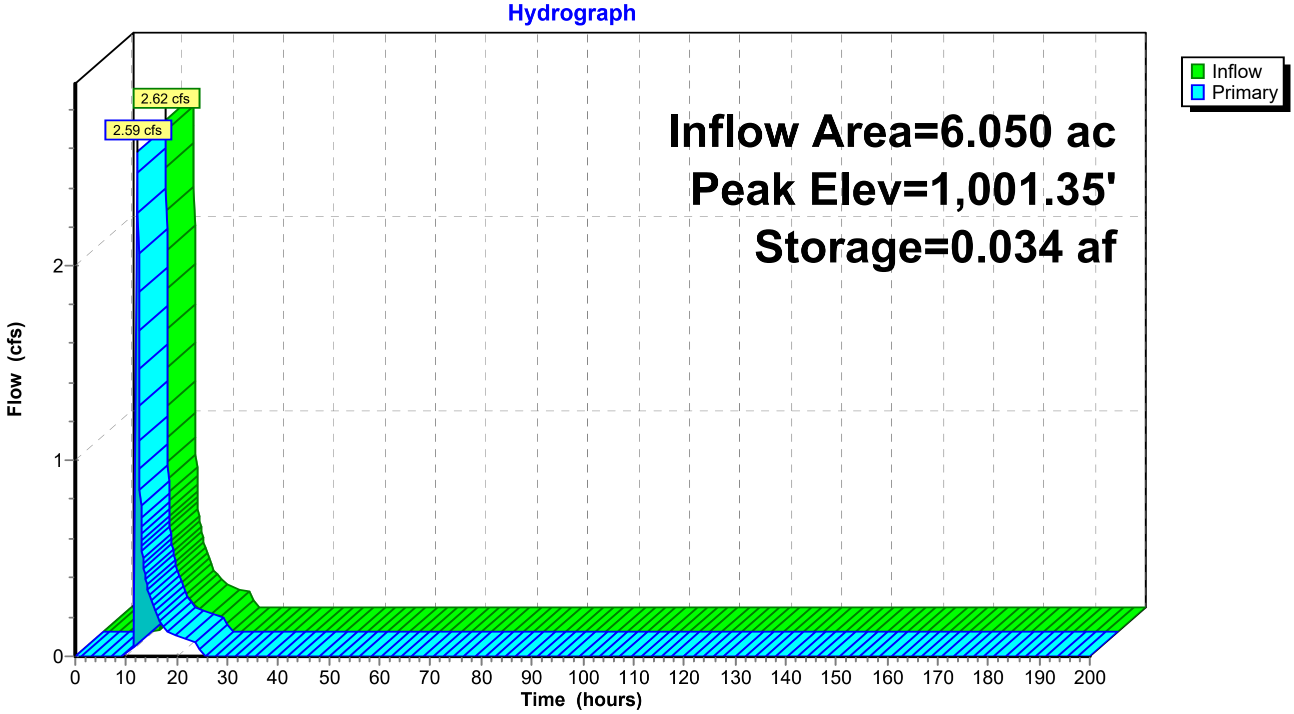
Plug-Flow detention time= 64.7 min calculated for 0.267 af (91% of inflow)
Center-of-Mass det. time= 20.5 min (905.5 - 885.0)

Volume	Invert	Avail.Storage	Storage Description
#1	999.00'	0.090 af	**7.00'W x 37.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.58 cfs @ 12.30 hrs HW=1,001.35' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.58 cfs @ 1.46 fps)

Pond SMA-12: SMA-12 Pocket Pond



Summary for Pond SMA-13: SMA-13 Pocket Pond

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth = 0.64" for 1-YEAR, 24-HOUR event
Inflow = 5.37 cfs @ 12.28 hrs, Volume= 0.569 af
Outflow = 5.35 cfs @ 12.30 hrs, Volume= 0.526 af, Atten= 0%, Lag= 1.6 min
Primary = 5.35 cfs @ 12.30 hrs, Volume= 0.526 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,001.54' @ 12.30 hrs Surf.Area= 0.026 ac Storage= 0.056 af

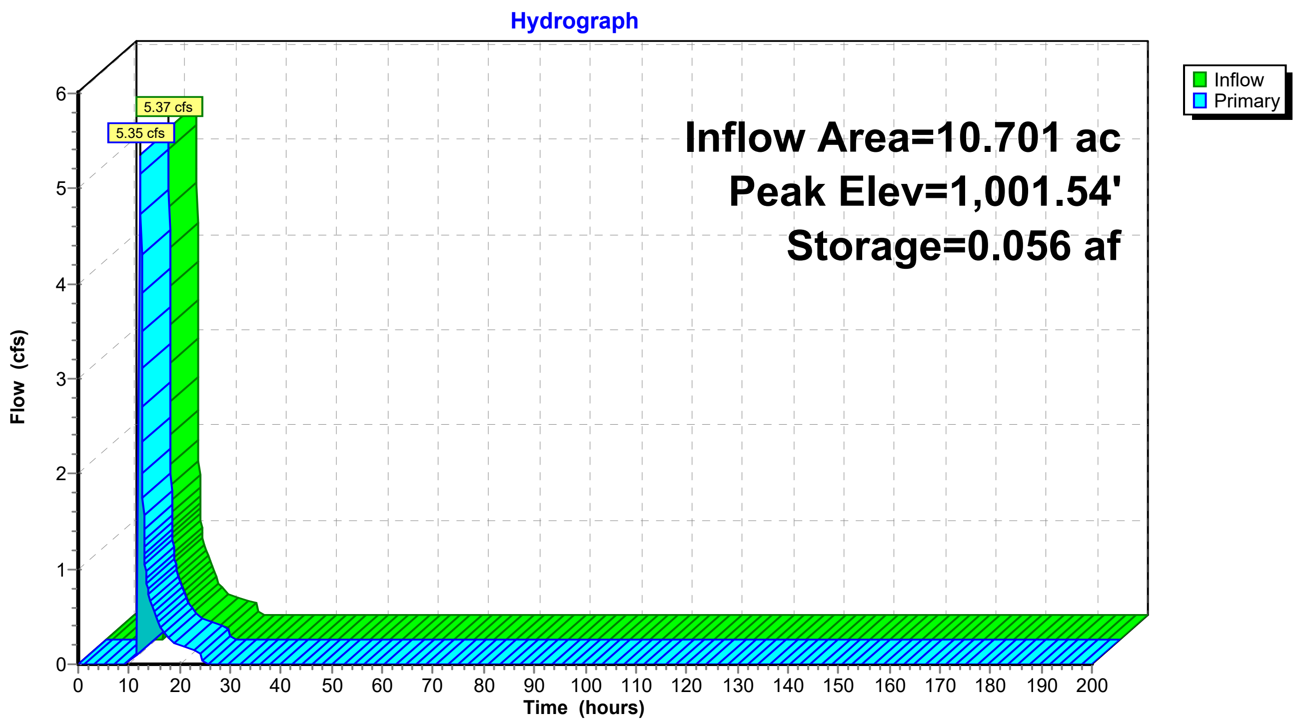
Plug-Flow detention time= 55.2 min calculated for 0.526 af (92% of inflow)
Center-of-Mass det. time= 16.4 min (899.4 - 883.0)

Volume	Invert	Avail.Storage	Storage Description
#1	996.00'	0.069 af	**5.00'D x 6.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**5.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.33 cfs @ 12.30 hrs HW=1,001.54' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.33 cfs @ 1.98 fps)

Pond SMA-13: SMA-13 Pocket Pond



Summary for Pond SMA-14: SMA-14 Pocket Pond

Inflow Area = 0.678 ac, 0.00% Impervious, Inflow Depth = 0.64" for 1-YEAR, 24-HOUR event
Inflow = 0.35 cfs @ 12.24 hrs, Volume= 0.036 af
Outflow = 0.35 cfs @ 12.24 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.4 min
Primary = 0.35 cfs @ 12.24 hrs, Volume= 0.035 af
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,017.13' @ 12.24 hrs Surf.Area= 0.002 ac Storage= 0.001 af

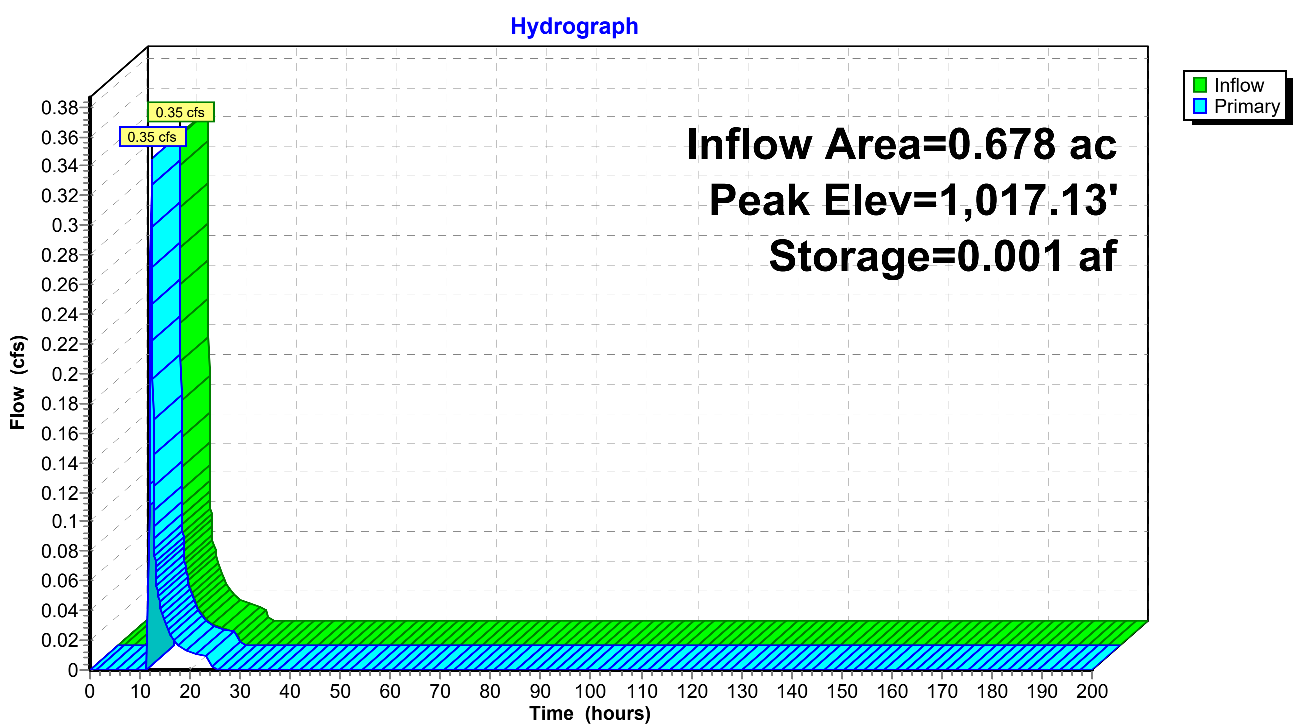
Plug-Flow detention time= 20.7 min calculated for 0.035 af (97% of inflow)
Center-of-Mass det. time= 5.8 min (884.8 - 879.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,016.00'	0.005 af	**2.00'W x 5.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.34 cfs @ 12.24 hrs HW=1,017.13' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 0.90 fps)

Pond SMA-14: SMA-14 Pocket Pond



Summary for Pond SMA-15: SMA-15 Pocket Pond

Inflow Area = 0.203 ac, 0.00% Impervious, Inflow Depth = 1.06" for 1-YEAR, 24-HOUR event
Inflow = 0.28 cfs @ 12.01 hrs, Volume= 0.018 af
Outflow = 0.23 cfs @ 12.11 hrs, Volume= 0.013 af, Atten= 20%, Lag= 5.5 min
Primary = 0.23 cfs @ 12.11 hrs, Volume= 0.013 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,017.07' @ 12.11 hrs Surf.Area= 0.006 ac Storage= 0.006 af

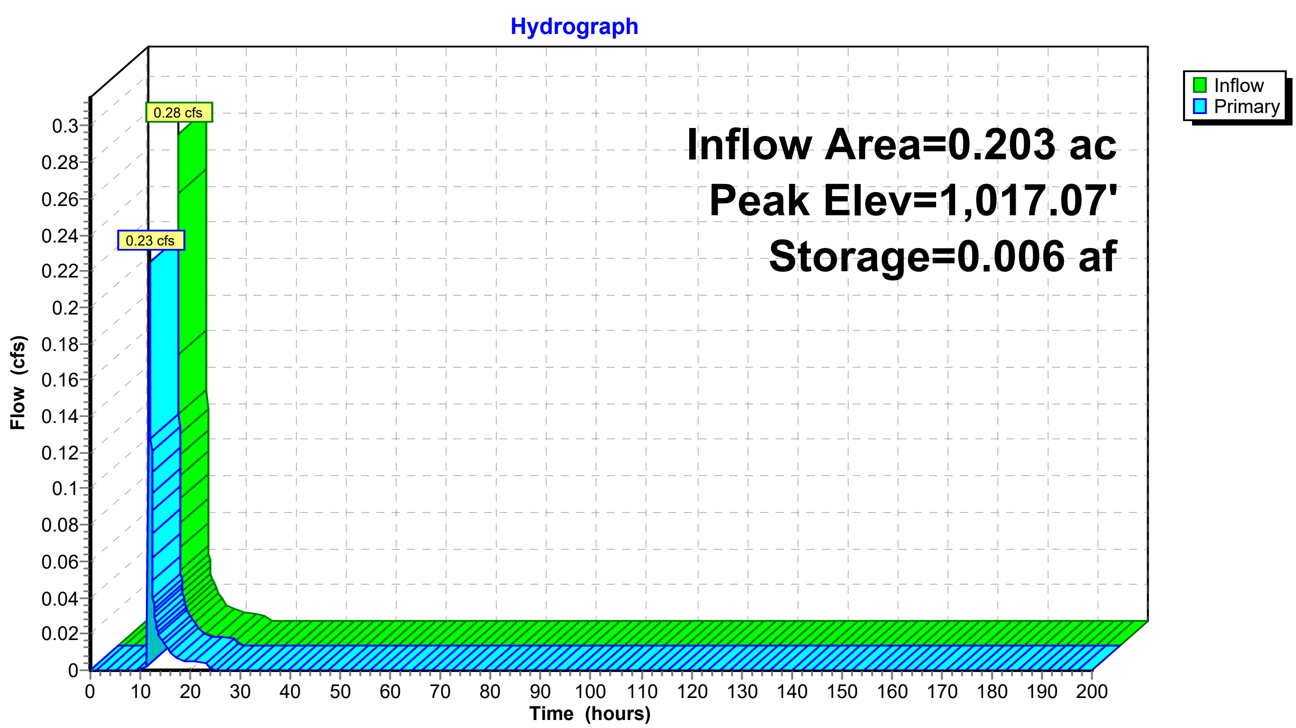
Plug-Flow detention time= 151.2 min calculated for 0.013 af (71% of inflow)
Center-of-Mass det. time= 54.9 min (888.4 - 833.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	0.028 af	**5.00'W x 3.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.21 cfs @ 12.11 hrs HW=1,017.07' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.21 cfs @ 0.63 fps)

Pond SMA-15: SMA-15 Pocket Pond



Summary for Pond SMA-16: SMA-16 Pocket Pond

Inflow Area = 7.634 ac, 0.00% Impervious, Inflow Depth = 0.60" for 1-YEAR, 24-HOUR event
Inflow = 3.57 cfs @ 12.24 hrs, Volume= 0.382 af
Outflow = 2.49 cfs @ 12.46 hrs, Volume= 0.360 af, Atten= 30%, Lag= 13.4 min
Primary = 2.49 cfs @ 12.46 hrs, Volume= 0.360 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,031.19' @ 12.46 hrs Surf.Area= 0.044 ac Storage= 0.065 af

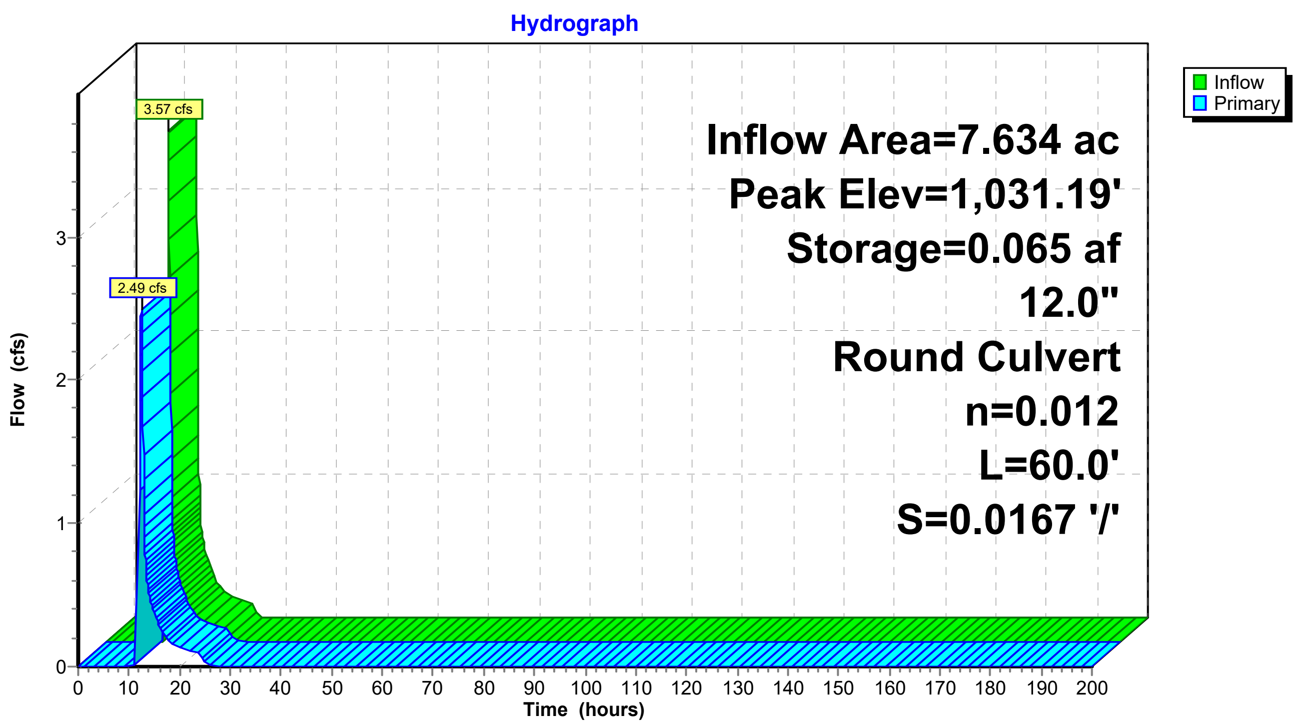
Plug-Flow detention time= 60.2 min calculated for 0.360 af (94% of inflow)
Center-of-Mass det. time= 30.1 min (913.1 - 883.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,029.00'	0.170 af	**10.00'W x 70.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,030.00' / 1,029.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.48 cfs @ 12.46 hrs HW=1,031.19' (Free Discharge)
1=Culvert (Inlet Controls 2.48 cfs @ 3.16 fps)

Pond SMA-16: SMA-16 Pocket Pond



Summary for Pond SMA-17: SMA-17 Pocket Pond

Inflow Area = 0.099 ac, 0.00% Impervious, Inflow Depth = 1.06" for 1-YEAR, 24-HOUR event
Inflow = 0.14 cfs @ 12.01 hrs, Volume= 0.009 af
Outflow = 0.06 cfs @ 12.20 hrs, Volume= 0.006 af, Atten= 58%, Lag= 11.5 min
Primary = 0.06 cfs @ 12.20 hrs, Volume= 0.006 af
Routed to Reach 211R : (new Reach)

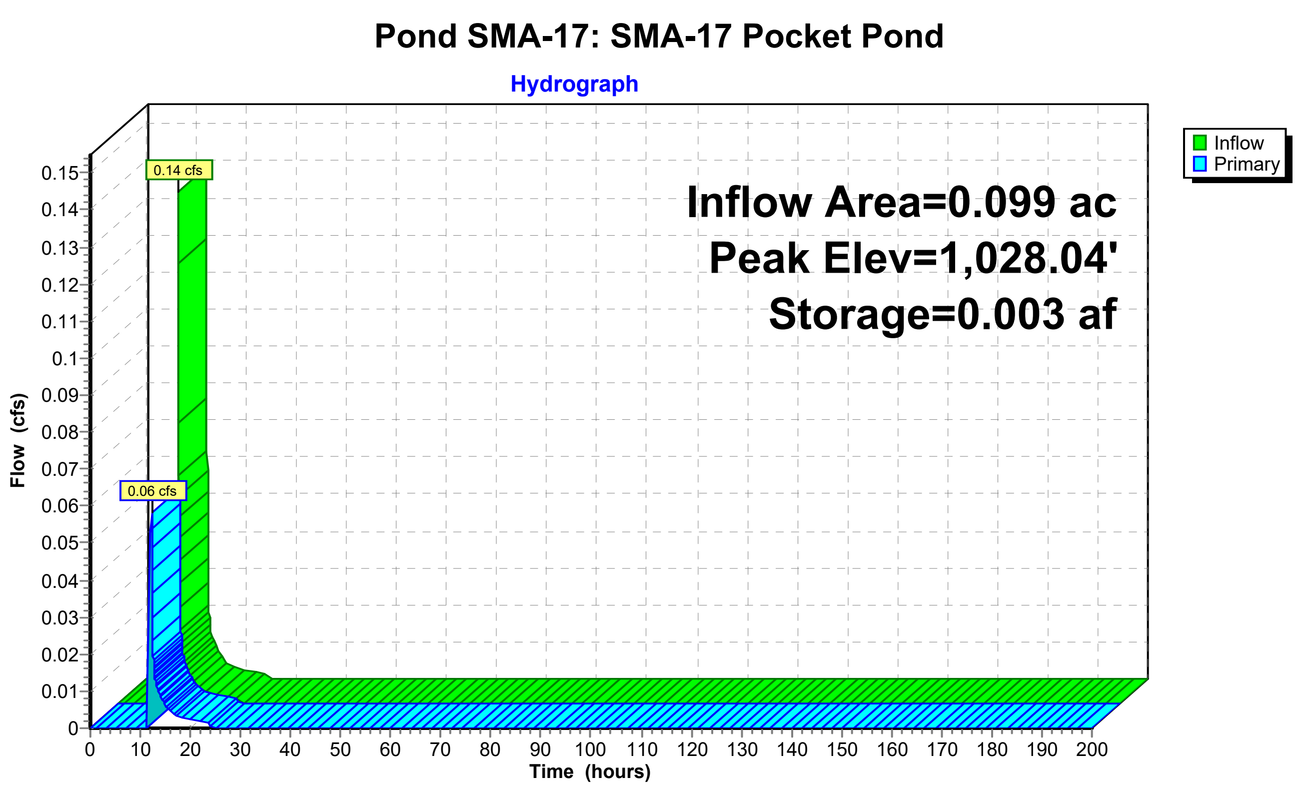
Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,028.04' @ 12.20 hrs Surf.Area= 0.005 ac Storage= 0.003 af

Plug-Flow detention time= 179.4 min calculated for 0.006 af (65% of inflow)
Center-of-Mass det. time= 73.0 min (906.3 - 833.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,027.00'	0.023 af	**7.00'W x 10.00'L x 3.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**3.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.06 cfs @ 12.20 hrs HW=1,028.04' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.06 cfs @ 0.47 fps)



Summary for Pond SMA-18: SMA-18 Pocket Pond

Inflow Area = 0.475 ac, 0.00% Impervious, Inflow Depth = 1.06" for 1-YEAR, 24-HOUR event
Inflow = 0.64 cfs @ 12.05 hrs, Volume= 0.042 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,029.62' @ 24.20 hrs Surf.Area= 0.027 ac Storage= 0.042 af

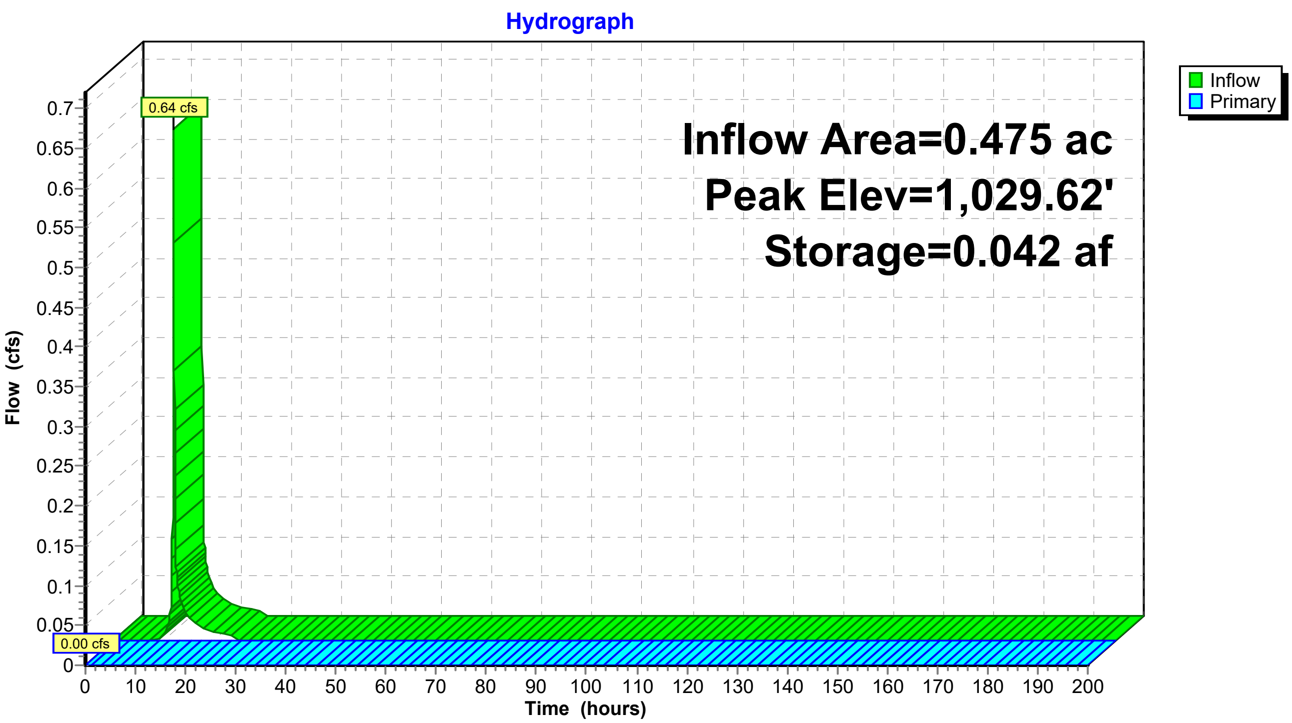
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	1,027.00'	0.138 af	**30.00'W x 10.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.00'	**4.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond SMA-18: SMA-18 Pocket Pond



Summary for Pond SMA-4: SMA-4 Pocket Pond

[92] Warning: Device #1 is above defined storage

Inflow Area = 1.961 ac, 0.00% Impervious, Inflow Depth = 0.89" for 1-YEAR, 24-HOUR event
Inflow = 2.29 cfs @ 12.01 hrs, Volume= 0.145 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-3 : Outfall to Southwest

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 853.79' @ 24.05 hrs Surf.Area= 3,987 sf Storage= 6,300 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

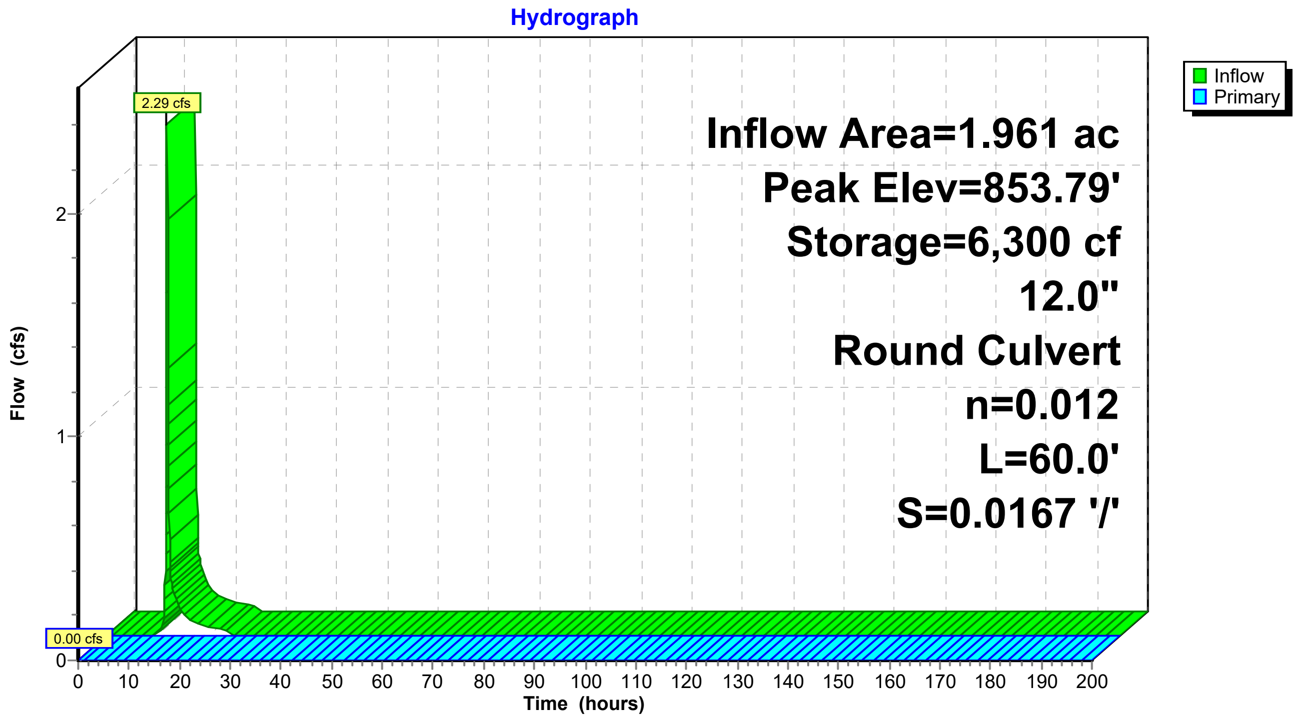
Volume	Invert	Avail.Storage	Storage Description
#1	850.00'	7,166 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
850.00	315	0	0
851.00	612	464	464
852.00	1,074	843	1,307
853.00	3,227	2,151	3,457
854.00	4,191	3,709	7,166

Device	Routing	Invert	Outlet Devices
#1	Primary	944.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 944.00' / 943.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=850.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Pond SMA-4: SMA-4 Pocket Pond



Summary for Pond SMA-5: SMA-5 Pocket Pond

Inflow Area = 1.049 ac, 0.00% Impervious, Inflow Depth = 0.81" for 1-YEAR, 24-HOUR event
Inflow = 0.30 cfs @ 12.60 hrs, Volume= 0.071 af
Outflow = 0.29 cfs @ 12.71 hrs, Volume= 0.071 af, Atten= 3%, Lag= 6.3 min
Primary = 0.29 cfs @ 12.71 hrs, Volume= 0.071 af
Routed to Reach 8R : Wetland Stream

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 934.30' @ 12.71 hrs Surf.Area= 568 sf Storage= 142 cf

Plug-Flow detention time= 15.7 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 15.4 min (951.5 - 936.1)

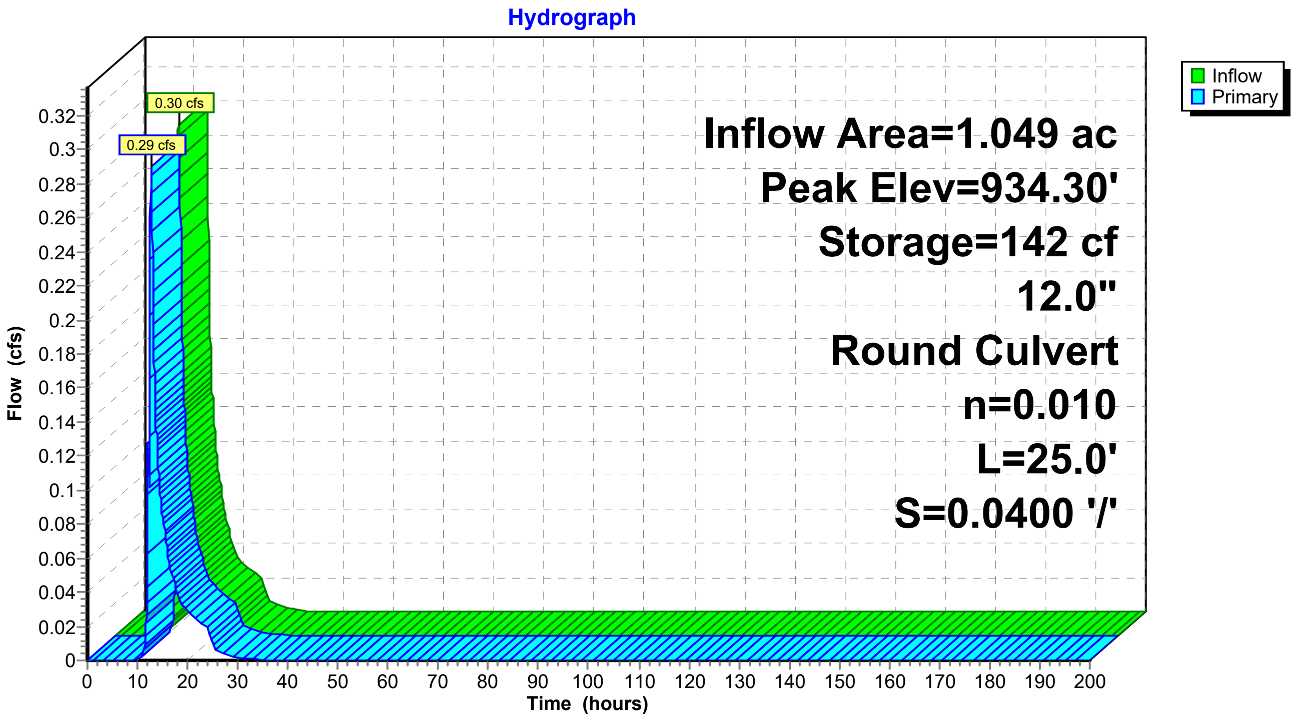
Volume	Invert	Avail.Storage	Storage Description
#1	934.00'	3,514 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
934.00	380	0	0
935.00	1,008	694	694
936.00	1,396	1,202	1,896
937.00	1,840	1,618	3,514

Device	Routing	Invert	Outlet Devices
#1	Primary	934.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 934.00' / 933.00' S= 0.0400 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.71 hrs HW=934.30' (Free Discharge)
└—**1=Culvert** (Inlet Controls 0.29 cfs @ 1.47 fps)

Pond SMA-5: SMA-5 Pocket Pond



Summary for Pond SMA-6: SMA-6 Pocket Pond

Inflow Area = 0.906 ac, 0.00% Impervious, Inflow Depth = 1.17" for 1-YEAR, 24-HOUR event
Inflow = 1.01 cfs @ 12.01 hrs, Volume= 0.088 af
Outflow = 0.28 cfs @ 12.61 hrs, Volume= 0.058 af, Atten= 73%, Lag= 36.2 min
Primary = 0.28 cfs @ 12.61 hrs, Volume= 0.058 af
Routed to Pond SMA-5 : SMA-5 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 942.29' @ 12.61 hrs Surf.Area= 1,689 sf Storage= 1,756 cf

Plug-Flow detention time= 227.1 min calculated for 0.058 af (66% of inflow)
Center-of-Mass det. time= 124.6 min (958.4 - 833.8)

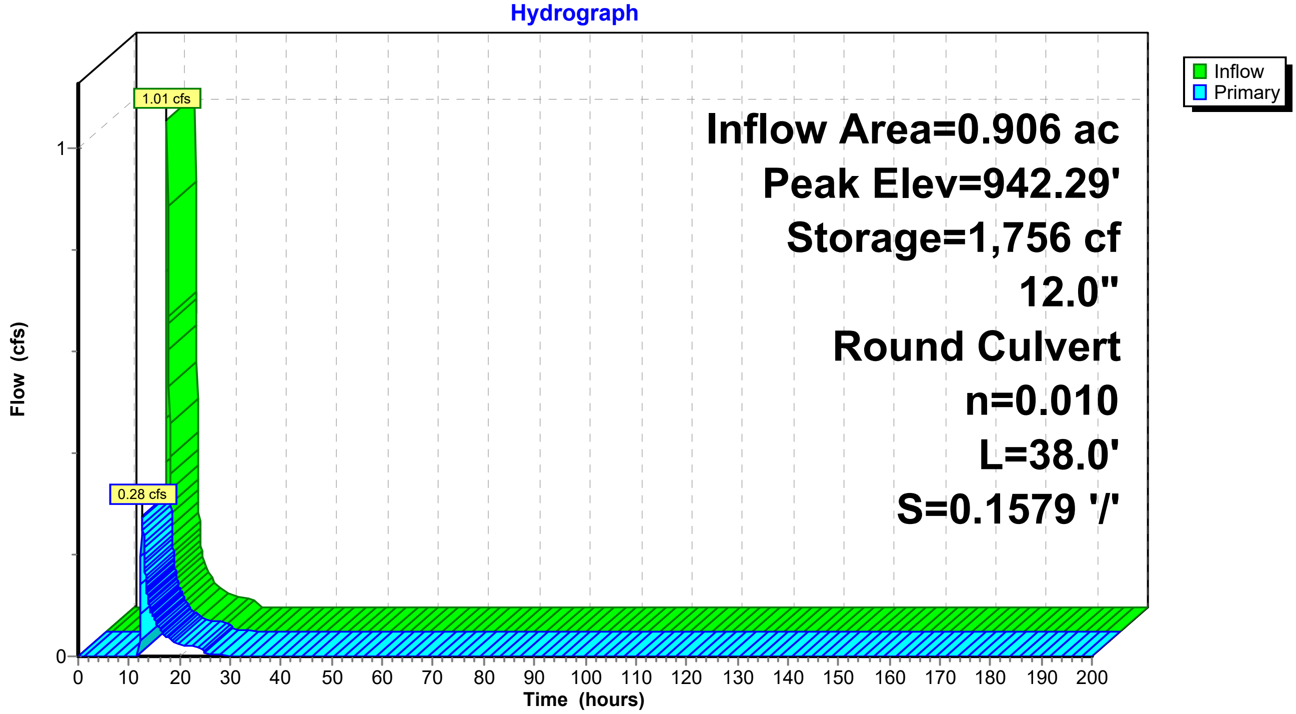
Volume	Invert	Avail.Storage	Storage Description
#1	940.00'	5,345 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
940.00	760	0	0
941.00	132	446	446
942.00	1,547	840	1,286
943.00	2,036	1,792	3,077
944.00	2,500	2,268	5,345

Device	Routing	Invert	Outlet Devices
#1	Primary	942.00'	**12.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 942.00' / 936.00' S= 0.1579 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.61 hrs HW=942.29' (Free Discharge)
1=Culvert (Inlet Controls 0.27 cfs @ 1.45 fps)

Pond SMA-6: SMA-6 Pocket Pond



Summary for Pond SMA-7: SMA-7 Pocket Pond

[93] Warning: Storage range exceeded by 1.31'

Inflow Area = 11.347 ac, 0.00% Impervious, Inflow Depth = 0.62" for 1-YEAR, 24-HOUR event
Inflow = 5.21 cfs @ 12.15 hrs, Volume= 0.583 af
Outflow = 5.01 cfs @ 12.29 hrs, Volume= 0.583 af, Atten= 4%, Lag= 8.6 min
Primary = 5.01 cfs @ 12.29 hrs, Volume= 0.583 af
Routed to Reach 9R : Flow to Northeast outlet

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 946.31' @ 12.29 hrs Surf.Area= 1,685 sf Storage= 2,513 cf

Plug-Flow detention time= 12.5 min calculated for 0.583 af (100% of inflow)
Center-of-Mass det. time= 12.6 min (889.3 - 876.6)

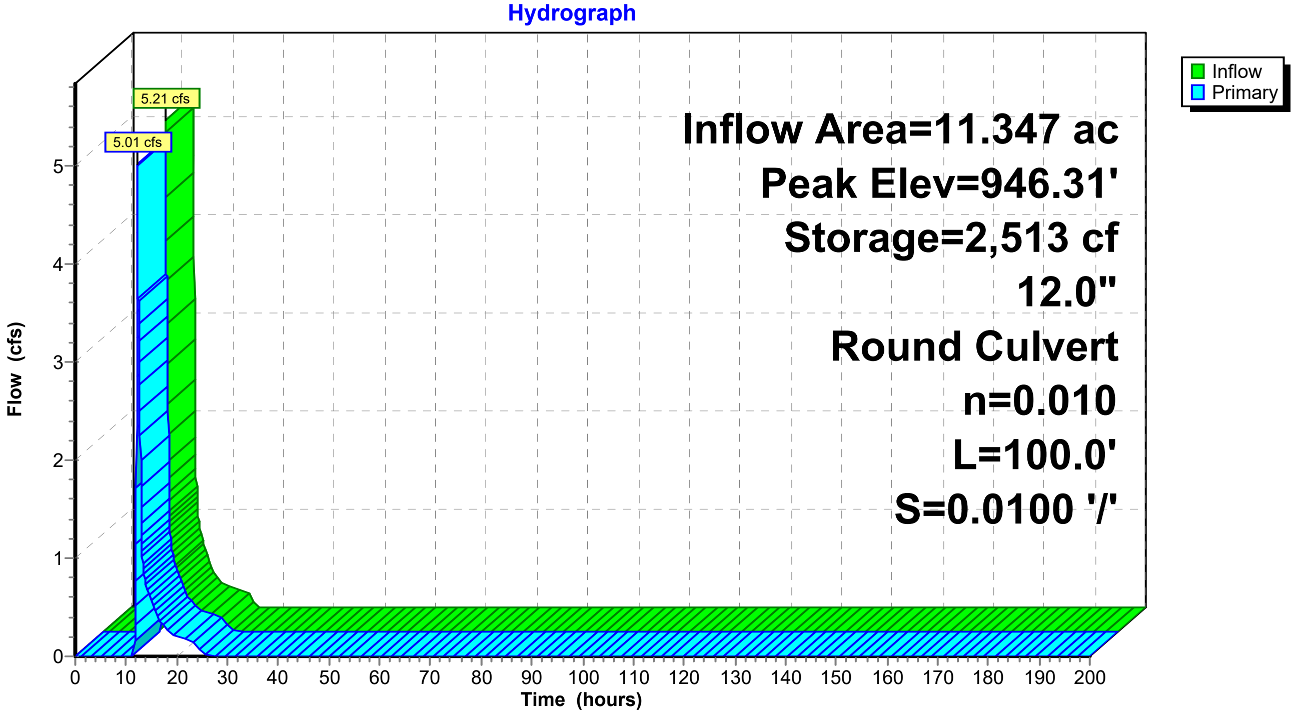
Volume	Invert	Avail.Storage	Storage Description
#1	943.00'	2,513 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
943.00	861	0	0
944.00	1,240	1,051	1,051
945.00	1,685	1,463	2,513

Device	Routing	Invert	Outlet Devices
#1	Primary	943.00'	**12.0" Round Culvert** L= 100.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 943.00' / 942.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=4.88 cfs @ 12.29 hrs HW=946.17' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.88 cfs @ 6.21 fps)

Pond SMA-7: SMA-7 Pocket Pond



Summary for Pond SMA-9: SMA-9 Pocket Pond

Inflow Area = 0.298 ac, 0.00% Impervious, Inflow Depth = 1.40" for 1-YEAR, 24-HOUR event
Inflow = 0.53 cfs @ 12.04 hrs, Volume= 0.035 af
Outflow = 0.54 cfs @ 12.04 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.1 min
Primary = 0.54 cfs @ 12.04 hrs, Volume= 0.035 af
Routed to Link DP-4 : Outfall to Southeast

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 963.18' @ 12.04 hrs Surf.Area= 0.000 ac Storage= 0.000 af

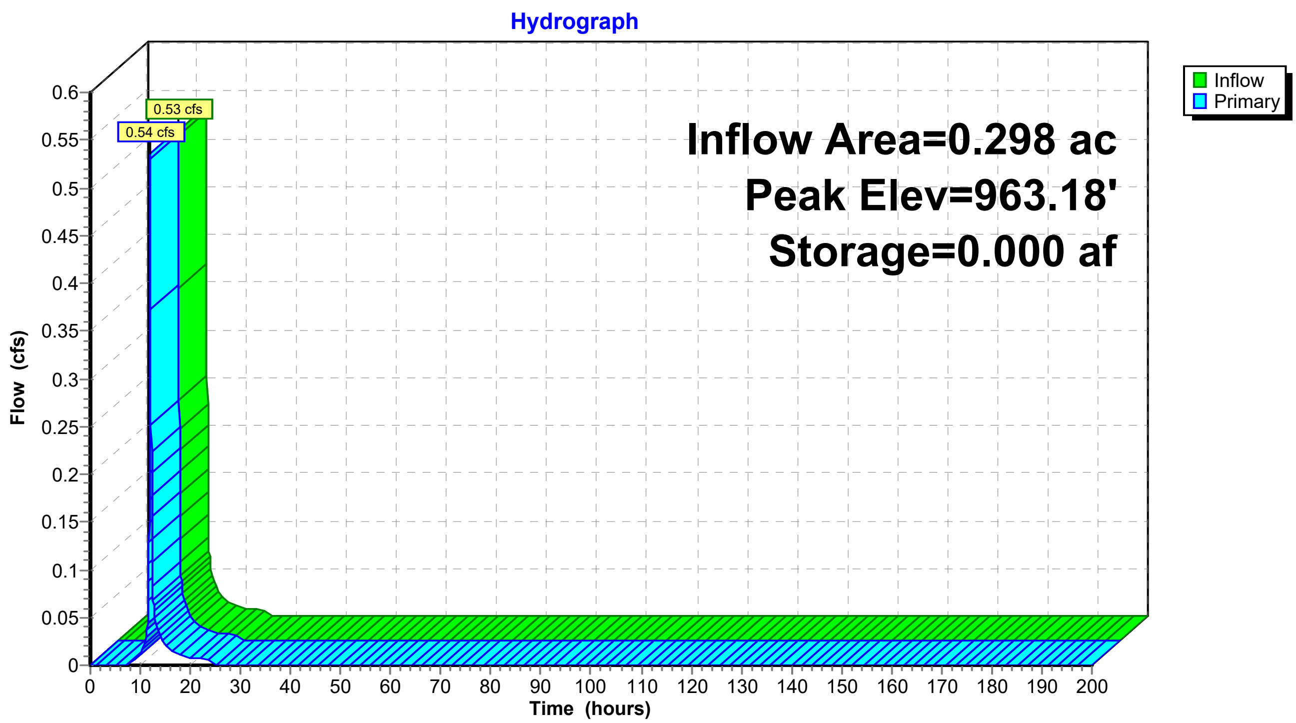
Plug-Flow detention time= 0.1 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (812.4 - 812.3)

Volume	Invert	Avail.Storage	Storage Description
#1	963.00'	0.046 af	**3.00'W x 3.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	963.00'	**3.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.51 cfs @ 12.04 hrs HW=963.17' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.51 cfs @ 0.98 fps)

Pond SMA-9: SMA-9 Pocket Pond

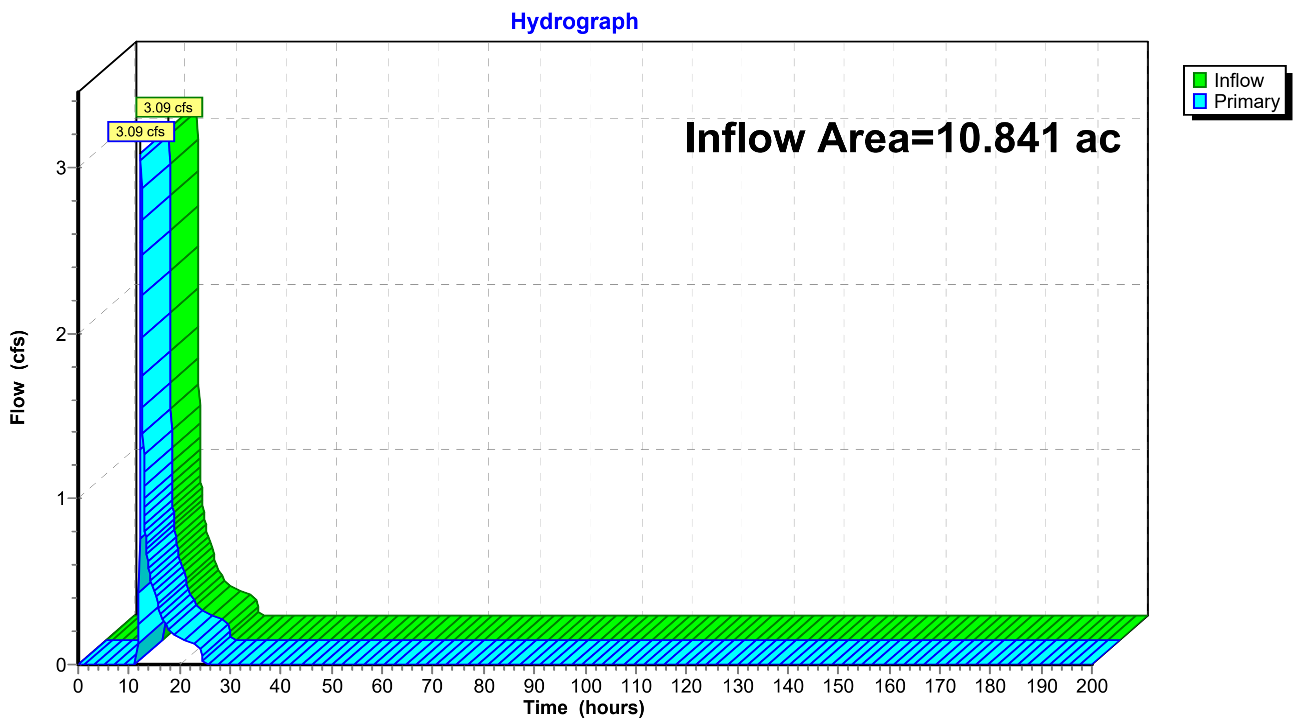


Summary for Link 215L: Subcatch 101 + 102

Inflow Area = 10.841 ac, 0.00% Impervious, Inflow Depth = 0.47" for 1-YEAR, 24-HOUR event
Inflow = 3.09 cfs @ 12.33 hrs, Volume= 0.421 af
Primary = 3.09 cfs @ 12.33 hrs, Volume= 0.421 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : Outfall to Southwest

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link 215L: Subcatch 101 + 102

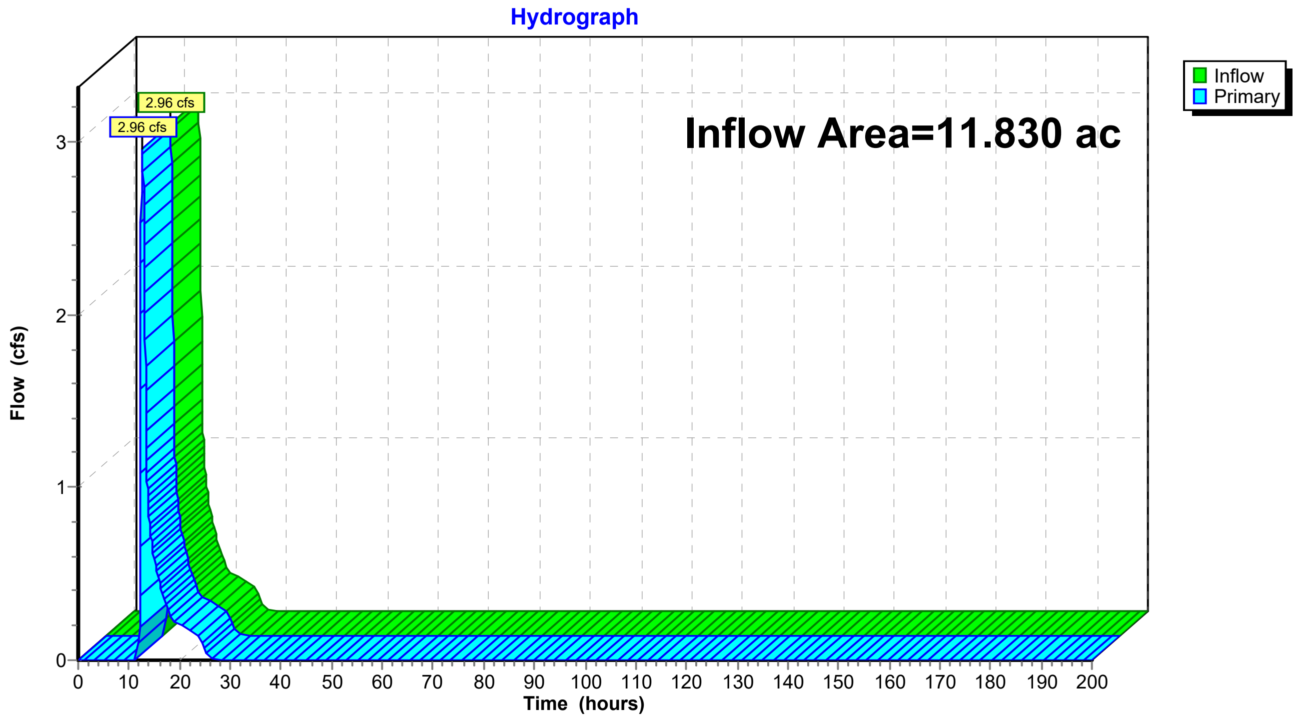


Summary for Link DP-1: Outfall to West

Inflow Area = 11.830 ac, 0.16% Impervious, Inflow Depth = 0.56" for 1-YEAR, 24-HOUR event
Inflow = 2.96 cfs @ 12.64 hrs, Volume= 0.552 af
Primary = 2.96 cfs @ 12.64 hrs, Volume= 0.552 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-1: Outfall to West

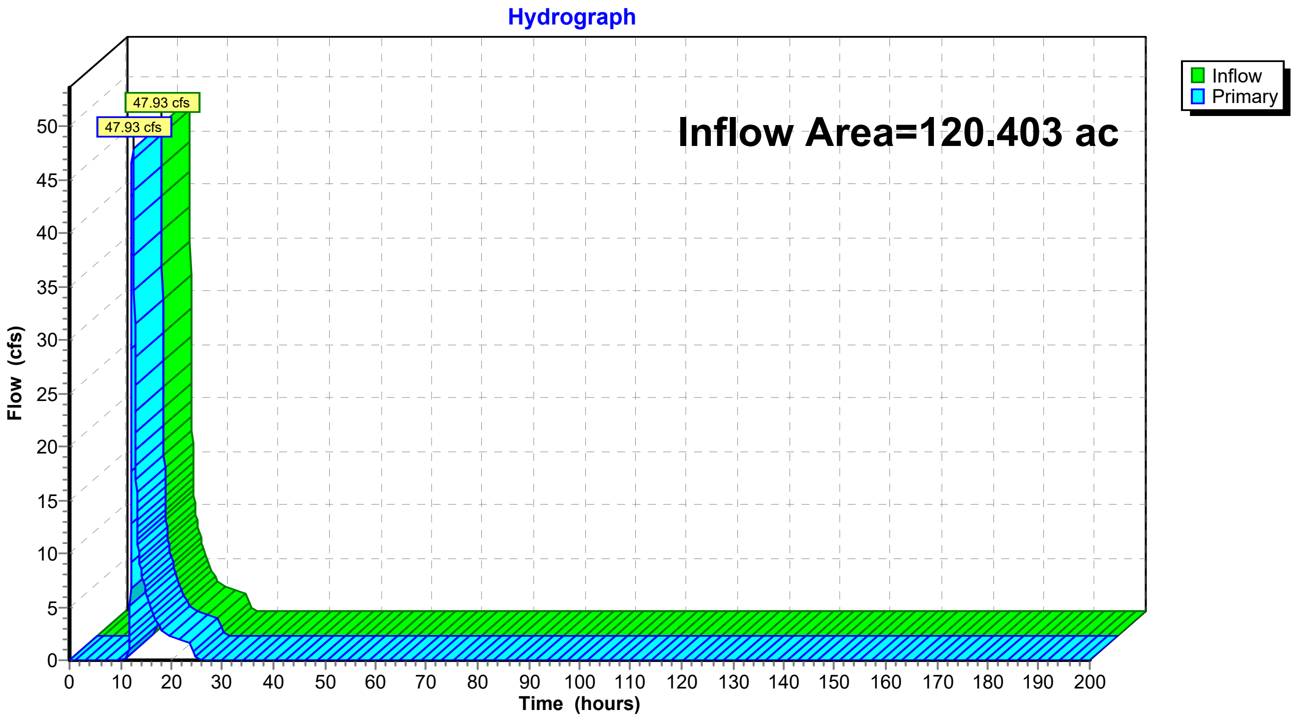


Summary for Link DP-2: Outfall to Northwest

Inflow Area = 120.403 ac, 0.92% Impervious, Inflow Depth = 0.65" for 1-YEAR, 24-HOUR event
Inflow = 47.93 cfs @ 12.42 hrs, Volume= 6.560 af
Primary = 47.93 cfs @ 12.42 hrs, Volume= 6.560 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-2: Outfall to Northwest

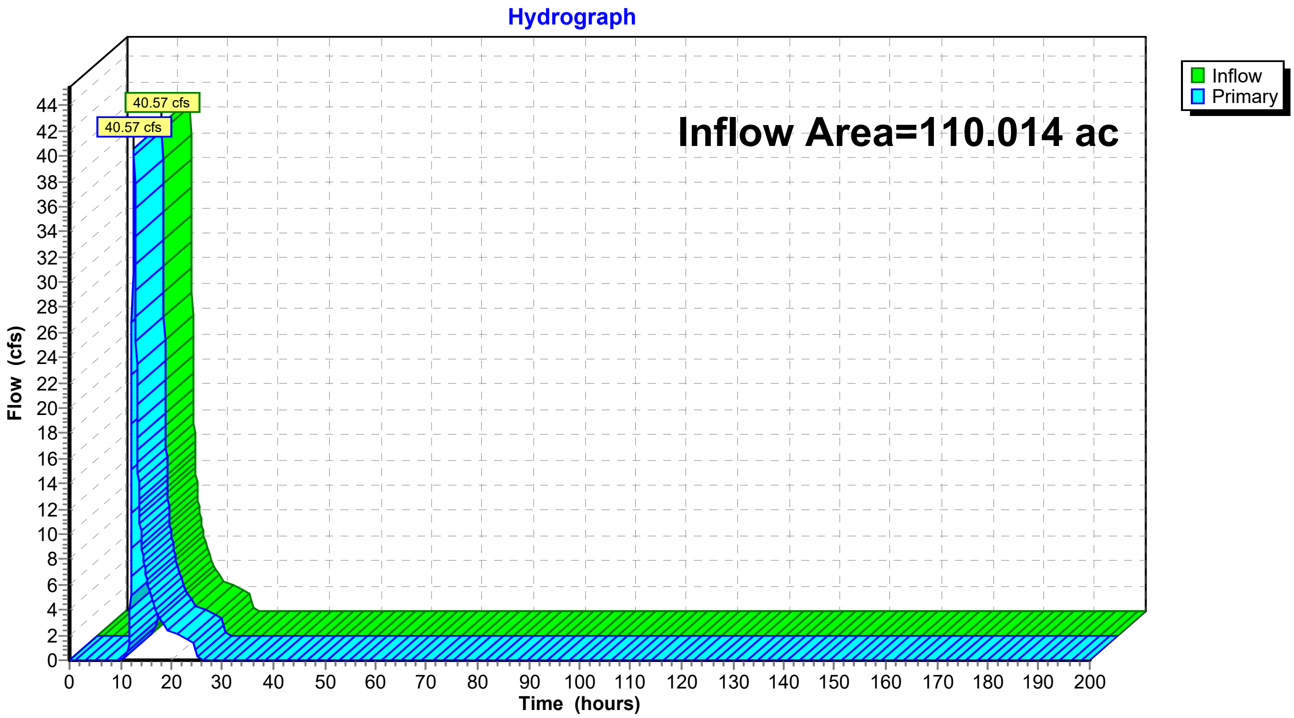


Summary for Link DP-3: Outfall to Southwest

Inflow Area = 110.014 ac, 0.00% Impervious, Inflow Depth = 0.74" for 1-YEAR, 24-HOUR event
Inflow = 40.57 cfs @ 12.65 hrs, Volume= 6.759 af
Primary = 40.57 cfs @ 12.65 hrs, Volume= 6.759 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-3: Outfall to Southwest

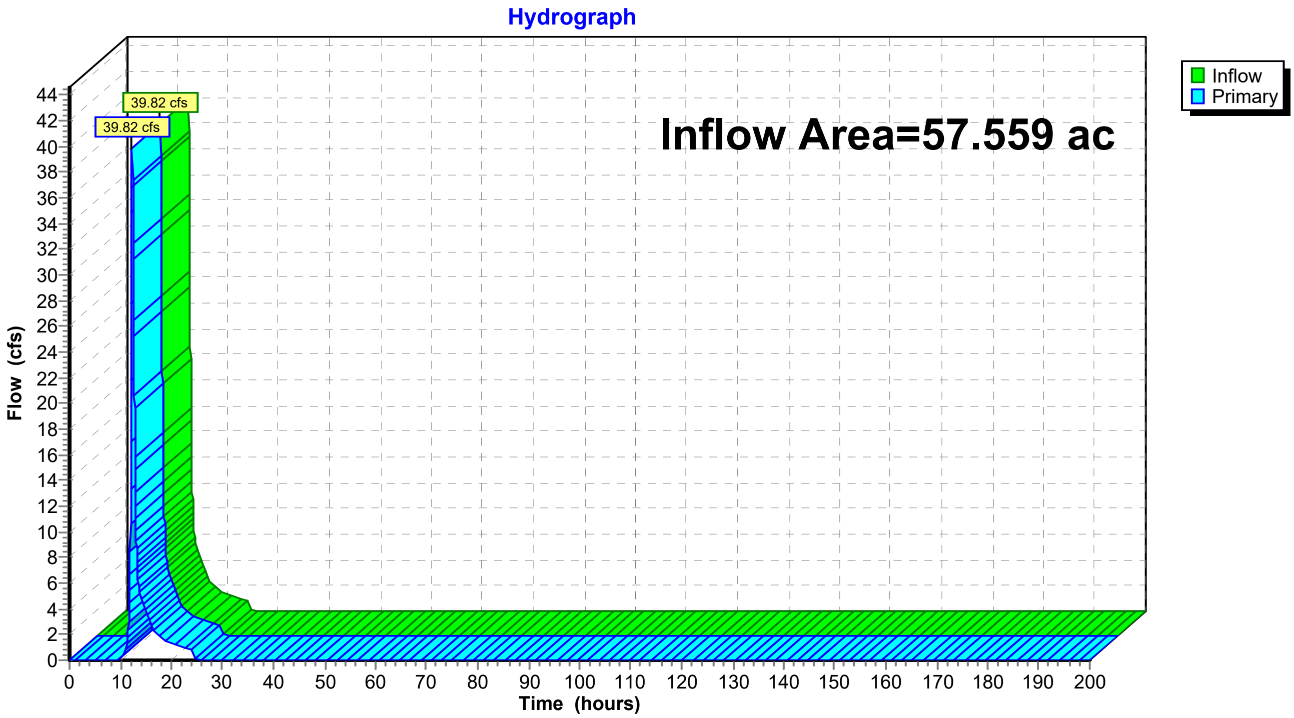


Summary for Link DP-4: Outfall to Southeast

Inflow Area = 57.559 ac, 0.00% Impervious, Inflow Depth = 0.94" for 1-YEAR, 24-HOUR event
Inflow = 39.82 cfs @ 12.35 hrs, Volume= 4.494 af
Primary = 39.82 cfs @ 12.35 hrs, Volume= 4.494 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-4: Outfall to Southeast



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 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: Subcat 100 Runoff Area=11.830 ac 0.16% Impervious Runoff Depth=1.60"
Flow Length=773' Tc=22.8 min CN=76 Runoff=13.87 cfs 1.579 af

Subcatchment101: Subcat 101 Runoff Area=5.410 ac 0.00% Impervious Runoff Depth=1.40"
Flow Length=845' Tc=15.1 min CN=73 Runoff=6.43 cfs 0.631 af

Subcatchment102: Subcat 102 Runoff Area=5.431 ac 0.00% Impervious Runoff Depth=1.47"
Flow Length=1,119' Tc=24.2 min CN=74 Runoff=5.62 cfs 0.663 af

Subcatchment200: Subcat 200 Runoff Area=83.894 ac 1.33% Impervious Runoff Depth=1.82"
Flow Length=4,461' Tc=27.5 min UI Adjusted CN=79 Runoff=104.31 cfs 12.713 af

Subcatchment201: Subcat 201 Runoff Area=10.257 ac 0.00% Impervious Runoff Depth=1.74"
Flow Length=1,008' Tc=14.7 min CN=78 Runoff=15.77 cfs 1.491 af

Subcatchment202: Subcat 202 Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=1.53"
Flow Length=260' Tc=7.7 min CN=75 Runoff=0.73 cfs 0.057 af

Subcatchment203: Subcat 203 Runoff Area=5.186 ac 0.00% Impervious Runoff Depth=1.60"
Flow Length=827' Tc=15.4 min CN=76 Runoff=7.13 cfs 0.692 af

Subcatchment204: Subcat 204 Runoff Area=0.186 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=175' Tc=0.4 min CN=86 Runoff=0.59 cfs 0.037 af

Subcatchment205: Subcat 205 Runoff Area=0.203 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=236' Tc=0.7 min CN=86 Runoff=0.64 cfs 0.040 af

Subcatchment206: Subcat 206 Runoff Area=0.678 ac 0.00% Impervious Runoff Depth=1.74"
Flow Length=489' Tc=15.4 min CN=78 Runoff=1.02 cfs 0.099 af

Subcatchment207: Subcat 207 Runoff Area=0.099 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=132' Tc=0.5 min CN=86 Runoff=0.31 cfs 0.020 af

Subcatchment208: Subcat 208 Runoff Area=0.475 ac 0.00% Impervious Runoff Depth=2.38"
Flow Length=681' Tc=2.7 min CN=86 Runoff=1.45 cfs 0.094 af

Subcatchment209: Subcat 209 Runoff Area=7.634 ac 0.00% Impervious Runoff Depth=1.67"
Flow Length=567' Tc=15.3 min CN=77 Runoff=11.04 cfs 1.064 af

Subcatchment300: Subcat 300 Runoff Area=96.162 ac 0.00% Impervious Runoff Depth=1.97"
Flow Length=4,194' Tc=45.6 min CN=81 Runoff=101.84 cfs 15.795 af

Subcatchment301: Subcat 301 Runoff Area=0.301 ac 0.00% Impervious Runoff Depth=2.65"
Flow Length=2,290' Tc=14.6 min CN=89 Runoff=0.71 cfs 0.067 af

Subcatchment302: Subcat 302 Runoff Area=7.050 ac 0.00% Impervious Runoff Depth=1.67"
Flow Length=878' Slope=0.1180 '/' Tc=13.3 min CN=77 Runoff=10.71 cfs 0.983 af

Subcatchment303: Subcat 303 Runoff Area=4.296 ac 0.00% Impervious Runoff Depth=1.74"
Tc=0.0 min CN=78 Runoff=10.04 cfs 0.625 af

Subcatchment304: Subcat 304 Runoff Area=0.604 ac 0.00% Impervious Runoff Depth=2.47"
Tc=0.0 min CN=87 Runoff=2.00 cfs 0.125 af

Subcatchment305: Subcat 305 Runoff Area=0.143 ac 0.00% Impervious Runoff Depth=2.38"
Tc=0.0 min CN=86 Runoff=0.46 cfs 0.028 af

Subcatchment306: Subcat 306 Runoff Area=1.961 ac 0.00% Impervious Runoff Depth=2.13"
Tc=0.0 min CN=83 Runoff=5.63 cfs 0.348 af

Subcatchment400: Subcat 400 Runoff Area=43.571 ac 0.00% Impervious Runoff Depth=2.21"
Flow Length=1,691' Tc=23.4 min CN=84 Runoff=71.24 cfs 8.036 af

Subcatchment401: Subcat 401 Runoff Area=12.329 ac 0.00% Impervious Runoff Depth=2.21"
Flow Length=1,337' Tc=18.7 min CN=84 Runoff=22.12 cfs 2.274 af

Subcatchment402: Subcat 402 Runoff Area=1.361 ac 0.00% Impervious Runoff Depth=1.82"
Flow Length=689' Tc=14.6 min CN=79 Runoff=2.19 cfs 0.206 af

Subcatchment403: Subcat 403 Runoff Area=0.298 ac 0.00% Impervious Runoff Depth=2.85"
Flow Length=562' Tc=2.0 min CN=91 Runoff=1.06 cfs 0.071 af

Reach 8R: Wetland Stream Avg. Flow Depth=0.10' Max Vel=1.56 fps Inflow=1.40 cfs 0.190 af
n=0.040 L=2,450.0' S=0.0392 '/' Capacity=238.28 cfs Outflow=1.03 cfs 0.190 af

Reach 9R: Flow to Northeast outlet Avg. Flow Depth=0.66' Max Vel=4.05 fps Inflow=16.91 cfs 1.607 af
n=0.040 L=2,500.0' S=0.0464 '/' Capacity=36.76 cfs Outflow=13.08 cfs 1.607 af

Reach 12R: Diversion Swale Avg. Flow Depth=0.42' Max Vel=6.87 fps Inflow=10.04 cfs 0.625 af
n=0.035 L=475.0' S=0.1368 '/' Capacity=266.51 cfs Outflow=9.08 cfs 0.625 af

Reach 211R: (new Reach) Inflow=133.27 cfs 16.154 af
Outflow=133.27 cfs 16.154 af

Reach 213R: (new Reach) Avg. Flow Depth=0.91' Max Vel=6.55 fps Inflow=16.33 cfs 1.548 af
n=0.035 L=500.0' S=0.0736 '/' Capacity=21.02 cfs Outflow=16.00 cfs 1.548 af

Reach 224R: Roadside Swale Avg. Flow Depth=0.10' Max Vel=3.02 fps Inflow=0.71 cfs 0.067 af
n=0.035 L=497.0' S=0.1328 '/' Capacity=262.54 cfs Outflow=0.68 cfs 0.067 af

Reach 307R: (new Reach) Avg. Flow Depth=0.94' Max Vel=5.61 fps Inflow=24.20 cfs 2.480 af
n=0.030 L=1,215.0' S=0.0568 '/' Capacity=6.96 cfs Outflow=23.05 cfs 2.480 af

Pond 1P: Subcatch 402 to 401 Culvert Peak Elev=1.21' Inflow=2.19 cfs 0.206 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0000 '/' Outflow=2.19 cfs 0.206 af

Pond 2P: SMA-8 Pocket Pond Peak Elev=1,025.19' Storage=504 cf Inflow=23.05 cfs 2.480 af
12.0" Round Culvert n=0.010 L=100.0' S=0.0100 '/' Outflow=23.07 cfs 2.480 af

Pond 3P: SMA-2 Pocket Pond Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.010 L=25.0' S=0.0400 '/' Primary=0.00 cfs 0.000 af

Pond 4P: SMA-3 Pocket Pond Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.010 L=47.0' S=0.0213 '/' Primary=0.00 cfs 0.000 af

Pond 5P: Subcatch 301 to 304 Culvert Peak Elev=0.61' Inflow=0.71 cfs 0.067 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0000 '/' Outflow=0.71 cfs 0.067 af

Pond 11P: Subcatch 303 to 302 Culvert Peak Elev=1,028.78' Inflow=10.04 cfs 0.625 af
12.0" Round Culvert n=0.010 L=60.0' S=0.0667 '/' Outflow=10.04 cfs 0.625 af

Pond SMA-1: SMA-1 Infiltration Basin Peak Elev=853.02' Storage=9,146 cf Inflow=13.87 cfs 1.579 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0800 '/' Outflow=14.49 cfs 1.579 af

Pond SMA-10: SMA-10 Pocket Pond Peak Elev=1,042.49' Storage=0.001 af Inflow=0.73 cfs 0.057 af
12.0" Round Culvert n=0.012 L=66.0' S=0.0152 '/' Outflow=0.72 cfs 0.057 af

Pond SMA-11: SMA-11 Pocket Pond Peak Elev=1,007.64' Storage=0.018 af Inflow=7.13 cfs 0.692 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/' Outflow=7.46 cfs 0.692 af

Pond SMA-12: SMA-12 Pocket Pond Peak Elev=1,001.73' Storage=0.044 af Inflow=8.70 cfs 0.827 af
Outflow=8.37 cfs 0.801 af

Pond SMA-13: SMA-13 Pocket Pond Peak Elev=1,002.14' Storage=0.069 af Inflow=16.00 cfs 1.548 af
Outflow=16.05 cfs 1.505 af

Pond SMA-14: SMA-14 Pocket Pond Peak Elev=1,017.26' Storage=0.002 af Inflow=1.02 cfs 0.099 af
Outflow=1.02 cfs 0.098 af

Pond SMA-15: SMA-15 Pocket Pond Peak Elev=1,017.14' Storage=0.006 af Inflow=0.64 cfs 0.040 af
Outflow=0.61 cfs 0.035 af

Pond SMA-16: SMA-16 Pocket Pond Peak Elev=1,045.38' Storage=0.170 af Inflow=11.04 cfs 1.064 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0167 '/' Outflow=11.56 cfs 1.042 af

Pond SMA-17: SMA-17 Pocket Pond Peak Elev=1,028.12' Storage=0.004 af Inflow=0.31 cfs 0.020 af
Outflow=0.29 cfs 0.017 af

Pond SMA-18: SMA-18 Pocket Pond Peak Elev=1,030.06' Storage=0.055 af Inflow=1.45 cfs 0.094 af
Outflow=0.16 cfs 0.042 af

Pond SMA-4: SMA-4 Pocket Pond Peak Elev=944.94' Storage=7,166 cf Inflow=5.63 cfs 0.348 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0167 '/' Outflow=2.00 cfs 0.184 af

Pond SMA-5: SMA-5 Pocket Pond Peak Elev=934.73' Storage=442 cf Inflow=1.43 cfs 0.190 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0400 '/' Outflow=1.40 cfs 0.190 af

Pond SMA-6: SMA-6 Pocket Pond Peak Elev=942.68' Storage=2,460 cf Inflow=2.24 cfs 0.191 af
12.0" Round Culvert n=0.010 L=38.0' S=0.1579 '/' Outflow=1.28 cfs 0.162 af

Pond SMA-7: SMA-7 Pocket Pond Peak Elev=975.57' Storage=2,513 cf Inflow=15.38 cfs 1.607 af
12.0" Round Culvert n=0.010 L=100.0' S=0.0100 '/' Outflow=16.91 cfs 1.607 af

Pond SMA-9: SMA-9 Pocket Pond Peak Elev=963.28' Storage=0.000 af Inflow=1.06 cfs 0.071 af
Outflow=1.06 cfs 0.071 af

Link 215L: Subcatch 101 + 102 Inflow=11.34 cfs 1.294 af
Primary=11.34 cfs 1.294 af

Link DP-1: Outfall to West Inflow=14.49 cfs 1.579 af
Primary=14.49 cfs 1.579 af

Link DP-2: Outfall to Northwest Inflow=145.93 cfs 17.761 af
Primary=145.93 cfs 17.761 af

Link DP-3: Outfall to Southwest Inflow=109.57 cfs 17.464 af
Primary=109.57 cfs 17.464 af

Link DP-4: Outfall to Southeast Inflow=94.03 cfs 10.587 af
Primary=94.03 cfs 10.587 af

Total Runoff Area = 299.806 ac Runoff Volume = 47.737 af Average Runoff Depth = 1.91"
99.62% Pervious = 298.674 ac 0.38% Impervious = 1.132 ac

Summary for Subcatchment 100: Subcat 100

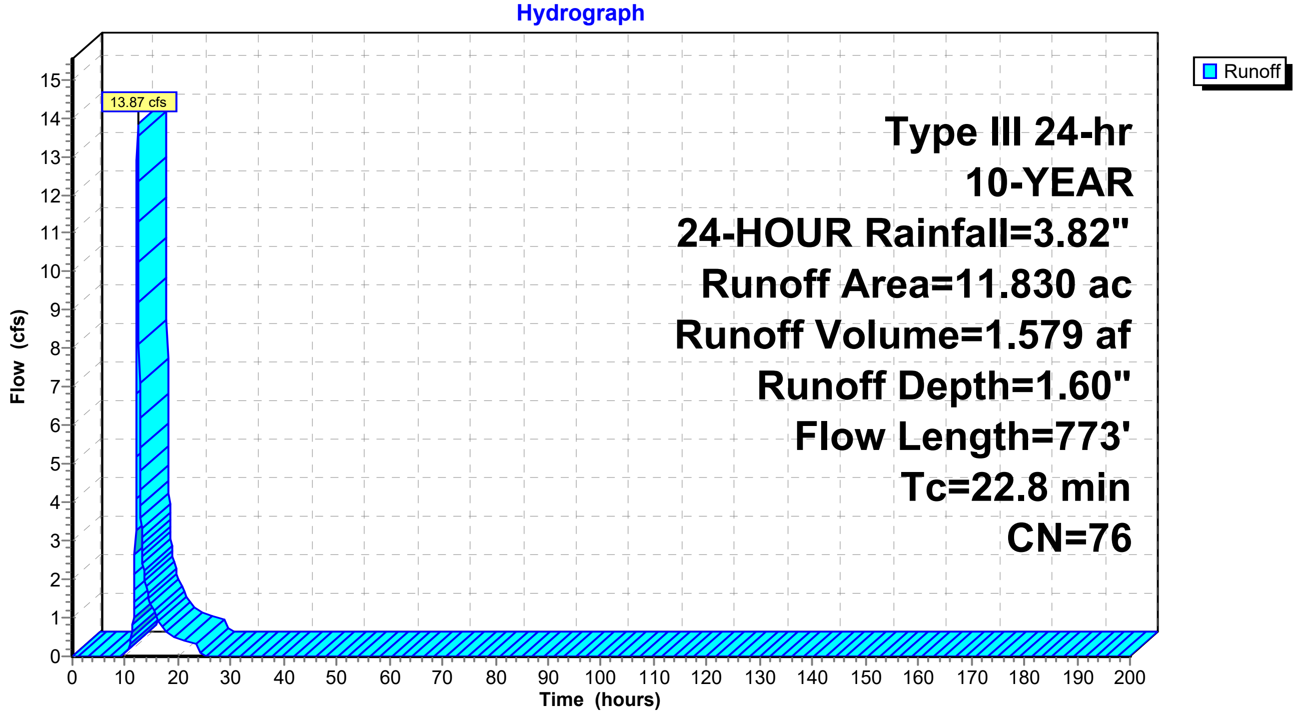
Runoff = 13.87 cfs @ 12.33 hrs, Volume= 1.579 af, Depth= 1.60"
Routed to Pond SMA-1 : SMA-1 Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.024	96	Gravel surface, HSG D
0.728	71	Meadow, non-grazed, HSG C
5.010	78	Meadow, non-grazed, HSG D
0.578	82	Row crops, contoured, Good, HSG C
0.501	86	Row crops, contoured, Good, HSG D
0.008	98	Unconnected roofs, HSG C
0.011	98	Unconnected roofs, HSG D
2.860	70	Woods, Good, HSG C
2.109	77	Woods, Good, HSG D
11.830	76	Weighted Average
11.811		99.84% Pervious Area
0.019		0.16% Impervious Area
0.019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
11.7	673	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.8	773	Total			

Subcatchment 100: Subcat 100



Summary for Subcatchment 101: Subcat 101

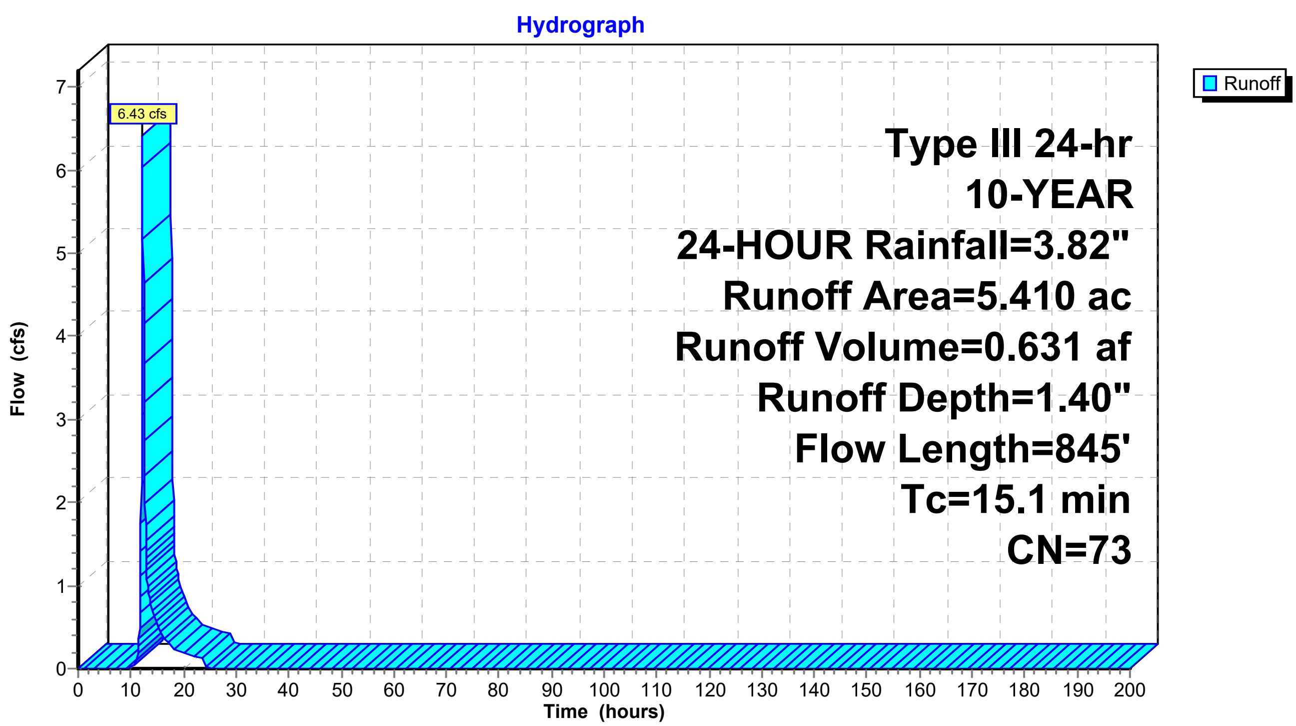
Runoff = 6.43 cfs @ 12.22 hrs, Volume= 0.631 af, Depth= 1.40"
Routed to Link 215L : Subcatch 101 + 102

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
0.104	96	Gravel surface, HSG D
4.400	71	Meadow, non-grazed, HSG C
0.903	78	Meadow, non-grazed, HSG D
5.410	73	Weighted Average
5.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1400	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
0.4	90	0.0560	3.81		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	655	0.0460	1.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.1	845	Total			

Subcatchment 101: Subcat 101



Summary for Subcatchment 102: Subcat 102

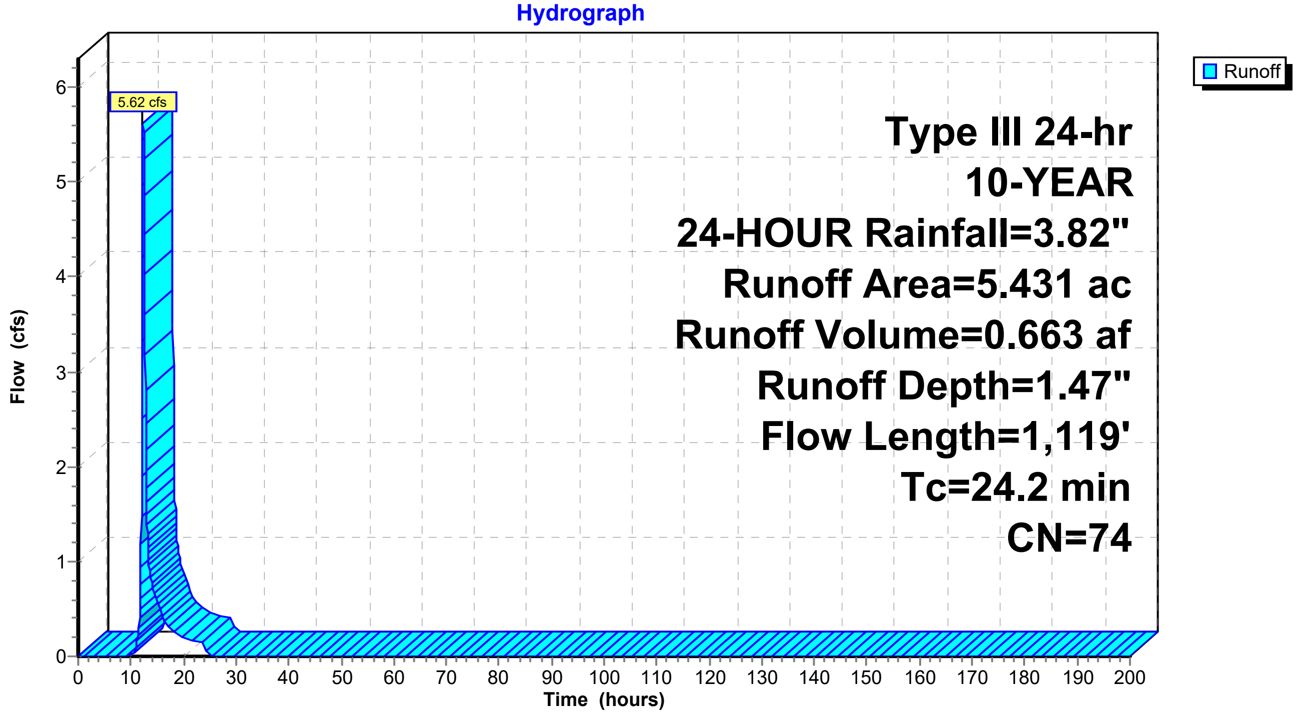
Runoff = 5.62 cfs @ 12.36 hrs, Volume= 0.663 af, Depth= 1.47"
Routed to Link 215L : Subcatch 101 + 102

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
2.103	71	Meadow, non-grazed, HSG C
1.832	78	Meadow, non-grazed, HSG D
0.041	86	Row crops, contoured, Good, HSG D
1.204	70	Woods, Good, HSG C
0.252	77	Woods, Good, HSG D
5.431	74	Weighted Average
5.431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
1.5	151	0.0330	1.63		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.5	133	0.0080	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	735	0.0340	1.29		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.2	1,119	Total			

Subcatchment 102: Subcat 102



Summary for Subcatchment 200: Subcat 200

[47] Hint: Peak is 777% of capacity of segment #5

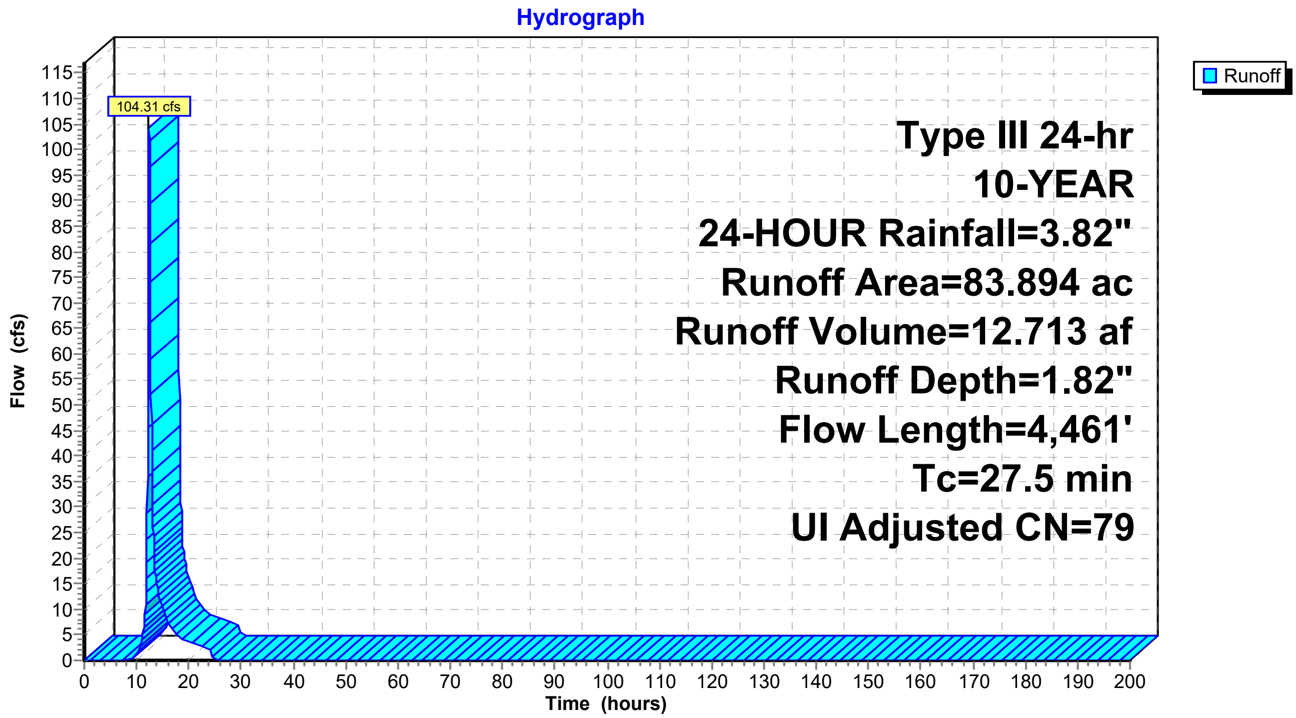
Runoff = 104.31 cfs @ 12.39 hrs, Volume= 12.713 af, Depth= 1.82"
Routed to Reach 211R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Adj	Description
0.215	96		Gravel surface, HSG C
0.337	96		Gravel surface, HSG D
2.936	71		Meadow, non-grazed, HSG C
44.017	78		Meadow, non-grazed, HSG D
0.616	65		Row crops, contoured, Good, HSG A
7.368	82		Row crops, contoured, Good, HSG C
13.931	86		Row crops, contoured, Good, HSG D
0.300	98		Unconnected roofs, HSG C
0.813	98		Unconnected roofs, HSG D
0.216	70		Woods, Good, HSG C
13.146	77		Woods, Good, HSG D
83.894	80	79	Weighted Average, UI Adjusted
82.781			98.67% Pervious Area
1.113			1.33% Impervious Area
1.113			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.2600	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
0.3	55	0.3090	2.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	690	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	330	0.2390	2.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.2	3,286	0.0300	4.47	13.42	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035 Earth, dense weeds
27.5	4,461	Total			

Subcatchment 200: Subcat 200



Summary for Subcatchment 201: Subcat 201

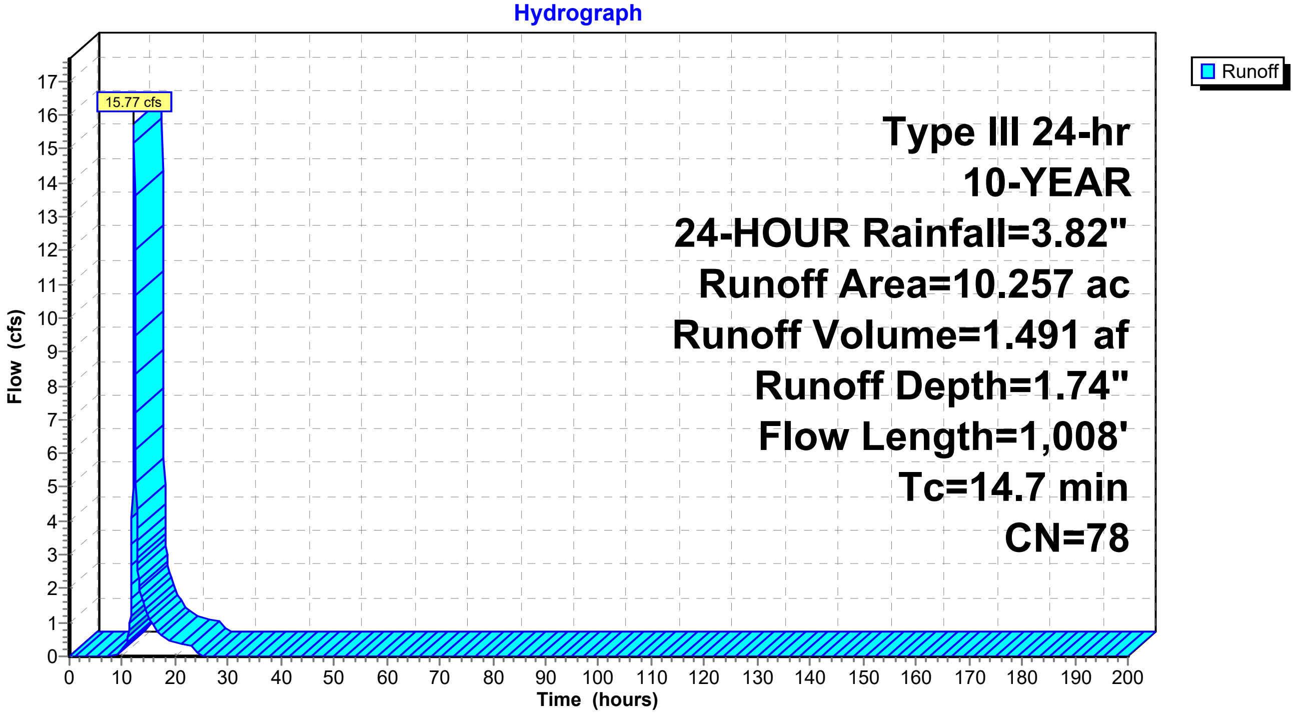
Runoff = 15.77 cfs @ 12.21 hrs, Volume= 1.491 af, Depth= 1.74"
Routed to Reach 213R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.128	96	Gravel surface, HSG C
0.146	96	Gravel surface, HSG D
1.009	71	Meadow, non-grazed, HSG C
5.521	78	Meadow, non-grazed, HSG D
0.249	86	Row crops, contoured, Good, HSG D
3.204	77	Woods, Good, HSG D
10.257	78	Weighted Average
10.257		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.2800	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
1.4	150	0.1270	1.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	758	0.1370	2.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.7	1,008	Total			

Subcatchment 201: Subcat 201



Summary for Subcatchment 202: Subcat 202

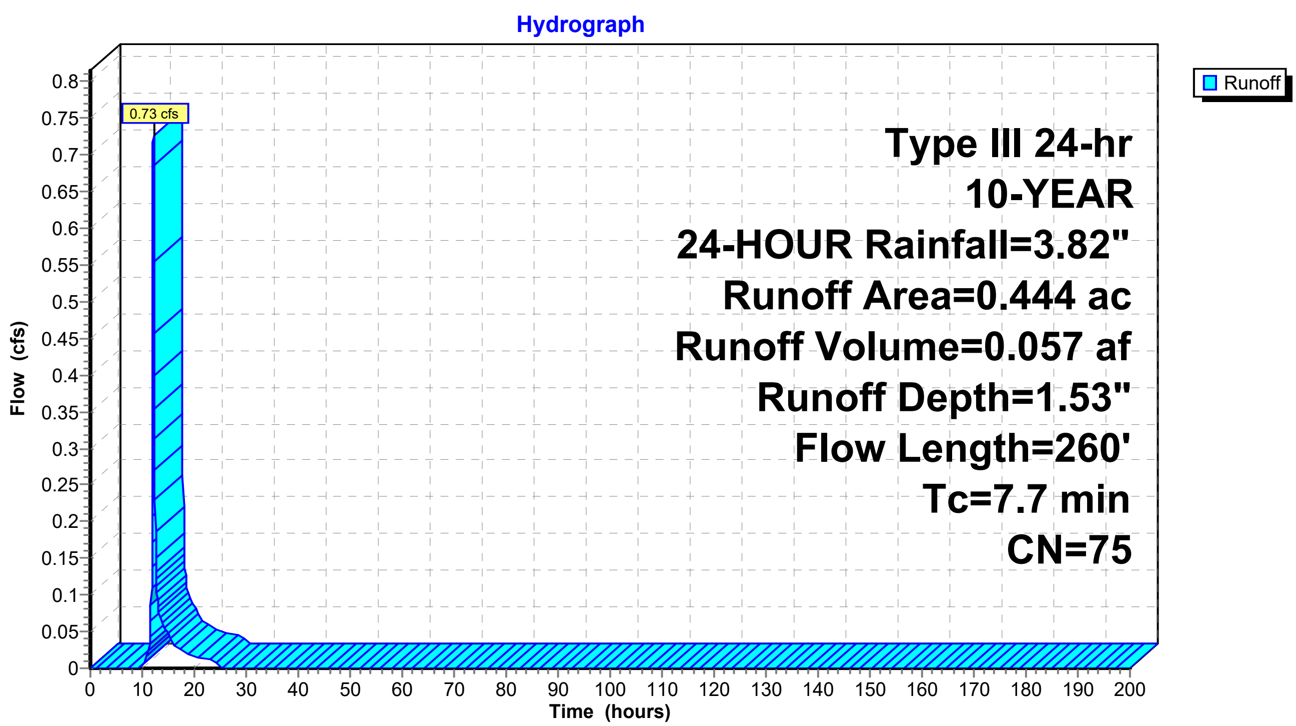
Runoff = 0.73 cfs @ 12.12 hrs, Volume= 0.057 af, Depth= 1.53"
Routed to Pond SMA-10 : SMA-10 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG C
0.168	71	Meadow, non-grazed, HSG C
0.276	78	Meadow, non-grazed, HSG D
0.444	75	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	100	0.2000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
1.3	160	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	260	Total			

Subcatchment 202: Subcat 202



Summary for Subcatchment 203: Subcat 203

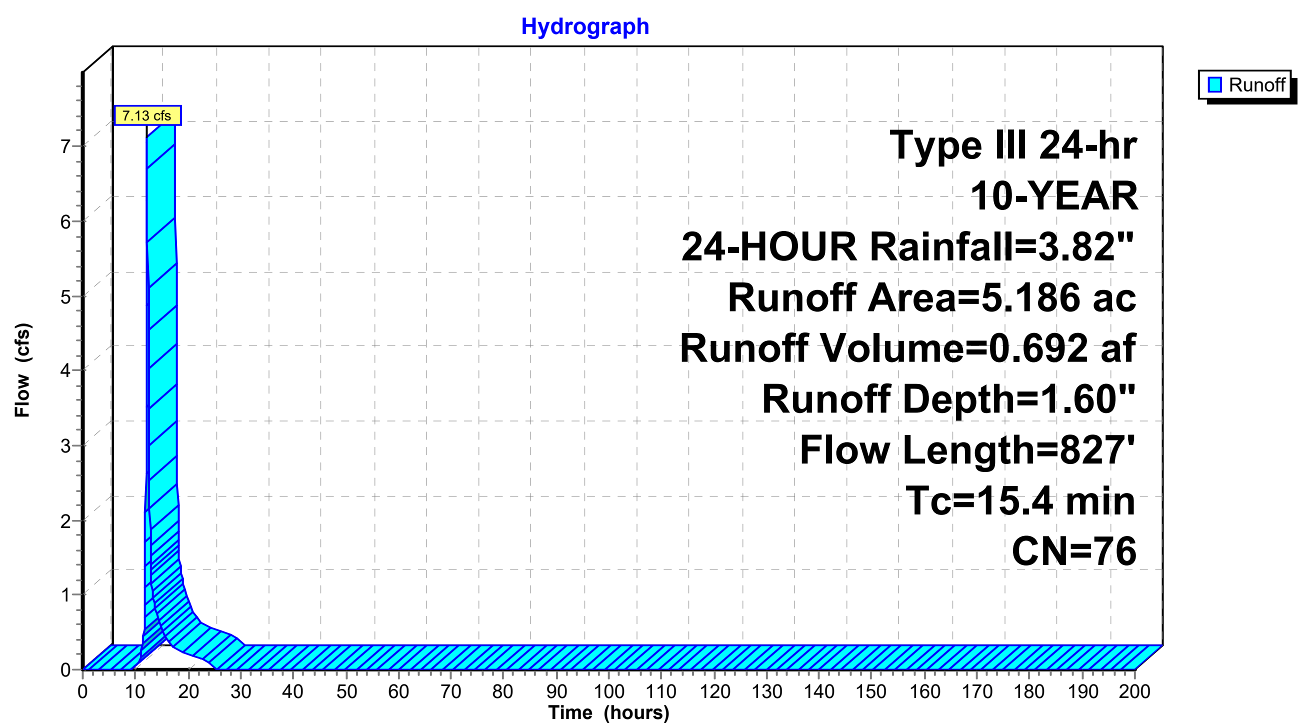
Runoff = 7.13 cfs @ 12.22 hrs, Volume= 0.692 af, Depth= 1.60"
Routed to Pond SMA-11 : SMA-11 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
1.673	71	Meadow, non-grazed, HSG C
3.513	78	Meadow, non-grazed, HSG D
5.186	76	Weighted Average
5.186		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
6.2	727	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.4	827	Total			

Subcatchment 203: Subcat 203



Summary for Subcatchment 204: Subcat 204

[49] Hint: Tc<2dt may require smaller dt

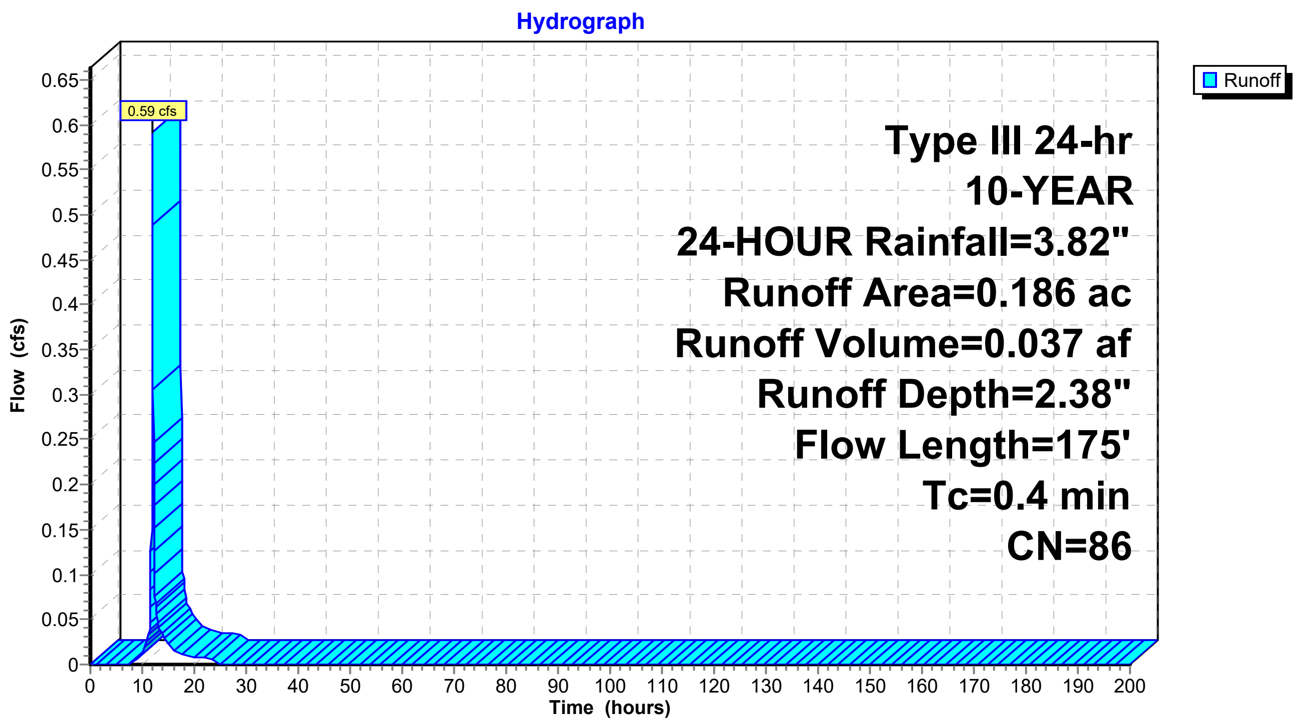
Runoff = 0.59 cfs @ 12.01 hrs, Volume= 0.037 af, Depth= 2.38"
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.085	96	Gravel surface, HSG D
0.102	78	Meadow, non-grazed, HSG D
0.186	86	Weighted Average
0.186		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	48	0.1250	5.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	127	0.0630	6.48	19.44	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.4	175	Total			

Subcatchment 204: Subcat 204



Summary for Subcatchment 205: Subcat 205

[49] Hint: Tc<2dt may require smaller dt

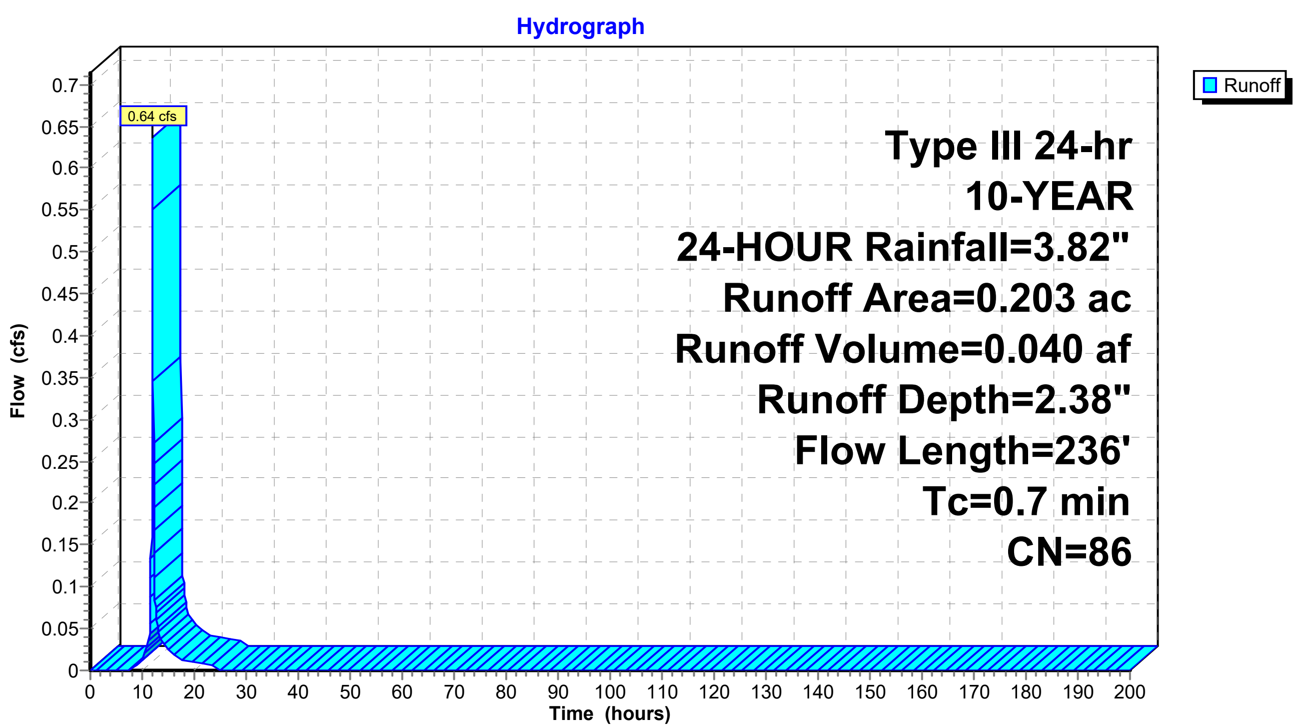
Runoff = 0.64 cfs @ 12.01 hrs, Volume= 0.040 af, Depth= 2.38"
Routed to Pond SMA-15 : SMA-15 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.086	96	Gravel surface, HSG D
0.117	78	Meadow, non-grazed, HSG D
0.203	86	Weighted Average
0.203		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	58	0.0520	3.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	178	0.0670	6.68	20.05	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.7	236	Total			

Subcatchment 205: Subcat 205



Summary for Subcatchment 206: Subcat 206

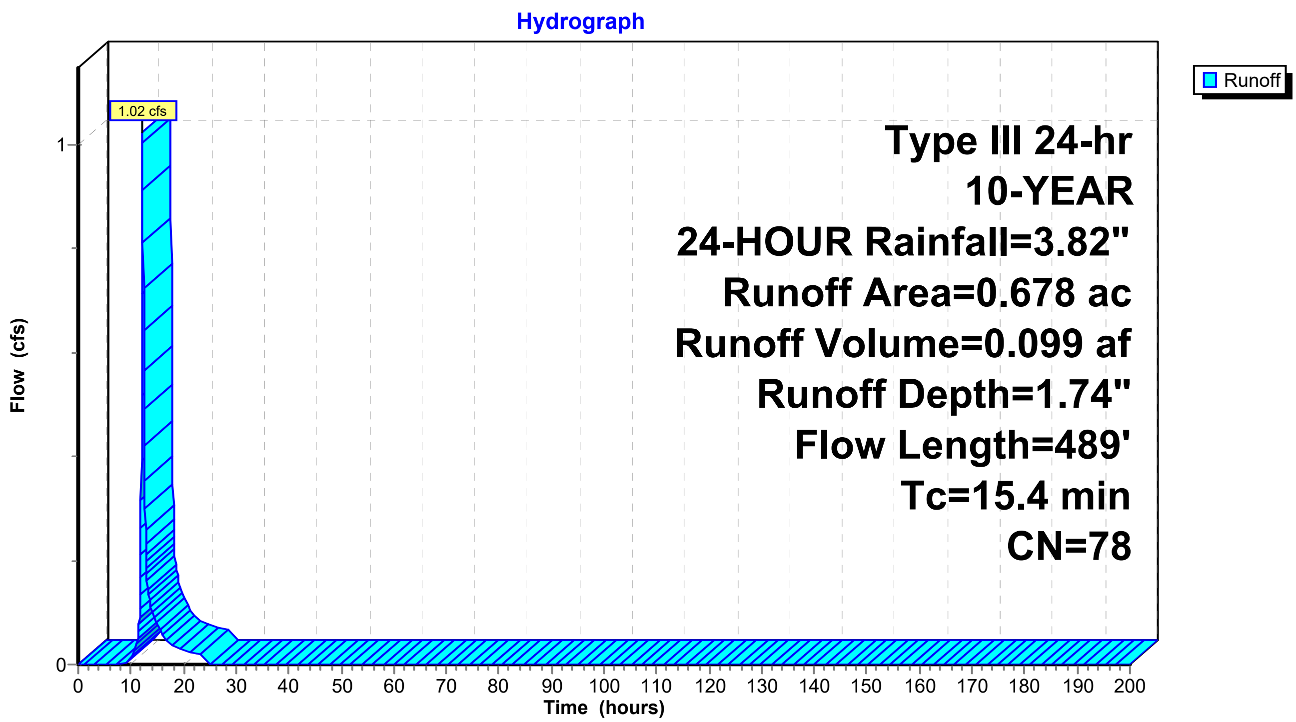
Runoff = 1.02 cfs @ 12.22 hrs, Volume= 0.099 af, Depth= 1.74"
Routed to Pond SMA-14 : SMA-14 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.001	96	Gravel surface, HSG D
0.677	78	Meadow, non-grazed, HSG D
0.678	78	Weighted Average
0.678		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
3.0	303	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	86	0.0580	6.22	18.66	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
15.4	489	Total			

Subcatchment 206: Subcat 206



Summary for Subcatchment 207: Subcat 207

[49] Hint: Tc<2dt may require smaller dt

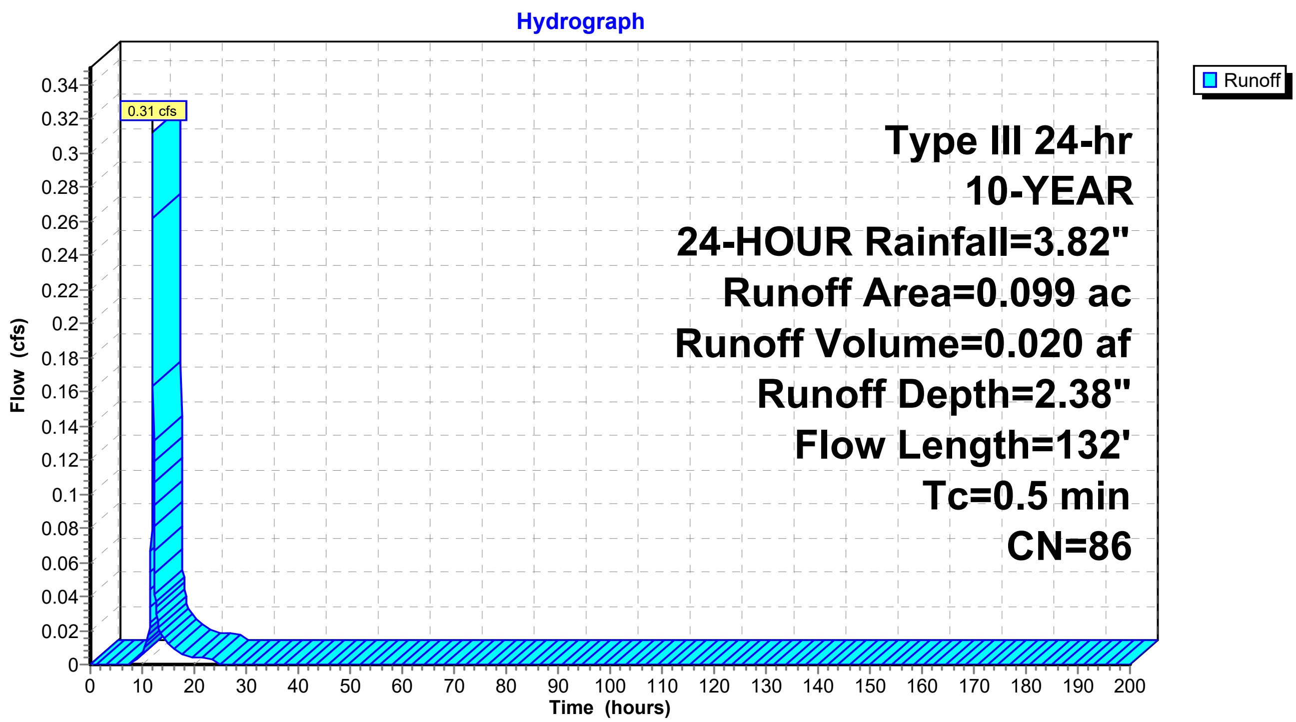
Runoff = 0.31 cfs @ 12.01 hrs, Volume= 0.020 af, Depth= 2.38"
Routed to Pond SMA-17 : SMA-17 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.046	96	Gravel surface, HSG D
0.053	78	Meadow, non-grazed, HSG D
0.099	86	Weighted Average
0.099		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.0330	2.92		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	102	0.0590	6.27	18.82	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.5	132	Total			

Subcatchment 207: Subcat 207



Summary for Subcatchment 208: Subcat 208

[49] Hint: Tc<2dt may require smaller dt

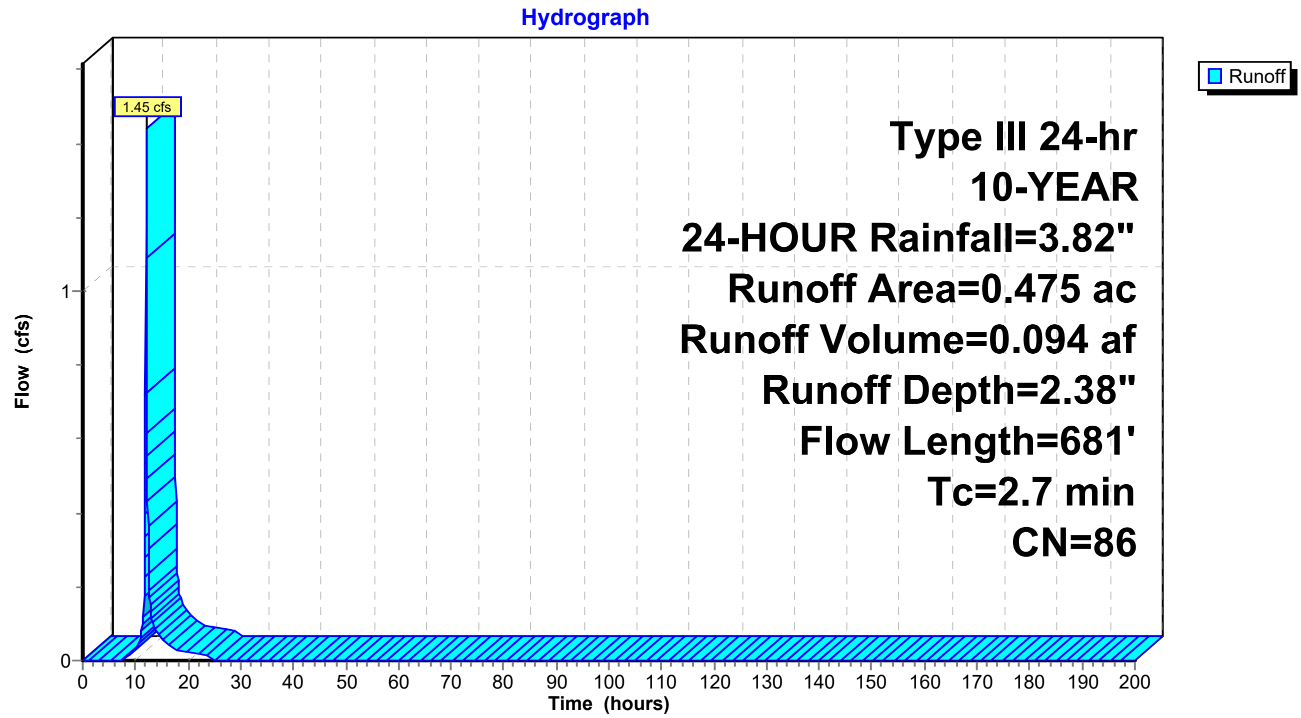
Runoff = 1.45 cfs @ 12.05 hrs, Volume= 0.094 af, Depth= 2.38"
Routed to Pond SMA-18 : SMA-18 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.103	96	Gravel surface, HSG C
0.132	96	Gravel surface, HSG D
0.066	71	Meadow, non-grazed, HSG C
0.173	78	Meadow, non-grazed, HSG D
0.475	86	Weighted Average
0.475		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	29	0.0340	2.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	652	0.0280	4.32	12.96	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
2.7	681	Total			

Subcatchment 208: Subcat 208



Summary for Subcatchment 209: Subcat 209

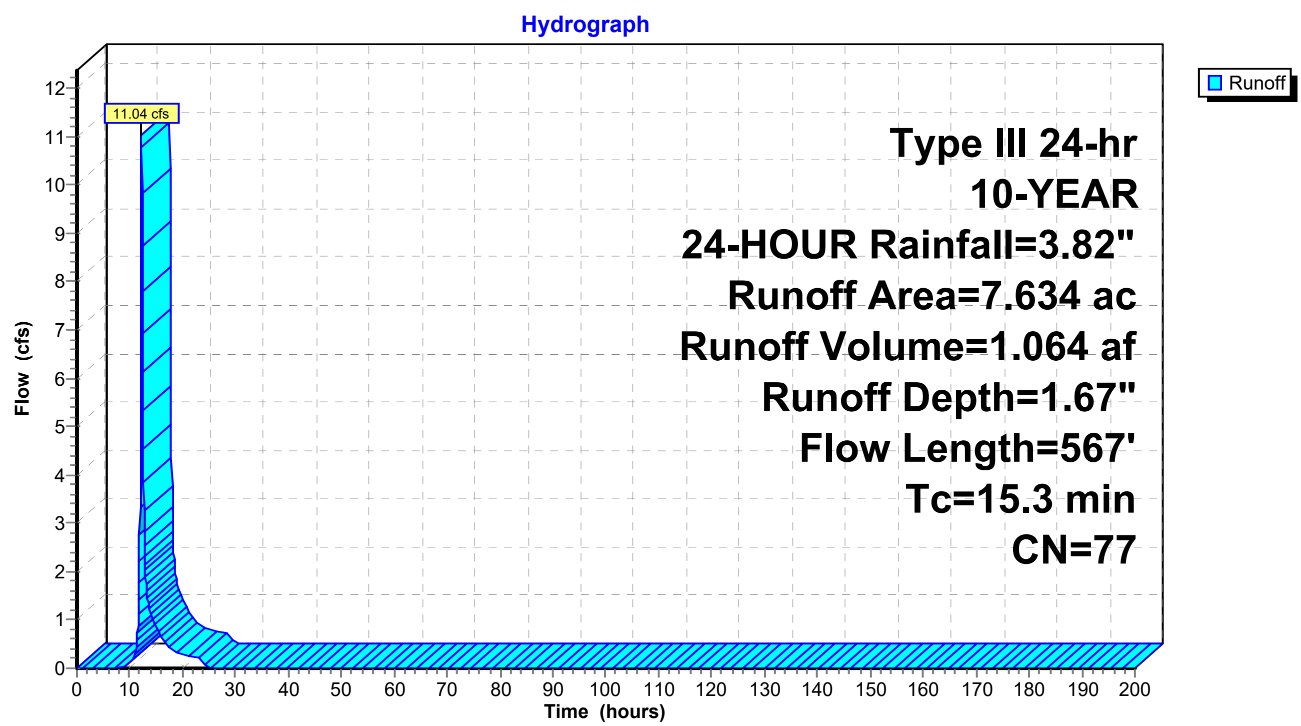
Runoff = 11.04 cfs @ 12.22 hrs, Volume= 1.064 af, Depth= 1.67"
Routed to Pond SMA-16 : SMA-16 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.001	96	Gravel surface, HSG D
1.096	71	Meadow, non-grazed, HSG C
6.537	78	Meadow, non-grazed, HSG D
7.634	77	Weighted Average
7.634		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
5.0	467	0.0490	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.3	567	Total			

Subcatchment 209: Subcat 209



Summary for Subcatchment 300: Subcat 300

[47] Hint: Peak is 676% of capacity of segment #4

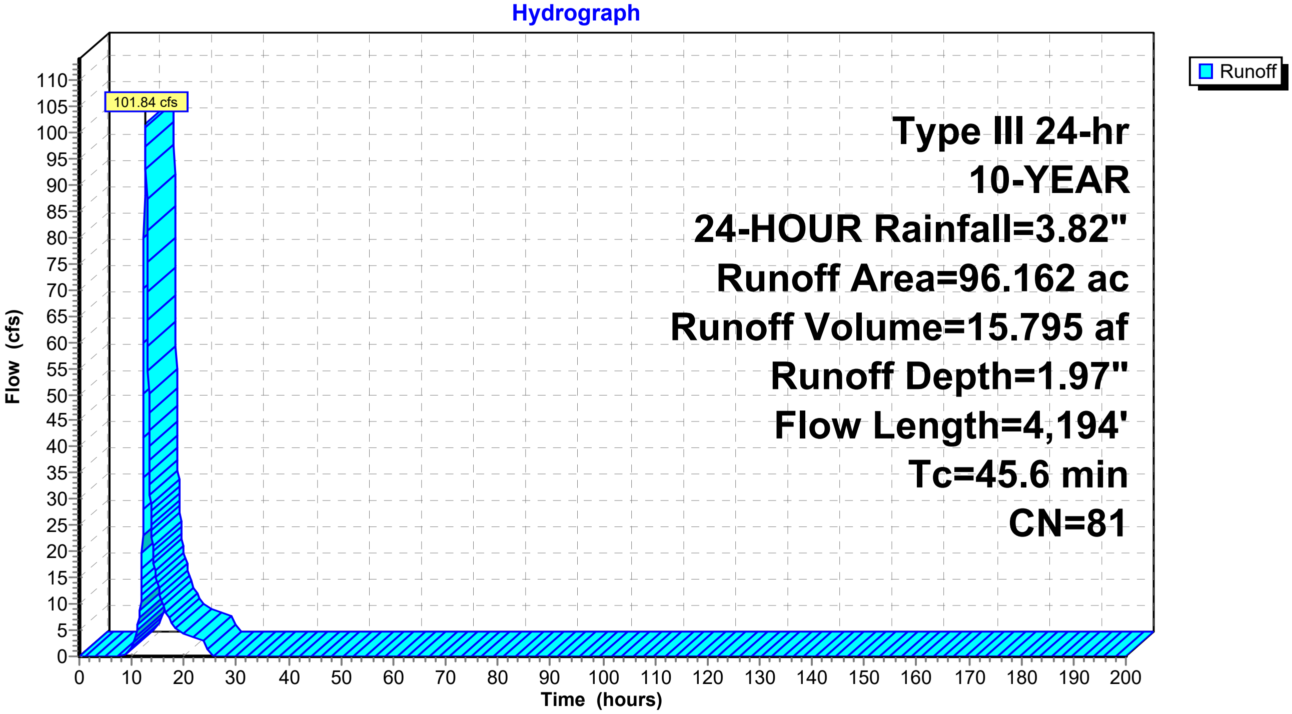
Runoff = 101.84 cfs @ 12.63 hrs, Volume= 15.795 af, Depth= 1.97"
Routed to Link DP-3 : Outfall to Southwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.494	96	Gravel surface, HSG C
0.247	96	Gravel surface, HSG D
7.922	71	Meadow, non-grazed, HSG C
16.281	78	Meadow, non-grazed, HSG D
6.324	82	Row crops, contoured, Good, HSG C
39.263	86	Row crops, contoured, Good, HSG D
2.120	70	Woods, Good, HSG C
23.512	77	Woods, Good, HSG D
96.162	81	Weighted Average
96.162		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1500	0.31		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.53"
4.7	887	0.1230	3.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.0	1,270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.6	955	0.0160	0.90	15.06	**Parabolic Channel,** W=50.00' D=0.50' Area=16.7 sf Perim=50.0' n= 0.100 Very weedy reaches w/pools
2.9	982	0.0120	5.66	203.60	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=3.00' Z= 3.0 '/' Top.W=21.00' n= 0.040 Winding stream, pools & shoals
45.6	4,194	Total			

Subcatchment 300: Subcat 300



Summary for Subcatchment 301: Subcat 301

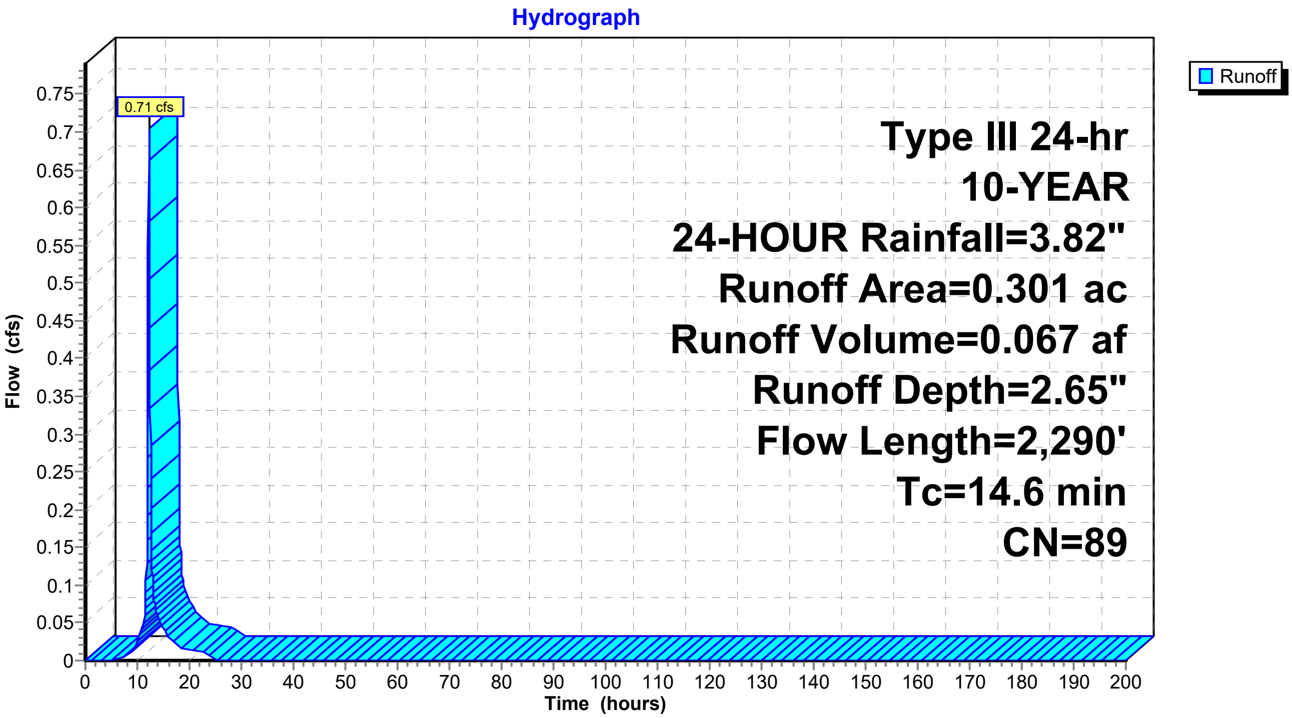
Runoff = 0.71 cfs @ 12.20 hrs, Volume= 0.067 af, Depth= 2.65"
Routed to Pond 5P : Subcatch 301 to 304 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
0.192	96	Gravel surface, HSG D
0.005	71	Meadow, non-grazed, HSG C
0.102	78	Meadow, non-grazed, HSG D
0.301	89	Weighted Average
0.301		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1400	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
2.5	435	0.1750	2.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.7	1,755	0.0580	6.22	18.66	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
14.6	2,290	Total			

Subcatchment 301: Subcat 301



Summary for Subcatchment 302: Subcat 302

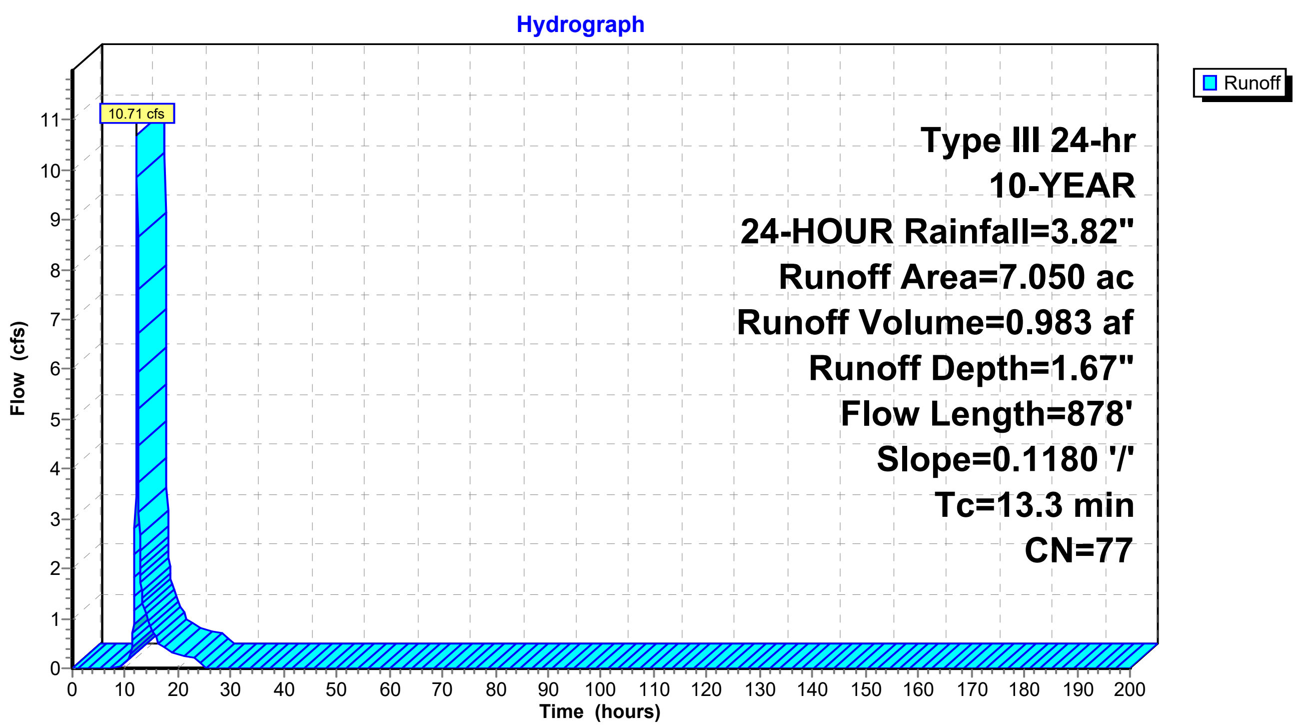
Runoff = 10.71 cfs @ 12.19 hrs, Volume= 0.983 af, Depth= 1.67"
Routed to Pond SMA-7 : SMA-7 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG D
1.290	71	Meadow, non-grazed, HSG C
5.758	78	Meadow, non-grazed, HSG D
7.050	77	Weighted Average
7.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.1180	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
5.4	778	0.1180	2.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.3	878	Total			

Subcatchment 302: Subcat 302



Summary for Subcatchment 303: Subcat 303

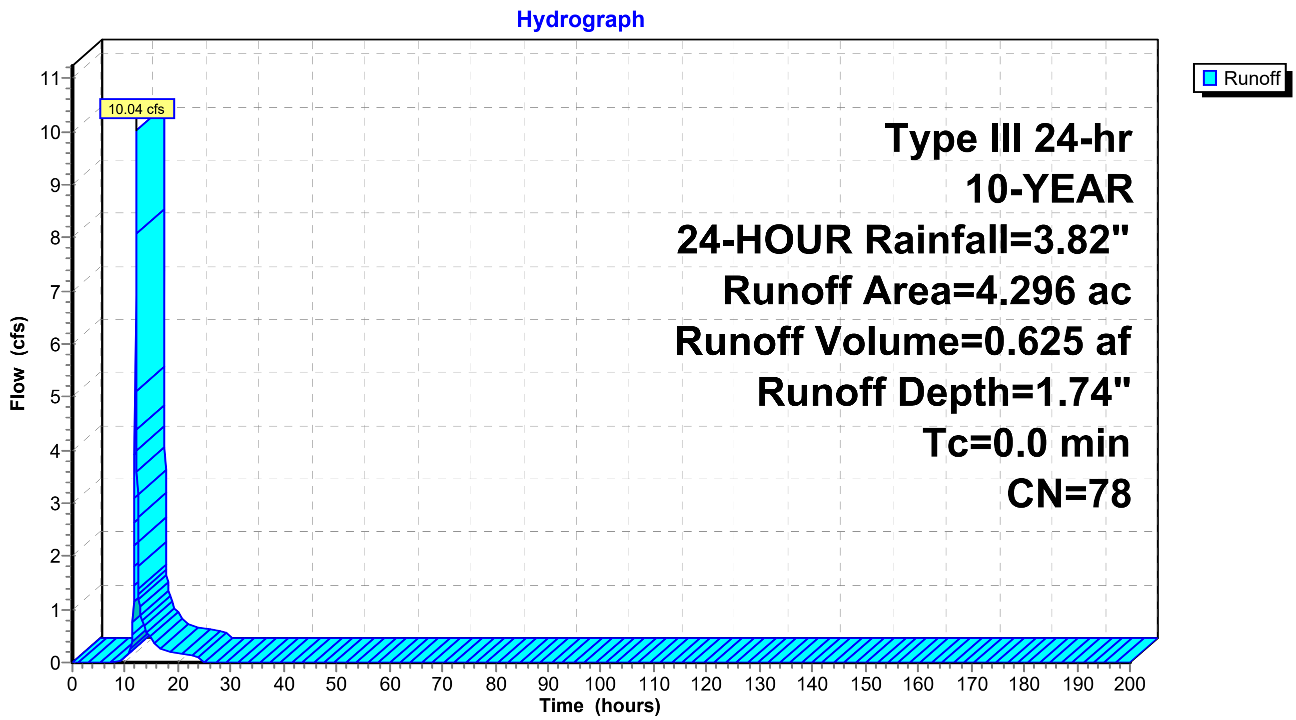
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 10.04 cfs @ 12.01 hrs, Volume= 0.625 af, Depth= 1.74"
Routed to Pond 11P : Subcatch 303 to 302 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG D
4.288	78	Meadow, non-grazed, HSG D
4.296	78	Weighted Average
4.296		100.00% Pervious Area

Subcatchment 303: Subcat 303



Summary for Subcatchment 304: Subcat 304

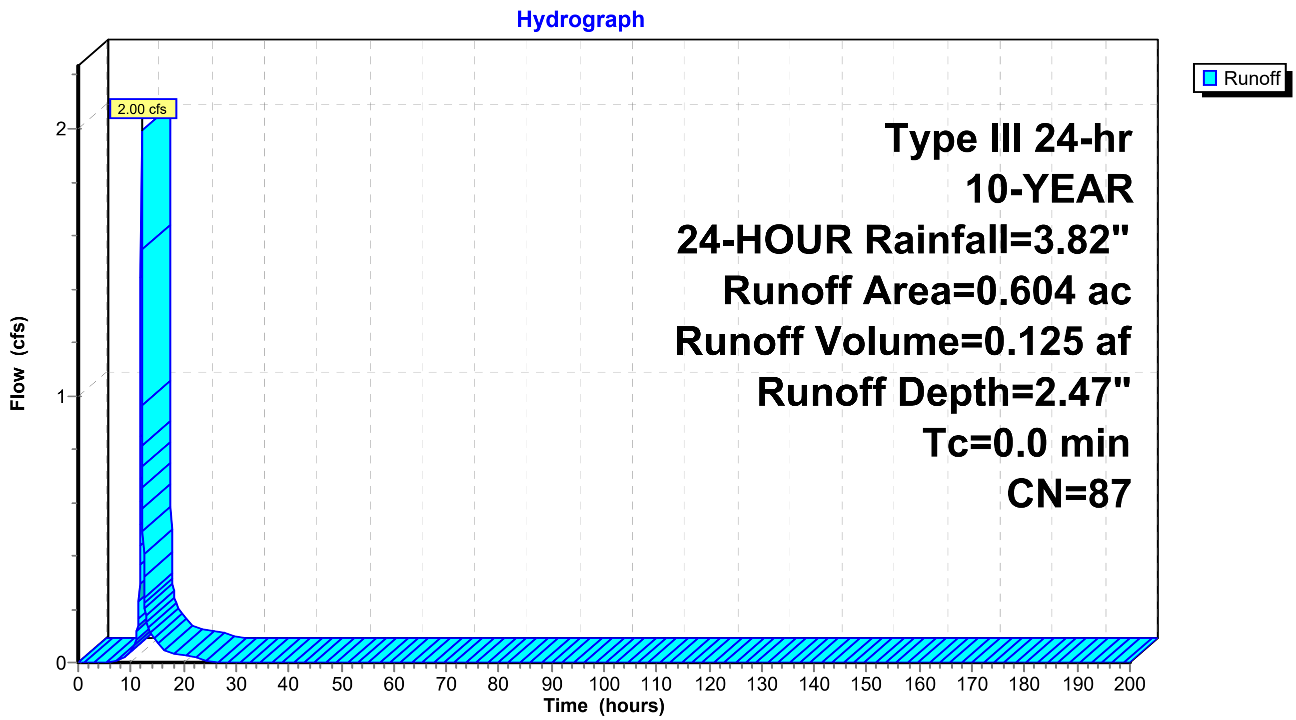
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 2.00 cfs @ 12.00 hrs, Volume= 0.125 af, Depth= 2.47"
Routed to Pond SMA-6 : SMA-6 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.315	96	Gravel surface, HSG D
0.289	78	Meadow, non-grazed, HSG D
0.604	87	Weighted Average
0.604		100.00% Pervious Area

Subcatchment 304: Subcat 304



Summary for Subcatchment 305: Subcat 305

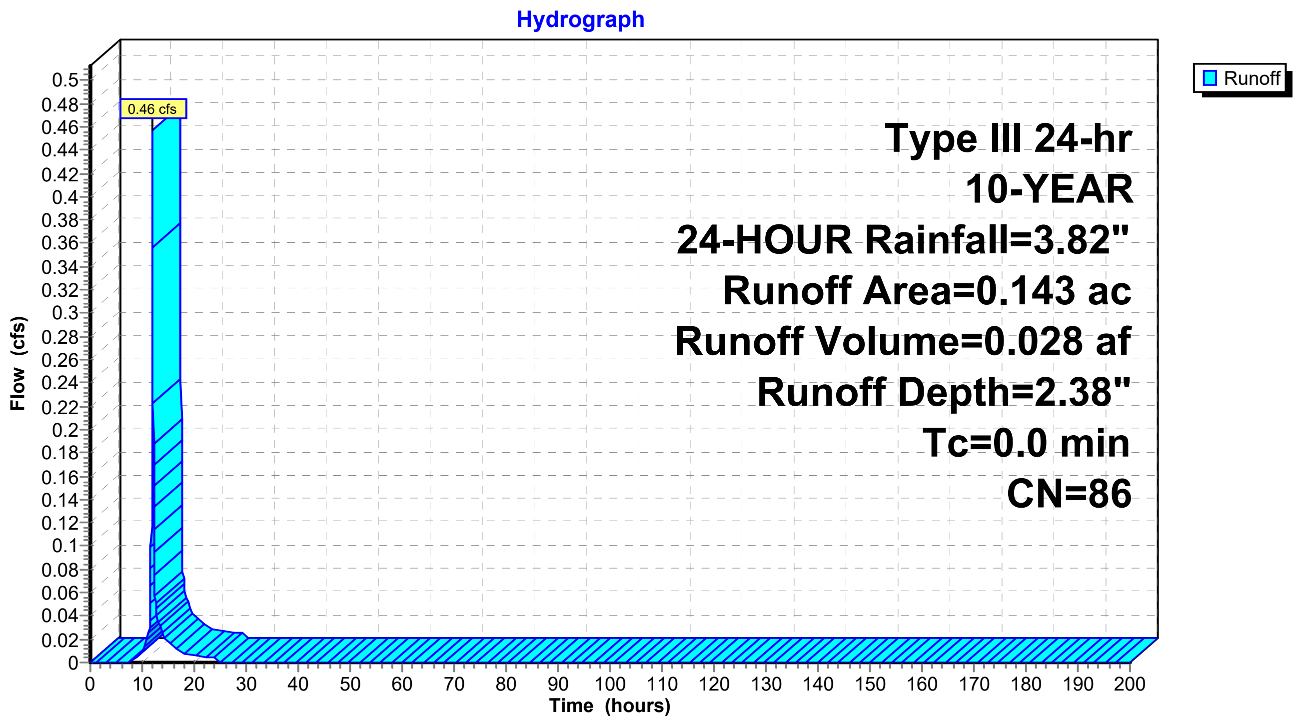
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.46 cfs @ 12.00 hrs, Volume= 0.028 af, Depth= 2.38"
Routed to Pond SMA-5 : SMA-5 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.066	96	Gravel surface, HSG D
0.077	78	Meadow, non-grazed, HSG D
0.143	86	Weighted Average
0.143		100.00% Pervious Area

Subcatchment 305: Subcat 305



Summary for Subcatchment 306: Subcat 306

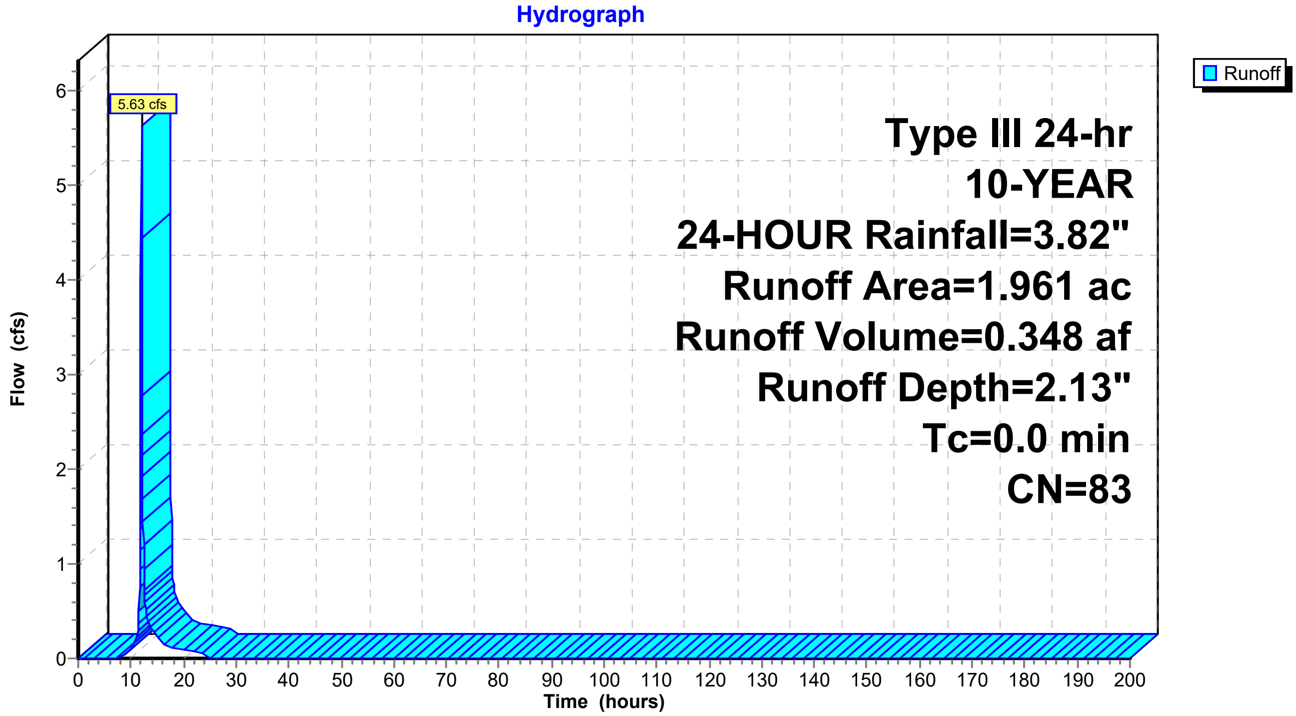
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 5.63 cfs @ 12.00 hrs, Volume= 0.348 af, Depth= 2.13"
Routed to Pond SMA-4 : SMA-4 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.580	96	Gravel surface, HSG D
1.382	78	Meadow, non-grazed, HSG D
1.961	83	Weighted Average
1.961		100.00% Pervious Area

Subcatchment 306: Subcat 306



Summary for Subcatchment 400: Subcat 400

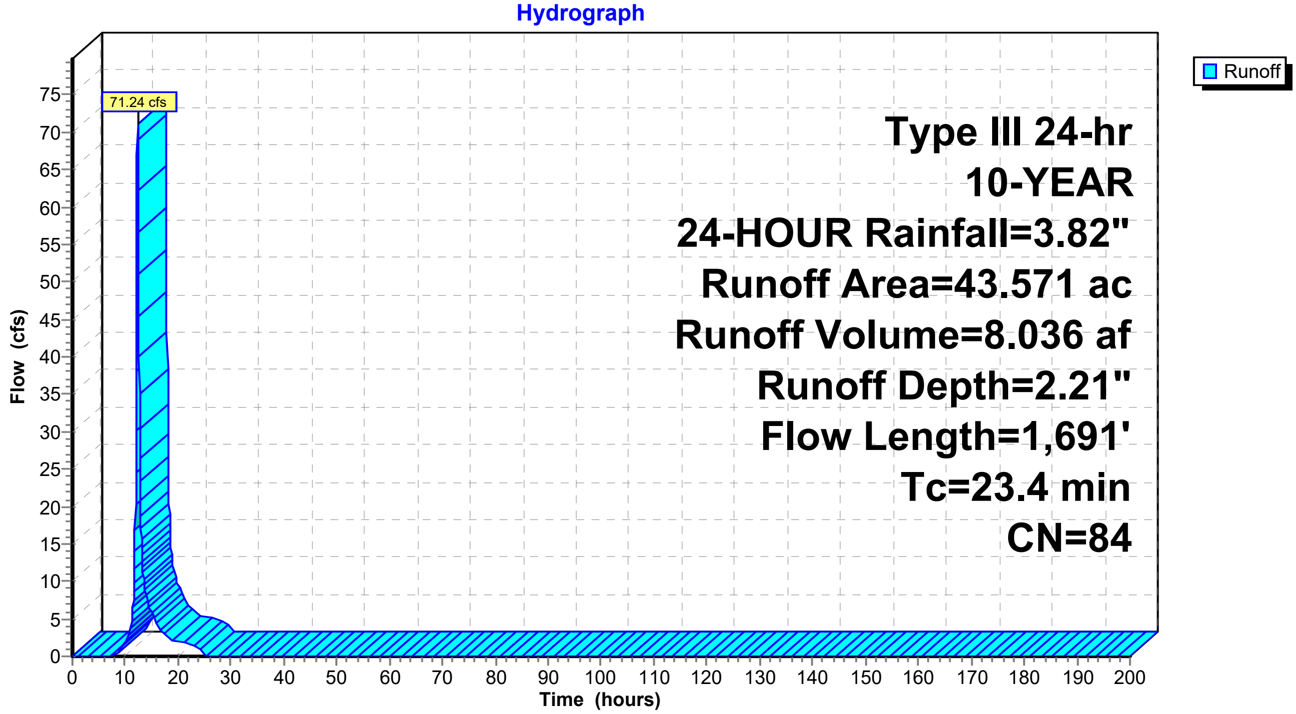
Runoff = 71.24 cfs @ 12.32 hrs, Volume= 8.036 af, Depth= 2.21"
Routed to Link DP-4 : Outfall to Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.029	96	Gravel surface, HSG C
0.022	96	Gravel surface, HSG D
0.007	71	Meadow, non-grazed, HSG C
5.593	78	Meadow, non-grazed, HSG D
10.592	82	Row crops, contoured, Good, HSG C
27.328	86	Row crops, contoured, Good, HSG D
43.571	84	Weighted Average
43.571		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
6.1	565	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	476	0.0970	2.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
5.3	550	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	1,691	Total			

Subcatchment 400: Subcat 400



Summary for Subcatchment 401: Subcat 401

[47] Hint: Peak is 160% of capacity of segment #4

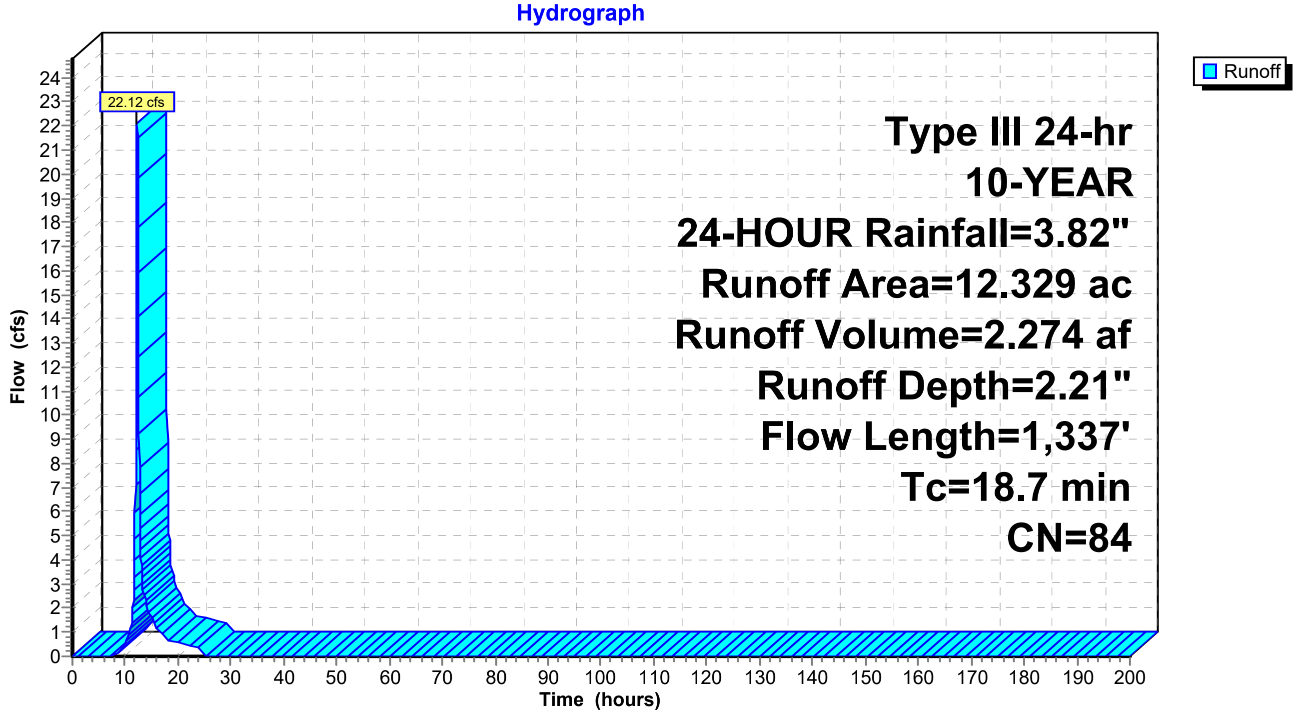
Runoff = 22.12 cfs @ 12.26 hrs, Volume= 2.274 af, Depth= 2.21"
Routed to Reach 307R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.009	96	Gravel surface, HSG C
0.153	96	Gravel surface, HSG D
0.057	71	Meadow, non-grazed, HSG C
2.681	78	Meadow, non-grazed, HSG D
0.258	82	Row crops, contoured, Good, HSG C
9.078	86	Row crops, contoured, Good, HSG D
0.092	77	Woods, Good, HSG D
12.329	84	Weighted Average
12.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
4.5	401	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	522	0.0610	2.22		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.1	314	0.0320	4.62	13.86	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
18.7	1,337	Total			

Subcatchment 401: Subcat 401



Summary for Subcatchment 402: Subcat 402

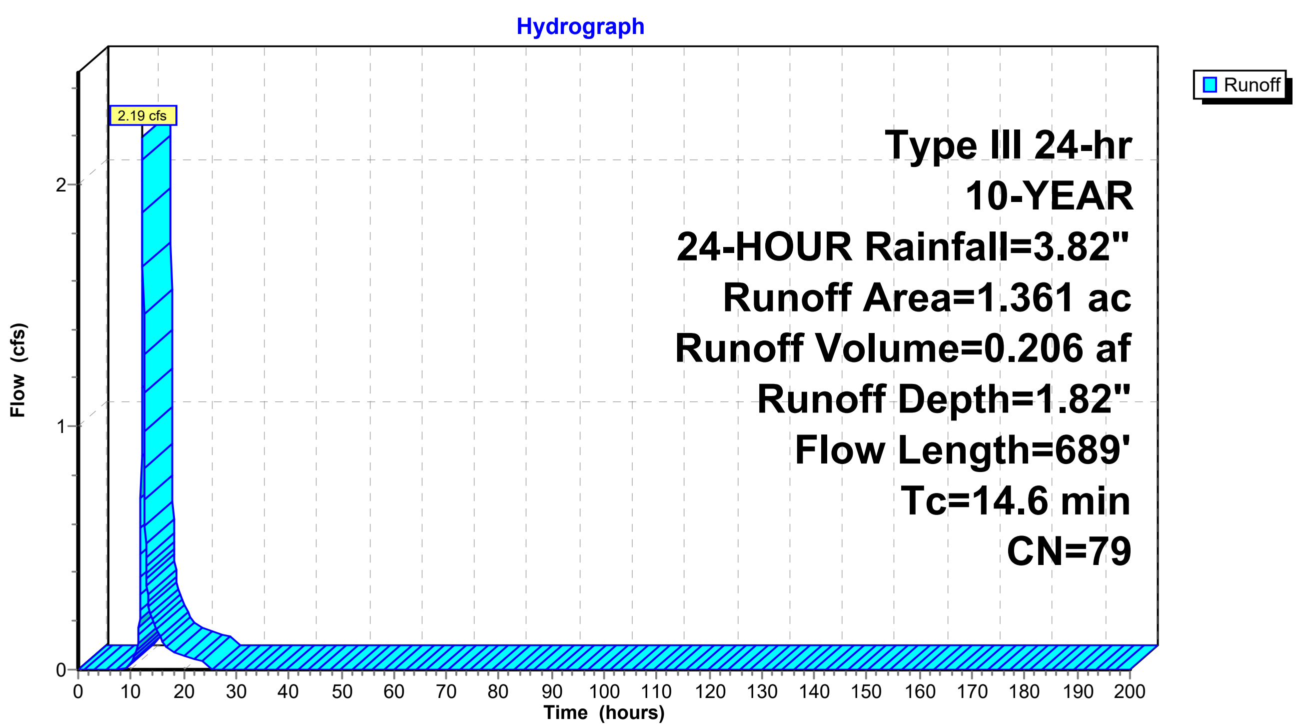
Runoff = 2.19 cfs @ 12.21 hrs, Volume= 0.206 af, Depth= 1.82"
Routed to Pond 1P : Subcatch 402 to 401 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.061	96	Gravel surface, HSG D
1.301	78	Meadow, non-grazed, HSG D
1.361	79	Weighted Average
1.361		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
4.9	589	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.6	689	Total			

Subcatchment 402: Subcat 402



Summary for Subcatchment 403: Subcat 403

[49] Hint: Tc<2dt may require smaller dt

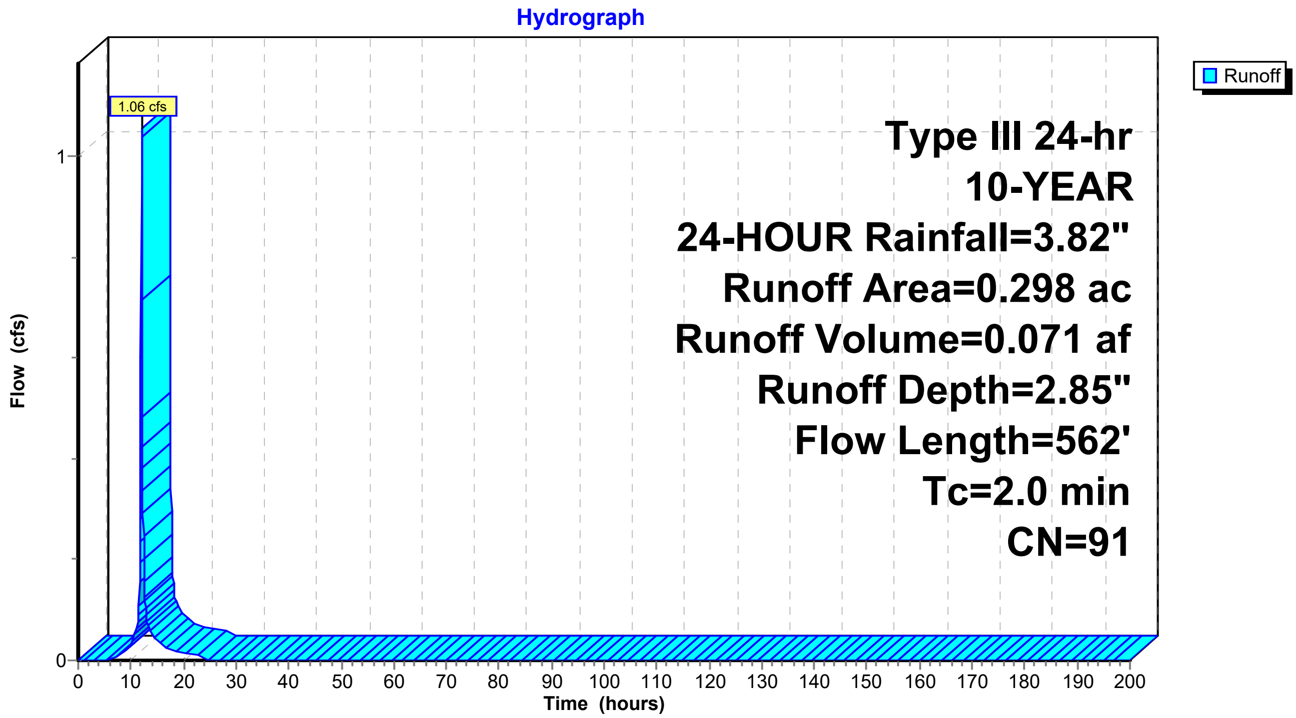
Runoff = 1.06 cfs @ 12.03 hrs, Volume= 0.071 af, Depth= 2.85"
Routed to Pond SMA-9 : SMA-9 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR, 24-HOUR Rainfall=3.82"

Area (ac)	CN	Description
0.036	96	Gravel surface, HSG C
0.156	96	Gravel surface, HSG D
0.012	71	Meadow, non-grazed, HSG C
0.038	78	Meadow, non-grazed, HSG D
0.011	82	Row crops, contoured, Good, HSG C
0.045	86	Row crops, contoured, Good, HSG D
0.298	91	Weighted Average
0.298		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	522	0.0360	4.90	14.70	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
2.0	562	Total			

Subcatchment 403: Subcat 403



Summary for Reach 8R: Wetland Stream

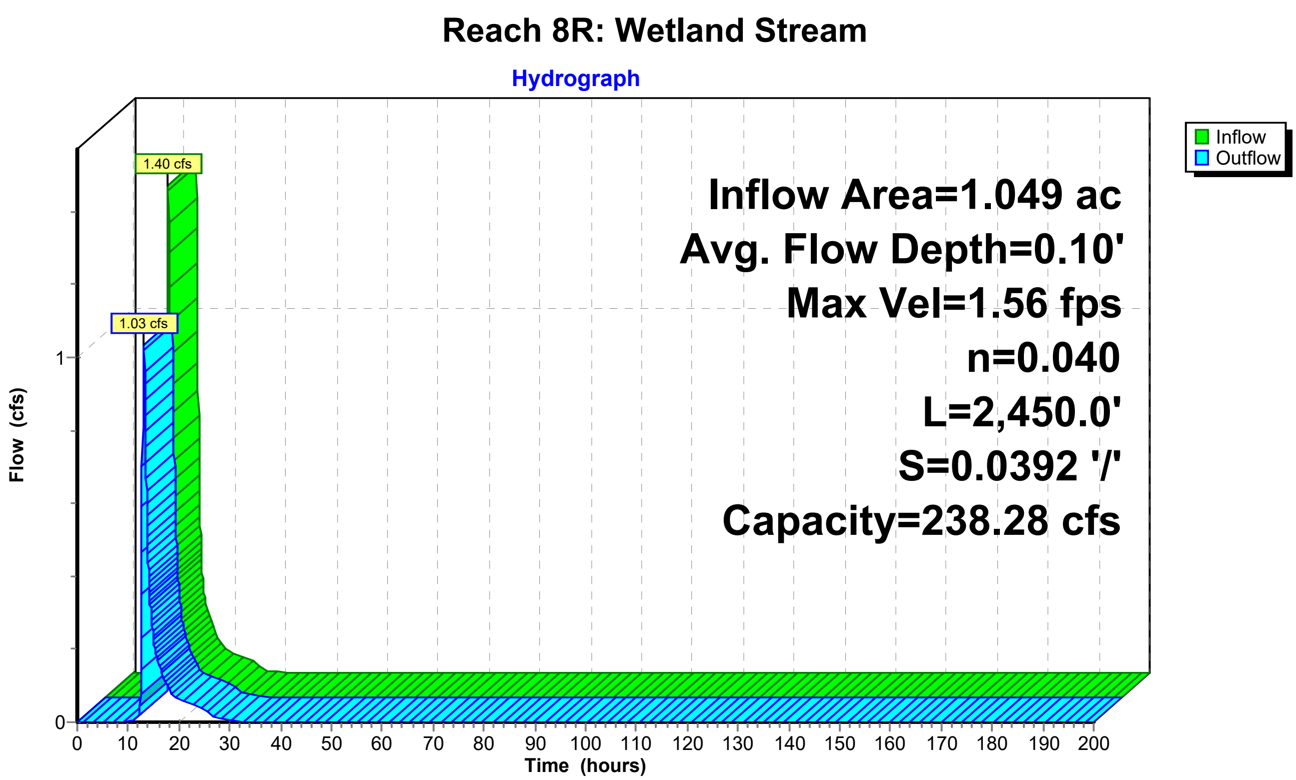
Inflow Area = 1.049 ac, 0.00% Impervious, Inflow Depth = 2.17" for 10-YEAR, 24-HOUR event
Inflow = 1.40 cfs @ 12.30 hrs, Volume= 0.190 af
Outflow = 1.03 cfs @ 13.04 hrs, Volume= 0.190 af, Atten= 26%, Lag= 44.0 min
Routed to Link DP-3 : Outfall to Southwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.56 fps, Min. Travel Time= 26.2 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 67.7 min

Peak Storage= 1,630 cf @ 12.60 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 6.83'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 238.28 cfs

6.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 2,450.0' Slope= 0.0392 '/'
Inlet Invert= 932.00', Outlet Invert= 836.00'

‡



Summary for Reach 9R: Flow to Northeast outlet

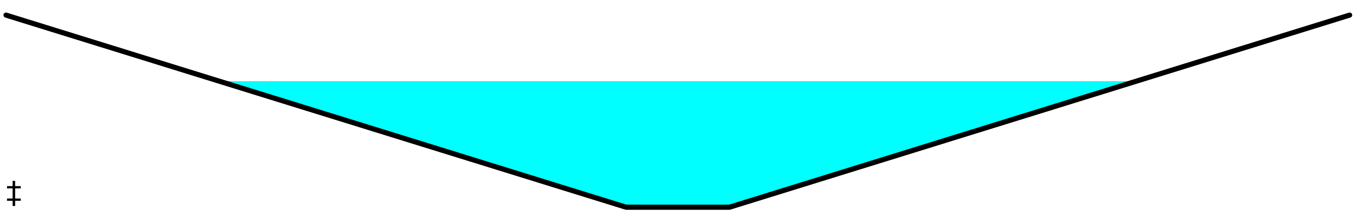
[81] Warning: Exceeded Pond SMA-7 by 2.05' @ 24.90 hrs

Inflow Area = 11.347 ac, 0.00% Impervious, Inflow Depth = 1.70" for 10-YEAR, 24-HOUR event
Inflow = 16.91 cfs @ 12.10 hrs, Volume= 1.607 af
Outflow = 13.08 cfs @ 12.45 hrs, Volume= 1.607 af, Atten= 23%, Lag= 20.7 min
Routed to Link DP-2 : Outfall to Northwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 10.3 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 33.1 min

Peak Storage= 8,112 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 8.88'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.76 cfs

1.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 2,500.0' Slope= 0.0464 '/'
Inlet Invert= 945.00', Outlet Invert= 829.00'



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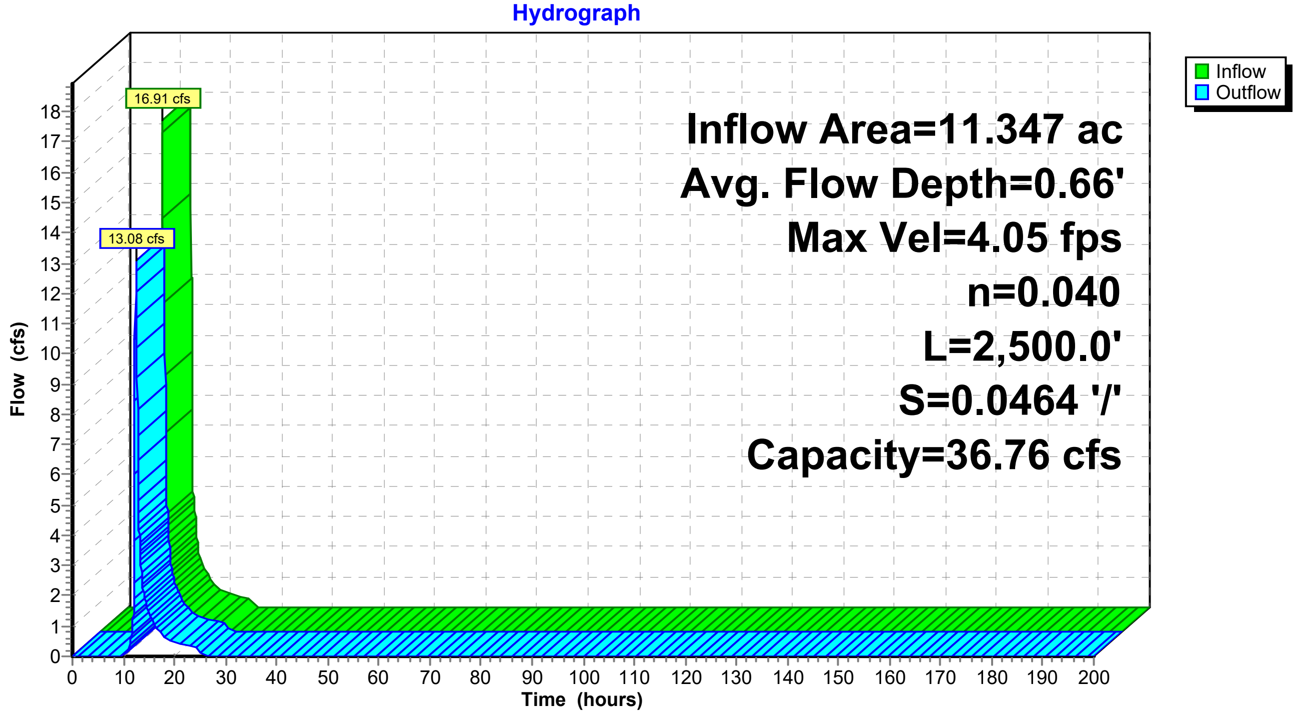
Reach 9R: Flow to Northeast outlet



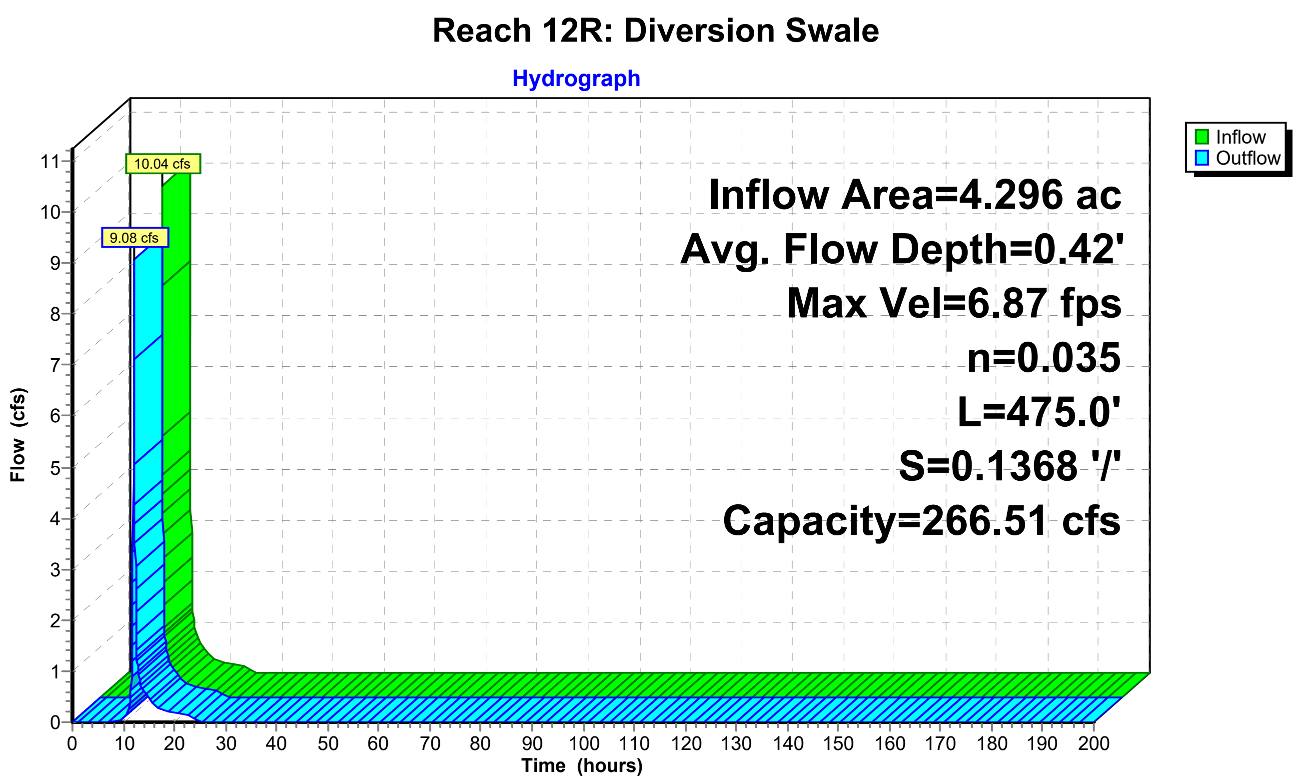
Summary for Reach 12R: Diversion Swale

Inflow Area = 4.296 ac, 0.00% Impervious, Inflow Depth = 1.74" for 10-YEAR, 24-HOUR event
Inflow = 10.04 cfs @ 12.01 hrs, Volume= 0.625 af
Outflow = 9.08 cfs @ 12.04 hrs, Volume= 0.625 af, Atten= 10%, Lag= 2.3 min
Routed to Pond SMA-7 : SMA-7 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.87 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 3.5 min

Peak Storage= 652 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 4.53'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 266.51 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 475.0' Slope= 0.1368 '/'
Inlet Invert= 1,012.00', Outlet Invert= 947.00'



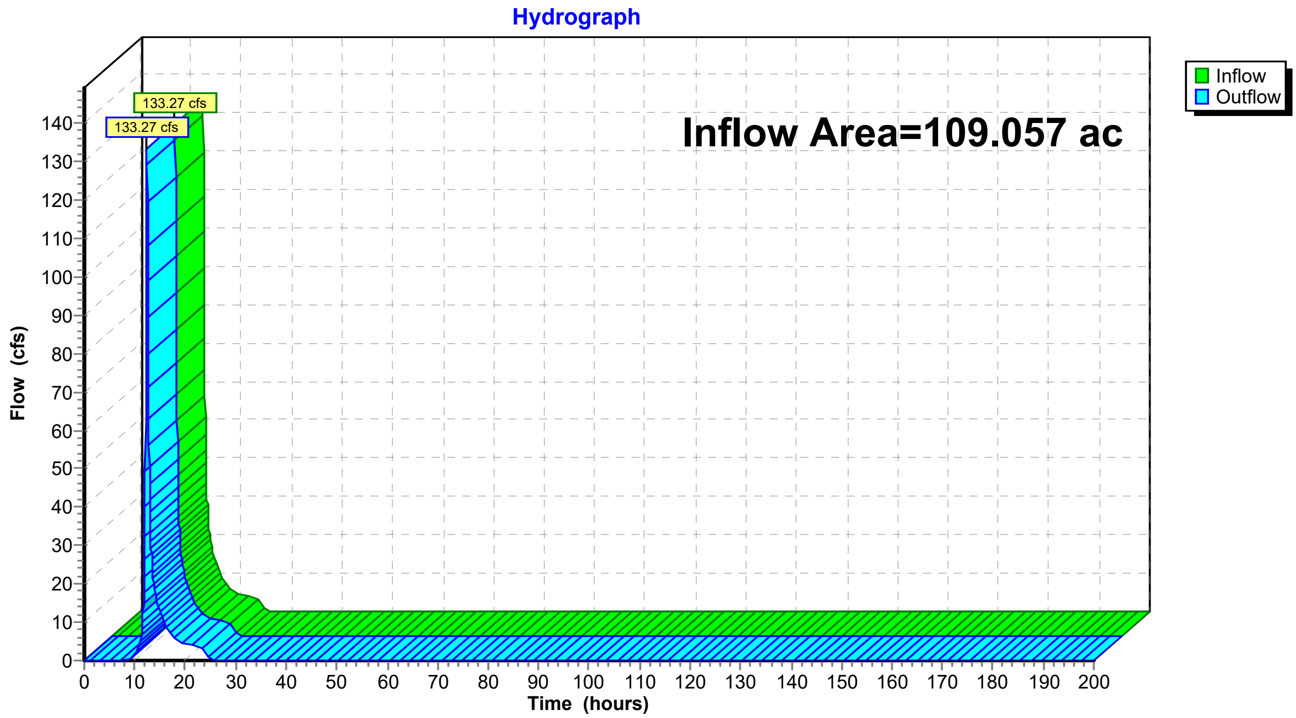
Summary for Reach 211R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 109.057 ac, 1.02% Impervious, Inflow Depth = 1.78" for 10-YEAR, 24-HOUR event
Inflow = 133.27 cfs @ 12.38 hrs, Volume= 16.154 af
Outflow = 133.27 cfs @ 12.38 hrs, Volume= 16.154 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-2 : Outfall to Northwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 211R: (new Reach)



Summary for Reach 213R: (new Reach)

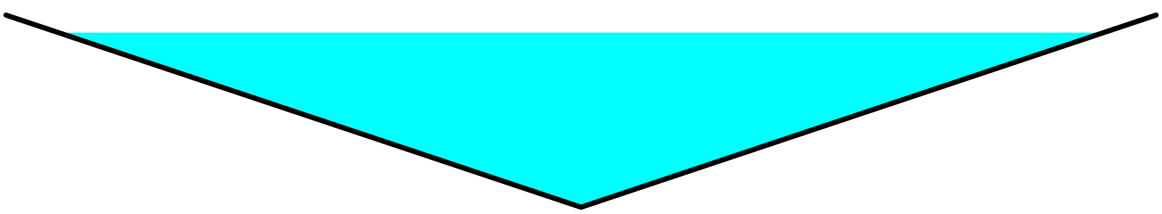
[79] Warning: Submerged Pond SMA-10 Primary device # 1 OUTLET by 0.20'

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth = 1.74" for 10-YEAR, 24-HOUR event
Inflow = 16.33 cfs @ 12.21 hrs, Volume= 1.548 af
Outflow = 16.00 cfs @ 12.25 hrs, Volume= 1.548 af, Atten= 2%, Lag= 2.5 min
Routed to Pond SMA-13 : SMA-13 Pocket Pond

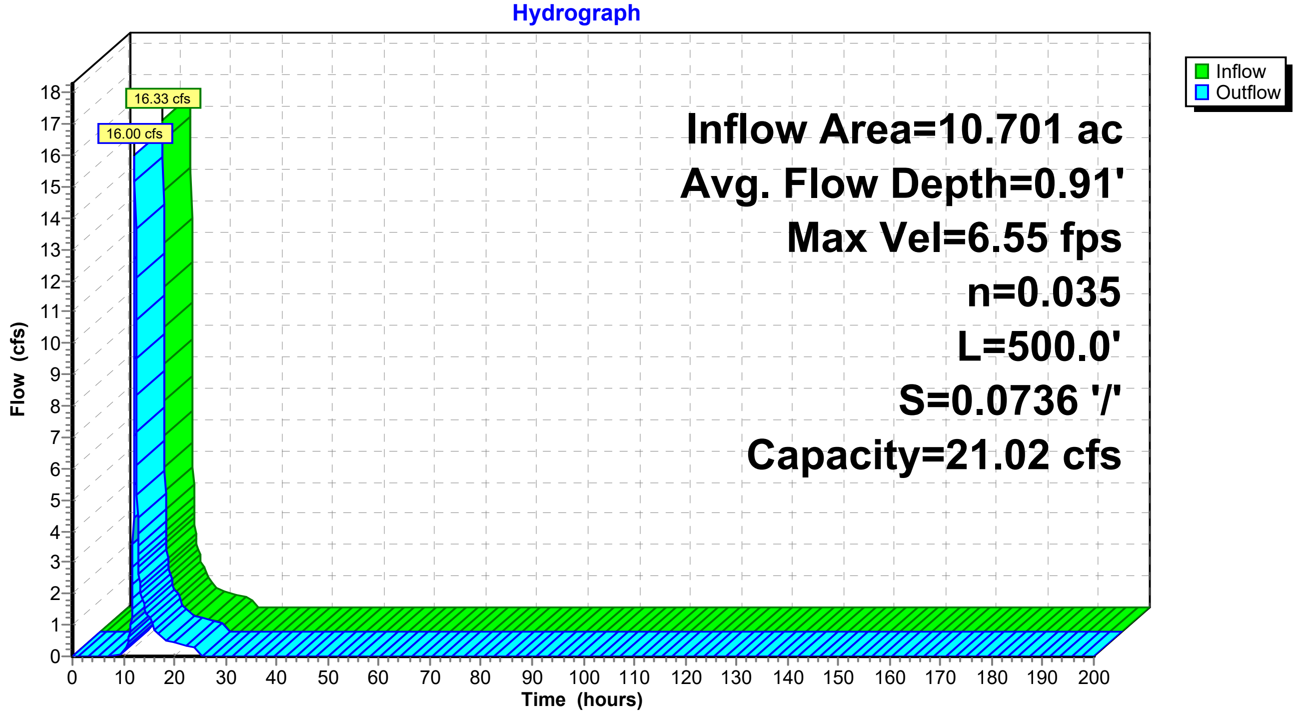
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.55 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.77 fps, Avg. Travel Time= 3.0 min

Peak Storage= 1,238 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.91' , Surface Width= 5.45'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 21.02 cfs

0.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 500.0' Slope= 0.0736 '/'
Inlet Invert= 1,040.30', Outlet Invert= 1,003.50'



Reach 213R: (new Reach)



Summary for Reach 224R: Roadside Swale

[81] Warning: Exceeded Pond 5P by 1,011.00' @ 24.85 hrs

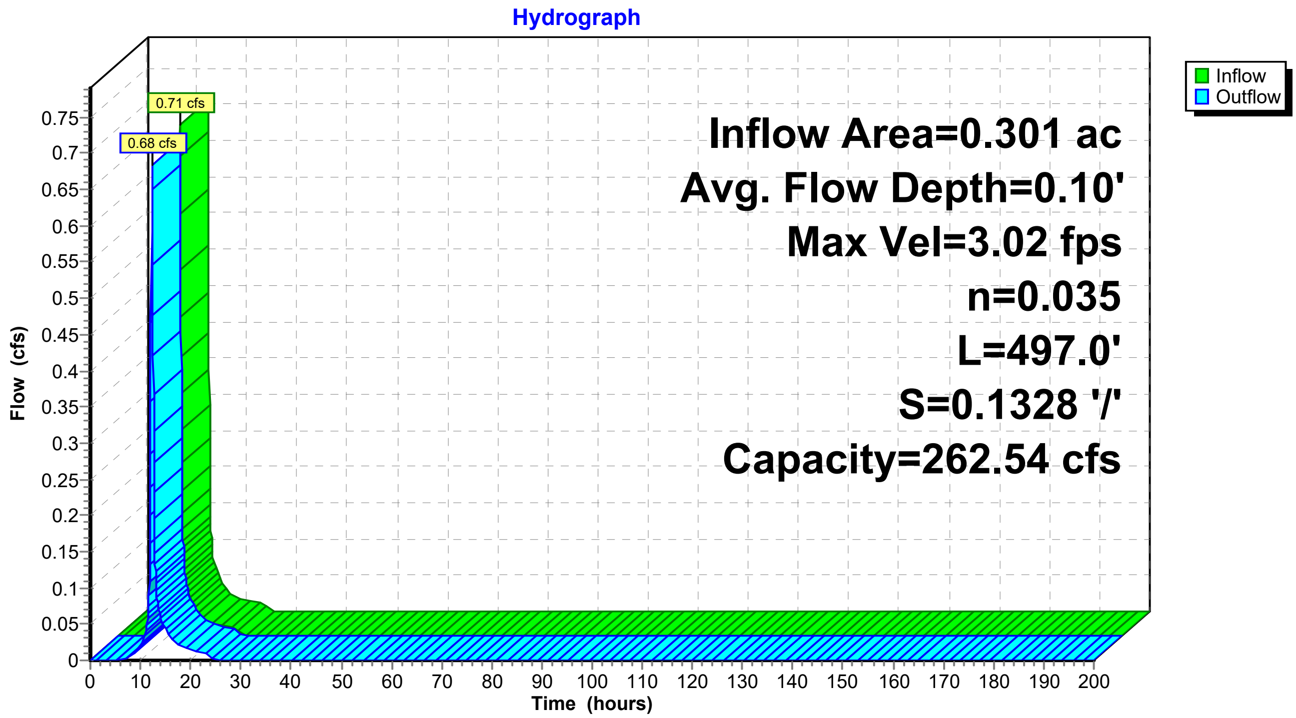
Inflow Area = 0.301 ac, 0.00% Impervious, Inflow Depth = 2.65" for 10-YEAR, 24-HOUR event
Inflow = 0.71 cfs @ 12.20 hrs, Volume= 0.067 af
Outflow = 0.68 cfs @ 12.28 hrs, Volume= 0.067 af, Atten= 3%, Lag= 4.7 min
Routed to Pond SMA-6 : SMA-6 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.02 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 6.8 min

Peak Storage= 113 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 2.59'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 262.54 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 497.0' Slope= 0.1328 '/'
Inlet Invert= 1,011.00', Outlet Invert= 945.00'

Reach 224R: Roadside Swale



Summary for Reach 307R: (new Reach)

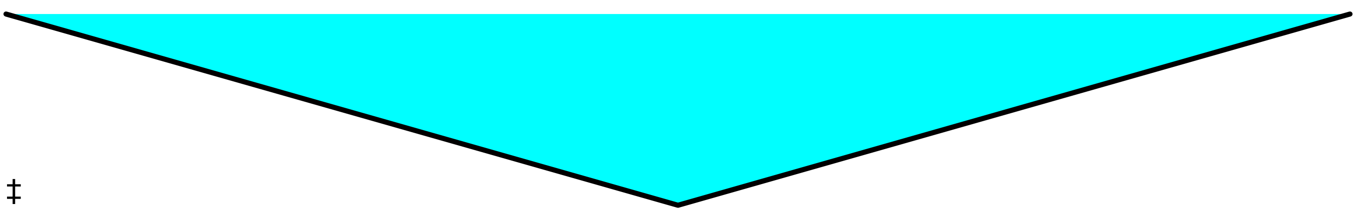
[91] Warning: Storage range exceeded by 0.44'
[55] Hint: Peak inflow is 348% of Manning's capacity
[81] Warning: Exceeded Pond 1P by 1,025.12' @ 8.85 hrs

Inflow Area = 13.690 ac, 0.00% Impervious, Inflow Depth = 2.17" for 10-YEAR, 24-HOUR event
Inflow = 24.20 cfs @ 12.25 hrs, Volume= 2.480 af
Outflow = 23.05 cfs @ 12.37 hrs, Volume= 2.480 af, Atten= 5%, Lag= 7.0 min
Routed to Pond 2P : SMA-8 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.61 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 2.30 fps, Avg. Travel Time= 8.8 min

Peak Storage= 5,015 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.94' , Surface Width= 11.28'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 6.96 cfs

0.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 6.0 '/' Top Width= 6.00'
Length= 1,215.0' Slope= 0.0568 '/'
Inlet Invert= 1,025.00', Outlet Invert= 956.00'



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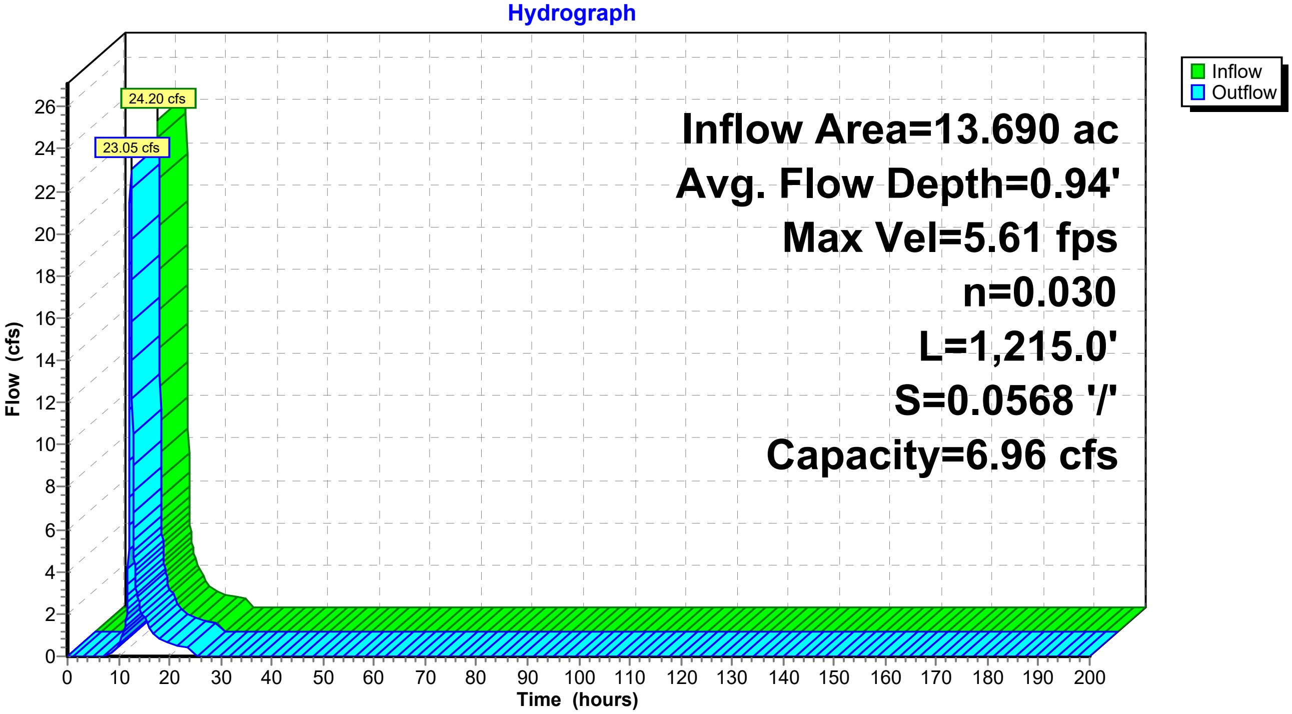
Reach 307R: (new Reach)



Summary for Pond 1P: Subcatch 402 to 401 Culvert

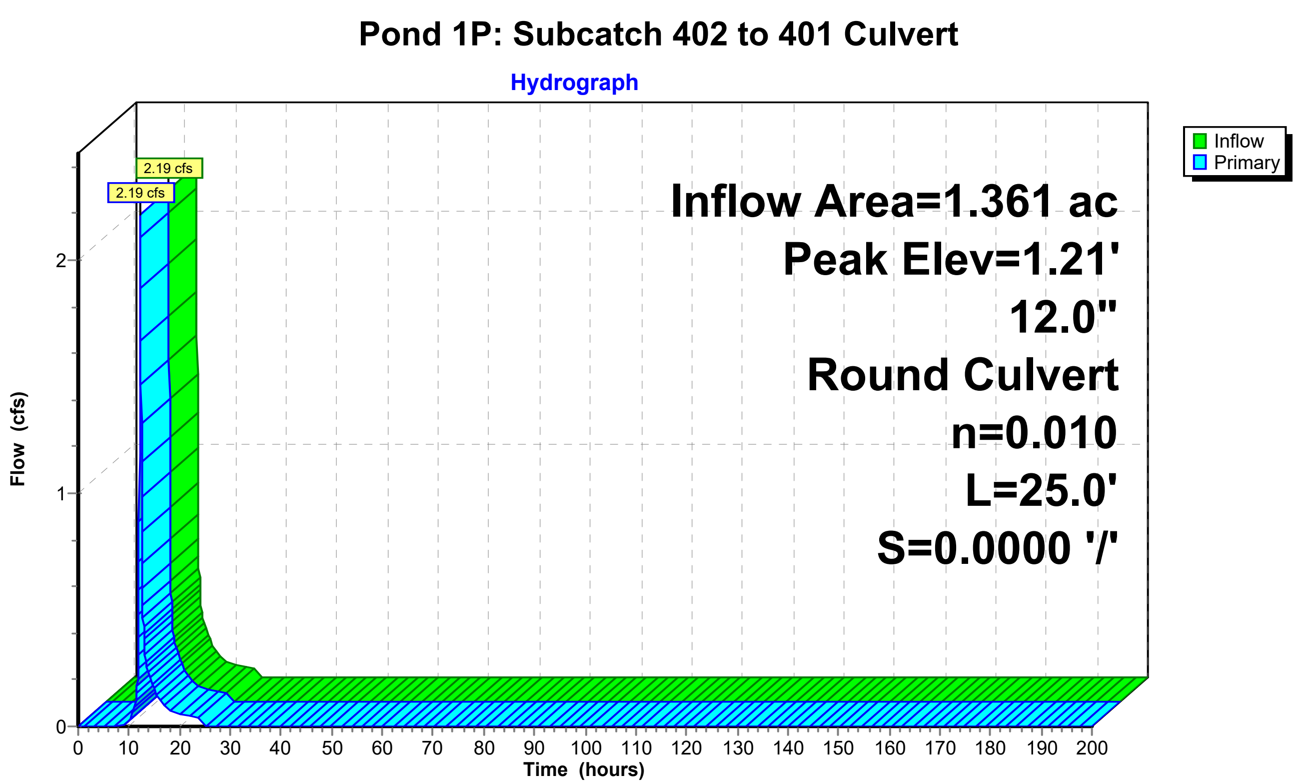
[57] Hint: Peaked at 1.21' (Flood elevation advised)

Inflow Area = 1.361 ac, 0.00% Impervious, Inflow Depth = 1.82" for 10-YEAR, 24-HOUR event
Inflow = 2.19 cfs @ 12.21 hrs, Volume= 0.206 af
Outflow = 2.19 cfs @ 12.21 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
Primary = 2.19 cfs @ 12.21 hrs, Volume= 0.206 af
Routed to Reach 307R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1.21' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.00' / 0.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.18 cfs @ 12.21 hrs HW=1.20' (Free Discharge)
1=Culvert (Barrel Controls 2.18 cfs @ 2.92 fps)



Summary for Pond 2P: SMA-8 Pocket Pond

[93] Warning: Storage range exceeded by 58.19'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 307R OUTLET depth by 67.63' @ 12.35 hrs
[64] Warning: Exceeded Reach 307R outlet bank by 68.69' @ 12.37 hrs

Inflow Area = 13.690 ac, 0.00% Impervious, Inflow Depth = 2.17" for 10-YEAR, 24-HOUR event
Inflow = 23.05 cfs @ 12.37 hrs, Volume= 2.480 af
Outflow = 23.07 cfs @ 12.37 hrs, Volume= 2.480 af, Atten= 0%, Lag= 0.0 min
Primary = 23.07 cfs @ 12.37 hrs, Volume= 2.480 af
Routed to Link DP-4 : Outfall to Southeast

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,025.19' @ 12.37 hrs Surf.Area= 350 sf Storage= 504 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.2 min (844.5 - 843.3)

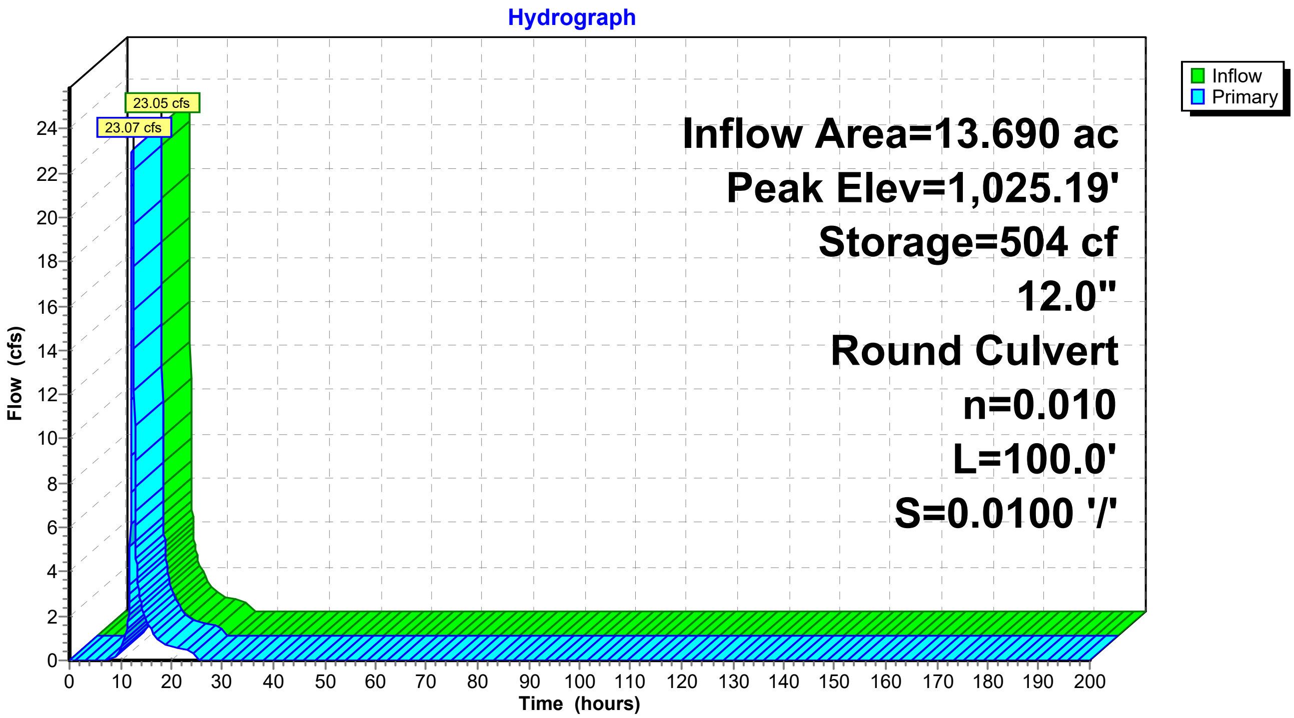
Volume	Invert	Avail.Storage	Storage Description
#1	965.00'	504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
965.00	98	0	0
966.00	280	189	189
967.00	350	315	504

Device	Routing	Invert	Outlet Devices
#1	Primary	965.00'	**12.0" Round Culvert** L= 100.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 965.00' / 964.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=22.87 cfs @ 12.37 hrs HW=1,024.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 22.87 cfs @ 29.12 fps)

Pond 2P: SMA-8 Pocket Pond



Summary for Pond 3P: SMA-2 Pocket Pond

[43] Hint: Has no inflow (Outflow=Zero)

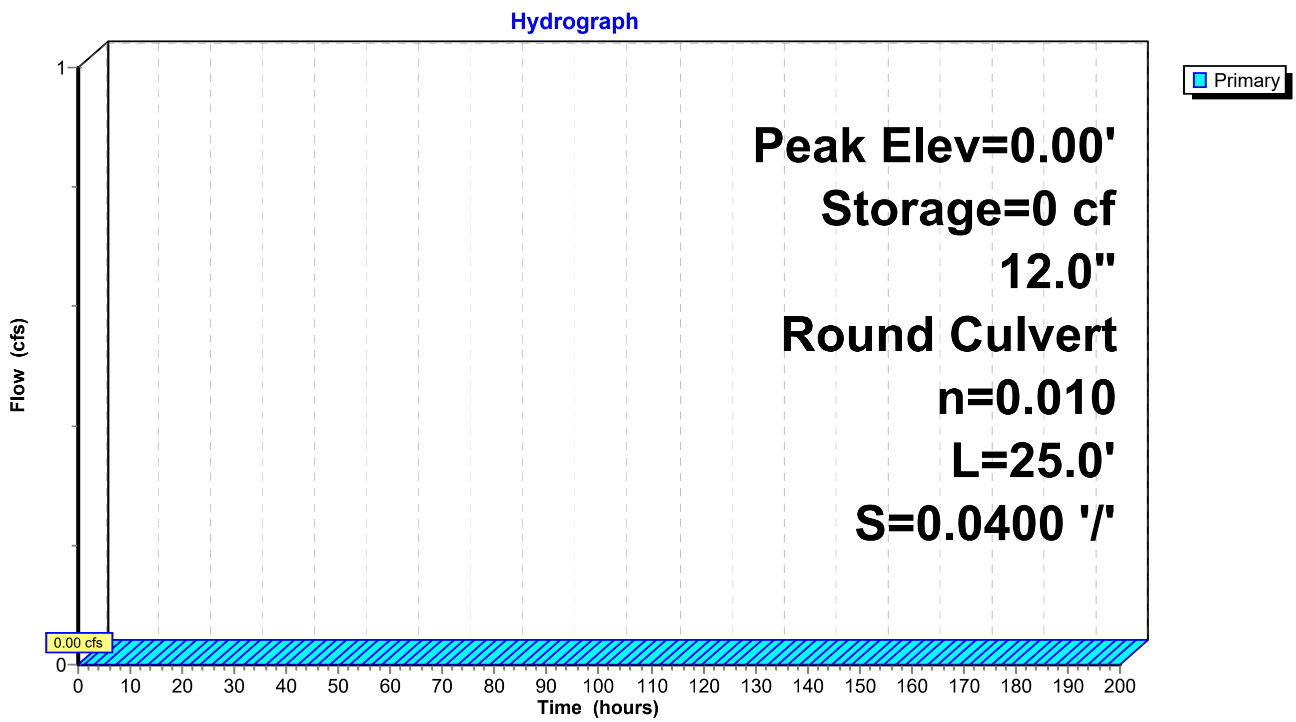
Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	1,537 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	1,459	0	0
846.10	849	115	115
847.00	1,958	1,263	1,379
847.10	1,204	158	1,537

Device	Routing	Invert	Outlet Devices
#1	Primary	846.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.00' / 845.00' S= 0.0400 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 3P: SMA-2 Pocket Pond



Summary for Pond 4P: SMA-3 Pocket Pond

[43] Hint: Has no inflow (Outflow=Zero)

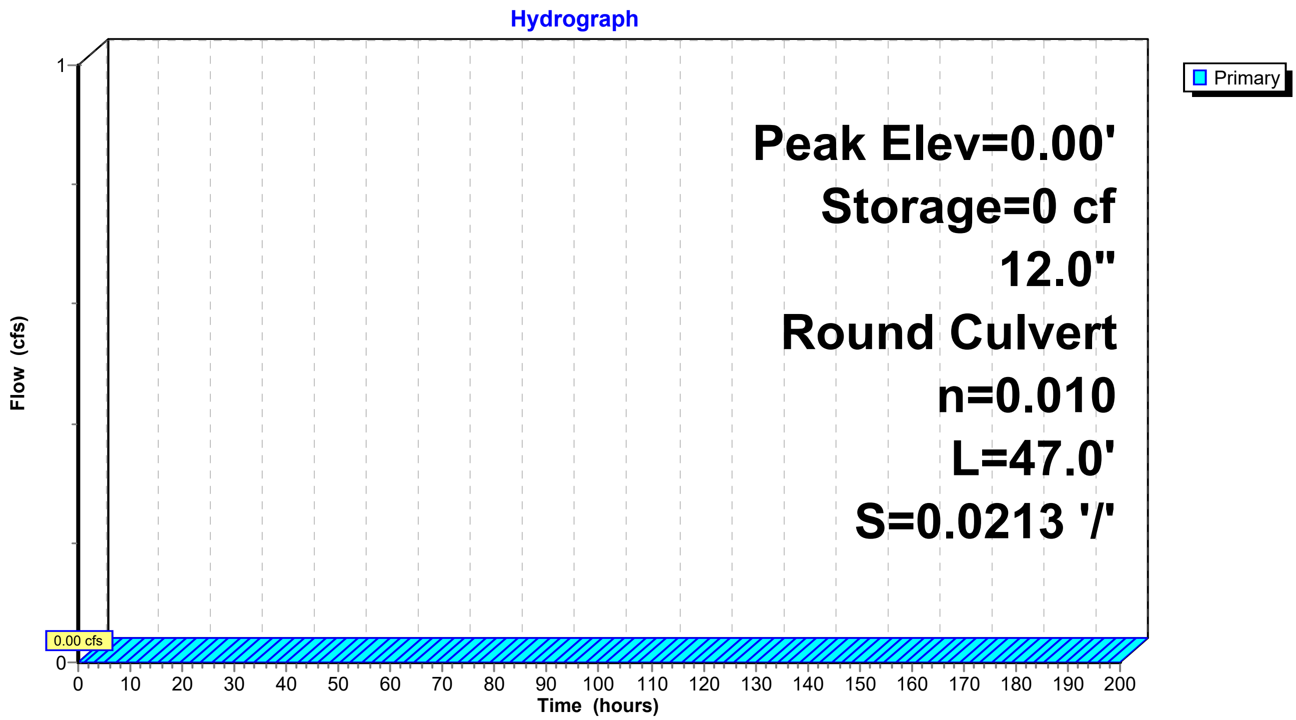
Volume	Invert	Avail.Storage	Storage Description
#1	842.00'	382 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
842.00	56	0	0
843.00	177	117	117
844.00	353	265	382

Device	Routing	Invert	Outlet Devices
#1	Primary	842.00'	**12.0" Round Culvert** L= 47.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 842.00' / 841.00' S= 0.0213 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond 4P: SMA-3 Pocket Pond



Summary for Pond 5P: Subcatch 301 to 304 Culvert

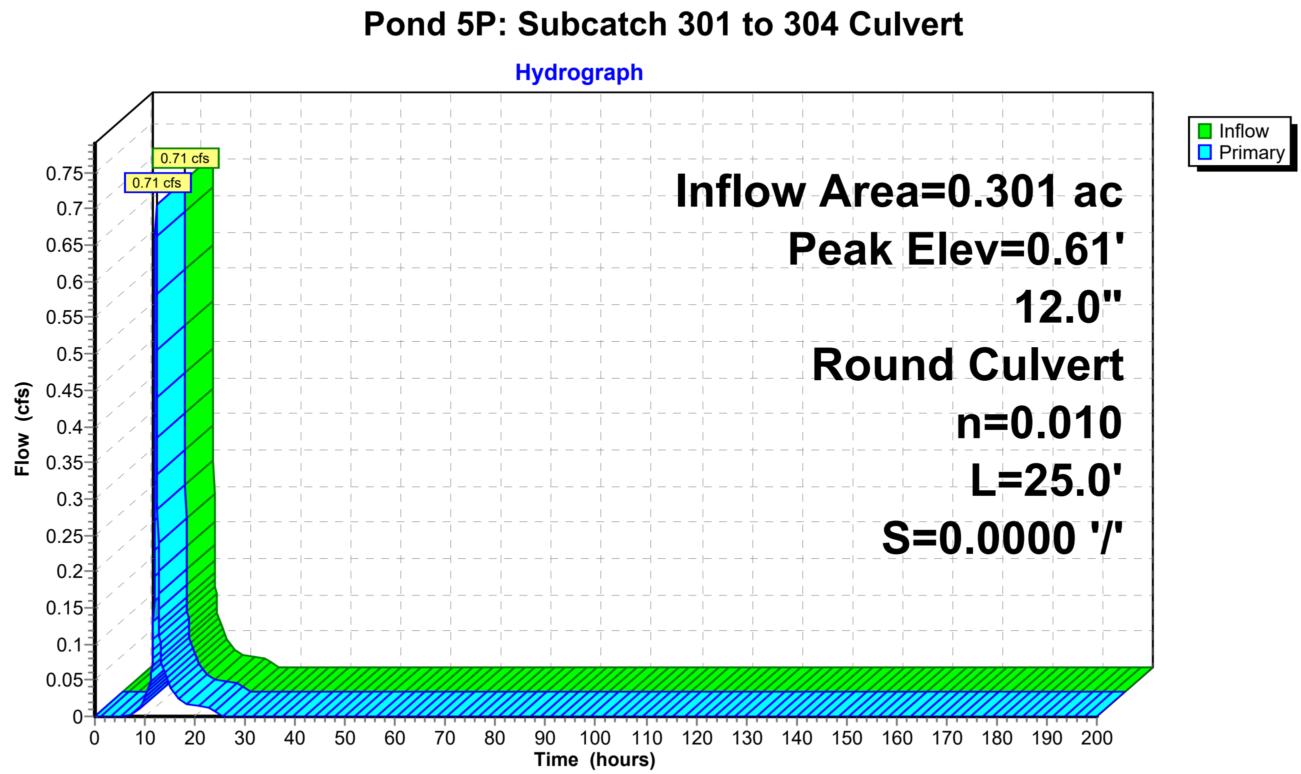
[57] Hint: Peaked at 0.61' (Flood elevation advised)

Inflow Area = 0.301 ac, 0.00% Impervious, Inflow Depth = 2.65" for 10-YEAR, 24-HOUR event
Inflow = 0.71 cfs @ 12.20 hrs, Volume= 0.067 af
Outflow = 0.71 cfs @ 12.20 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 12.20 hrs, Volume= 0.067 af
Routed to Reach 224R : Roadside Swale

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 0.61' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.00' / 0.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.20 hrs HW=0.61' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.71 cfs @ 2.02 fps)



Summary for Pond 11P: Subcatch 303 to 302 Culvert

[57] Hint: Peaked at 1,028.78' (Flood elevation advised)

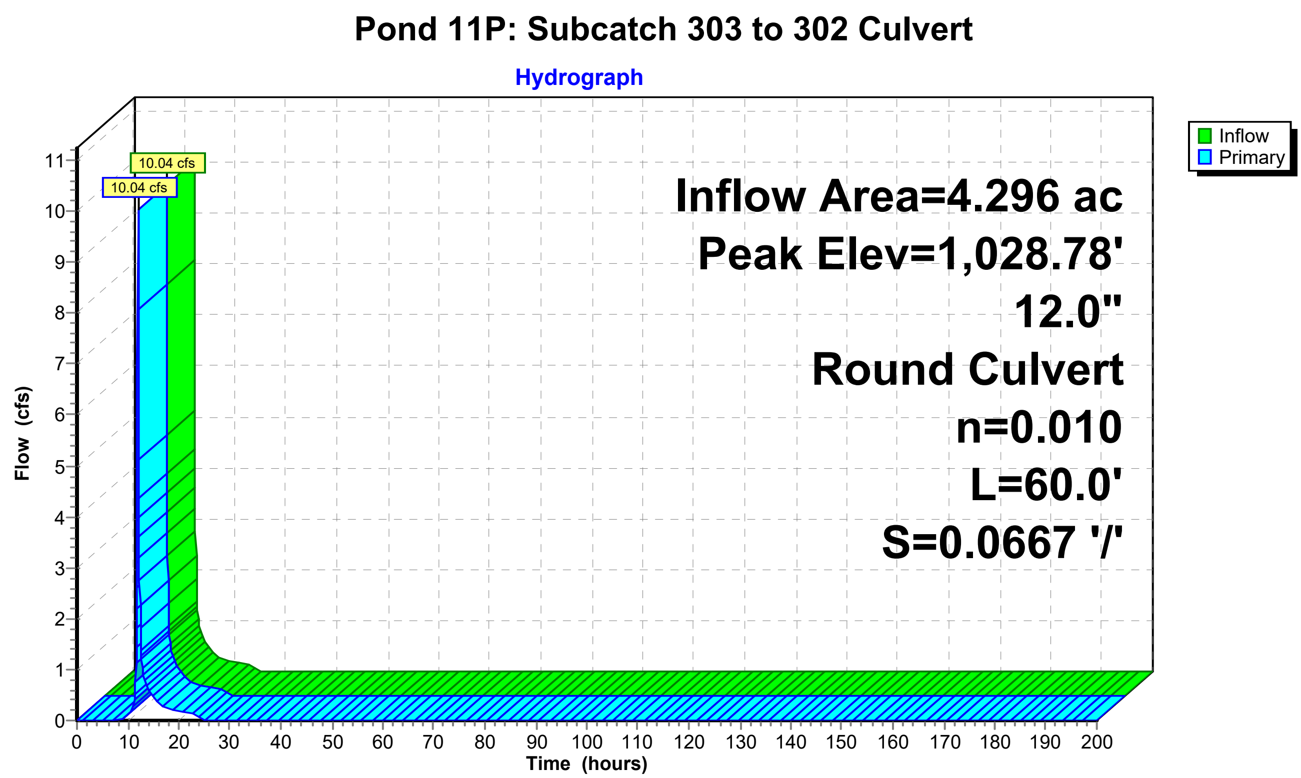
Inflow Area =	4.296 ac,	0.00% Impervious, Inflow Depth = 1.74"	for 10-YEAR, 24-HOUR event	
Inflow =	10.04 cfs @	12.01 hrs, Volume=	0.625 af	
Outflow =	10.04 cfs @	12.01 hrs, Volume=	0.625 af,	Atten= 0%, Lag= 0.0 min
Primary =	10.04 cfs @	12.01 hrs, Volume=	0.625 af	

Routed to Reach 12R : Diversion Swale

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,028.78' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,017.00' / 1,013.00' S= 0.0667 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=9.80 cfs @ 12.01 hrs HW=1,028.28' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.80 cfs @ 12.48 fps)



Summary for Pond SMA-1: SMA-1 Infiltration Basin

[93] Warning: Storage range exceeded by 21.02'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 11.830 ac, 0.16% Impervious, Inflow Depth = 1.60" for 10-YEAR, 24-HOUR event
Inflow = 13.87 cfs @ 12.33 hrs, Volume= 1.579 af
Outflow = 14.49 cfs @ 12.39 hrs, Volume= 1.579 af, Atten= 0%, Lag= 3.7 min
Primary = 14.49 cfs @ 12.39 hrs, Volume= 1.579 af
Routed to Link DP-1 : Outfall to West

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 853.02' @ 12.39 hrs Surf.Area= 4,639 sf Storage= 9,146 cf

Plug-Flow detention time= 21.1 min calculated for 1.579 af (100% of inflow)
Center-of-Mass det. time= 21.2 min (882.5 - 861.3)

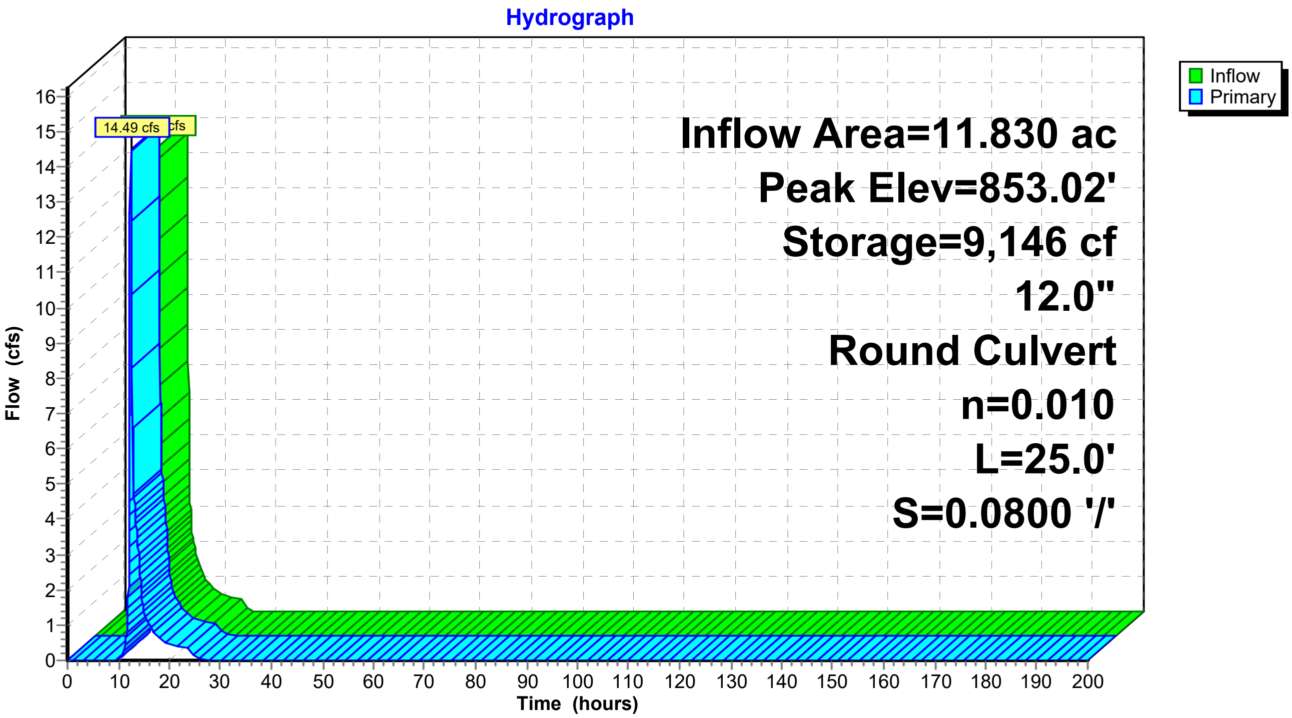
Volume	Invert	Avail.Storage	Storage Description
#1	829.00'	9,146 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
829.00	1,584	0	0
830.00	2,509	2,047	2,047
831.00	3,525	3,017	5,064
832.00	4,639	4,082	9,146

Device	Routing	Invert	Outlet Devices
#1	Primary	829.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 829.00' / 827.00' S= 0.0800 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=14.19 cfs @ 12.39 hrs HW=852.09' (Free Discharge)
└─**1=Culvert** (Inlet Controls 14.19 cfs @ 18.07 fps)

Pond SMA-1: SMA-1 Infiltration Basin



Summary for Pond SMA-10: SMA-10 Pocket Pond

Inflow Area = 0.444 ac, 0.00% Impervious, Inflow Depth = 1.53" for 10-YEAR, 24-HOUR event
Inflow = 0.73 cfs @ 12.12 hrs, Volume= 0.057 af
Outflow = 0.72 cfs @ 12.13 hrs, Volume= 0.057 af, Atten= 2%, Lag= 0.8 min
Primary = 0.72 cfs @ 12.13 hrs, Volume= 0.057 af
Routed to Reach 213R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,042.49' @ 12.13 hrs Surf.Area= 0.002 ac Storage= 0.001 af

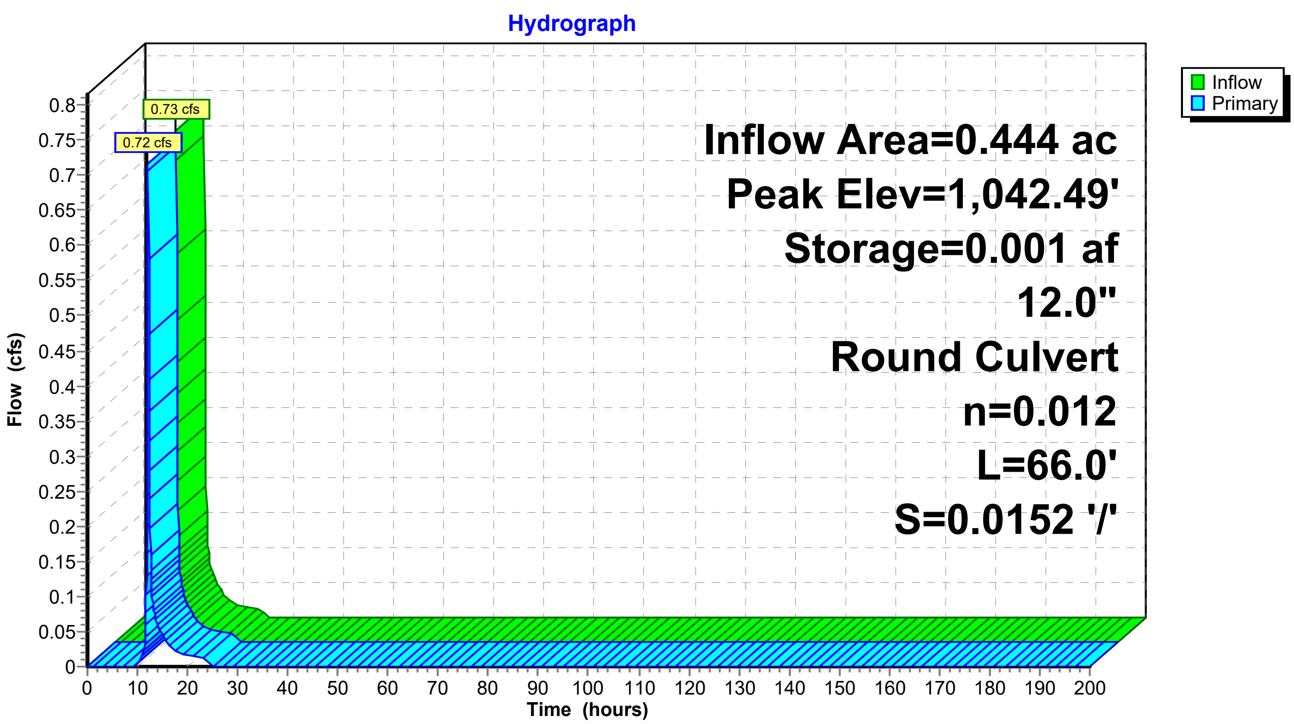
Plug-Flow detention time= 1.8 min calculated for 0.057 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (852.0 - 850.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,042.00'	0.017 af	**7.75'D x 3.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,042.00'	**12.0" Round Culvert** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,042.00' / 1,041.00' S= 0.0152 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.70 cfs @ 12.13 hrs HW=1,042.48' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.70 cfs @ 1.87 fps)

Pond SMA-10: SMA-10 Pocket Pond



Summary for Pond SMA-11: SMA-11 Pocket Pond

[93] Warning: Storage range exceeded by 3.64'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 5.186 ac, 0.00% Impervious, Inflow Depth = 1.60" for 10-YEAR, 24-HOUR event
Inflow = 7.13 cfs @ 12.22 hrs, Volume= 0.692 af
Outflow = 7.46 cfs @ 12.22 hrs, Volume= 0.692 af, Atten= 0%, Lag= 0.0 min
Primary = 7.46 cfs @ 12.22 hrs, Volume= 0.692 af
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,007.64' @ 12.22 hrs Surf.Area= 0.013 ac Storage= 0.018 af

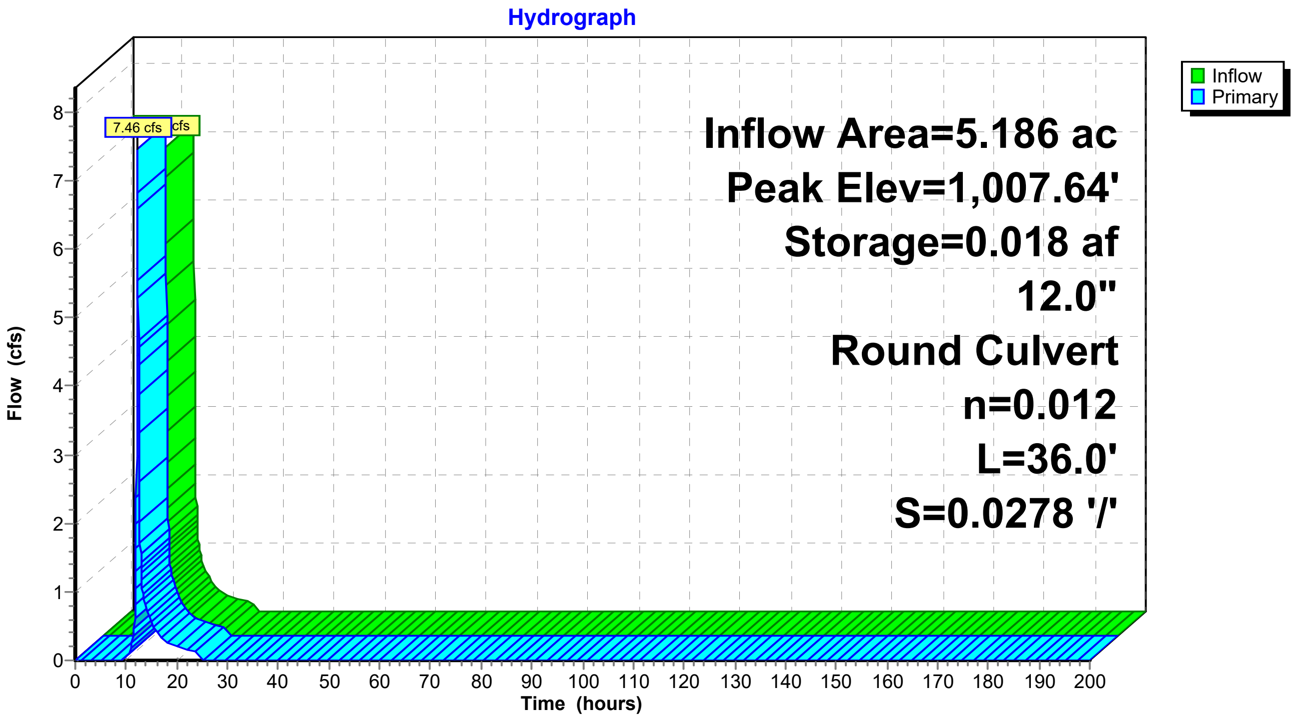
Plug-Flow detention time= 1.4 min calculated for 0.692 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (855.9 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,001.00'	0.018 af	**8.40'D x 3.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,001.00' / 1,000.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=7.09 cfs @ 12.22 hrs HW=1,007.13' (Free Discharge)
└─**1=Culvert** (Inlet Controls 7.09 cfs @ 9.02 fps)

Pond SMA-11: SMA-11 Pocket Pond



Summary for Pond SMA-12: SMA-12 Pocket Pond

[79] Warning: Submerged Pond SMA-11 Primary device # 1 INLET by 0.73'

Inflow Area = 6.050 ac, 0.00% Impervious, Inflow Depth = 1.64" for 10-YEAR, 24-HOUR event
Inflow = 8.70 cfs @ 12.22 hrs, Volume= 0.827 af
Outflow = 8.37 cfs @ 12.26 hrs, Volume= 0.801 af, Atten= 4%, Lag= 2.4 min
Primary = 8.37 cfs @ 12.26 hrs, Volume= 0.801 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,001.73' @ 12.26 hrs Surf.Area= 0.029 ac Storage= 0.044 af

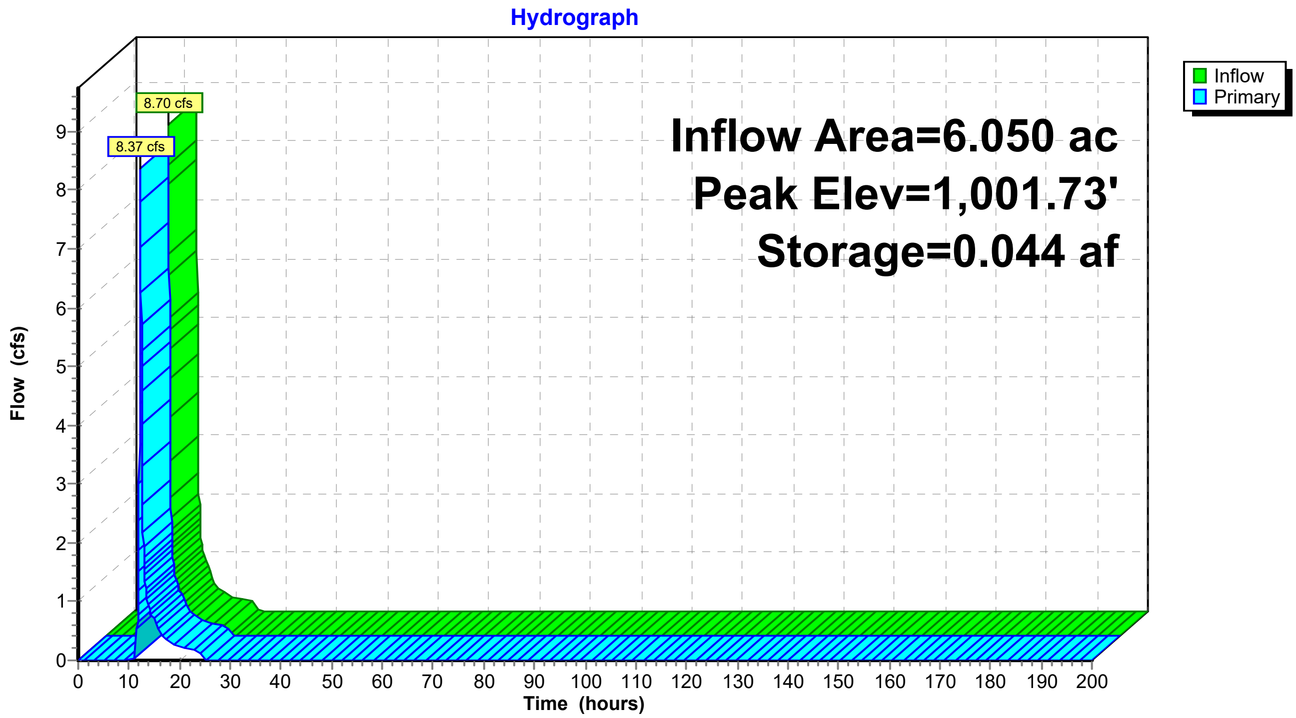
Plug-Flow detention time= 27.2 min calculated for 0.801 af (97% of inflow)
Center-of-Mass det. time= 9.4 min (862.7 - 853.3)

Volume	Invert	Avail.Storage	Storage Description
#1	999.00'	0.090 af	**7.00'W x 37.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=8.25 cfs @ 12.26 hrs HW=1,001.72' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 8.25 cfs @ 2.28 fps)

Pond SMA-12: SMA-12 Pocket Pond



Summary for Pond SMA-13: SMA-13 Pocket Pond

[93] Warning: Storage range exceeded by 0.14'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth = 1.74" for 10-YEAR, 24-HOUR event
Inflow = 16.00 cfs @ 12.25 hrs, Volume= 1.548 af
Outflow = 16.05 cfs @ 12.25 hrs, Volume= 1.505 af, Atten= 0%, Lag= 0.0 min
Primary = 16.05 cfs @ 12.25 hrs, Volume= 1.505 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,002.14' @ 12.25 hrs Surf.Area= 0.030 ac Storage= 0.069 af

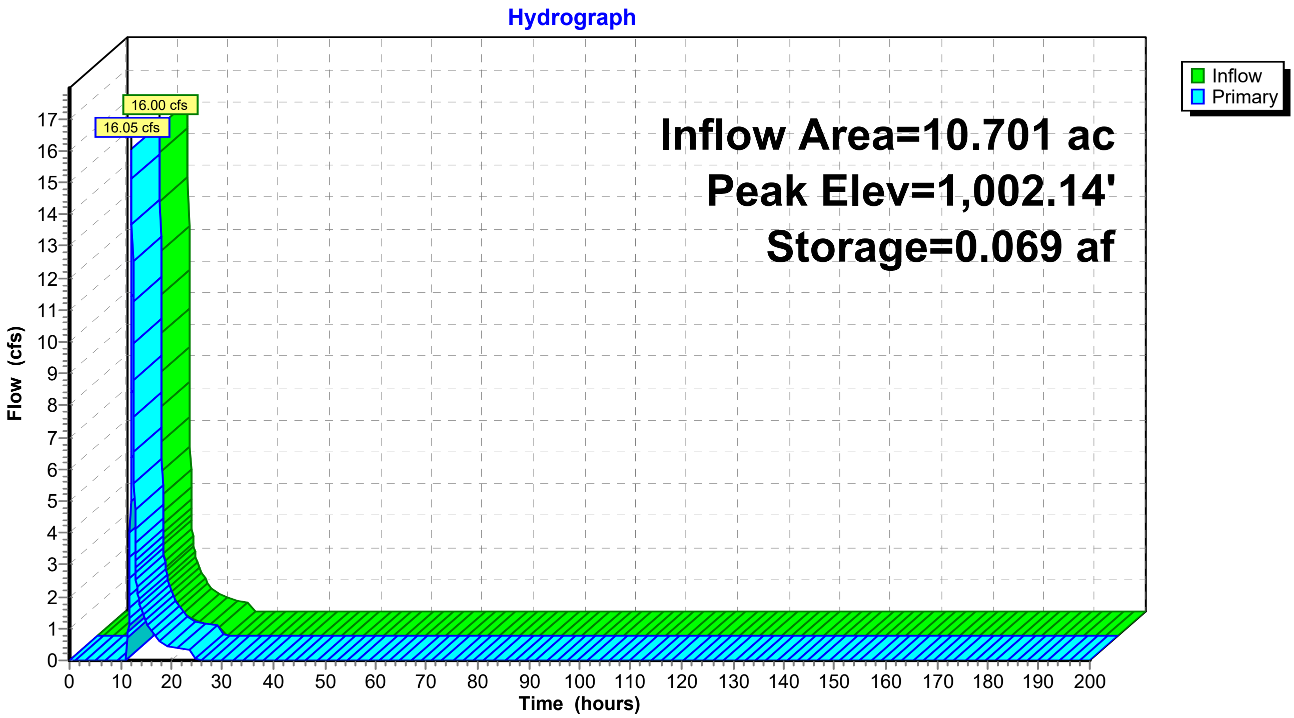
Plug-Flow detention time= 23.9 min calculated for 1.505 af (97% of inflow)
Center-of-Mass det. time= 8.2 min (859.6 - 851.5)

Volume	Invert	Avail.Storage	Storage Description
#1	996.00'	0.069 af	**5.00'D x 6.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**5.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=16.04 cfs @ 12.25 hrs HW=1,002.14' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 16.04 cfs @ 2.81 fps)

Pond SMA-13: SMA-13 Pocket Pond



Summary for Pond SMA-14: SMA-14 Pocket Pond

Inflow Area = 0.678 ac, 0.00% Impervious, Inflow Depth = 1.74" for 10-YEAR, 24-HOUR event
Inflow = 1.02 cfs @ 12.22 hrs, Volume= 0.099 af
Outflow = 1.02 cfs @ 12.22 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.3 min
Primary = 1.02 cfs @ 12.22 hrs, Volume= 0.098 af
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,017.26' @ 12.22 hrs Surf.Area= 0.003 ac Storage= 0.002 af

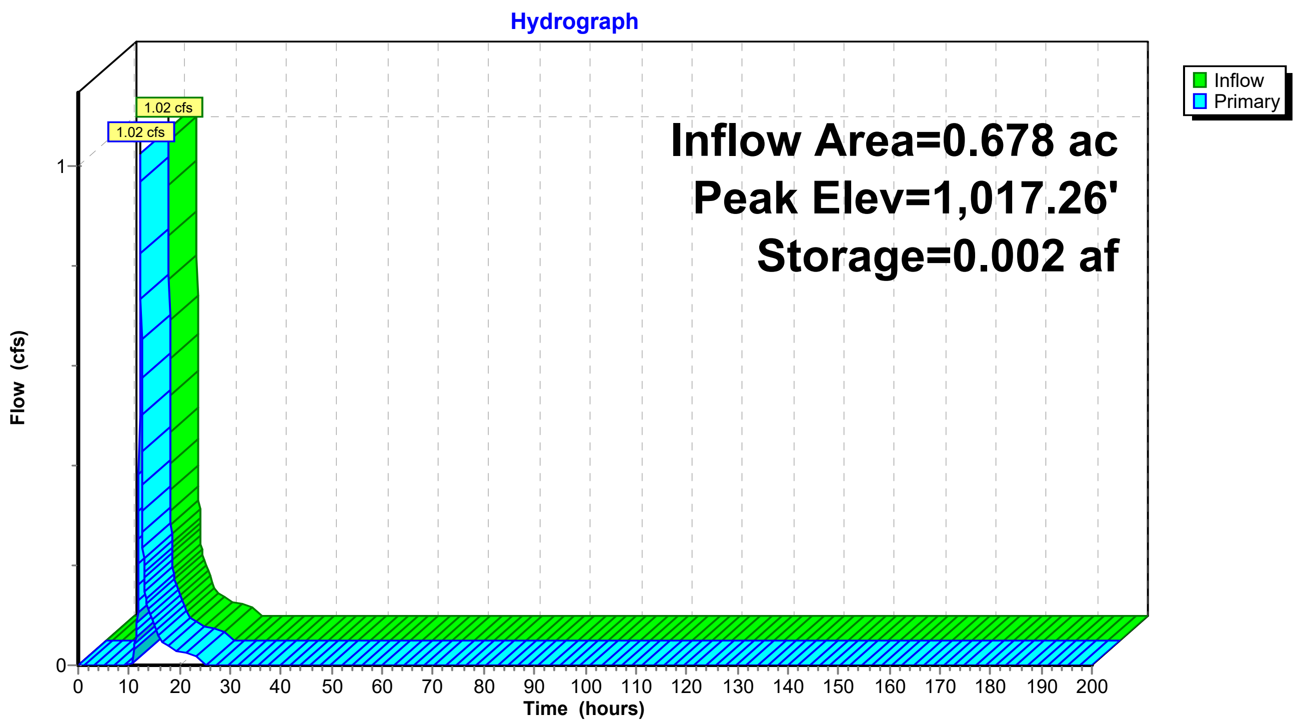
Plug-Flow detention time= 9.1 min calculated for 0.098 af (99% of inflow)
Center-of-Mass det. time= 3.2 min (851.8 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,016.00'	0.005 af	**2.00'W x 5.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.01 cfs @ 12.22 hrs HW=1,017.26' (Free Discharge)
└—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.01 cfs @ 1.30 fps)

Pond SMA-14: SMA-14 Pocket Pond



Summary for Pond SMA-15: SMA-15 Pocket Pond

Inflow Area = 0.203 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-YEAR, 24-HOUR event
Inflow = 0.64 cfs @ 12.01 hrs, Volume= 0.040 af
Outflow = 0.61 cfs @ 12.03 hrs, Volume= 0.035 af, Atten= 4%, Lag= 1.1 min
Primary = 0.61 cfs @ 12.03 hrs, Volume= 0.035 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,017.14' @ 12.03 hrs Surf.Area= 0.006 ac Storage= 0.006 af

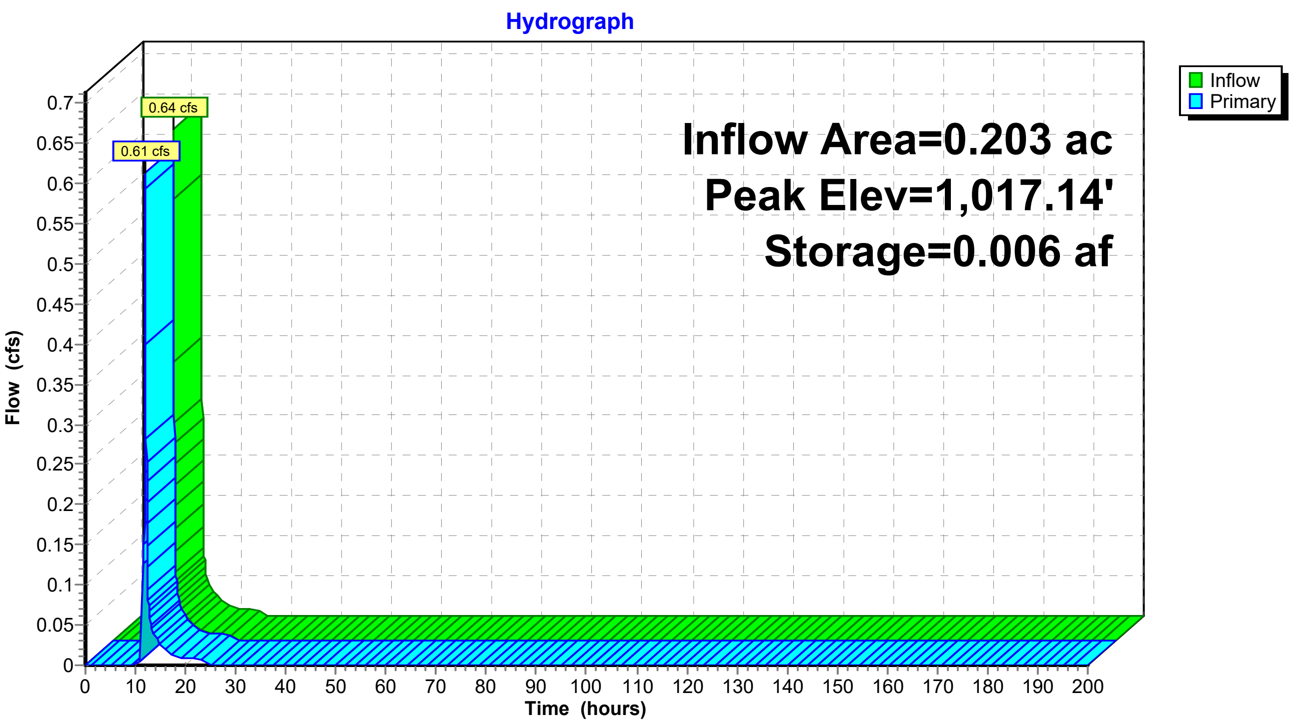
Plug-Flow detention time= 84.9 min calculated for 0.035 af (87% of inflow)
Center-of-Mass det. time= 27.4 min (837.5 - 810.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	0.028 af	**5.00'W x 3.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.58 cfs @ 12.03 hrs HW=1,017.13' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.58 cfs @ 0.89 fps)

Pond SMA-15: SMA-15 Pocket Pond



Summary for Pond SMA-16: SMA-16 Pocket Pond

[93] Warning: Storage range exceeded by 12.38'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 7.634 ac, 0.00% Impervious, Inflow Depth = 1.67" for 10-YEAR, 24-HOUR event
Inflow = 11.04 cfs @ 12.22 hrs, Volume= 1.064 af
Outflow = 11.56 cfs @ 12.31 hrs, Volume= 1.042 af, Atten= 0%, Lag= 5.2 min
Primary = 11.56 cfs @ 12.31 hrs, Volume= 1.042 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,045.38' @ 12.30 hrs Surf.Area= 0.073 ac Storage= 0.170 af

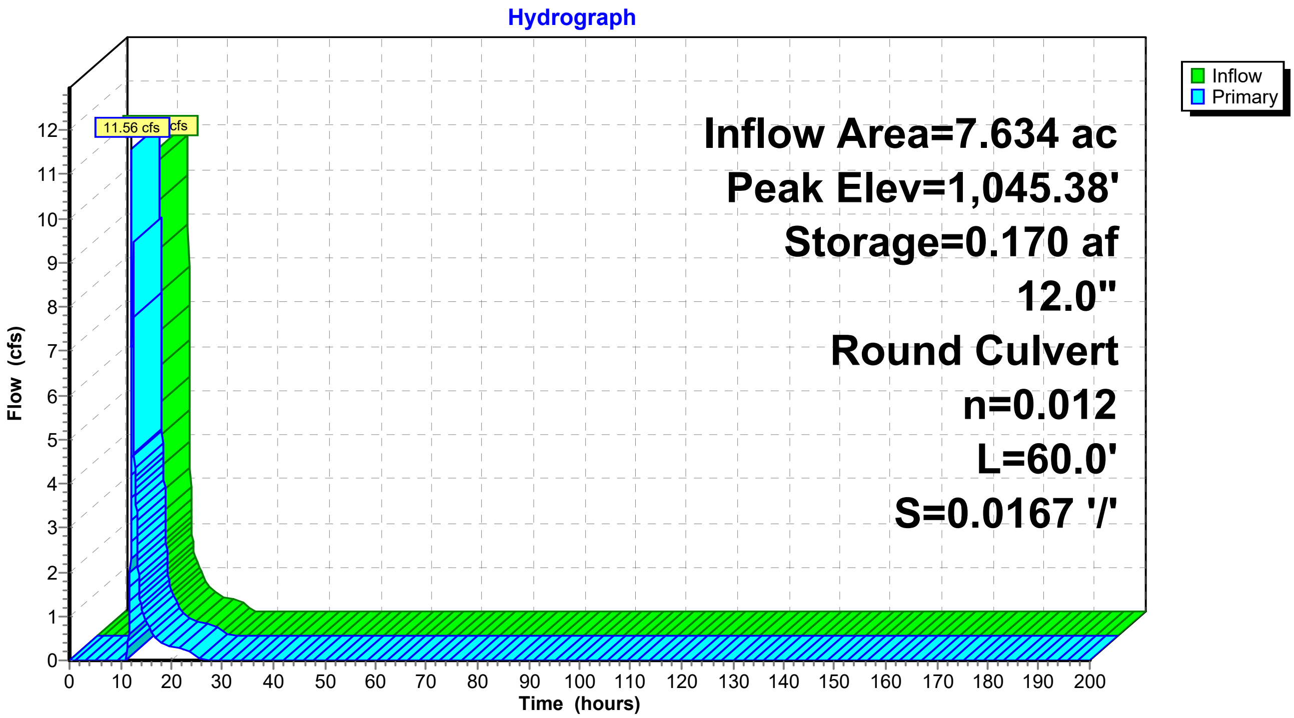
Plug-Flow detention time= 33.3 min calculated for 1.042 af (98% of inflow)
Center-of-Mass det. time= 21.3 min (872.8 - 851.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,029.00'	0.170 af	**10.00'W x 70.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,030.00' / 1,029.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=11.09 cfs @ 12.31 hrs HW=1,044.30' (Free Discharge)
1=Culvert (Inlet Controls 11.09 cfs @ 14.12 fps)

Pond SMA-16: SMA-16 Pocket Pond



Summary for Pond SMA-17: SMA-17 Pocket Pond

Inflow Area = 0.099 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-YEAR, 24-HOUR event
Inflow = 0.31 cfs @ 12.01 hrs, Volume= 0.020 af
Outflow = 0.29 cfs @ 12.03 hrs, Volume= 0.017 af, Atten= 6%, Lag= 1.4 min
Primary = 0.29 cfs @ 12.03 hrs, Volume= 0.017 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,028.12' @ 12.03 hrs Surf.Area= 0.005 ac Storage= 0.004 af

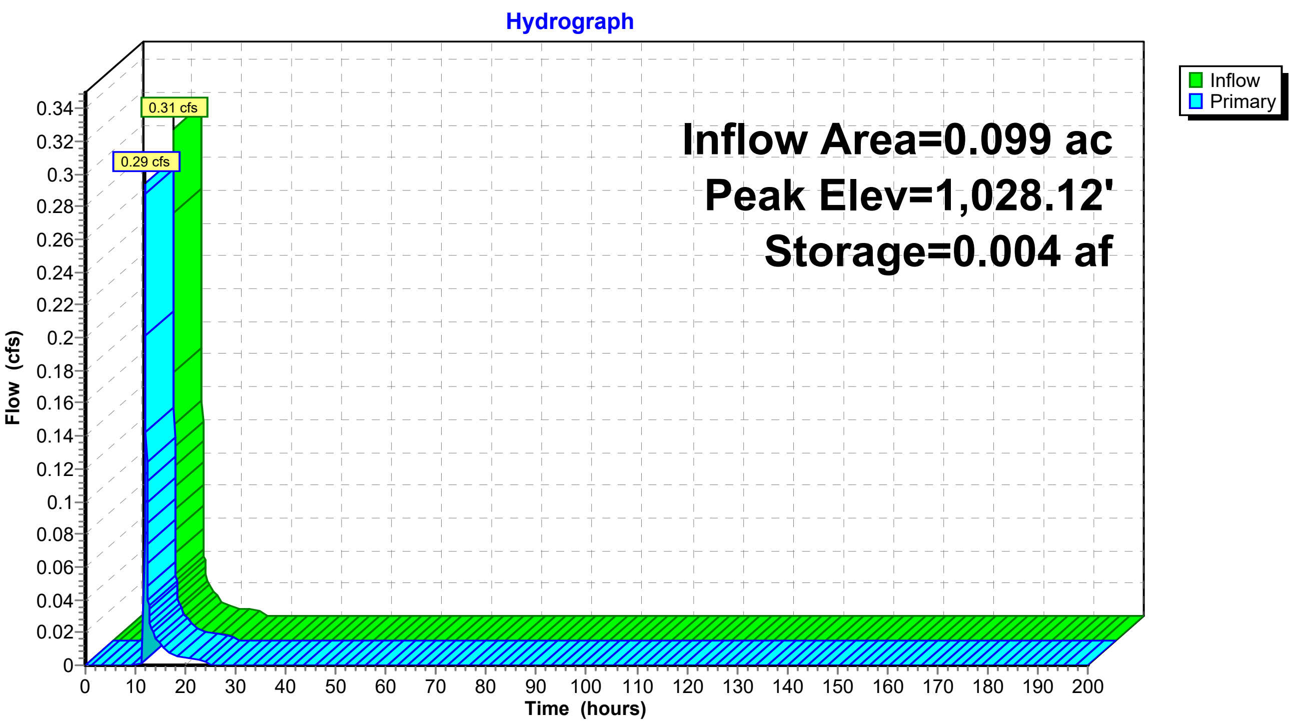
Plug-Flow detention time= 99.3 min calculated for 0.017 af (84% of inflow)
Center-of-Mass det. time= 33.2 min (843.2 - 810.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,027.00'	0.023 af	**7.00'W x 10.00'L x 3.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**3.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.28 cfs @ 12.03 hrs HW=1,028.12' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.28 cfs @ 0.80 fps)

Pond SMA-17: SMA-17 Pocket Pond



Summary for Pond SMA-18: SMA-18 Pocket Pond

Inflow Area = 0.475 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-YEAR, 24-HOUR event
Inflow = 1.45 cfs @ 12.05 hrs, Volume= 0.094 af
Outflow = 0.16 cfs @ 12.72 hrs, Volume= 0.042 af, Atten= 89%, Lag= 40.1 min
Primary = 0.16 cfs @ 12.72 hrs, Volume= 0.042 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,030.06' @ 12.72 hrs Surf.Area= 0.032 ac Storage= 0.055 af

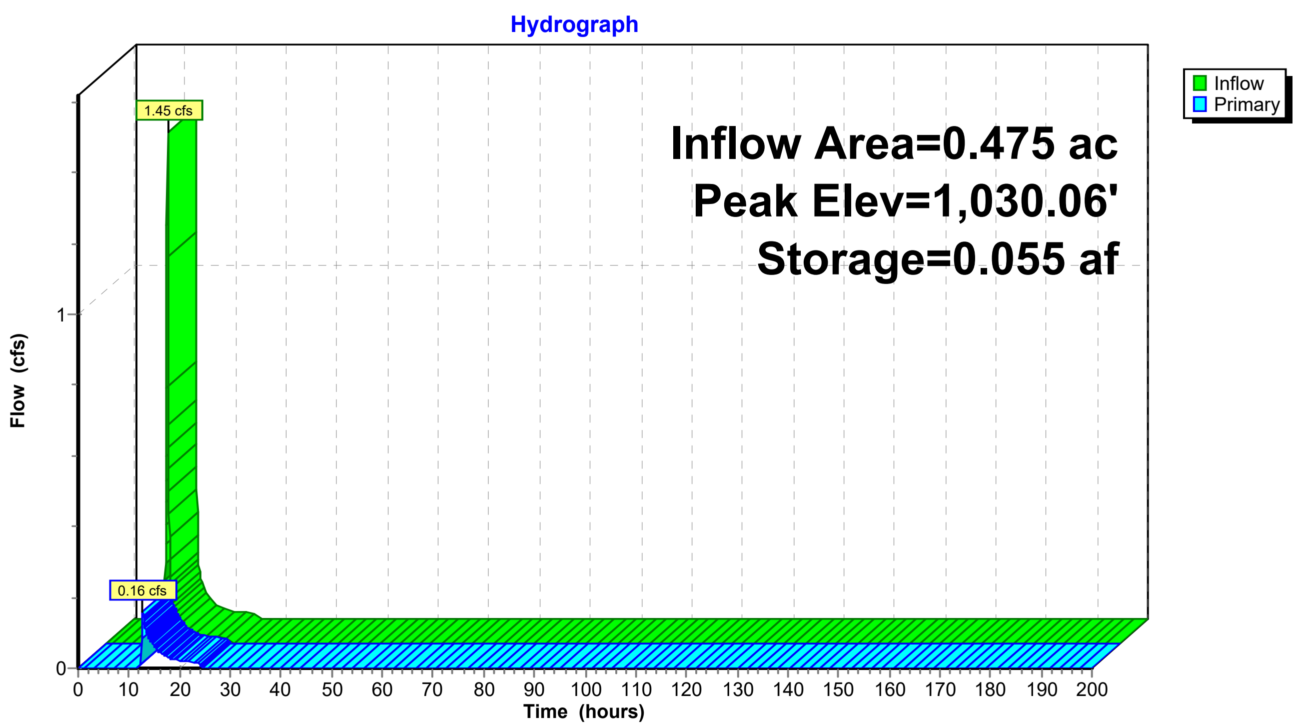
Plug-Flow detention time= 267.6 min calculated for 0.042 af (44% of inflow)
Center-of-Mass det. time= 149.4 min (961.4 - 812.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,027.00'	0.138 af	**30.00'W x 10.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.00'	**4.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.15 cfs @ 12.72 hrs HW=1,030.06' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.15 cfs @ 0.59 fps)

Pond SMA-18: SMA-18 Pocket Pond



Summary for Pond SMA-4: SMA-4 Pocket Pond

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 90.94'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=115)

Inflow Area = 1.961 ac, 0.00% Impervious, Inflow Depth = 2.13" for 10-YEAR, 24-HOUR event
Inflow = 5.63 cfs @ 12.00 hrs, Volume= 0.348 af
Outflow = 2.00 cfs @ 12.29 hrs, Volume= 0.184 af, Atten= 65%, Lag= 17.1 min
Primary = 2.00 cfs @ 12.29 hrs, Volume= 0.184 af
Routed to Link DP-3 : Outfall to Southwest

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 944.94' @ 12.30 hrs Surf.Area= 4,191 sf Storage= 7,166 cf

Plug-Flow detention time= 219.3 min calculated for 0.184 af (53% of inflow)
Center-of-Mass det. time= 105.7 min (925.0 - 819.3)

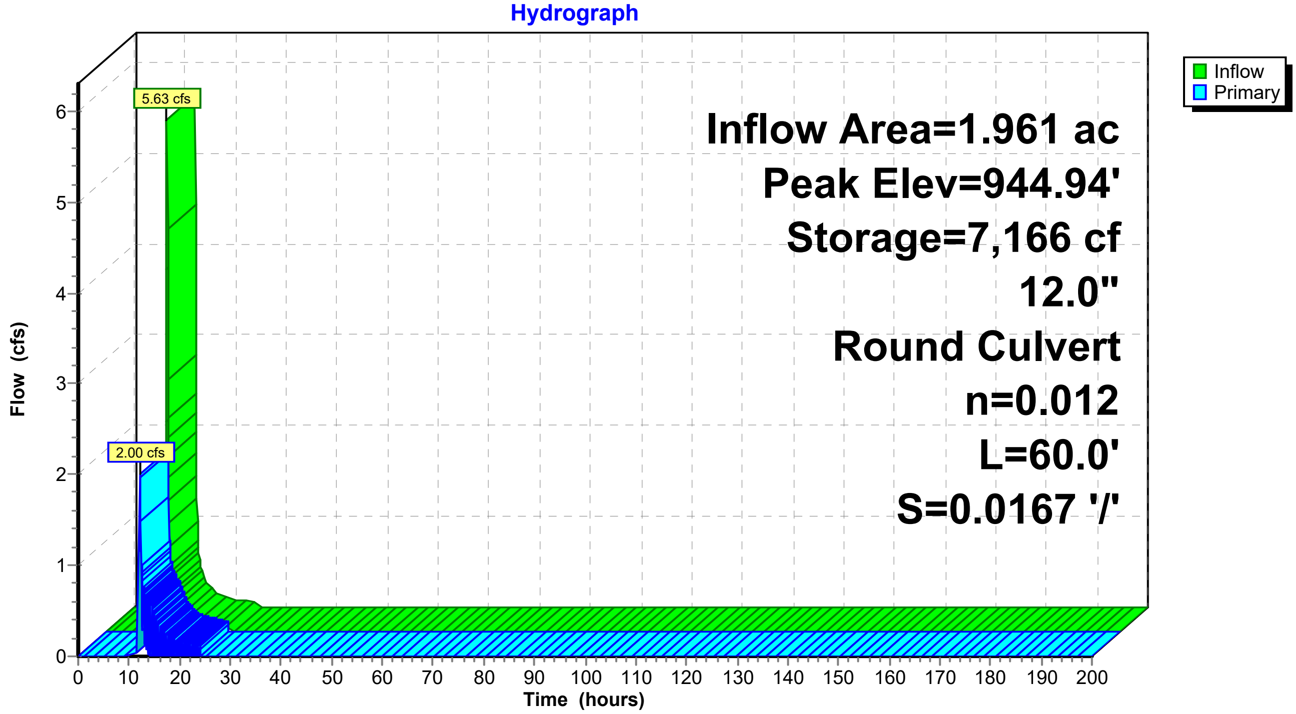
Volume	Invert	Avail.Storage	Storage Description
#1	850.00'	7,166 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
850.00	315	0	0
851.00	612	464	464
852.00	1,074	843	1,307
853.00	3,227	2,151	3,457
854.00	4,191	3,709	7,166

Device	Routing	Invert	Outlet Devices
#1	Primary	944.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 944.00' / 943.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.92 cfs @ 12.29 hrs HW=944.91' (Free Discharge)
└—**1=Culvert** (Inlet Controls 1.92 cfs @ 2.56 fps)

Pond SMA-4: SMA-4 Pocket Pond



Summary for Pond SMA-5: SMA-5 Pocket Pond

Inflow Area = 1.049 ac, 0.00% Impervious, Inflow Depth = 2.17" for 10-YEAR, 24-HOUR event
Inflow = 1.43 cfs @ 12.05 hrs, Volume= 0.190 af
Outflow = 1.40 cfs @ 12.30 hrs, Volume= 0.190 af, Atten= 2%, Lag= 15.2 min
Primary = 1.40 cfs @ 12.30 hrs, Volume= 0.190 af
Routed to Reach 8R : Wetland Stream

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 934.73' @ 12.30 hrs Surf.Area= 837 sf Storage= 442 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.8 min (876.4 - 866.7)

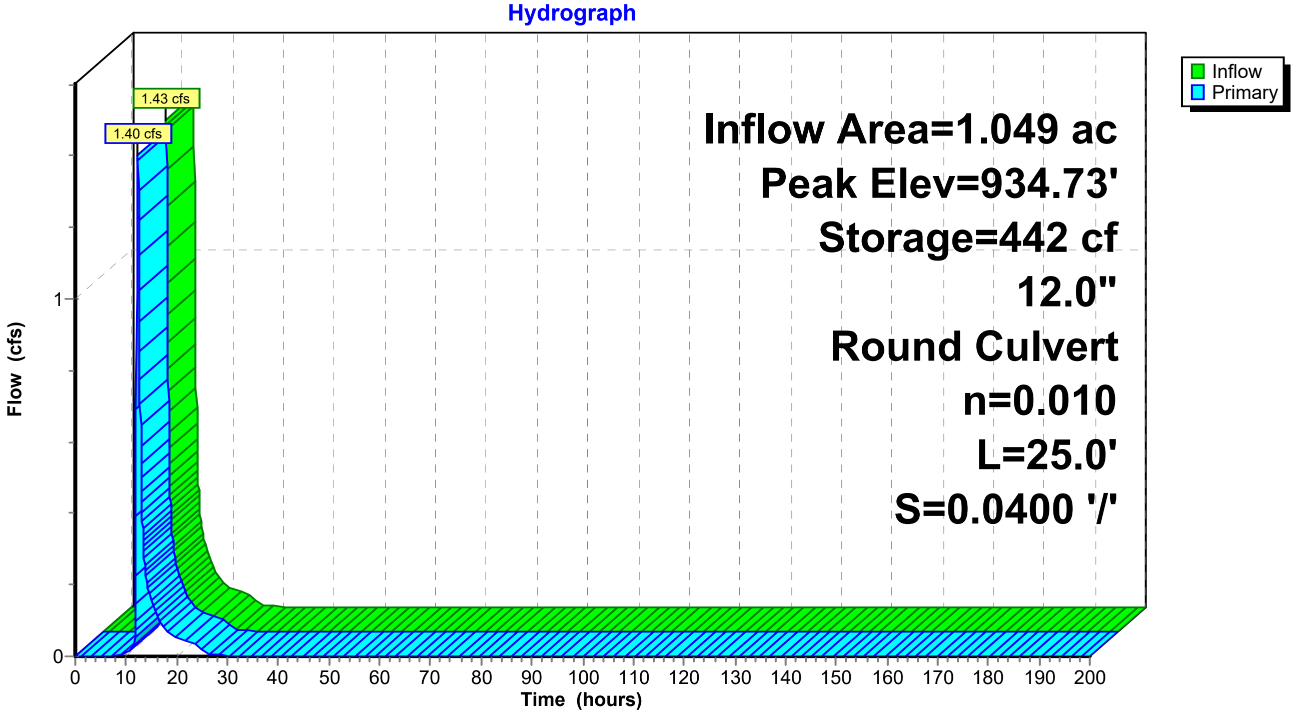
Volume	Invert	Avail.Storage	Storage Description
#1	934.00'	3,514 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
934.00	380	0	0
935.00	1,008	694	694
936.00	1,396	1,202	1,896
937.00	1,840	1,618	3,514

Device	Routing	Invert	Outlet Devices
#1	Primary	934.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 934.00' / 933.00' S= 0.0400 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.40 cfs @ 12.30 hrs HW=934.73' (Free Discharge)
└—**1=Culvert** (Inlet Controls 1.40 cfs @ 2.29 fps)

Pond SMA-5: SMA-5 Pocket Pond



Summary for Pond SMA-6: SMA-6 Pocket Pond

Inflow Area = 0.906 ac, 0.00% Impervious, Inflow Depth = 2.53" for 10-YEAR, 24-HOUR event
Inflow = 2.24 cfs @ 12.00 hrs, Volume= 0.191 af
Outflow = 1.28 cfs @ 12.29 hrs, Volume= 0.162 af, Atten= 43%, Lag= 16.9 min
Primary = 1.28 cfs @ 12.29 hrs, Volume= 0.162 af
Routed to Pond SMA-5 : SMA-5 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 942.68' @ 12.29 hrs Surf.Area= 1,882 sf Storage= 2,460 cf

Plug-Flow detention time= 132.2 min calculated for 0.162 af (85% of inflow)
Center-of-Mass det. time= 65.8 min (876.7 - 810.9)

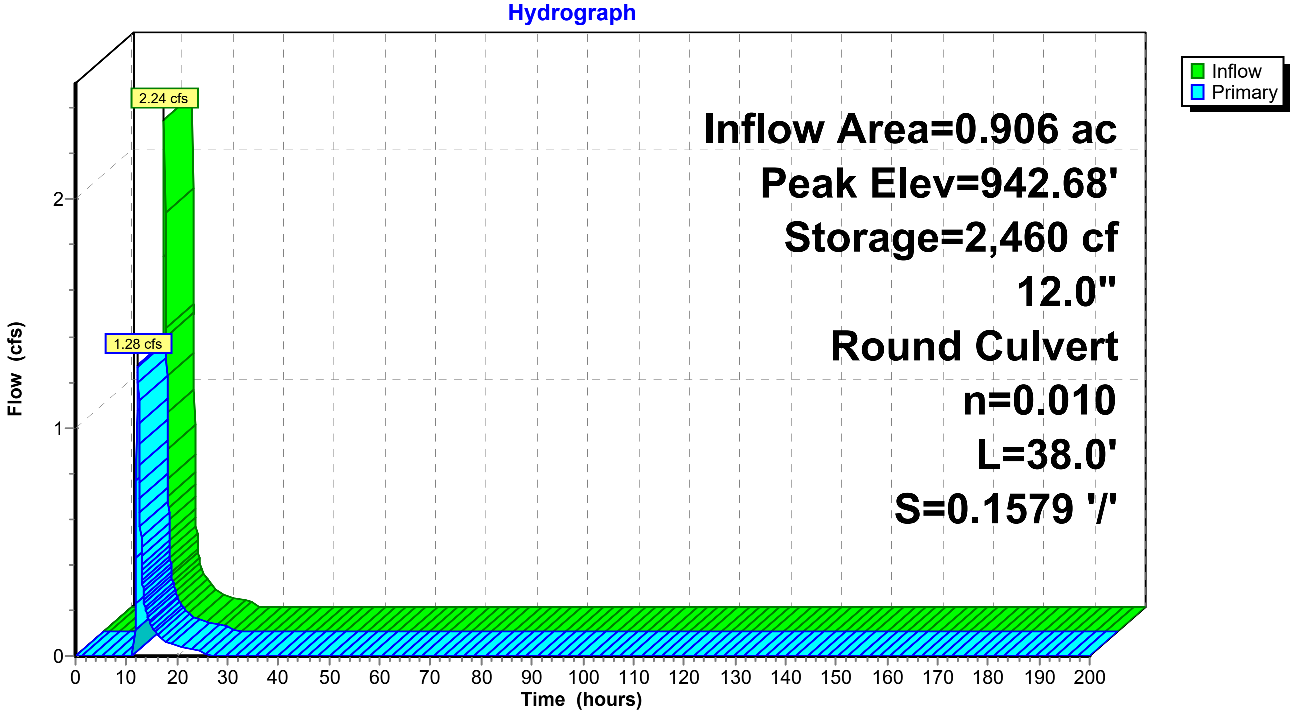
Volume	Invert	Avail.Storage	Storage Description
#1	940.00'	5,345 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
940.00	760	0	0
941.00	132	446	446
942.00	1,547	840	1,286
943.00	2,036	1,792	3,077
944.00	2,500	2,268	5,345

Device	Routing	Invert	Outlet Devices
#1	Primary	942.00'	**12.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 942.00' / 936.00' S= 0.1579 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.27 cfs @ 12.29 hrs HW=942.68' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.27 cfs @ 2.22 fps)

Pond SMA-6: SMA-6 Pocket Pond



Summary for Pond SMA-7: SMA-7 Pocket Pond

[93] Warning: Storage range exceeded by 30.57'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)
[62] Hint: Exceeded Reach 12R OUTLET depth by 28.24' @ 12.10 hrs
[64] Warning: Exceeded Reach 12R outlet bank by 26.57' @ 12.10 hrs

Inflow Area = 11.347 ac, 0.00% Impervious, Inflow Depth = 1.70" for 10-YEAR, 24-HOUR event
Inflow = 15.38 cfs @ 12.12 hrs, Volume= 1.607 af
Outflow = 16.91 cfs @ 12.10 hrs, Volume= 1.607 af, Atten= 0%, Lag= 0.0 min
Primary = 16.91 cfs @ 12.10 hrs, Volume= 1.607 af
Routed to Reach 9R : Flow to Northeast outlet

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 975.57' @ 12.10 hrs Surf.Area= 1,685 sf Storage= 2,513 cf

Plug-Flow detention time= 7.9 min calculated for 1.607 af (100% of inflow)
Center-of-Mass det. time= 7.9 min (852.9 - 845.0)

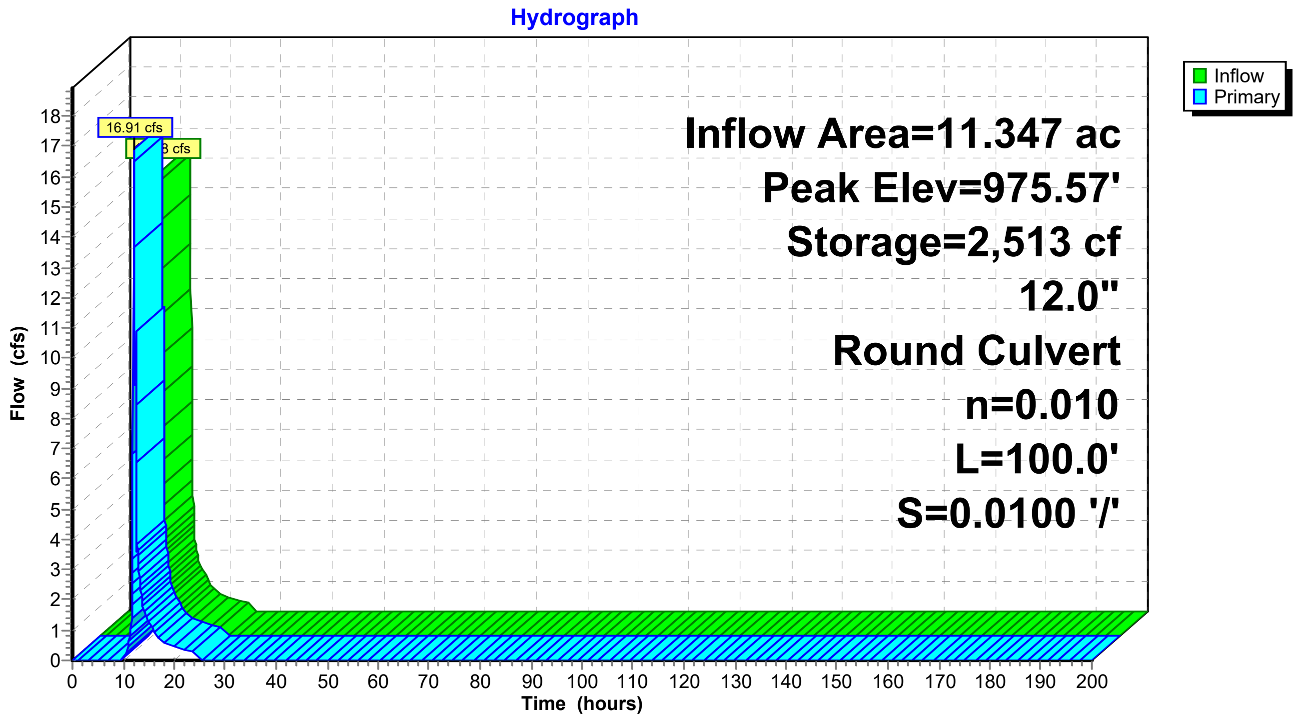
Volume	Invert	Avail.Storage	Storage Description
#1	943.00'	2,513 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
943.00	861	0	0
944.00	1,240	1,051	1,051
945.00	1,685	1,463	2,513

Device	Routing	Invert	Outlet Devices
#1	Primary	943.00'	**12.0" Round Culvert** L= 100.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 943.00' / 942.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=16.84 cfs @ 12.10 hrs HW=975.32' (Free Discharge)
└─**1=Culvert** (Inlet Controls 16.84 cfs @ 21.44 fps)

Pond SMA-7: SMA-7 Pocket Pond



Summary for Pond SMA-9: SMA-9 Pocket Pond

Inflow Area = 0.298 ac, 0.00% Impervious, Inflow Depth = 2.85" for 10-YEAR, 24-HOUR event
Inflow = 1.06 cfs @ 12.03 hrs, Volume= 0.071 af
Outflow = 1.06 cfs @ 12.04 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.1 min
Primary = 1.06 cfs @ 12.04 hrs, Volume= 0.071 af
Routed to Link DP-4 : Outfall to Southeast

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 963.28' @ 12.04 hrs Surf.Area= 0.001 ac Storage= 0.000 af

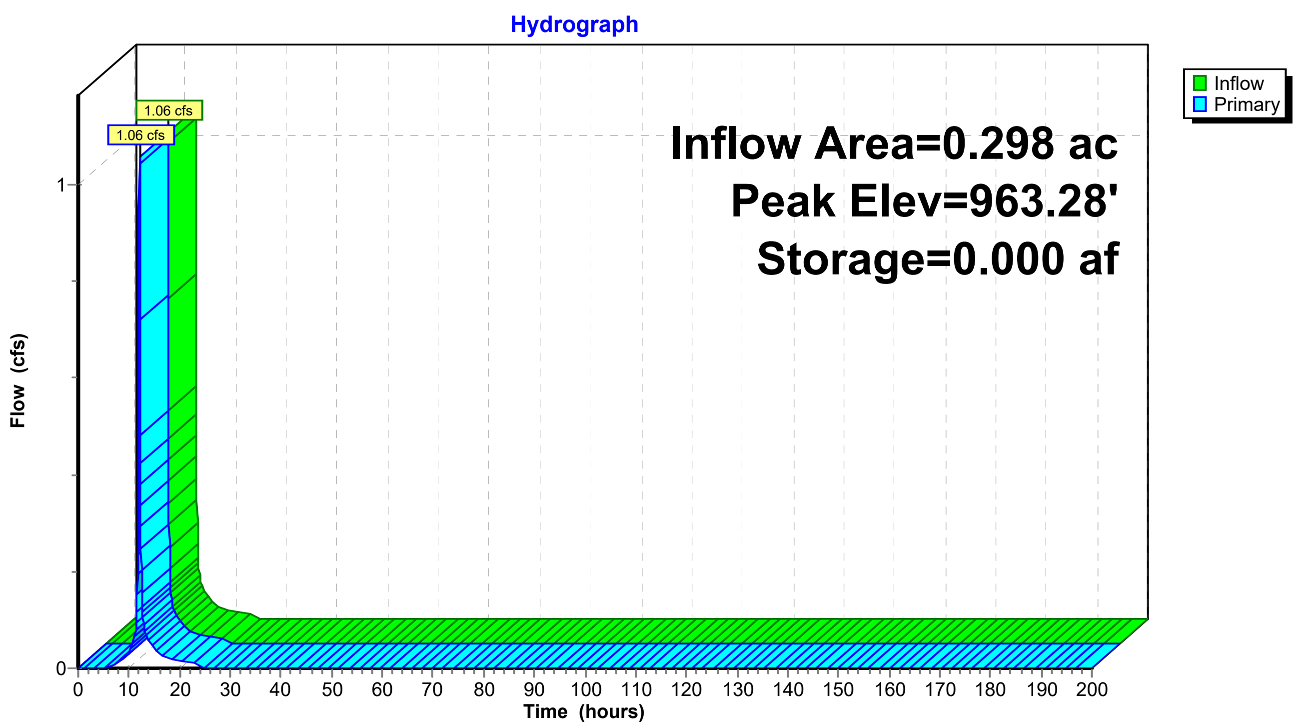
Plug-Flow detention time= 0.1 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (792.4 - 792.3)

Volume	Invert	Avail.Storage	Storage Description
#1	963.00'	0.046 af	**3.00'W x 3.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	963.00'	**3.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.01 cfs @ 12.04 hrs HW=963.27' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.01 cfs @ 1.25 fps)

Pond SMA-9: SMA-9 Pocket Pond

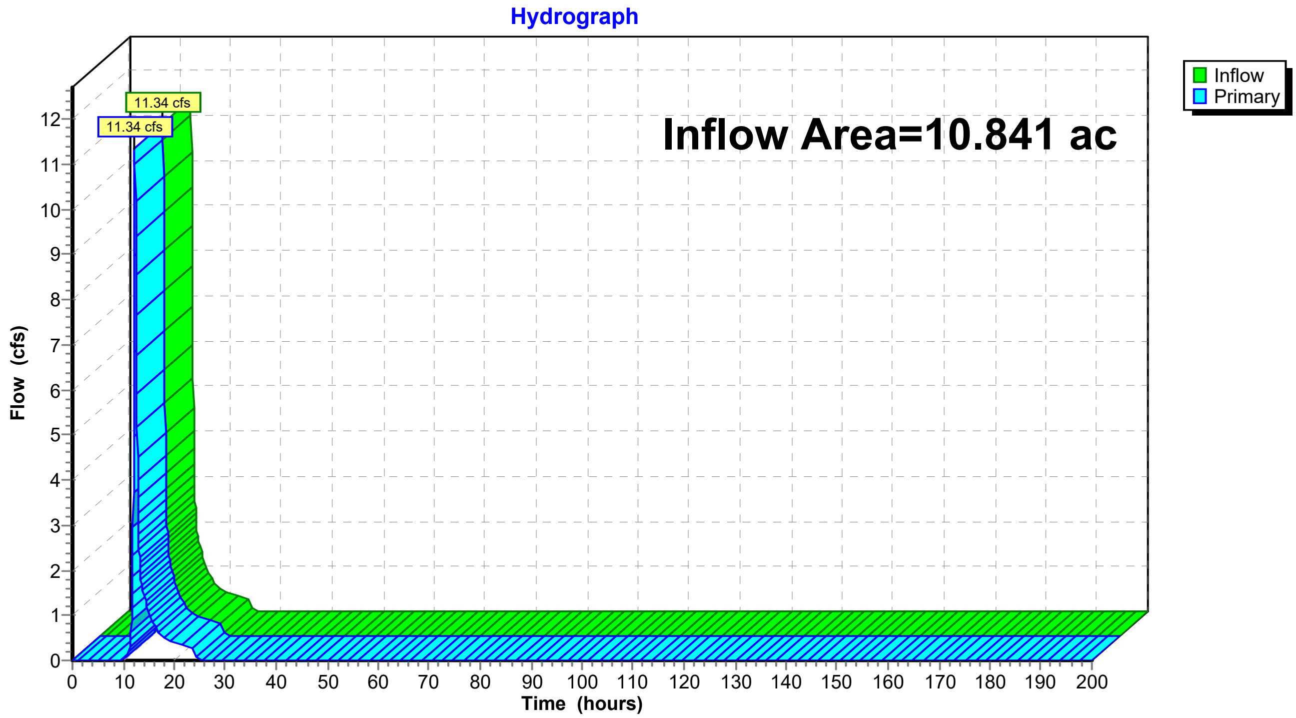


Summary for Link 215L: Subcatch 101 + 102

Inflow Area = 10.841 ac, 0.00% Impervious, Inflow Depth = 1.43" for 10-YEAR, 24-HOUR event
Inflow = 11.34 cfs @ 12.27 hrs, Volume= 1.294 af
Primary = 11.34 cfs @ 12.27 hrs, Volume= 1.294 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : Outfall to Southwest

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link 215L: Subcatch 101 + 102

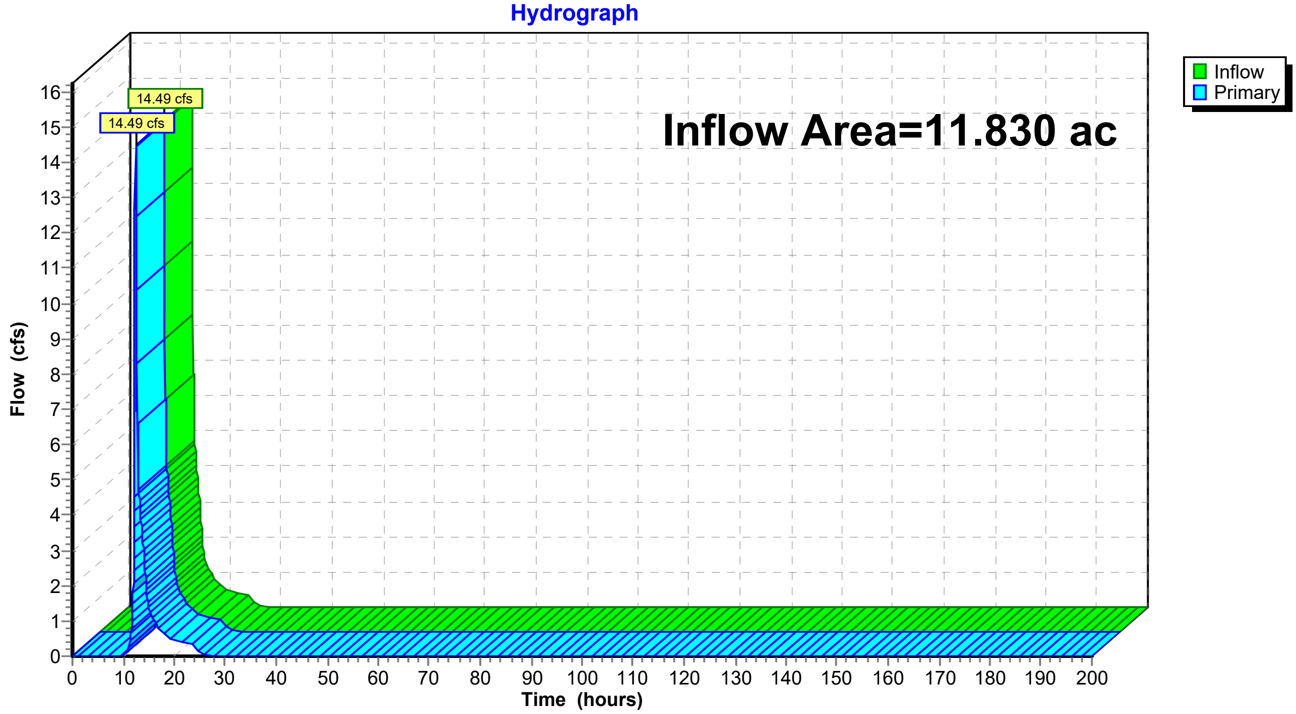


Summary for Link DP-1: Outfall to West

Inflow Area = 11.830 ac, 0.16% Impervious, Inflow Depth = 1.60" for 10-YEAR, 24-HOUR event
Inflow = 14.49 cfs @ 12.39 hrs, Volume= 1.579 af
Primary = 14.49 cfs @ 12.39 hrs, Volume= 1.579 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-1: Outfall to West

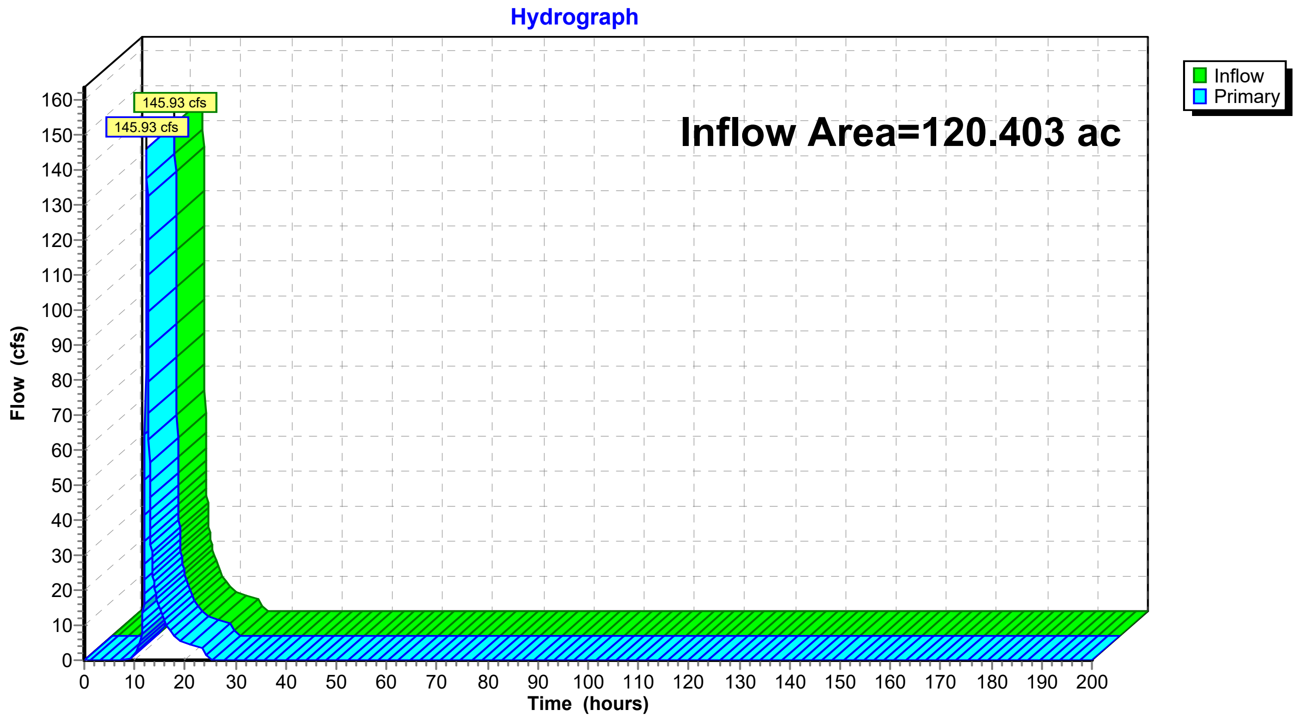


Summary for Link DP-2: Outfall to Northwest

Inflow Area = 120.403 ac, 0.92% Impervious, Inflow Depth = 1.77" for 10-YEAR, 24-HOUR event
Inflow = 145.93 cfs @ 12.39 hrs, Volume= 17.761 af
Primary = 145.93 cfs @ 12.39 hrs, Volume= 17.761 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-2: Outfall to Northwest

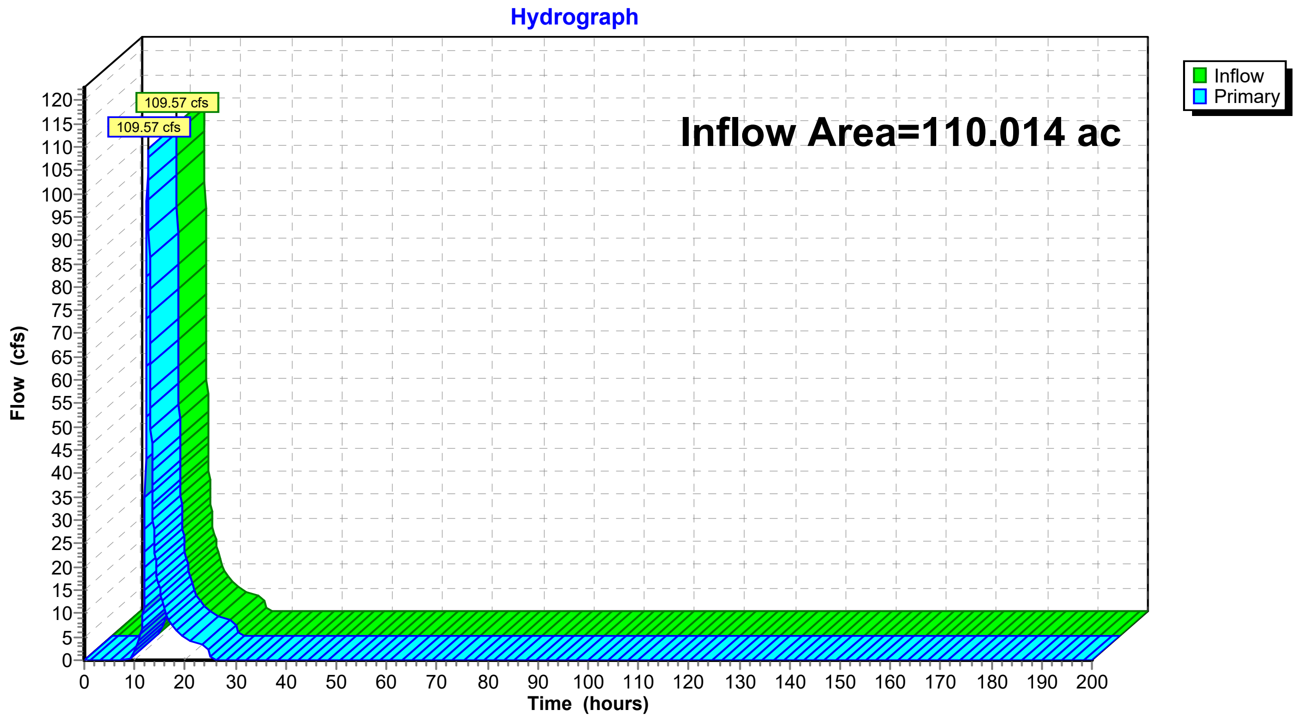


Summary for Link DP-3: Outfall to Southwest

Inflow Area = 110.014 ac, 0.00% Impervious, Inflow Depth = 1.90" for 10-YEAR, 24-HOUR event
Inflow = 109.57 cfs @ 12.61 hrs, Volume= 17.464 af
Primary = 109.57 cfs @ 12.61 hrs, Volume= 17.464 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-3: Outfall to Southwest

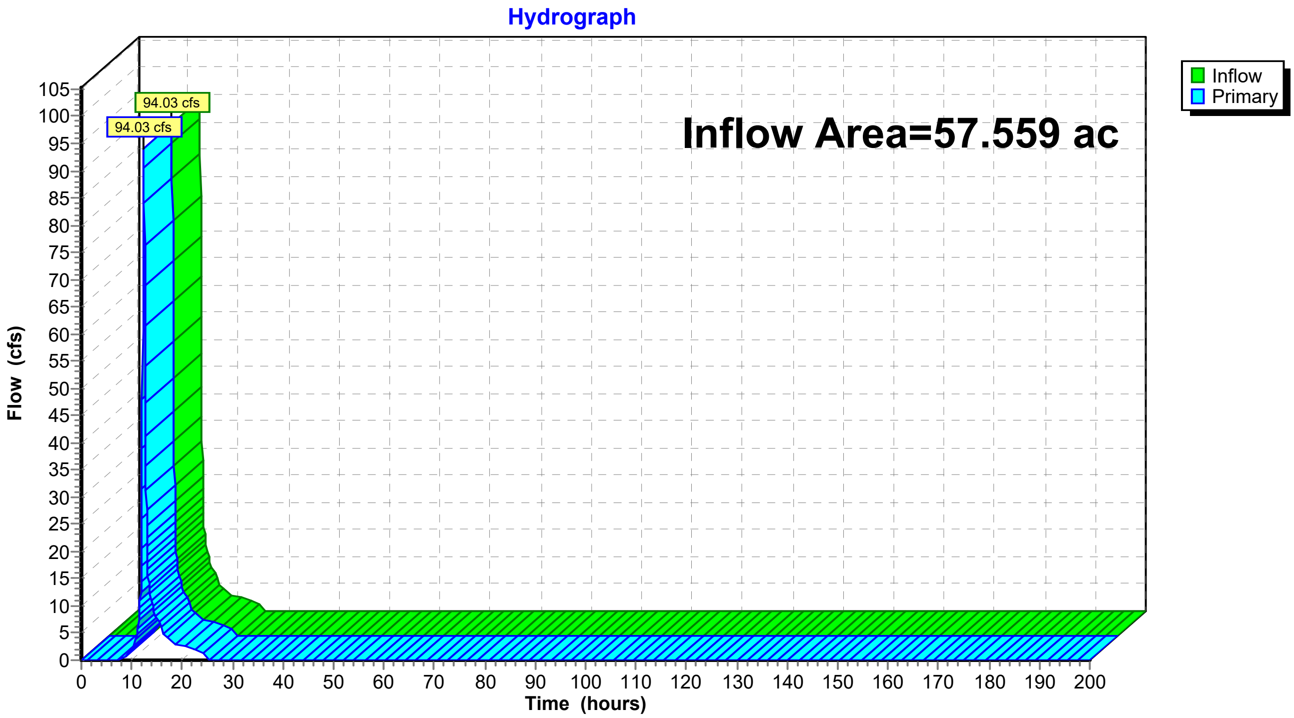


Summary for Link DP-4: Outfall to Southeast

Inflow Area = 57.559 ac, 0.00% Impervious, Inflow Depth = 2.21" for 10-YEAR, 24-HOUR event
Inflow = 94.03 cfs @ 12.34 hrs, Volume= 10.587 af
Primary = 94.03 cfs @ 12.34 hrs, Volume= 10.587 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-4: Outfall to Southeast



Time span=0.00-200.00 hrs, dt=0.05 hrs, 4001 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: Subcat 100 Runoff Area=11.830 ac 0.16% Impervious Runoff Depth=3.86"
Flow Length=773' Tc=22.8 min CN=76 Runoff=34.09 cfs 3.805 af

Subcatchment101: Subcat 101 Runoff Area=5.410 ac 0.00% Impervious Runoff Depth=3.55"
Flow Length=845' Tc=15.1 min CN=73 Runoff=16.92 cfs 1.601 af

Subcatchment102: Subcat 102 Runoff Area=5.431 ac 0.00% Impervious Runoff Depth=3.65"
Flow Length=1,119' Tc=24.2 min CN=74 Runoff=14.43 cfs 1.653 af

Subcatchment200: Subcat 200 Runoff Area=83.894 ac 1.33% Impervious Runoff Depth=4.17"
Flow Length=4,461' Tc=27.5 min UI Adjusted CN=79 Runoff=240.32 cfs 29.185 af

Subcatchment201: Subcat 201 Runoff Area=10.257 ac 0.00% Impervious Runoff Depth=4.07"
Flow Length=1,008' Tc=14.7 min CN=78 Runoff=37.07 cfs 3.478 af

Subcatchment202: Subcat 202 Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=3.76"
Flow Length=260' Tc=7.7 min CN=75 Runoff=1.82 cfs 0.139 af

Subcatchment203: Subcat 203 Runoff Area=5.186 ac 0.00% Impervious Runoff Depth=3.86"
Flow Length=827' Tc=15.4 min CN=76 Runoff=17.51 cfs 1.668 af

Subcatchment204: Subcat 204 Runoff Area=0.186 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=175' Tc=0.4 min CN=86 Runoff=1.19 cfs 0.077 af

Subcatchment205: Subcat 205 Runoff Area=0.203 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=236' Tc=0.7 min CN=86 Runoff=1.29 cfs 0.083 af

Subcatchment206: Subcat 206 Runoff Area=0.678 ac 0.00% Impervious Runoff Depth=4.07"
Flow Length=489' Tc=15.4 min CN=78 Runoff=2.41 cfs 0.230 af

Subcatchment207: Subcat 207 Runoff Area=0.099 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=132' Tc=0.5 min CN=86 Runoff=0.63 cfs 0.041 af

Subcatchment208: Subcat 208 Runoff Area=0.475 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=681' Tc=2.7 min CN=86 Runoff=2.91 cfs 0.195 af

Subcatchment209: Subcat 209 Runoff Area=7.634 ac 0.00% Impervious Runoff Depth=3.96"
Flow Length=567' Tc=15.3 min CN=77 Runoff=26.52 cfs 2.522 af

Subcatchment300: Subcat 300 Runoff Area=96.162 ac 0.00% Impervious Runoff Depth=4.39"
Flow Length=4,194' Tc=45.6 min CN=81 Runoff=226.27 cfs 35.165 af

Subcatchment301: Subcat 301 Runoff Area=0.301 ac 0.00% Impervious Runoff Depth=5.27"
Flow Length=2,290' Tc=14.6 min CN=89 Runoff=1.36 cfs 0.132 af

Subcatchment302: Subcat 302 Runoff Area=7.050 ac 0.00% Impervious Runoff Depth=3.96"
Flow Length=878' Slope=0.1180 '/' Tc=13.3 min CN=77 Runoff=25.68 cfs 2.329 af

Subcatchment 303: Subcat 303 Runoff Area=4.296 ac 0.00% Impervious Runoff Depth=4.07"
Tc=0.0 min CN=78 Runoff=23.46 cfs 1.457 af

Subcatchment 304: Subcat 304 Runoff Area=0.604 ac 0.00% Impervious Runoff Depth=5.05"
Tc=0.0 min CN=87 Runoff=3.96 cfs 0.254 af

Subcatchment 305: Subcat 305 Runoff Area=0.143 ac 0.00% Impervious Runoff Depth=4.93"
Tc=0.0 min CN=86 Runoff=0.92 cfs 0.059 af

Subcatchment 306: Subcat 306 Runoff Area=1.961 ac 0.00% Impervious Runoff Depth=4.60"
Tc=0.0 min CN=83 Runoff=11.95 cfs 0.753 af

Subcatchment 400: Subcat 400 Runoff Area=43.571 ac 0.00% Impervious Runoff Depth=4.71"
Flow Length=1,691' Tc=23.4 min CN=84 Runoff=149.47 cfs 17.115 af

Subcatchment 401: Subcat 401 Runoff Area=12.329 ac 0.00% Impervious Runoff Depth=4.71"
Flow Length=1,337' Tc=18.7 min CN=84 Runoff=46.39 cfs 4.843 af

Subcatchment 402: Subcat 402 Runoff Area=1.361 ac 0.00% Impervious Runoff Depth=4.17"
Flow Length=689' Tc=14.6 min CN=79 Runoff=5.05 cfs 0.474 af

Subcatchment 403: Subcat 403 Runoff Area=0.298 ac 0.00% Impervious Runoff Depth=5.50"
Flow Length=562' Tc=2.0 min CN=91 Runoff=1.96 cfs 0.137 af

Reach 8R: Wetland Stream Avg. Flow Depth=0.17' Max Vel=2.14 fps Inflow=2.76 cfs 0.416 af
n=0.040 L=2,450.0' S=0.0392 '/' Capacity=238.28 cfs Outflow=2.50 cfs 0.416 af

Reach 9R: Flow to Northeast outlet Avg. Flow Depth=0.96' Max Vel=5.11 fps Inflow=37.53 cfs 3.785 af
n=0.040 L=2,500.0' S=0.0464 '/' Capacity=36.76 cfs Outflow=32.90 cfs 3.785 af

Reach 12R: Diversion Swale Avg. Flow Depth=0.65' Max Vel=8.76 fps Inflow=23.46 cfs 1.457 af
n=0.035 L=475.0' S=0.1368 '/' Capacity=266.51 cfs Outflow=21.33 cfs 1.457 af

Reach 211R: (new Reach) Inflow=309.68 cfs 37.464 af
Outflow=309.68 cfs 37.464 af

Reach 213R: (new Reach) Avg. Flow Depth=1.31' Max Vel=7.88 fps Inflow=38.48 cfs 3.617 af
n=0.035 L=500.0' S=0.0736 '/' Capacity=21.02 cfs Outflow=37.68 cfs 3.617 af

Reach 224R: Roadside Swale Avg. Flow Depth=0.15' Max Vel=3.78 fps Inflow=1.36 cfs 0.132 af
n=0.035 L=497.0' S=0.1328 '/' Capacity=262.54 cfs Outflow=1.33 cfs 0.132 af

Reach 307R: (new Reach) Avg. Flow Depth=1.64' Max Vel=5.89 fps Inflow=51.15 cfs 5.316 af
n=0.030 L=1,215.0' S=0.0568 '/' Capacity=6.96 cfs Outflow=48.78 cfs 5.316 af

Pond 1P: Subcatch 402 to 401 Culvert Peak Elev=3.37' Inflow=5.05 cfs 0.474 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0000 '/' Outflow=5.05 cfs 0.474 af

Pond 2P: SMA-8 Pocket Pond Peak Elev=1,232.11' Storage=504 cf Inflow=48.78 cfs 5.316 af
12.0" Round Culvert n=0.010 L=100.0' S=0.0100 '/' Outflow=48.75 cfs 5.316 af

Pond 3P: SMA-2 Pocket Pond Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.010 L=25.0' S=0.0400 '/' Primary=0.00 cfs 0.000 af

Pond 4P: SMA-3 Pocket Pond Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.010 L=47.0' S=0.0213 '/' Primary=0.00 cfs 0.000 af

Pond 5P: Subcatch 301 to 304 Culvert Peak Elev=0.88' Inflow=1.36 cfs 0.132 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0000 '/' Outflow=1.36 cfs 0.132 af

Pond 11P: Subcatch 303 to 302 Culvert Peak Elev=1,079.21' Inflow=23.46 cfs 1.457 af
12.0" Round Culvert n=0.010 L=60.0' S=0.0667 '/' Outflow=23.46 cfs 1.457 af

Pond SMA-1: SMA-1 Infiltration Basin Peak Elev=1,030.10' Storage=9,146 cf Inflow=34.09 cfs 3.805 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0800 '/' Outflow=42.29 cfs 3.805 af

Pond SMA-10: SMA-10 Pocket Pond Peak Elev=1,042.86' Storage=0.002 af Inflow=1.82 cfs 0.139 af
12.0" Round Culvert n=0.012 L=66.0' S=0.0152 '/' Outflow=1.79 cfs 0.139 af

Pond SMA-11: SMA-11 Pocket Pond Peak Elev=1,038.96' Storage=0.018 af Inflow=17.51 cfs 1.668 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/' Outflow=18.28 cfs 1.668 af

Pond SMA-12: SMA-12 Pocket Pond Peak Elev=1,002.32' Storage=0.063 af Inflow=21.11 cfs 1.973 af
Outflow=20.11 cfs 1.947 af

Pond SMA-13: SMA-13 Pocket Pond Peak Elev=1,003.02' Storage=0.069 af Inflow=37.68 cfs 3.617 af
Outflow=37.82 cfs 3.574 af

Pond SMA-14: SMA-14 Pocket Pond Peak Elev=1,017.46' Storage=0.002 af Inflow=2.41 cfs 0.230 af
Outflow=2.41 cfs 0.229 af

Pond SMA-15: SMA-15 Pocket Pond Peak Elev=1,017.22' Storage=0.006 af Inflow=1.29 cfs 0.083 af
Outflow=1.24 cfs 0.078 af

Pond SMA-16: SMA-16 Pocket Pond Peak Elev=1,119.68' Storage=0.170 af Inflow=26.52 cfs 2.522 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0167 '/' Outflow=28.20 cfs 2.500 af

Pond SMA-17: SMA-17 Pocket Pond Peak Elev=1,028.19' Storage=0.004 af Inflow=0.63 cfs 0.041 af
Outflow=0.60 cfs 0.038 af

Pond SMA-18: SMA-18 Pocket Pond Peak Elev=1,030.39' Storage=0.066 af Inflow=2.91 cfs 0.195 af
Outflow=2.48 cfs 0.143 af

Pond SMA-4: SMA-4 Pocket Pond Peak Elev=961.46' Storage=7,166 cf Inflow=11.95 cfs 0.753 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0167 '/' Outflow=12.55 cfs 0.594 af

Pond SMA-5: SMA-5 Pocket Pond Peak Elev=935.35' Storage=1,073 cf Inflow=3.13 cfs 0.416 af
12.0" Round Culvert n=0.010 L=25.0' S=0.0400 '/' Outflow=2.76 cfs 0.416 af

Pond SMA-6: SMA-6 Pocket Pond Peak Elev=943.23' Storage=3,557 cf Inflow=4.49 cfs 0.386 af
12.0" Round Culvert n=0.010 L=38.0' S=0.1579 '/' Outflow=2.55 cfs 0.357 af

Pond SMA-7: SMA-7 Pocket Pond Peak Elev=1,103.04' Storage=2,513 cf Inflow=36.22 cfs 3.785 af
12.0" Round Culvert n=0.010 L=100.0' S=0.0100 '/' Outflow=37.53 cfs 3.785 af

Pond SMA-9: SMA-9 Pocket Pond Peak Elev=963.41' Storage=0.000 af Inflow=1.96 cfs 0.137 af
Outflow=1.97 cfs 0.137 af

Link 215L: Subcatch 101 + 102 Inflow=29.62 cfs 3.254 af
Primary=29.62 cfs 3.254 af

Link DP-1: Outfall to West Inflow=42.29 cfs 3.805 af
Primary=42.29 cfs 3.805 af

Link DP-2: Outfall to Northwest Inflow=342.02 cfs 41.249 af
Primary=342.02 cfs 41.249 af

Link DP-3: Outfall to Southwest Inflow=246.03 cfs 39.428 af
Primary=246.03 cfs 39.428 af

Link DP-4: Outfall to Southeast Inflow=197.60 cfs 22.568 af
Primary=197.60 cfs 22.568 af

Total Runoff Area = 299.806 ac Runoff Volume = 107.391 af Average Runoff Depth = 4.30"
99.62% Pervious = 298.674 ac 0.38% Impervious = 1.132 ac

Summary for Subcatchment 100: Subcat 100

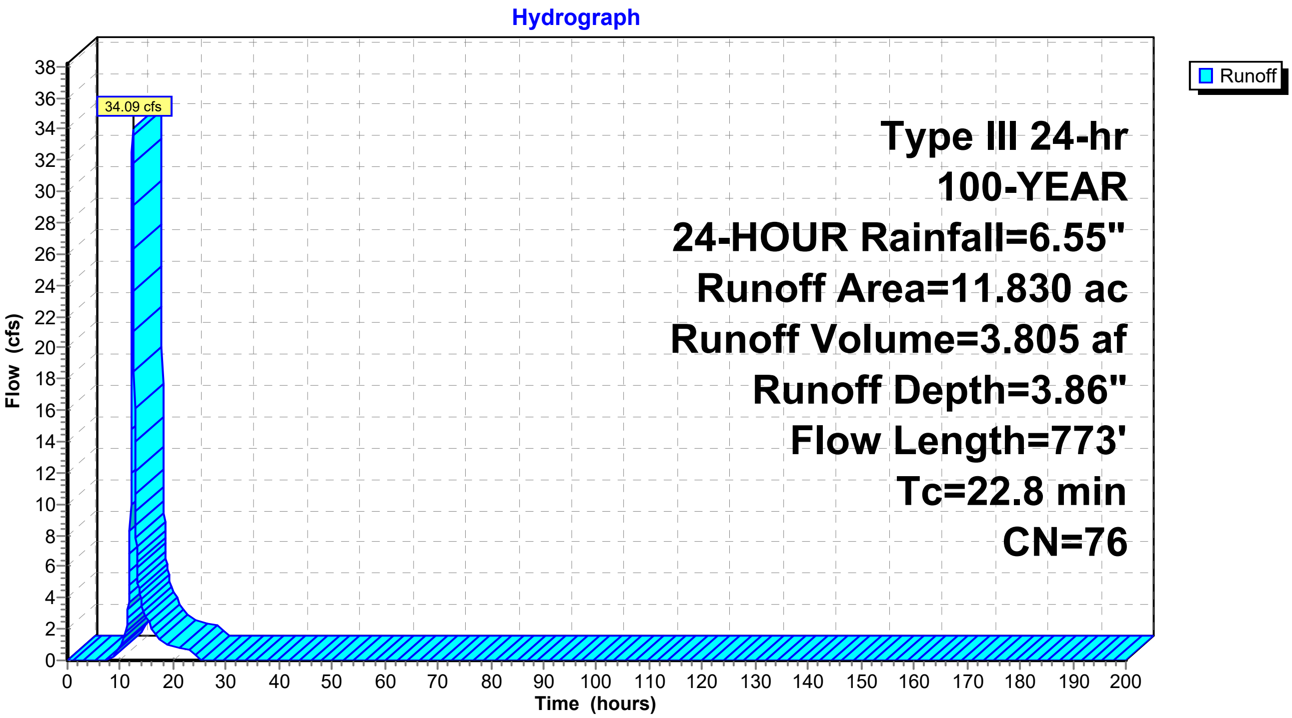
Runoff = 34.09 cfs @ 12.32 hrs, Volume= 3.805 af, Depth= 3.86"
Routed to Pond SMA-1 : SMA-1 Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.024	96	Gravel surface, HSG D
0.728	71	Meadow, non-grazed, HSG C
5.010	78	Meadow, non-grazed, HSG D
0.578	82	Row crops, contoured, Good, HSG C
0.501	86	Row crops, contoured, Good, HSG D
0.008	98	Unconnected roofs, HSG C
0.011	98	Unconnected roofs, HSG D
2.860	70	Woods, Good, HSG C
2.109	77	Woods, Good, HSG D
11.830	76	Weighted Average
11.811		99.84% Pervious Area
0.019		0.16% Impervious Area
0.019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
11.7	673	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.8	773	Total			

Subcatchment 100: Subcat 100



Summary for Subcatchment 101: Subcat 101

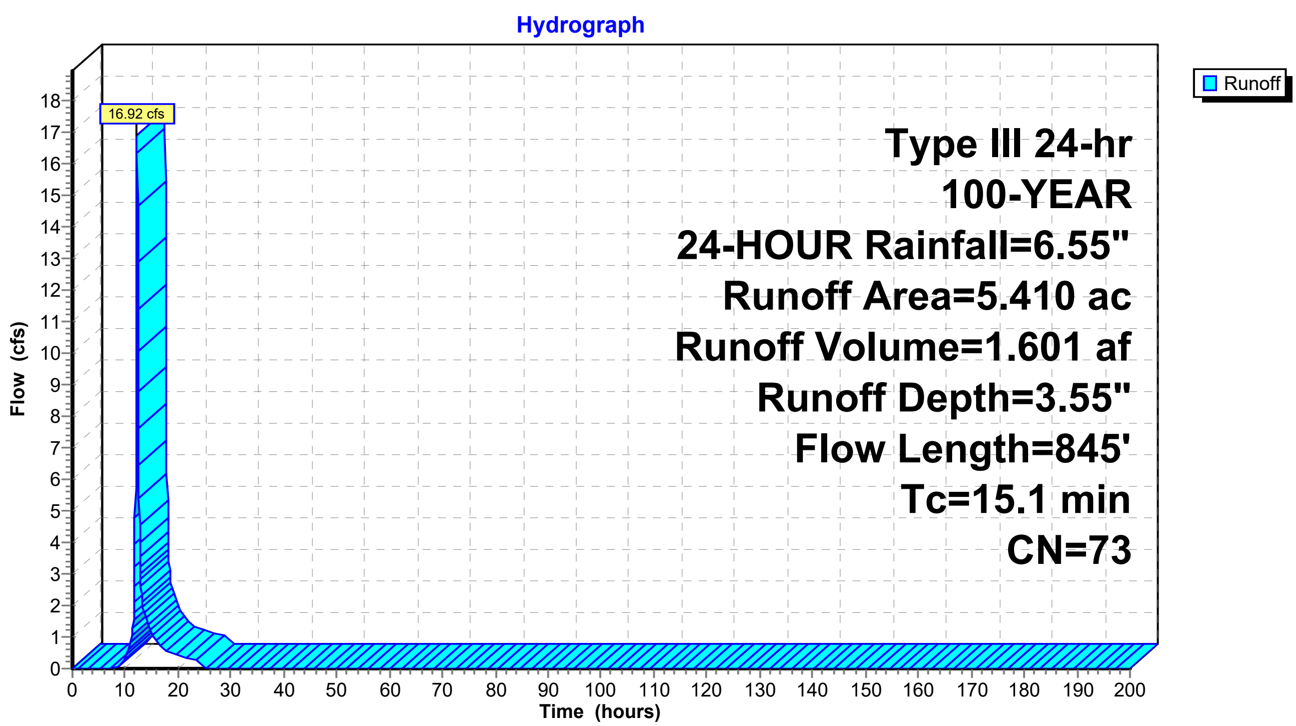
Runoff = 16.92 cfs @ 12.21 hrs, Volume= 1.601 af, Depth= 3.55"
Routed to Link 215L : Subcatch 101 + 102

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
0.104	96	Gravel surface, HSG D
4.400	71	Meadow, non-grazed, HSG C
0.903	78	Meadow, non-grazed, HSG D
5.410	73	Weighted Average
5.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1400	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
0.4	90	0.0560	3.81		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.3	655	0.0460	1.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.1	845	Total			

Subcatchment 101: Subcat 101



Summary for Subcatchment 102: Subcat 102

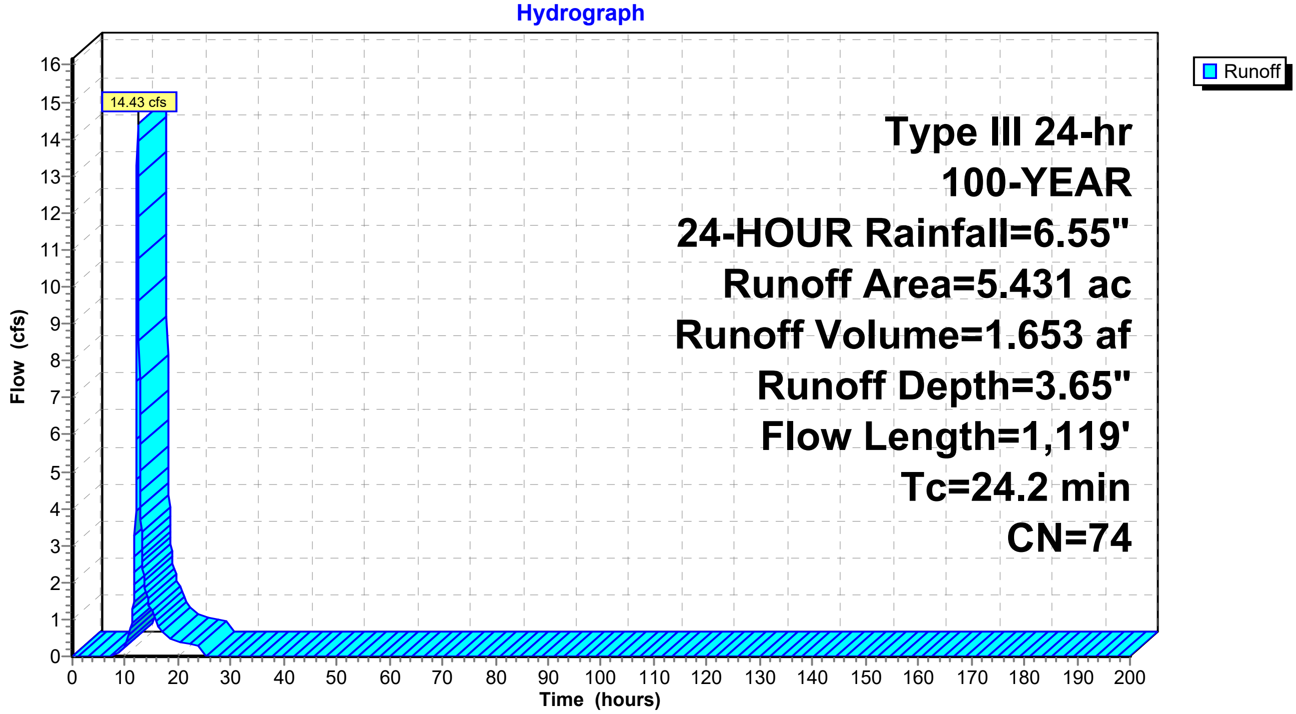
Runoff = 14.43 cfs @ 12.34 hrs, Volume= 1.653 af, Depth= 3.65"
Routed to Link 215L : Subcatch 101 + 102

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
2.103	71	Meadow, non-grazed, HSG C
1.832	78	Meadow, non-grazed, HSG D
0.041	86	Row crops, contoured, Good, HSG D
1.204	70	Woods, Good, HSG C
0.252	77	Woods, Good, HSG D
5.431	74	Weighted Average
5.431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
1.5	151	0.0330	1.63		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.5	133	0.0080	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	735	0.0340	1.29		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.2	1,119	Total			

Subcatchment 102: Subcat 102



Summary for Subcatchment 200: Subcat 200

[47] Hint: Peak is 1791% of capacity of segment #5

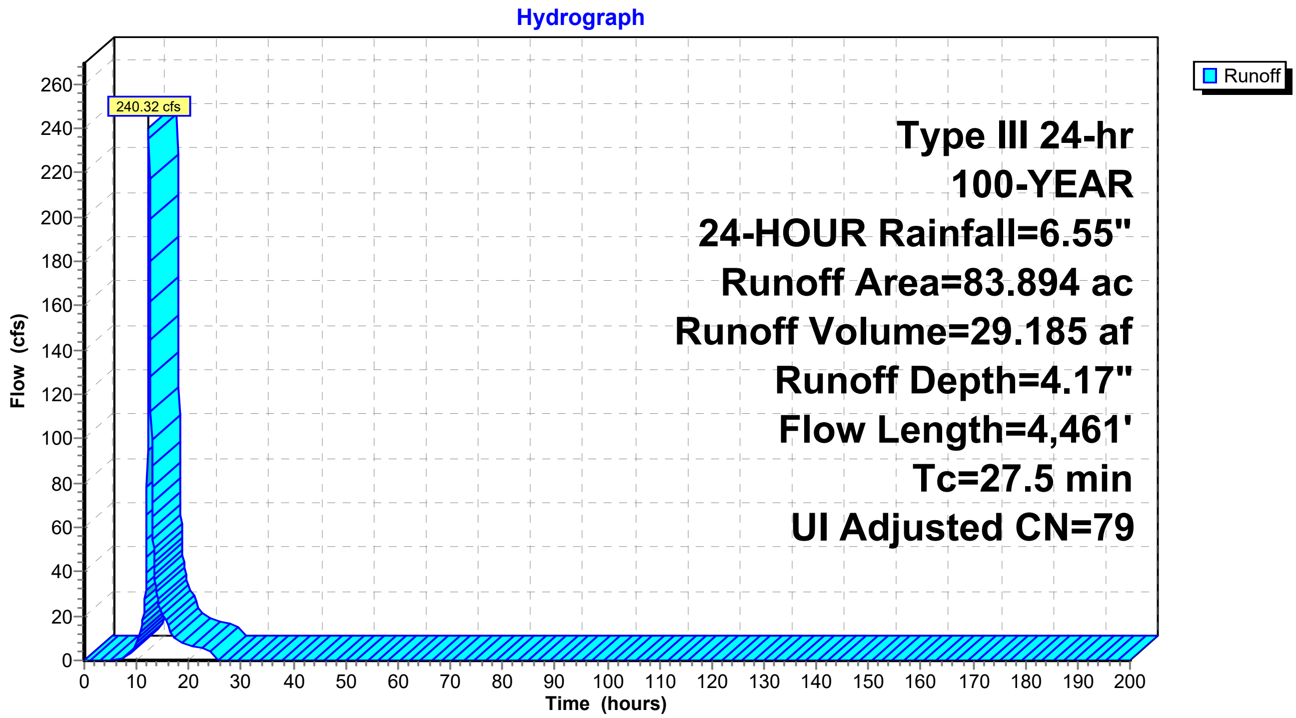
Runoff = 240.32 cfs @ 12.38 hrs, Volume= 29.185 af, Depth= 4.17"
Routed to Reach 211R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Adj	Description
0.215	96		Gravel surface, HSG C
0.337	96		Gravel surface, HSG D
2.936	71		Meadow, non-grazed, HSG C
44.017	78		Meadow, non-grazed, HSG D
0.616	65		Row crops, contoured, Good, HSG A
7.368	82		Row crops, contoured, Good, HSG C
13.931	86		Row crops, contoured, Good, HSG D
0.300	98		Unconnected roofs, HSG C
0.813	98		Unconnected roofs, HSG D
0.216	70		Woods, Good, HSG C
13.146	77		Woods, Good, HSG D
83.894	80	79	Weighted Average, UI Adjusted
82.781			98.67% Pervious Area
1.113			1.33% Impervious Area
1.113			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.2600	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
0.3	55	0.3090	2.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.0	690	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	330	0.2390	2.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.2	3,286	0.0300	4.47	13.42	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035 Earth, dense weeds
27.5	4,461	Total			

Subcatchment 200: Subcat 200



Summary for Subcatchment 201: Subcat 201

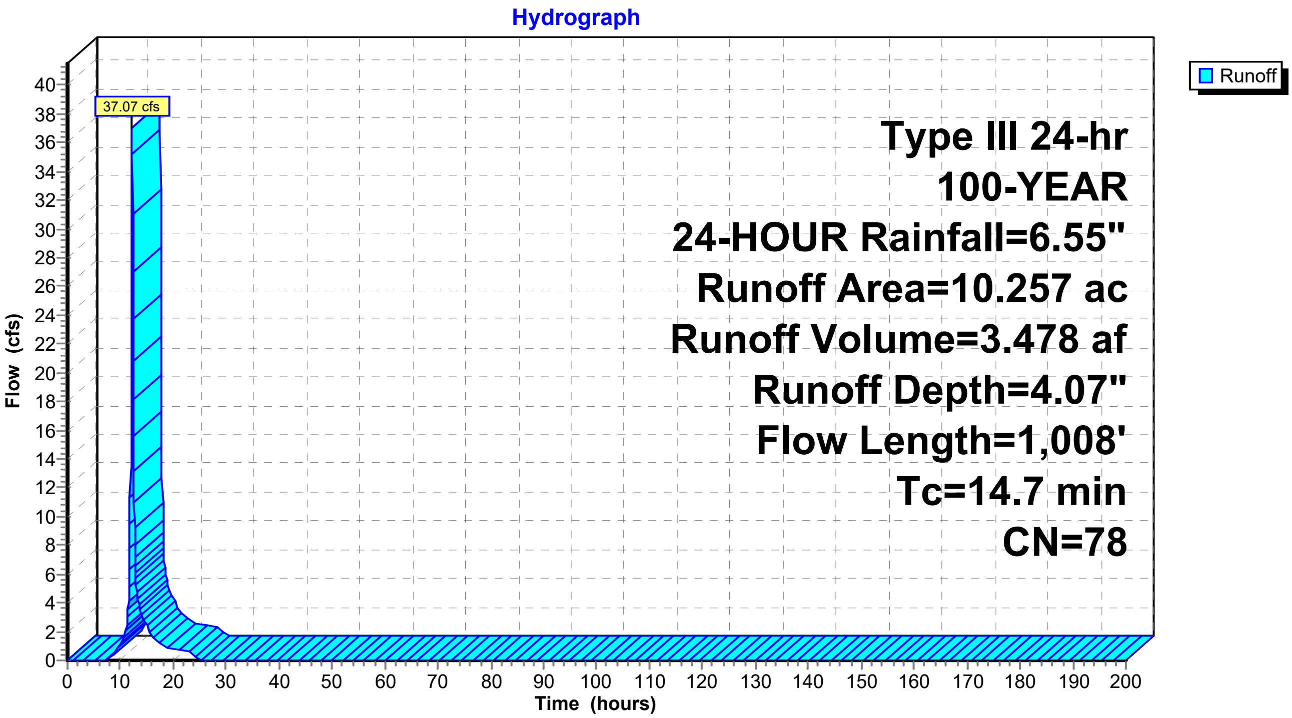
Runoff = 37.07 cfs @ 12.20 hrs, Volume= 3.478 af, Depth= 4.07"
Routed to Reach 213R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.128	96	Gravel surface, HSG C
0.146	96	Gravel surface, HSG D
1.009	71	Meadow, non-grazed, HSG C
5.521	78	Meadow, non-grazed, HSG D
0.249	86	Row crops, contoured, Good, HSG D
3.204	77	Woods, Good, HSG D
10.257	78	Weighted Average
10.257		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.2800	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.53"
1.4	150	0.1270	1.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	758	0.1370	2.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.7	1,008	Total			

Subcatchment 201: Subcat 201



Summary for Subcatchment 202: Subcat 202

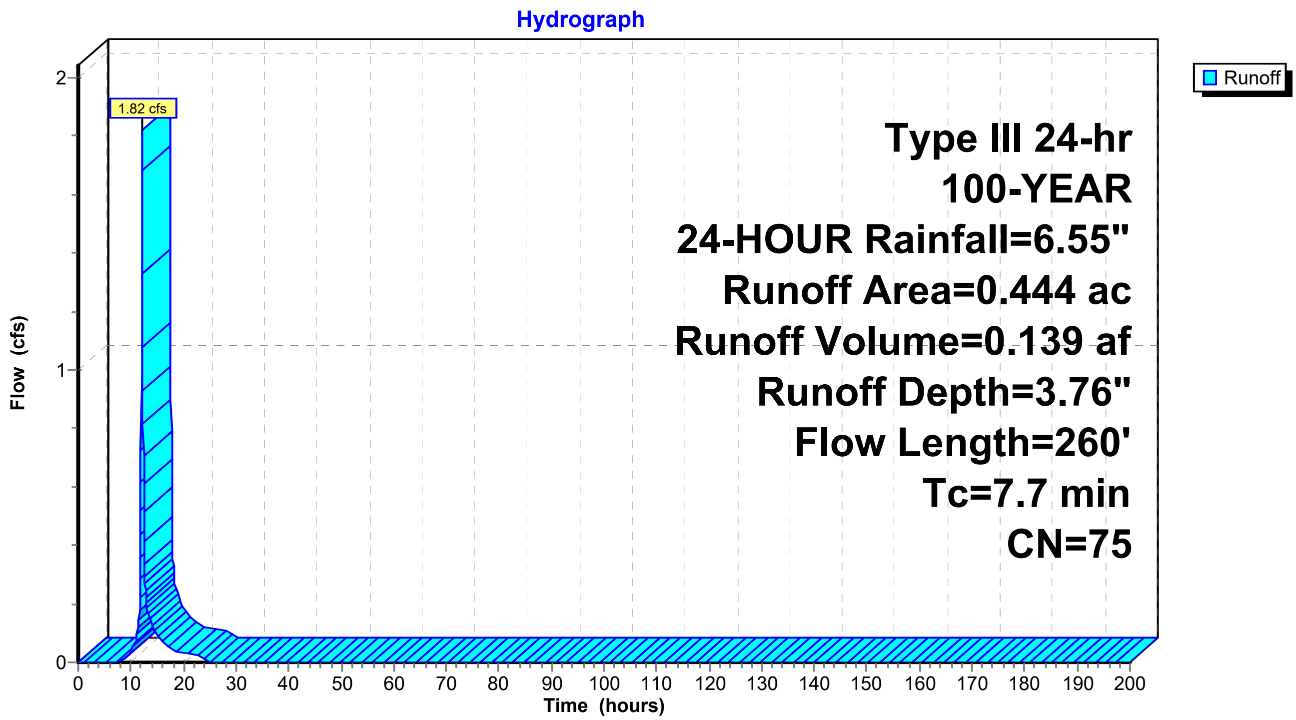
Runoff = 1.82 cfs @ 12.11 hrs, Volume= 0.139 af, Depth= 3.76"
Routed to Pond SMA-10 : SMA-10 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG C
0.168	71	Meadow, non-grazed, HSG C
0.276	78	Meadow, non-grazed, HSG D
0.444	75	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	100	0.2000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
1.3	160	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	260	Total			

Subcatchment 202: Subcat 202



Summary for Subcatchment 203: Subcat 203

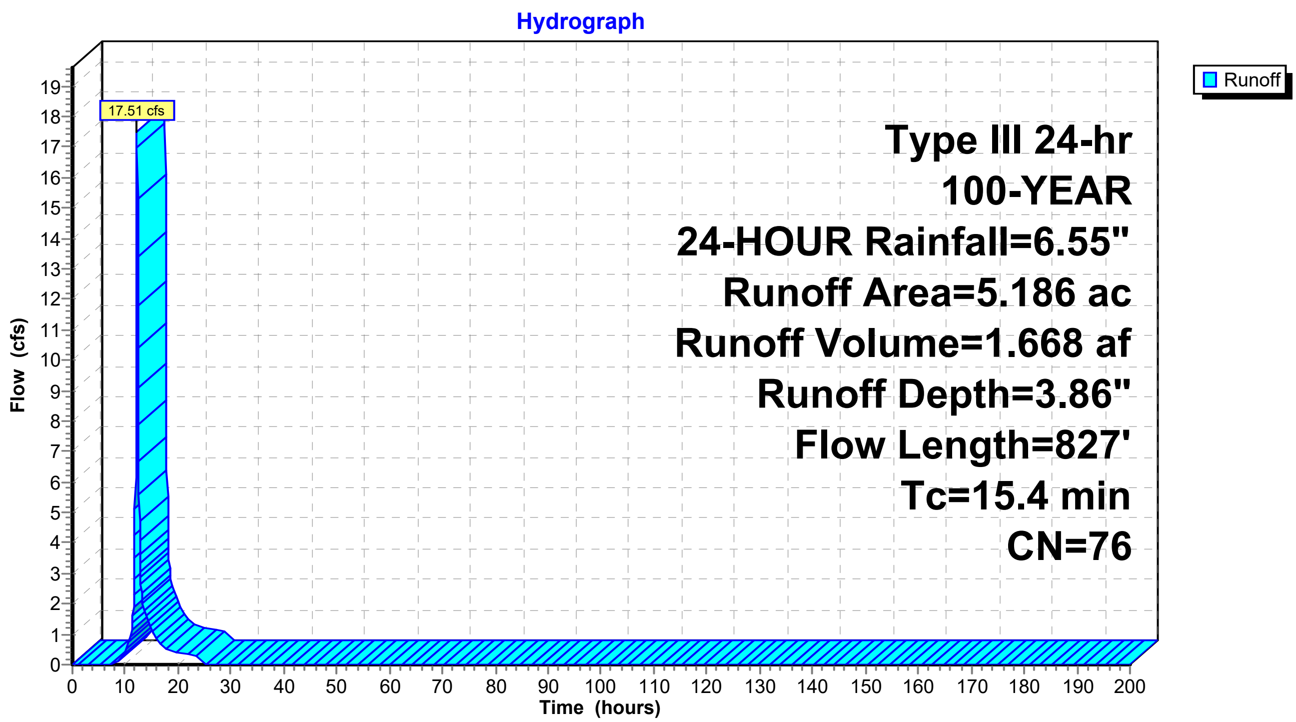
Runoff = 17.51 cfs @ 12.21 hrs, Volume= 1.668 af, Depth= 3.86"
Routed to Pond SMA-11 : SMA-11 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
1.673	71	Meadow, non-grazed, HSG C
3.513	78	Meadow, non-grazed, HSG D
5.186	76	Weighted Average
5.186		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
6.2	727	0.0770	1.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.4	827	Total			

Subcatchment 203: Subcat 203



Summary for Subcatchment 204: Subcat 204

[49] Hint: Tc<2dt may require smaller dt

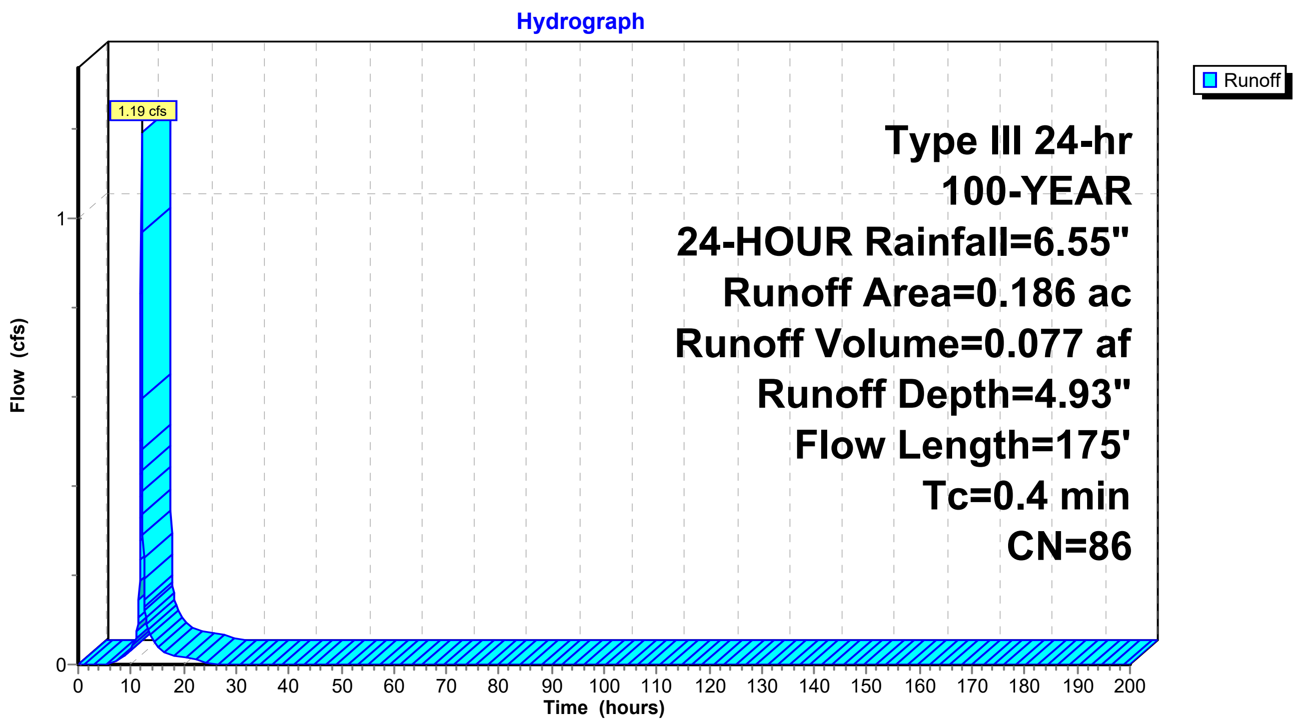
Runoff = 1.19 cfs @ 12.01 hrs, Volume= 0.077 af, Depth= 4.93"
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.085	96	Gravel surface, HSG D
0.102	78	Meadow, non-grazed, HSG D
0.186	86	Weighted Average
0.186		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	48	0.1250	5.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	127	0.0630	6.48	19.44	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.4	175	Total			

Subcatchment 204: Subcat 204



Summary for Subcatchment 205: Subcat 205

[49] Hint: Tc<2dt may require smaller dt

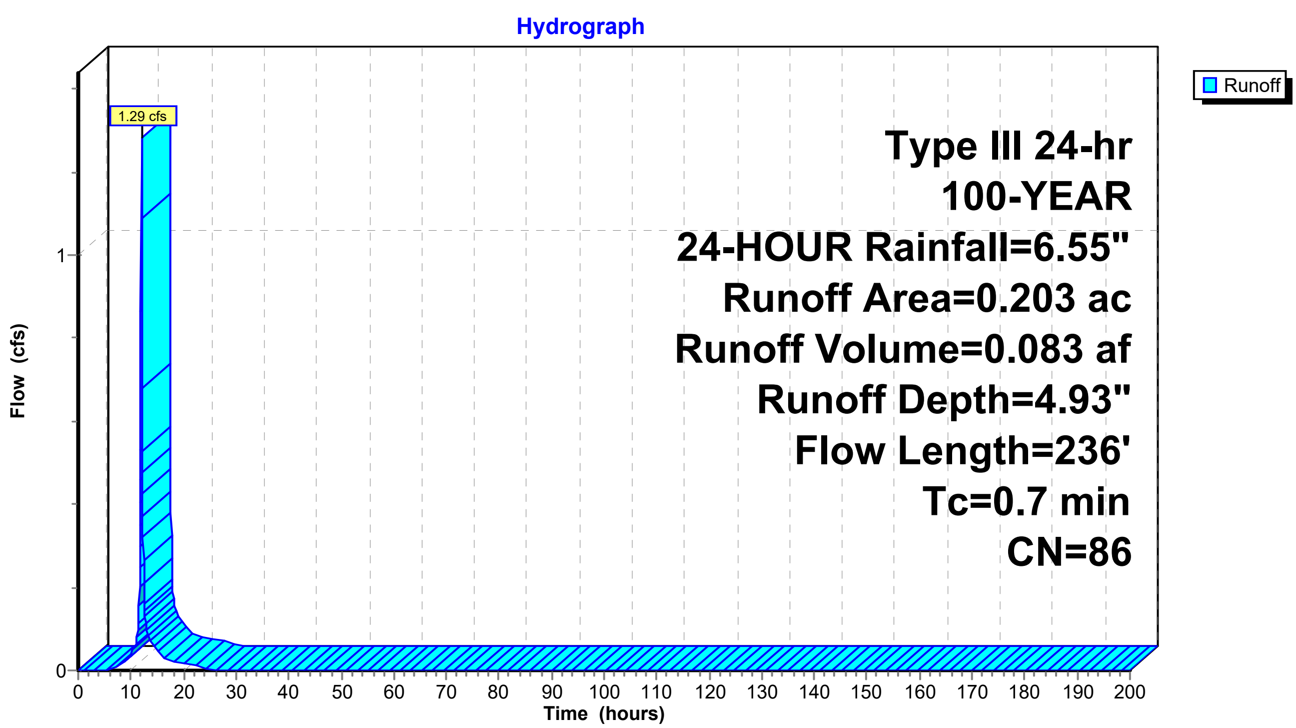
Runoff = 1.29 cfs @ 12.01 hrs, Volume= 0.083 af, Depth= 4.93"
Routed to Pond SMA-15 : SMA-15 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.086	96	Gravel surface, HSG D
0.117	78	Meadow, non-grazed, HSG D
0.203	86	Weighted Average
0.203		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	58	0.0520	3.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	178	0.0670	6.68	20.05	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.7	236	Total			

Subcatchment 205: Subcat 205



Summary for Subcatchment 206: Subcat 206

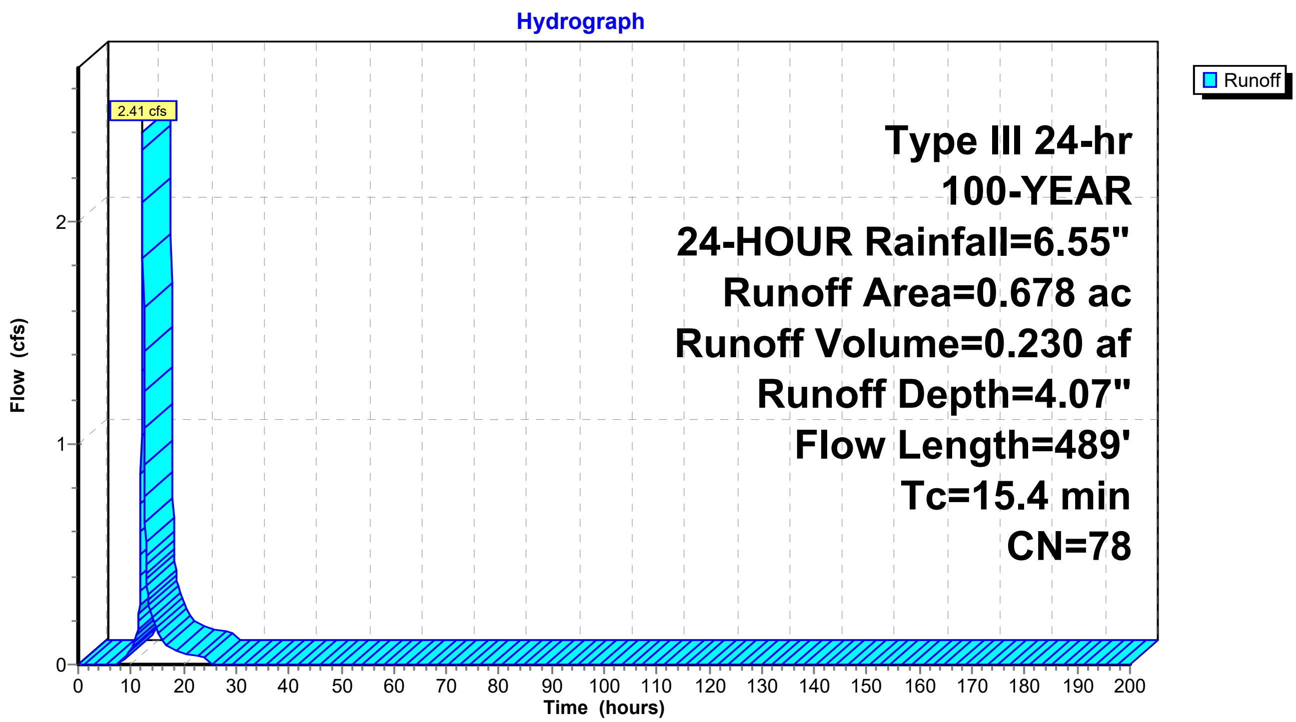
Runoff = 2.41 cfs @ 12.21 hrs, Volume= 0.230 af, Depth= 4.07"
Routed to Pond SMA-14 : SMA-14 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.001	96	Gravel surface, HSG D
0.677	78	Meadow, non-grazed, HSG D
0.678	78	Weighted Average
0.678		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
3.0	303	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	86	0.0580	6.22	18.66	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
15.4	489	Total			

Subcatchment 206: Subcat 206



Summary for Subcatchment 207: Subcat 207

[49] Hint: Tc<2dt may require smaller dt

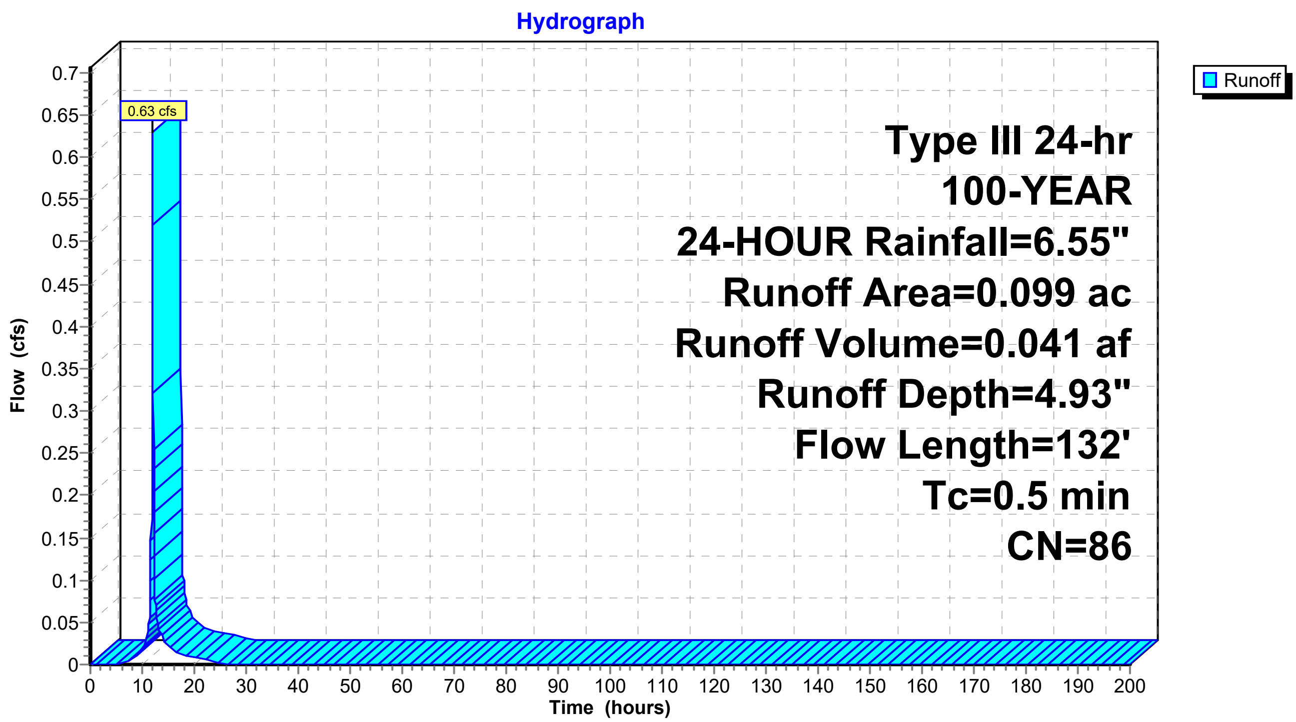
Runoff = 0.63 cfs @ 12.01 hrs, Volume= 0.041 af, Depth= 4.93"
Routed to Pond SMA-17 : SMA-17 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.046	96	Gravel surface, HSG D
0.053	78	Meadow, non-grazed, HSG D
0.099	86	Weighted Average
0.099		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.0330	2.92		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	102	0.0590	6.27	18.82	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
0.5	132	Total			

Subcatchment 207: Subcat 207



Summary for Subcatchment 208: Subcat 208

[49] Hint: Tc<2dt may require smaller dt

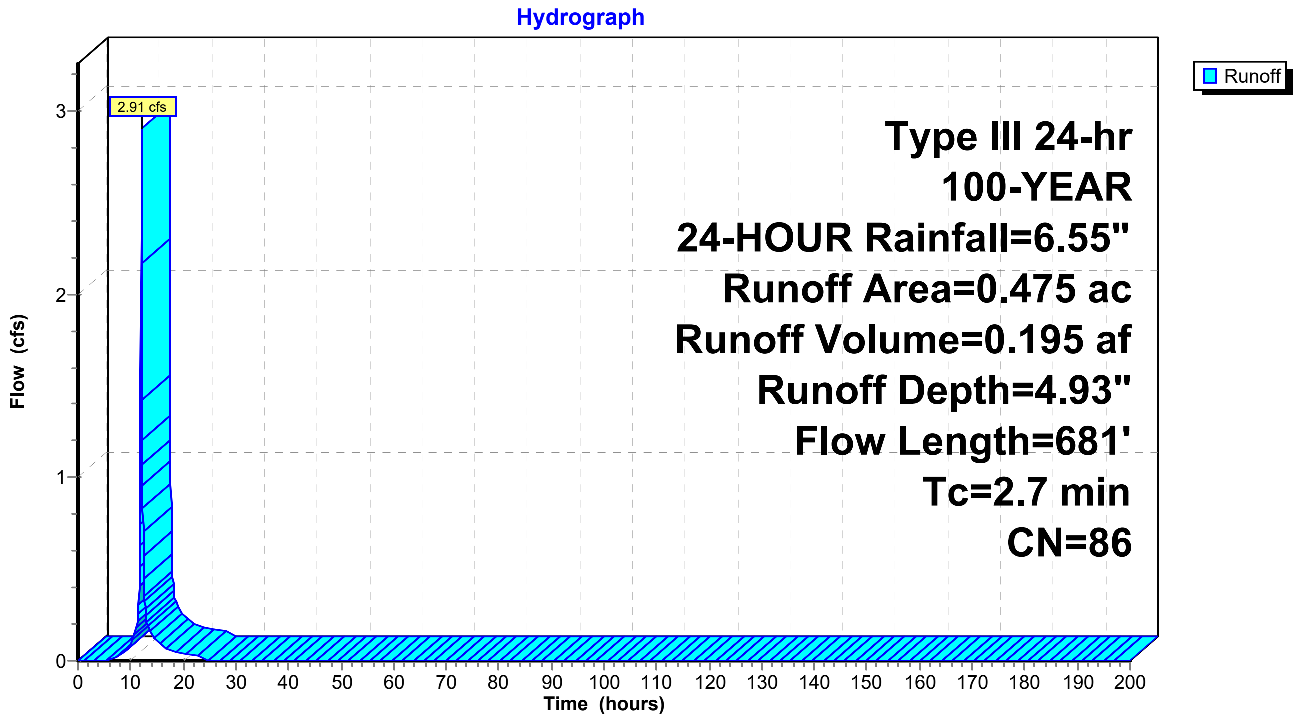
Runoff = 2.91 cfs @ 12.04 hrs, Volume= 0.195 af, Depth= 4.93"
Routed to Pond SMA-18 : SMA-18 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.103	96	Gravel surface, HSG C
0.132	96	Gravel surface, HSG D
0.066	71	Meadow, non-grazed, HSG C
0.173	78	Meadow, non-grazed, HSG D
0.475	86	Weighted Average
0.475		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	29	0.0340	2.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	652	0.0280	4.32	12.96	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
2.7	681	Total			

Subcatchment 208: Subcat 208



Summary for Subcatchment 209: Subcat 209

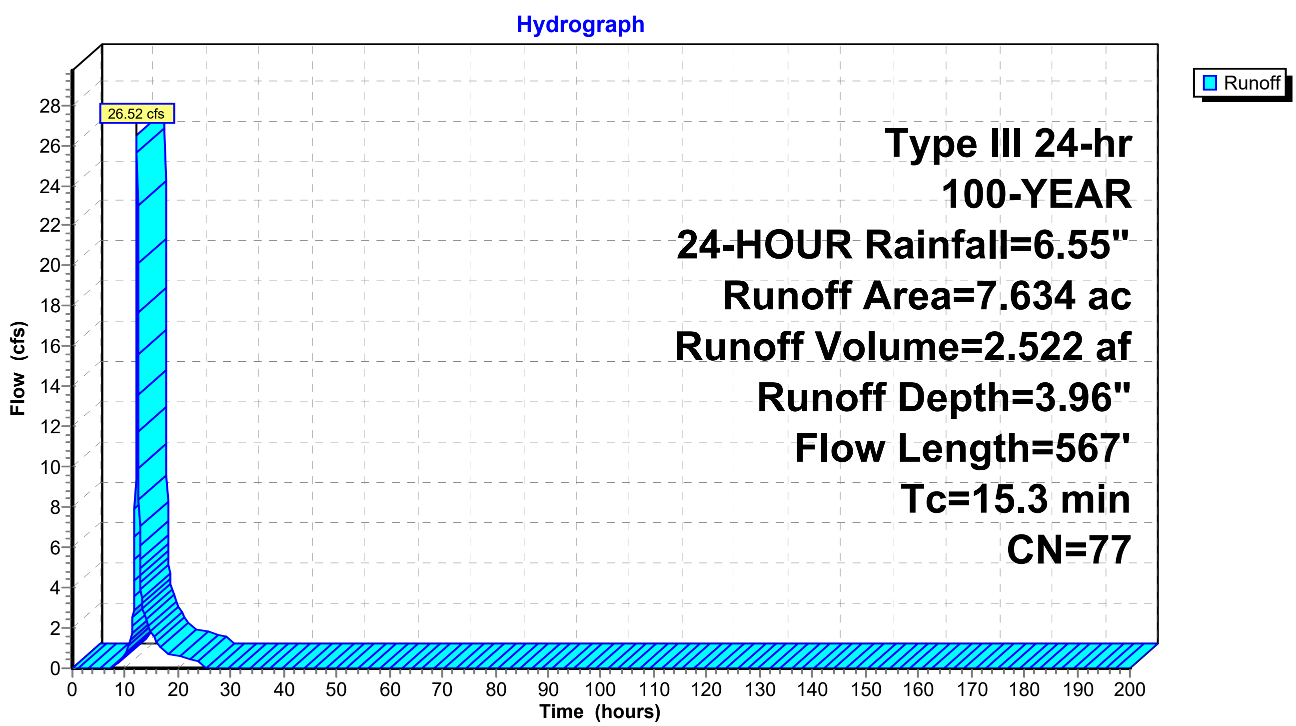
Runoff = 26.52 cfs @ 12.21 hrs, Volume= 2.522 af, Depth= 3.96"
Routed to Pond SMA-16 : SMA-16 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.001	96	Gravel surface, HSG D
1.096	71	Meadow, non-grazed, HSG C
6.537	78	Meadow, non-grazed, HSG D
7.634	77	Weighted Average
7.634		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0600	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
5.0	467	0.0490	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.3	567	Total			

Subcatchment 209: Subcat 209



Summary for Subcatchment 300: Subcat 300

[47] Hint: Peak is 1503% of capacity of segment #4
[47] Hint: Peak is 111% of capacity of segment #5

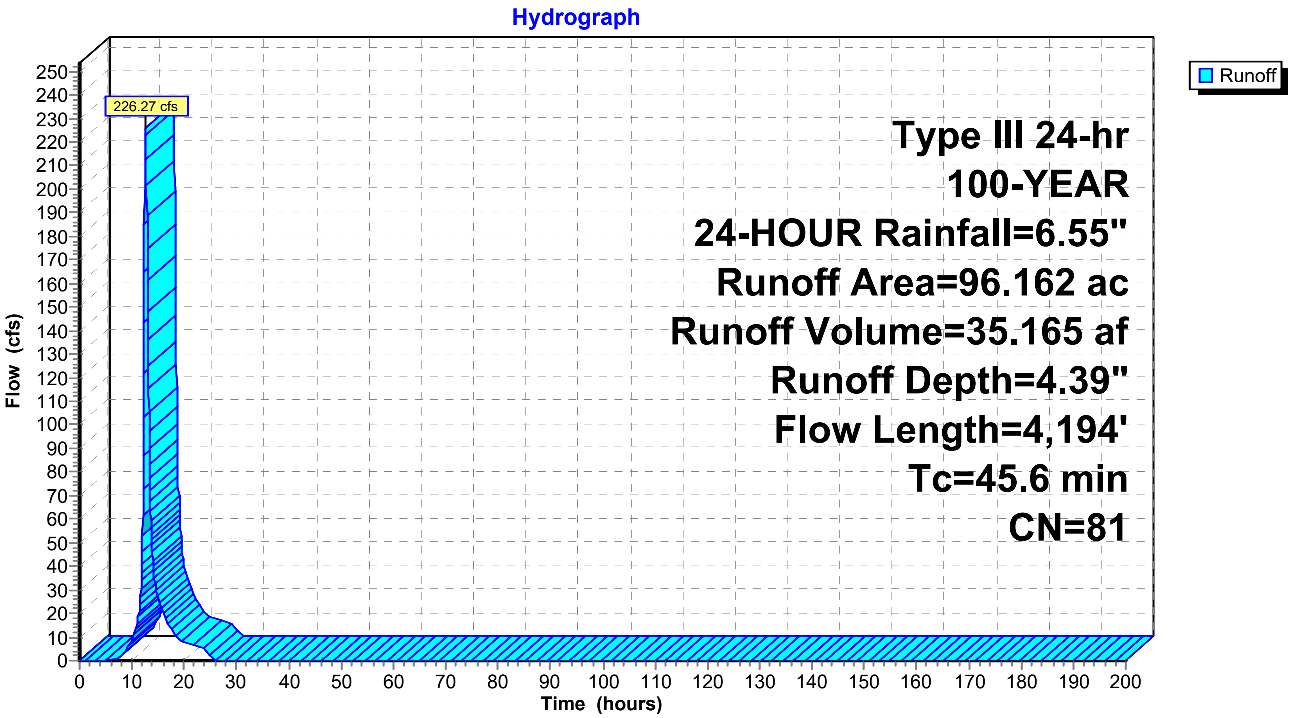
Runoff = 226.27 cfs @ 12.61 hrs, Volume= 35.165 af, Depth= 4.39"
Routed to Link DP-3 : Outfall to Southwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.494	96	Gravel surface, HSG C
0.247	96	Gravel surface, HSG D
7.922	71	Meadow, non-grazed, HSG C
16.281	78	Meadow, non-grazed, HSG D
6.324	82	Row crops, contoured, Good, HSG C
39.263	86	Row crops, contoured, Good, HSG D
2.120	70	Woods, Good, HSG C
23.512	77	Woods, Good, HSG D
96.162	81	Weighted Average
96.162		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1500	0.31		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.53"
4.7	887	0.1230	3.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.0	1,270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.6	955	0.0160	0.90	15.06	**Parabolic Channel,** W=50.00' D=0.50' Area=16.7 sf Perim=50.0' n= 0.100 Very weedy reaches w/pools
2.9	982	0.0120	5.66	203.60	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=3.00' Z= 3.0 '/' Top.W=21.00' n= 0.040 Winding stream, pools & shoals
45.6	4,194	Total			

Subcatchment 300: Subcat 300



Summary for Subcatchment 301: Subcat 301

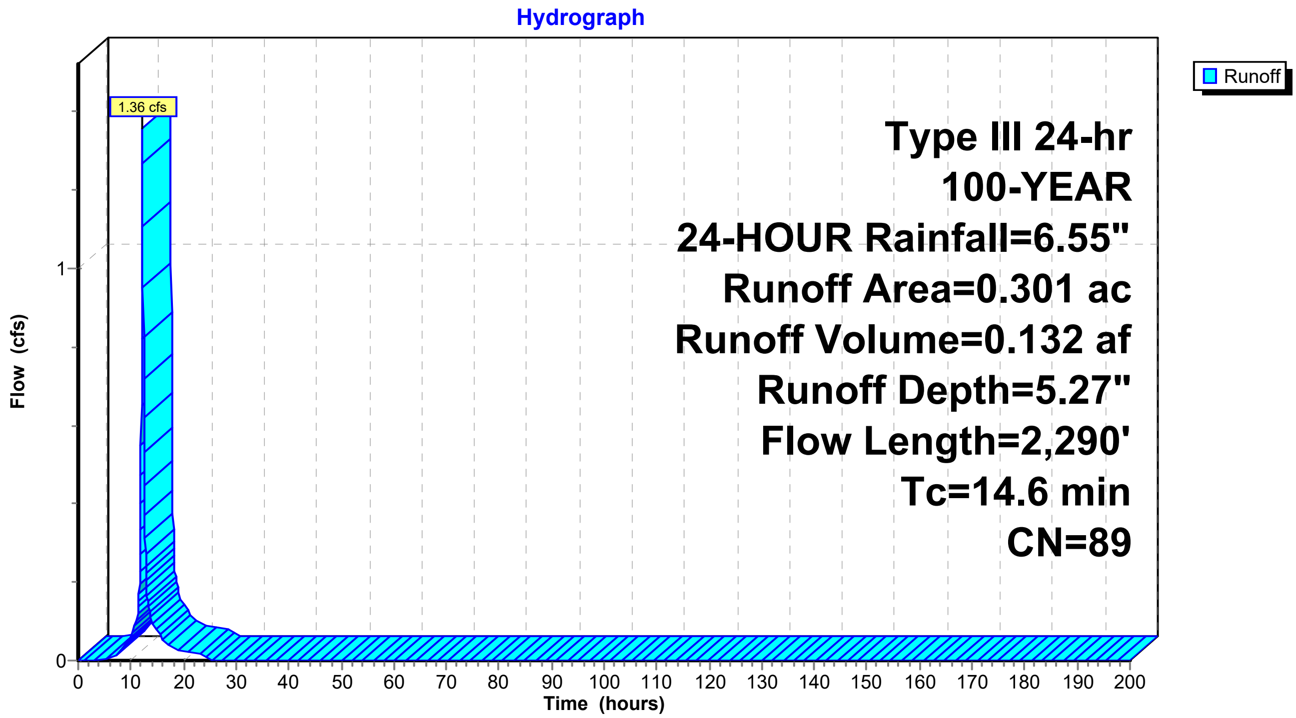
Runoff = 1.36 cfs @ 12.20 hrs, Volume= 0.132 af, Depth= 5.27"
Routed to Pond 5P : Subcatch 301 to 304 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
0.192	96	Gravel surface, HSG D
0.005	71	Meadow, non-grazed, HSG C
0.102	78	Meadow, non-grazed, HSG D
0.301	89	Weighted Average
0.301		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1400	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
2.5	435	0.1750	2.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.7	1,755	0.0580	6.22	18.66	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
14.6	2,290	Total			

Subcatchment 301: Subcat 301



Summary for Subcatchment 302: Subcat 302

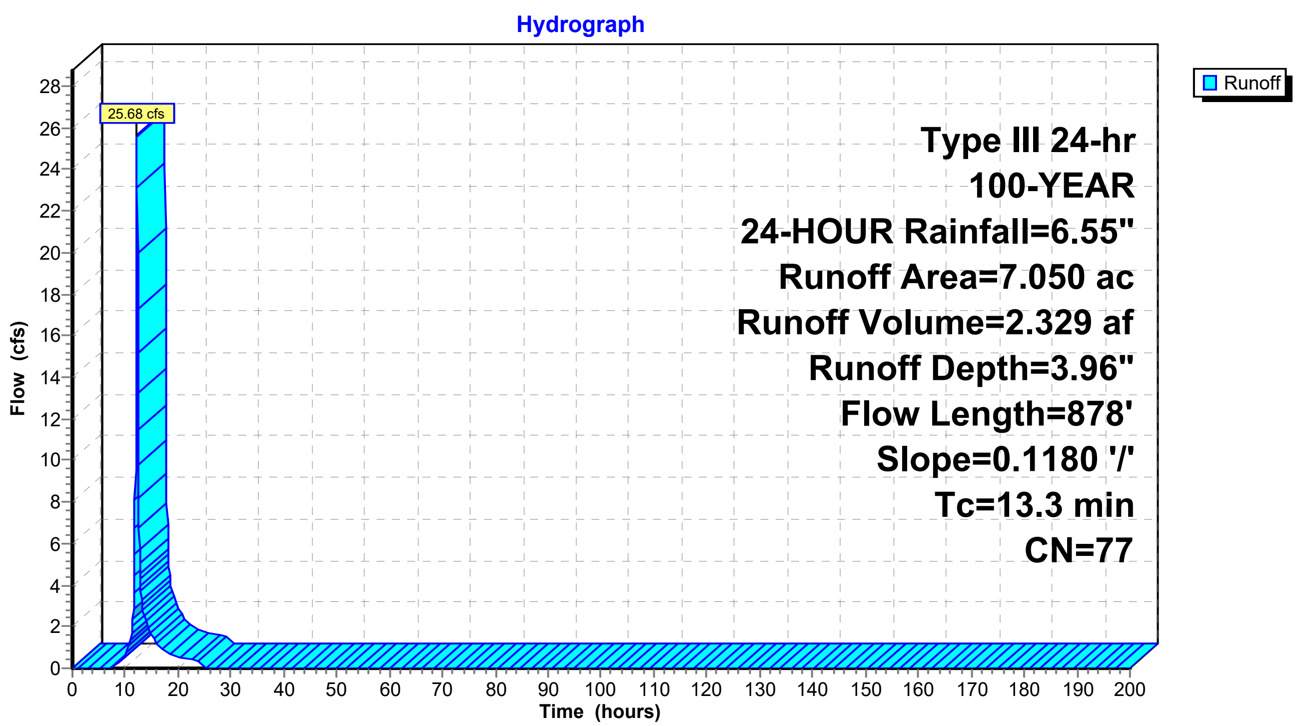
Runoff = 25.68 cfs @ 12.19 hrs, Volume= 2.329 af, Depth= 3.96"
Routed to Pond SMA-7 : SMA-7 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG D
1.290	71	Meadow, non-grazed, HSG C
5.758	78	Meadow, non-grazed, HSG D
7.050	77	Weighted Average
7.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.1180	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
5.4	778	0.1180	2.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.3	878	Total			

Subcatchment 302: Subcat 302



Summary for Subcatchment 303: Subcat 303

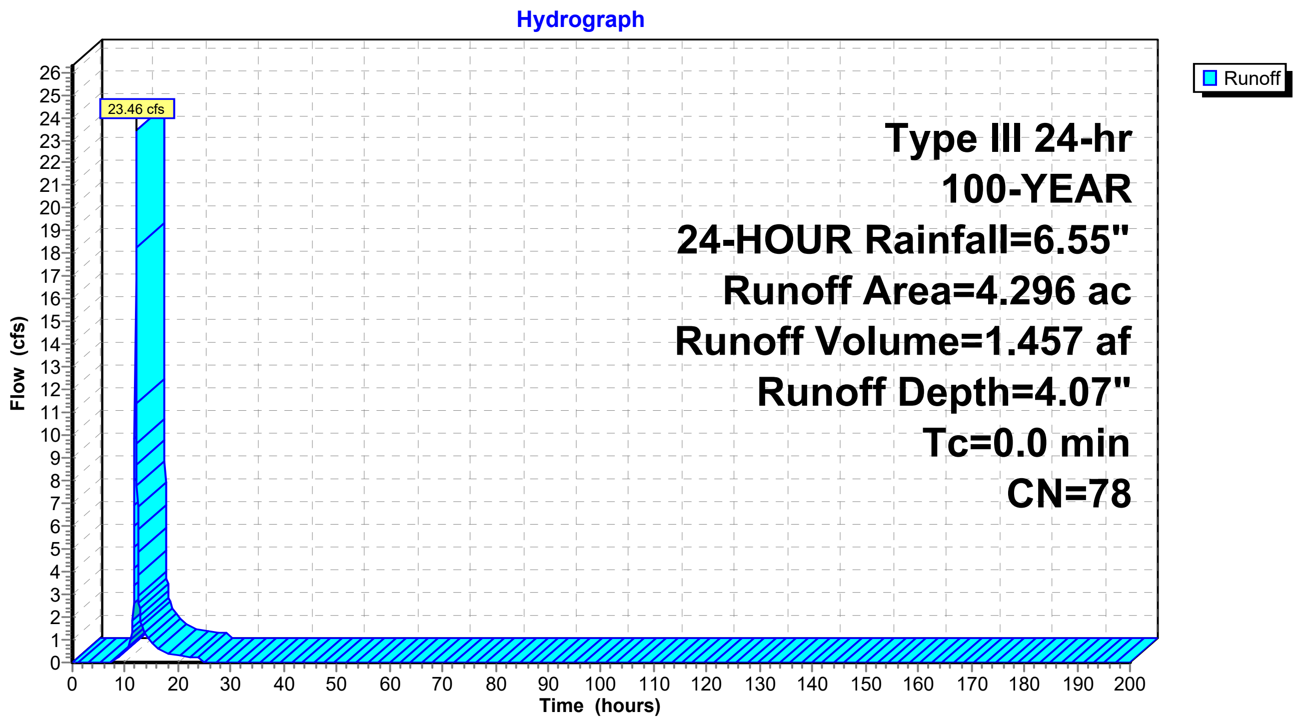
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 23.46 cfs @ 12.00 hrs, Volume= 1.457 af, Depth= 4.07"
Routed to Pond 11P : Subcatch 303 to 302 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG D
4.288	78	Meadow, non-grazed, HSG D
4.296	78	Weighted Average
4.296		100.00% Pervious Area

Subcatchment 303: Subcat 303



Summary for Subcatchment 304: Subcat 304

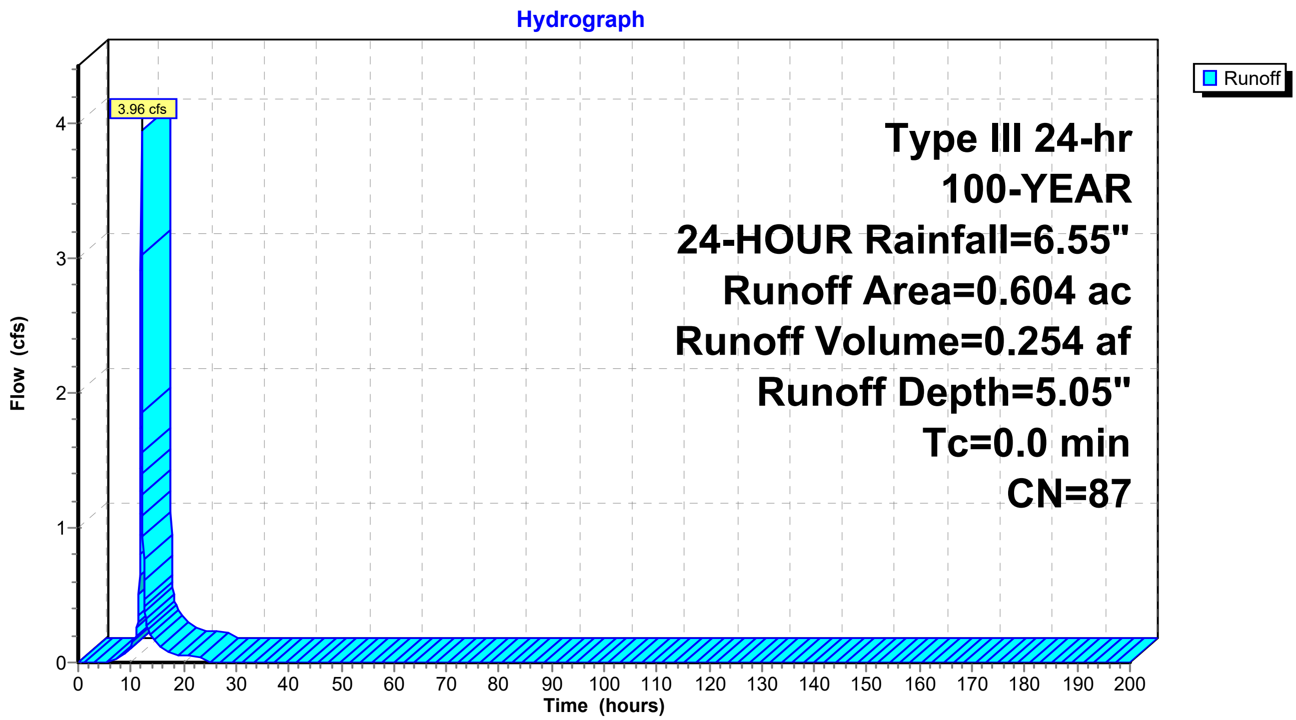
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 3.96 cfs @ 12.00 hrs, Volume= 0.254 af, Depth= 5.05"
Routed to Pond SMA-6 : SMA-6 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.315	96	Gravel surface, HSG D
0.289	78	Meadow, non-grazed, HSG D
0.604	87	Weighted Average
0.604		100.00% Pervious Area

Subcatchment 304: Subcat 304



Summary for Subcatchment 305: Subcat 305

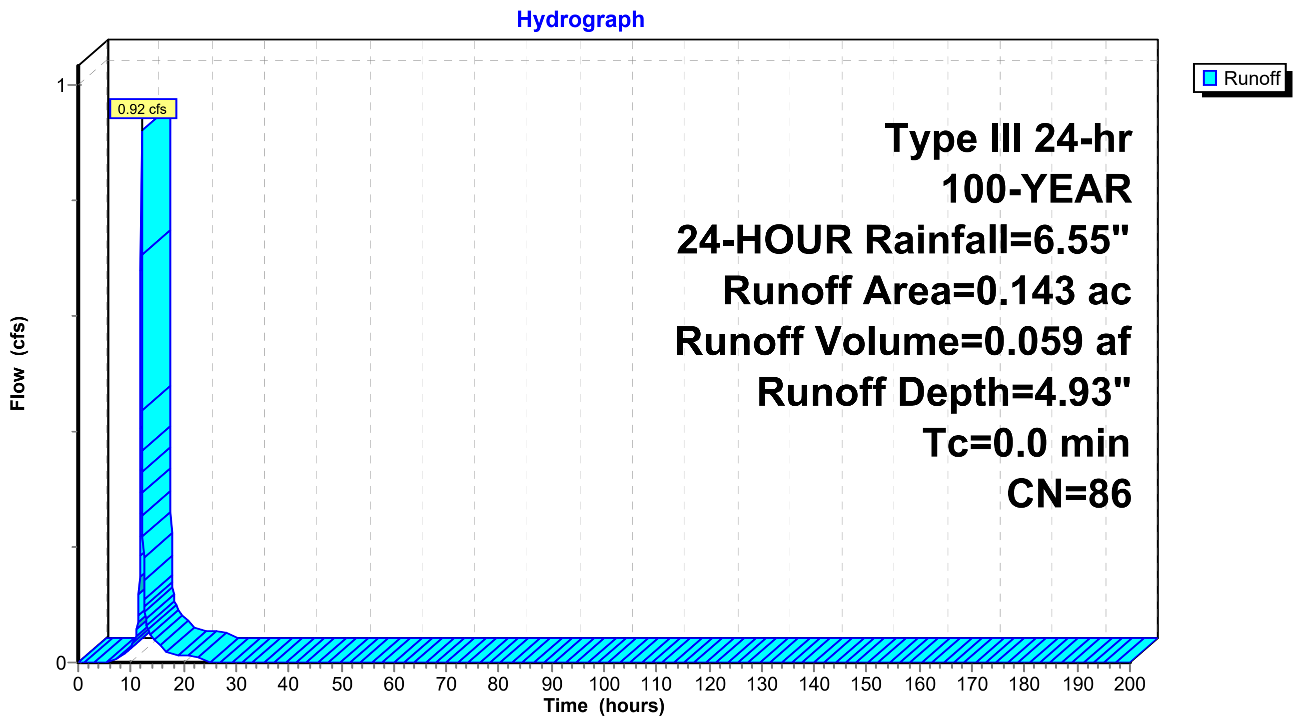
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.92 cfs @ 12.00 hrs, Volume= 0.059 af, Depth= 4.93"
Routed to Pond SMA-5 : SMA-5 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.066	96	Gravel surface, HSG D
0.077	78	Meadow, non-grazed, HSG D
0.143	86	Weighted Average
0.143		100.00% Pervious Area

Subcatchment 305: Subcat 305



Summary for Subcatchment 306: Subcat 306

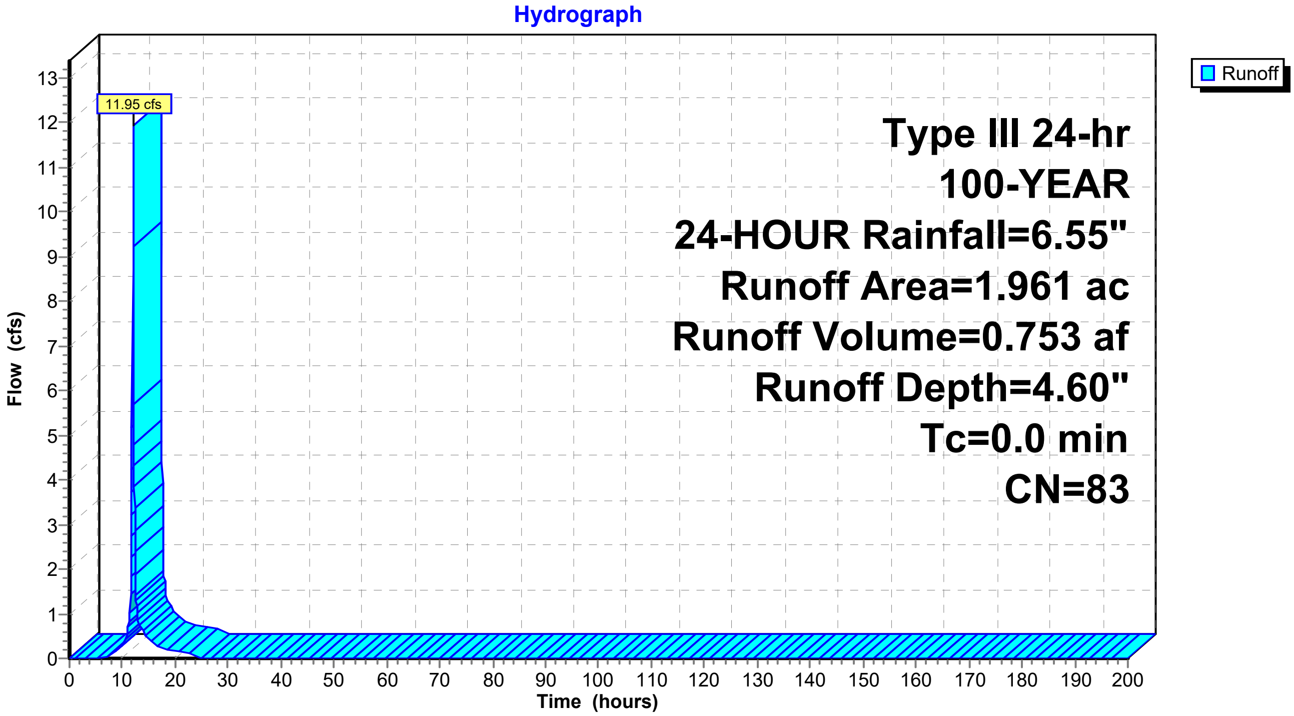
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 11.95 cfs @ 12.00 hrs, Volume= 0.753 af, Depth= 4.60"
Routed to Pond SMA-4 : SMA-4 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.580	96	Gravel surface, HSG D
1.382	78	Meadow, non-grazed, HSG D
1.961	83	Weighted Average
1.961		100.00% Pervious Area

Subcatchment 306: Subcat 306



Summary for Subcatchment 400: Subcat 400

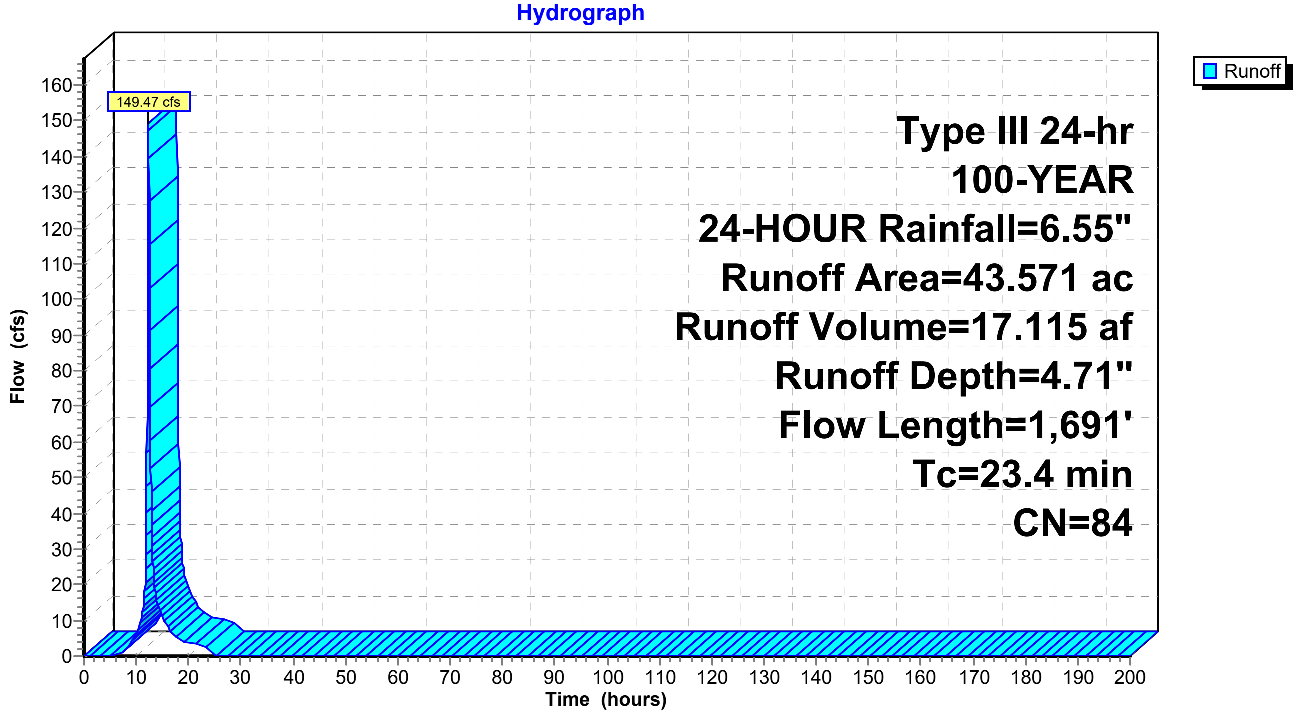
Runoff = 149.47 cfs @ 12.32 hrs, Volume= 17.115 af, Depth= 4.71"
Routed to Link DP-4 : Outfall to Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.029	96	Gravel surface, HSG C
0.022	96	Gravel surface, HSG D
0.007	71	Meadow, non-grazed, HSG C
5.593	78	Meadow, non-grazed, HSG D
10.592	82	Row crops, contoured, Good, HSG C
27.328	86	Row crops, contoured, Good, HSG D
43.571	84	Weighted Average
43.571		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
6.1	565	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	476	0.0970	2.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
5.3	550	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	1,691	Total			

Subcatchment 400: Subcat 400



Summary for Subcatchment 401: Subcat 401

[47] Hint: Peak is 335% of capacity of segment #4

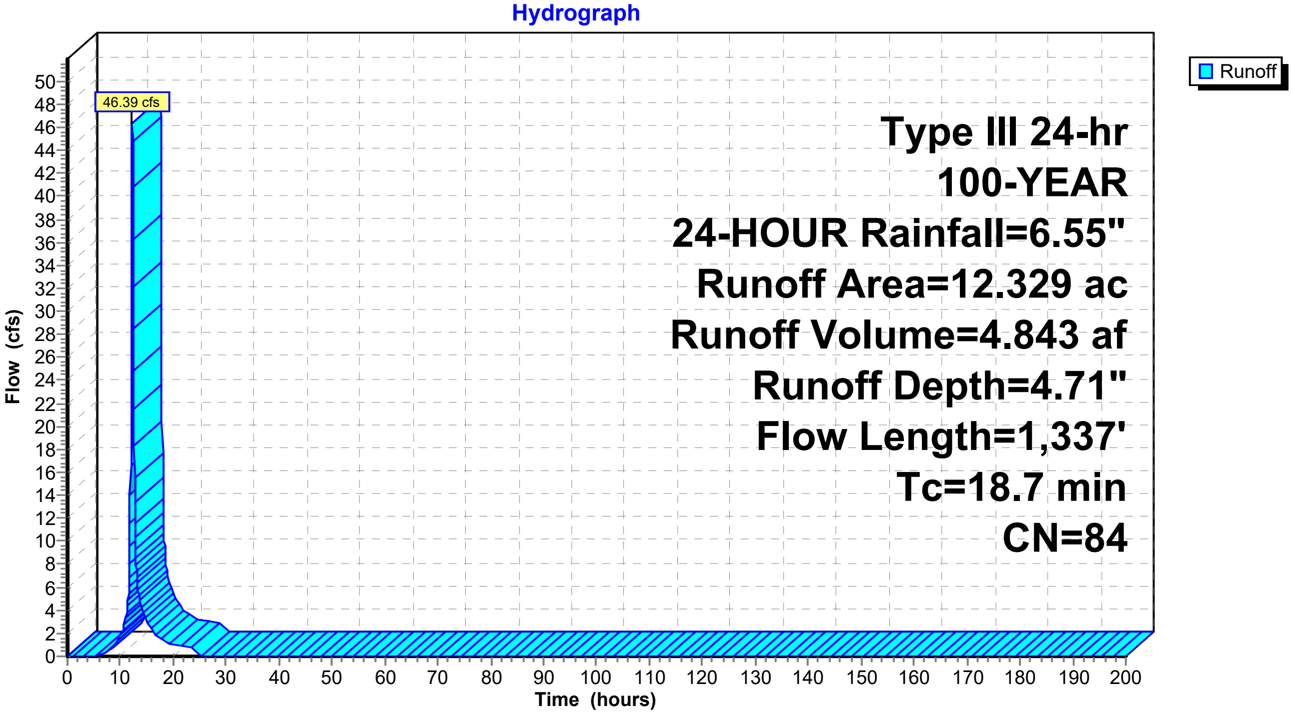
Runoff = 46.39 cfs @ 12.25 hrs, Volume= 4.843 af, Depth= 4.71"
Routed to Reach 307R : (new Reach)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.009	96	Gravel surface, HSG C
0.153	96	Gravel surface, HSG D
0.057	71	Meadow, non-grazed, HSG C
2.681	78	Meadow, non-grazed, HSG D
0.258	82	Row crops, contoured, Good, HSG C
9.078	86	Row crops, contoured, Good, HSG D
0.092	77	Woods, Good, HSG D
12.329	84	Weighted Average
12.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
4.5	401	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.9	522	0.0610	2.22		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.1	314	0.0320	4.62	13.86	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
18.7	1,337	Total			

Subcatchment 401: Subcat 401



Summary for Subcatchment 402: Subcat 402

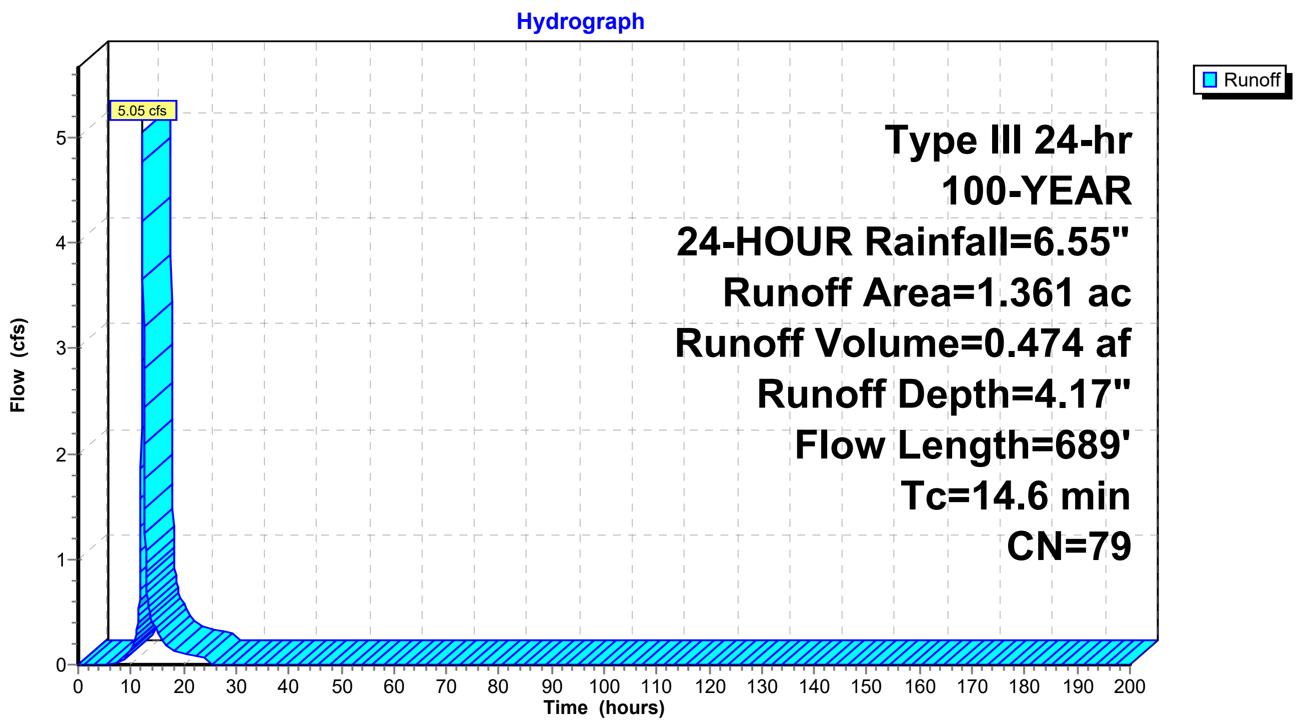
Runoff = 5.05 cfs @ 12.20 hrs, Volume= 0.474 af, Depth= 4.17"
Routed to Pond 1P : Subcatch 402 to 401 Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.061	96	Gravel surface, HSG D
1.301	78	Meadow, non-grazed, HSG D
1.361	79	Weighted Average
1.361		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.53"
4.9	589	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.6	689	Total			

Subcatchment 402: Subcat 402



Summary for Subcatchment 403: Subcat 403

[49] Hint: Tc<2dt may require smaller dt

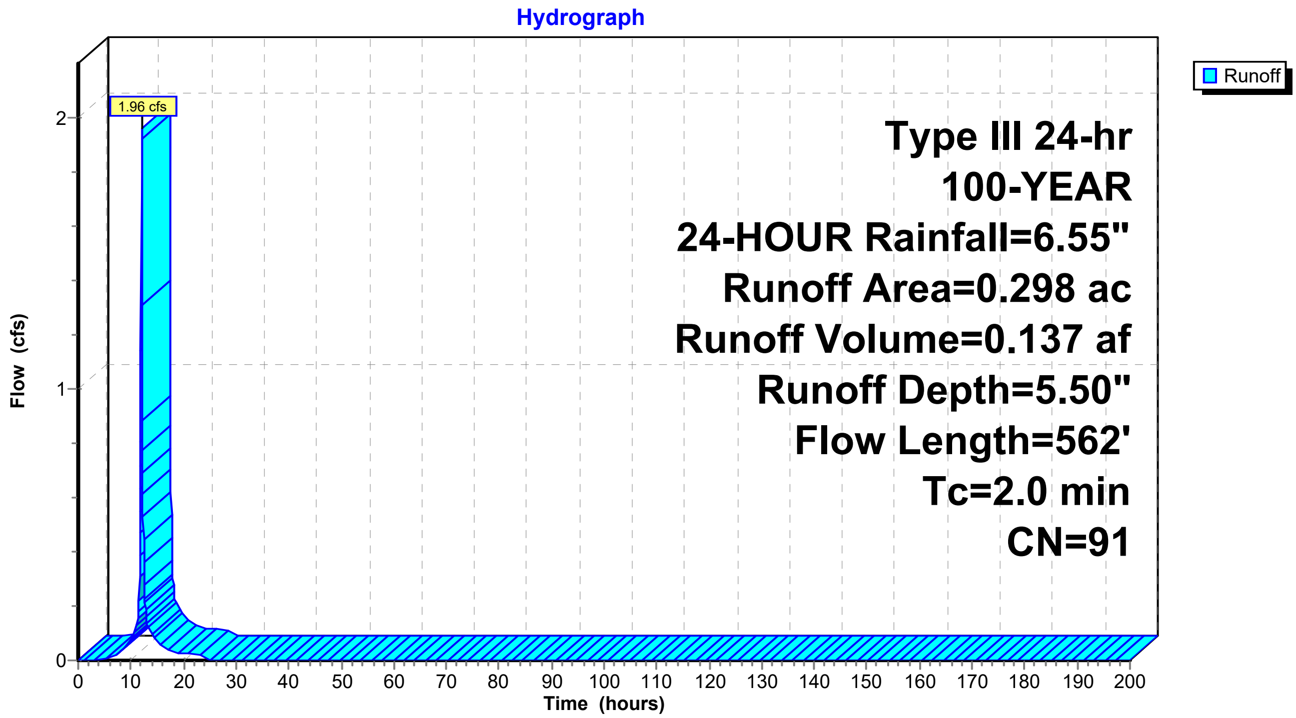
Runoff = 1.96 cfs @ 12.03 hrs, Volume= 0.137 af, Depth= 5.50"
Routed to Pond SMA-9 : SMA-9 Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR, 24-HOUR Rainfall=6.55"

Area (ac)	CN	Description
0.036	96	Gravel surface, HSG C
0.156	96	Gravel surface, HSG D
0.012	71	Meadow, non-grazed, HSG C
0.038	78	Meadow, non-grazed, HSG D
0.011	82	Row crops, contoured, Good, HSG C
0.045	86	Row crops, contoured, Good, HSG D
0.298	91	Weighted Average
0.298		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.8	522	0.0360	4.90	14.70	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.035
2.0	562	Total			

Subcatchment 403: Subcat 403



Summary for Reach 8R: Wetland Stream

Inflow Area = 1.049 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-YEAR, 24-HOUR event
Inflow = 2.76 cfs @ 12.32 hrs, Volume= 0.416 af
Outflow = 2.50 cfs @ 12.86 hrs, Volume= 0.416 af, Atten= 9%, Lag= 32.2 min
Routed to Link DP-3 : Outfall to Southwest

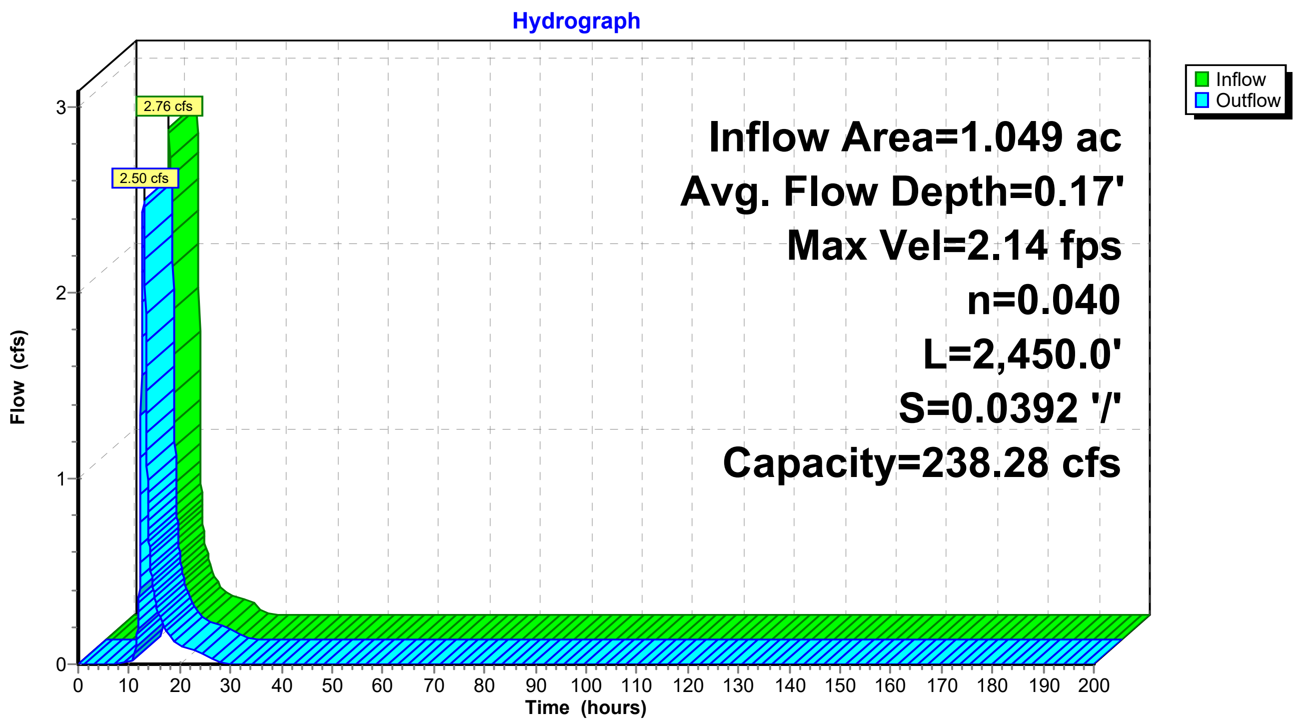
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.14 fps, Min. Travel Time= 19.0 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 61.4 min

Peak Storage= 2,864 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 7.40'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 238.28 cfs

6.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 2,450.0' Slope= 0.0392 '/'
Inlet Invert= 932.00', Outlet Invert= 836.00'

‡

Reach 8R: Wetland Stream



Summary for Reach 9R: Flow to Northeast outlet

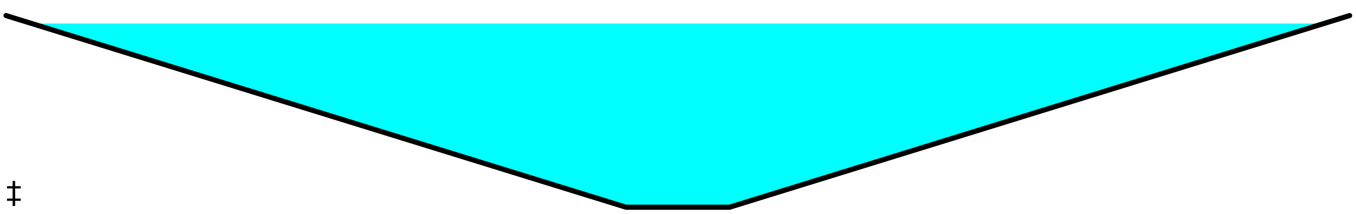
[55] Hint: Peak inflow is 102% of Manning's capacity
[81] Warning: Exceeded Pond SMA-7 by 2.09' @ 24.60 hrs

Inflow Area = 11.347 ac, 0.00% Impervious, Inflow Depth = 4.00" for 100-YEAR, 24-HOUR event
Inflow = 37.53 cfs @ 12.05 hrs, Volume= 3.785 af
Outflow = 32.90 cfs @ 12.36 hrs, Volume= 3.785 af, Atten= 12%, Lag= 18.9 min
Routed to Link DP-2 : Outfall to Northwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.11 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 27.4 min

Peak Storage= 16,163 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.96' , Surface Width= 12.50'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.76 cfs

1.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 2,500.0' Slope= 0.0464 '/'
Inlet Invert= 945.00', Outlet Invert= 829.00'



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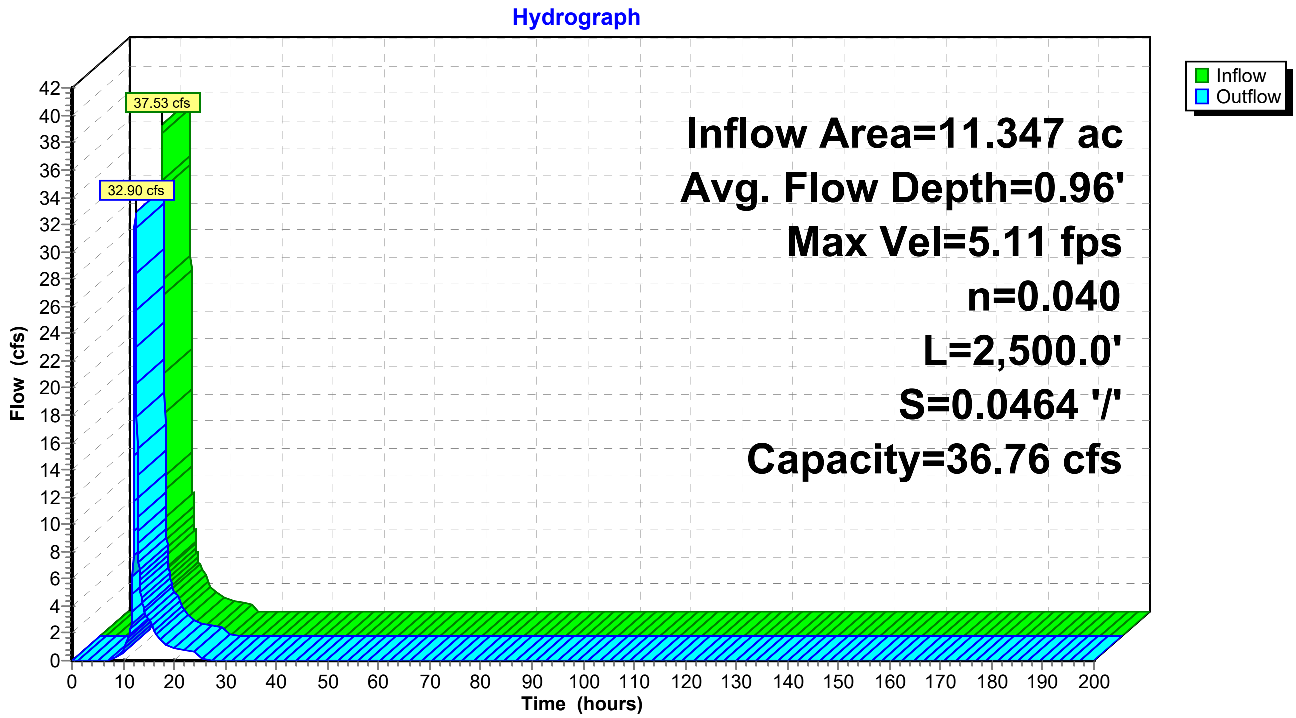
Reach 9R: Flow to Northeast outlet



Summary for Reach 12R: Diversion Swale

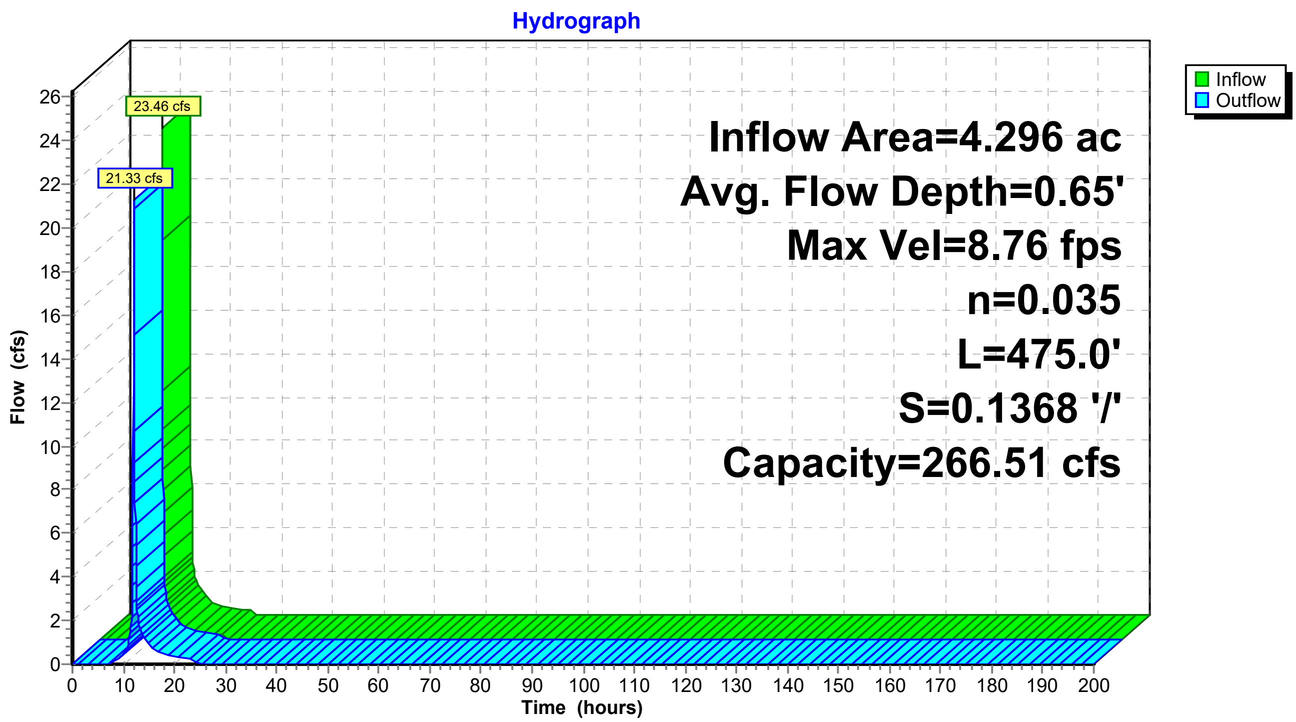
Inflow Area = 4.296 ac, 0.00% Impervious, Inflow Depth = 4.07" for 100-YEAR, 24-HOUR event
Inflow = 23.46 cfs @ 12.00 hrs, Volume= 1.457 af
Outflow = 21.33 cfs @ 12.03 hrs, Volume= 1.457 af, Atten= 9%, Lag= 1.8 min
Routed to Pond SMA-7 : SMA-7 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.76 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.80 fps, Avg. Travel Time= 2.8 min

Peak Storage= 1,220 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 5.91'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 266.51 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 475.0' Slope= 0.1368 '/'
Inlet Invert= 1,012.00', Outlet Invert= 947.00'

Reach 12R: Diversion Swale



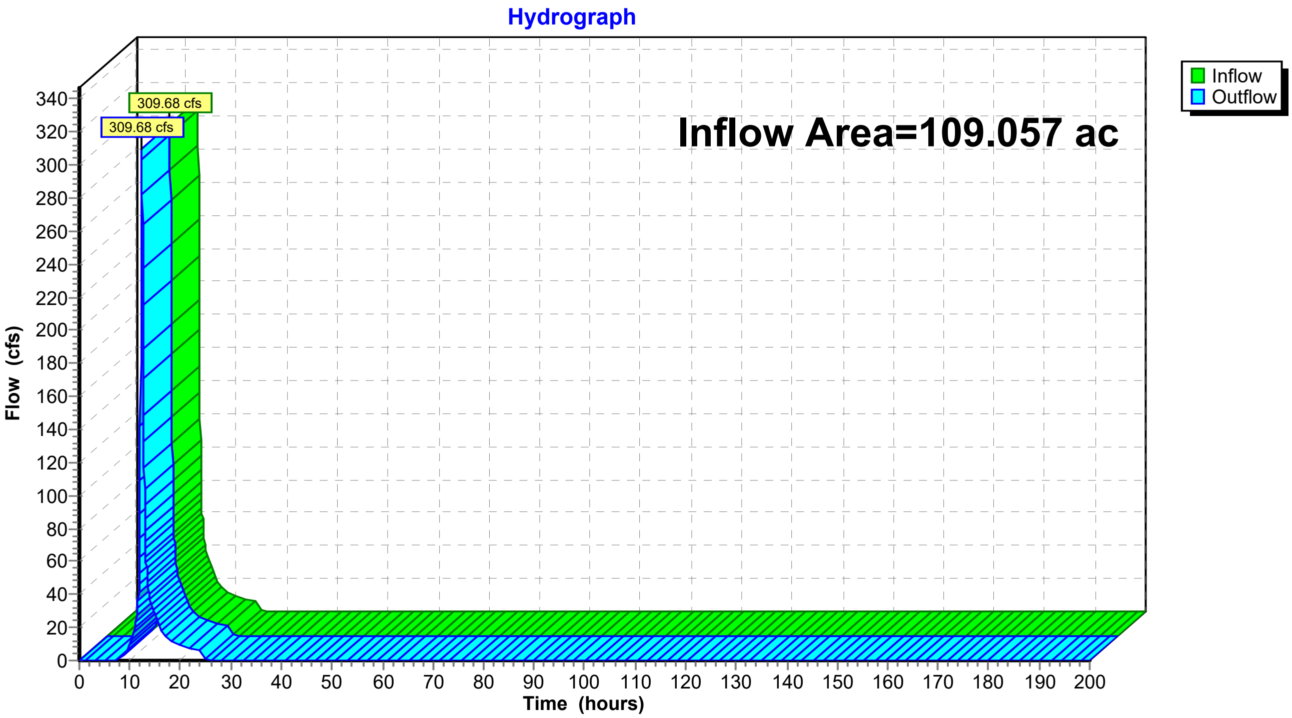
Summary for Reach 211R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 109.057 ac, 1.02% Impervious, Inflow Depth = 4.12" for 100-YEAR, 24-HOUR event
Inflow = 309.68 cfs @ 12.32 hrs, Volume= 37.464 af
Outflow = 309.68 cfs @ 12.32 hrs, Volume= 37.464 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-2 : Outfall to Northwest

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Reach 211R: (new Reach)



Summary for Reach 213R: (new Reach)

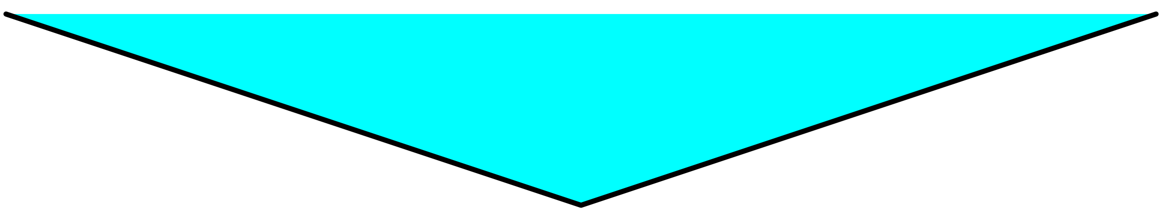
[91] Warning: Storage range exceeded by 0.31'
[55] Hint: Peak inflow is 183% of Manning's capacity
[79] Warning: Submerged Pond SMA-10 Primary device # 1 OUTLET by 0.61'

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth = 4.06" for 100-YEAR, 24-HOUR event
Inflow = 38.48 cfs @ 12.20 hrs, Volume= 3.617 af
Outflow = 37.68 cfs @ 12.23 hrs, Volume= 3.617 af, Atten= 2%, Lag= 2.1 min
Routed to Pond SMA-13 : SMA-13 Pocket Pond

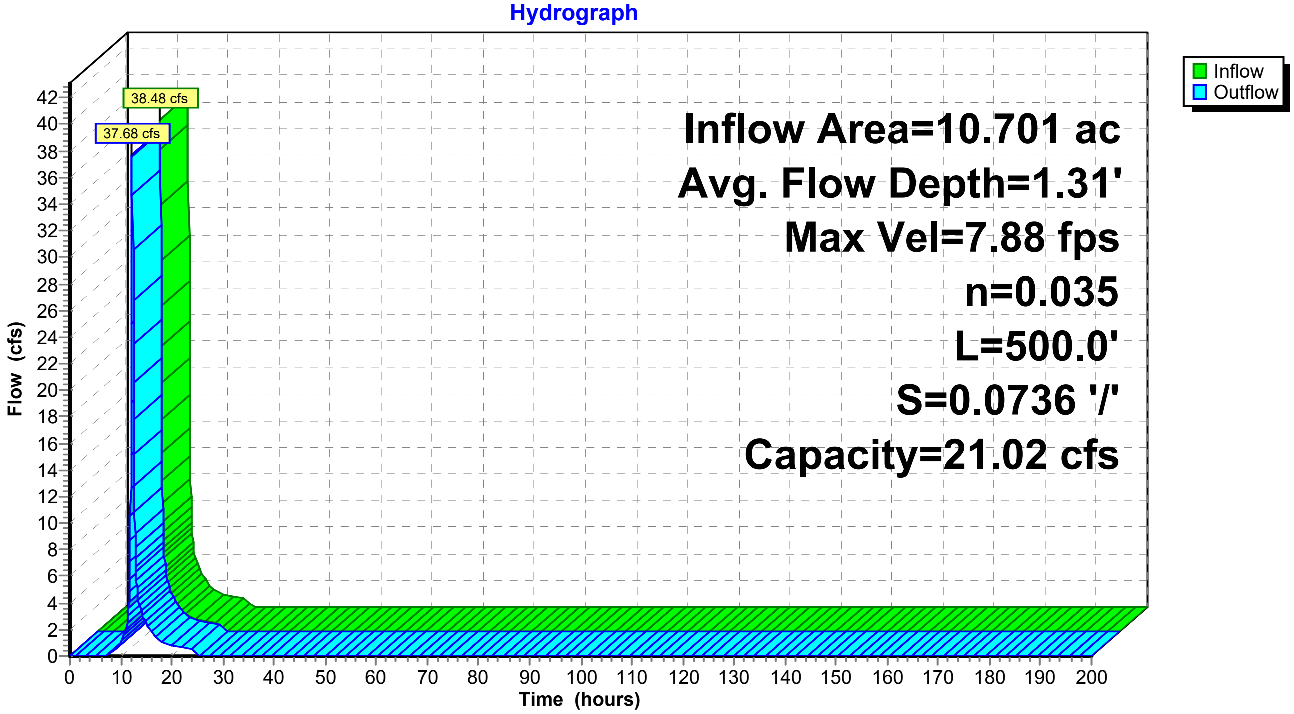
Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.88 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 3.26 fps, Avg. Travel Time= 2.6 min

Peak Storage= 2,430 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.31' , Surface Width= 7.87'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 21.02 cfs

0.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 500.0' Slope= 0.0736 '/'
Inlet Invert= 1,040.30', Outlet Invert= 1,003.50'



Reach 213R: (new Reach)



Summary for Reach 224R: Roadside Swale

[81] Warning: Exceeded Pond 5P by 1,011.00' @ 24.85 hrs

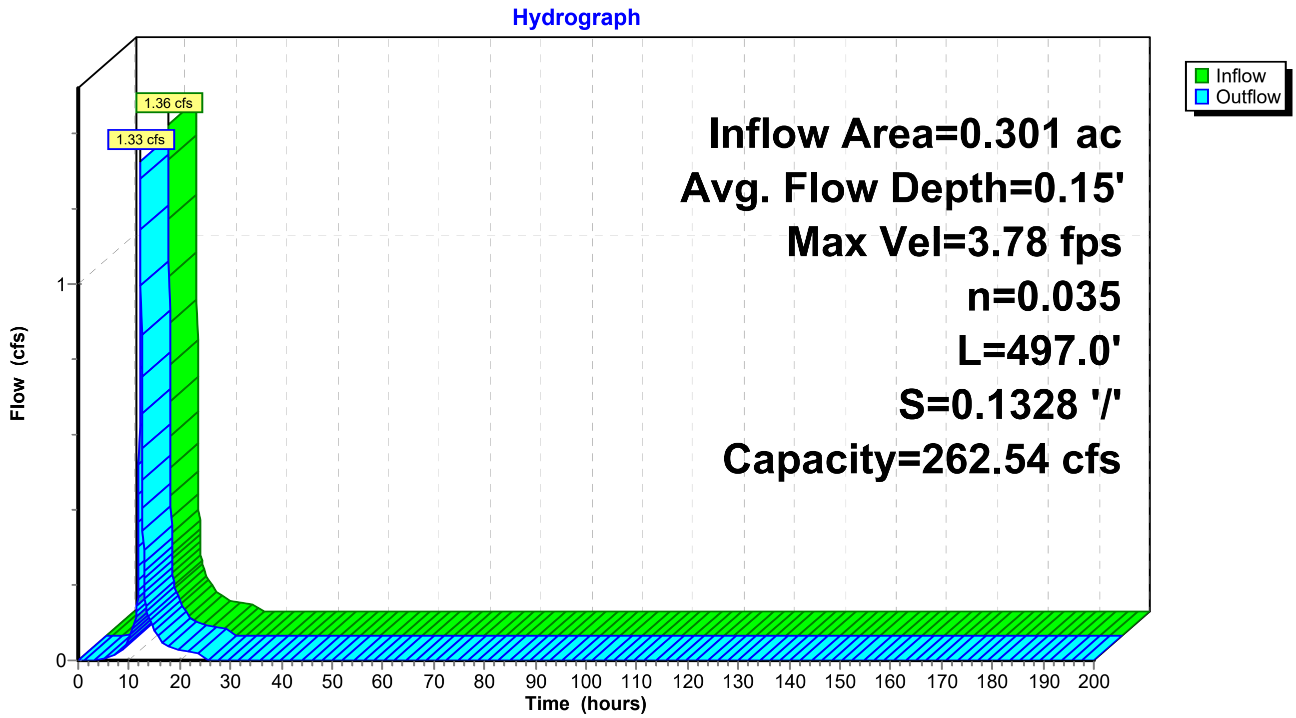
Inflow Area = 0.301 ac, 0.00% Impervious, Inflow Depth = 5.27" for 100-YEAR, 24-HOUR event
Inflow = 1.36 cfs @ 12.20 hrs, Volume= 0.132 af
Outflow = 1.33 cfs @ 12.26 hrs, Volume= 0.132 af, Atten= 3%, Lag= 3.9 min
Routed to Pond SMA-6 : SMA-6 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.78 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 6.3 min

Peak Storage= 176 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 2.87'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 262.54 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 497.0' Slope= 0.1328 '/'
Inlet Invert= 1,011.00', Outlet Invert= 945.00'

Reach 224R: Roadside Swale



Summary for Reach 307R: (new Reach)

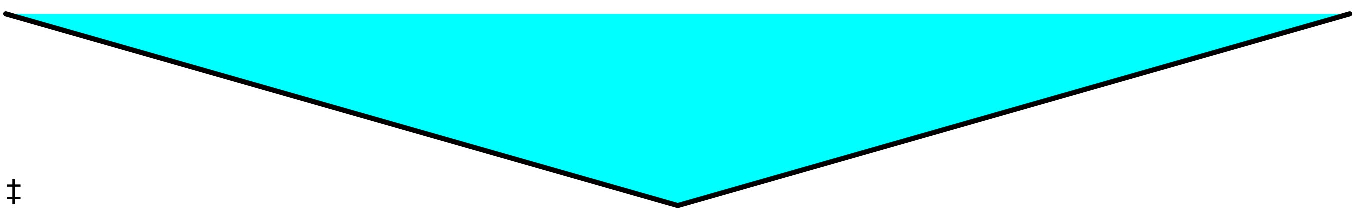
[91] Warning: Storage range exceeded by 1.14'
[55] Hint: Peak inflow is 735% of Manning's capacity
[81] Warning: Exceeded Pond 1P by 1,025.12' @ 6.60 hrs

Inflow Area = 13.690 ac, 0.00% Impervious, Inflow Depth = 4.66" for 100-YEAR, 24-HOUR event
Inflow = 51.15 cfs @ 12.25 hrs, Volume= 5.316 af
Outflow = 48.78 cfs @ 12.36 hrs, Volume= 5.316 af, Atten= 5%, Lag= 6.8 min
Routed to Pond 2P : SMA-8 Pocket Pond

Routing by Stor-Ind+Trans method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.89 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 7.6 min

Peak Storage= 10,098 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.64' , Surface Width= 19.69'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 6.96 cfs

0.00' x 0.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 6.0 '/' Top Width= 6.00'
Length= 1,215.0' Slope= 0.0568 '/'
Inlet Invert= 1,025.00', Outlet Invert= 956.00'



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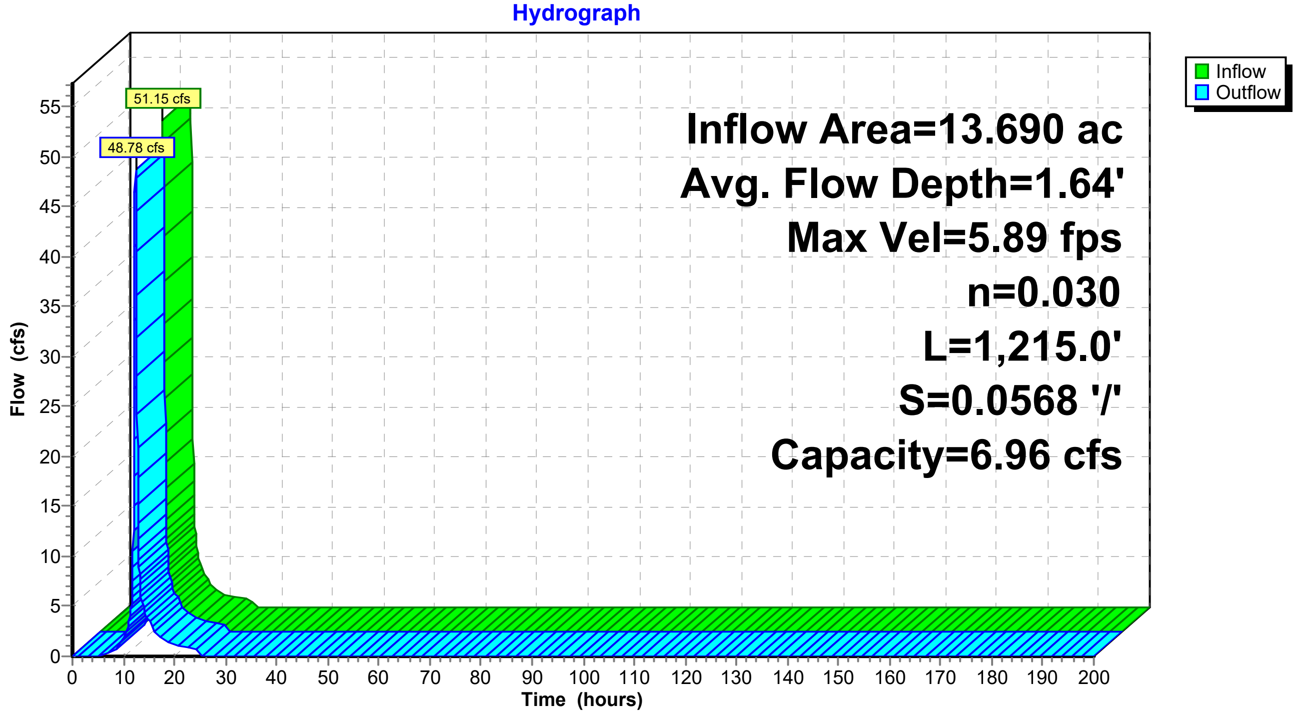
Reach 307R: (new Reach)



Summary for Pond 1P: Subcatch 402 to 401 Culvert

[57] Hint: Peaked at 3.37' (Flood elevation advised)

Inflow Area =	1.361 ac,	0.00% Impervious,	Inflow Depth = 4.17"	for 100-YEAR, 24-HOUR event	
Inflow =	5.05 cfs @	12.20 hrs,	Volume=	0.474 af	
Outflow =	5.05 cfs @	12.20 hrs,	Volume=	0.474 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.05 cfs @	12.20 hrs,	Volume=	0.474 af	

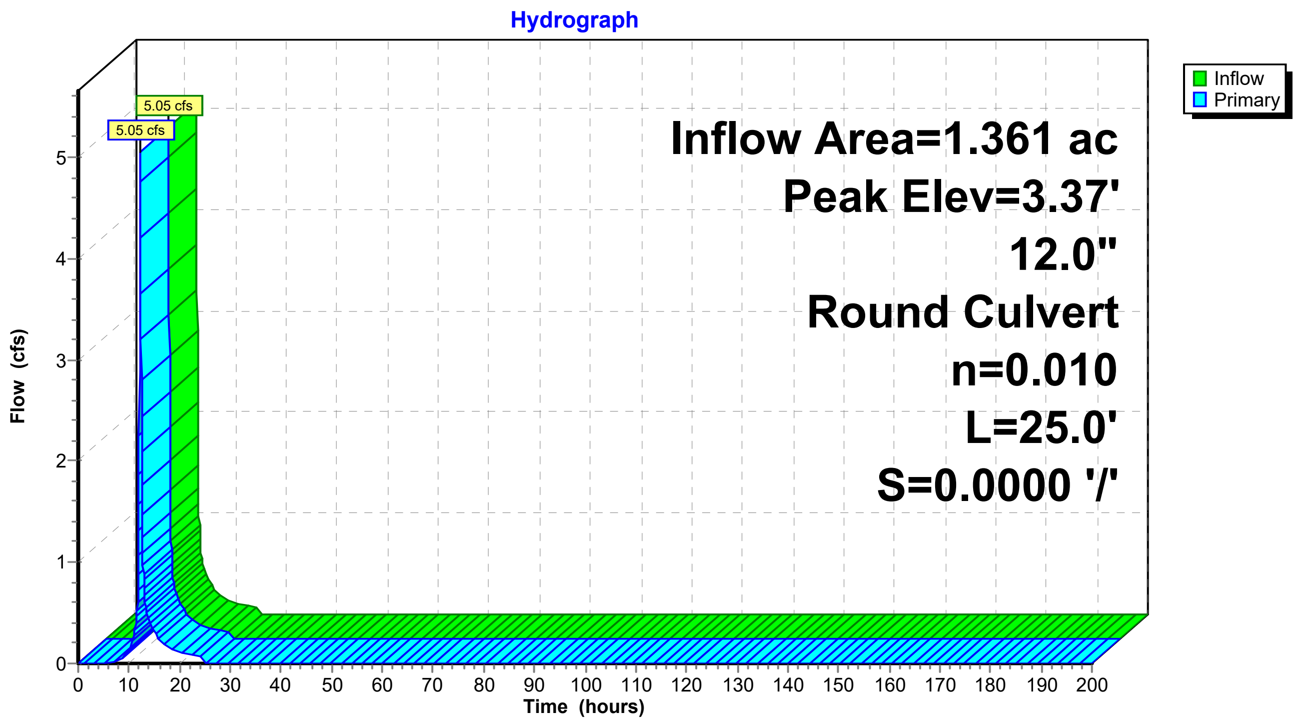
Routed to Reach 307R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 3.37' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.00' / 0.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.05 cfs @ 12.20 hrs HW=3.36' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.05 cfs @ 6.42 fps)

Pond 1P: Subcatch 402 to 401 Culvert



Summary for Pond 2P: SMA-8 Pocket Pond

[93] Warning: Storage range exceeded by 265.11'
[63] Warning: Exceeded Reach 307R INLET depth by 204.76' @ 12.35 hrs
[64] Warning: Exceeded Reach 307R outlet bank by 275.61' @ 12.36 hrs

Inflow Area = 13.690 ac, 0.00% Impervious, Inflow Depth = 4.66" for 100-YEAR, 24-HOUR event
Inflow = 48.78 cfs @ 12.36 hrs, Volume= 5.316 af
Outflow = 48.75 cfs @ 12.36 hrs, Volume= 5.316 af, Atten= 0%, Lag= 0.0 min
Primary = 48.75 cfs @ 12.36 hrs, Volume= 5.316 af
Routed to Link DP-4 : Outfall to Southeast

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,232.11' @ 12.36 hrs Surf.Area= 350 sf Storage= 504 cf

Plug-Flow detention time= 1.0 min calculated for 5.315 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (821.9 - 820.9)

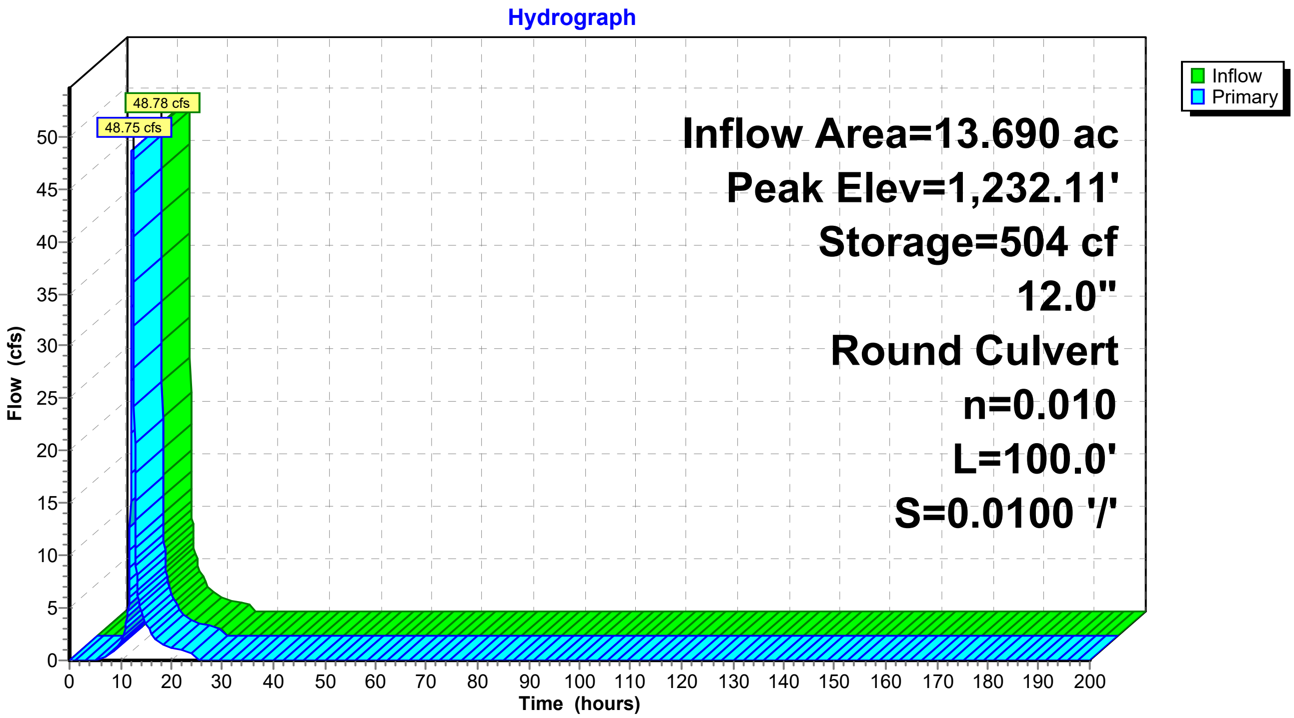
Volume	Invert	Avail.Storage	Storage Description
#1	965.00'	504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
965.00	98	0	0
966.00	280	189	189
967.00	350	315	504

Device	Routing	Invert	Outlet Devices
#1	Primary	965.00'	**12.0" Round Culvert** L= 100.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 965.00' / 964.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=48.49 cfs @ 12.36 hrs HW=1,229.30' (Free Discharge)
└─**1=Culvert** (Inlet Controls 48.49 cfs @ 61.74 fps)

Pond 2P: SMA-8 Pocket Pond



Summary for Pond 3P: SMA-2 Pocket Pond

[43] Hint: Has no inflow (Outflow=Zero)

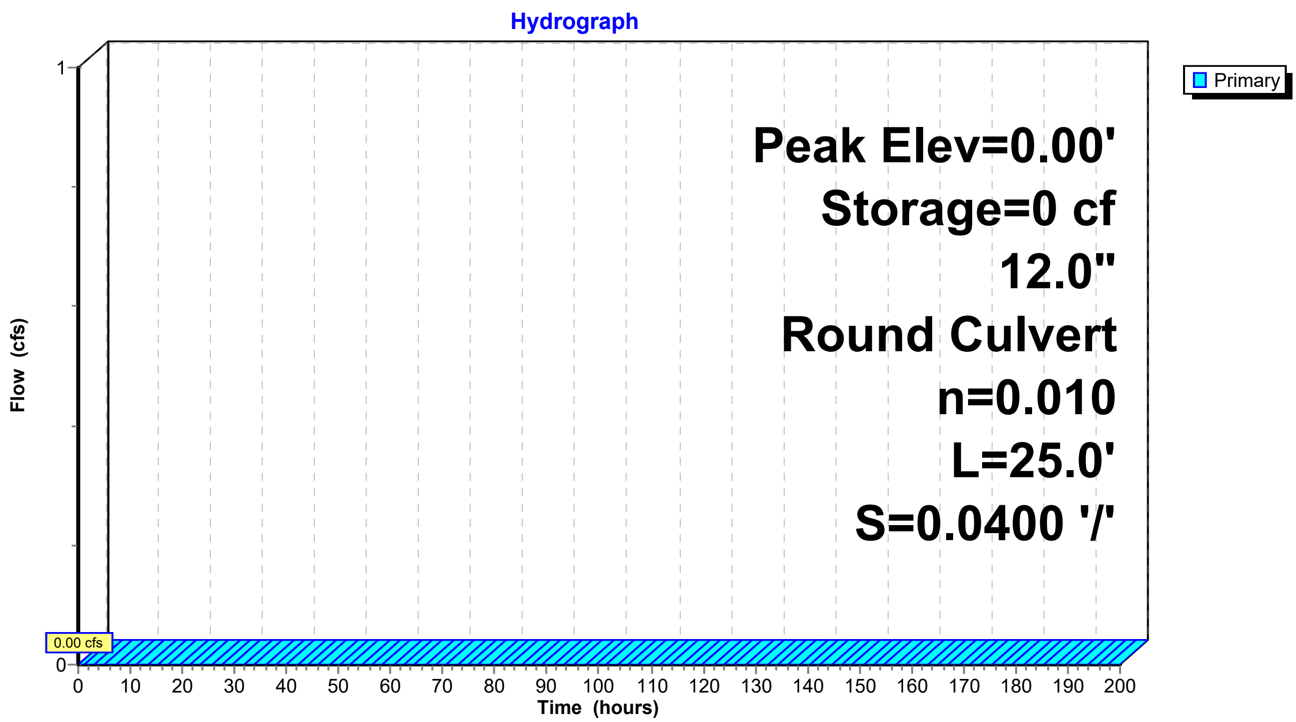
Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	1,537 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	1,459	0	0
846.10	849	115	115
847.00	1,958	1,263	1,379
847.10	1,204	158	1,537

Device	Routing	Invert	Outlet Devices
#1	Primary	846.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.00' / 845.00' S= 0.0400 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Pond 3P: SMA-2 Pocket Pond



Summary for Pond 4P: SMA-3 Pocket Pond

[43] Hint: Has no inflow (Outflow=Zero)

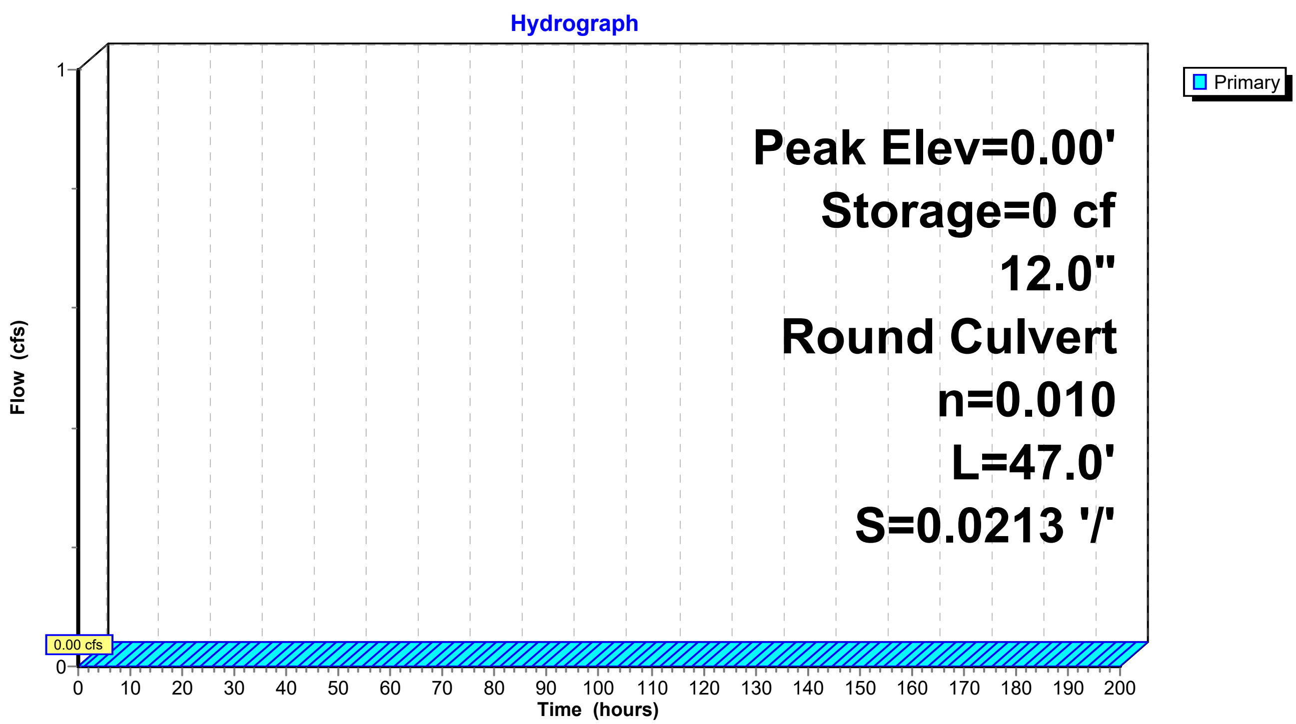
Volume	Invert	Avail.Storage	Storage Description
#1	842.00'	382 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
842.00	56	0	0
843.00	177	117	117
844.00	353	265	382

Device	Routing	Invert	Outlet Devices
#1	Primary	842.00'	**12.0" Round Culvert** L= 47.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 842.00' / 841.00' S= 0.0213 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond 4P: SMA-3 Pocket Pond



Summary for Pond 5P: Subcatch 301 to 304 Culvert

[57] Hint: Peaked at 0.88' (Flood elevation advised)

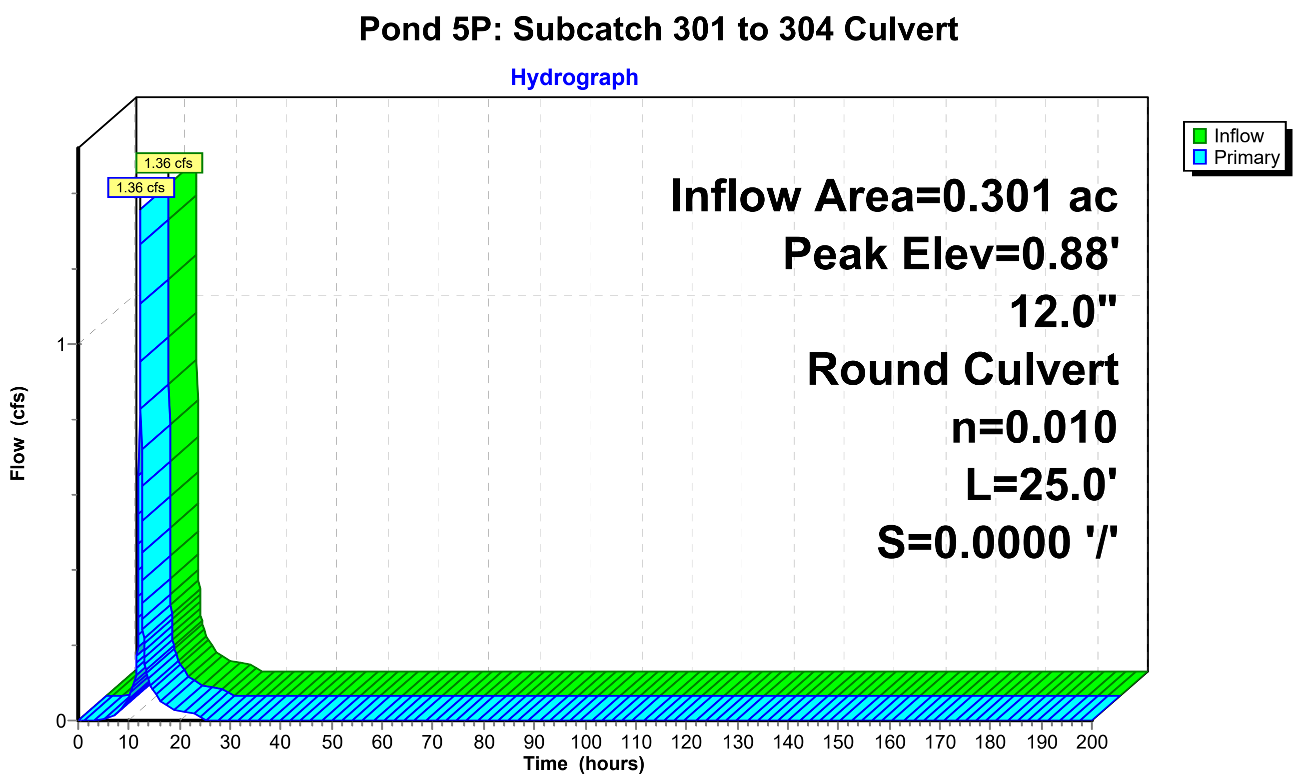
Inflow Area =	0.301 ac,	0.00% Impervious, Inflow Depth =	5.27"	for 100-YEAR, 24-HOUR event
Inflow =	1.36 cfs @	12.20 hrs, Volume=	0.132 af	
Outflow =	1.36 cfs @	12.20 hrs, Volume=	0.132 af, Atten= 0%, Lag= 0.0 min	
Primary =	1.36 cfs @	12.20 hrs, Volume=	0.132 af	

Routed to Reach 224R : Roadside Swale

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 0.88' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.00' / 0.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.35 cfs @ 12.20 hrs HW=0.87' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.35 cfs @ 2.48 fps)



Summary for Pond 11P: Subcatch 303 to 302 Culvert

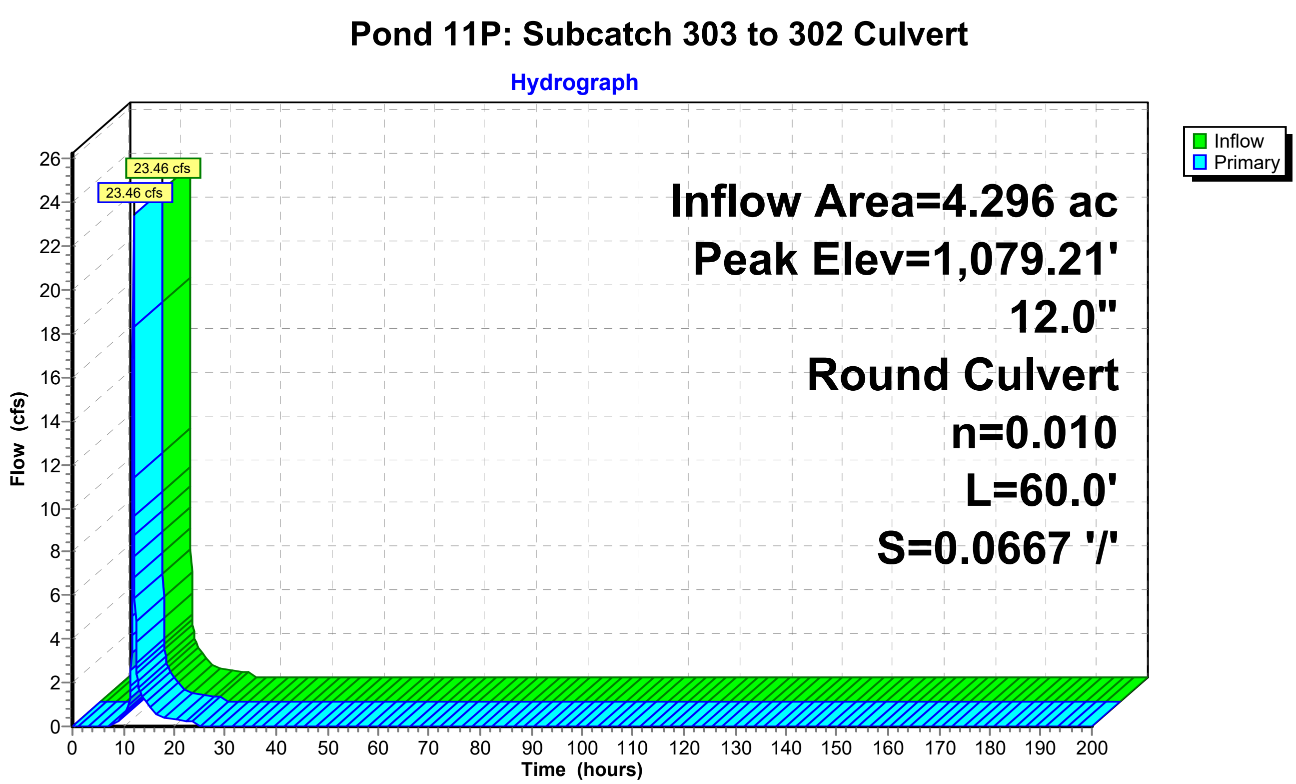
[57] Hint: Peaked at 1,079.21' (Flood elevation advised)

Inflow Area = 4.296 ac, 0.00% Impervious, Inflow Depth = 4.07" for 100-YEAR, 24-HOUR event
Inflow = 23.46 cfs @ 12.00 hrs, Volume= 1.457 af
Outflow = 23.46 cfs @ 12.00 hrs, Volume= 1.457 af, Atten= 0%, Lag= 0.0 min
Primary = 23.46 cfs @ 12.00 hrs, Volume= 1.457 af
Routed to Reach 12R : Diversion Swale

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,079.21' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,017.00' / 1,013.00' S= 0.0667 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=23.15 cfs @ 12.00 hrs HW=1,077.65' (Free Discharge)
└─**1=Culvert** (Inlet Controls 23.15 cfs @ 29.48 fps)



Summary for Pond SMA-1: SMA-1 Infiltration Basin

[93] Warning: Storage range exceeded by 198.10'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=11)

Inflow Area = 11.830 ac, 0.16% Impervious, Inflow Depth = 3.86" for 100-YEAR, 24-HOUR event
Inflow = 34.09 cfs @ 12.32 hrs, Volume= 3.805 af
Outflow = 42.29 cfs @ 12.30 hrs, Volume= 3.805 af, Atten= 0%, Lag= 0.0 min
Primary = 42.29 cfs @ 12.30 hrs, Volume= 3.805 af
Routed to Link DP-1 : Outfall to West

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,030.10' @ 12.30 hrs Surf.Area= 4,639 sf Storage= 9,146 cf

Plug-Flow detention time= 15.2 min calculated for 3.804 af (100% of inflow)
Center-of-Mass det. time= 15.2 min (851.0 - 835.8)

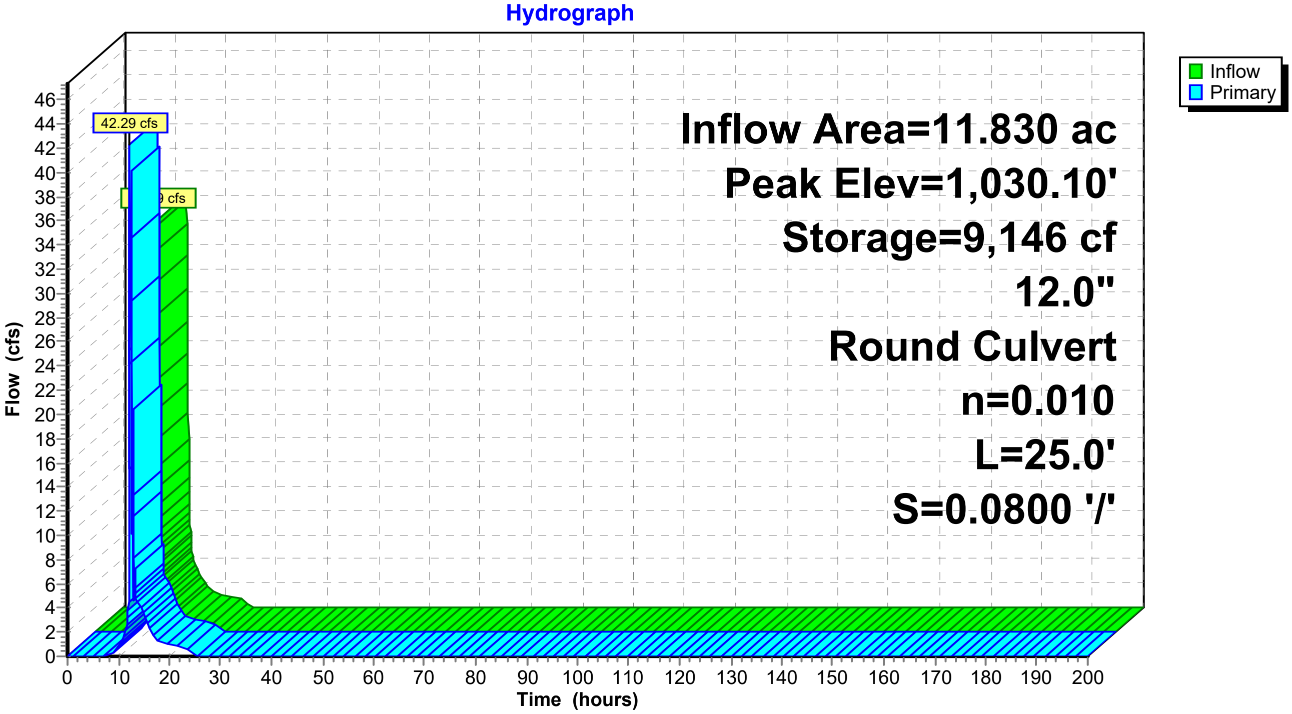
Volume	Invert	Avail.Storage	Storage Description
#1	829.00'	9,146 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
829.00	1,584	0	0
830.00	2,509	2,047	2,047
831.00	3,525	3,017	5,064
832.00	4,639	4,082	9,146

Device	Routing	Invert	Outlet Devices
#1	Primary	829.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 829.00' / 827.00' S= 0.0800 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=42.05 cfs @ 12.30 hrs HW=1,027.88' (Free Discharge)
└─**1=Culvert** (Inlet Controls 42.05 cfs @ 53.54 fps)

Pond SMA-1: SMA-1 Infiltration Basin



Summary for Pond SMA-10: SMA-10 Pocket Pond

Inflow Area = 0.444 ac, 0.00% Impervious, Inflow Depth = 3.76" for 100-YEAR, 24-HOUR event
Inflow = 1.82 cfs @ 12.11 hrs, Volume= 0.139 af
Outflow = 1.79 cfs @ 12.13 hrs, Volume= 0.139 af, Atten= 2%, Lag= 0.9 min
Primary = 1.79 cfs @ 12.13 hrs, Volume= 0.139 af
Routed to Reach 213R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,042.86' @ 12.13 hrs Surf.Area= 0.003 ac Storage= 0.002 af

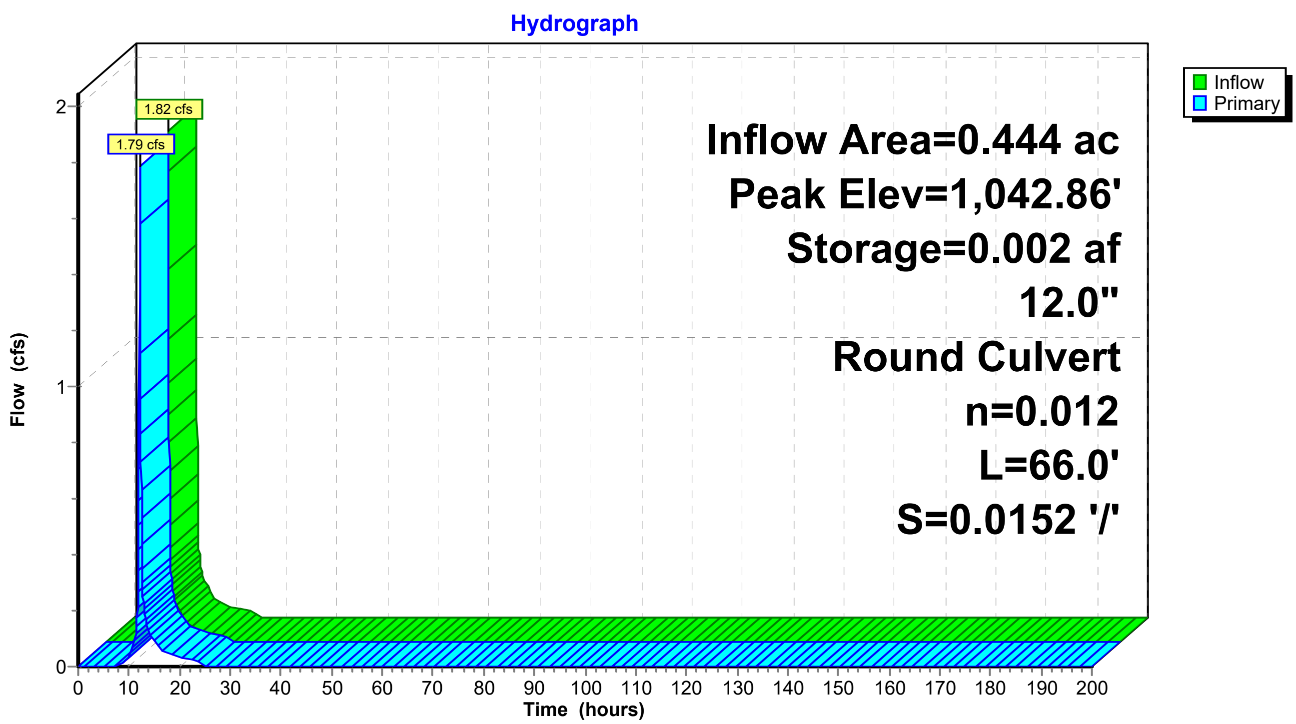
Plug-Flow detention time= 1.3 min calculated for 0.139 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (825.4 - 824.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,042.00'	0.017 af	**7.75'D x 3.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,042.00'	**12.0" Round Culvert** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,042.00' / 1,041.00' S= 0.0152 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.13 hrs HW=1,042.84' (Free Discharge)
1=Culvert (Inlet Controls 1.74 cfs @ 2.47 fps)

Pond SMA-10: SMA-10 Pocket Pond



Summary for Pond SMA-11: SMA-11 Pocket Pond

[93] Warning: Storage range exceeded by 34.96'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 5.186 ac, 0.00% Impervious, Inflow Depth = 3.86" for 100-YEAR, 24-HOUR event
Inflow = 17.51 cfs @ 12.21 hrs, Volume= 1.668 af
Outflow = 18.28 cfs @ 12.20 hrs, Volume= 1.668 af, Atten= 0%, Lag= 0.0 min
Primary = 18.28 cfs @ 12.20 hrs, Volume= 1.668 af
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,038.96' @ 12.20 hrs Surf.Area= 0.013 ac Storage= 0.018 af

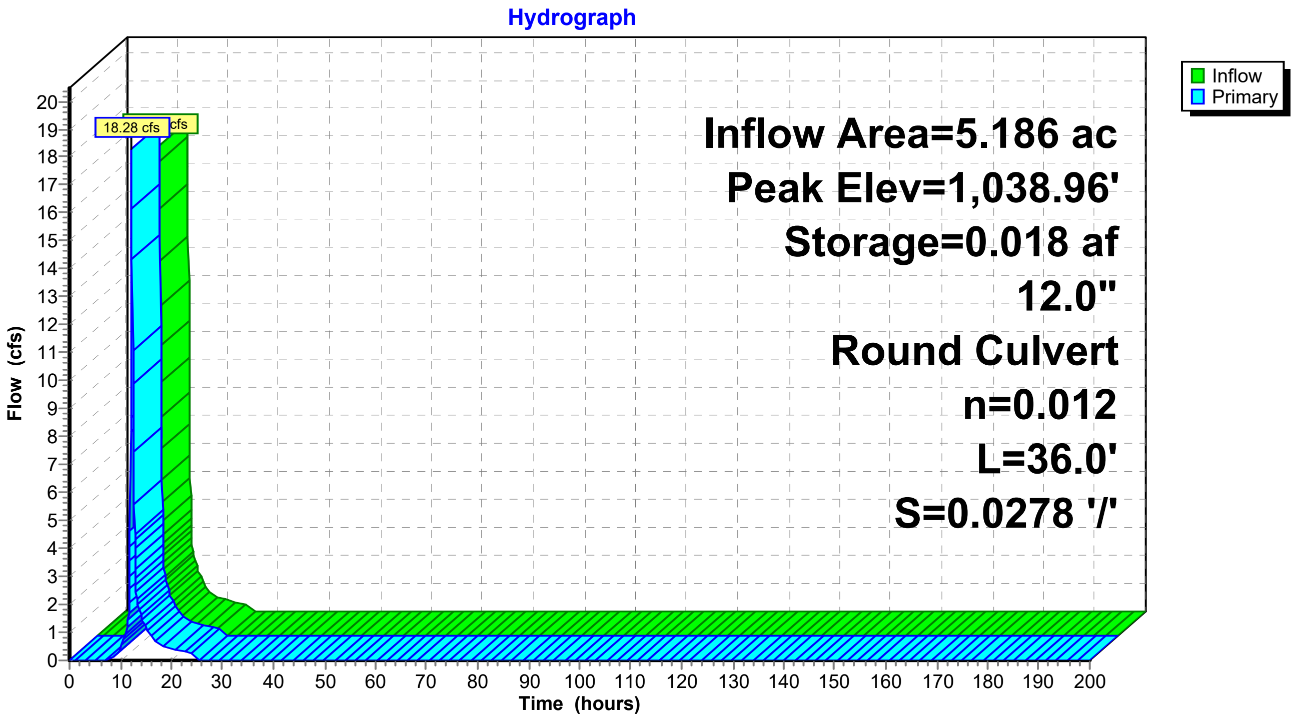
Plug-Flow detention time= 1.1 min calculated for 1.667 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (830.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,001.00'	0.018 af	**8.40'D x 3.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,001.00' / 1,000.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=18.05 cfs @ 12.20 hrs HW=1,038.06' (Free Discharge)
└─**1=Culvert** (Inlet Controls 18.05 cfs @ 22.98 fps)

Pond SMA-11: SMA-11 Pocket Pond



Summary for Pond SMA-12: SMA-12 Pocket Pond

[79] Warning: Submerged Pond SMA-11 Primary device # 1 INLET by 1.32'

Inflow Area = 6.050 ac, 0.00% Impervious, Inflow Depth = 3.91" for 100-YEAR, 24-HOUR event
Inflow = 21.11 cfs @ 12.21 hrs, Volume= 1.973 af
Outflow = 20.11 cfs @ 12.23 hrs, Volume= 1.947 af, Atten= 5%, Lag= 1.7 min
Primary = 20.11 cfs @ 12.23 hrs, Volume= 1.947 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,002.32' @ 12.23 hrs Surf.Area= 0.035 ac Storage= 0.063 af

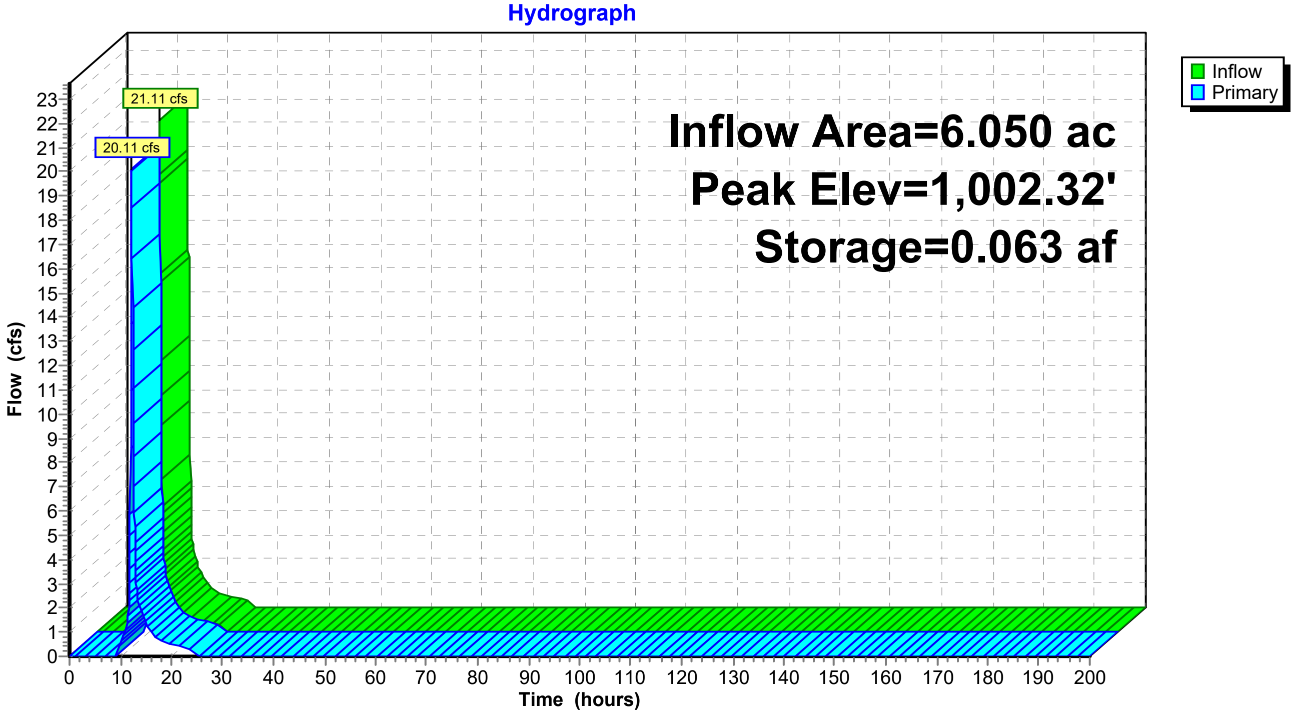
Plug-Flow detention time= 14.3 min calculated for 1.947 af (99% of inflow)
Center-of-Mass det. time= 6.3 min (834.3 - 828.0)

Volume	Invert	Avail.Storage	Storage Description
#1	999.00'	0.090 af	**7.00'W x 37.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=19.91 cfs @ 12.23 hrs HW=1,002.31' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 19.91 cfs @ 3.04 fps)

Pond SMA-12: SMA-12 Pocket Pond



Summary for Pond SMA-13: SMA-13 Pocket Pond

[93] Warning: Storage range exceeded by 1.02'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth = 4.06" for 100-YEAR, 24-HOUR event
Inflow = 37.68 cfs @ 12.23 hrs, Volume= 3.617 af
Outflow = 37.82 cfs @ 12.24 hrs, Volume= 3.574 af, Atten= 0%, Lag= 0.1 min
Primary = 37.82 cfs @ 12.24 hrs, Volume= 3.574 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,003.02' @ 12.24 hrs Surf.Area= 0.030 ac Storage= 0.069 af

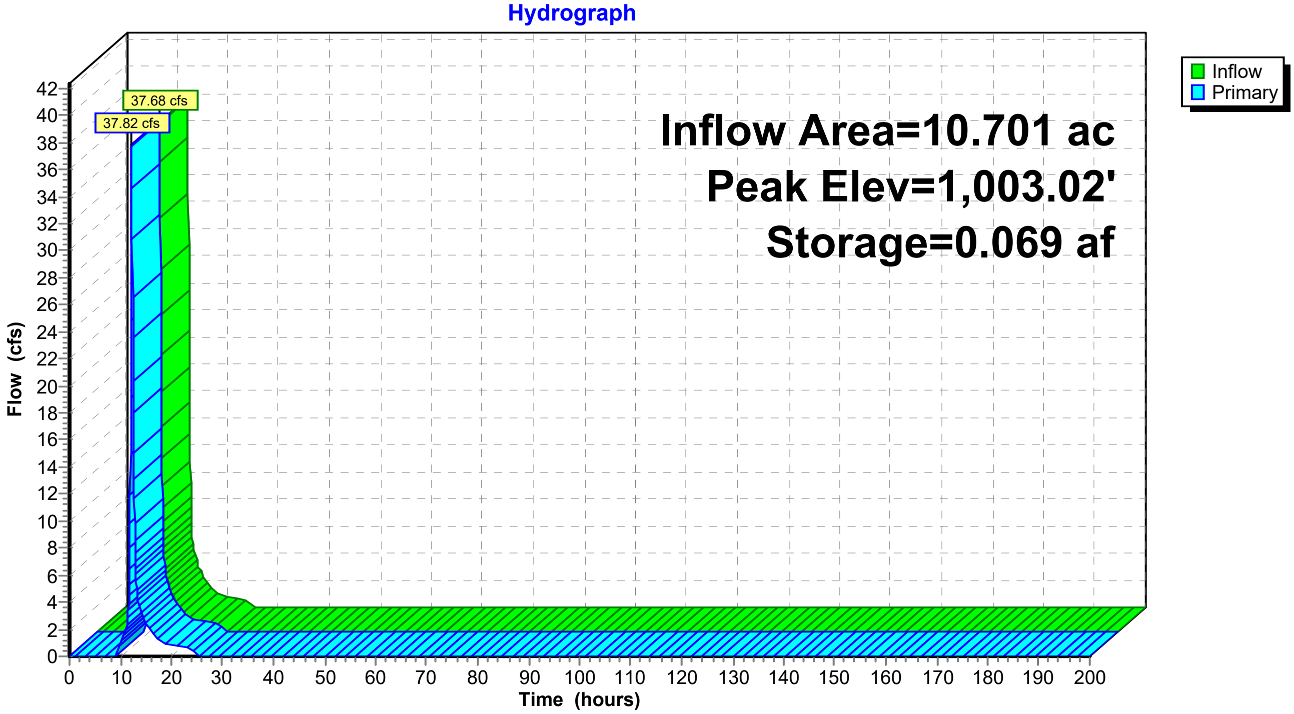
Plug-Flow detention time= 12.6 min calculated for 3.574 af (99% of inflow)
Center-of-Mass det. time= 5.3 min (831.7 - 826.4)

Volume	Invert	Avail.Storage	Storage Description
#1	996.00'	0.069 af	**5.00'D x 6.00'H Vertical Cone/Cylinder Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.00'	**5.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=37.42 cfs @ 12.24 hrs HW=1,003.01' (Free Discharge)
└—**1=Broad-Crested Rectangular Weir** (Weir Controls 37.42 cfs @ 3.73 fps)

Pond SMA-13: SMA-13 Pocket Pond



Summary for Pond SMA-14: SMA-14 Pocket Pond

Inflow Area = 0.678 ac, 0.00% Impervious, Inflow Depth = 4.07" for 100-YEAR, 24-HOUR event
Inflow = 2.41 cfs @ 12.21 hrs, Volume= 0.230 af
Outflow = 2.41 cfs @ 12.22 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.3 min
Primary = 2.41 cfs @ 12.22 hrs, Volume= 0.229 af
Routed to Pond SMA-12 : SMA-12 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,017.46' @ 12.22 hrs Surf.Area= 0.003 ac Storage= 0.002 af

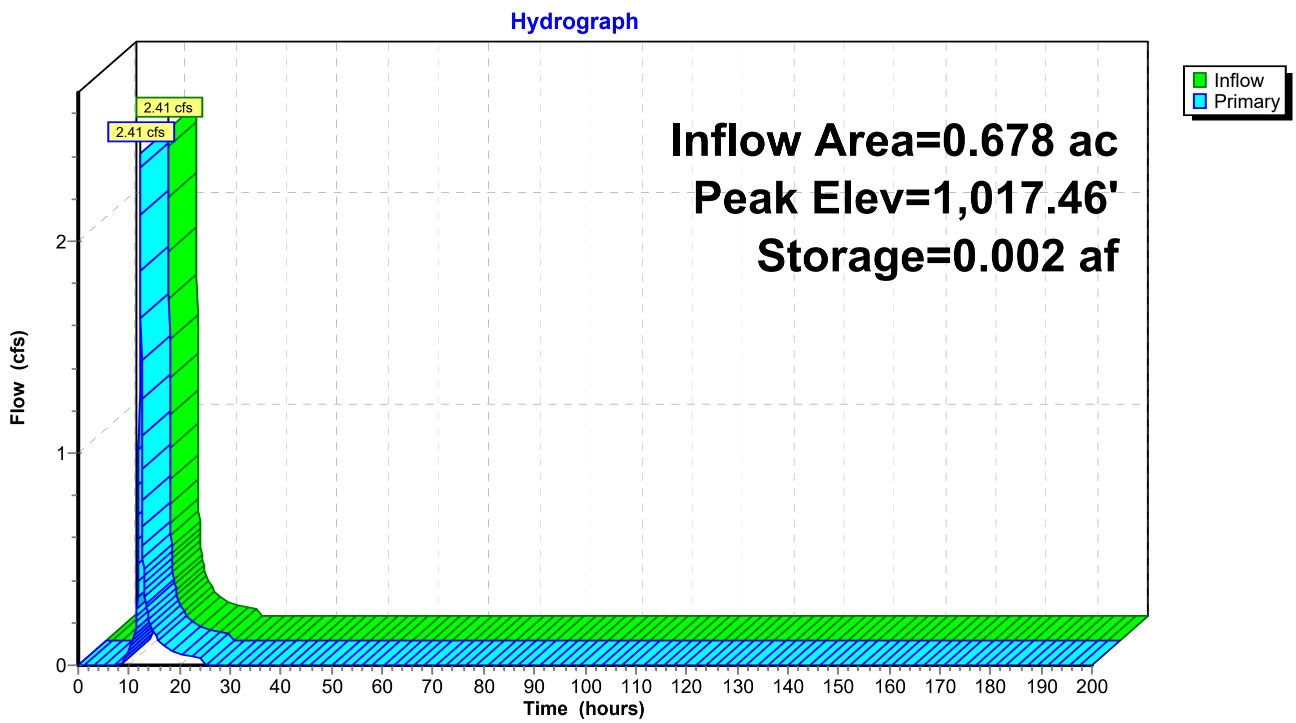
Plug-Flow detention time= 4.8 min calculated for 0.229 af (100% of inflow)
Center-of-Mass det. time= 2.1 min (826.3 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,016.00'	0.005 af	**2.00'W x 5.00'L x 2.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.38 cfs @ 12.22 hrs HW=1,017.45' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.38 cfs @ 1.75 fps)

Pond SMA-14: SMA-14 Pocket Pond



Summary for Pond SMA-15: SMA-15 Pocket Pond

Inflow Area = 0.203 ac, 0.00% Impervious, Inflow Depth = 4.93" for 100-YEAR, 24-HOUR event
Inflow = 1.29 cfs @ 12.01 hrs, Volume= 0.083 af
Outflow = 1.24 cfs @ 12.02 hrs, Volume= 0.078 af, Atten= 3%, Lag= 0.8 min
Primary = 1.24 cfs @ 12.02 hrs, Volume= 0.078 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,017.22' @ 12.02 hrs Surf.Area= 0.007 ac Storage= 0.006 af

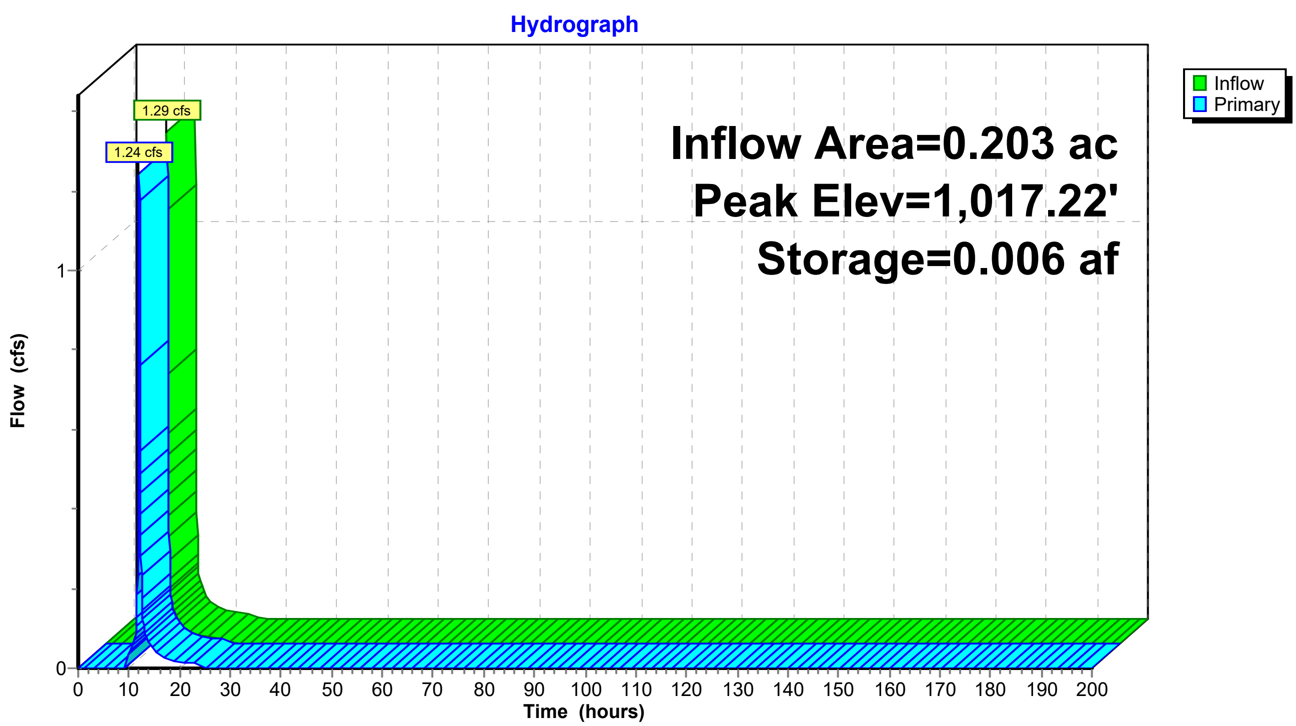
Plug-Flow detention time= 53.1 min calculated for 0.078 af (94% of inflow)
Center-of-Mass det. time= 19.6 min (809.3 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	0.028 af	**5.00'W x 3.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,017.00'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.18 cfs @ 12.02 hrs HW=1,017.21' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.18 cfs @ 1.12 fps)

Pond SMA-15: SMA-15 Pocket Pond



Summary for Pond SMA-16: SMA-16 Pocket Pond

[93] Warning: Storage range exceeded by 86.68'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 7.634 ac, 0.00% Impervious, Inflow Depth = 3.96" for 100-YEAR, 24-HOUR event
Inflow = 26.52 cfs @ 12.21 hrs, Volume= 2.522 af
Outflow = 28.20 cfs @ 12.20 hrs, Volume= 2.500 af, Atten= 0%, Lag= 0.0 min
Primary = 28.20 cfs @ 12.20 hrs, Volume= 2.500 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,119.68' @ 12.20 hrs Surf.Area= 0.073 ac Storage= 0.170 af

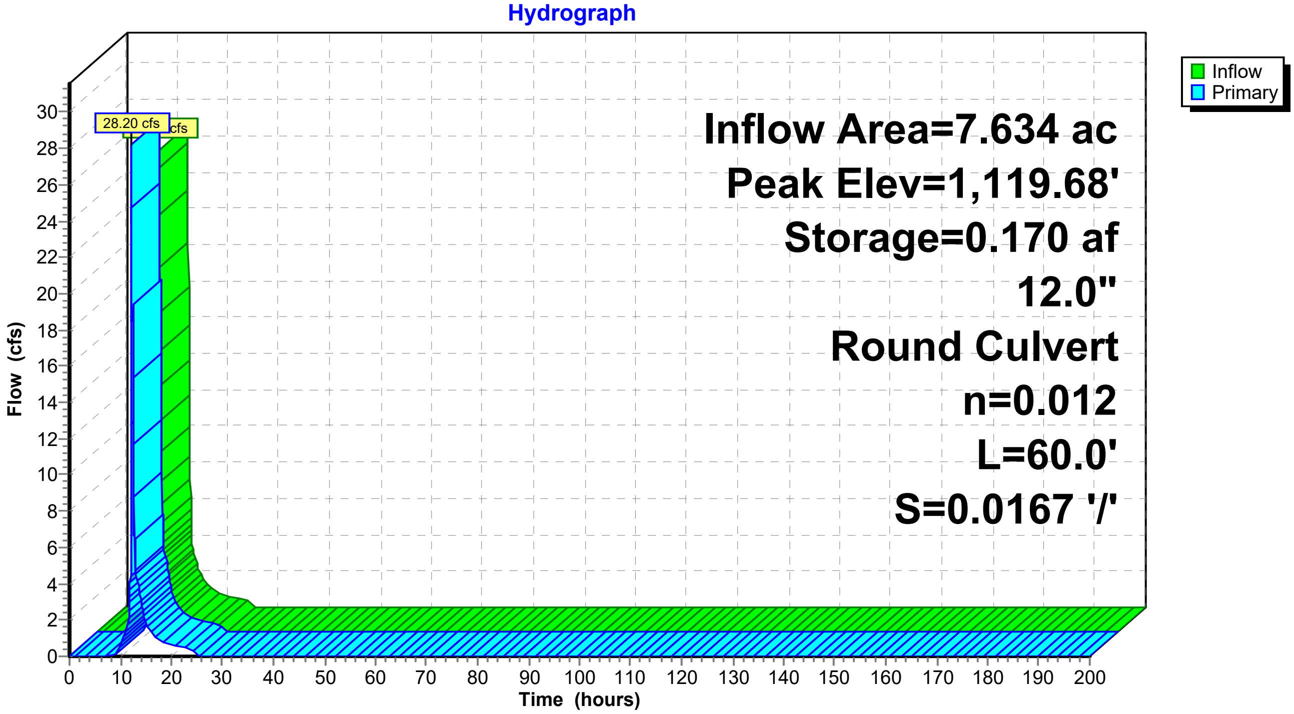
Plug-Flow detention time= 20.1 min calculated for 2.500 af (99% of inflow)
Center-of-Mass det. time= 14.8 min (841.3 - 826.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,029.00'	0.170 af	**10.00'W x 70.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,030.00' / 1,029.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=27.90 cfs @ 12.20 hrs HW=1,117.83' (Free Discharge)
└─**1=Culvert** (Inlet Controls 27.90 cfs @ 35.52 fps)

Pond SMA-16: SMA-16 Pocket Pond



Summary for Pond SMA-17: SMA-17 Pocket Pond

Inflow Area = 0.099 ac, 0.00% Impervious, Inflow Depth = 4.93" for 100-YEAR, 24-HOUR event
Inflow = 0.63 cfs @ 12.01 hrs, Volume= 0.041 af
Outflow = 0.60 cfs @ 12.03 hrs, Volume= 0.038 af, Atten= 5%, Lag= 1.1 min
Primary = 0.60 cfs @ 12.03 hrs, Volume= 0.038 af
Routed to Reach 211R : (new Reach)

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,028.19' @ 12.03 hrs Surf.Area= 0.006 ac Storage= 0.004 af

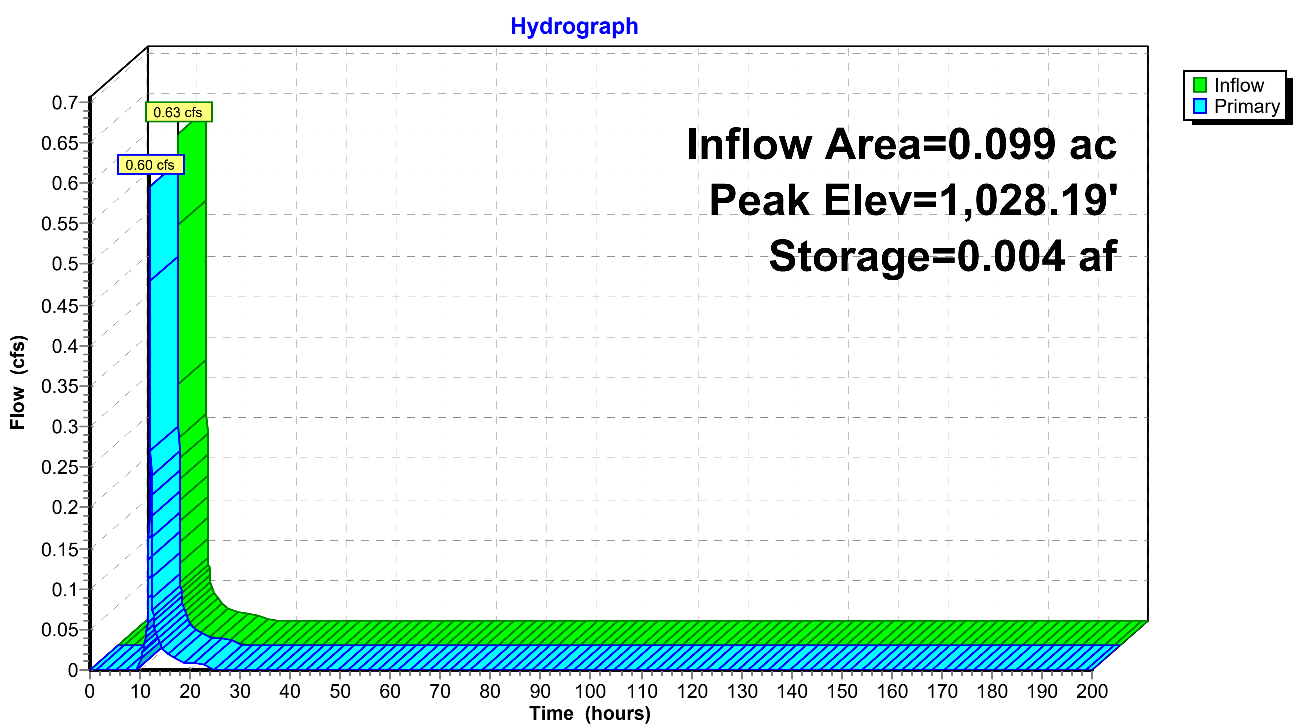
Plug-Flow detention time= 62.9 min calculated for 0.038 af (92% of inflow)
Center-of-Mass det. time= 23.7 min (813.2 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,027.00'	0.023 af	**7.00'W x 10.00'L x 3.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**3.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.57 cfs @ 12.03 hrs HW=1,028.19' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.57 cfs @ 1.01 fps)

Pond SMA-17: SMA-17 Pocket Pond



Summary for Pond SMA-18: SMA-18 Pocket Pond

Inflow Area = 0.475 ac, 0.00% Impervious, Inflow Depth = 4.93" for 100-YEAR, 24-HOUR event
Inflow = 2.91 cfs @ 12.04 hrs, Volume= 0.195 af
Outflow = 2.48 cfs @ 12.09 hrs, Volume= 0.143 af, Atten= 15%, Lag= 2.7 min
Primary = 2.48 cfs @ 12.09 hrs, Volume= 0.143 af
Routed to Reach 211R : (new Reach)

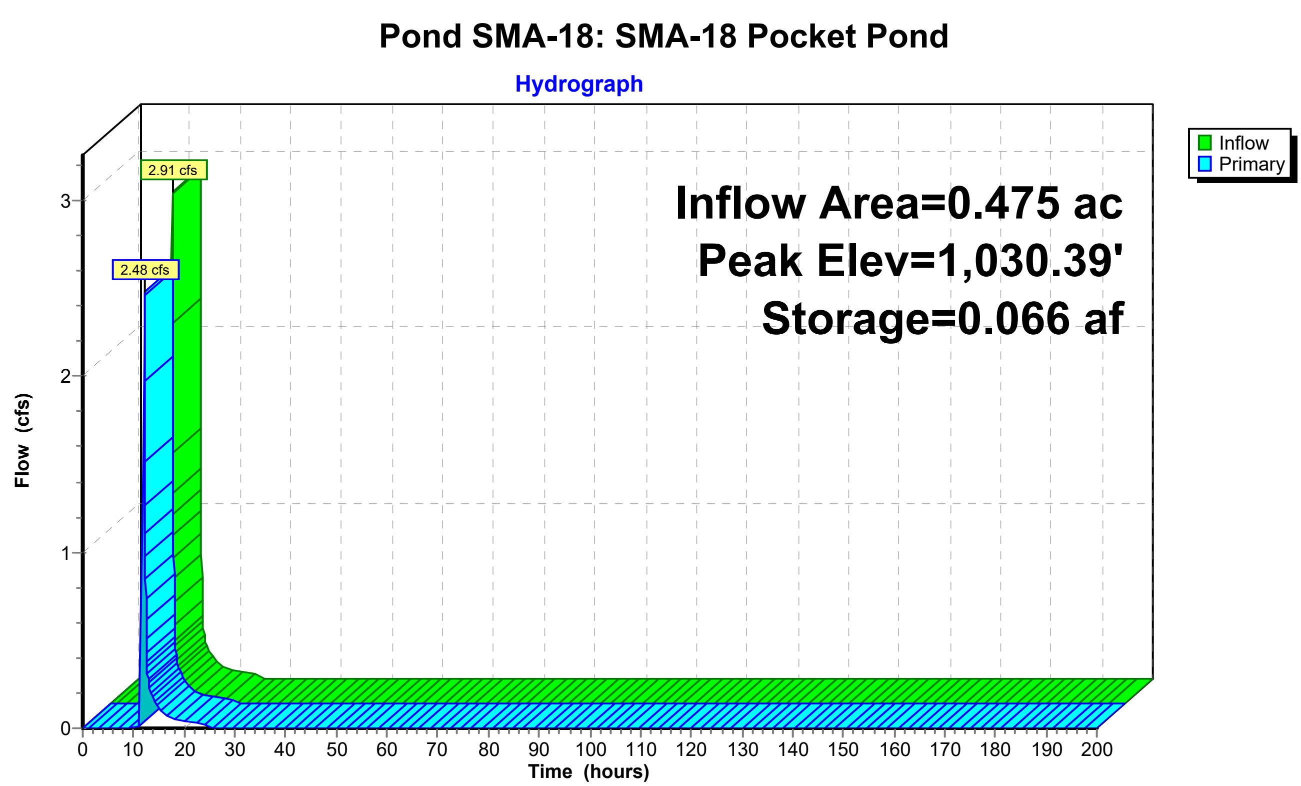
Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,030.39' @ 12.09 hrs Surf.Area= 0.035 ac Storage= 0.066 af

Plug-Flow detention time= 151.5 min calculated for 0.143 af (73% of inflow)
Center-of-Mass det. time= 63.1 min (854.6 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,027.00'	0.138 af	**30.00'W x 10.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.00'	**4.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.42 cfs @ 12.09 hrs HW=1,030.39' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.42 cfs @ 1.55 fps)



Summary for Pond SMA-4: SMA-4 Pocket Pond

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 107.46'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=119)

Inflow Area = 1.961 ac, 0.00% Impervious, Inflow Depth = 4.60" for 100-YEAR, 24-HOUR event
Inflow = 11.95 cfs @ 12.00 hrs, Volume= 0.753 af
Outflow = 12.55 cfs @ 12.04 hrs, Volume= 0.594 af, Atten= 0%, Lag= 2.1 min
Primary = 12.55 cfs @ 12.04 hrs, Volume= 0.594 af
Routed to Link DP-3 : Outfall to Southwest

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 961.46' @ 12.04 hrs Surf.Area= 4,191 sf Storage= 7,166 cf

Plug-Flow detention time= 121.8 min calculated for 0.594 af (79% of inflow)
Center-of-Mass det. time= 43.8 min (841.2 - 797.3)

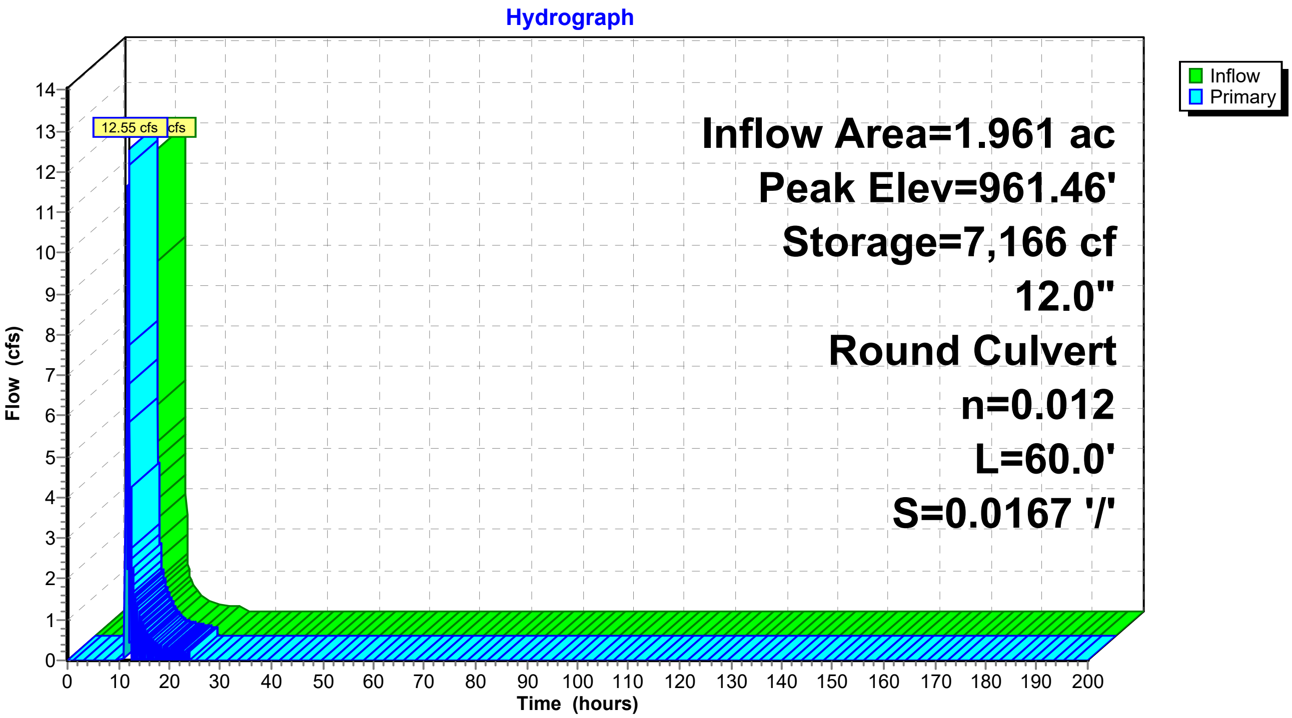
Volume	Invert	Avail.Storage	Storage Description
#1	850.00'	7,166 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
850.00	315	0	0
851.00	612	464	464
852.00	1,074	843	1,307
853.00	3,227	2,151	3,457
854.00	4,191	3,709	7,166

Device	Routing	Invert	Outlet Devices
#1	Primary	944.00'	**12.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 944.00' / 943.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=11.46 cfs @ 12.04 hrs HW=959.24' (Free Discharge)
└─**1=Culvert** (Inlet Controls 11.46 cfs @ 14.59 fps)

Pond SMA-4: SMA-4 Pocket Pond



Summary for Pond SMA-5: SMA-5 Pocket Pond

Inflow Area = 1.049 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-YEAR, 24-HOUR event
Inflow = 3.13 cfs @ 12.04 hrs, Volume= 0.416 af
Outflow = 2.76 cfs @ 12.32 hrs, Volume= 0.416 af, Atten= 12%, Lag= 16.9 min
Primary = 2.76 cfs @ 12.32 hrs, Volume= 0.416 af
Routed to Reach 8R : Wetland Stream

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 935.35' @ 12.32 hrs Surf.Area= 1,145 sf Storage= 1,073 cf

Plug-Flow detention time= 8.0 min calculated for 0.416 af (100% of inflow)
Center-of-Mass det. time= 8.0 min (839.9 - 831.9)

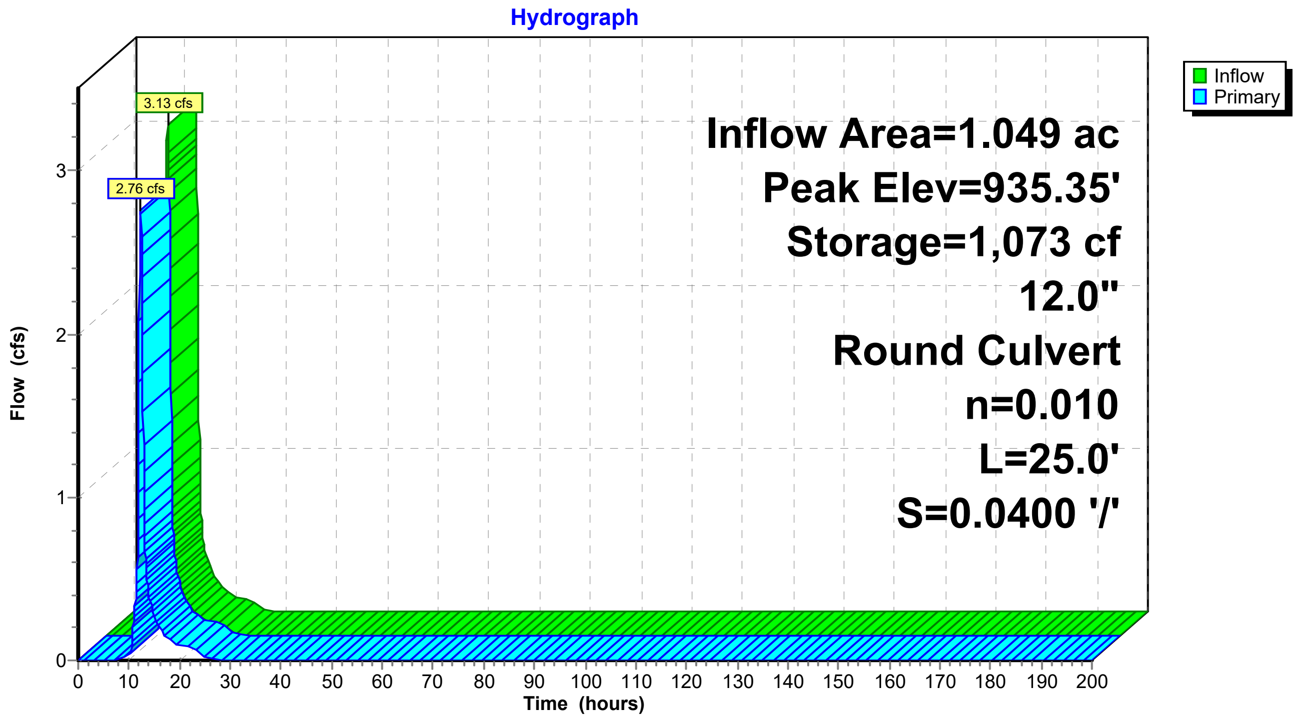
Volume	Invert	Avail.Storage	Storage Description
#1	934.00'	3,514 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
934.00	380	0	0
935.00	1,008	694	694
936.00	1,396	1,202	1,896
937.00	1,840	1,618	3,514

Device	Routing	Invert	Outlet Devices
#1	Primary	934.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 934.00' / 933.00' S= 0.0400 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.75 cfs @ 12.32 hrs HW=935.35' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.75 cfs @ 3.51 fps)

Pond SMA-5: SMA-5 Pocket Pond



Summary for Pond SMA-6: SMA-6 Pocket Pond

Inflow Area = 0.906 ac, 0.00% Impervious, Inflow Depth = 5.12" for 100-YEAR, 24-HOUR event
Inflow = 4.49 cfs @ 12.00 hrs, Volume= 0.386 af
Outflow = 2.55 cfs @ 12.25 hrs, Volume= 0.357 af, Atten= 43%, Lag= 14.5 min
Primary = 2.55 cfs @ 12.25 hrs, Volume= 0.357 af
Routed to Pond SMA-5 : SMA-5 Pocket Pond

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 943.23' @ 12.25 hrs Surf.Area= 2,143 sf Storage= 3,557 cf

Plug-Flow detention time= 89.0 min calculated for 0.357 af (92% of inflow)
Center-of-Mass det. time= 48.1 min (838.9 - 790.8)

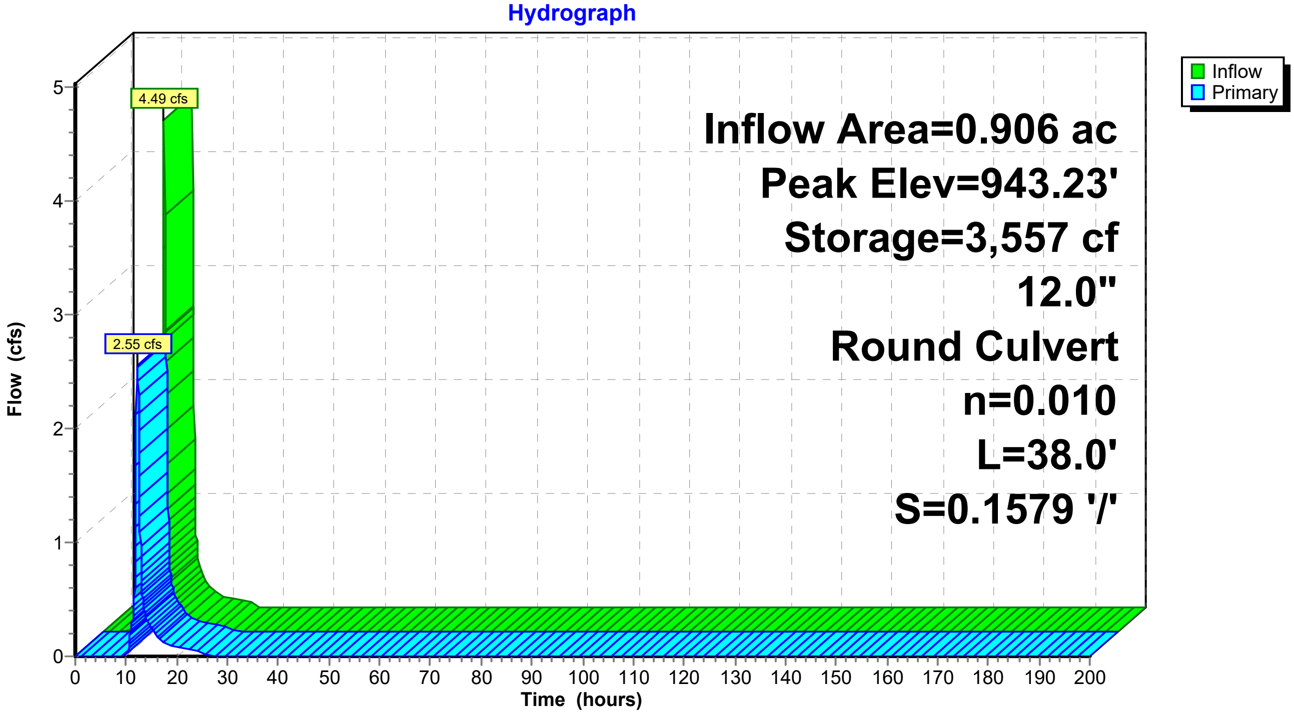
Volume	Invert	Avail.Storage	Storage Description
#1	940.00'	5,345 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
940.00	760	0	0
941.00	132	446	446
942.00	1,547	840	1,286
943.00	2,036	1,792	3,077
944.00	2,500	2,268	5,345

Device	Routing	Invert	Outlet Devices
#1	Primary	942.00'	**12.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 942.00' / 936.00' S= 0.1579 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.55 cfs @ 12.25 hrs HW=943.23' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.55 cfs @ 3.25 fps)

Pond SMA-6: SMA-6 Pocket Pond



Summary for Pond SMA-7: SMA-7 Pocket Pond

[93] Warning: Storage range exceeded by 158.04'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=13)
[63] Warning: Exceeded Reach 12R INLET depth by 88.92' @ 12.05 hrs
[64] Warning: Exceeded Reach 12R outlet bank by 154.04' @ 12.06 hrs

Inflow Area = 11.347 ac, 0.00% Impervious, Inflow Depth = 4.00" for 100-YEAR, 24-HOUR event
Inflow = 36.22 cfs @ 12.05 hrs, Volume= 3.785 af
Outflow = 37.53 cfs @ 12.05 hrs, Volume= 3.785 af, Atten= 0%, Lag= 0.0 min
Primary = 37.53 cfs @ 12.05 hrs, Volume= 3.785 af
Routed to Reach 9R : Flow to Northeast outlet

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 1,103.04' @ 12.06 hrs Surf.Area= 1,685 sf Storage= 2,513 cf

Plug-Flow detention time= 5.6 min calculated for 3.784 af (100% of inflow)
Center-of-Mass det. time= 5.6 min (825.7 - 820.1)

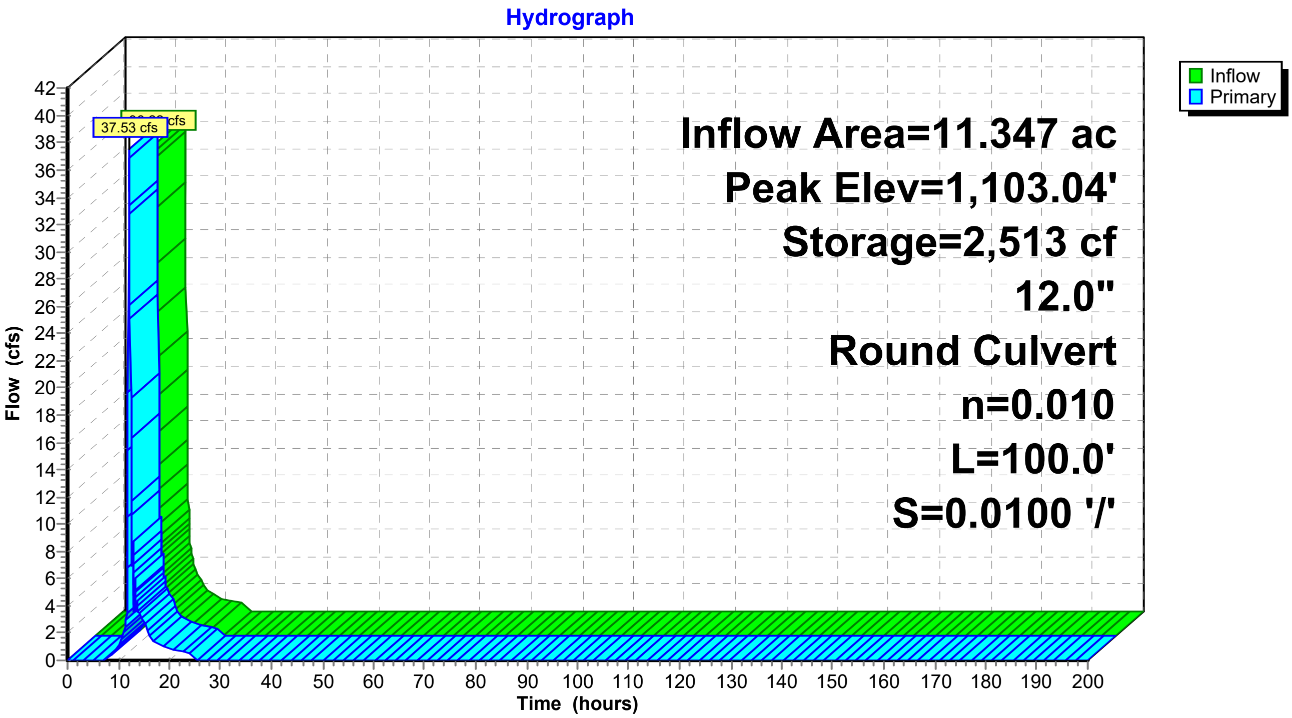
Volume	Invert	Avail.Storage	Storage Description
#1	943.00'	2,513 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
943.00	861	0	0
944.00	1,240	1,051	1,051
945.00	1,685	1,463	2,513

Device	Routing	Invert	Outlet Devices
#1	Primary	943.00'	**12.0" Round Culvert** L= 100.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 943.00' / 942.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=37.53 cfs @ 12.05 hrs HW=1,101.54' (Free Discharge)
└─**1=Culvert** (Inlet Controls 37.53 cfs @ 47.79 fps)

Pond SMA-7: SMA-7 Pocket Pond



Summary for Pond SMA-9: SMA-9 Pocket Pond

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.298 ac, 0.00% Impervious, Inflow Depth = 5.50" for 100-YEAR, 24-HOUR event
Inflow = 1.96 cfs @ 12.03 hrs, Volume= 0.137 af
Outflow = 1.97 cfs @ 12.03 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.1 min
Primary = 1.97 cfs @ 12.03 hrs, Volume= 0.137 af
Routed to Link DP-4 : Outfall to Southeast

Routing by Stor-Ind method, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs
Peak Elev= 963.41' @ 12.03 hrs Surf.Area= 0.001 ac Storage= 0.000 af

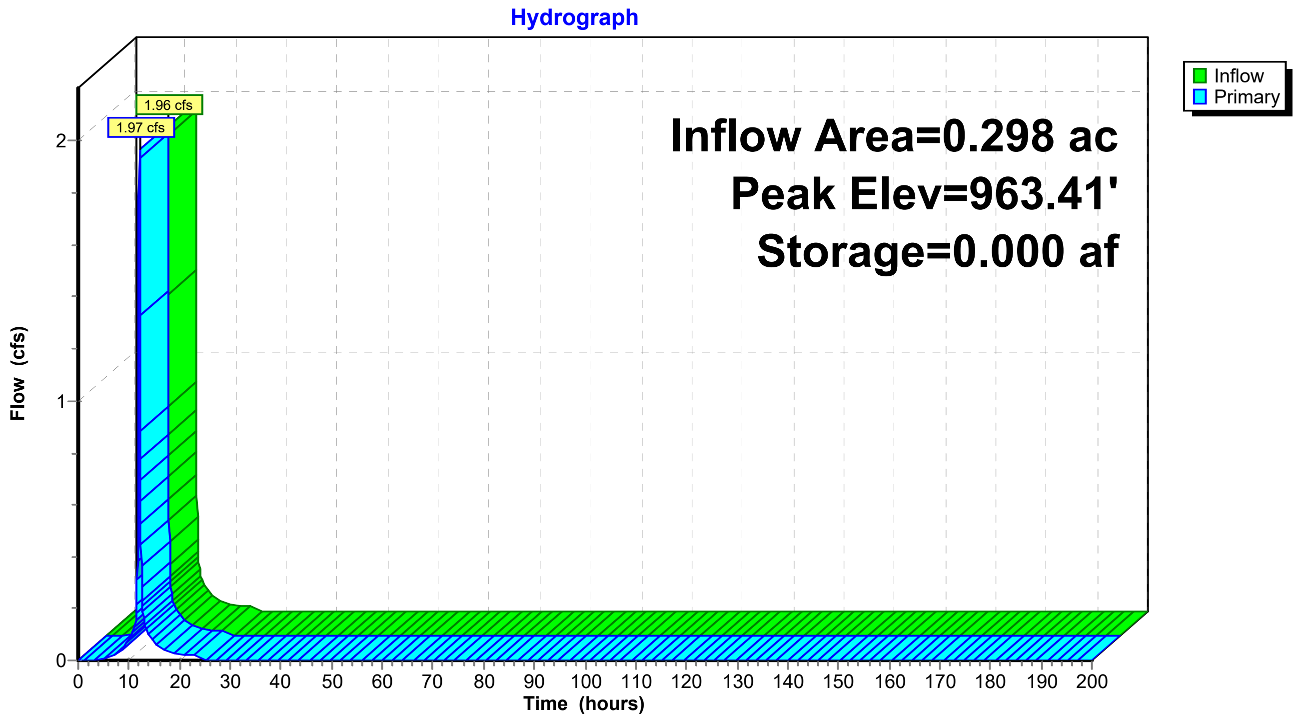
Plug-Flow detention time= 0.1 min calculated for 0.137 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (774.8 - 774.7)

Volume	Invert	Avail.Storage	Storage Description
#1	963.00'	0.046 af	**3.00'W x 3.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	963.00'	**3.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.88 cfs @ 12.03 hrs HW=963.40' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.88 cfs @ 1.58 fps)

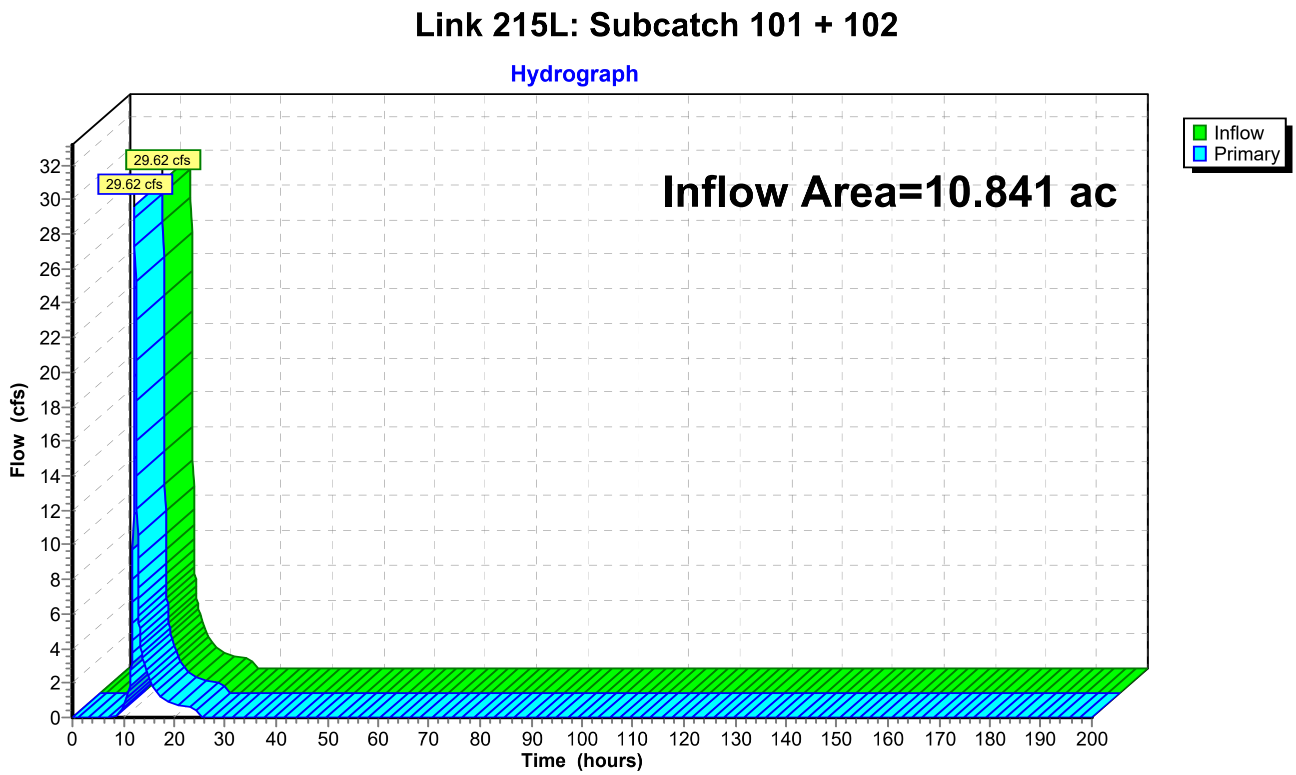
Pond SMA-9: SMA-9 Pocket Pond



Summary for Link 215L: Subcatch 101 + 102

Inflow Area = 10.841 ac, 0.00% Impervious, Inflow Depth = 3.60" for 100-YEAR, 24-HOUR event
Inflow = 29.62 cfs @ 12.26 hrs, Volume= 3.254 af
Primary = 29.62 cfs @ 12.26 hrs, Volume= 3.254 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : Outfall to Southwest

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

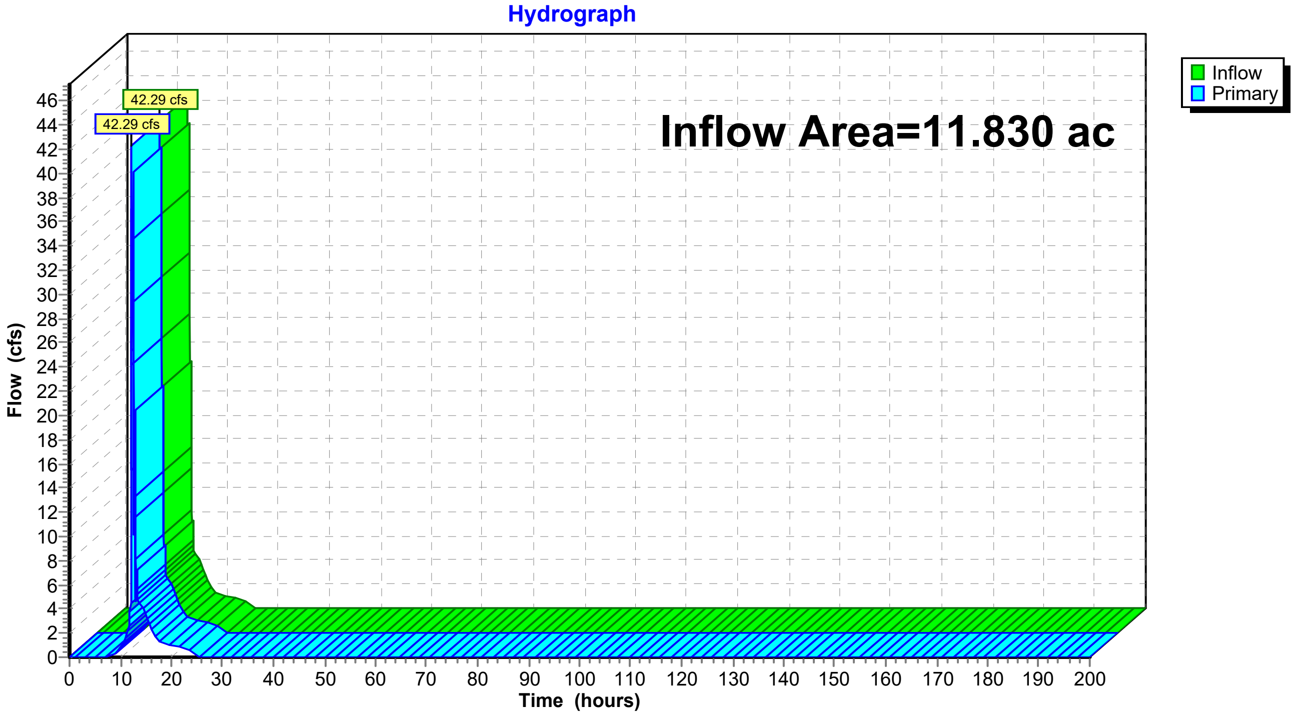


Summary for Link DP-1: Outfall to West

Inflow Area = 11.830 ac, 0.16% Impervious, Inflow Depth = 3.86" for 100-YEAR, 24-HOUR event
Inflow = 42.29 cfs @ 12.30 hrs, Volume= 3.805 af
Primary = 42.29 cfs @ 12.30 hrs, Volume= 3.805 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-1: Outfall to West

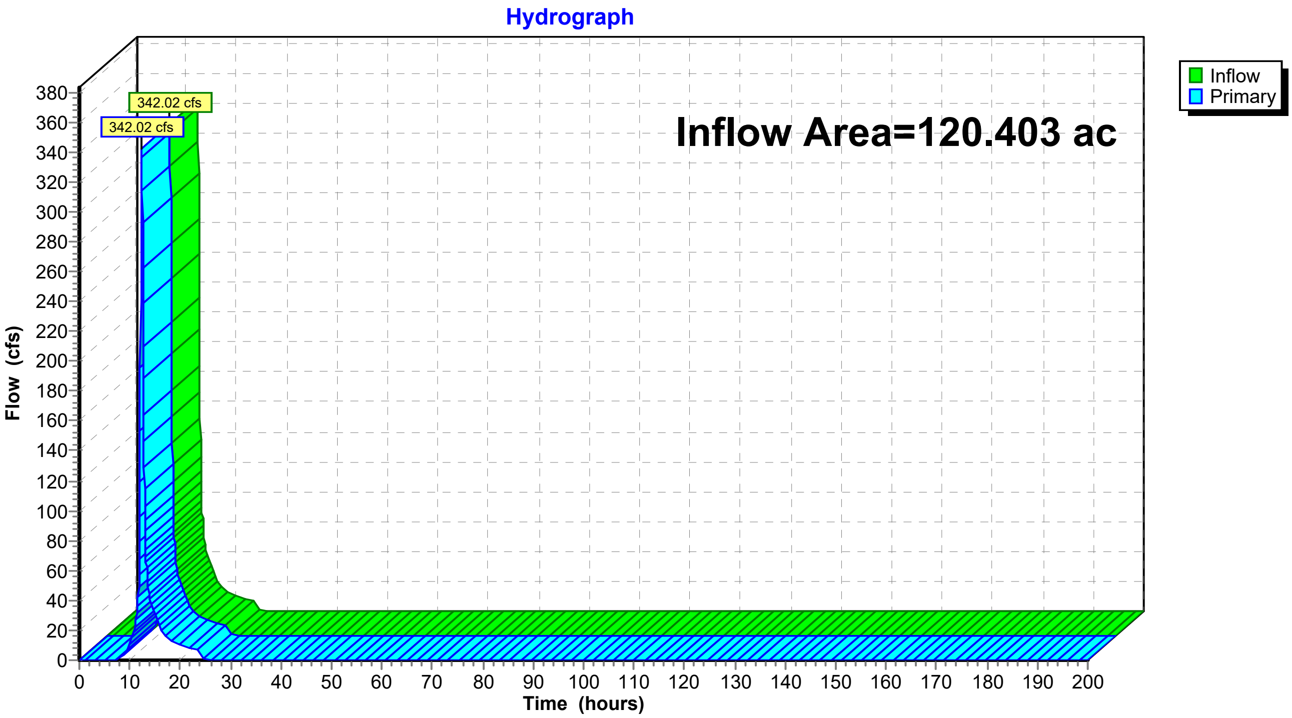


Summary for Link DP-2: Outfall to Northwest

Inflow Area =	120.403 ac,	0.92% Impervious,	Inflow Depth = 4.11"	for 100-YEAR, 24-HOUR event
Inflow =	342.02 cfs @	12.32 hrs, Volume=	41.249 af	
Primary =	342.02 cfs @	12.32 hrs, Volume=	41.249 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-2: Outfall to Northwest

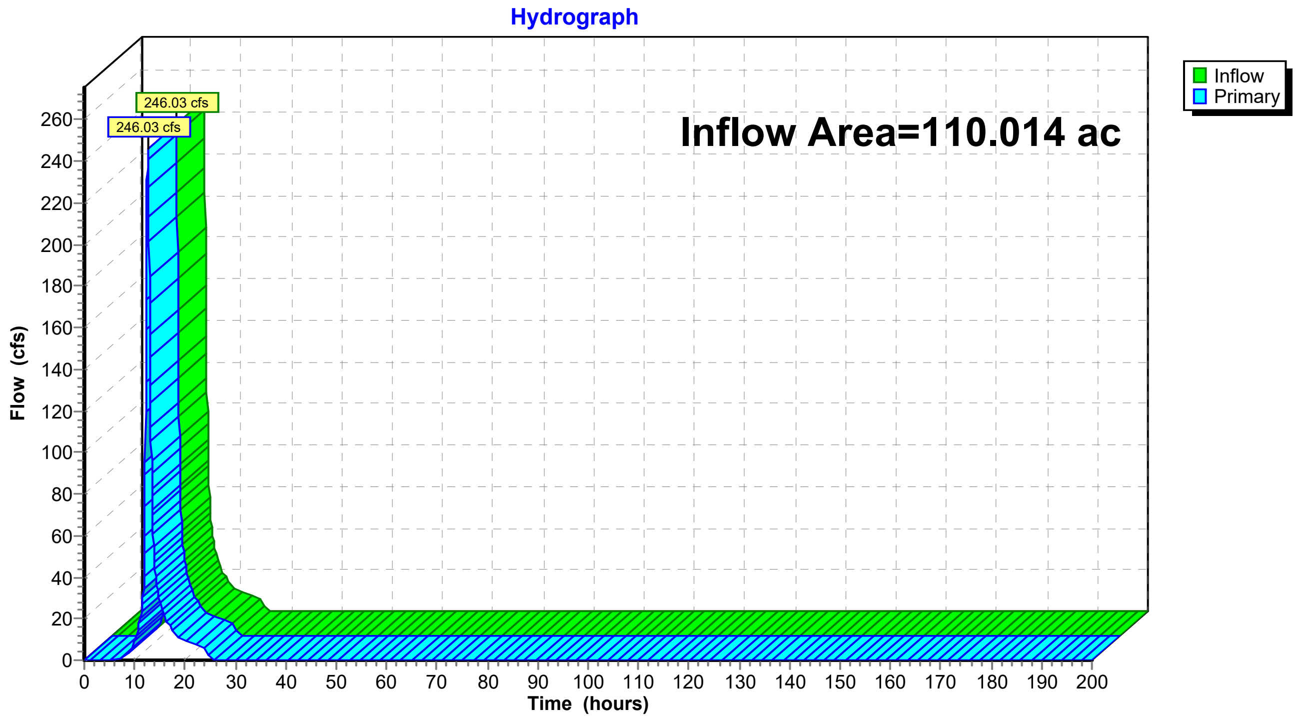


Summary for Link DP-3: Outfall to Southwest

Inflow Area = 110.014 ac, 0.00% Impervious, Inflow Depth = 4.30" for 100-YEAR, 24-HOUR event
Inflow = 246.03 cfs @ 12.57 hrs, Volume= 39.428 af
Primary = 246.03 cfs @ 12.57 hrs, Volume= 39.428 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-3: Outfall to Southwest

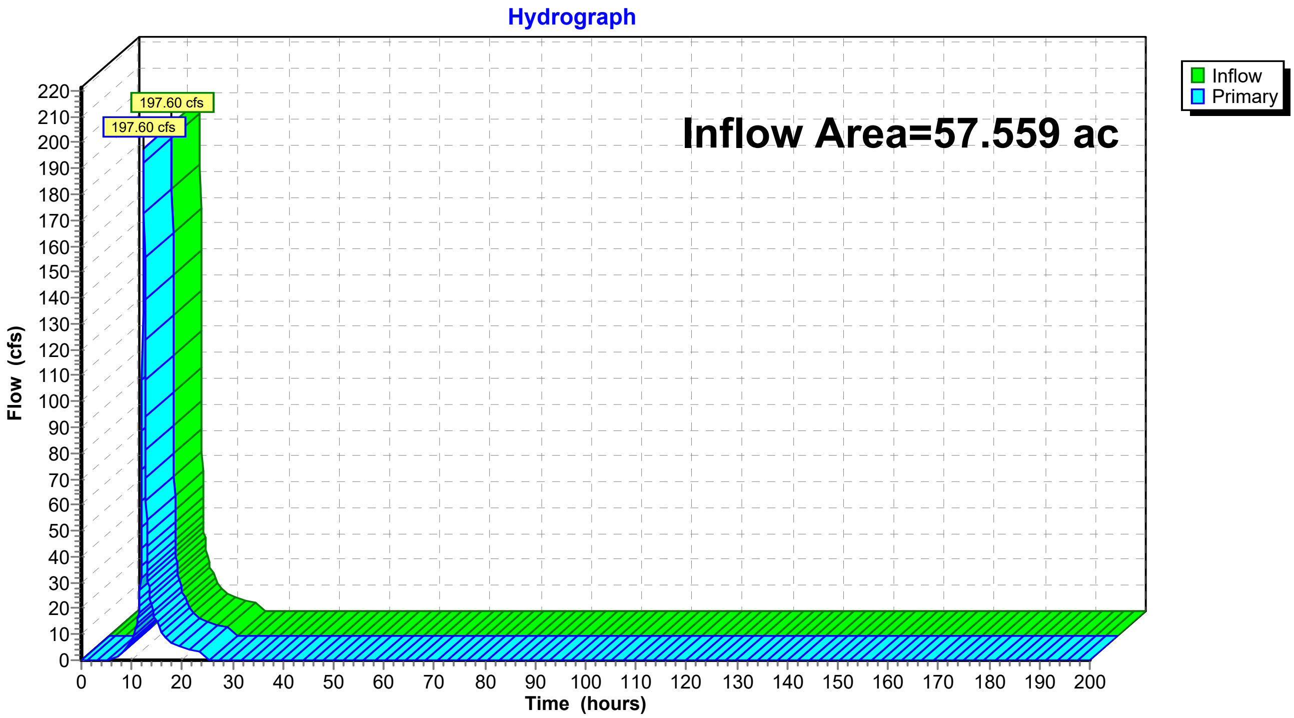


Summary for Link DP-4: Outfall to Southeast

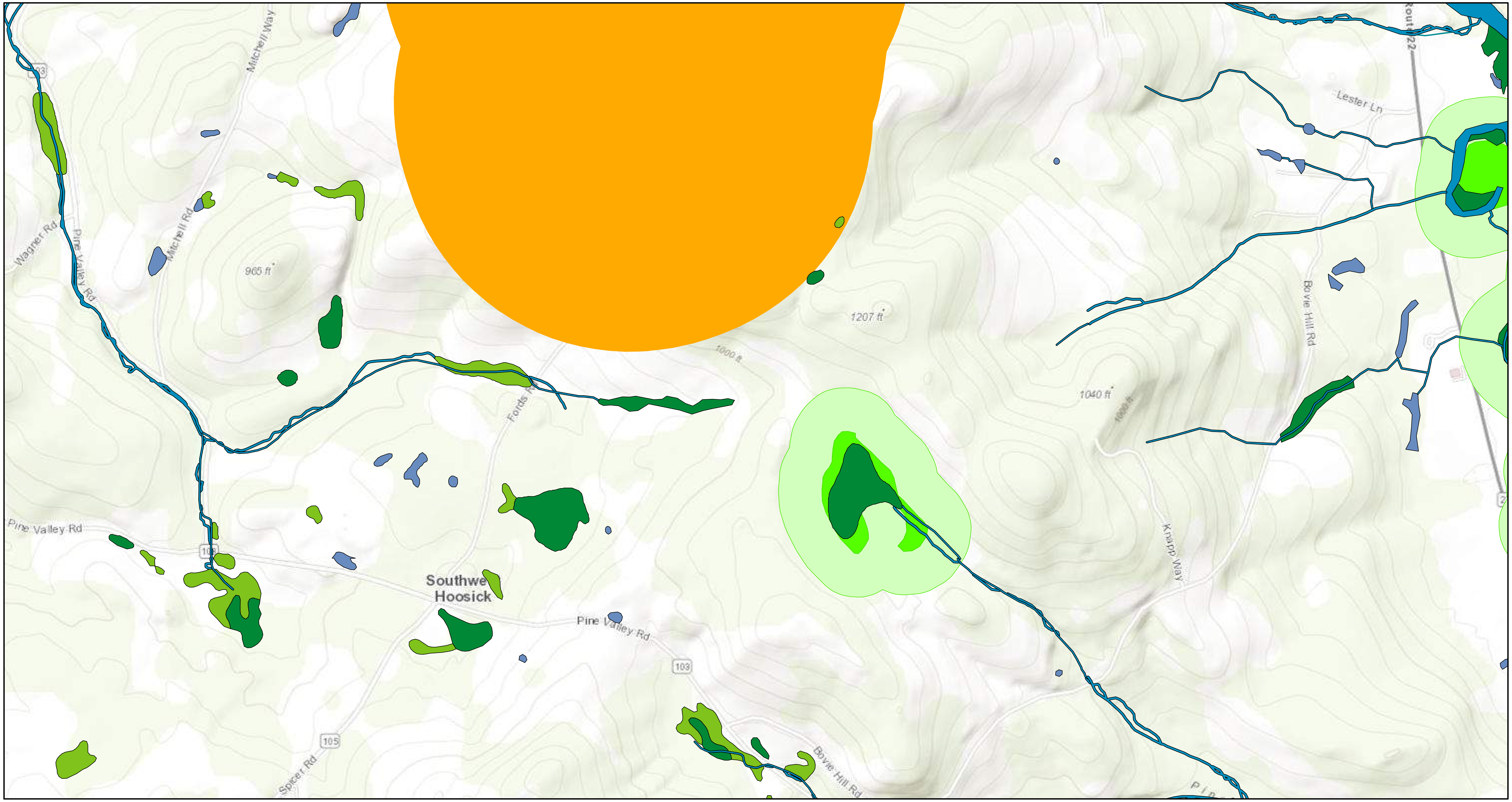
Inflow Area = 57.559 ac, 0.00% Impervious, Inflow Depth = 4.70" for 100-YEAR, 24-HOUR event
Inflow = 197.60 cfs @ 12.33 hrs, Volume= 22.568 af
Primary = 197.60 cfs @ 12.33 hrs, Volume= 22.568 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-200.00 hrs, dt= 0.05 hrs

Link DP-4: Outfall to Southeast



HAWTHORN SOLAR



March 30, 2023

1:18,056

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

NYSDEC Environmental Resource Mapper Figure

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
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United States Department of Agriculture

NRCS

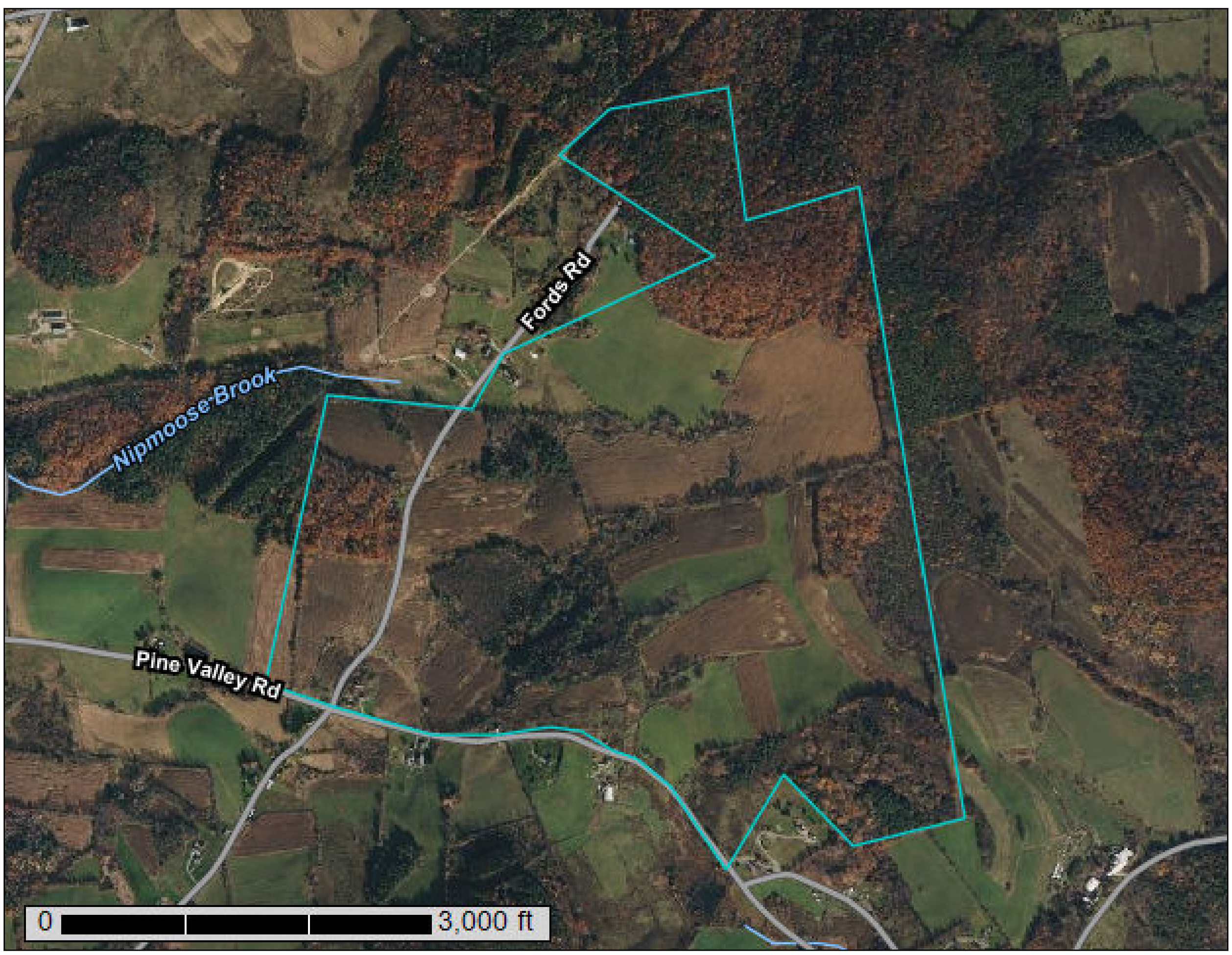
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Rensselaer County, New York

HAWTHORN SOLAR, LLC.



March 29, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

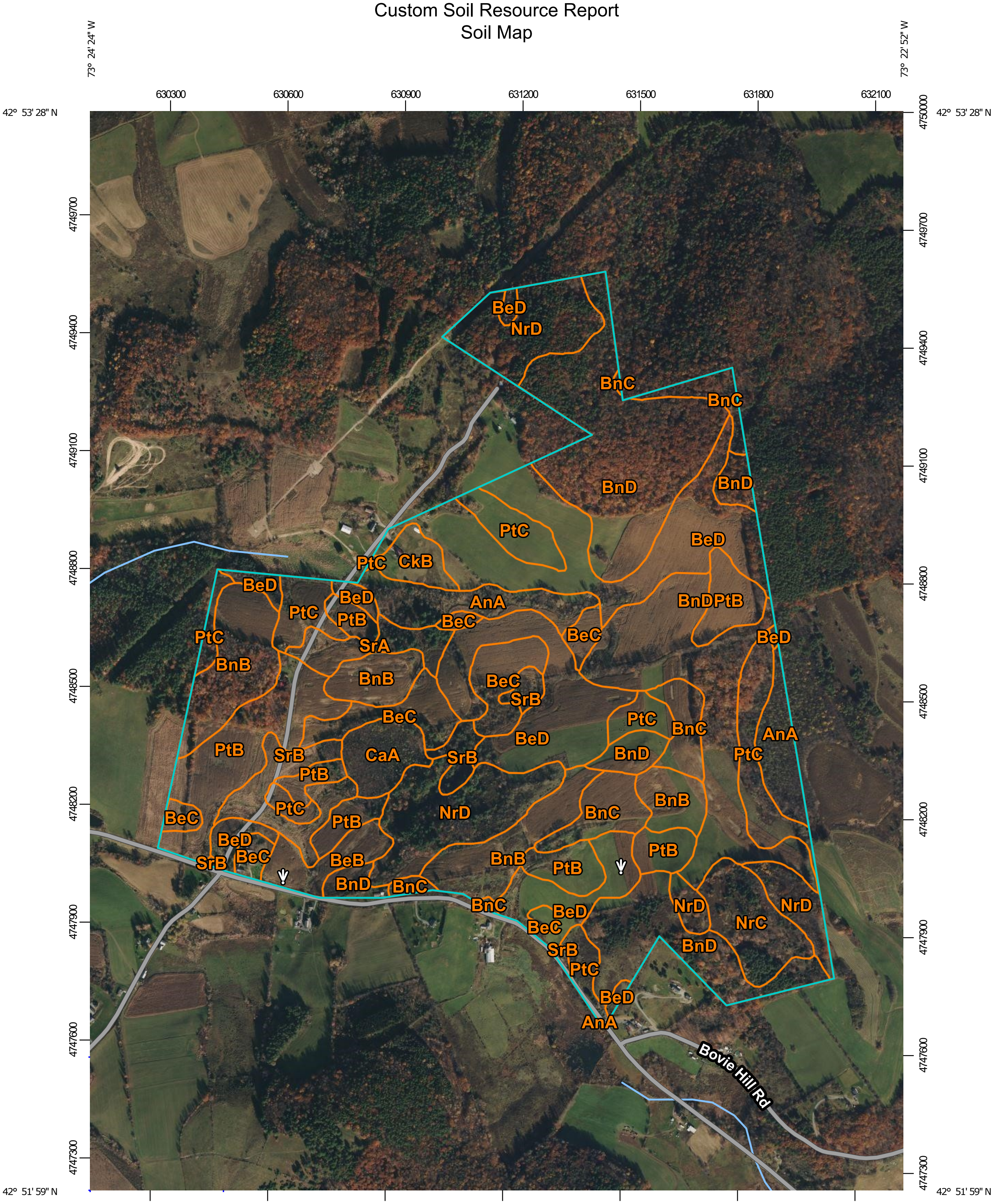
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:13,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rensselaer County, New York
Survey Area Data: Version 19, Sep 10, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2021—Nov 8, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AnA	Alden silt loam, 0 to 3 percent slopes	19.1	4.1%
BeB	Bernardston gravelly silt loam, 3 to 8 percent slopes	7.2	1.6%
BeC	Bernardston gravelly silt loam, 8 to 15 percent slopes	22.4	4.9%
BeD	Bernardston gravelly silt loam, 15 to 25 percent slopes	78.9	17.2%
BnB	Bernardston-Nassau complex, undulating	39.8	8.7%
BnC	Bernardston-Nassau complex, rolling	17.9	3.9%
BnD	Bernardston-Nassau complex, hilly	106.7	23.2%
CaA	Catden muck, 0 to 2 percent slopes	8.0	1.8%
CkB	Chenango gravelly loam, fan, 3 to 8 percent slopes	4.9	1.1%
NrC	Nassau-Rock outcrop, complex, rolling	12.3	2.7%
NrD	Nassau-Rock outcrop complex, hilly	43.6	9.5%
PtB	Pittstown gravelly silt loam, 3 to 8 percent slopes	43.1	9.4%
PtC	Pittstown gravelly silt loam, 8 to 15 percent slopes	32.3	7.0%
SrA	Scriba silt loam, 0 to 3 percent slopes	7.2	1.6%
SrB	Scriba silt loam, 3 to 8 percent slopes	16.0	3.5%
Totals for Area of Interest		**459.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rensselaer County, New York

AnA—Alden silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9v12
Elevation: 300 to 1,500 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Alden and similar soils: 80 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alden

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: A silty mantle of local deposition overlying loamy till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 40 inches: silty clay loam
H3 - 40 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F144AY040NY - Semi-Rich Very Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Alden, mucky surface

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

Fluvaquents

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

BeB—Bernardston gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v14
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bernardston and similar soils: 75 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

BeC—Bernardston gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9v15
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Bernardston and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

BeD—Bernardston gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9v16
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Bernardston and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

BnB—Bernardston-Nassau complex, undulating

Map Unit Setting

National map unit symbol: 9v1b
Elevation: 0 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bernardston and similar soils: 45 percent
Nassau and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

BnC—Bernardston-Nassau complex, rolling

Map Unit Setting

National map unit symbol: 9v1c
Elevation: 0 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Bernardston and similar soils: 45 percent
Nassau and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

BnD—Bernardston-Nassau complex, hilly

Map Unit Setting

National map unit symbol: 9v1d
Elevation: 0 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Bernardston and similar soils: 40 percent
Nassau and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

CaA—Catden muck, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t2qk
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Catden and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Catden

Setting

Landform: Kettles, fens, swamps, marshes, depressions, depressions, depressions, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed herbaceous organic material and/or highly decomposed woody organic material

Typical profile

Oa1 - 0 to 2 inches: muck
Oa2 - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 26.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY042NY - Semi-Rich Organic Wetlands
Hydric soil rating: Yes

Minor Components

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Natchaug

Percent of map unit: 5 percent
Landform: Depressions, depressions
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Alden

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Timakwa

Percent of map unit: 5 percent
Landform: Swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

CkB—Chenango gravelly loam, fan, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v1q
Elevation: 100 to 1,330 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango, fan, and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango, Fan

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 10 inches: gravelly loam
H2 - 10 to 24 inches: very gravelly loam

H3 - 24 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

NrC—Nassau-Rock outcrop, complex, rolling

Map Unit Setting

National map unit symbol: 9v2m
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 40 percent
Rock outcrop: 30 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Benches, till plains, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Depth to restrictive feature: 0 inches to lithic bedrock

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 1 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

NrD—Nassau-Rock outcrop complex, hilly

Map Unit Setting

National map unit symbol: 9v2n
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 40 percent
Rock outcrop: 35 percent
Minor components: 2 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Depth to restrictive feature: 0 inches to lithic bedrock

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 1 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

PtB—Pittstown gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v2s
Elevation: 100 to 1,390 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pittstown and similar soils: 80 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pittstown

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 24 inches: gravelly silt loam
H3 - 24 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

PtC—Pittstown gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9v2t
Elevation: 20 to 1,890 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pittstown and similar soils: 80 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pittstown

Setting

Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 24 inches: gravelly silt loam
H3 - 24 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

SrA—Scriba silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9v35
Elevation: 230 to 1,300 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scriba and similar soils: 80 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scriba

Setting

Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 21 inches: silt loam
H3 - 21 to 50 inches: gravelly silt loam
H4 - 50 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 12 to 21 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

SrB—Scriba silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v36
Elevation: 30 to 1,440 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scriba and similar soils: 80 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scriba

Setting

Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 21 inches: silt loam
H3 - 21 to 50 inches: gravelly silt loam
H4 - 50 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 12 to 21 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

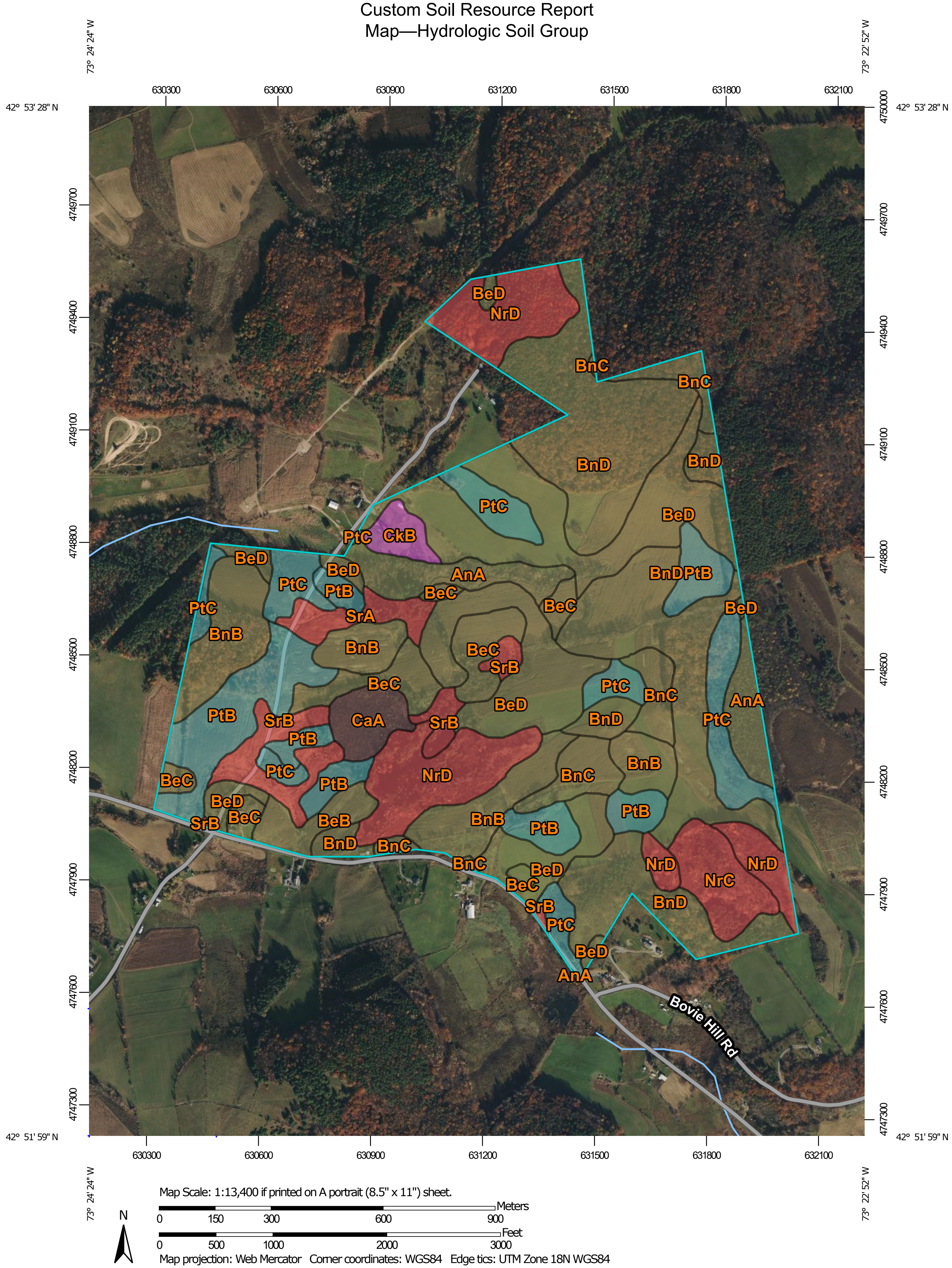
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group



Map Scale: 1:13,400 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 150, 300, 600, 900

Feet: 0, 500, 1000, 2000, 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rensselaer County, New York
Survey Area Data: Version 19, Sep 10, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2021—Nov 8, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnA	Alden silt loam, 0 to 3 percent slopes	C/D	19.1	4.1%
BeB	Bernardston gravelly silt loam, 3 to 8 percent slopes	C/D	7.2	1.6%
BeC	Bernardston gravelly silt loam, 8 to 15 percent slopes	C/D	22.4	4.9%
BeD	Bernardston gravelly silt loam, 15 to 25 percent slopes	C/D	78.9	17.2%
BnB	Bernardston-Nassau complex, undulating	C/D	39.8	8.7%
BnC	Bernardston-Nassau complex, rolling	C/D	17.9	3.9%
BnD	Bernardston-Nassau complex, hilly	C/D	106.7	23.2%
CaA	Catden muck, 0 to 2 percent slopes	B/D	8.0	1.8%
CkB	Chenango gravelly loam, fan, 3 to 8 percent slopes	A	4.9	1.1%
NrC	Nassau-Rock outcrop, complex, rolling	D	12.3	2.7%
NrD	Nassau-Rock outcrop complex, hilly	D	43.6	9.5%
PtB	Pittstown gravelly silt loam, 3 to 8 percent slopes	C	43.1	9.4%
PtC	Pittstown gravelly silt loam, 8 to 15 percent slopes	C	32.3	7.0%
SrA	Scriba silt loam, 0 to 3 percent slopes	D	7.2	1.6%
SrB	Scriba silt loam, 3 to 8 percent slopes	D	16.0	3.5%
Totals for Area of Interest			**459.4**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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SECTION 7

Completed Inspection Reports