Exhibit IX.A.2.b.4 - Storm water

Urda Engineering, PLLC (URDA) was contracted to complete the site design, including storm water discharge and management planning for the Traditions Resort & Casino Project. URDA is a professional engineering firm specializing in commercial site planning and design, including layout of site parking, travel ways, site utilities, and storm water design. Alexander Urda, PE, CPESC has 15 years of experience working with site design and storm water analysis and completed the storm water discharge and management analysis and design for the Traditions project.

Existing and developed conditions, including offsite runoff contributing to the site, were evaluated for the 1-year, 10-year, and 100-year rainfall/storm events per Town of Union and NYS Department of Environmental Conservation regulations. Hydrology was modeled utilizing Hydrocad and TR-55 methodology. Storm water from the additional roof and parking areas of Phases I and II will be detained in an existing detention pond having available storage capacity, and underground storm drainage water retention/infiltration chambers installed under the parking lot. As required by town code and NYS regulations, the rate of storm water leaving the property will be less than the amount of leaving the property at the present time for each of the storm events evaluated. The local and state regulations also require that water quality improvements are addressed, runoff reduction techniques are utilized, and channel protection is implemented. All of these are address and in compliance. Permeable pavements and walkways, grassed 'pavements', grassed swales, an infiltration mall, diversion methods, pond forebay, and other methods are being employed to promote infiltration and water quality improvements. These quantity and quality controls result in impacts less than those existing and have no adverse impact on the local infrastructure.

Refer to the subsequent documentation for a complete copy of the Traditions Resort & Casino Stormwater Pollution Prevention Plan (SWPPP.)

The project will not have any adverse local or regional impact on storm water discharge and management.

STORMWATER POLLUTION PREVENTION PLAN

Traditions Resort & Casino

4101 and 4311 Watson Boulevard
Town of Union, Broome County, New York

TRADITIONS
Resort & Casino

THINK BIG
REALLY BIG

Prepared for:
Walsh & Sons Construction Corporation
200 Plaza Drive, Suite A
Vestal, NY 13850

Prepared by:
Alexander N. Urda, P.E., CPESC
Urda Engineering, PLLC
P.O. Box 142, Windsor, NY 13865

March 26, 2014
Revised June 27, 2014

1. Complete Revision

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STATE OF NEW YORK
ALEXANDER N. URDA
083068
LICENSED PROFESSIONAL ENGINEER

6/27/14

WARNING: It is a violation of Article 145, Section 7209, Subdivision 2 for any person, unless he/she is acting under the direction of a licensed professional engineer or land surveyor, to alter an item in any way on any plans, specifications, plats, and/or reports to which the seal of a professional engineer or land surveyor has been applied. If an item bearing the seal of an engineer or land surveyor is altered, the altering engineer or land surveyor shall affix to the item his/her seal and the notation "altered by" followed by his/her signature and the date of such alteration, and a specific description of the alteration.

Stormwater Pollution Prevention Plan
Walsh & Sons Construction Corp.
Traditions Resort & Casino
4101 and 4311 Watson Boulevard
Town of Union
Broome County, New York

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1.0 PROJECT DESCRIPTION

Urda Engineering, PLLC (URDA) was retained by Walsh & Sons Construction Corp. (WSC) to complete the Planned Unit Development plans, site plans, erosion and sediment control plans, and the Stormwater Pollution Prevention Plan (SWPPP) associated with the proposed "Traditions Resort & Casino" project located primarily on of 4101 and 4311 Watson Boulevard, Town of Union, Broome County (Tax Map Nos. 142.7-1-9.1 and 126.04-1-10.111 respectively), New York. Refer to the attached figures:

Figure 1 – Location Map
Figure 2 – USGS Vicinity Map
Figure 3 - Aerial Photo (2011)
Figure 5 - NWI Wetland Map
Figure 6 - Flood Map
Figure 7 - Archeo Sensitive Map

WSC is seeking Town of Union approvals for the project which will include the casino and resort development, and an outdoor event venue as described below (Refer to project plans in appendix A.).

Traditions' gaming facility will be situated on a parcel land located at 4101 Watson Boulevard in the Town of Union. Traditions' site is comprised of additional lands which are located at 4311, 4300, and 4207 Watson Boulevard, 29 Barton Avenue, 16 Beech Street, and 50 Eagle Drive, which are all located in the Town of Union and will be utilized to support the Traditions Resort & Casino. In total, Traditions' site is comprised of a total of approximately 419 acres of land. The parcels are owned under different legal entities, but are all controlled by William Walsh. In addition to Traditions' 419 acre campus described above, there is a 26.26 acre to the west of the project site which is also controlled by Mr. Walsh.
The following is a brief description of each parcel noted above.

4101 Watson Boulevard Town of Union, Broome County, NY Broome County Tax Map # 142.07-1-9.1 132.42 Acres Owner: Homestead Development Group, LLC	**4311 Watson Boulevard** Town of Union, Broome County, NY Broome County Tax Map # 126.04-1-10.111 255.94 Acres Owner: Homestead Development Group, LLC
4300 Watson Boulevard Town of Union, Broome County, NY Broome County Tax Map # 142.02-1-20 8.59 Acres Owner: Homestead Development Group, LLC	**4207 Watson Boulevard** Town of Union, Broome County, NY Broome County Tax Map # 142.11-2-16 0.8 Acres Owner: Homestead Development Group, LLC

29 Barton Ave Town of Union, Broome County, NY Broome County Tax Map # 142.11-2-14 0.31 Acres Owner: Homestead Development Group, LLC	**16 Beech Street** Town of Union, Broome County, NY Broome County Tax Map # 142.11-1-53 3.64 Acres Owner: Homestead Development Group, LLC
50 Eagle Drive Town of Union, Broome County, NY Broome County Tax Map # 142.11-3-38 17.25 Acres Owner: Homestead Village at the Glen, LLC	**3901 Watson Boulevard** Town of Union, Broome County, NY Broome County Tax Map # 142.14-2-25.12 26.26 Acres Owner: Walsh Realty, LLC

The proposed Resort & Casino will be developed in two phases. Phase I includes a 5 story building addition with 98,300 SF footprint at the location of the Traditions at the Glen, Resort and Conference Center at the 4101 Watson Boulevard property, and associated parking. Two sublevels of parking garage, a sublevel mechanical room, and the Casino with mezzanine level will be Phase 1. Phase one includes all parking west of the Casino, the revised entrance road, and all access road to and from the two casino entrances. Phase 2 will involve the addition of six story hotel. This portion of the project also includes the parking lot south of the proposed hotel, reconfiguration of an existing lot northeast of the hotel, and redevelopment and expansion of the existing parking lot in the southeast corner of 4301 Watson Boulevard. This lot will be utilized as an employee/shuttle lot.

The proposed Outdoor Event Venue is a seasonal venue with a temporary stage structure setup seasonally. Events are set up and taken down immediately before and after such that the golf course can remain open. The venue will occupy approximately 12 acres of the southern end of the existing 18 hole Traditions at the Glen golf course at the 4301 Watson Boulevard property. Temporary parking will be established on the grassed fields along Watson Boulevard at the project parcels at 4101, 4300, and 4311. WSC has developed a traffic management plan and event security plan with the Broome County Sheriff for events. Additional temporary grass parking will also be coordinated with Walsh Realty, LLC at 3901 Watson Boulevard. The antiquated and flood damage tennis courts at 4300 are likely to be removed.

2.0 REGULATORY REQUIREMENTS

As a project that will disturb more than one acre of land, as per the regulatory requirements of the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges for Construction Activities (see Appendix B – SPDES Permit Information) GP-0-10-001, this project must complete a SWPPP and file a Notice of Intent Form (NOI) with the NYSDEC to be permitted to commence. The project involves multiple properties under the ownership of various Walsh family legal entities which currently have active SPDES permits for construction stormwater discharges. The Homestead Village Development subdivision, existing Phase I completed on Eagle Drive and the future Phases II and III (58 Eagle Drive) is currently regulated under SPDES Permit No. NYR10K855 (operator Homestead Village Development Group, LLC). The overall existing Homestead Village Development PUD and Walsh Realty, LLC Fill site at 3901 Watson Boulevard are permitted under SPDES Permit No. NYR10R962 (Walsh & Sons Construction, Corp.). Both have prepared SWPPP's. The existing PUD SWPPP includes the subdivision design and has been utilized as the basis for this report and is superseded by this report. The SPDES permits will be adjusted as necessary with the MS4 and NYSDEC. It should be noted that portions of this project are redevelopment of existing parking lots, prior impervious areas, and prior golf course.

The project is also subject to the local Municipal Separate Storm Sewer System (MS4) stormwater code criteria for the Town of Union, New York. An “MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form” must be completed and signed by the Town of Union stormwater officer, and be submitted with the NOI to the NYSDEC.

Earthwork related contractors involved on the project must become familiar with the project plans, specifications, and SWPPP and complete the required contractor certification statement. A contractor representative with a 4 hour contractor training certification in erosion and sediment control must be on site daily.

Appendix B contains a copy of the NOI, a blank MS4 SWPPP Acceptance Form, a blank Notice of Termination (NOT), and a copy of GP-0-10-001.

3.0 SITE DESCRIPTION

The project area will be developed as noted previously and is within the watershed area of construction under the original SWPPP and SPDES permit for the Pole Barn & Fill Plan and Homestead village Residential Development. Minor drainage pattern revisions are planned. However, all general paths and discharging points are maintained similar to those previously developed and studied.

Two stormwater detention ponds exist on site, east and west ponds. The existing outlet structures and weirs will be maintained for the two ponds on site. The size of the detention areas will remain the same. The east pond was designed to attenuate the storm runoff and assess water quality from the majority of Phase I and all of Phases II and III of the subdivision. Phase III is partly eliminated by the proposed casino to the extent that it is possible.

3.1 Stormwater Runoff and Drainage

The site is within the Susquehanna River drainage basin. Stormwater modeling has been completed to three independent discharge points. Catchment "Area West", 91.57 acres, travels through a concrete culvert southerly under Watson Boulevard, railroad tracks, NYS Route 17, and ultimately to the Susquehanna River. Catchment "Area Central", 212.75 acres, travels to a closed storm system on the east side of Country Club road continuing south to an open drainage trench to the Susquehanna River. Catchment "Area East", 803.28 acres, travels to an onsite intermittent stream and flows south, ultimately discharging into the Susquehanna River.

3.2 Wetlands

Review of the online NYSDEC Environmental Resource Mapper indicates that there are no known NYSDEC regulated wetlands, nor wetland check zone within the project area. See Figure 4 – NYSDEC ERM. Review of the US Fish and Wildlife National Wetland Inventory online mapping resource indicates that there are no known federally regulated wetlands within the project site. See Figure 5 – NWI Wetland Map. However, in 2005 the project area on 4101 Watson Boulevard and within the Homestead Village Development subdivision area was inspected for wetlands and those found were delineated by Barnes-Williams Environmental Services (BWES). The areas were surveyed and mapped and are included on the project plans. These areas were preliminarily mapped, but no final jurisdictional determination was made. These areas are indicators of wetlands, but are not yet officially documented as wetlands. At the time they were avoided and no further action was required.

Efforts were made to avoid wetland impacts. The project area includes two intermittent drainage channels that are part of the existing ditched and piped drainage system that was part of the previous 9-hole golf course. These were within the original design of the westerly parking area for the proposed casino and were noted by BWES as requiring determination of status by the ACOE. The project area was modified to avoid any disturbance.

URDA coordinated with the ACOE and BWES to establish if the areas are indeed federally regulated wetlands or not. Upon meeting it was determined best to avoid these areas regardless of jurisdiction. Further review, determination, and permitting with the ACOE was not required.

3.3 Flood Plain

The Susquehanna River runs parallel to the subject site on the opposite side of NYS Route 17. Portions of the site are within a FEMA mapped flood hazard area. The project area is mapped on FEMA's National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM), Community "Union, Town of" Community Panel 360056 0025B, Panel 25 of 35, effective date November 21, 1980. See Figure 6 – Flood Map. Minimal impacts created by the new access road are to be mitigated by earthwork balancing.

3.4 Soils

Refer to Appendix C – Soils Information for the "Custom Soil Resource Report for Broome County, New York, Traditions at the Glen Casino and Resort, Watson Boulevard, Union, NY, 13790" dated March 27, 2014, obtained from the USDA NRCS web soil survey website. This document includes soils types, percent coverage, pertinent soils information, and figures utilized in the hydrology and hydraulic analysis of this report.

3.5 Historic Places/Archeological Resource

Review of the NY State Historic Preservation Office GIS-Public Access website (www.oprhp.state.ny.us/nr/main.asp) indicates that there may be "archeo sensitive areas" within the southern edge of the project site along 4101 Watson Boulevard. See Figure 8 – Archeo Sensitive map. Nothing is noted at the 4311 Watson Boulevard parcel. The majority of the current project area is not within the critical areas, however, to avoid project segmentation, the Area of Impact (AOI) on 4101 Watson Boulevard was studied as was required by New York State Office of Parks Recreation and Historic Preservation (NYS OPRHP).

As required, a "Project Review Cover Form" was sent to NYSOPRHP on January 23, 2014 for their review and determination if an area of interest exists requiring further investigation. NYS OPRHP responded in a letter February 20, 2014 (Appendix b) requiring that a Phase 1 Cultural Resource Survey be conducted. WSC contracted with the Public Archaeology Facility (PAF) of Binghamton University, NY to conduct a Phase 1 Cultural Resource Survey of the project area and buildings. The Phase 1 Cultural Resource Survey was completed on March 7, 2014 and sent to NYS OPRHP for review. The Phase 2 End-of-Field Study was completed on March 7, 2014 and upgraded to Phase 2 Site Examination Report on June 13, 2014 and sent to NYS OPRHP on the same date. NYS OPRHP responded and requested a Phase 3 Report. The Phase 2 and Phase 3 studies involve only 3 study areas. Two have been avoided and the third, unfortunately, is located in the access road, but will be mitigated by a Phase 3 clearance of the entire area. The Phase 3 is to be conducted prior to construction.

3.6 Rare and Endangered Species

The site is not located within any NYSDEC radius of rare or Endangered Species according to the NYSDEC Environmental Resource Mapper (See Figure 4 – NYSDEC ERM).

4.0 EROSION AND SEDIMENT CONTROL PRACTICES

4.1 Temporary Erosion and Sediment Control Practices

4.1.1 Temporary Stabilized Construction Entrance

Temporary stabilized gravel construction entrances will be installed at both the upper and lower access drives proposed for the casino. These will access the project site from the onsite asphalt paved access road internally on the parcel and are greater.

4.1.2 Silt Fence

Silt fence shall be installed as indicated on the project plans to limit the migration of sediments.

4.1.3 Dust Control

Dust is not anticipated to be a problem at this location. If necessary, dust control will be conducted by water application.

4.1.4 Diversion

Land grading will predominantly result in drainage paths similar to existing conditions. Offsite and onsite drainage immediately north of the project area will be temporarily and permanently diverted around the project area to the north.

4.1.5 Temporary Check Dams

Temporary check dams will be installed in all drainage swales and ditches as indicated on the project plans.

4.1.6 Temporary Stabilization

Stabilization measures must be initiated as soon as practicable, but in no case more than 14 days after construction activity has ceased. Stabilize denuded areas by implementing soil covering practices (e.g. seeding/mulching, matting, soding). Site disturbance shall remain under 5 acres at any given time unless NYSDEC and MS4 approval is sought.

4.1.7 Temporary sediment basins/traps.

Temporary sediment traps will be utilized where applicable and possible given the nature of the slope of the site. Refer to the project plans.

4.1.8 Temporary Seeding and Mulching

Temporary seeding and mulching shall be applied per Section 4.1.6 per NYSDEC standards. The area must be graded and slopes physically stable. Large debris and rocks are usually removed. The seedbed should be seeded within 24 hours of disturbance or scarification of the soil surface may be necessary. Fertilizer and lime are not typically used for temporary seeding.

If SPRING, SUMMER, or EARLY FALL:

Seed the area with ryegrass (annual or perennial) at 30 lbs. per acre.

If LATE FALL or EARLY WINTER:

Seed the area with Certified ‘Aroostook’ winter rye at 100 lbs. per acre.

Any seeding method may be used that will provide uniform application of seed to the area. Mulch the area with hay or straw at 2 tons/acre. Mulch anchoring may be required in areas where wind or concentrated water are of concern. Wood fiber hydro-mulch or other sprayable products approved for erosion control (nylon web or mesh, etc.) may be used if applied according to manufacturers' specifications.

4.2 Permanent Erosion and Sediment Control Practices - Include the following:

4.2.1 Land Grading

The finished slopes will be stabilized to limit the erosion potential for the site. Land grading specifications have been provided within the project plans.

4.2.2 Diversion

Drainage paths will be maintained on site and vegetated for final stabilization. Offsite and onsite drainage with currently bisects our western parking lot will be piped under the parking lots.

4.2.3 Vegetated Channels

Vegetated Channels will be provided along the first 750 lf of access Road within the landscaped island.

4.2.4 Culverts

Installed per project plans. Contractor may utilize temporary piping through out construction.

4.2.5 Infiltration Basin

Not applicable.

4.2.6 Soil Restoration

Soil restoration of all areas compacted during construction (predominantly adjacent to the proposed building and along the former access road) is required by the NSYDEC as documented within the *New York State Stormwater Management Design Manual (NYSSMDM),* Section 5.1.6 Soil Restoration. The pertinent portion of this section is included in Appendix E – Soil Restoration.

4.2.7 Top soiling/Seeding/Mulching

The finished site will be stabilized with topsoil, seed, and mulch. This will improve the surface condition and aid in minimizing the erosion potential for the site.

1. Fall planting is preferred. Seed after August 15th. In the spring plant until May 15th.
2. The site area shall be prepared per the Land Grading specifications in the project plans.
3. All disturbed areas shall fine graded. Remove all debris (roots, woody material, stones, etc.) greater than 2 inches in any dimension.
4. Sample the soil pH and lime to a pH of 6.5 if necessary.
5. Fertilized as per soil test, or if soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at a rate of 600 pounds of 5-10-10 or equivalent per acre.
6. Seed shall be a mixture of 45% perennial ryegrass, 21% Kentucky bluegrass, 20% creeping red fescue, and 15% annual ryegrass at a rate of 100 pounds per acre (double if hydro-seeding).
7. Broadcasting, drilling, cultipack type seeding, or hydro-seeding are acceptable methods.

8. When placing by hydro-seeding seed shall be placed a 200 pounds per acre, hydro-mulch at 1,200 pounds per acre, water at 500 gallons per acre, and fertilizer at a minimum of 220 pounds per acre.
9. Mulching shall be by the use of small grain straw applied at a rate of 2 tons per acre and anchored with a netting or tackifier, unless placed by hydro-seed/mulch.
10. Seeded areas shall be irrigated as necessary to establish and maintain plant growth. The contractor is responsible to water, reseed and mulch, as necessary to establish growth of the plants until a uniform growth of grass is established to a height of 4 inches.

5.0 SEQUENCE OF OPERATIONS

The following sequence of operations shall be followed:

a. Obtain Plan Approval from municipal and regulatory agencies including MS4 acceptance.
b. Submit written request to MS4 and NYSDEC for greater than 5 acre disturbance initially to clear grub, and begin cuts/fills for the hotel. The building disturbance will be near 3 acres and require additional acreage for access and staging initially. Subsequently, areas will be limited to less than 5 acres at a time.
c. Submit Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity Under the SPDES General Permit (Permit No. GP-0-10-001) to NYSDEC along with MS4 acceptance document.
d. Each earthwork/site Contractor shall sign the Contractor's Certification Statement prepared for the project prior to commencement of work and identify one person from their staff as the trained contractor to be onsite on a daily basis during earth disturbing activities.
e. Hold Pre-construction Conference.
f. Install on-site mail box to hold NOI, permit notice, project plans, inspection reporting, and SWPPP.
g. Construction Duration Inspections must be conducted by a qualified inspector on a weekly basis if disturbances are to remain at less than 5 acres at any given time. However, it is anticipated that disturbances will exceed the 5 acre threshold and that inspections must be conducted twice weekly, pending prior written approval from the Town of Union MS4 Stormwater Officer.
h. Install stabilized construction entrances.
i. Install silt fence.
j. Construct temporary sediment basins and traps.
k. Construct drainage diversions and swales.
l. Install culvert pipes.
m. Clear/grub site.
n. Strip and stockpile topsoil if available (install silt fence around stockpile).
o. Apply temporary seeding and mulch if construction on a disturbed area will not resume for 14 days.
p. Monitor for dust control needs.
q. Conduct bulk excavations and earth moving.
r. Install concrete washout.
s. Excavate for and construct building foundation, footers, and slabs.
t. Construct access to future paved areas.
u. Install underground utilities.
v. Construct paved areas.
w. Construct building.

x. Establish finished grades.
y. Conduct soil restoration where necessary.
z. Topsoil, fine grade, and final seed, fertilize, and mulch all disturbed areas once final grades are achieved.
aa. Inspect all erosion and sediment controls weekly and after rainfall events; repair as required.
bb. Water vegetation as required.
cc. After the site is stabilized and vegetation has become established, and the site has been inspected by a qualified professional, remove all temporary erosion control measures.
dd. Request a final inspection by the MS4, or review of the qualified professional's last report by the MS4 representative.
ee. Submit Notice of Termination (NOT) form for Stormwater Discharges Associated with Construction Activity Under the SPDES General Permit (by Operator).
ff. Complete any record plan requirements as directed by the MS4.

6.0 POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

6.1 General

Post-construction stormwater management practices were designed in accordance with the *NYSSMDM.* The design provides for water quality protection volume, runoff reduction volume, channel protection, and peak flow attenuation of the 10-year and 100-year storm events. In general, grassed swales are utilized for pretreatment before flows enter a the existing East Stormwater Pond, and underground infiltration and detention chambers (Stormtech or equal) are to be utilized with prefiltering chambers for additional detention.

6.2 Stormwater Controls

In general, the existing drainage channels, including vegetated swales and dry swales and two storm water ponds as part of existing and proposed conditions from the previously approved SWPPP will remain in place.

The new primary detention facilities include underground infiltration and detention chambers (Stormtech or equal) to be utilized with prefiltering chambers and use of the the existing wet pond. The existing pond was designed for the third phase of the Homestead Village Subdivision, for which parking has been exchanged in an equal proportion of impervious area. It in anticipated there will also be infiltration from this facility due to the soil characteristics.

6.3 Methodology

The project is redevelopment due to the fact that redevelopment from previously parking, access roads, golf course, etc is be converted to new building, parking and asphalt. Site revisions were incorporated in a hydraulic model completed in Hydro cad utilizing TR-55 methodology for the 1-year, 10,-year, and 100-year storm events. The input data, calculations, and output data are attached. Pre development conditions prior to the Casino and associated improvements, and post development conditions for the overall site developments, including both the existing facilities and proposed Casino and site improvements, were analyzed and compared. A 0.5 acre impervious allowance was added to the model to allow for any minimal site changes (ex. minor increases in impervious area) during construction. The Susquehanna river backs up into this parcel during flood events. Modeling of these river events in Hydrocad is not possible and has not been included as part of the study.

Nearly 50% of the primary resort and casino parking area is being developed over an area that was previously approved for Phase 3 of the Homestead Village Development. Consisting of 3-bedroom townhouses and associated paved roadways and driveways, as well as concrete curb and gutter scheduled to be constructed will now offset the impervious areas for this portion of casino parking. The detention pond that was intended for the subdivision, including Phase 3 of the subdivision will now incorporate portions of the casino runoff equal to the contributing flow rate of prior Phase 3. All other new impervious areas will be directed to the subsurface detention/infiltration system to the extent possible.

The drainage area was subdivided into three (3) main sub areas in line with the previously approved SWPPP permits: the area of new development falls under the "Central Area" watershed. Refer to Figure 8 - Pre-development Drainage Map and Figure 9 - Post-development Drainage Map.

6.4 Calculations

Calculations consider pre-developed conditions (pre casino) versus post developed conditions.

6.4.1 Pre versus Post Development Conditions

The resulting pre versus post development flow rates for the site based on the above noted revisions and methodology are:

	1-year	10-year	100 year	
Pre	112.9 cfs	482.3 cfs	1029.4 cfs	(Pre-Casino)
Post	111.7 cfs	479.0 cfs	1021.95 cfs	(Stormtech MC-4500)

Post runoff rates are less than predeveloped, and well under the 5% allotment per NYDEC design standard. They are also conservative and do not account for all newly utilized RRV practices. Permeable pavers are utilized throught areas of the parking lots and porte cocheres, and all new concrete sidewalk being pervious (Minor variations in pre developed rates occur between prior models in the prior SWPPP for the site. Differences are caused by a switch in modeling software.)

6.4.2 Stormwater Basin Characteristics

Feature	Elev.	Remarks
Top of Bank/Berm	838.00	Infiltration basin will be overtopped if this elevation is exceeded
Stone Spillway – 12' wide	837	> 100 event
100-yr Storm Event	837.93	.57 feet of freeboard 1.76 ac-ft
10-yr Storm Event	835.48	3.02 feet of freeboard 1.325 ac-ft
Static Water Elevation	None	(infiltration)
Bottom of Main 'Pool'	832.00	

6.4.3 Water Quality Volume (WQv) Required

The following WQv calculation is based on the area of proposed improvements to the existing and proposed storm water facilities (Hydrocad area "Casino Area") which includes the majority of the proposed site improvements.

<u>WQv Required:</u>

WQv (ac-ft) = (P)(Rv)(A)/12 From the *NYSSMDM*
P = 0.90 inches Per Figure 4.1 Page 4-2 *NYSSMDM*
Impervious area = 8.4 acres
A = 9.9 acres (Hydrocad area "Casino Area")
I = (6.9/9.9)x100 = 70%
Rv = 0.05 + 0.009 (I) = 0.05 + 0.009(70) = 0.68 > 0.20 (min. required) Ok.
WQv = (0.9 x 0.68 x 9.9) / 12 = 0.505 ac-ft or 21,993 CF

Pretreatment of WQv is provided within the grass filter as required.

6.4.4 Planning Practices

The following is a review of the planning practices noted in Chapter 5, Table 5.1 "Planning Practices for Preservation of Natural Features and Conservation" within the *NYSSMDM.*

1. <u>Preservation of Undisturbed Areas</u>

   This was not applied. Although not applied, hundreds of areas will remain undisturbed including the 18 hole gold course.

2. <u>Preservation of Buffers</u>

   This was not applied formally, however we stay away from those areas by providing under building parking instead of spreading out.

3. <u>Reduction of Clearing and Grading</u>

   Site disturbances are reduced to the footprint necessary to complete the project. Casino is multi level to reduce foot print.

   Reduced use of concrete by eliminating concrete curing for at least 750 feet of the entrance road.

   To limit additional surface disturbance, fill, and need of stormwater detention by making use of the natural grades, the building is developed with a large 'walkout' style approach and placed nearly 180,000 SF (4 acres) of parking area under the building. This eliminates four acres of impervious construction subject to increased runoff.

   Design accounts for the full build out of 4 -12 lanes as is typical at most casinos/resorts of this size and capacity. However the developer will be utilizing only two 15 foot lanes for as many years as traffic conditions warrant. This results in an initial reduction of 0.37 acres of impervious area.

Reuse of existing parking facilities, or demolition of old parking areas and replacement with new areas utilizing new materials and runoff reduction, quality improvements, and runoff quantity reduction.

Cart paths and access roads for the prior golf course are to be removed. Some areas will be restored to grass, while other are replaced with modern construction methods including stormwater improvements.

Outdoor event venue is to be developed with temporary grass parking stalls, and the stage and seating are to be seasonal with no permanent impervious area.

The developer is pursuing contracts with BC Transit for a public bus stop at the Casino entrance for employees and patrons to help limit the need for additional parking while reducing automobile related emissions. They are also utilizing an existing underutilized parking area on their contiguous lands for employee parking and will run a shuttle to these lots from the casino. It is being pursued to relocation the adjacent BC Transit bus stop from near Poplar and Watson Boulevard to this lot to improve bus use and availability to employees.

4. Locating Development in Less Sensitive areas.

The project was located at this facility in this location for this reason to avoid sensitive areas encountered on other portions of this site. The project avoids archeological sensitive areas on this parcel, environmentally sensitive areas, and steep slopes to the extent as possible. The access road and buildings, and parking areas designed to work with existing grades to fit into the site. The project utilizes land that was previously used for other uses and redeveloping it. Wetland areas are to be enhanced as water features. Impacts to the flood plain, although required for site access, are minimal with no net fill or change to the flood plain. Critical habitats and steep slopes were avoided.

5. Open Space Design

Best efforts were made to condense parking and limit sprawl of impervious. See 3. reduction of clearing and grubbing. Also, nearly 110 acres of land have been deeded as open space as a requirement of the PUD zoning within the Town of Union.

6. Soil Restoration
Soil restoration will be completed in any areas necessary as created by the construction process.

6.4.5 Green Infrastructure Techniques

1. Conservation of Natural Areas
Not applied. There are no stream or wetland buffers in the areas of site improvements to aid in achieving this technique. Hundreds of acres will

be left in there natural setting or enhanced natural setting including a professionally design and landscaped mature golf course.

2. <u>Sheet flow to Riparian Buffers or Filter Strips</u>
No down gradient riparian buffers exist on site.

3. <u>Vegetated Swale</u>
Multiple vegetated swales are utilized throughout the project area.

4. <u>Tree Planting/Tree Pit</u>
Extensive landscaping is utilized throughout the project area.

5. <u>Disconnection of Rooftop Runoff</u>
The rooftop area of this building is approximately 90,000 SF with limited vegetated areas to discharge to achieve WQv reductions. For employee safety (icing during winter) the downspouts are to be tied into a piped network and then discharged to either a grassed swale over HSG B soils which will convey the roof runoff to the wet pond forebay, or to the subsurface system.

6. <u>Stream Day lighting</u>
The majority of all existing streams and pipes on site daylight. Proposed piping on site is designed to be minimal with vegetated open swales preferred.

7. <u>Rain Gardens</u>
Rain gardens are not proposed and were not deemed necessary with all drainage flowing to grassed areas, vegetated swales, and ultimately to the infiltration forebay and basin. Approximately 750 feet of the lower portion of the entrance road are graded inward to a bio-retention/infiltration swale that doubles as an attractive landscaped median. Curbing was eliminated on both sides to eliminate the extra materials , production, and construction.

8. <u>Green Roofs</u>
Green roofs are not incorporated within this design. It was determined to go subsurface with the rainwater as opposed to increasing the roof load on a building of this size.

9. <u>Stormwater Planters</u>
None..

10. <u>Rain Barrels and Cisterns</u>
Rain barrels and cisterns were not deemed necessary with all drainage flowing to grassed areas, vegetated swales, and ultimately to the infiltration forebay and basin.

11. <u>Porous Pavement</u>
Porous pavement is being utilized on the site for concrete walk ways and pavers for the drop off loop. 41 infiltration tests were conducted utilizing the NSYDEC standard method within the NY Stormwater Management

Design Manual, Appendix D and with spacing as allowed by Frequently Asked Questions. (Infiltration testing was conducted at a 1 per 5000 SF area, in a grid formation. Our practical infiltration rate at a depth of 3 feet 0.5")

6.4.6 Minimum Runoff Reduction Volume (RRv)

The following RRv calculation is based on the area contributing to the infiltration basin (Hydrocad area "Casino"). This includes the newly proposed Casino and parking.

<u>RRv Required</u>
RRv (ac-feet) = [(P)(Rv*)(Ai)]/12 From the *NYSSMDM*
P = 0.90 inches Per Figure 4.1 Page 4-2 *NYSSMDM*
Impervious area = 6.9 acres
Ai = (S)(Aic) = Impervious cover targeted for runoff reduction
Aic =Total area of new impervious cover
Rv* = 0.05+0.009(I) where I is 100% impervious
S = Hydrologic Soil Group (HSG) Specific Reduction Factor
$S_{HSG\ A} = 0.55$
$S_{HSG\ B} = 0.40$
$S_{HSG\ C} = 0.30$
$S_{HSG\ D} = 0.20$
$S_{modified}$ = [(5% HSG D)0.20 + (95%HSG B)0.40]/100 = 0.39

RRv = [(0.9)(0.95)(0.39)(6.9)]/12 = 0.19 ac-ft or 8,276 CF

6.4.7 Runoff Reduction Volumes – Standard Practices

Efforts were made to achieve RRv up to 100% of the WQv. Multiple standard practices were utilized, however some of them were in series. Nearly 100 percent of the site, including the bypass area not going to the infiltration basin, drains through vegetated swales on HSG B soils. The infiltration basin forebay RRv is summarized below based on the contributing area WQv.

<u>WQv Required:</u>
WQv (ac-ft) = (P)(Rv)(A)/12 From the *NYSSMDM*
P = 0.90 inches Per Figure 4.1 Page 4-2 *NYSSMDM*
Impervious area = 8.4 acres
A = 9.9 acres (Hydrocad area "Casino Area")
I = (6.9/9.9)x100 = 70%
Rv = 0.05 + 0.009 (I) = 0.05 + 0.009(70) = 0.68 > 0.20 (min. required) Ok.
WQv = (0.9 x 0.68 x 9.9) / 12 = 0.505 ac-ft or 21,993 CF
RRv = 39% (WQv) for 95% B and 5% D soils = 0.40(0.505) ac-ft = 0.236 ac-ft.

6.4.8 WQv/RRv – Summary

WQv initial basis = 0.505 ac-ft
RRv provided = 0.333 ac-ft > 0.24 required. Ok.
WQv remaining = 0.505 – 0.333 = 0.172 ac-ft

WQv provided in SMP-1 in = 0.927 ac-ft (40,404 cf from Hydrocad).
0.927 provided > .172 required. Ok.

Although 100% of the WQv passes through a reduction practices, 100% was not achieved through reduction practices.

6.4.9 Conclusions

It should be noted that additional water quality and quantity benefits occur on site (infiltration along grassed drainage swales), but are not documented herein for lack of infiltration testing. Should they be questioned or the volume needed to be determined, they can be calculated subsequent to soil infiltration testing, however, this is not deemed necessary

Although portions of the originally designed stormwater controls were modified, and the site impervious areas increased, the site was able to be modified to continue to direct stormwater runoff to the prior storm water pond for quantity control.

Post development flow rates are less than pre, and water quality and quantity criteria are met, thereby complying with NYSDEC and municipal codes.

7.0 ENHANCED PHOSPHORUS REMOVAL STANDARDS (NOT APPLICABLE)

This project is <u>NOT</u> located within a watershed requiring post-construction stormwater management practices designed in conformance with the Enhance Phosphorus Removal Standards included in the *NYSSMDM.*

8.0 MAINTENANCE AND RECORD KEEPING

8.1 Record Keeping During Construction

Record keeping requirements are included in Appendix F – Stormwater Construction Site Logbook. This appendix addresses record keeping, certifications, site assessments and inspections, reporting, and final inspection. Properly completing the forms contained in the Construction Site Logbook will meet the inspection requirements for the NYSDEC SPDES General Permit for Construction Activities. The logbook and completed forms and this SWPPP shall be kept on site at all times during construction and made available to authorities upon request. All documents must be kept up to date.

The parcel owner/operator or developer, and contractors shall be responsible for development and implementation of appropriate temporary and permanent erosion and sediment control features on the parcel in compliance with all applicable rules, regulations, permits, project plans and specifications, and the SWPPP. Documentation of installation of stormwater management and erosion and sediment control practices should be accordance with Appendix G –Stormwater Construction Site Logbook.

Construction Duration Inspections shall be conducted weekly by a qualified professional while earth is disturbed. Disturbance shall be in increments less than 5 acres at a time when applicable, otherwise prior written approval is required from the MS4 and NSYDEC and two inspections are required weekly.

8.2 Temporary Stabilization and Project Shut Down

Construction sites that have reached temporary stabilization, or have been shut down must meet the criteria set forth in GP-0-10-001 Part IV to temporarily suspend inspections.

8.3 Construction and Waste Materials and Spill Controls

8.3.1 Construction materials expected to be stored on site include at a minimum concrete forms, soil and stone stockpiles, lumber, metal building parts and pieces, etc., as well as those supplies necessary to maintain the erosion and sediment controls in working order.

8.3.2 No waste materials are expected to be stored on the site during the construction.

8.3.3 All litter shall be cleaned up by the end of each working day and disposed of properly. All chemicals shall be properly applied according to directions and properly stored in appropriate containers when not in use

8.3.4 All petroleum spills that occur within New York State (NYS) must be reported to the NYS Spill Hotline (1-800-457-7362) within 2 hours of discovery, except spills which meet all of the following criteria:

a. The quantity is known to be less than 5 gallons; and
b. The spill is contained and under the control of the spiller; and
c. The spill has not and will not reach the State's water or any land; and
d. The spill is cleaned up within 2 hours of discovery.

A spill is considered to have not impacted land if it occurs on a paved surface such as asphalt or concrete. A spill in a dirt or gravel parking lot is considered to have impacted land and is reportable.

9.0 MAINTENANCE PLAN

9.1 Short Term Maintenance

All erosion and sediment control practices will be checked for stability and operation following every runoff producing rainfall, but in no case less than once every week while soil disturbing activities take place. Any necessary repairs will be made immediately to maintain all practices as designed and installed.

9.1.1 Stone Check Dams

Inspect after each rainfall. Remove sediment behind dam when depth exceeds 6 inches. Replace stones and repair dams as needed to maintain design section. Refer to the detail on the plans.

9.1.2 Silt Fence

Clean any buildup of sediment as necessary for proper operation. Repair as necessary to eliminate openings and tears. Refer to the detail on the plans.

9.1.3 Vegetated Areas

Repair eroded areas immediately by filling and regarding. Maintain 80% coverage with vegetation. Mow as necessary to maintain a height of 4” to 6”.

9.1.4 Culverts

Inspect after rainfall events and clean any sediment buildup immediately.

9.1.5 Infiltration Basin Forebay

Remove sediment when the forebay capacity has diminished to 50%. Dispose of sediments on site where applicable.

9.2 Long Term Maintenance

The site owner is responsible for long term maintenance of the stormwater management system, including but not limited to, the components installed previously for the facility (dryswale, and vegetated swales) and those proposed (vegetated swale, and SMP -1.

<u>Post Construction Maintenance Tasks</u>

1. Maintain 80% minimum vegetative cover on all grassed areas.

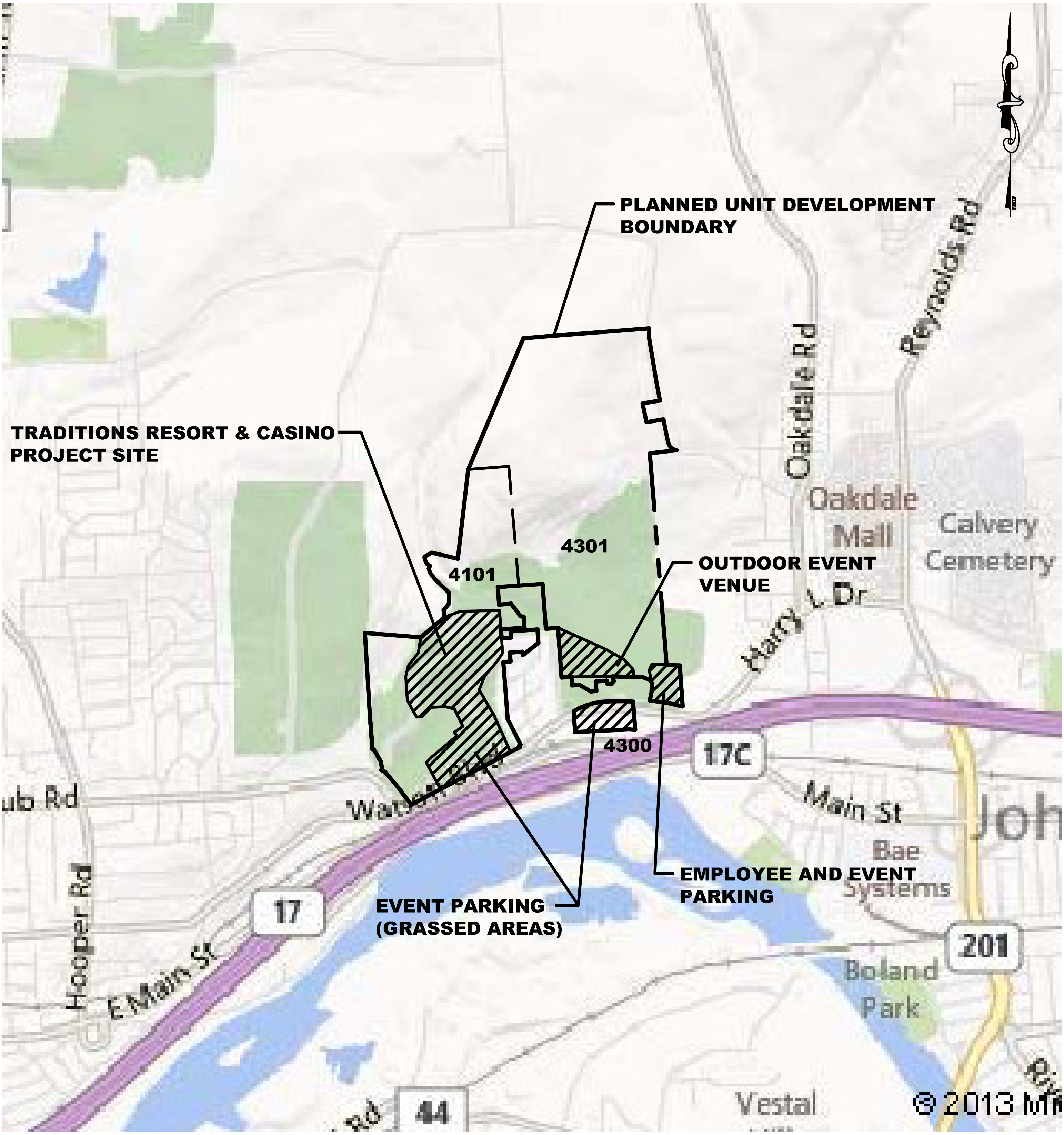
2. Inspect swales, ditches, and perimeter berms as required to maintain performance.
3. Inspect the stone-lined weir and clean as necessary to maintain performance.
4. No woody growth shall be allowed on the berm of the infiltration basin.
5. Inspect and clean culverts monthly.
6. Inspect infiltration basin and forebay after every rain event. Monitor for sediment buildup and prolonged standing water. Repair as necessary. consult a design professional if the infiltration ability is compromised and repair or replacement is required.

Table 9-1 Maintenance Schedule

Structure/Feature	Monitoring/Maintenance Schedule
Grass	Mow as required to maintain grass at required height and free of woody plant growth.
Culverts	Inspect and clean as required annually.
Detention System/ Infiltration system	Inspect monthly and after major rainfalls. Clean as required. Provide direct maintenance access.

END.

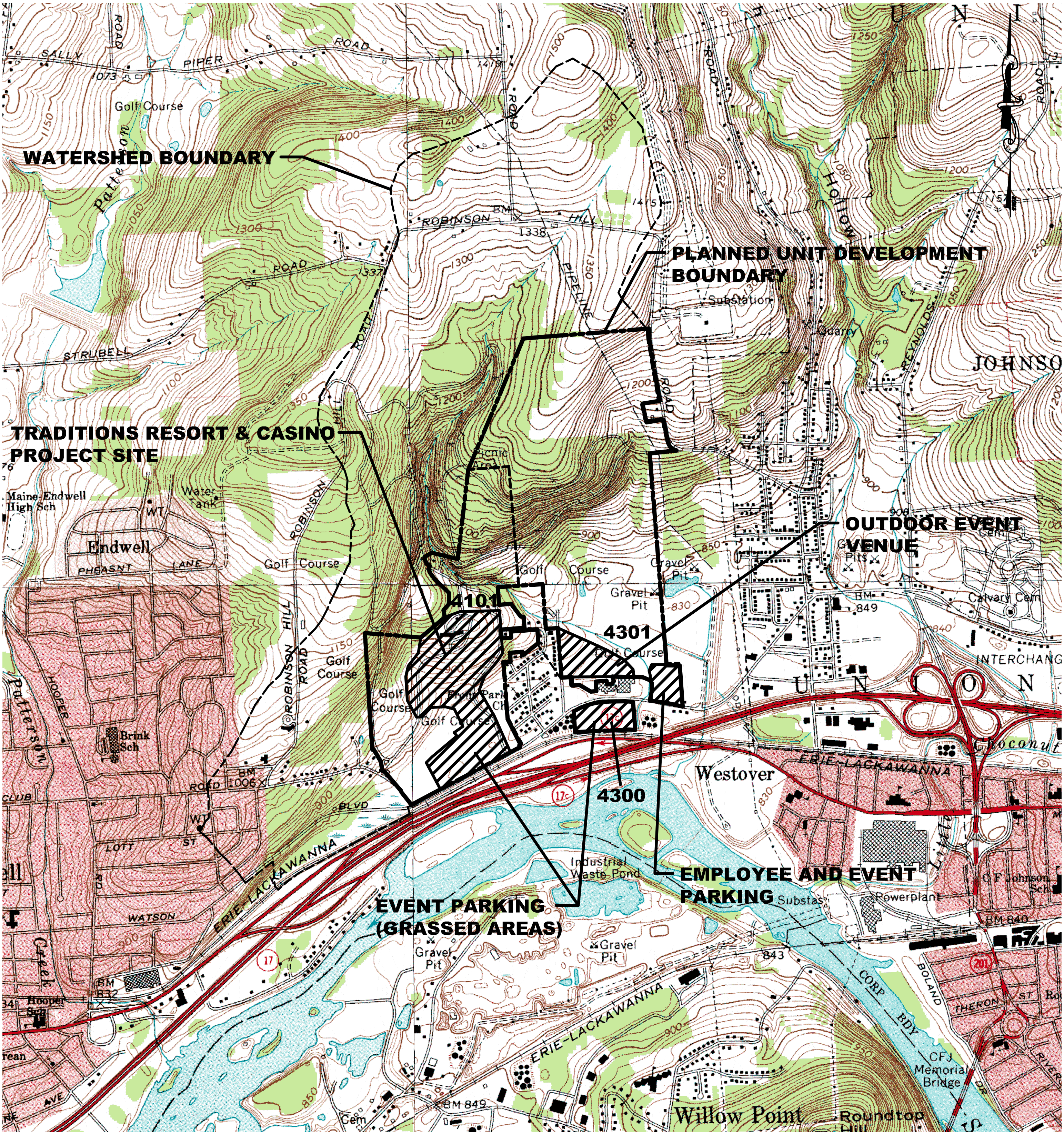
FIGURES



SCALE: 1 INCH = 2,000 FT

March 26, 2014

URDA ENGINEERING, PLLC P.O. BOX 142, 102 MAIN STREET WINDSOR, NY 13865 607.760.6545 www.urdaengineering.com	Project: TRADITIONS RESORT PUD TRADITIONS RESORT & CASINO PROJECT 4101, 4301, & 4300 WATSON BOULEVARD TOWN OF UNION BROOME COUNTY NEW YORK	Sheet Title: LOCATION MAP Sheet No: Figure 1



USGS Quads: Maine, Castle Creek, Endicott, and Binghamton West, NY 1976

SCALE: 1 INCH = 2,000 FT

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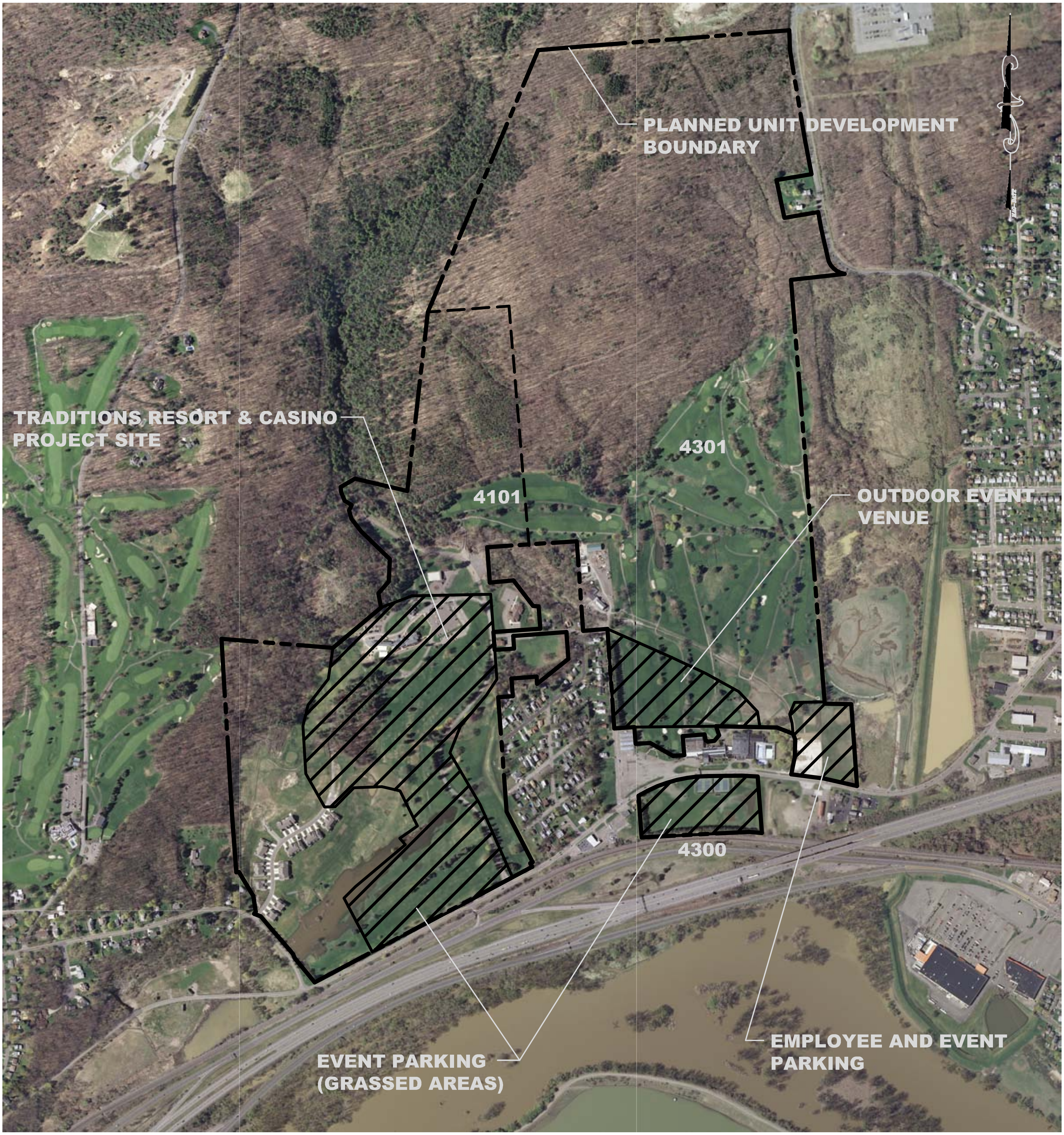

Source: NYSGIS (2011)

SCALE: 1 INCH = 1,000 FT

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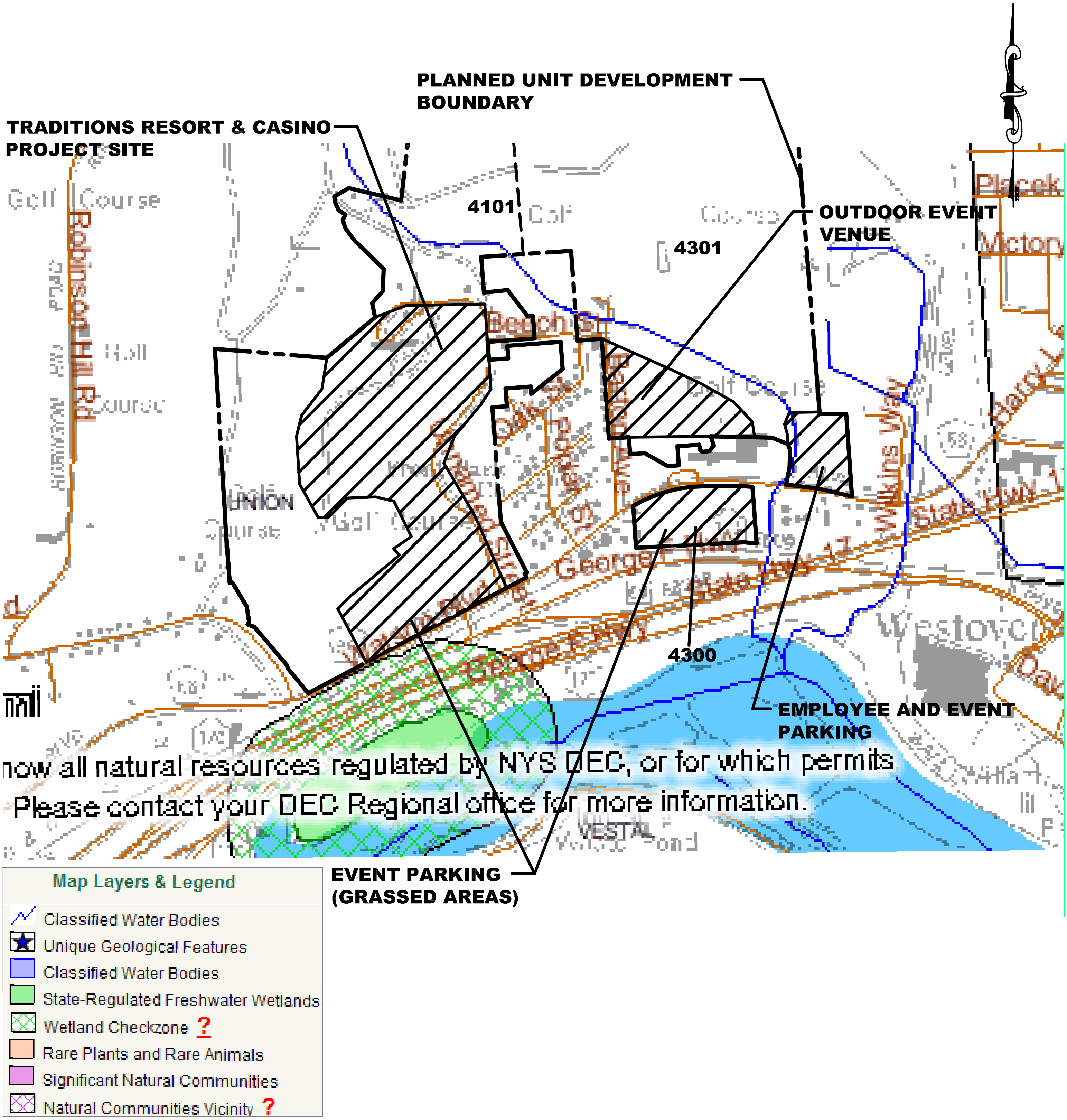
4101, 4301, & 4300 WATSON BOULEVARD
TOWN OF UNION
BROOME COUNTY
NEW YORK

Sheet Title:

AERIAL PHOTO (2011)

Sheet No:

Figure 3



SCALE: 1 INCH = 1,000 FT

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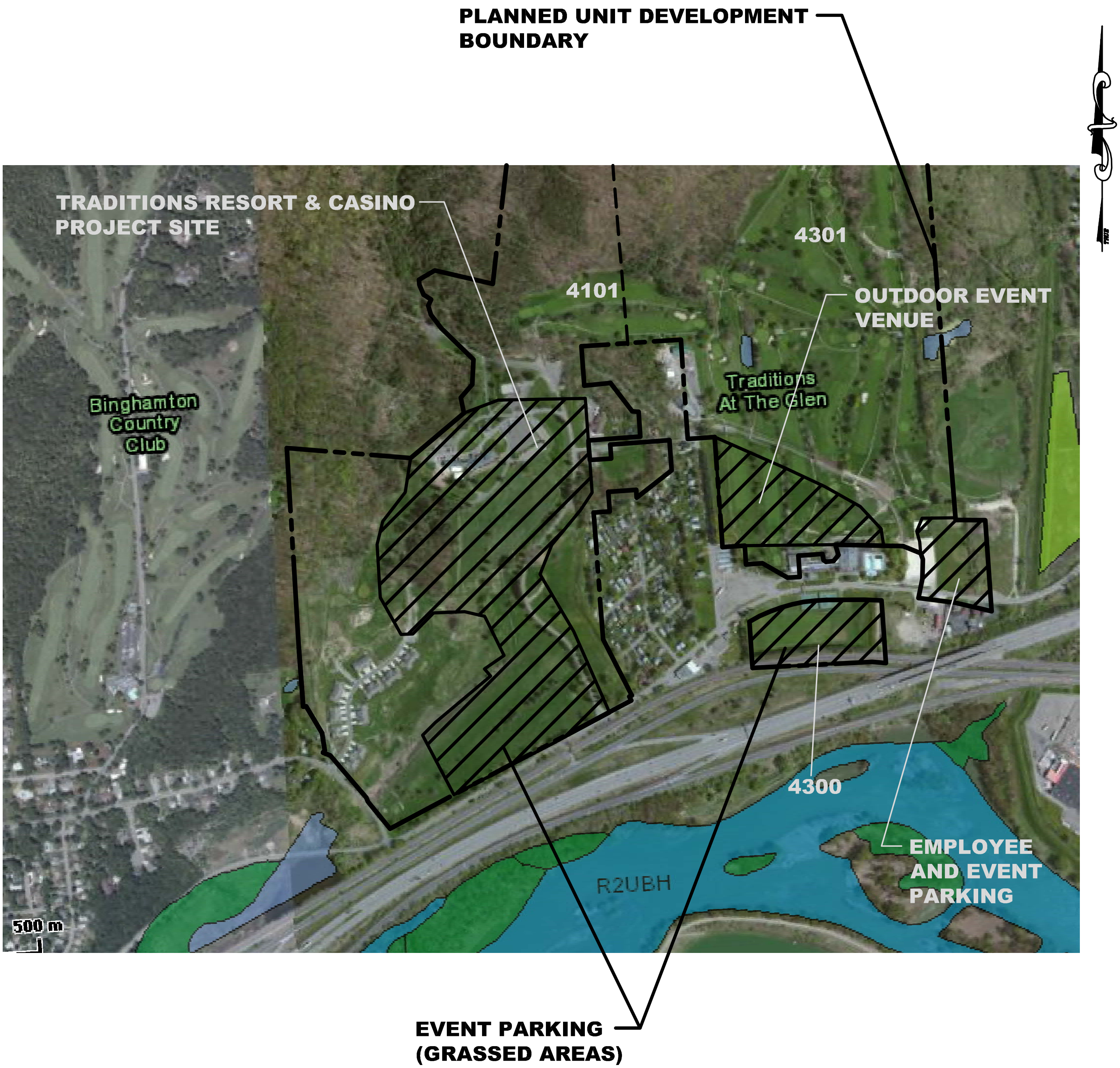
BROOME COUNTY
NEW YORK

Sheet Title:

NYSDEC ERM

Sheet No:

Figure 4



SCALE: 1 INCH = 1,000 FT

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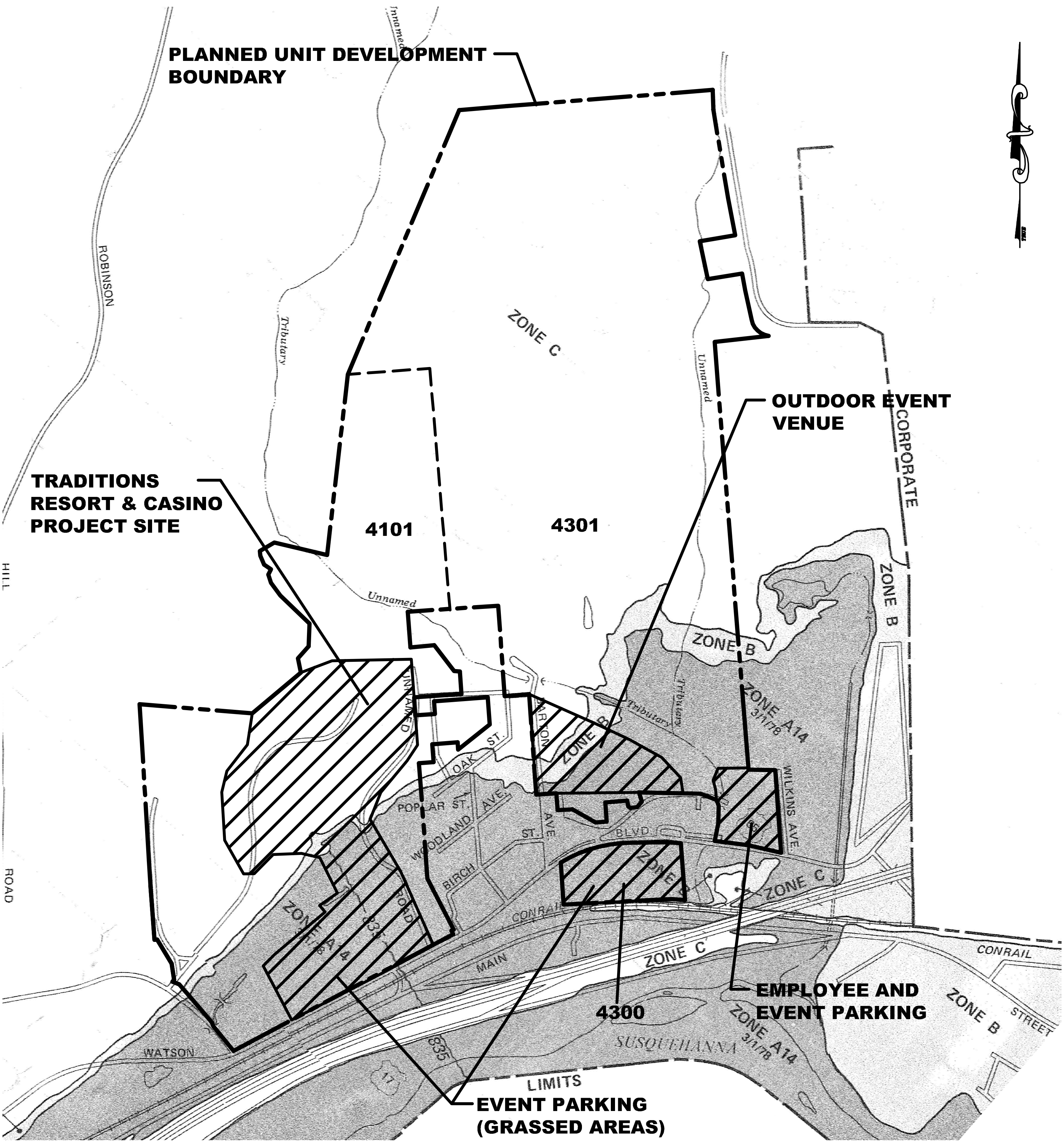
BROOME COUNTY
NEW YORK

Sheet Title:

NWI WETLAND MAP

Sheet No:

Figure 5



Community Panel
No. 360056 0025 B
November 21, 1980

SCALE: 1 INCH = 1,000 FT

March 26, 2014

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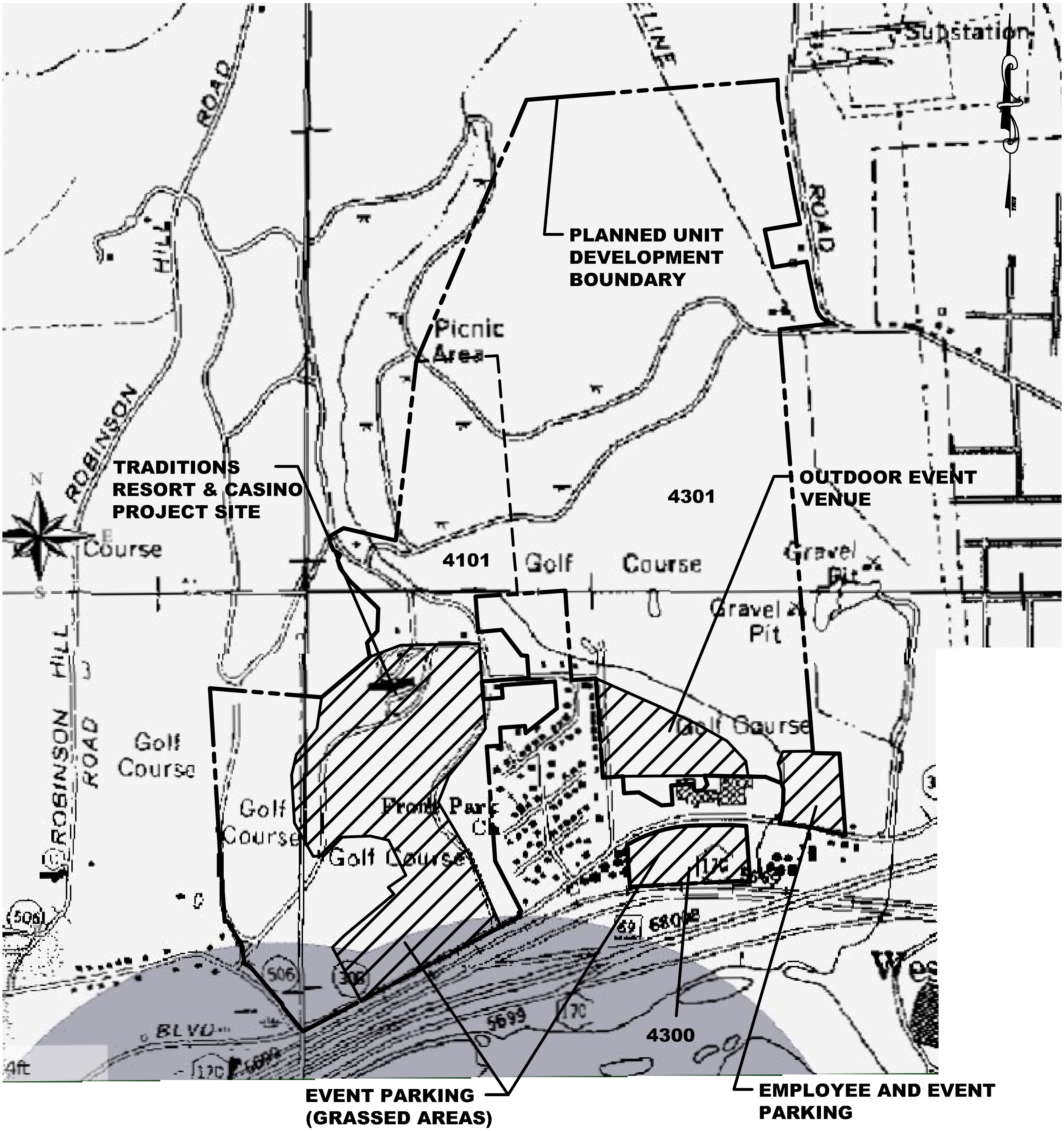
4101, 4301, & 4300 WATSON BOULEVARD
TOWN OF UNION
BROOME COUNTY
NEW YORK

Sheet Title:

FLOOD MAP

Sheet No:

Figure 6



DARK GRAY AREA
ARCHEO SENSITIVE AREA
NYSOPRHP

SCALE: 1 INCH = 1,000 FT

March 26, 2014

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4101, 4301, & 4300 WATSON BOULEVARD
TOWN OF UNION
BROOME COUNTY
NEW YORK

Sheet Title:

ARCHEO SENSITIVE

Sheet No:

Figure 7

APPENDIX A
PROJECT PLANS

APPENDIX B
SPDES PERMIT INFORMATION

1358331598

NOTICE OF INTENT

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

NYR ______ (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

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

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

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

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

1863331599

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

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

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State: N Y Zip: - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

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

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

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

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

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

X Coordinates (Easting)

Y Coordinates (Northing) 4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in imperviousness**

○ **Redevelopment with no increase in imperviousness**

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

Pre-Development Existing Land Use

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

Post-Development Future Land Use

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

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

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

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ◯ **Yes** ◯ **No**

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

7. 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 Acreage	**Acreage To Be Disturbed**	**Existing Impervious Area Within Disturbed**	**Future Impervious Area Within Disturbed**
.	.	.	.

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

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

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

10. Is this a phased project? ○ Yes ○ No

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

Start Date __/__/____ - End Date __/__/____

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

Name

12a. Type of waterbody identified in Question 12?

- ○ Wetland / State Jurisdiction On Site (Answer 12b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 12b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

12b. How was the wetland identified?

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

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ Yes ○ No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ Yes ○ No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ Yes ○ No

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

○ **Yes** ○ **No**

☐☐☐☐.☐

17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?

○ **Yes** ○ **No**

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

○ **Yes** ○ **No** ○ **Unknown**

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

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

○ **Yes** ○ **No** ○ **Unknown**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ?

○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) **(If No, skip questions 23 and 27-35)**

○ **Yes** ○ **No**

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ?

○ **Yes** ○ **No**

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

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

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State

Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name

MI

Last Name

Signature

Date / /

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

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

Temporary Structural

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

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

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

Permanent Structural

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

Other

0199331590

Water Quality and Quantity Control

Important: **Completion of Questions 27-35 is not required if response to Question 22 is No.**

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds

- ○ **Micropool Extended Detention (P-1)**
- ○ **Wet Pond (P-2)**
- ○ **Wet Extended Detention (P-3)**
- ○ **Multiple Pond System (P-4)**
- ○ **Pocket Pond (P-5)**

Filtering

- ○ **Surface Sand Filter (F-1)**
- ○ **Underground Sand Filter (F-2)**
- ○ **Perimeter Sand Filter (F-3)**
- ○ **Organic Filter (F-4)**
- ○ **Bioretention (F-5)**
- ○ **Other** ______________

Alternative Practice

- ○ **Rain Garden**
- ○ **Cistern**
- ○ **Green Roof**
- ○ **Stormwater Planters**
- ○ **Permeable Paving (Modular Block)**

Wetlands

- ○ **Shallow Wetland (W-1)**
- ○ **Extended Detention Wetland (W-2)**
- ○ **Pond/Wetland System (W-3)**
- ○ **Pocket Wetland (W-4)**

Infiltration

- ○ **Infiltration Trench (I-1)**
- ○ **Infiltration Basin (I-2)**
- ○ **Dry Well (I-3)**
- ○ **Underground Infiltration System**

Open Channels

- ○ **Dry Swale (O-1)**
- ○ **Wet Swale (O-2)**

Verified Proprietary Practice

- ○ **Hydrodynamic**
- ○ **Wet Vault**
- ○ **Media Filter**

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

____

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

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

____

____

30. Provide the total water quality volume required and the total provided for the site.

WQv Required ___ . ___ **acre-feet**

WQv Provided ___ . ___ **acre-feet**

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required ___ . ___ **acre-feet**

CPv Provided ___ . ___ **acre-feet**

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development ___ . ___ **CFS**

Post-development ___ . ___ **CFS**

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development ___ . ___ **CFS**

Post-development ___ . ___ **CFS**

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. ___ %

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. ___ %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. ___

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems) ___

36. Identify other DEC permits that are required for this project.

DEC Permits

○ Air Pollution Control	○ Navigable Waters Protection / Article 15
○ Coastal Erosion	○ Water Quality Certificate
○ Hazardous Waste	○ Dam Safety
○ Long Island Wells	○ Water Supply
○ Mined Land Reclamation	○ Freshwater Wetlands/Article 24
○ Other SPDES	○ Tidal Wetlands
○ Solid Waste	○ Wild, Scenic and Recreational Rivers
○ None	○ Stream Bed or Bank Protection / Article 15
○ Other	

37. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. _____._

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 39)

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

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. NYR

Owner/Operator Certification

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

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date / /

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

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

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

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

(NYS DEC - MS4 SWPPP Acceptance Form - January 2010)

MS4 SWPPP Acceptance Form - continued

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

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

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

Contractor Certification Statement

PROJECT:

OWNER/OPERATOR:

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
PROJECT SITE PLANS:

Pursuant to Part III.A.6 of the *New York State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwatar Discharges from Construction Activity – Permit No. GP-0-10-001* 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 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 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."*

CONTRACT DESCRIPTION: ____

COMPANY: ______________________________

ADDRESS: ______________________________

____

PHONE: ______________________________

FAX: ______________________________

EMAIL: ______________________________

AUTHORIZED SIGNATURE: ______________________________ DATE: ____________

PRINTED NAME: ______________________________

TITLE: ______________________________

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

5. 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, the deed of record has been modified to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.
- ☐ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, 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 2010)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010

Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

William R. Adriance
Authorized Signature

January 28, 2010
Date

Address: NYS DEC
Div. 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’s *State Pollutant Discharge Elimination System (“SPDES”)* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law (“ECL”).*

This general permit (“permit”) is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation (“the Department”) regional office (see Appendix G).They are also available on the Department’s website at:

http://www.dec.ny.gov/

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 Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

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

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

FROM CONSTRUCTION ACTIVITIES

TABLE OF CONTENTS

Part I. 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 (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and 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.

C. 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 D. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from *construction activities*.

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater *discharges* may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with water quality standards in Part I.B.

D. <u>Activities Which Are Ineligible for Coverage Under This General Permit</u> - All of the following are **<u>not</u>** authorized by this permit:

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

2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection C.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, subparagraph K of this permit;

4. *Discharges* from *construction activities* that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

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 that:

    a. are tributary to waters of the state classified as AA or AA-s; and

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and

   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

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 develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

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

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 develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form 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, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

This requirement does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

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.

B. <u>Permit Authorization</u>

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,

    b. where required, all necessary Department permits subject to the *Uniform Procedures Act (UPA)* (see 6 NYCRR Part 621) 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 Regional Office 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. an 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.B.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

(Part II. B. 3)

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 NOI for *construction activities* with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

   ii. Sixty (60) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has not been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

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 a complete NOI and signed "MS4 SWPPP Acceptance" form,

4. The Department may suspend or deny an *owner's or operator's* coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. 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.

C. 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.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-10-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department.

(Part II. C. 2)

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 MS4 (provided the 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. 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 been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

    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. 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.

(Part II. C)

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the *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 *MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *MS4* prior to commencing construction of the post-construction stormwater management practice.

D. Permit Coverage for Discharges Authorized Under GP-0-08-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), a*n owner or operator* of *construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. 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.A.1.. 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.

   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. 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*.

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:

    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; and

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

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.

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.

(Part III. A. 6)

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 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 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. "

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.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:

a. Information on whether the stormwater discharge or *construction activities* would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the *owner or operator* fails to describe and implement such measures, the stormwater *discharge* is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

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 most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this 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), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; 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 the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, 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., 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 most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

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 requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. 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 standards.

2. Post-construction stormwater management practice component - All construction projects 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 most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). If the Design Manual is revised during the term of this permit, an *owner or operator* must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

   Where post-construction stormwater management practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard.

   At a minimum, 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;

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

c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

d. Identification of any elements of the design that are not in conformance with the Design Manual. 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 standards;

e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

g. 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 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.g. above.

(Part III. C)

C. <u>Required SWPPP Components by Project Type</u> - 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. *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.

Part IV. <u>INSPECTION AND MAINTENANCE REQUIREMENTS</u>

A. <u>General Construction Site Inspection and Maintenance Requirements</u>

1. The *owner or operator* must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

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. <u>Owner or Operator Maintenance Inspection Requirements</u>

1. The *owner or operator* shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

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 *owner or operator* can stop conducting the maintenance inspections. The *owner or operator* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> 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.

(Part IV. C)

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. **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),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

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

    a. the construction of a single family residential subdivision with 25% or less impervious cover at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

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

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

    d. construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) 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.

(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.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 Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the 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* <u>and</u> 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 Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the 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,* <u>and</u> 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.A.1..

(Part IV. C. 3)

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices 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 that need repair or maintenance;

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

   h. Description and sketch 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;

(Part IV. C 4)

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 to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. 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 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.C.2., the inspection reports shall be maintained on site with the SWPPP.

Part V. <u>TERMINATION OF PERMIT COVERAGE</u>

A. <u>Termination of Permit Coverage</u>

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.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

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; <u>and</u> all areas disturbed as of the project shutdown date 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 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.E.

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 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.

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 also have the MS4 sign the “MS4 Acceptance” statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4,* sign the “MS4 Acceptance” statement. The 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 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.3.

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:

(Part V. A. 5)

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 modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, 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 OF 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 site achieves *final stabilization*. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

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.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department 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*.

B. <u>Continuation of the Expired General Permit</u> - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an *owner or operator* seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. <u>Enforcement</u> - 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. <u>Need to Halt or Reduce Activity Not a Defense</u> - 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. <u>Duty to Mitigate</u> - 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. <u>Duty to Provide Information</u> - The *owner or operator* shall make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation 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 the NOI, SWPPP or inspection reports. Copying of documents will be done at the requester's expense.

G. <u>Other Information</u> - 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 other report, 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. 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. 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.;

   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.

(Part VII. K)
K. <u>Denial of Coverage Under This Permit</u>

1. At its sole discretion, 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 Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, 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. Any *owner or operator* authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the *owner or operator* shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F).The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. 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. <u>Proper Operation and Maintenance</u> - 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. <u>Inspection and Entry</u> - The *owner or operator* shall allow the Department or an authorized representative of EPA, the State, 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:

(Part VII. M)

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).

N. Permit Actions - At the Department's sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. 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. 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 – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

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

Definitions

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.

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.

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

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 authorizing a category of discharges.

Groundwater - 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.

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.

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) application, 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.

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).

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.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

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 Parts 700 et seq of this Title.

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, 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 in order to prepare a SWPPP that conforms to the Department's technical standard. 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.

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

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,
- Stream bank restoration projects (does not include the placement of spoil material),
- 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 makes 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.

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.

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 or underground 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.

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 sources. 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 sources, 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, 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* will be 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 and 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 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 • Bike paths and trails • Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics • Spoil areas that will be covered with vegetation • Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), 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 less than five acres and construction activities that include the construction or reconstruction of impervious area
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 (5000) square feet and one (1) acre of land.

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 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 townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- 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, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- 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 or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* and *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

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

Figure 1 - New York City Watershed East of the Hudson

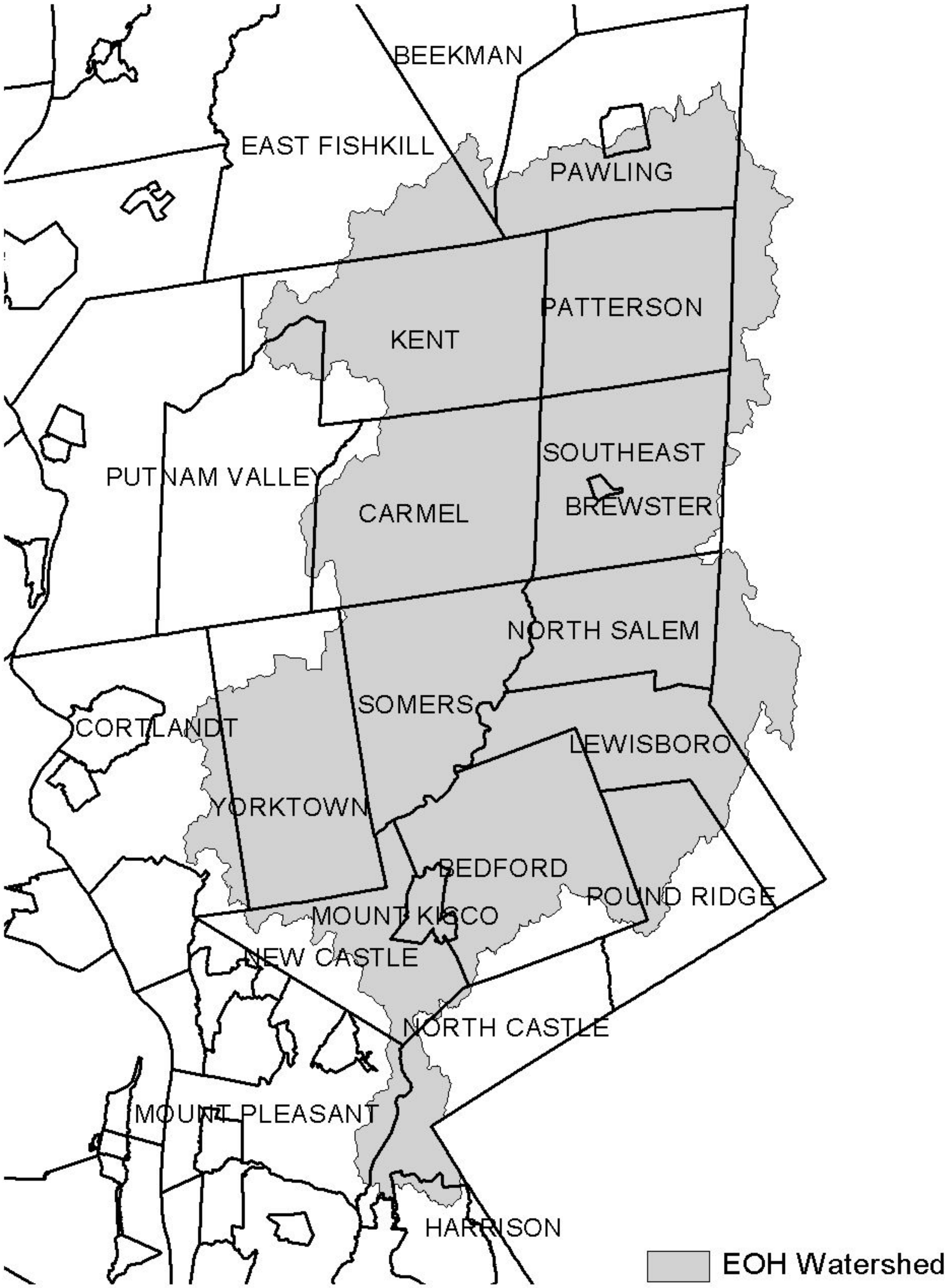


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

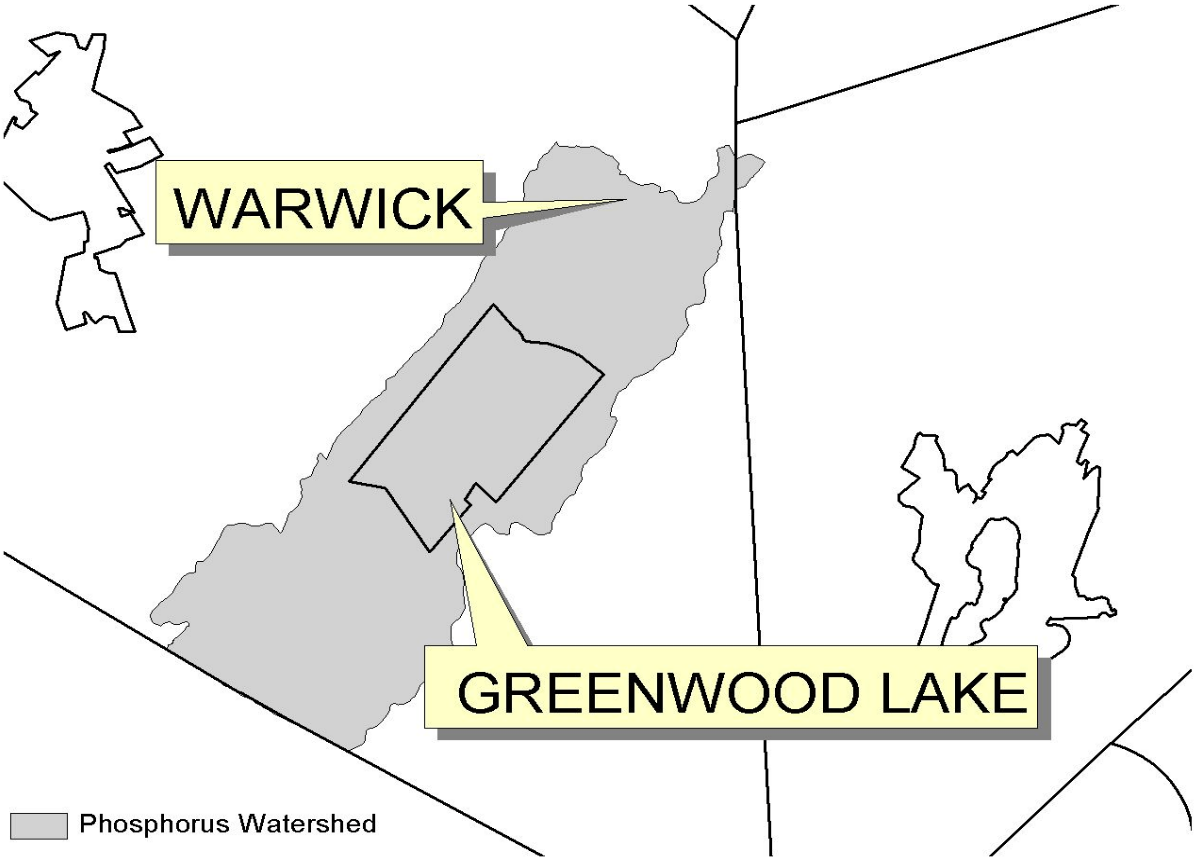
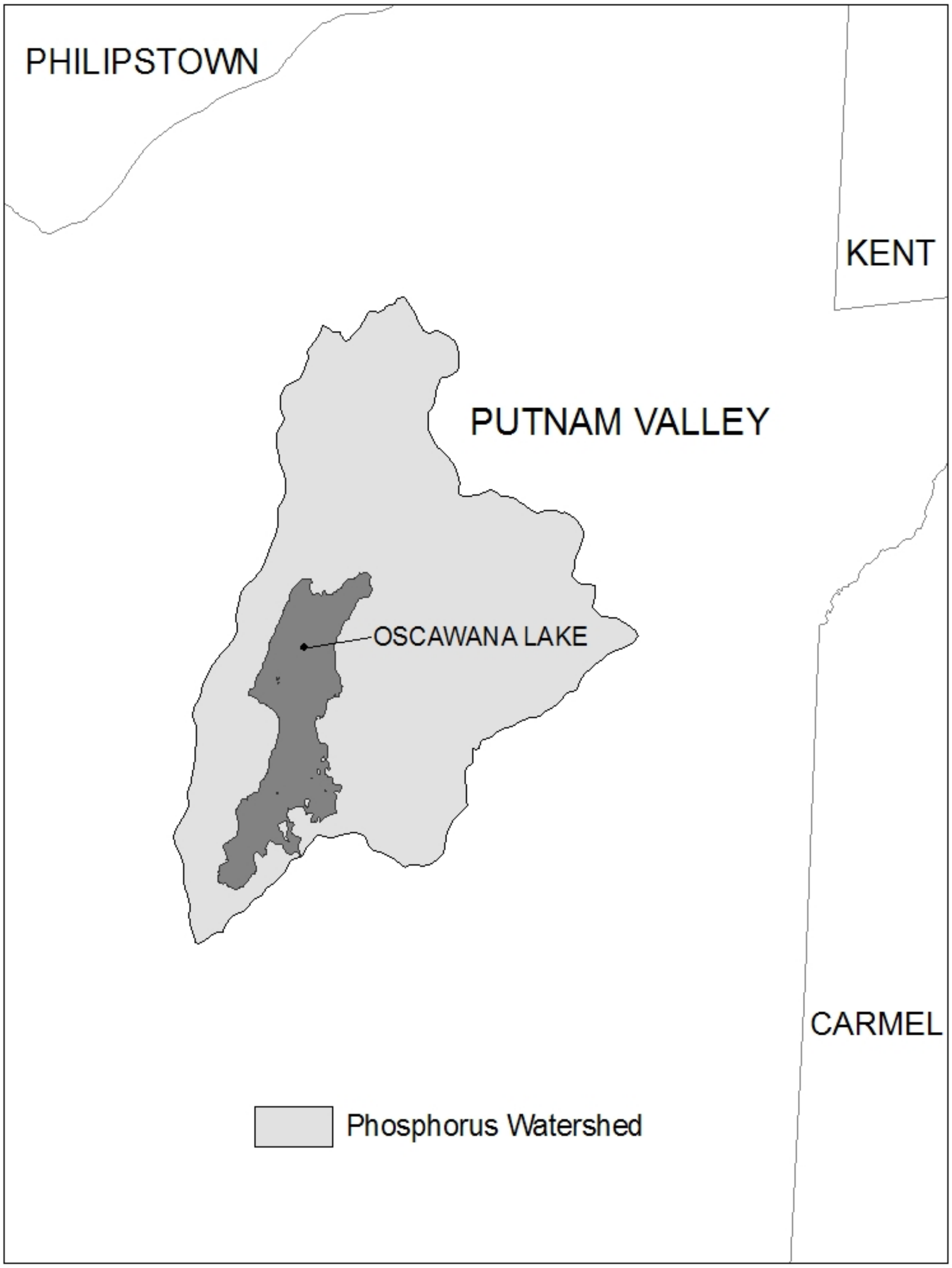


Figure 4 - Oscawana Lake Watershed



APPENDIX D

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

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivision construction activities 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 most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

COUNTY	WATERBODY	COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond	Monroe	Genesee River, Lower, Main Stem
Albany	Basic Creek Reservoir	Monroe	Genesee River, Middle, Main Stem
Bronx	Van Cortlandt Lake	Monroe	Black Creek, Lower, and minor tribs
Broome	Whitney Point Lake/Reservoir	Monroe	Buck Pond
Broome	Beaver Lake	Monroe	Long Pond
Broome	White Birch Lake	Monroe	Cranberry Pond
Chautauqua	Chautauqua Lake, North	Monroe	Mill Creek and tribs
Chautauqua	Chautauqua Lake, South	Monroe	Shipbuilders Creek and tribs
Chautauqua	Bear Lake	Monroe	Minor tribs to Irondequoit Bay
Chautauqua	Chadakoin River and tribs	Monroe	Thomas Creek/White Brook and tribs
Chautauqua	Lower Cassadaga Lake	Nassau	Glen Cove Creek, Lower, and tribs
Chautauqua	Middle Cassadaga Lake	Nassau	LI Tribs (fresh) to East Bay
Chautauqua	Findley Lake	Nassau	East Meadow Brook, Upper, and tribs
Clinton	Great Chazy River, Lower, Main Stem	Nassau	Hempstead Bay
Columbia	Kinderhook Lake	Nassau	Hempstead Lake
Columbia	Robinson Pond	Nassau	Grant Park Pond
Dutchess	Hillside Lake	Niagara	Bergholtz Creek and tribs
Dutchess	Wappinger Lakes	Oneida	Ballou, Nail Creeks
Dutchess	Fall Kill and tribs	Onondaga	Ley Creek and tribs
Dutchess	Rudd Pond	Onondaga	Onondaga Creek, Lower and tribs
Erie	Rush Creek and tribs	Onondaga	Onondaga creek, Middle and tribs
Erie	Ellicott Creek, Lower, and tribs	Onondaga	Onondaga Creek, Upper, and minor tribs
Erie	Beeman Creek and tribs	Onondaga	Harbor Brook, Lower, and tribs
Erie	Murder Creek, Lower, and tribs	Onondaga	Ninemile Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs	Onondaga	Minor tribs to Onondaga Lake
Erie	Little Sister Creek, Lower, and tribs	Ontario	Honeoye Lake
Essex	Lake George (primary county listed as Warren)	Ontario	Hemlock Lake Outlet and minor tribs
Genesee	Black Creek, Upper, and minor tribs	Ontario	Great Brook and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem	Oswego	Lake Neatahwanta
Genesee	Tonawanda Creek, Upper, and minor tribs	Putnam	Oscawana Lake
Genesee	Little Tonawanda Creek, Lower, and tribs	Putnam	Lake Carmel
Genesee	Oak Orchard Creek, Upper, and tribs	Queens	Jamaica Bay, Eastern, and tribs (Queens)
Genesee	Bowen Brook and tribs	Queens	Bergen Basin
Genesee	Bigelow Creek and tribs	Queens	Shellbank Basin
Greene	Schoharie Reservoir	Rensselaer	Snyders Lake
Greene	Sleepy Hollow Lake	Richmond	Grasmere, Arbutus and Wolfes Lakes
Herkimer	Steele Creek tribs	Saratoga	Dwaas Kill and tribs
Kings	Hendrix Creek	Saratoga	Tribs to Lake Lonely
Lewis	Mill Creek/South Branch and tribs	Saratoga	Lake Lonely
Livingston	Conesus Lake	Saratoga	Schuyler Creek and tribs
Livingston	Jaycox Creek and tribs	Schenectady	Collins Lake
Livingston	Mill Creek and minor tribs		

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

Note: The list above identifies those waters from the final New York State "2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated May 26, 2008, that are impaired by silt, sediment or 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, PO BOX 220 WARRENSBURG, NY 12885-0220 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 ROAD AVON, 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 AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

APPENDIX C
SOILS INFORMATION

United States Department of Agriculture

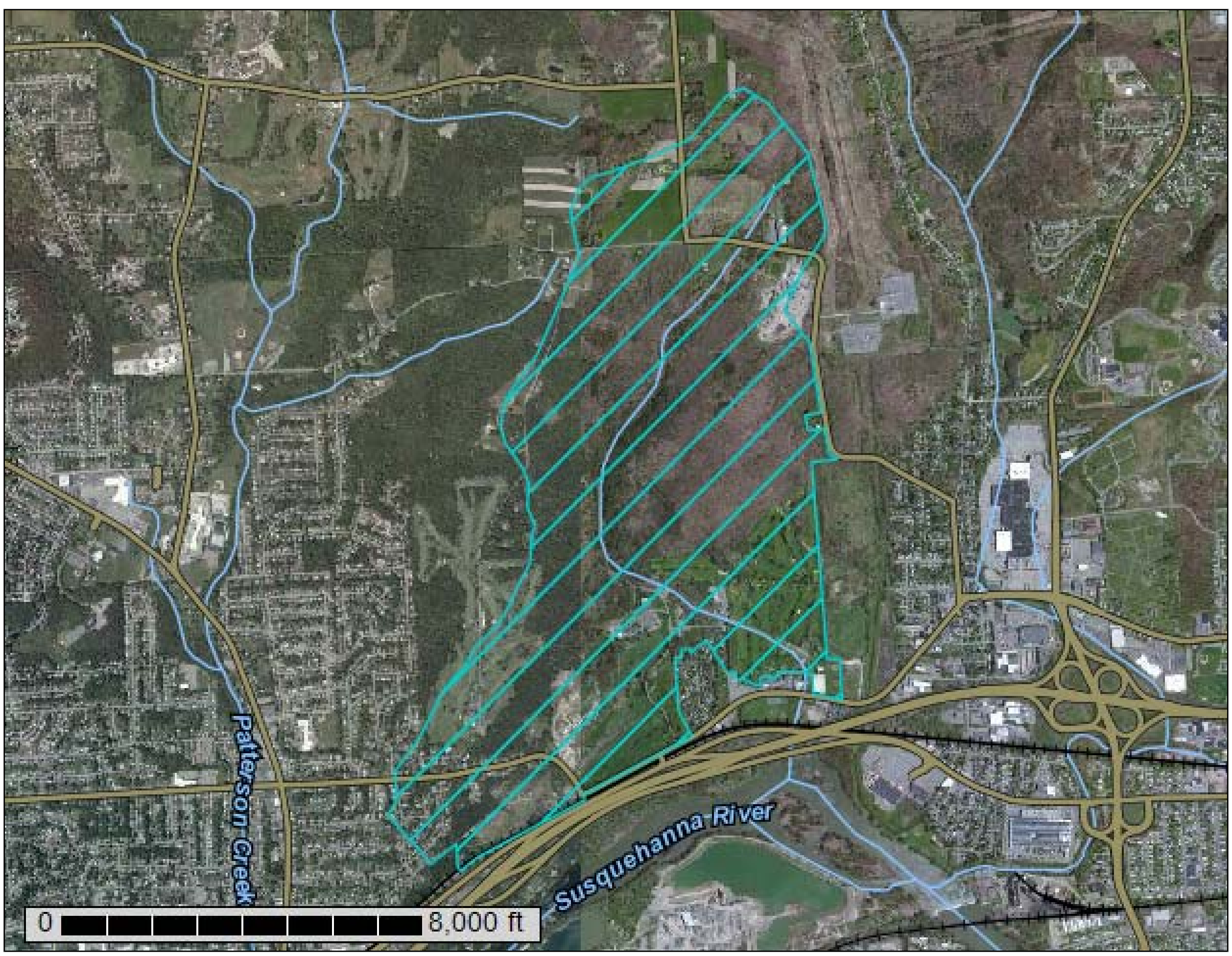
Natural Resources Conservation Service

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

Broome County, New York

Traditions At the Glen Casino and Resort-401 Watson Boulevard Union, NY 13790



March 27, 2014

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 (http://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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Contents

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.

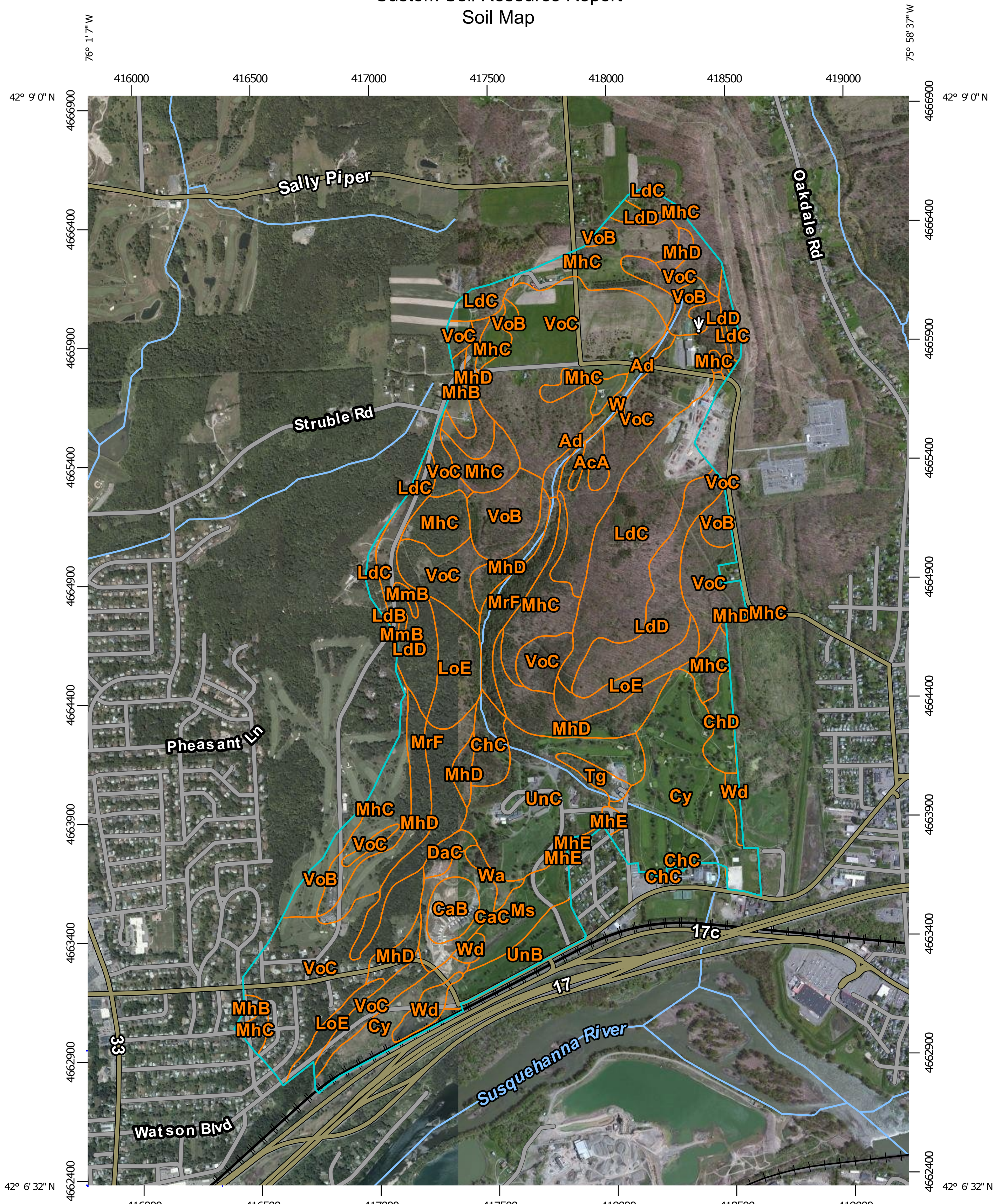
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree 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: 1:22,300 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 300, 600, 1200, 1800

Feet: 0, 1000, 2000, 4000, 6000

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: http://websoilsurvey.nrcs.usda.gov
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: Broome County, New York
Survey Area Data: Version 11, Dec 15, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 2, 2010—Oct 8, 2011

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

Broome County, New York (NY007)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AcA	Alden and Chippewa soils, 0 to 3 percent slopes	5.8	0.5%
Ad	Alluvial land	9.9	0.9%
CaB	Canaseraga silt loam, 3 to 8 percent slopes	11.7	1.1%
CaC	Canaseraga silt loam, 8 to 15 percent slopes	13.9	1.3%
ChC	Chenango and Howard gravelly loams, 5 to 15 percent slopes	12.1	1.1%
ChD	Chenango and Howard gravelly loams, 15 to 25 percent slopes	10.0	0.9%
Cy	Cut and fill lands, silty materials	95.3	8.6%
DaC	Dalton silt loam, 8 to 15 percent slopes	5.3	0.5%
LdB	Lordstown channery silt loam, 0 to 5 percent slopes	0.5	0.0%
LdC	Lordstown channery silt loam, 5 to 15 percent slopes	87.7	7.9%
LdD	Lordstown channery silt loam, 15 to 25 percent slopes	72.7	6.6%
LoE	Lordstown and Oquaga channery silt loams, 25 to 35 percent slopes	44.1	4.0%
MhB	Mardin channery silt loam, 2 to 8 percent slopes	8.0	0.7%
MhC	Mardin channery silt loam, 8 to 15 percent slopes	124.5	11.2%
MhD	Mardin channery silt loam, 15 to 25 percent slopes	81.7	7.4%
MhE	Mardin channery silt loam, 25 to 35 percent slopes	3.0	0.3%
MmB	Mardin channery silt loam, moderately shallow variant, 2 to 8 percent slopes	2.0	0.2%
MrF	Mardin and Cattaraugus soils, 35 to 60 percent slopes	43.4	3.9%
Ms	Middlebury silt loam	19.3	1.7%
Tg	Tioga gravelly silt loam, fan	5.5	0.5%
UnB	Unadilla silt loam, 0 to 5 percent slopes	20.1	1.8%
UnC	Unadilla silt loam, 5 to 15 percent slopes	69.0	6.2%

Broome County, New York (NY007)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
VoB	Volusia channery silt loam, 3 to 8 percent slopes	46.0	4.2%
VoC	Volusia channery silt loam, 8 to 15 percent slopes	298.5	27.0%
W	Water	0.8	0.1%
Wa	Wallington silt loam	4.2	0.4%
Wd	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	12.3	1.1%
Totals for Area of Interest		**1,107.3**	**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.

Broome County, New York

AcA—Alden and Chippewa soils, 0 to 3 percent slopes

Map Unit Setting

Elevation: 300 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Alden and similar soils: 50 percent
Chippewa and similar soils: 30 percent
Minor components: 20 percent

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

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 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: C/D

Typical profile

0 to 10 inches: Silt loam
10 to 20 inches: Silty clay loam
20 to 60 inches: Silt loam

Description of Chippewa

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy till dominated by siltstone, sandstone, and shale fragments

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 10 to 18 inches to fragipan
Drainage class: 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 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 1.7 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 4w
Hydrologic Soil Group: D

Typical profile

0 to 5 inches: Channery silt loam
5 to 12 inches: Channery silt loam
12 to 36 inches: Channery silt loam
36 to 60 inches: Channery silt loam

Minor Components

Fluvaquents

Percent of map unit: 5 percent
Landform: Flood plains

Udifluvents

Percent of map unit: 5 percent

Volusia

Percent of map unit: 5 percent

Mardin

Percent of map unit: 5 percent

Ad—Alluvial land

Map Unit Setting

Elevation: 100 to 3,000 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Fluvaquents and similar soils: 50 percent
Udifluvents and similar soils: 30 percent
Minor components: 20 percent

Description of Fluvaquents

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium with highly variable texture

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 6.1 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: B/D

Typical profile

0 to 5 inches: Gravelly silt loam
5 to 70 inches: Gravelly silt loam

Description of Udifluvents

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium with a wide range of texture

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: A

Typical profile

0 to 4 inches: Very gravelly loam
4 to 70 inches: Very gravelly sand

Minor Components

Chenango

Percent of map unit: 5 percent

Middlebury

Percent of map unit: 5 percent

Tioga

Percent of map unit: 5 percent

Wayland

Percent of map unit: 5 percent
Landform: Flood plains

CaB—Canaseraga silt loam, 3 to 8 percent slopes

Map Unit Setting

Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Canaseraga and similar soils: 75 percent
Minor components: 25 percent

Description of Canaseraga

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: A silty mantle over loamy till derived from siltstone, shale, and sandstone, with varying amounts of limestone

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 30 inches to fragipan
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 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.2 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D

Typical profile
0 to 8 inches: Silt loam
8 to 23 inches: Silt loam
23 to 60 inches: Channery silt loam
60 to 65 inches: Channery silt loam

Minor Components

Unadilla
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

Dalton
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

Scio
Percent of map unit: 5 percent

CaC—Canaseraga silt loam, 8 to 15 percent slopes

Map Unit Setting
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Canaseraga and similar soils: 75 percent
Minor components: 25 percent

Description of Canaseraga

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: A silty mantle over loamy till derived from siltstone, shale, and sandstone, with varying amounts of limestone

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 30 inches to fragipan
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 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.2 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: D

Typical profile

0 to 8 inches: Silt loam
8 to 23 inches: Silt loam
23 to 60 inches: Channery silt loam
60 to 65 inches: Channery silt loam

Minor Components

Unadilla

Percent of map unit: 5 percent

Volusia

Percent of map unit: 5 percent

Lordstown

Percent of map unit: 5 percent

Dalton

Percent of map unit: 5 percent

Mardin

Percent of map unit: 5 percent

ChC—Chenango and Howard gravelly loams, 5 to 15 percent slopes

Map Unit Setting

Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Chenango and similar soils: 50 percent
Howard and similar soils: 30 percent
Minor components: 20 percent

Description of Chenango

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Shoulder
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

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: Low (about 4.2 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: A

Typical profile

0 to 5 inches: Gravelly loam
5 to 29 inches: Very gravelly loam
29 to 60 inches: Very gravelly coarse sand

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Shoulder
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, containing significant amounts of limestone

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: A

Typical profile

0 to 7 inches: Gravelly loam
7 to 15 inches: Gravelly loam
15 to 40 inches: Very gravelly loam
40 to 60 inches: Stratified sand to gravel

Minor Components

Tioga

Percent of map unit: 5 percent

Unadilla

Percent of map unit: 5 percent

Mardin

Percent of map unit: 5 percent

Braceville

Percent of map unit: 5 percent

ChD—Chenango and Howard gravelly loams, 15 to 25 percent slopes

Map Unit Setting

Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Chenango and similar soils: 45 percent
Howard and similar soils: 35 percent
Minor components: 20 percent

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
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

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: Low (about 4.2 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability (nonirrigated): 4e
Hydrologic Soil Group: A

Typical profile
0 to 5 inches: Gravelly loam
5 to 29 inches: Very gravelly loam
29 to 60 inches: Very gravelly coarse sand

Description of Howard

Setting
Landform: Terraces, valley trains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Properties and qualities
Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.6 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability (nonirrigated): 4e
Hydrologic Soil Group: A

Typical profile
0 to 7 inches: Gravelly loam
7 to 15 inches: Gravelly loam
15 to 40 inches: Very gravelly loam
40 to 60 inches: Stratified sand to gravel

Minor Components

Canaseraga
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

Udifluvents
Percent of map unit: 5 percent

Unadilla
Percent of map unit: 5 percent

Cy—Cut and fill lands, silty materials

Map Unit Setting
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Udorthents, silty, and similar soils: 75 percent
Minor components: 25 percent

Description of Udorthents, Silty

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 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: 15 percent
Available water capacity: Low (about 5.5 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability (nonirrigated): 6s
Hydrologic Soil Group: A

Typical profile
0 to 4 inches: Silt loam
4 to 70 inches: Silt loam

Minor Components

Fluvaquents
Percent of map unit: 5 percent
Landform: Flood plains

Scio
Percent of map unit: 5 percent

Unadilla

Percent of map unit: 5 percent

Wayland

Percent of map unit: 5 percent
Landform: Flood plains

Udifluvents

Percent of map unit: 5 percent

DaC—Dalton silt loam, 8 to 15 percent slopes

Map Unit Setting

Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Dalton and similar soils: 80 percent
Minor components: 20 percent

Description of Dalton

Setting

Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: A silty mantle of glaciolacustrine deposits over loamy till derived from siltstone, shale, and sandstone

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 12 to 22 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: 1 percent
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: D

Typical profile

0 to 6 inches: Silt loam

6 to 20 inches: Silt loam
20 to 60 inches: Channery silt loam

Minor Components

Volusia
Percent of map unit: 5 percent

Canaseraga
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

Wallington
Percent of map unit: 5 percent

LdB—Lordstown channery silt loam, 0 to 5 percent slopes

Map Unit Setting
Elevation: 750 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Lordstown and similar soils: 80 percent
Minor components: 20 percent

Description of Lordstown

Setting
Landform: Benches, hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Properties and qualities
Slope: 0 to 5 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.6 inches)

Interpretive groups
Farmland classification: All areas are prime farmland

Land capability (nonirrigated): 2s
Hydrologic Soil Group: C

Typical profile
0 to 7 inches: Channery silt loam
7 to 26 inches: Channery silt loam
26 to 28 inches: Very channery silt loam
28 to 32 inches: Bedrock

Minor Components

Arnot
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

Tuller
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

LdC—Lordstown channery silt loam, 5 to 15 percent slopes

Map Unit Setting
Elevation: 750 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Lordstown and similar soils: 80 percent
Minor components: 20 percent

Description of Lordstown

Setting
Landform: Benches, hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Properties and qualities
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.6 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: C

Typical profile
0 to 7 inches: Channery silt loam
7 to 26 inches: Channery silt loam
26 to 28 inches: Very channery silt loam
28 to 32 inches: Bedrock

Minor Components

Tuller
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

Arnot
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

LdD—Lordstown channery silt loam, 15 to 25 percent slopes

Map Unit Setting
Elevation: 750 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Lordstown and similar soils: 75 percent
Minor components: 25 percent

Description of Lordstown

Setting
Landform: Benches, hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Properties and qualities
Slope: 15 to 25 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.6 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability (nonirrigated): 4e
Hydrologic Soil Group: C

Typical profile
0 to 7 inches: Channery silt loam
7 to 26 inches: Channery silt loam
26 to 28 inches: Very channery silt loam
28 to 32 inches: Bedrock

Minor Components

Oquaga
Percent of map unit: 5 percent

Arnot
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

Rock outcrop
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

LoE—Lordstown and Oquaga channery silt loams, 25 to 35 percent slopes

Map Unit Setting
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Lordstown and similar soils: 40 percent
Oquaga and similar soils: 40 percent
Minor components: 20 percent

Description of Oquaga

Setting

Landform: Ridges, benches, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till with lithology dominated by reddish sandstone, siltstone, and shale

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 6e
Hydrologic Soil Group: C

Typical profile

0 to 6 inches: Channery silt loam
6 to 32 inches: Very channery silt loam
32 to 36 inches: Bedrock

Description of Lordstown

Setting

Landform: Benches, hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 6e
Hydrologic Soil Group: C

Typical profile
0 to 7 inches: Channery silt loam
7 to 26 inches: Channery silt loam
26 to 28 inches: Very channery silt loam
28 to 32 inches: Bedrock

Minor Components

Arnot
Percent of map unit: 5 percent

Cattaraugus
Percent of map unit: 5 percent

Mardin
Percent of map unit: 5 percent

Rock outcrop
Percent of map unit: 5 percent

MhB—Mardin channery silt loam, 2 to 8 percent slopes

Map Unit Setting
Elevation: 800 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Mardin and similar soils: 85 percent
Minor components: 15 percent

Description of Mardin

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 derived mainly from acid sedimentary rock

Properties and qualities
Slope: 2 to 8 percent
Depth to restrictive feature: 18 to 22 inches to fragipan
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 16 to 22 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.4 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D

Typical profile
0 to 7 inches: Channery silt loam
7 to 18 inches: Channery silt loam
18 to 58 inches: Channery silt loam
58 to 70 inches: Very channery silt loam

Minor Components

Lordstown
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

Cattaraugus
Percent of map unit: 5 percent

MhC—Mardin channery silt loam, 8 to 15 percent slopes

Map Unit Setting
Elevation: 800 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Mardin and similar soils: 85 percent
Minor components: 15 percent

Description of Mardin

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 derived mainly from acid sedimentary rock

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 22 inches to fragipan
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 16 to 22 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.4 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: D

Typical profile
0 to 7 inches: Channery silt loam
7 to 18 inches: Channery silt loam
18 to 58 inches: Channery silt loam
58 to 70 inches: Very channery silt loam

Minor Components

Lordstown
Percent of map unit: 5 percent

Cattaraugus
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

MhD—Mardin channery silt loam, 15 to 25 percent slopes

Map Unit Setting
Elevation: 800 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition
Mardin and similar soils: 85 percent
Minor components: 15 percent

Description of Mardin

Setting
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sedimentary rock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 18 to 22 inches to fragipan
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 16 to 22 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 4e
Hydrologic Soil Group: D

Typical profile

0 to 7 inches: Channery silt loam
7 to 18 inches: Channery silt loam
18 to 58 inches: Channery silt loam
58 to 70 inches: Very channery silt loam

Minor Components

Lordstown

Percent of map unit: 5 percent

Volusia

Percent of map unit: 5 percent

Cattaraugus

Percent of map unit: 5 percent

MhE—Mardin channery silt loam, 25 to 35 percent slopes

Map Unit Setting

Elevation: 800 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Mardin and similar soils: 80 percent
Minor components: 20 percent

Description of Mardin

Setting

Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sedimentary rock

Properties and qualities
Slope: 25 to 35 percent
Depth to restrictive feature: 18 to 22 inches to fragipan
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 16 to 22 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.4 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability (nonirrigated): 6e
Hydrologic Soil Group: D

Typical profile
0 to 7 inches: Channery silt loam
7 to 18 inches: Channery silt loam
18 to 58 inches: Channery silt loam
58 to 70 inches: Very channery silt loam

Minor Components

Culvers
Percent of map unit: 5 percent

Morris
Percent of map unit: 5 percent

Volusia
Percent of map unit: 5 percent

Lordstown
Percent of map unit: 5 percent

MmB—Mardin channery silt loam, moderately shallow variant, 2 to 8 percent slopes

Map Unit Setting
Elevation: 750 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Mardin, moderately shallow, and similar soils: 85 percent
Minor components: 15 percent

Description of Mardin, Moderately Shallow

Setting

Landform: Benches, hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sedimentary rock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 18 to 22 inches to fragipan; 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 16 to 21 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D

Typical profile

0 to 7 inches: Channery silt loam
7 to 18 inches: Channery silt loam
18 to 30 inches: Channery silt loam
30 to 34 inches: Bedrock

Minor Components

Arnot

Percent of map unit: 5 percent

Mardin

Percent of map unit: 5 percent

Lordstown

Percent of map unit: 5 percent

MrF—Mardin and Cattaraugus soils, 35 to 60 percent slopes

Map Unit Setting

Elevation: 800 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Mardin and similar soils: 40 percent
Cattaraugus and similar soils: 35 percent
Minor components: 25 percent

Description of Mardin

Setting

Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sedimentary rock

Properties and qualities

Slope: 35 to 45 percent
Depth to restrictive feature: 18 to 22 inches to fragipan
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 16 to 22 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 6e
Hydrologic Soil Group: D

Typical profile

0 to 7 inches: Channery silt loam
7 to 18 inches: Channery silt loam
18 to 58 inches: Channery silt loam
58 to 70 inches: Very channery silt loam

Description of Cattaraugus

Setting

Landform: Till plains, hills, drumlinoid ridges

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from reddish sandstone, siltstone, and shale

Properties and qualities

Slope: 35 to 50 percent
Depth to restrictive feature: 24 to 30 inches to fragipan
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 23 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7e
Hydrologic Soil Group: C

Typical profile

0 to 6 inches: Channery silt loam
6 to 28 inches: Channery silt loam
28 to 48 inches: Very channery silt loam
48 to 60 inches: Very channery silt loam

Minor Components

Oquaga

Percent of map unit: 5 percent

Volusia

Percent of map unit: 5 percent

Culvers

Percent of map unit: 5 percent

Lordstown

Percent of map unit: 5 percent

Morris

Percent of map unit: 5 percent

Ms—Middlebury silt loam

Map Unit Setting

Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Middlebury and similar soils: 90 percent
Minor components: 10 percent

Description of Middlebury

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy alluvium predominantly from areas of shale and sandstone with some lime-bearing material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 15 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water capacity: Low (about 5.3 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2w
Hydrologic Soil Group: B/D

Typical profile

0 to 7 inches: Silt loam
7 to 16 inches: Silt loam
16 to 60 inches: Fine sandy loam

Minor Components

Tioga

Percent of map unit: 5 percent

Udifluvents

Percent of map unit: 5 percent

Tg—Tioga gravelly silt loam, fan

Map Unit Setting

Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Tioga and similar soils: 85 percent
Minor components: 15 percent

Description of Tioga

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well 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: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: Moderate (about 6.1 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 1
Hydrologic Soil Group: A

Typical profile

0 to 9 inches: Gravelly silt loam
9 to 35 inches: Gravelly silt loam
35 to 60 inches: Very gravelly loamy sand

Minor Components

Middlebury

Percent of map unit: 5 percent

Udifluvents

Percent of map unit: 5 percent

Chenango

Percent of map unit: 5 percent

UnB—Unadilla silt loam, 0 to 5 percent slopes

Map Unit Setting

Elevation: 600 to 1,800 feet

Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Unadilla and similar soils: 80 percent
Minor components: 20 percent

Description of Unadilla

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Glaciolacustrine deposits, eolian deposits, or old alluvium, comprised mainly of silt and very fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: High (about 10.4 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 1
Hydrologic Soil Group: B

Typical profile

0 to 10 inches: Silt loam
10 to 32 inches: Very fine sandy loam
32 to 52 inches: Very fine sandy loam
52 to 72 inches: Gravelly sandy loam

Minor Components

Scio

Percent of map unit: 5 percent

Tioga

Percent of map unit: 5 percent

Wallington

Percent of map unit: 5 percent

Chenango

Percent of map unit: 5 percent

UnC—Unadilla silt loam, 5 to 15 percent slopes

Map Unit Setting

Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Unadilla and similar soils: 75 percent
Minor components: 25 percent

Description of Unadilla

Setting

Landform: Lake plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Glaciolacustrine deposits, eolian deposits, or old alluvium, comprised mainly of silt and very fine sand

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: High (about 10.4 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: B

Typical profile

0 to 10 inches: Silt loam
10 to 32 inches: Very fine sandy loam
32 to 52 inches: Very fine sandy loam
52 to 72 inches: Gravelly sandy loam

Minor Components

Chenango

Percent of map unit: 5 percent

Howard

Percent of map unit: 5 percent

Scio

Percent of map unit: 5 percent

Wallington

Percent of map unit: 5 percent

Tioga

Percent of map unit: 5 percent

VoB—Volusia channery silt loam, 3 to 8 percent slopes

Map Unit Setting

Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days

Map Unit Composition

Volusia and similar soils: 90 percent
Minor components: 10 percent

Description of Volusia

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from interbedded sedimentary rock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 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: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3w

Hydrologic Soil Group: D

Typical profile

0 to 9 inches: Channery silt loam
9 to 15 inches: Channery silt loam
15 to 17 inches: Channery silt loam
17 to 29 inches: Channery loam
29 to 54 inches: Extremely channery loam
54 to 72 inches: Channery silt loam

Minor Components

Chippewa

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

Mardin

Percent of map unit: 5 percent
Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex

VoC—Volusia channery silt loam, 8 to 15 percent slopes

Map Unit Setting

Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days

Map Unit Composition

Volusia and similar soils: 90 percent
Minor components: 10 percent

Description of Volusia

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from interbedded sedimentary rock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 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: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability (nonirrigated): 3e
Hydrologic Soil Group: D

Typical profile

0 to 9 inches: Channery silt loam
9 to 15 inches: Channery silt loam
15 to 17 inches: Channery silt loam
17 to 29 inches: Channery loam
29 to 54 inches: Extremely channery loam
54 to 72 inches: Channery silt loam

Minor Components

Mardin

Percent of map unit: 6 percent
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex

Chippewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

W—Water

Map Unit Setting

Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F

Frost-free period: 110 to 180 days

Map Unit Composition

Water: 100 percent

Wa—Wallington silt loam

Map Unit Setting

Mean annual precipitation: 36 to 45 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 110 to 180 days

Map Unit Composition

Wallington and similar soils: 85 percent
Minor components: 15 percent

Description of Wallington

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciolacustrine or eolian deposits high in silt and very fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: 15 to 18 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 17 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.5 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 3w
Hydrologic Soil Group: D

Typical profile

0 to 7 inches: Silt loam
7 to 18 inches: Very fine sandy loam
18 to 38 inches: Silt loam
38 to 60 inches: Very fine sandy loam

Minor Components

Scio

Percent of map unit: 5 percent

Unadilla

Percent of map unit: 5 percent

Dalton

Percent of map unit: 5 percent

Wd—Wayland soils complex, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 68 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent

Description of Wayland

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 12.6 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: B/D

Typical profile

0 to 6 inches: Silt loam
6 to 12 inches: Silt loam
12 to 18 inches: Silt loam

18 to 46 inches: Silt loam
46 to 72 inches: Silty clay loam

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

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 high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 12.8 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: B/D

Typical profile

0 to 6 inches: Mucky silt loam
6 to 12 inches: Silt loam
12 to 18 inches: Silt loam
18 to 46 inches: Silt loam
46 to 72 inches: Silty clay loam

Minor Components

Wakeville

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear

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 (Traditions At the Glen Casino and Resort)

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.

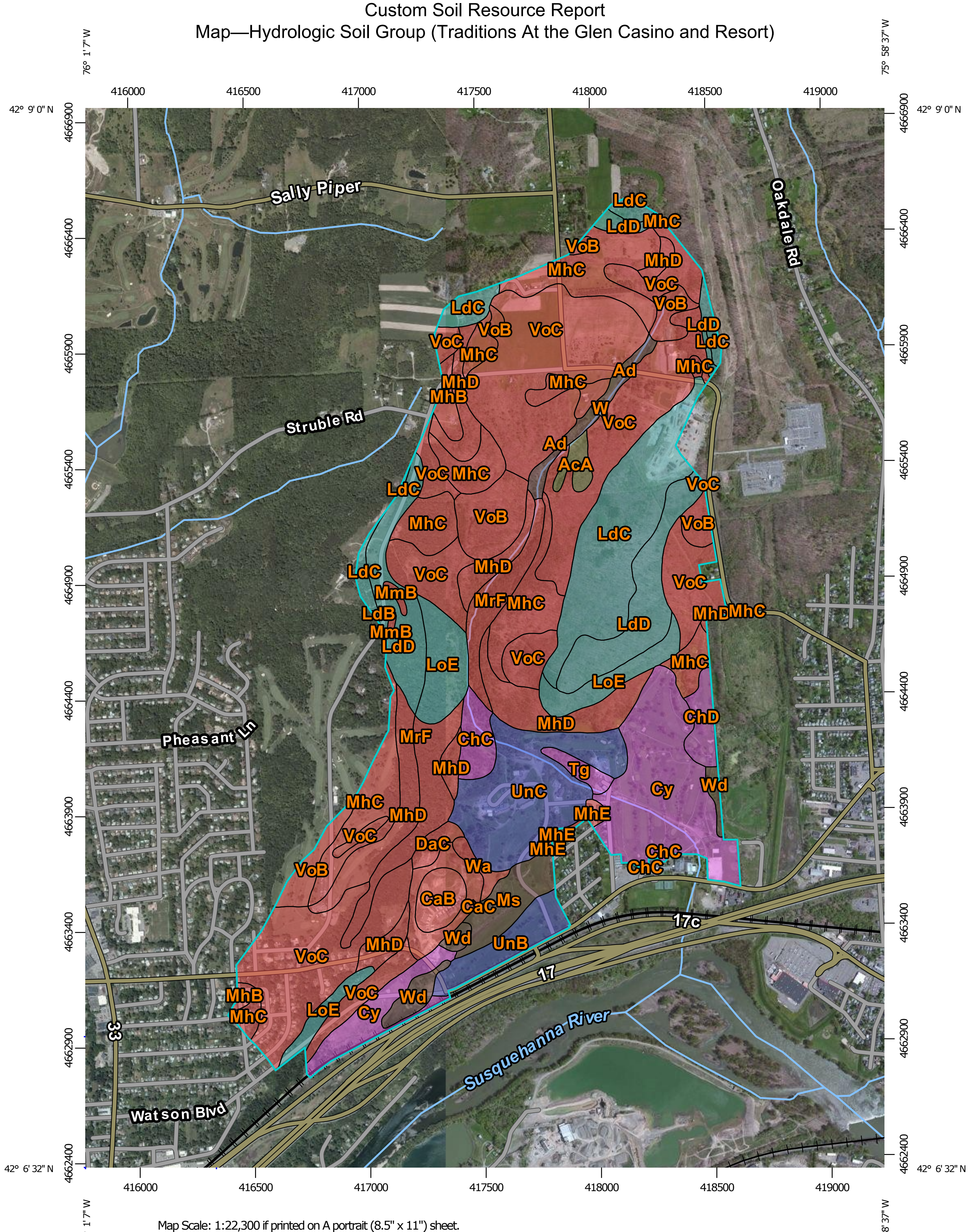
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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 (Traditions At the Glen Casino and Resort)



Map Scale: 1:22,300 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 300, 600, 1200, 1800

Feet: 0, 1000, 2000, 4000, 6000

N

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: http://websoilsurvey.nrcs.usda.gov
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: Broome County, New York
Survey Area Data: Version 11, Dec 15, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 2, 2010—Oct 8, 2011

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 (Traditions At the Glen Casino and Resort)

Hydrologic Soil Group— Summary by Map Unit — Broome County, New York (NY007)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AcA	Alden and Chippewa soils, 0 to 3 percent slopes	C/D	5.8	0.5%
Ad	Alluvial land	B/D	9.9	0.9%
CaB	Canaseraga silt loam, 3 to 8 percent slopes	D	11.7	1.1%
CaC	Canaseraga silt loam, 8 to 15 percent slopes	D	13.9	1.3%
ChC	Chenango and Howard gravelly loams, 5 to 15 percent slopes	A	12.1	1.1%
ChD	Chenango and Howard gravelly loams, 15 to 25 percent slopes	A	10.0	0.9%
Cy	Cut and fill lands, silty materials	A	95.3	8.6%
DaC	Dalton silt loam, 8 to 15 percent slopes	D	5.3	0.5%
LdB	Lordstown channery silt loam, 0 to 5 percent slopes	C	0.5	0.0%
LdC	Lordstown channery silt loam, 5 to 15 percent slopes	C	87.7	7.9%
LdD	Lordstown channery silt loam, 15 to 25 percent slopes	C	72.7	6.6%
LoE	Lordstown and Oquaga channery silt loams, 25 to 35 percent slopes	C	44.1	4.0%
MhB	Mardin channery silt loam, 2 to 8 percent slopes	D	8.0	0.7%
MhC	Mardin channery silt loam, 8 to 15 percent slopes	D	124.5	11.2%
MhD	Mardin channery silt loam, 15 to 25 percent slopes	D	81.7	7.4%
MhE	Mardin channery silt loam, 25 to 35 percent slopes	D	3.0	0.3%
MmB	Mardin channery silt loam, moderately shallow variant, 2 to 8 percent slopes	D	2.0	0.2%

Hydrologic Soil Group— Summary by Map Unit — Broome County, New York (NY007)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
MrF	Mardin and Cattaraugus soils, 35 to 60 percent slopes	D	43.4	3.9%
Ms	Middlebury silt loam	B/D	19.3	1.7%
Tg	Tioga gravelly silt loam, fan	A	5.5	0.5%
UnB	Unadilla silt loam, 0 to 5 percent slopes	B	20.1	1.8%
UnC	Unadilla silt loam, 5 to 15 percent slopes	B	69.0	6.2%
VoB	Volusia channery silt loam, 3 to 8 percent slopes	D	46.0	4.2%
VoC	Volusia channery silt loam, 8 to 15 percent slopes	D	298.5	27.0%
W	Water		0.8	0.1%
Wa	Wallington silt loam	D	4.2	0.4%
Wd	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	B/D	12.3	1.1%
Totals for Area of Interest			**1,107.3**	**100.0%**

Rating Options—Hydrologic Soil Group (Traditions At the Glen Casino and Resort)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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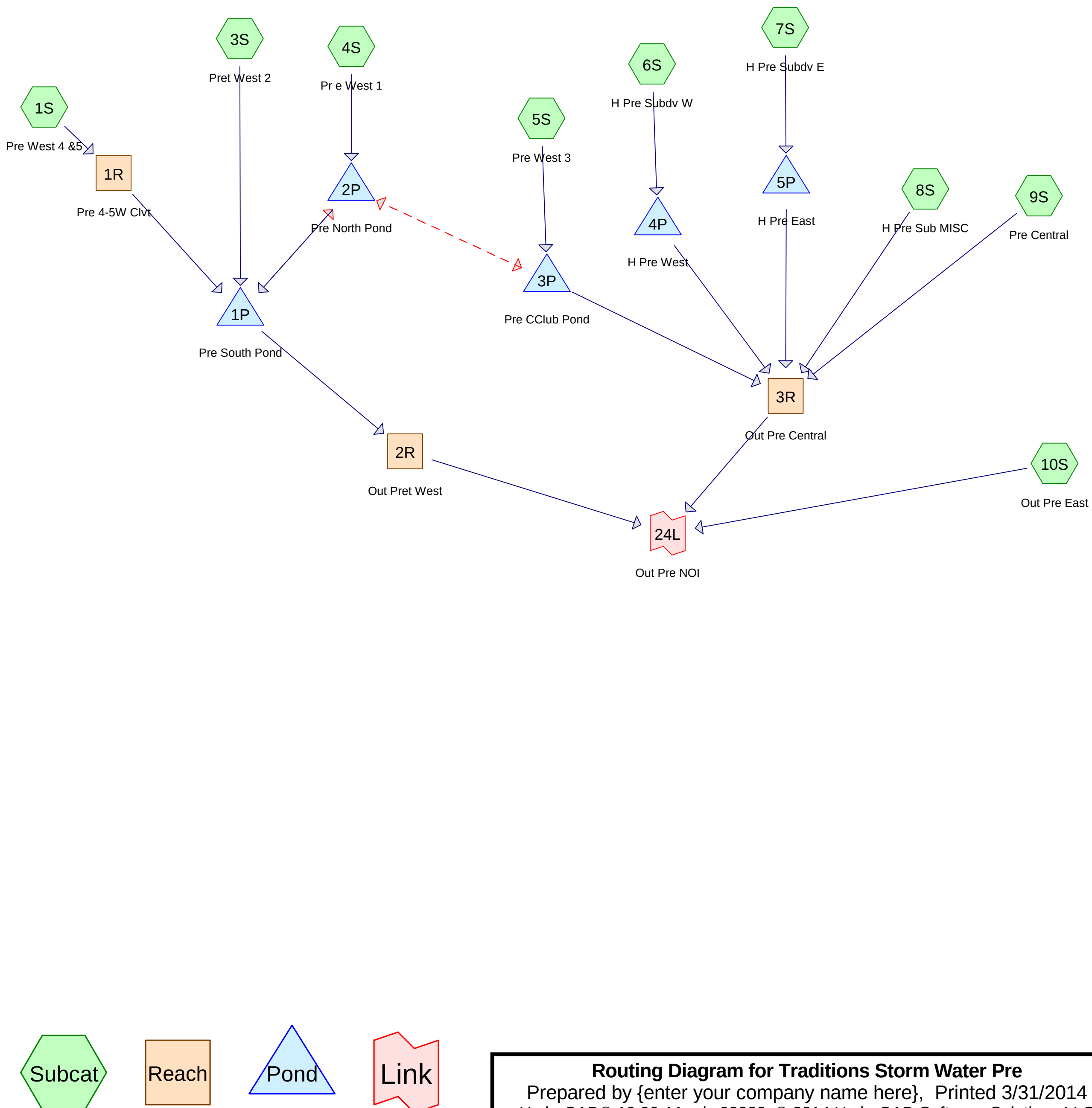
APPENDIX D
DRAINAGE CALCULATIONS



Routing Diagram for Traditions Storm Water Pre
Prepared by {enter your company name here}, Printed 3/31/2014
HydroCAD® 10.00-11 s/n 03080 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
37.100	80	1/2 acre lots, 25% imp, HSG C (1S, 9S)
3.220	83	1/4 acre lots, 38% imp, HSG C (4S)
37.314	61	>75% Grass cover, Good, HSG B (7S, 8S, 9S)
196.132	74	>75% Grass cover, Good, HSG C (1S, 4S, 6S, 7S, 8S, 9S, 10S)
2.718	80	>75% Grass cover, Good, HSG D (6S, 8S, 9S)
0.380	70	Brush, Fair, HSG C (3S)
0.440	48	Brush, Good, HSG B (5S)
14.830	65	Brush, Good, HSG C (3S, 4S, 5S)
1.010	73	Brush, Good, HSG D (4S, 5S)
9.290	30	Meadow, non-grazed, HSG A (10S)
8.967	58	Meadow, non-grazed, HSG B (10S)
108.170	71	Meadow, non-grazed, HSG C (4S, 9S, 10S)
5.840	78	Meadow, non-grazed, HSG D (4S, 5S, 10S)
16.921	98	Paved parking, HSG D (3S, 4S, 5S, 7S, 9S, 10S)
0.080	98	Paved roads w/curbs & sewers, HSG C (1S)
0.909	98	Paved roads w/curbs & sewers, HSG D (3S, 6S, 9S)
6.155	98	Roofs, HSG D (6S, 7S, 10S)
0.250	98	Unconnected pavement, HSG D (8S)
2.870	98	Water Surface, HSG D (3S, 4S)
11.770	30	Woods, Good, HSG A (10S)
18.541	55	Woods, Good, HSG B (3S, 7S, 8S, 10S)
610.403	70	Woods, Good, HSG C (1S, 3S, 4S, 5S, 7S, 8S, 9S, 10S)
12.510	77	Woods, Good, HSG D (3S, 10S)
1,105.820	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
21.060	HSG A	10S
65.262	HSG B	3S, 5S, 7S, 8S, 9S, 10S
970.315	HSG C	1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S
49.183	HSG D	3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S
0.000	Other	
1,105.820		**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	37.100	0.000	0.000	37.100	1/2 acre lots, 25% imp	1S, 9S
0.000	0.000	3.220	0.000	0.000	3.220	1/4 acre lots, 38% imp	4S
0.000	37.314	196.132	2.718	0.000	236.164	>75% Grass cover, Good	1S, 4S, 6S, 7S, 8S, 9S, 10 S
0.000	0.000	0.380	0.000	0.000	0.380	Brush, Fair	3S
0.000	0.440	14.830	1.010	0.000	16.280	Brush, Good	3S, 4S, 5S
9.290	8.967	108.170	5.840	0.000	132.267	Meadow, non-grazed	4S, 5S, 9S, 10 S
0.000	0.000	0.000	16.921	0.000	16.921	Paved parking	3S, 4S, 5S, 7S, 9S, 10 S

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
0.000	0.000	0.080	0.909	0.000	0.989	Paved roads w/curbs & sewers	1S, 3S, 6S, 9S
0.000	0.000	0.000	6.155	0.000	6.155	Roofs	6S, 7S, 10 S
0.000	0.000	0.000	0.250	0.000	0.250	Unconnected pavement	8S
0.000	0.000	0.000	2.870	0.000	2.870	Water Surface	3S, 4S
11.770	18.541	610.403	12.510	0.000	653.224	Woods, Good	1S, 3S, 4S, 5S, 7S, 8S, 9S, 10 S
21.060	**65.262**	**970.315**	**49.183**	**0.000**	**1,105.820**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	819.81	820.81	30.0	-0.0333	0.011	24.0	0.0	0.0
2	2P	820.41	819.81	30.0	0.0200	0.011	24.0	0.0	0.0
3	2P	823.50	819.00	210.0	0.0214	0.011	24.0	0.0	0.0
4	3P	819.42	817.75	50.0	0.0334	0.011	24.0	0.0	0.0
5	3P	819.00	823.50	210.0	-0.0214	0.011	24.0	0.0	0.0
6	4P	825.90	825.16	82.8	0.0089	0.011	15.0	0.0	0.0
7	5P	841.00	835.64	121.0	0.0443	0.011	18.0	0.0	0.0

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Sim-Route method - Pond routing by Sim-Route method w/Net Flows

Subcatchment 1S: Pre West 4 &5 Runoff Area=54.390 ac 16.07% Impervious Runoff Depth=0.78"
Flow Length=1,592' Tc=38.2 min CN=73/98 Runoff=26.66 cfs 3.538 af

Subcatchment 3S: Pret West 2 Runoff Area=19.170 ac 19.04% Impervious Runoff Depth=0.65"
Flow Length=1,118' Tc=36.8 min CN=66/98 Runoff=7.31 cfs 1.033 af

Subcatchment 4S: Pr e West 1 Runoff Area=15.200 ac 13.44% Impervious Runoff Depth=0.71"
Flow Length=1,386' Tc=15.5 min CN=72/98 Runoff=11.69 cfs 0.893 af

Subcatchment 5S: Pre West 3 Runoff Area=2.830 ac 15.55% Impervious Runoff Depth=0.56"
Flow Length=1,204' Tc=18.0 min CN=65/98 Runoff=1.38 cfs 0.132 af

Subcatchment 6S: H Pre Subdv W Runoff Area=3.343 ac 42.51% Impervious Runoff Depth=1.24"
Flow Length=1,048' Tc=11.7 min CN=74/98 Runoff=5.35 cfs 0.346 af

Subcatchment 7S: H Pre Subdv E Runoff Area=20.187 ac 39.80% Impervious Runoff Depth=1.17"
Flow Length=2,047' Tc=17.3 min CN=73/98 Runoff=25.35 cfs 1.975 af

Subcatchment 8S: H Pre Sub MISC Runoff Area=16.470 ac 1.52% Impervious Runoff Depth=0.44"
Flow Length=2,438' Tc=28.5 min CN=70/98 Runoff=4.72 cfs 0.597 af

Subcatchment 9S: Pre Central Runoff Area=170.950 ac 4.24% Impervious Runoff Depth=0.48"
Flow Length=5,764' Tc=93.5 min CN=70/98 Runoff=24.30 cfs 6.884 af

Subcatchment 10S: Out Pre East Runoff Area=803.280 ac 0.73% Impervious Runoff Depth=0.39"
Flow Length=12,536' Tc=116.7 min CN=69/98 Runoff=72.56 cfs 26.051 af

Reach 1R: Pre 4-5W Clvt Inflow=26.66 cfs 3.538 af
Outflow=26.66 cfs 3.538 af

Reach 2R: Out Pret West Inflow=25.28 cfs 5.262 af
Outflow=25.28 cfs 5.262 af

Reach 3R: Out Pre Central Inflow=28.14 cfs 9.155 af
Outflow=28.14 cfs 9.155 af

Pond 1P: Pre South Pond Peak Elev=822.12' Storage=0.739 af Inflow=37.73 cfs 5.562 af
Primary=25.28 cfs 5.262 af Secondary=0.56 cfs 0.315 af Outflow=25.28 cfs 5.577 af

Pond 2P: Pre North Pond Peak Elev=822.13' Storage=0.418 af Inflow=11.69 cfs 1.208 af
Primary=6.56 cfs 0.991 af Secondary=0.00 cfs 0.000 af Outflow=6.56 cfs 0.991 af

Pond 3P: Pre CClub Pond Peak Elev=819.85' Storage=0.006 af Inflow=1.38 cfs 0.132 af
Primary=1.35 cfs 0.132 af Secondary=0.00 cfs 0.000 af Outflow=1.35 cfs 0.132 af

Pond 4P: H Pre West Peak Elev=827.86' Storage=0.218 af Inflow=5.35 cfs 0.346 af
Discarded=0.05 cfs 0.168 af Primary=1.31 cfs 0.270 af Outflow=1.36 cfs 0.438 af

Pond 5P: H Pre East Peak Elev=848.57' Storage=2.093 af Inflow=25.35 cfs 1.975 af
Discarded=0.28 cfs 1.420 af Primary=1.97 cfs 1.272 af Outflow=2.24 cfs 2.693 af

Link 24L: Out Pre NOI Inflow=112.92 cfs 40.467 af
Primary=112.92 cfs 40.467 af

Total Runoff Area = 1,105.820 ac Runoff Volume = 41.448 af Average Runoff Depth = 0.45"
96.59% Pervious = 1,068.136 ac 3.41% Impervious = 37.684 ac

Summary for Subcatchment 1S: Pre West 4 &5

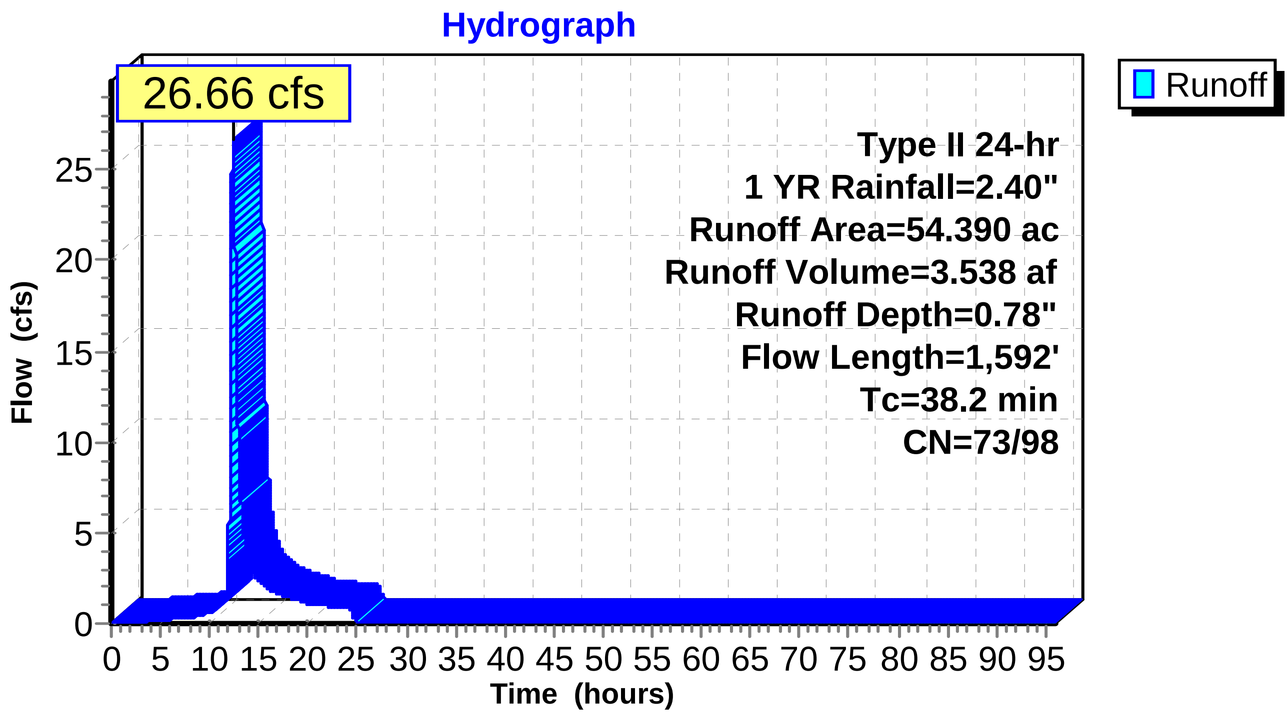
Runoff = 26.66 cfs @ 12.35 hrs, Volume= 3.538 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
22.690	80	1/2 acre lots, 25% imp, HSG C
11.210	70	Woods, Good, HSG C
1.910	70	Woods, Good, HSG C
11.950	80	1/2 acre lots, 25% imp, HSG C
5.240	74	>75% Grass cover, Good, HSG C
1.310	70	Woods, Good, HSG C
0.080	98	Paved roads w/curbs & sewers, HSG C
54.390	77	Weighted Average
45.650		83.93% Pervious Area
8.740		16.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0100	0.06		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
2.4	845	0.1300	5.80		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.5	647	0.0150	1.97		**Shallow Concentrated Flow, C -D** Unpaved Kv= 16.1 fps
38.2	1,592	Total			

Subcatchment 1S: Pre West 4 &5



Summary for Subcatchment 3S: Pret West 2

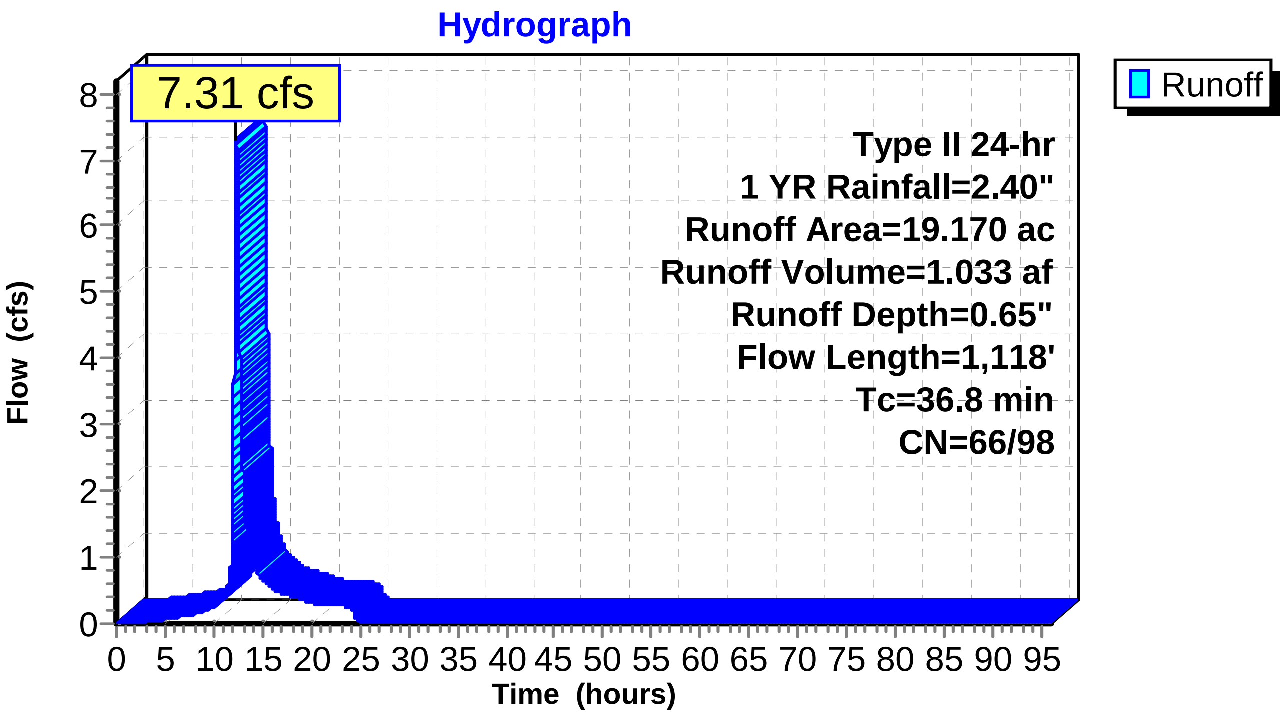
Runoff = 7.31 cfs @ 12.35 hrs, Volume= 1.033 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG D
0.100	55	Woods, Good, HSG B
0.650	70	Woods, Good, HSG C
0.660	77	Woods, Good, HSG D
0.320	98	Paved roads w/curbs & sewers, HSG D
0.620	65	Brush, Good, HSG C
1.970	65	Brush, Good, HSG C
2.620	98	Water Surface, HSG D
0.380	70	Brush, Fair, HSG C
0.640	98	Paved parking, HSG D
4.020	65	Brush, Good, HSG C
7.120	65	Brush, Good, HSG C
19.170	72	Weighted Average
15.520		80.96% Pervious Area
3.650		19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0800	0.13		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
7.9	240	0.0010	0.51		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.3	114	0.1580	6.40		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
15.4	664	0.0020	0.72		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
36.8	1,118	Total			

Subcatchment 3S: Pret West 2



Summary for Subcatchment 4S: Pr e West 1

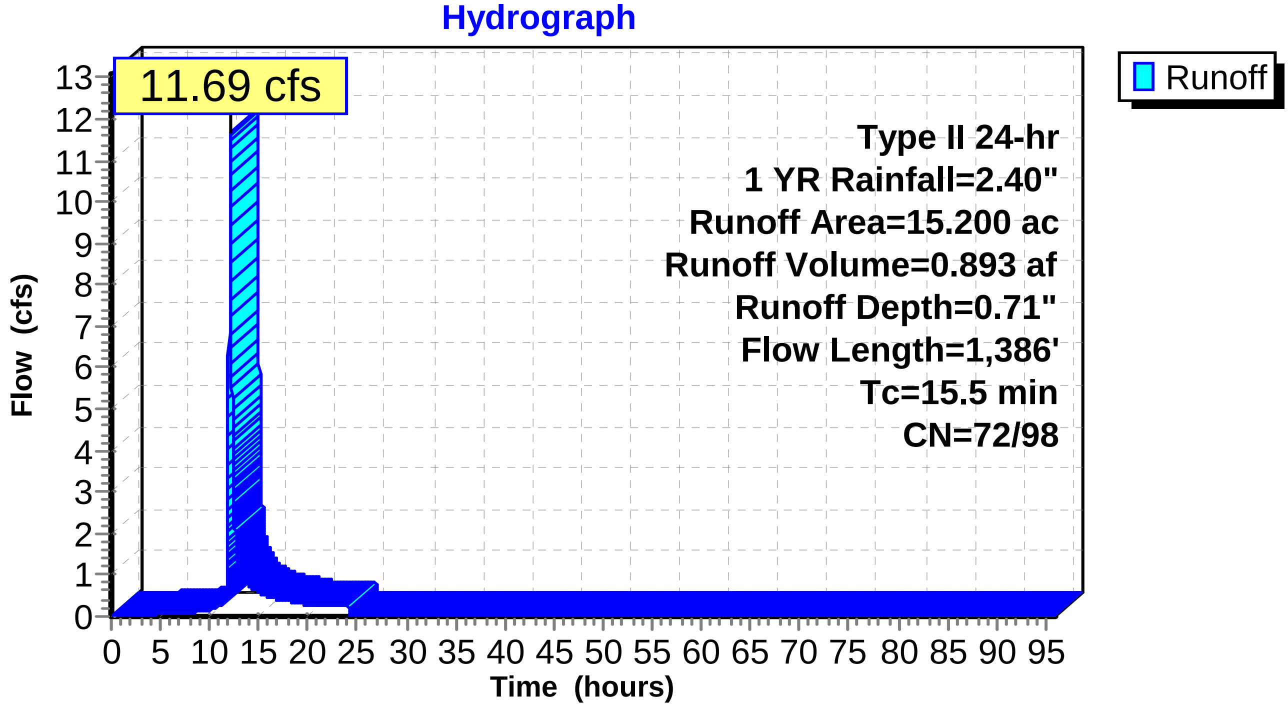
Runoff = 11.69 cfs @ 12.09 hrs, Volume= 0.893 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
3.220	83	1/4 acre lots, 38% imp, HSG C
1.960	70	Woods, Good, HSG C
0.240	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
4.610	70	Woods, Good, HSG C
2.690	74	>75% Grass cover, Good, HSG C
0.290	71	Meadow, non-grazed, HSG C
0.770	78	Meadow, non-grazed, HSG D
0.250	98	Water Surface, HSG D
0.330	65	Brush, Good, HSG C
0.510	73	Brush, Good, HSG D
15.200	75	Weighted Average
13.156		86.56% Pervious Area
2.044		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.1000	0.21		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.6	286	0.2450	7.97		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	399	0.2260	7.65		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
3.1	96	0.0010	0.51		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
2.9	505	0.0320	2.88		**Shallow Concentrated Flow, E - F** Unpaved Kv= 16.1 fps
15.5	1,386	Total			

Subcatchment 4S: Pr e West 1



Summary for Subcatchment 5S: Pre West 3

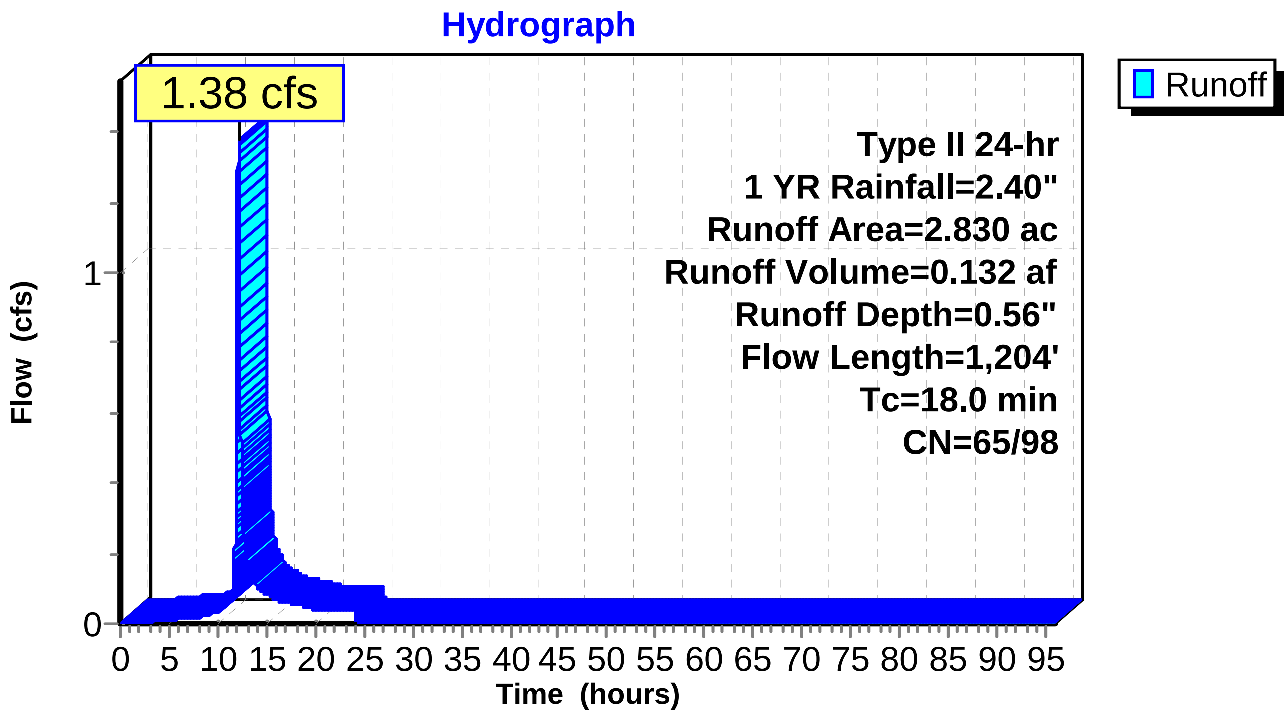
Runoff = 1.38 cfs @ 12.12 hrs, Volume= 0.132 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.070	78	Meadow, non-grazed, HSG D
0.610	70	Woods, Good, HSG C
0.140	98	Paved parking, HSG D
0.300	98	Paved parking, HSG D
0.770	65	Brush, Good, HSG C
0.500	73	Brush, Good, HSG D
0.440	48	Brush, Good, HSG B
2.830	70	Weighted Average
2.390		84.45% Pervious Area
0.440		15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.1200	0.15		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
0.5	174	0.1150	5.46		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.3	930	0.0230	2.44		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
18.0	1,204	Total			

Subcatchment 5S: Pre West 3



Summary for Subcatchment 6S: H Pre Subdv W

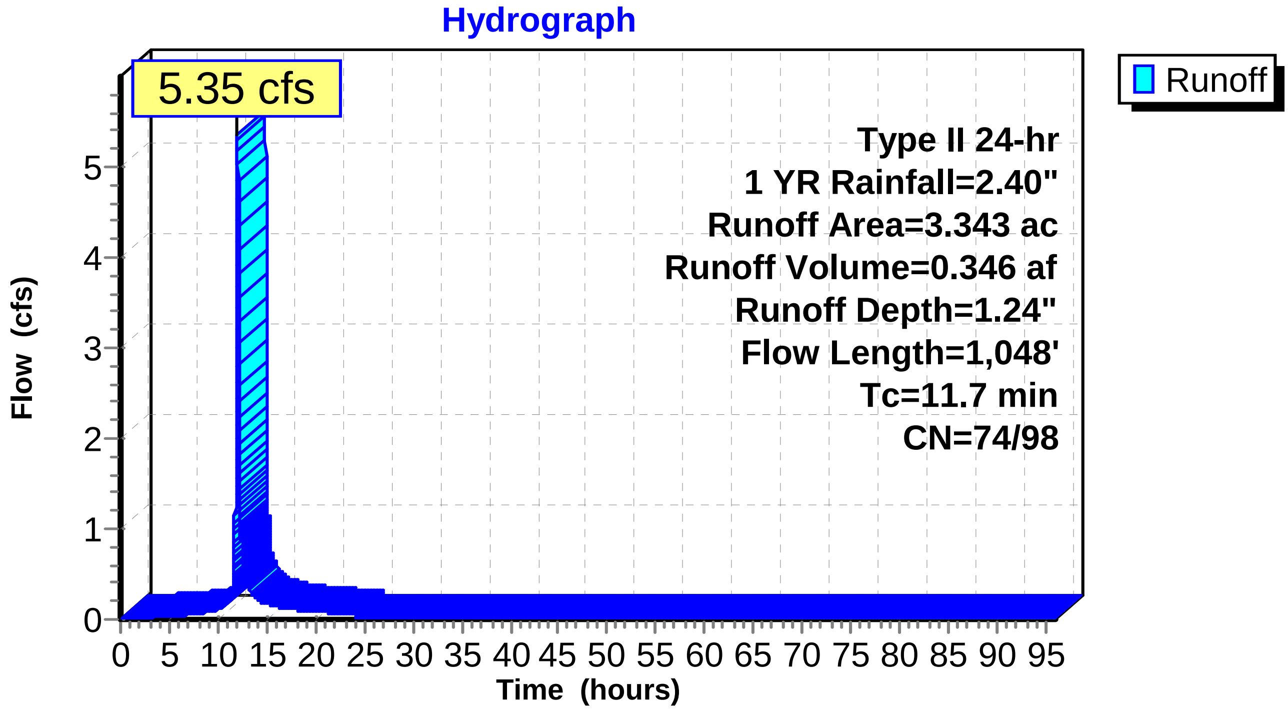
Runoff = 5.35 cfs @ 12.03 hrs, Volume= 0.346 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
1.829	74	>75% Grass cover, Good, HSG C
0.093	80	>75% Grass cover, Good, HSG D
0.439	98	Paved roads w/curbs & sewers, HSG D
0.982	98	Roofs, HSG D
3.343	84	Weighted Average
1.922		57.49% Pervious Area
1.421		42.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1100	0.22		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.5	187	0.1440	6.11		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	90	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.7	150	0.0520	3.67		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.2	68	0.1000	6.42		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.1	28	0.0100	5.48	4.38	**Channel Flow, F - G** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	131	0.1000	19.47	23.36	**Channel Flow, G - H** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
0.1	100	0.1550	28.05	50.49	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
1.2	110	0.0540	1.53	24.47	**Channel Flow, I - J** Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.240
0.2	84	0.0100	6.16	7.39	**Channel Flow, J - K** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
11.7	1,048	Total			

Subcatchment 6S: H Pre Subdv W



Summary for Subcatchment 7S: H Pre Subdv E

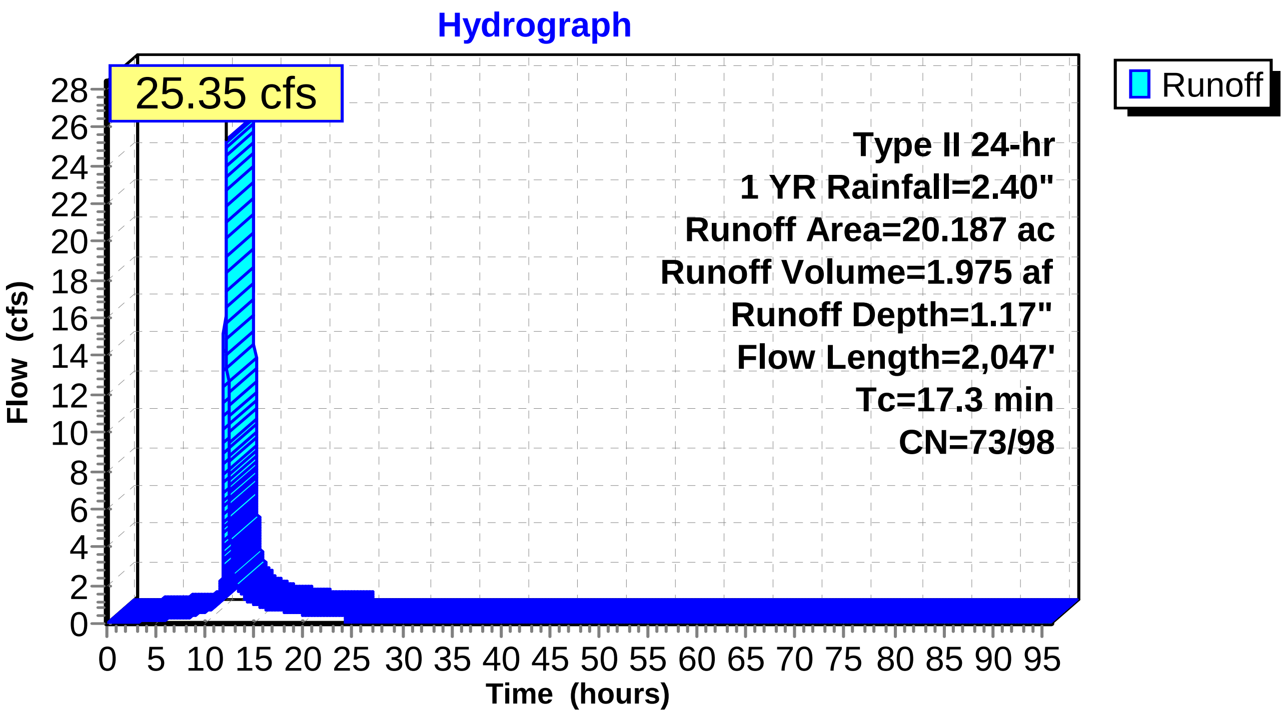
Runoff = 25.35 cfs @ 12.09 hrs, Volume= 1.975 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.206	55	Woods, Good, HSG B
0.531	70	Woods, Good, HSG C
0.925	61	>75% Grass cover, Good, HSG B
10.491	74	>75% Grass cover, Good, HSG C
2.961	98	Paved parking, HSG D
5.073	98	Roofs, HSG D
20.187	83	Weighted Average
12.153		60.20% Pervious Area
8.034		39.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	58	0.4300	0.33		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
10.1	42	0.0100	0.07		**Sheet Flow, B - C** n= 0.240 P2= 2.80"
0.7	67	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.8	158	0.0470	3.49		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.7	189	0.0530	4.67		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.2	87	0.1000	6.42		**Shallow Concentrated Flow, F - G** Paved Kv= 20.3 fps
0.0	29	0.0900	16.43	13.14	**Channel Flow, G - H** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	176	0.1000	22.53	40.55	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.2	116	0.0236	10.94	19.70	**Channel Flow, I - J** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.3	258	0.0239	13.02	40.35	**Channel Flow, J - K** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	81	0.0300	14.58	45.21	**Channel Flow, K - L** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
1.0	501	0.0100	8.42	26.10	**Channel Flow, L - M** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	185	0.0730	26.77	131.19	**Channel Flow, M - N** Area= 4.9 sf Perim= 7.8' r= 0.63' n= 0.011
0.1	100	0.0900	21.37	38.47	**Channel Flow, N - O** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
17.3	2,047	Total			

Subcatchment 7S: H Pre Subdv E



Summary for Subcatchment 8S: H Pre Sub MISC

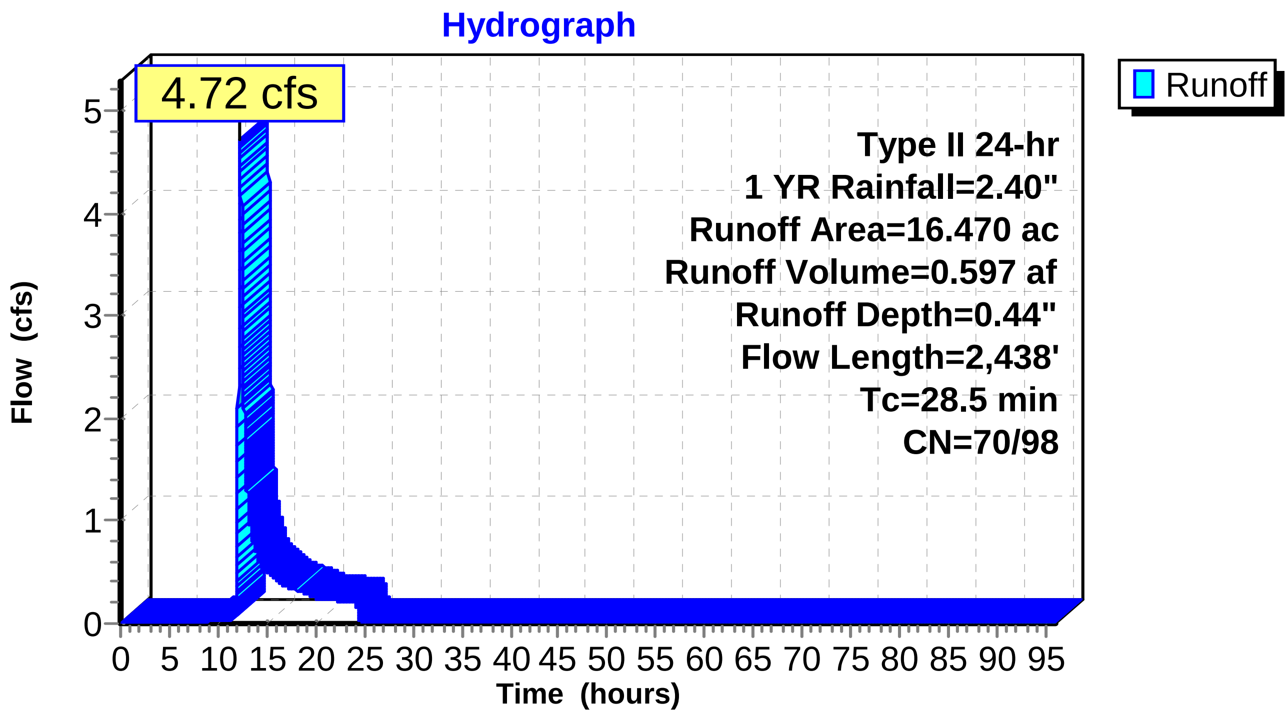
Runoff = 4.72 cfs @ 12.28 hrs, Volume= 0.597 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.955	55	Woods, Good, HSG B
9.912	70	Woods, Good, HSG C
0.489	61	>75% Grass cover, Good, HSG B
4.449	74	>75% Grass cover, Good, HSG C
0.415	80	>75% Grass cover, Good, HSG D
0.250	98	Unconnected pavement, HSG D
16.470	71	Weighted Average
16.220		98.48% Pervious Area
0.250		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.1600	0.18		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.2	672	0.3420	9.42		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.8	230	0.0220	0.66	13.26	**Channel Flow, C - D** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
0.9	460	0.0110	8.83	27.38	**Channel Flow, D - E** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
3.8	322	0.1020	1.43	28.55	**Channel Flow, E -F** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
1.5	348	0.0570	3.84		**Shallow Concentrated Flow, F - G** Unpaved Kv= 16.1 fps
1.5	256	0.0330	2.92		**Shallow Concentrated Flow, G - H** Unpaved Kv= 16.1 fps
28.5	2,438	Total			

Subcatchment 8S: H Pre Sub MISC



Summary for Subcatchment 9S: Pre Central

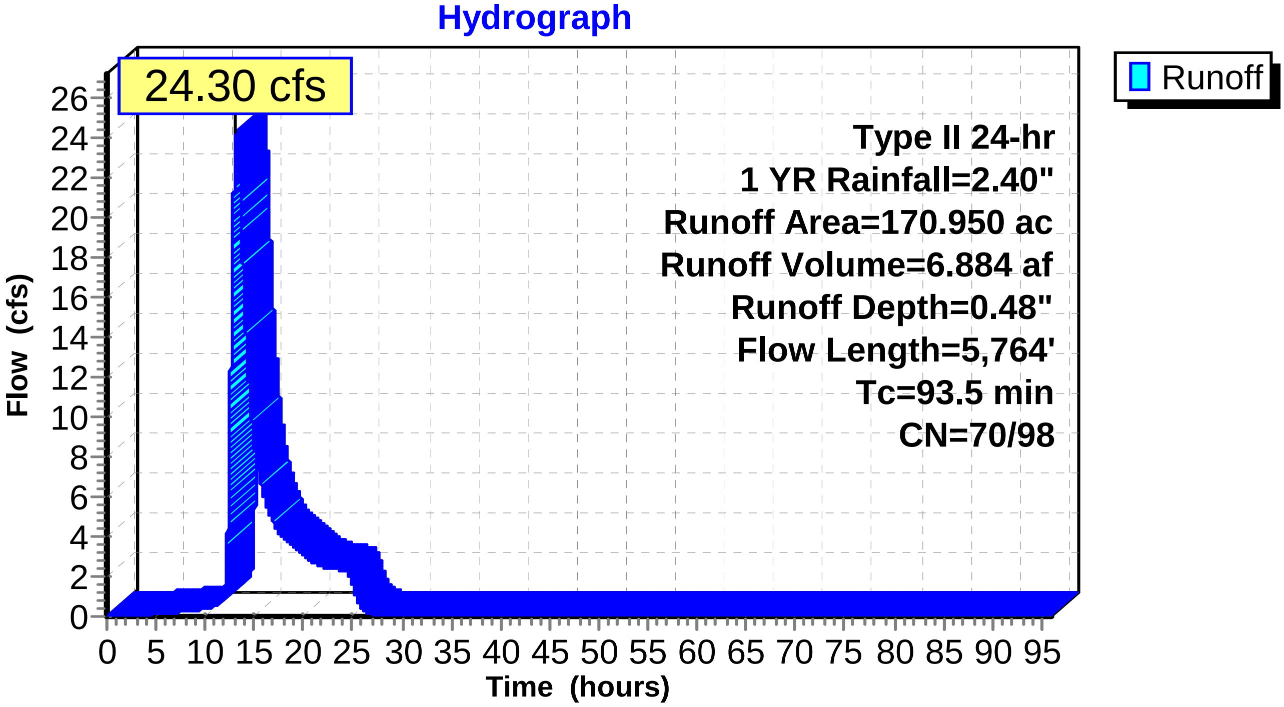
Runoff = 24.30 cfs @ 13.20 hrs, Volume= 6.884 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.900	98	Paved parking, HSG D
2.460	80	1/2 acre lots, 25% imp, HSG C
13.020	74	>75% Grass cover, Good, HSG C
33.500	74	>75% Grass cover, Good, HSG C
2.680	98	Paved parking, HSG D
43.100	70	Woods, Good, HSG C
2.880	71	Meadow, non-grazed, HSG C
0.150	98	Paved roads w/curbs & sewers, HSG D
19.240	74	>75% Grass cover, Good, HSG C
1.770	98	Paved parking, HSG D
2.160	74	>75% Grass cover, Good, HSG C
3.440	74	>75% Grass cover, Good, HSG C
0.120	98	Paved parking, HSG D
2.210	80	>75% Grass cover, Good, HSG D
28.430	61	>75% Grass cover, Good, HSG B
0.640	98	Paved parking, HSG D
0.380	98	Paved parking, HSG D
2.200	74	>75% Grass cover, Good, HSG C
6.660	61	>75% Grass cover, Good, HSG B
3.840	74	>75% Grass cover, Good, HSG C
0.810	61	>75% Grass cover, Good, HSG B
0.360	74	>75% Grass cover, Good, HSG C
170.950	71	Weighted Average
163.695		95.76% Pervious Area
7.255		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
6.4	2,043	0.1080	5.29		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.6	2,079	0.1060	5.24		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
57.5	1,542	0.0030	0.45	2.23	**Channel Flow, D - E** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
93.5	5,764	Total			

Subcatchment 9S: Pre Central



Summary for Subcatchment 10S: Out Pre East

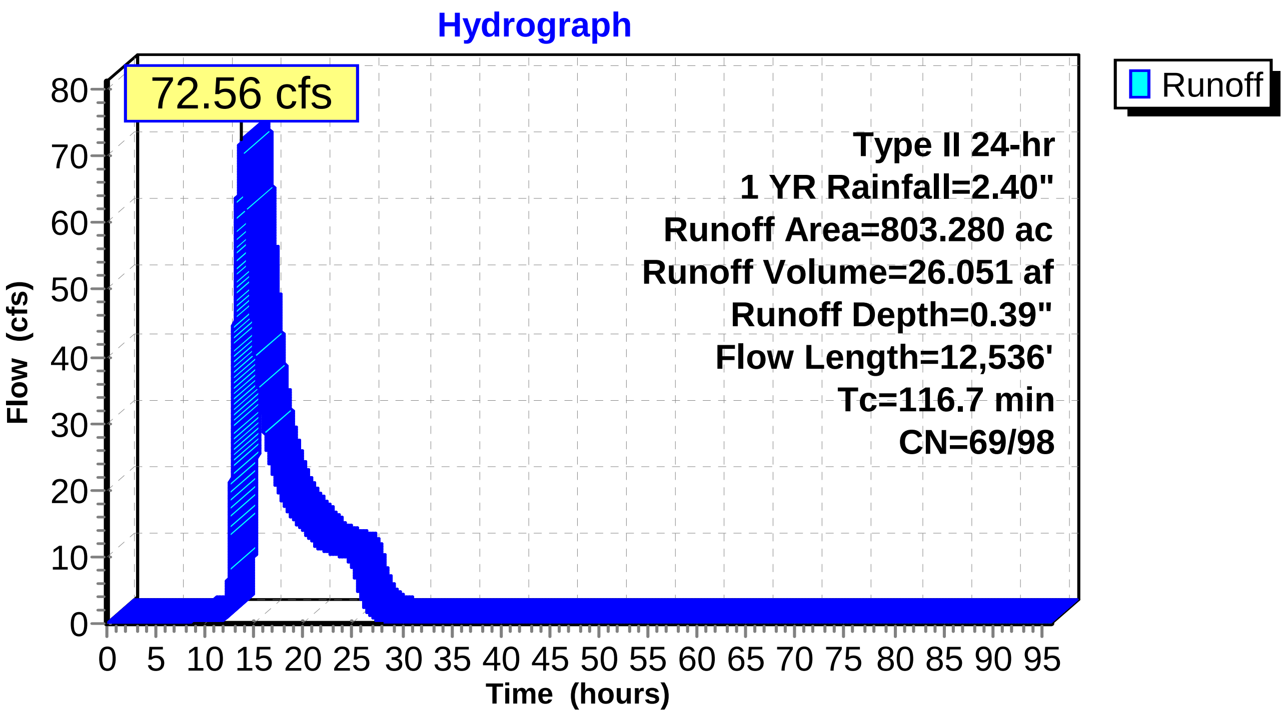
Runoff = 72.56 cfs @ 13.62 hrs, Volume= 26.051 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
11.850	77	Woods, Good, HSG D
5.000	78	Meadow, non-grazed, HSG D
8.390	30	Woods, Good, HSG A
0.390	55	Woods, Good, HSG B
2.250	98	Paved parking, HSG D
7.850	55	Woods, Good, HSG B
0.110	98	Paved parking, HSG D
353.100	70	Woods, Good, HSG C
105.000	71	Meadow, non-grazed, HSG C
3.380	30	Woods, Good, HSG A
9.290	30	Meadow, non-grazed, HSG A
1.750	98	Paved parking, HSG D
9.040	55	Woods, Good, HSG B
8.967	58	Meadow, non-grazed, HSG B
181.500	70	Woods, Good, HSG C
1.640	98	Paved parking, HSG D
93.673	74	>75% Grass cover, Good, HSG C
0.100	98	Roofs, HSG D
803.280	69	Weighted Average
797.430		99.27% Pervious Area
5.850		0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0500	0.10		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
9.0	2,298	0.0700	4.26		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
91.8	10,138	0.0510	1.84	9.21	**Channel Flow, C - D** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
116.7	12,536	Total			

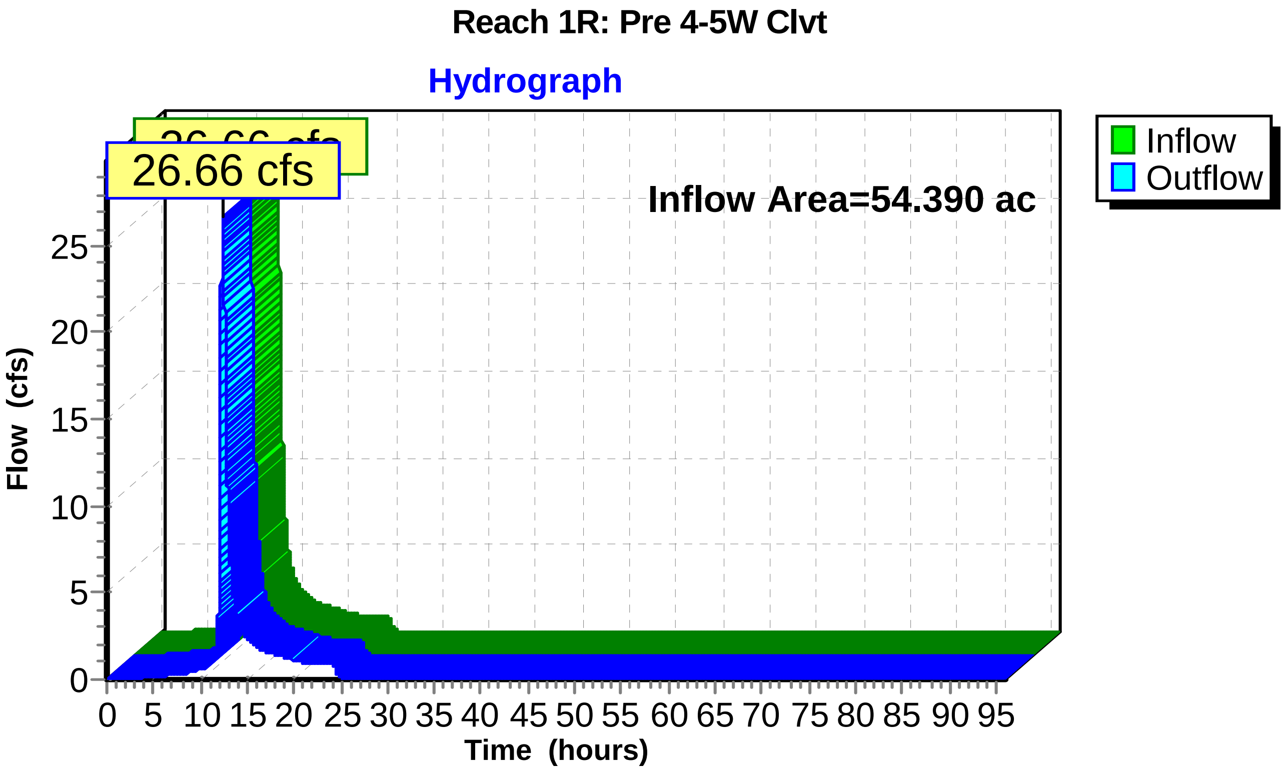
Subcatchment 10S: Out Pre East



Summary for Reach 1R: Pre 4-5W Clvt

Inflow Area = 54.390 ac, 16.07% Impervious, Inflow Depth = 0.78" for 1 YR event
Inflow = 26.66 cfs @ 12.35 hrs, Volume= 3.538 af
Outflow = 26.66 cfs @ 12.36 hrs, Volume= 3.538 af, Atten= 0%, Lag= 0.6 min

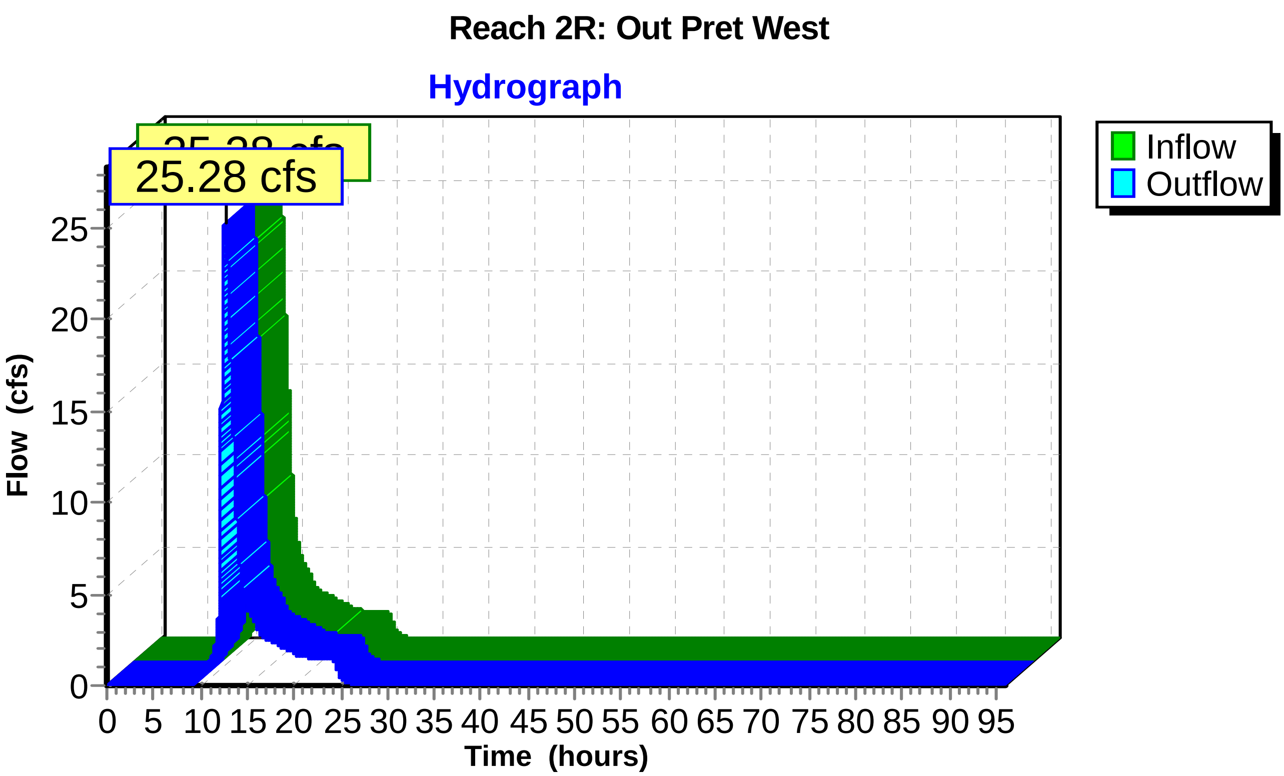
Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Summary for Reach 2R: Out Pret West

Inflow	=	25.28 cfs @	12.64 hrs,	Volume=	5.262 af
Outflow	=	25.28 cfs @	12.65 hrs,	Volume=	5.262 af, Atten= 0%, Lag= 0.6 min

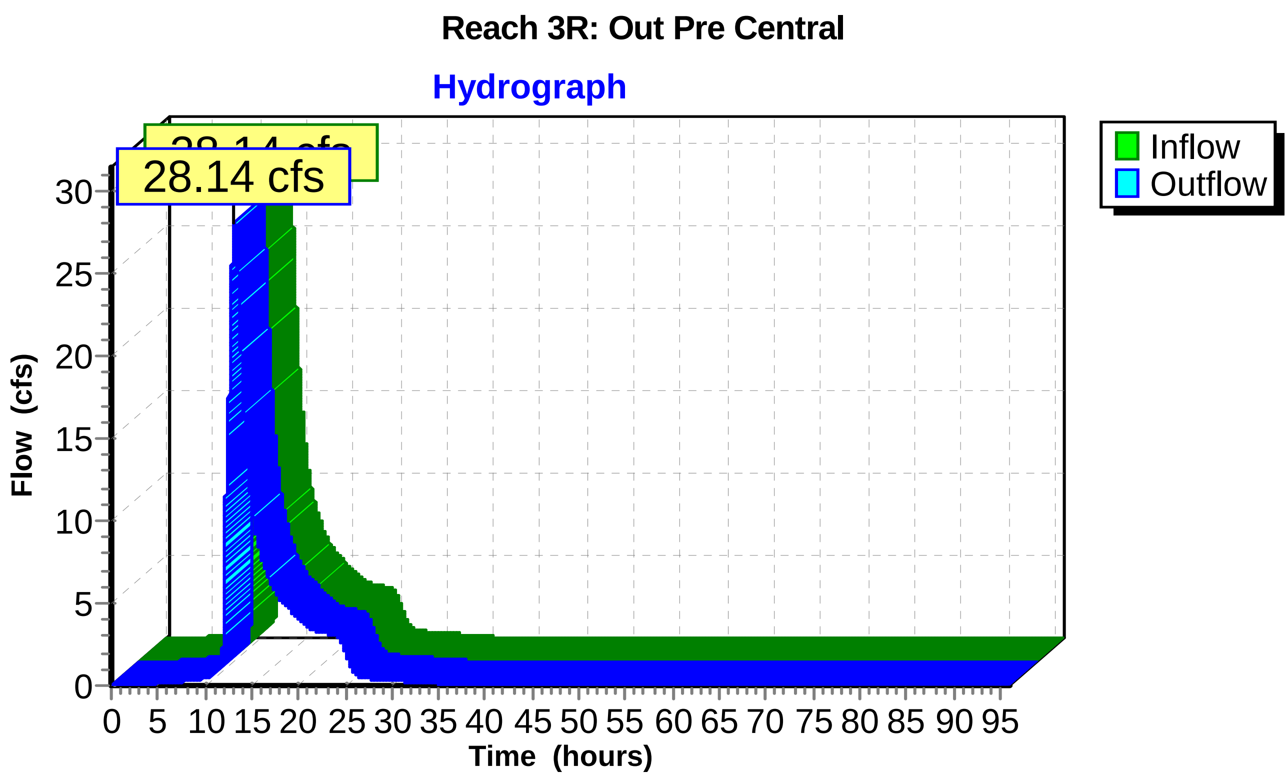
Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Summary for Reach 3R: Out Pre Central

Inflow	=	28.14 cfs @	13.19 hrs,	Volume=	9.155 af
Outflow	=	28.14 cfs @	13.20 hrs,	Volume=	9.155 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Summary for Pond 1P: Pre South Pond

Inflow = 37.73 cfs @ 12.32 hrs, Volume= 5.562 af
Outflow = 25.28 cfs @ 12.64 hrs, Volume= 5.577 af, Atten= 33%, Lag= 19.3 min
Primary = 25.28 cfs @ 12.64 hrs, Volume= 5.262 af
Secondary = 0.56 cfs @ 8.91 hrs, Volume= 0.315 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 822.12' @ 12.64 hrs Surf.Area= 1.837 ac Storage= 0.739 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.6 min (946.2 - 934.6)

Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	418.450 af	**PosSPond (Conic)** Listed below (Recalc)

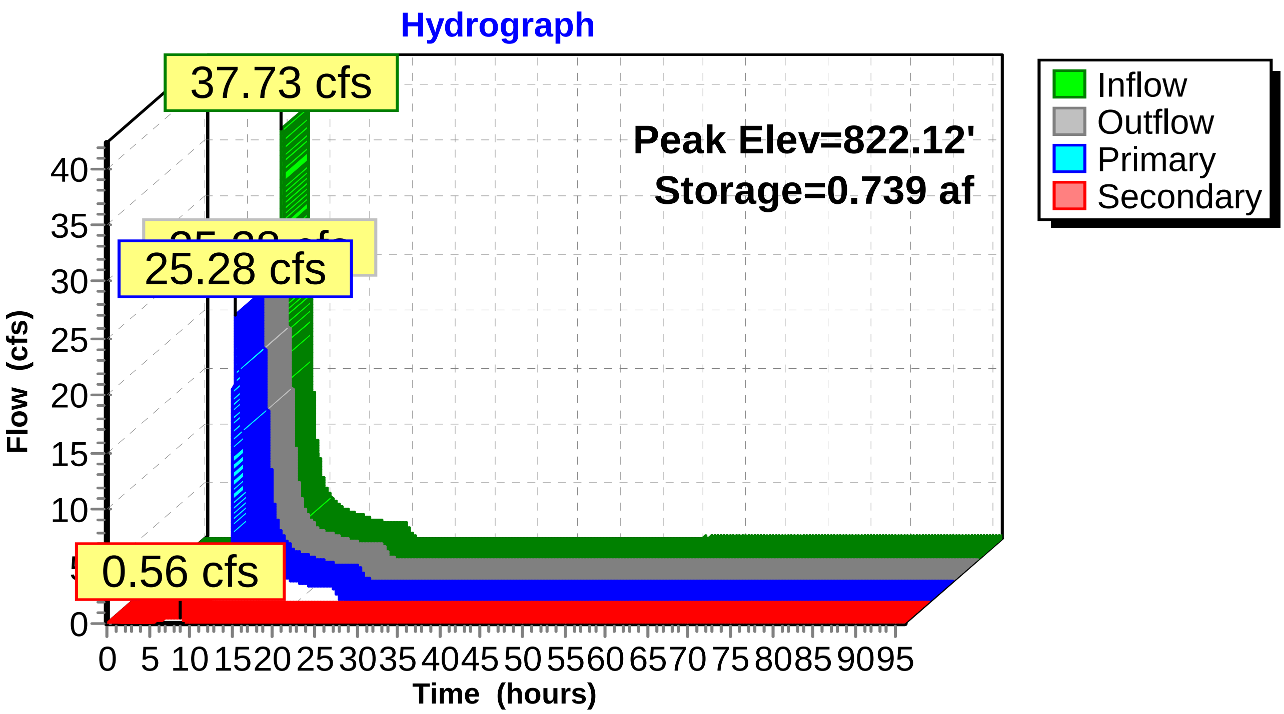
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
821.00	0.010	0.000	0.000	0.010
822.60	3.600	2.027	2.027	3.600
824.00	6.020	6.662	8.688	6.021
826.00	6.790	12.802	21.491	6.795
828.00	7.430	14.215	35.706	7.442
830.00	7.880	15.308	51.014	7.902
832.00	8.280	16.158	67.172	8.313
834.00	8.500	16.780	83.951	8.554
836.00	8.990	17.488	101.439	9.054
838.00	9.850	18.833	120.273	9.920
840.00	10.330	20.178	140.451	10.412
842.00	15.310	25.477	165.928	15.394
858.00	16.260	252.522	418.450	16.832

Device	Routing	Invert	Outlet Devices
#1	Primary	821.11'	**9.5' long x 100.0' 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
#2	Secondary	820.81'	**24.0" Round Culvert** L= 30.0' Ke= 0.200 Inlet / Outlet Invert= 819.81' / 820.81' S= -0.0333 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=25.27 cfs @ 12.64 hrs HW=822.12' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 25.27 cfs @ 2.64 fps)

Secondary OutFlow Max=0.55 cfs @ 8.91 hrs HW=821.11' TW=821.01' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.55 cfs @ 1.86 fps)

Pond 1P: Pre South Pond



Summary for Pond 2P: Pre North Pond

Inflow =	11.69 cfs @	12.09 hrs,	Volume=	1.208 af
Outflow =	6.56 cfs @	12.20 hrs,	Volume=	0.991 af, Atten= 44%, Lag= 6.5 min
Primary =	6.56 cfs @	12.20 hrs,	Volume=	0.991 af
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.81' Surf.Area= 0.020 ac Storage= 0.006 af
Peak Elev= 822.13' @ 12.66 hrs Surf.Area= 0.243 ac Storage= 0.418 af (0.413 af above start)

Plug-Flow detention time= 680.9 min calculated for 1.023 af (82% of inflow)
Center-of-Mass det. time= 216.3 min (1,296.3 - 1,091.5)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	37.557 af	**PostNPond (Conic)** Listed below

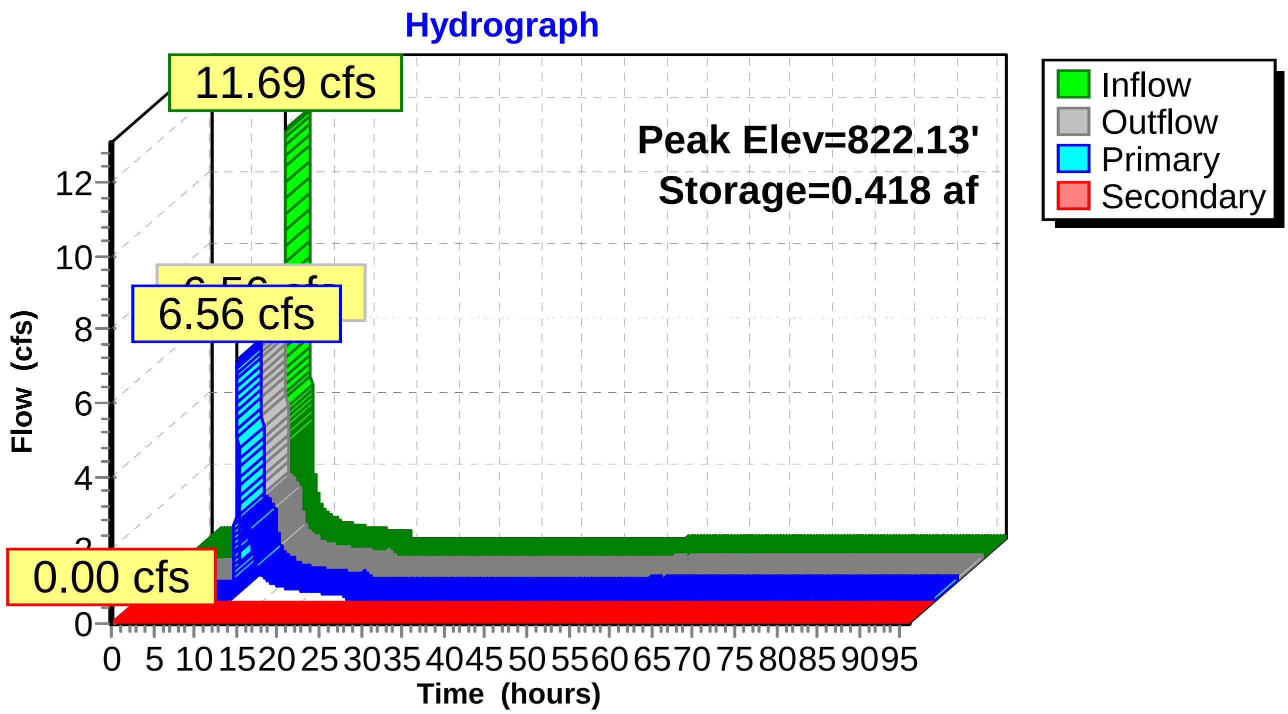
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
819.81	0.020	0.006	0.006	0.020
820.00	0.030	0.005	0.010	0.030
824.00	0.430	0.765	0.775	0.431
826.00	1.030	1.417	2.192	1.032
828.00	1.340	2.363	4.555	1.344
830.00	2.170	3.477	8.032	2.175
832.00	2.470	4.637	12.669	2.480
834.00	2.790	5.257	17.926	2.804
836.00	3.090	5.877	23.803	3.110
838.00	3.440	6.527	30.330	3.465
840.00	3.790	7.227	37.557	3.821

Device	Routing	Invert	Outlet Devices
#1	Primary	820.41'	**24.0" Round Culvert - Watson** L= 30.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 820.41' / 819.81' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Secondary	823.50'	**24.0" Round Culvert - Post Pipe** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 823.50' / 819.00' S= 0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=6.40 cfs @ 12.20 hrs HW=822.01' TW=821.78' (Dynamic Tailwater)
└─**1=Culvert - Watson** (Outlet Controls 6.40 cfs @ 3.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.81' TW=819.42' (Dynamic Tailwater)
└─**2=Culvert - Post Pipe** (Controls 0.00 cfs)

Pond 2P: Pre North Pond



Summary for Pond 3P: Pre CClub Pond

Inflow	=	1.38 cfs @	12.12 hrs,	Volume=	0.132 af
Outflow	=	1.35 cfs @	12.15 hrs,	Volume=	0.132 af, Atten= 2%, Lag= 2.0 min
Primary	=	1.35 cfs @	12.15 hrs,	Volume=	0.132 af
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.42' Surf.Area= 0.010 ac Storage= 0.000 af
Peak Elev= 819.85' @ 12.15 hrs Surf.Area= 0.017 ac Storage= 0.006 af

Plug-Flow detention time= 9.7 min calculated for 0.132 af (100% of inflow)
Center-of-Mass det. time= 9.6 min (847.7 - 838.1)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	1.167 af	**PostCClubPond (Conic)** Listed below (Recalc)

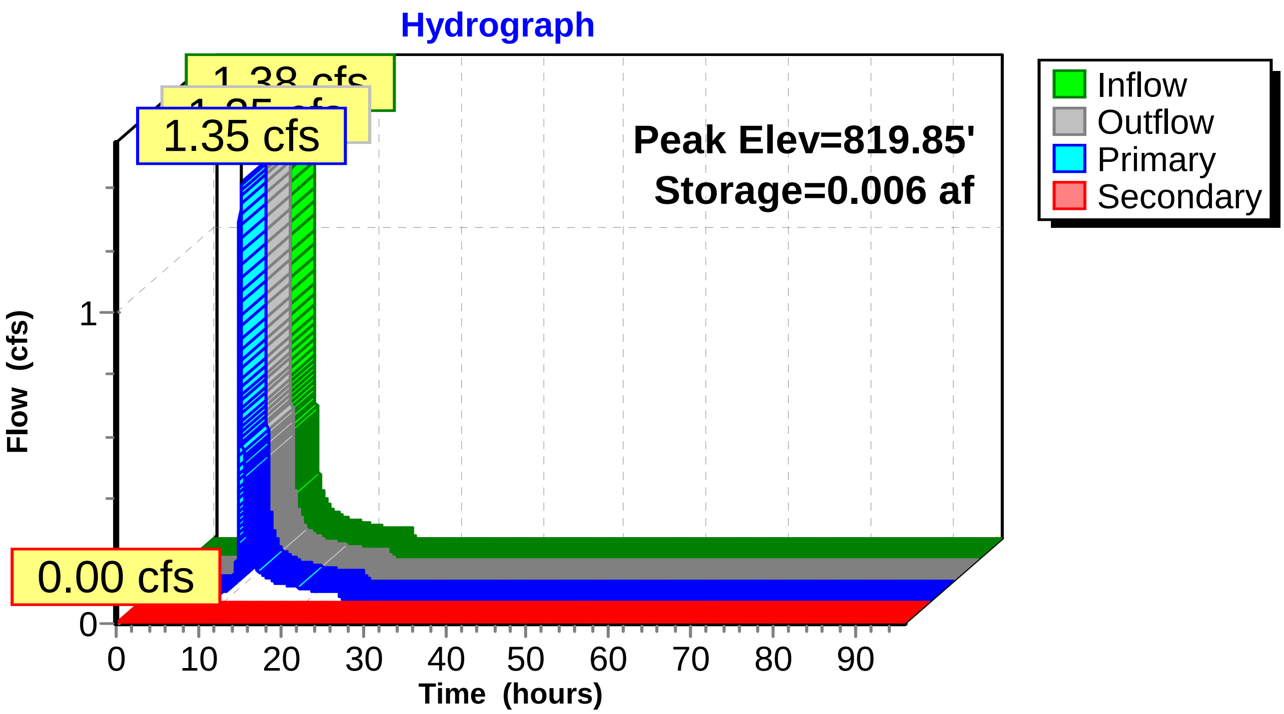
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
820.00	0.020	0.009	0.009	0.020
824.00	0.030	0.099	0.108	0.035
826.00	0.040	0.070	0.178	0.047
828.00	0.050	0.090	0.267	0.059
830.00	0.060	0.110	0.377	0.072
832.00	0.070	0.130	0.507	0.085
834.00	0.080	0.150	0.657	0.099
840.00	0.090	0.510	1.167	0.130

Device	Routing	Invert	Outlet Devices
#1	Primary	819.42'	**24.0" Round Culvert** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 819.42' / 817.75' S= 0.0334 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Primary	825.05'	**145.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#3	Secondary	823.50'	**24.0" Round Culvert** L= 210.0' Ke= 0.500 Inlet / Outlet Invert= 819.00' / 823.50' S= -0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=1.35 cfs @ 12.15 hrs HW=819.84' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.35 cfs @ 2.77 fps)
2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.42' TW=819.81' (Dynamic Tailwater)
3=Culvert (Controls 0.00 cfs)

Pond 3P: Pre CClub Pond



Summary for Pond 4P: H Pre West

Inflow Area = 3.343 ac, 42.51% Impervious, Inflow Depth = 1.24" for 1 YR event
Inflow = 5.35 cfs @ 12.03 hrs, Volume= 0.346 af
Outflow = 1.36 cfs @ 12.28 hrs, Volume= 0.438 af, Atten= 75%, Lag= 14.5 min
Discarded = 0.05 cfs @ 12.28 hrs, Volume= 0.168 af
Primary = 1.31 cfs @ 12.28 hrs, Volume= 0.270 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 826.00' Surf.Area= 0.052 ac Storage= 0.093 af
Peak Elev= 827.86' @ 12.28 hrs Surf.Area= 0.083 ac Storage= 0.218 af (0.125 af above start)

Plug-Flow detention time= 714.2 min calculated for 0.344 af (100% of inflow)
Center-of-Mass det. time= 517.7 min (1,313.0 - 795.3)

Volume	Invert	Avail.Storage	Storage Description
#1	822.00'	0.452 af	**H Pond West (Conic)** Listed below (Recalc)

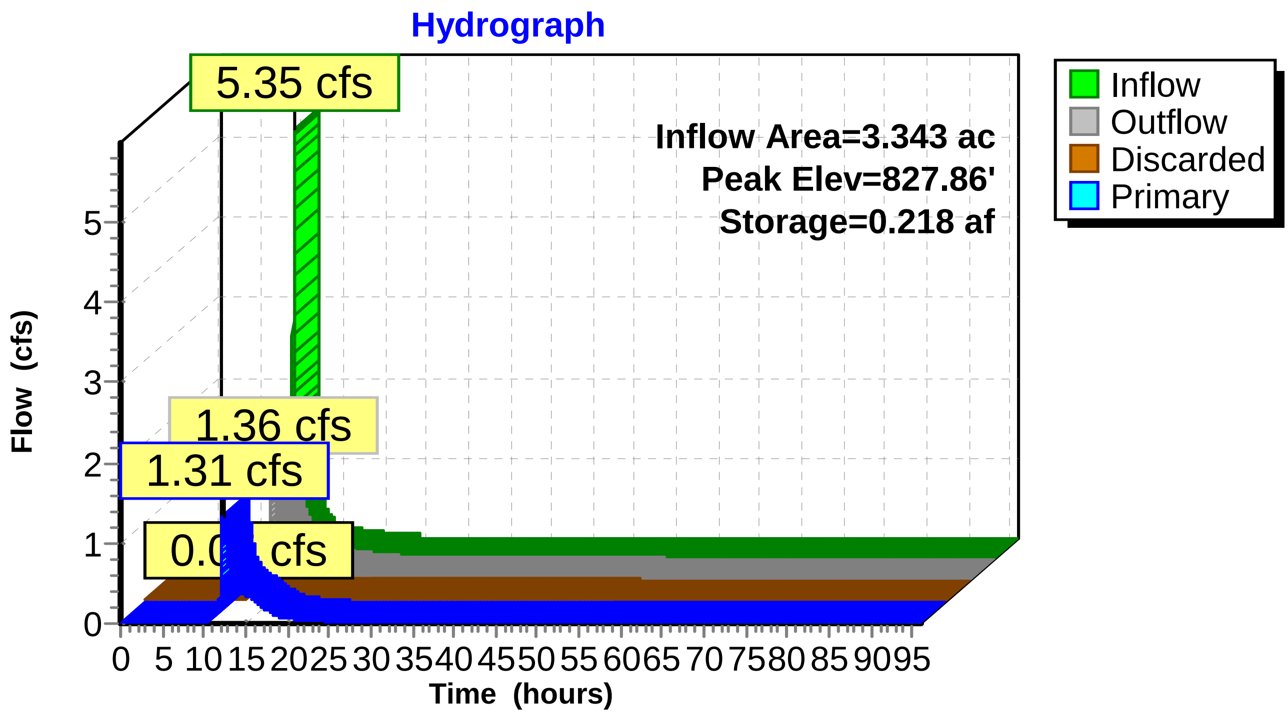
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
822.00	0.004	0.000	0.000	0.004
824.00	0.021	0.023	0.023	0.021
826.00	0.052	0.071	0.093	0.053
828.00	0.086	0.137	0.230	0.088
829.00	0.116	0.101	0.331	0.119
830.00	0.126	0.121	0.452	0.130

Device	Routing	Invert	Outlet Devices
#1	Discarded	822.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	825.90'	**15.0" Round Culvert** L= 82.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 825.90' / 825.16' S= 0.0089 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#3	Device 2	826.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	827.00'	**45.0 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	828.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	829.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.05 cfs @ 12.28 hrs HW=827.86' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.31 cfs @ 12.28 hrs HW=827.86' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Passes 1.31 cfs of 6.82 cfs potential flow)
│ ├─**3=Orifice/Grate** (Orifice Controls 0.55 cfs @ 6.26 fps)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.76 cfs @ 2.50 fps)
│ └─**5=Orifice/Grate** (Controls 0.00 cfs)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: H Pre West



Summary for Pond 5P: H Pre East

Inflow Area = 20.187 ac, 39.80% Impervious, Inflow Depth = 1.17" for 1 YR event
Inflow = 25.35 cfs @ 12.09 hrs, Volume= 1.975 af
Outflow = 2.24 cfs @ 13.07 hrs, Volume= 2.693 af, Atten= 91%, Lag= 58.3 min
Discarded = 0.28 cfs @ 13.07 hrs, Volume= 1.420 af
Primary = 1.97 cfs @ 13.07 hrs, Volume= 1.272 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 846.00' Surf.Area= 0.300 ac Storage= 1.128 af
Peak Elev= 848.57' @ 13.07 hrs Surf.Area= 0.437 ac Storage= 2.093 af (0.964 af above start)

Plug-Flow detention time= 1,949.2 min calculated for 1.564 af (79% of inflow)
Center-of-Mass det. time= 1,088.5 min (1,891.2 - 802.7)

Volume	Invert	Avail.Storage	Storage Description
#1	840.00'	4.506 af	**H Pond East (Conic)** Listed below

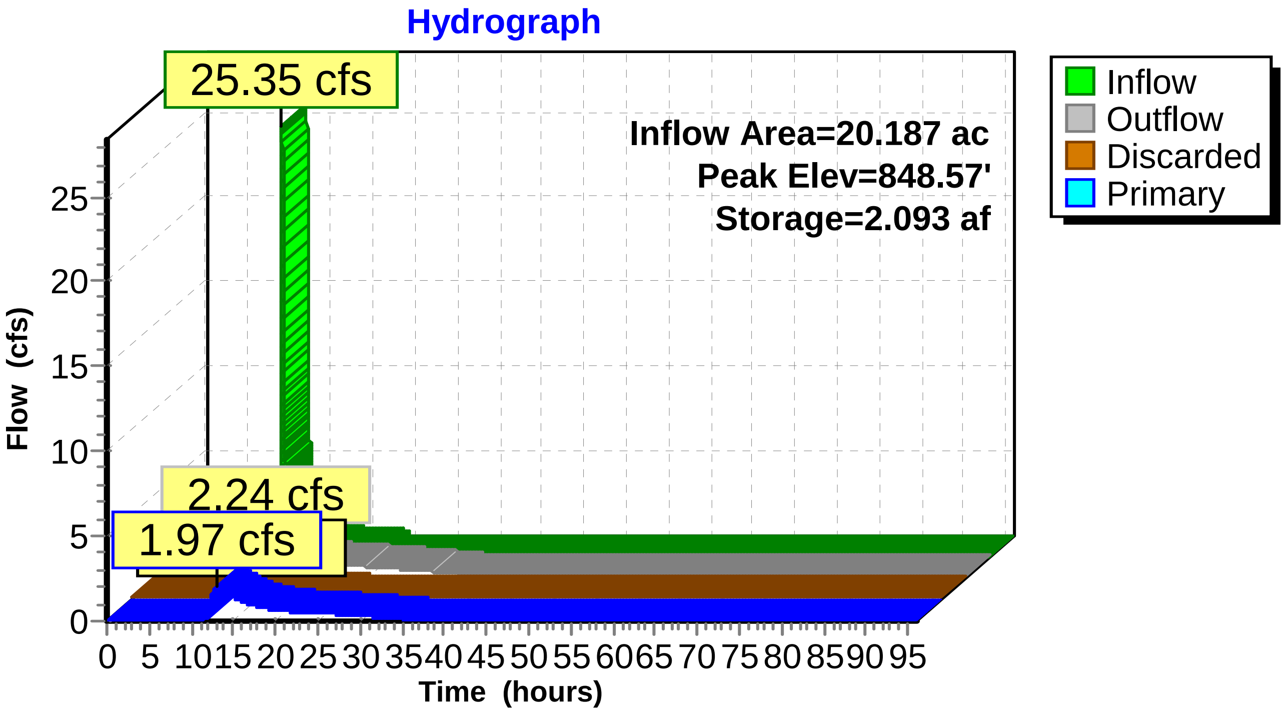
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
840.00	0.093	0.000	0.000	0.093
842.00	0.151	0.242	0.242	0.152
844.00	0.220	0.369	0.611	0.223
846.00	0.300	0.518	1.128	0.305
848.00	0.407	0.704	1.833	0.413
850.00	0.512	0.917	2.750	0.521
852.00	0.608	1.119	3.868	0.620
853.00	0.668	0.638	4.506	0.682

Device	Routing	Invert	Outlet Devices
#1	Discarded	840.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	841.00'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.00' / 835.64' S= 0.0443 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#3	Device 2	846.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	847.50'	**45.0 deg x 849.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	849.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	851.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.28 cfs @ 13.07 hrs HW=848.57' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=1.97 cfs @ 13.07 hrs HW=848.57' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Passes 1.97 cfs of 22.22 cfs potential flow)
│ ├─**3=Orifice/Grate** (Orifice Controls 0.65 cfs @ 7.46 fps)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.32 cfs @ 2.79 fps)
│ └─**5=Orifice/Grate** (Controls 0.00 cfs)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

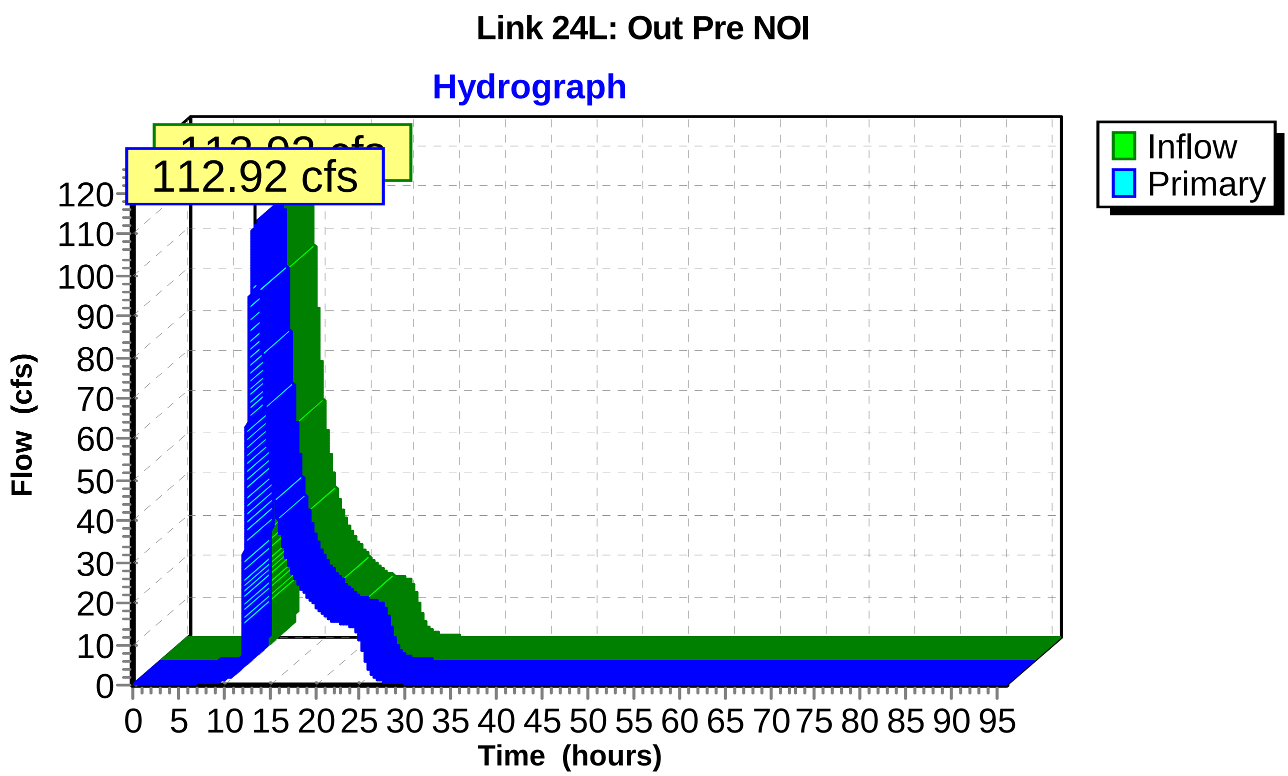
Pond 5P: H Pre East



Summary for Link 24L: Out Pre NOI

Inflow	=	112.92 cfs @	13.36 hrs, Volume=	40.467 af
Primary	=	112.92 cfs @	13.37 hrs, Volume=	40.467 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Sim-Route method - Pond routing by Sim-Route method w/Net Flows

Subcatchment 1S: Pre West 4 &5 Runoff Area=54.390 ac 16.07% Impervious Runoff Depth=2.04"
Flow Length=1,592' Tc=38.2 min CN=73/98 Runoff=77.60 cfs 9.250 af

Subcatchment 3S: Pret West 2 Runoff Area=19.170 ac 19.04% Impervious Runoff Depth=1.73"
Flow Length=1,118' Tc=36.8 min CN=66/98 Runoff=22.46 cfs 2.767 af

Subcatchment 4S: Pr e West 1 Runoff Area=15.200 ac 13.44% Impervious Runoff Depth=1.92"
Flow Length=1,386' Tc=15.5 min CN=72/98 Runoff=35.40 cfs 2.431 af

Subcatchment 5S: Pre West 3 Runoff Area=2.830 ac 15.55% Impervious Runoff Depth=1.58"
Flow Length=1,204' Tc=18.0 min CN=65/98 Runoff=4.76 cfs 0.374 af

Subcatchment 6S: H Pre Subdv W Runoff Area=3.343 ac 42.51% Impervious Runoff Depth=2.69"
Flow Length=1,048' Tc=11.7 min CN=74/98 Runoff=11.90 cfs 0.749 af

Subcatchment 7S: H Pre Subdv E Runoff Area=20.187 ac 39.80% Impervious Runoff Depth=2.58"
Flow Length=2,047' Tc=17.3 min CN=73/98 Runoff=57.98 cfs 4.348 af

Subcatchment 8S: H Pre Sub MISC Runoff Area=16.470 ac 1.52% Impervious Runoff Depth=1.50"
Flow Length=2,438' Tc=28.5 min CN=70/98 Runoff=21.00 cfs 2.063 af

Subcatchment 9S: Pre Central Runoff Area=170.950 ac 4.24% Impervious Runoff Depth=1.57"
Flow Length=5,764' Tc=93.5 min CN=70/98 Runoff=95.39 cfs 22.379 af

Subcatchment 10S: Out Pre East Runoff Area=803.280 ac 0.73% Impervious Runoff Depth=1.42"
Flow Length=12,536' Tc=116.7 min CN=69/98 Runoff=336.12 cfs 94.861 af

Reach 1R: Pre 4-5W Clvt Inflow=77.60 cfs 9.250 af
Outflow=77.60 cfs 9.250 af

Reach 2R: Out Pret West Inflow=59.16 cfs 14.240 af
Outflow=59.16 cfs 14.240 af

Reach 3R: Out Pre Central Inflow=106.40 cfs 29.049 af
Outflow=106.40 cfs 29.049 af

Pond 1P: Pre South Pond Peak Elev=822.89' Storage=3.121 af Inflow=116.38 cfs 14.545 af
Primary=59.16 cfs 14.240 af Secondary=0.70 cfs 0.313 af Outflow=59.16 cfs 14.552 af

Pond 2P: Pre North Pond Peak Elev=823.53' Storage=0.685 af Inflow=35.40 cfs 2.744 af
Primary=21.26 cfs 2.527 af Secondary=0.00 cfs 0.000 af Outflow=21.26 cfs 2.527 af

Pond 3P: Pre CClub Pond Peak Elev=820.24' Storage=0.013 af Inflow=4.76 cfs 0.374 af
Primary=4.71 cfs 0.374 af Secondary=0.00 cfs 0.000 af Outflow=4.71 cfs 0.374 af

Pond 4P: H Pre West Peak Elev=828.52' Storage=0.278 af Inflow=11.90 cfs 0.749 af
Discarded=0.06 cfs 0.175 af Primary=8.34 cfs 0.666 af Outflow=8.40 cfs 0.841 af

Pond 5P: H Pre East Peak Elev=850.02' Storage=2.762 af Inflow=57.98 cfs 4.348 af
Discarded=0.33 cfs 1.473 af Primary=24.47 cfs 3.568 af Outflow=24.80 cfs 5.041 af

Link 24L: Out Pre NOI Inflow=482.25 cfs 138.150 af
Primary=482.25 cfs 138.150 af

Total Runoff Area = 1,105.820 ac Runoff Volume = 139.223 af Average Runoff Depth = 1.51"
96.59% Pervious = 1,068.136 ac 3.41% Impervious = 37.684 ac

Summary for Subcatchment 1S: Pre West 4 &5

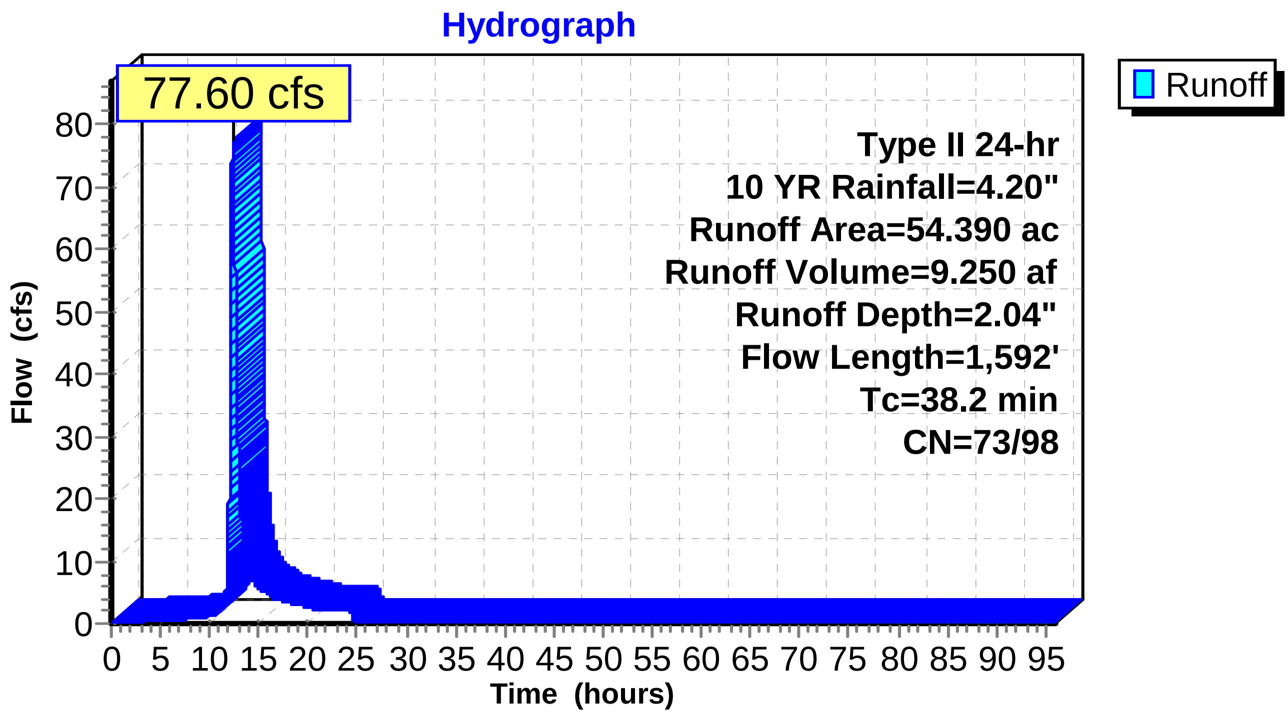
Runoff = 77.60 cfs @ 12.35 hrs, Volume= 9.250 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
22.690	80	1/2 acre lots, 25% imp, HSG C
11.210	70	Woods, Good, HSG C
1.910	70	Woods, Good, HSG C
11.950	80	1/2 acre lots, 25% imp, HSG C
5.240	74	>75% Grass cover, Good, HSG C
1.310	70	Woods, Good, HSG C
0.080	98	Paved roads w/curbs & sewers, HSG C
54.390	77	Weighted Average
45.650		83.93% Pervious Area
8.740		16.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0100	0.06		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
2.4	845	0.1300	5.80		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.5	647	0.0150	1.97		**Shallow Concentrated Flow, C -D** Unpaved Kv= 16.1 fps
38.2	1,592	Total			

Subcatchment 1S: Pre West 4 &5



Summary for Subcatchment 3S: Pret West 2

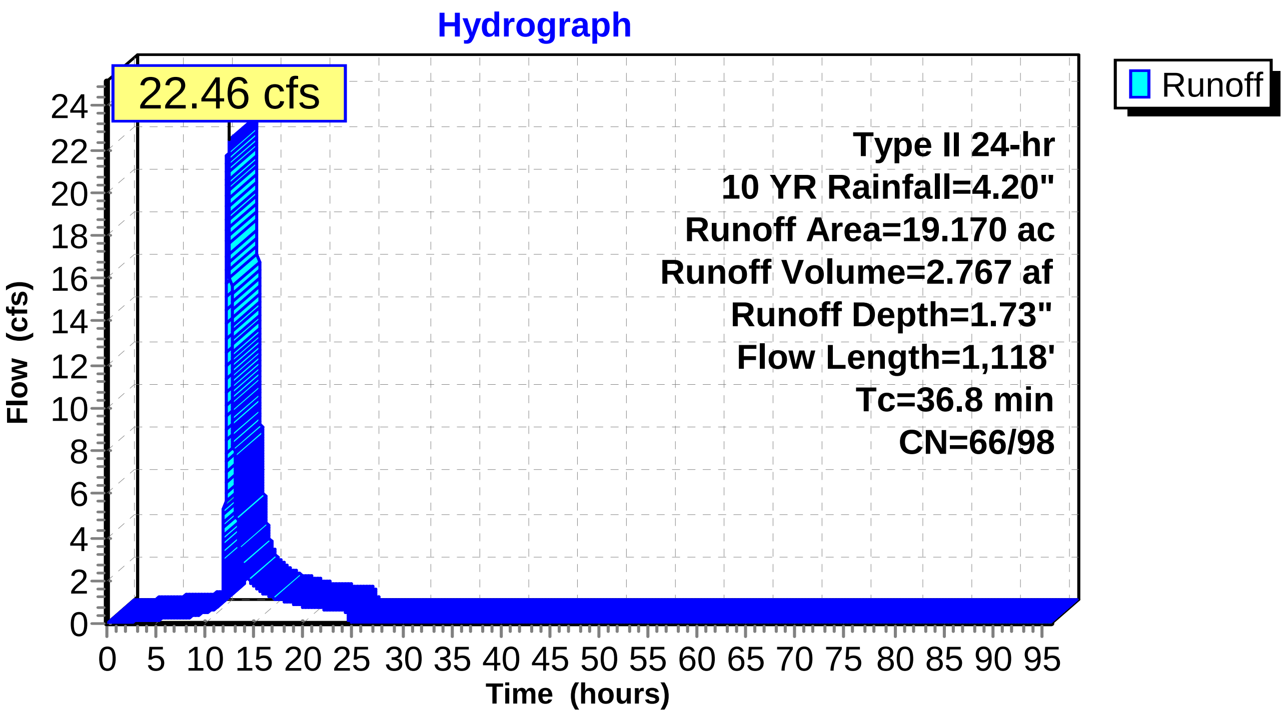
Runoff = 22.46 cfs @ 12.34 hrs, Volume= 2.767 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG D
0.100	55	Woods, Good, HSG B
0.650	70	Woods, Good, HSG C
0.660	77	Woods, Good, HSG D
0.320	98	Paved roads w/curbs & sewers, HSG D
0.620	65	Brush, Good, HSG C
1.970	65	Brush, Good, HSG C
2.620	98	Water Surface, HSG D
0.380	70	Brush, Fair, HSG C
0.640	98	Paved parking, HSG D
4.020	65	Brush, Good, HSG C
7.120	65	Brush, Good, HSG C
19.170	72	Weighted Average
15.520		80.96% Pervious Area
3.650		19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0800	0.13		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
7.9	240	0.0010	0.51		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.3	114	0.1580	6.40		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
15.4	664	0.0020	0.72		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
36.8	1,118	Total			

Subcatchment 3S: Pret West 2



Summary for Subcatchment 4S: Pr e West 1

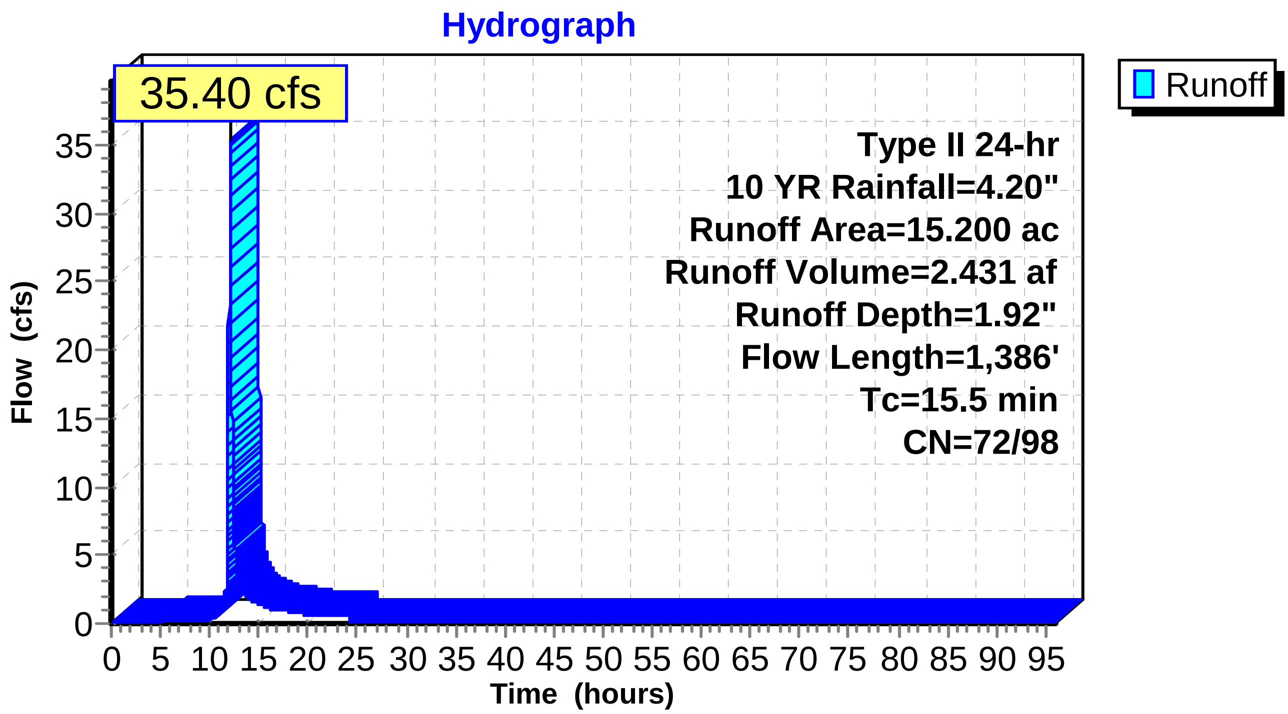
Runoff = 35.40 cfs @ 12.08 hrs, Volume= 2.431 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
3.220	83	1/4 acre lots, 38% imp, HSG C
1.960	70	Woods, Good, HSG C
0.240	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
4.610	70	Woods, Good, HSG C
2.690	74	>75% Grass cover, Good, HSG C
0.290	71	Meadow, non-grazed, HSG C
0.770	78	Meadow, non-grazed, HSG D
0.250	98	Water Surface, HSG D
0.330	65	Brush, Good, HSG C
0.510	73	Brush, Good, HSG D
15.200	75	Weighted Average
13.156		86.56% Pervious Area
2.044		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.1000	0.21		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.6	286	0.2450	7.97		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	399	0.2260	7.65		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
3.1	96	0.0010	0.51		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
2.9	505	0.0320	2.88		**Shallow Concentrated Flow, E - F** Unpaved Kv= 16.1 fps
15.5	1,386	Total			

Subcatchment 4S: Pr e West 1



Summary for Subcatchment 5S: Pre West 3

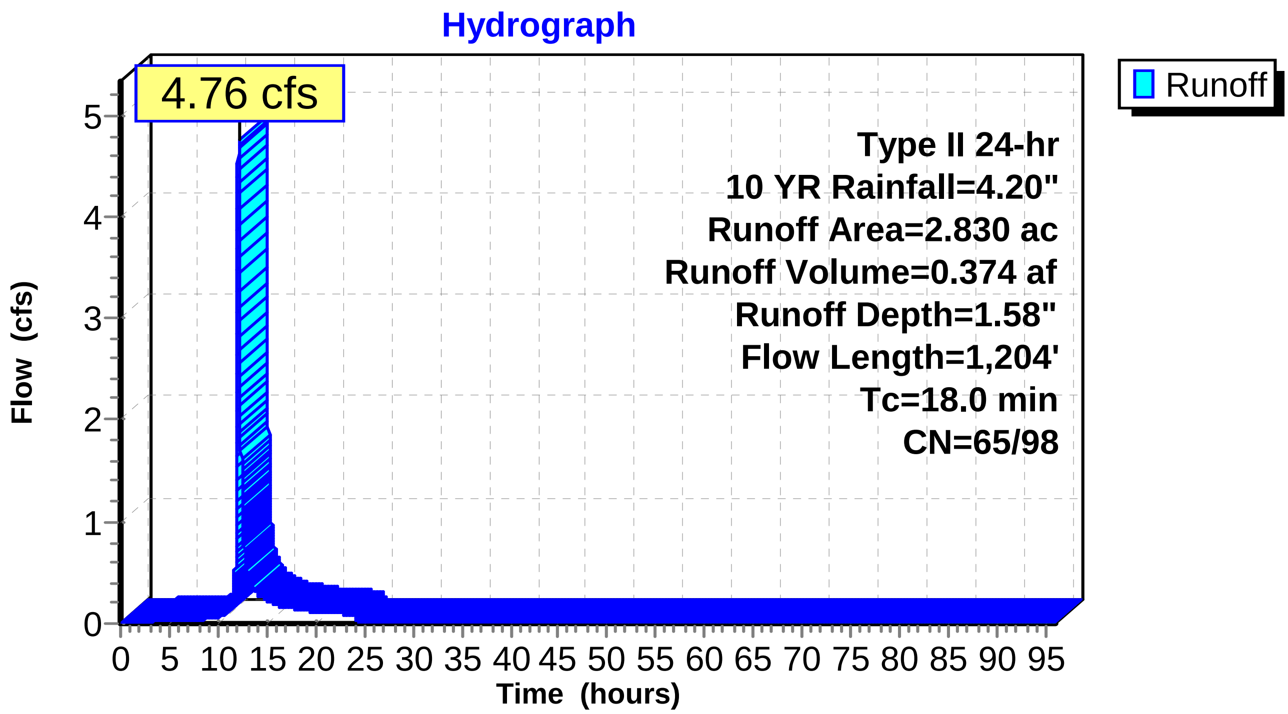
Runoff = 4.76 cfs @ 12.11 hrs, Volume= 0.374 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.070	78	Meadow, non-grazed, HSG D
0.610	70	Woods, Good, HSG C
0.140	98	Paved parking, HSG D
0.300	98	Paved parking, HSG D
0.770	65	Brush, Good, HSG C
0.500	73	Brush, Good, HSG D
0.440	48	Brush, Good, HSG B
2.830	70	Weighted Average
2.390		84.45% Pervious Area
0.440		15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.1200	0.15		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
0.5	174	0.1150	5.46		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.3	930	0.0230	2.44		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
18.0	1,204	Total			

Subcatchment 5S: Pre West 3



Summary for Subcatchment 6S: H Pre Subdv W

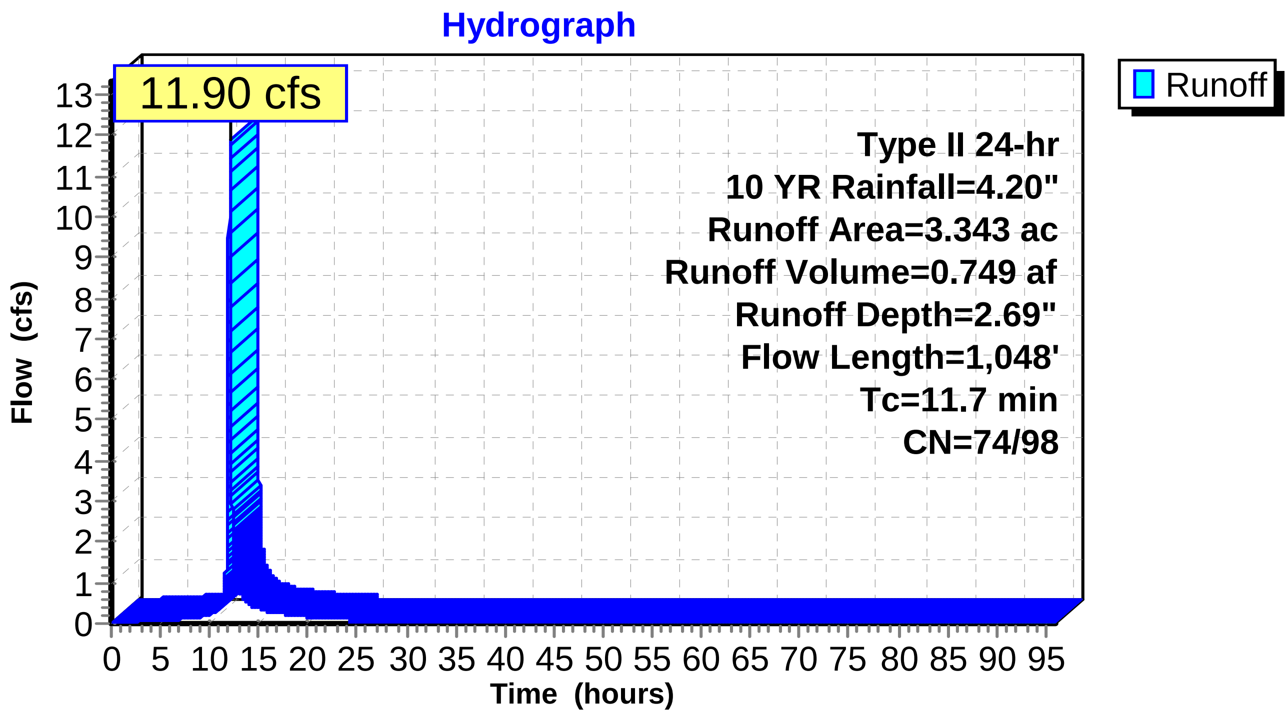
Runoff = 11.90 cfs @ 12.03 hrs, Volume= 0.749 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
1.829	74	>75% Grass cover, Good, HSG C
0.093	80	>75% Grass cover, Good, HSG D
0.439	98	Paved roads w/curbs & sewers, HSG D
0.982	98	Roofs, HSG D
3.343	84	Weighted Average
1.922		57.49% Pervious Area
1.421		42.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1100	0.22		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.5	187	0.1440	6.11		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	90	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.7	150	0.0520	3.67		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.2	68	0.1000	6.42		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.1	28	0.0100	5.48	4.38	**Channel Flow, F - G** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	131	0.1000	19.47	23.36	**Channel Flow, G - H** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
0.1	100	0.1550	28.05	50.49	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
1.2	110	0.0540	1.53	24.47	**Channel Flow, I - J** Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.240
0.2	84	0.0100	6.16	7.39	**Channel Flow, J - K** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
11.7	1,048	Total			

Subcatchment 6S: H Pre Subdv W



Summary for Subcatchment 7S: H Pre Subdv E

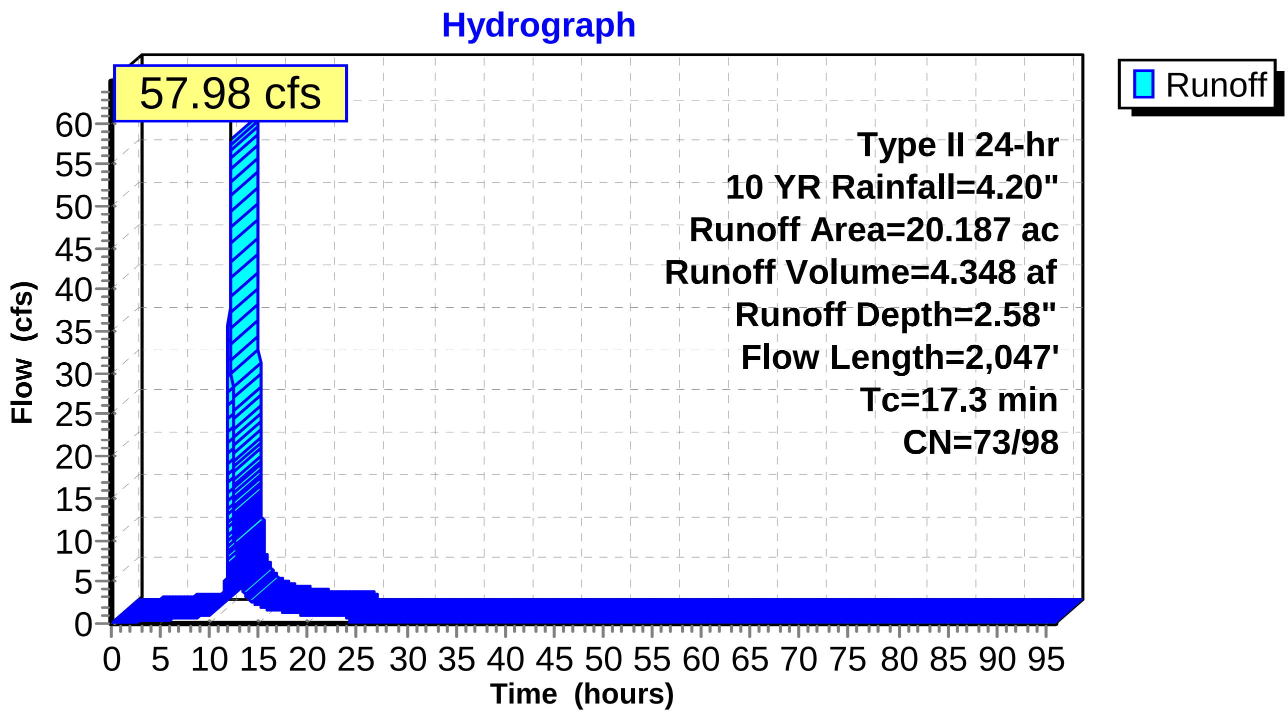
Runoff = 57.98 cfs @ 12.09 hrs, Volume= 4.348 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.206	55	Woods, Good, HSG B
0.531	70	Woods, Good, HSG C
0.925	61	>75% Grass cover, Good, HSG B
10.491	74	>75% Grass cover, Good, HSG C
2.961	98	Paved parking, HSG D
5.073	98	Roofs, HSG D
20.187	83	Weighted Average
12.153		60.20% Pervious Area
8.034		39.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	58	0.4300	0.33		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
10.1	42	0.0100	0.07		**Sheet Flow, B - C** n= 0.240 P2= 2.80"
0.7	67	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.8	158	0.0470	3.49		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.7	189	0.0530	4.67		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.2	87	0.1000	6.42		**Shallow Concentrated Flow, F - G** Paved Kv= 20.3 fps
0.0	29	0.0900	16.43	13.14	**Channel Flow, G - H** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	176	0.1000	22.53	40.55	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.2	116	0.0236	10.94	19.70	**Channel Flow, I - J** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.3	258	0.0239	13.02	40.35	**Channel Flow, J - K** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	81	0.0300	14.58	45.21	**Channel Flow, K - L** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
1.0	501	0.0100	8.42	26.10	**Channel Flow, L - M** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	185	0.0730	26.77	131.19	**Channel Flow, M - N** Area= 4.9 sf Perim= 7.8' r= 0.63' n= 0.011
0.1	100	0.0900	21.37	38.47	**Channel Flow, N - O** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
17.3	2,047	Total			

Subcatchment 7S: H Pre Subdv E



Summary for Subcatchment 8S: H Pre Sub MISC

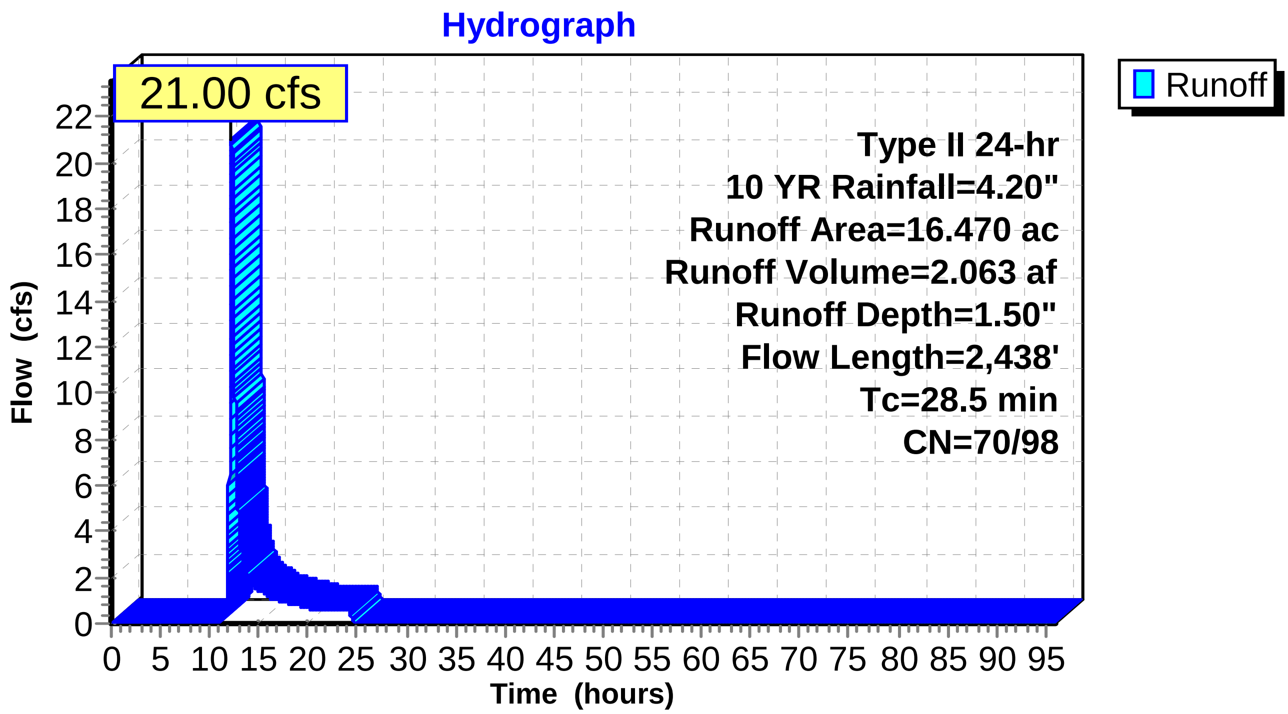
Runoff = 21.00 cfs @ 12.25 hrs, Volume= 2.063 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.955	55	Woods, Good, HSG B
9.912	70	Woods, Good, HSG C
0.489	61	>75% Grass cover, Good, HSG B
4.449	74	>75% Grass cover, Good, HSG C
0.415	80	>75% Grass cover, Good, HSG D
0.250	98	Unconnected pavement, HSG D
16.470	71	Weighted Average
16.220		98.48% Pervious Area
0.250		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.1600	0.18		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.2	672	0.3420	9.42		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.8	230	0.0220	0.66	13.26	**Channel Flow, C - D** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
0.9	460	0.0110	8.83	27.38	**Channel Flow, D - E** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
3.8	322	0.1020	1.43	28.55	**Channel Flow, E -F** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
1.5	348	0.0570	3.84		**Shallow Concentrated Flow, F - G** Unpaved Kv= 16.1 fps
1.5	256	0.0330	2.92		**Shallow Concentrated Flow, G - H** Unpaved Kv= 16.1 fps
28.5	2,438	Total			

Subcatchment 8S: H Pre Sub MISC



Summary for Subcatchment 9S: Pre Central

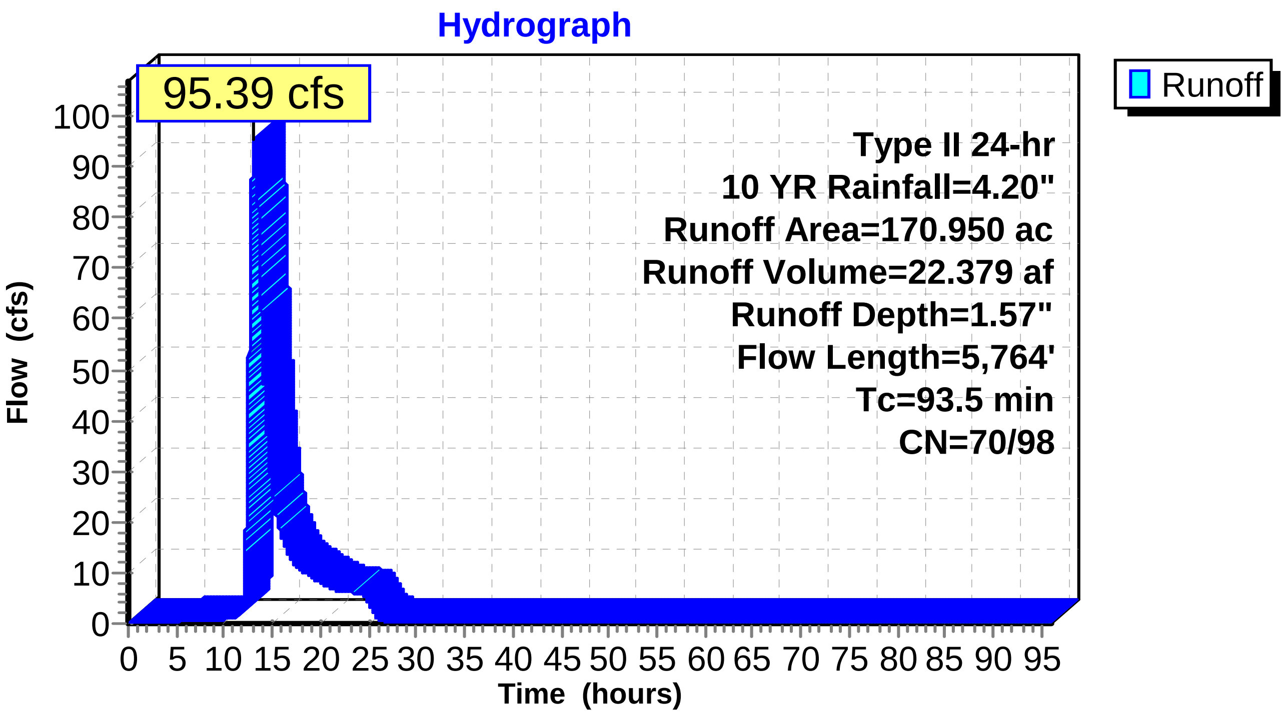
Runoff = 95.39 cfs @ 13.19 hrs, Volume= 22.379 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.900	98	Paved parking, HSG D
2.460	80	1/2 acre lots, 25% imp, HSG C
13.020	74	>75% Grass cover, Good, HSG C
33.500	74	>75% Grass cover, Good, HSG C
2.680	98	Paved parking, HSG D
43.100	70	Woods, Good, HSG C
2.880	71	Meadow, non-grazed, HSG C
0.150	98	Paved roads w/curbs & sewers, HSG D
19.240	74	>75% Grass cover, Good, HSG C
1.770	98	Paved parking, HSG D
2.160	74	>75% Grass cover, Good, HSG C
3.440	74	>75% Grass cover, Good, HSG C
0.120	98	Paved parking, HSG D
2.210	80	>75% Grass cover, Good, HSG D
28.430	61	>75% Grass cover, Good, HSG B
0.640	98	Paved parking, HSG D
0.380	98	Paved parking, HSG D
2.200	74	>75% Grass cover, Good, HSG C
6.660	61	>75% Grass cover, Good, HSG B
3.840	74	>75% Grass cover, Good, HSG C
0.810	61	>75% Grass cover, Good, HSG B
0.360	74	>75% Grass cover, Good, HSG C
170.950	71	Weighted Average
163.695		95.76% Pervious Area
7.255		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
6.4	2,043	0.1080	5.29		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.6	2,079	0.1060	5.24		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
57.5	1,542	0.0030	0.45	2.23	**Channel Flow, D - E** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
93.5	5,764	Total			

Subcatchment 9S: Pre Central



Summary for Subcatchment 10S: Out Pre East

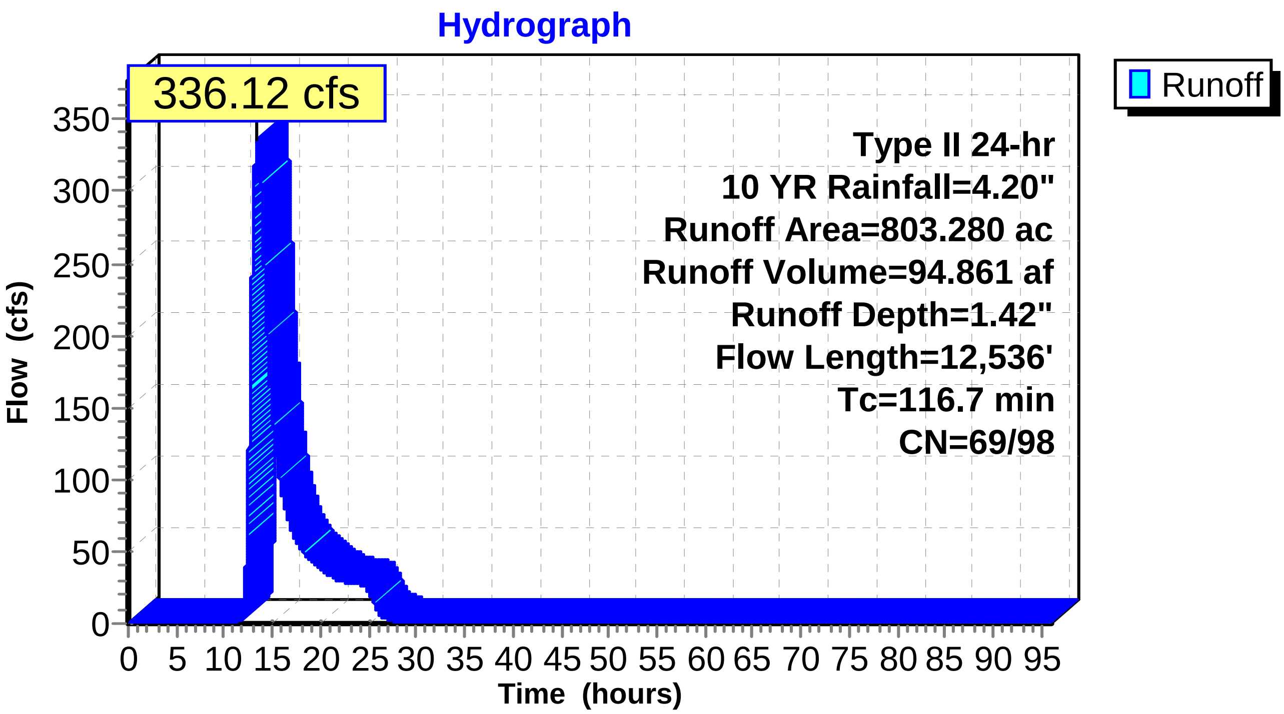
Runoff = 336.12 cfs @ 13.36 hrs, Volume= 94.861 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
11.850	77	Woods, Good, HSG D
5.000	78	Meadow, non-grazed, HSG D
8.390	30	Woods, Good, HSG A
0.390	55	Woods, Good, HSG B
2.250	98	Paved parking, HSG D
7.850	55	Woods, Good, HSG B
0.110	98	Paved parking, HSG D
353.100	70	Woods, Good, HSG C
105.000	71	Meadow, non-grazed, HSG C
3.380	30	Woods, Good, HSG A
9.290	30	Meadow, non-grazed, HSG A
1.750	98	Paved parking, HSG D
9.040	55	Woods, Good, HSG B
8.967	58	Meadow, non-grazed, HSG B
181.500	70	Woods, Good, HSG C
1.640	98	Paved parking, HSG D
93.673	74	>75% Grass cover, Good, HSG C
0.100	98	Roofs, HSG D
803.280	69	Weighted Average
797.430		99.27% Pervious Area
5.850		0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0500	0.10		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
9.0	2,298	0.0700	4.26		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
91.8	10,138	0.0510	1.84	9.21	**Channel Flow, C - D** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
116.7	12,536	Total			

Subcatchment 10S: Out Pre East

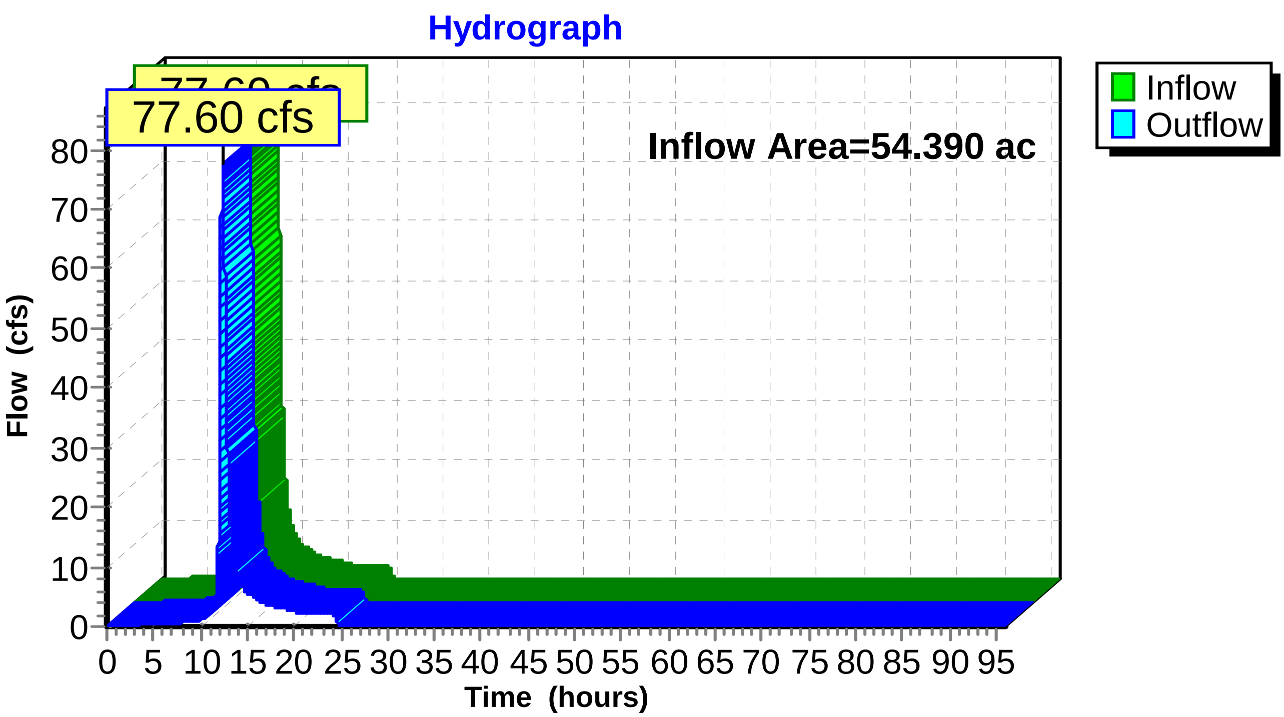


Summary for Reach 1R: Pre 4-5W Clvt

Inflow Area = 54.390 ac, 16.07% Impervious, Inflow Depth = 2.04" for 10 YR event
Inflow = 77.60 cfs @ 12.35 hrs, Volume= 9.250 af
Outflow = 77.60 cfs @ 12.36 hrs, Volume= 9.250 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 1R: Pre 4-5W Clvt

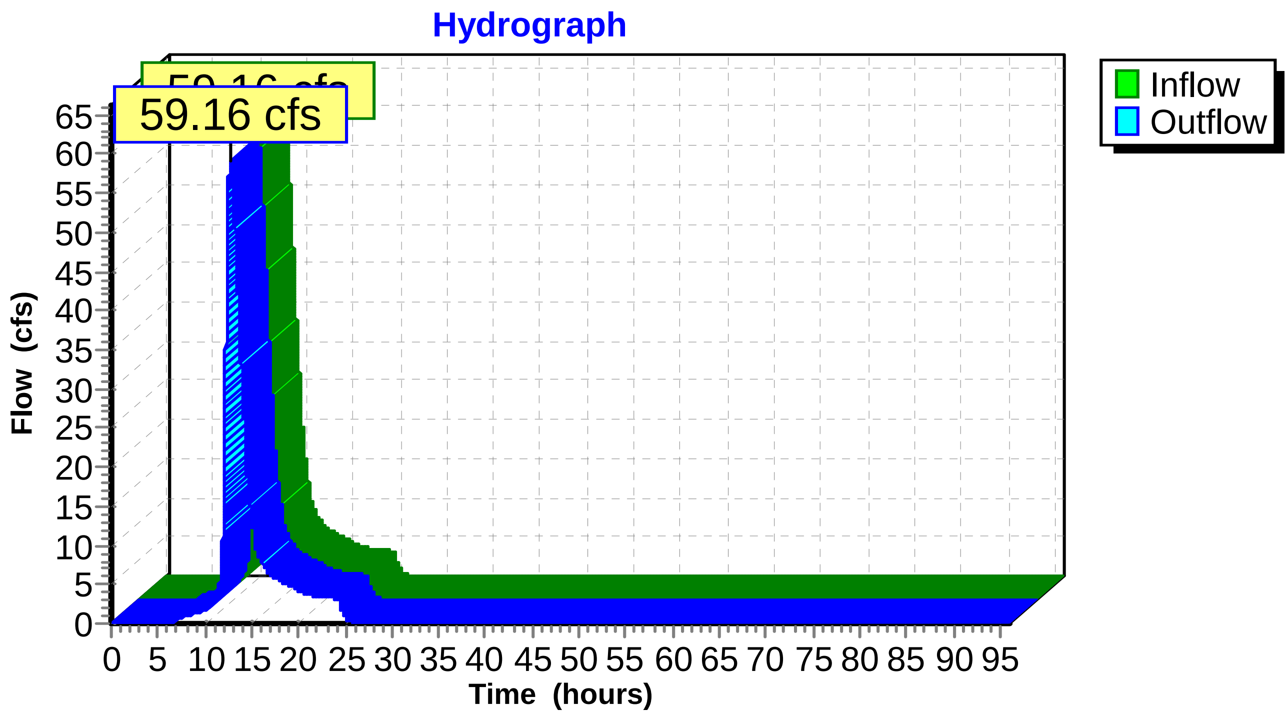


Summary for Reach 2R: Out Pret West

Inflow	=	59.16 cfs @	12.72 hrs, Volume=	14.240 af
Outflow	=	59.16 cfs @	12.73 hrs, Volume=	14.240 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

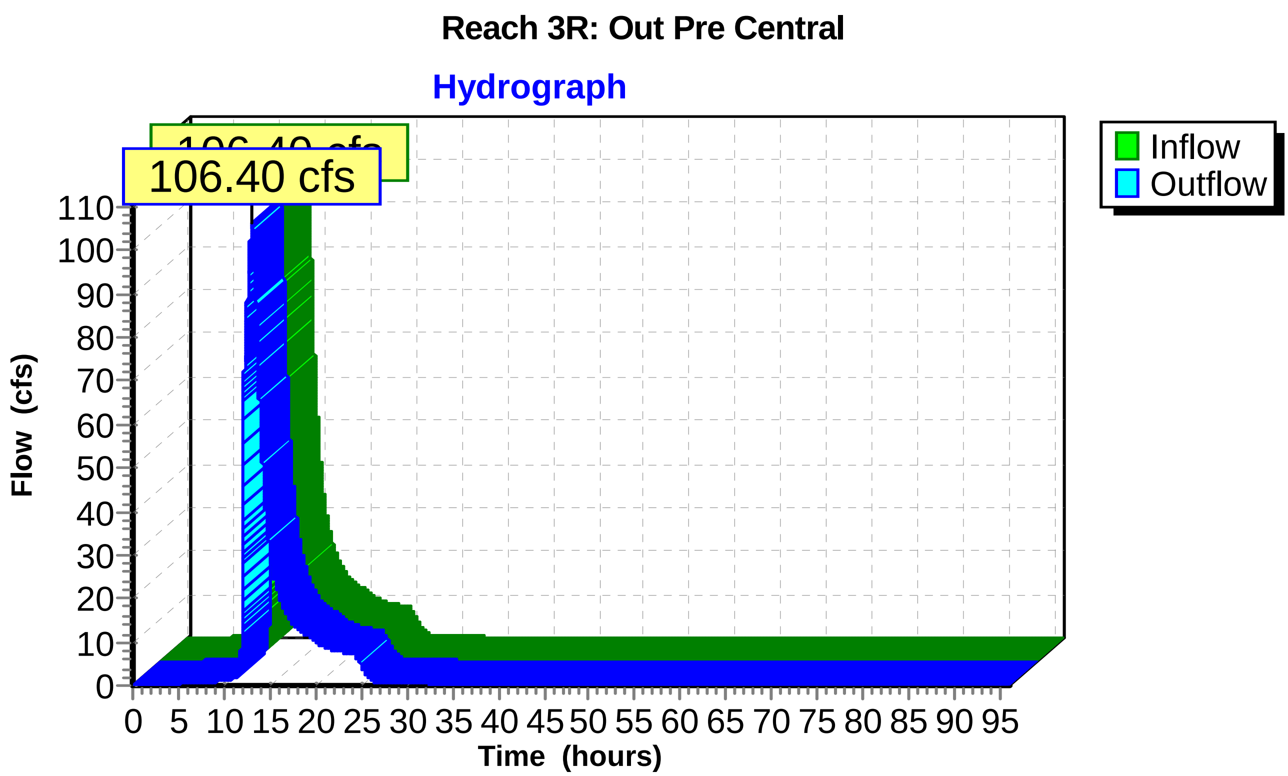
Reach 2R: Out Pret West



Summary for Reach 3R: Out Pre Central

Inflow	=	106.40 cfs @	13.09 hrs,	Volume=	29.049 af
Outflow	=	106.40 cfs @	13.10 hrs,	Volume=	29.049 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Summary for Pond 1P: Pre South Pond

Inflow	=	116.38 cfs @	12.32 hrs,	Volume=	14.545 af
Outflow	=	59.16 cfs @	12.72 hrs,	Volume=	14.552 af, Atten= 49%, Lag= 23.8 min
Primary	=	59.16 cfs @	12.72 hrs,	Volume=	14.240 af
Secondary	=	0.70 cfs @	6.15 hrs,	Volume=	0.313 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 822.89' @ 12.72 hrs Surf.Area= 4.045 ac Storage= 3.121 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 22.9 min (899.7 - 876.8)

Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	418.450 af	**PosSPond (Conic)** Listed below (Recalc)

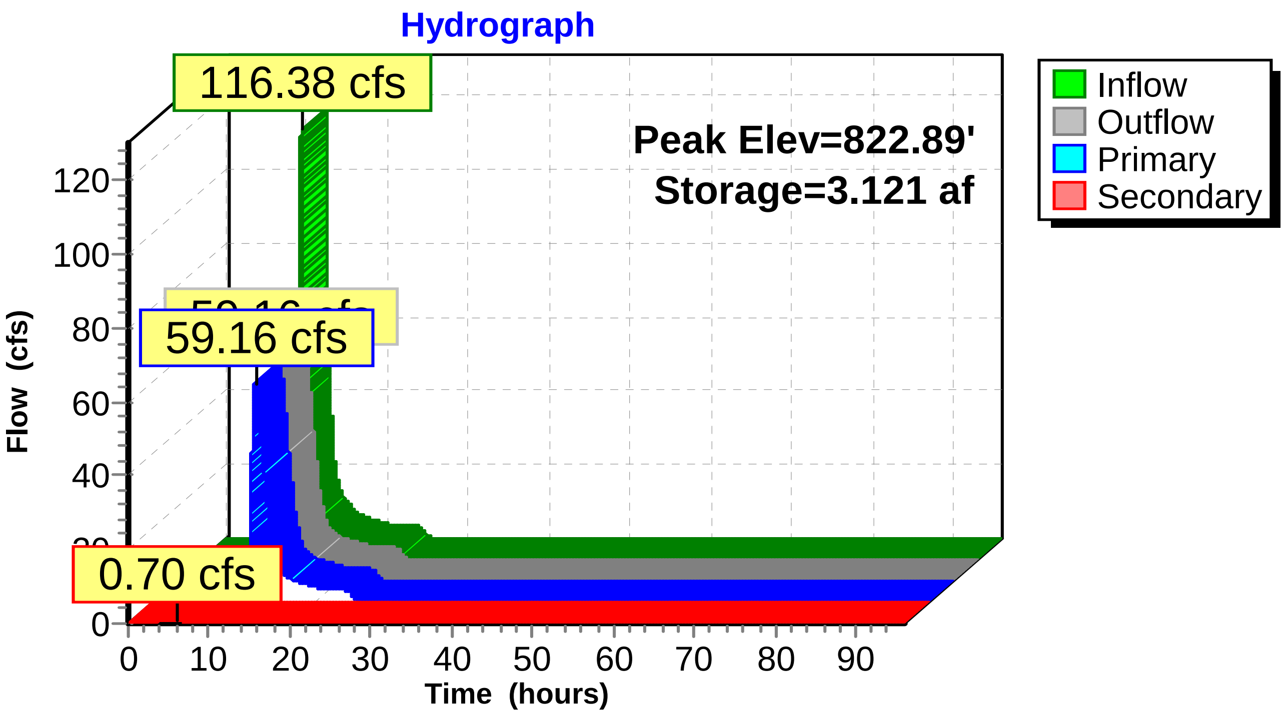
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
821.00	0.010	0.000	0.000	0.010
822.60	3.600	2.027	2.027	3.600
824.00	6.020	6.662	8.688	6.021
826.00	6.790	12.802	21.491	6.795
828.00	7.430	14.215	35.706	7.442
830.00	7.880	15.308	51.014	7.902
832.00	8.280	16.158	67.172	8.313
834.00	8.500	16.780	83.951	8.554
836.00	8.990	17.488	101.439	9.054
838.00	9.850	18.833	120.273	9.920
840.00	10.330	20.178	140.451	10.412
842.00	15.310	25.477	165.928	15.394
858.00	16.260	252.522	418.450	16.832

Device	Routing	Invert	Outlet Devices
#1	Primary	821.11'	**9.5' long x 100.0' 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
#2	Secondary	820.81'	**24.0" Round Culvert** L= 30.0' Ke= 0.200 Inlet / Outlet Invert= 819.81' / 820.81' S= -0.0333 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=59.16 cfs @ 12.72 hrs HW=822.89' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 59.16 cfs @ 3.51 fps)

Secondary OutFlow Max=0.69 cfs @ 6.15 hrs HW=821.11' TW=820.96' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.69 cfs @ 2.33 fps)

Pond 1P: Pre South Pond



Summary for Pond 2P: Pre North Pond

Inflow	=	35.40 cfs @	12.08 hrs, Volume=	2.744 af	
Outflow	=	21.26 cfs @	12.18 hrs, Volume=	2.527 af,	Atten= 40%, Lag= 6.3 min
Primary	=	21.26 cfs @	12.18 hrs, Volume=	2.527 af	
Secondary	=	0.00 cfs @	12.22 hrs, Volume=	0.000 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.81' Surf.Area= 0.020 ac Storage= 0.006 af
Peak Elev= 823.53' @ 12.22 hrs Surf.Area= 0.383 ac Storage= 0.685 af (0.679 af above start)

Plug-Flow detention time= 304.7 min calculated for 2.554 af (92% of inflow)
Center-of-Mass det. time= 99.6 min (1,028.6 - 931.4)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	37.557 af	**PostNPond (Conic)** Listed below

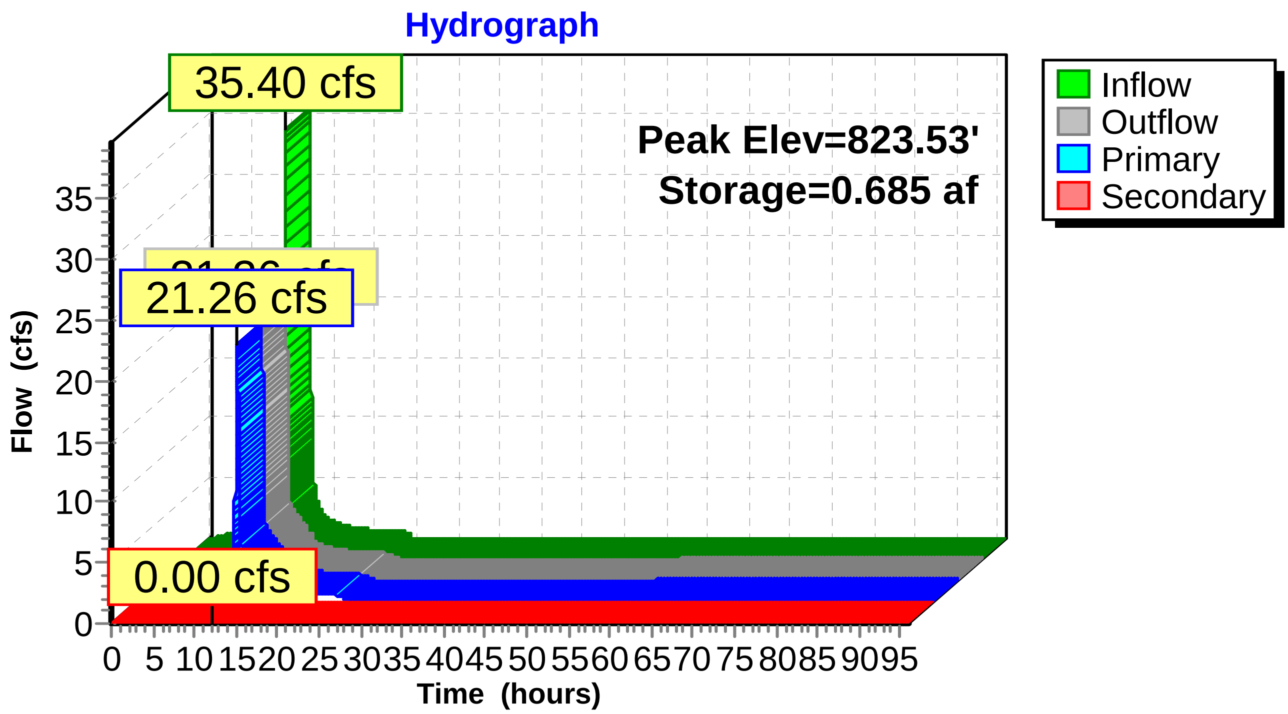
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
819.81	0.020	0.006	0.006	0.020
820.00	0.030	0.005	0.010	0.030
824.00	0.430	0.765	0.775	0.431
826.00	1.030	1.417	2.192	1.032
828.00	1.340	2.363	4.555	1.344
830.00	2.170	3.477	8.032	2.175
832.00	2.470	4.637	12.669	2.480
834.00	2.790	5.257	17.926	2.804
836.00	3.090	5.877	23.803	3.110
838.00	3.440	6.527	30.330	3.465
840.00	3.790	7.227	37.557	3.821

Device	Routing	Invert	Outlet Devices
#1	Primary	820.41'	**24.0" Round Culvert - Watson** L= 30.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 820.41' / 819.81' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Secondary	823.50'	**24.0" Round Culvert - Post Pipe** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 823.50' / 819.00' S= 0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=21.06 cfs @ 12.18 hrs HW=823.49' TW=822.24' (Dynamic Tailwater)
↑—**1=Culvert - Watson** (Inlet Controls 21.06 cfs @ 6.70 fps)

Secondary OutFlow Max=0.00 cfs @ 12.22 hrs HW=823.53' TW=820.17' (Dynamic Tailwater)
↑—**2=Culvert - Post Pipe** (Inlet Controls 0.00 cfs @ 0.55 fps)

Pond 2P: Pre North Pond



Summary for Pond 3P: Pre CClub Pond

Inflow	=	4.76 cfs @ 12.11 hrs,	Volume=	0.374 af
Outflow	=	4.71 cfs @ 12.14 hrs,	Volume=	0.374 af, Atten= 1%, Lag= 1.6 min
Primary	=	4.71 cfs @ 12.14 hrs,	Volume=	0.374 af
Secondary	=	0.00 cfs @ 0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.42' Surf.Area= 0.010 ac Storage= 0.000 af
Peak Elev= 820.24' @ 12.14 hrs Surf.Area= 0.021 ac Storage= 0.013 af

Plug-Flow detention time= 5.8 min calculated for 0.374 af (100% of inflow)
Center-of-Mass det. time= 5.7 min (838.5 - 832.9)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	1.167 af	**PostCClubPond (Conic)** Listed below (Recalc)

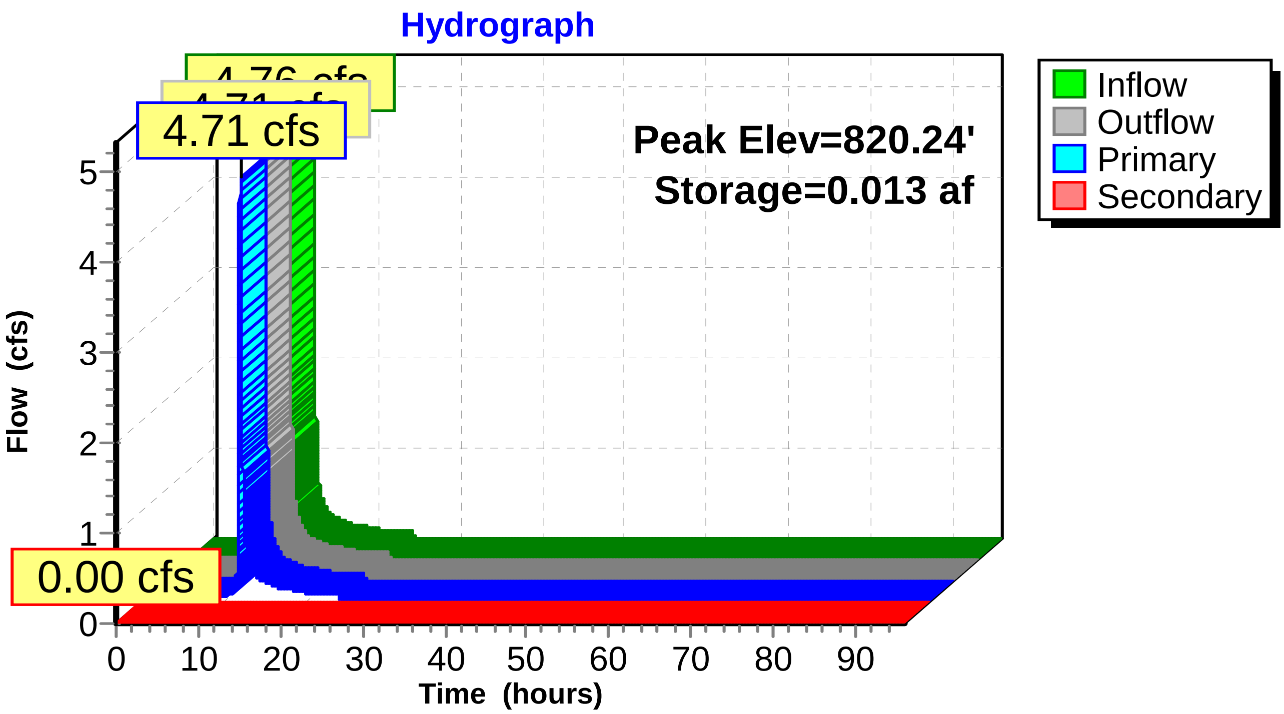
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
820.00	0.020	0.009	0.009	0.020
824.00	0.030	0.099	0.108	0.035
826.00	0.040	0.070	0.178	0.047
828.00	0.050	0.090	0.267	0.059
830.00	0.060	0.110	0.377	0.072
832.00	0.070	0.130	0.507	0.085
834.00	0.080	0.150	0.657	0.099
840.00	0.090	0.510	1.167	0.130

Device	Routing	Invert	Outlet Devices
#1	Primary	819.42'	**24.0" Round Culvert** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 819.42' / 817.75' S= 0.0334 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Primary	825.05'	**145.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#3	Secondary	823.50'	**24.0" Round Culvert** L= 210.0' Ke= 0.500 Inlet / Outlet Invert= 819.00' / 823.50' S= -0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=4.71 cfs @ 12.14 hrs HW=820.24' TW=0.00' (Dynamic Tailwater)
├─**1=Culvert** (Inlet Controls 4.71 cfs @ 3.86 fps)
└─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.42' TW=819.81' (Dynamic Tailwater)
└─**3=Culvert** (Controls 0.00 cfs)

Pond 3P: Pre CClub Pond



Summary for Pond 4P: H Pre West

Inflow Area =	3.343 ac, 42.51% Impervious, Inflow Depth = 2.69"	for 10 YR event	
Inflow =	11.90 cfs @ 12.03 hrs, Volume=	0.749 af	
Outflow =	8.40 cfs @ 12.12 hrs, Volume=	0.841 af,	Atten= 29%, Lag= 5.6 min
Discarded =	0.06 cfs @ 12.12 hrs, Volume=	0.175 af	
Primary =	8.34 cfs @ 12.12 hrs, Volume=	0.666 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 826.00' Surf.Area= 0.052 ac Storage= 0.093 af
Peak Elev= 828.52' @ 12.12 hrs Surf.Area= 0.101 ac Storage= 0.278 af (0.185 af above start)

Plug-Flow detention time= 370.7 min calculated for 0.747 af (100% of inflow)
Center-of-Mass det. time= 299.1 min (1,087.3 - 788.1)

Volume	Invert	Avail.Storage	Storage Description
#1	822.00'	0.452 af	**H Pond West (Conic)** Listed below (Recalc)

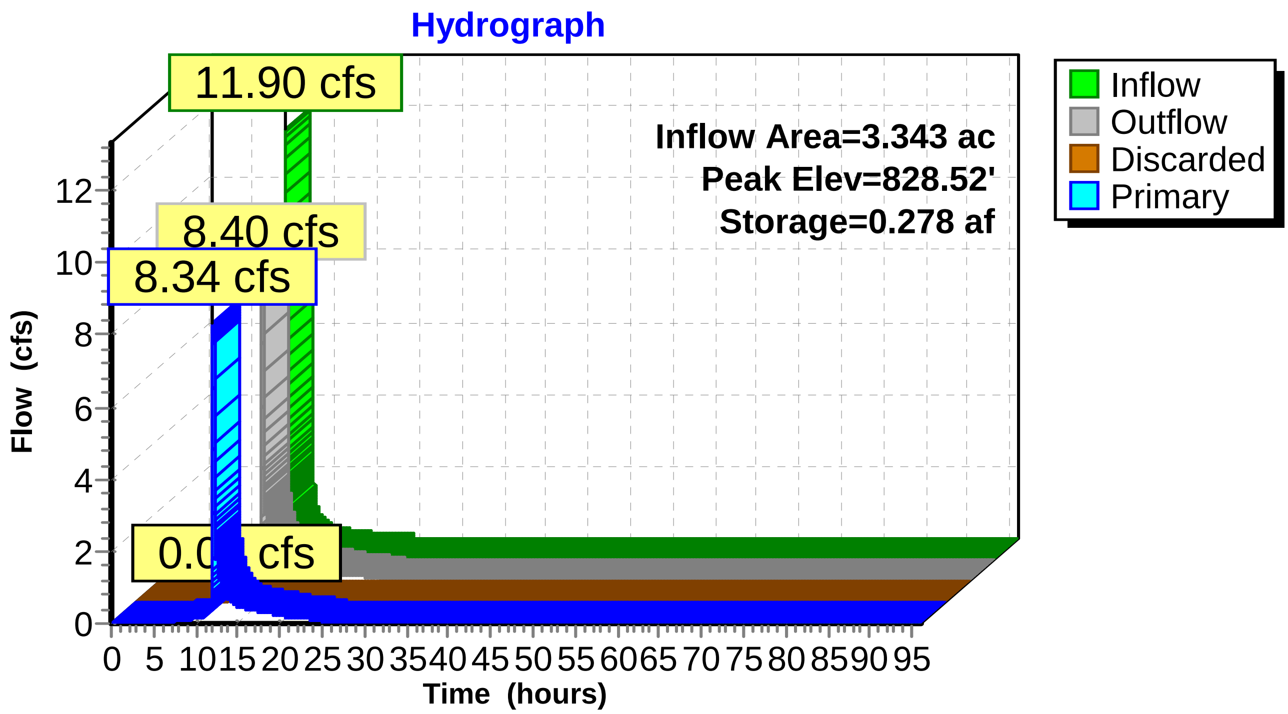
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
822.00	0.004	0.000	0.000	0.004
824.00	0.021	0.023	0.023	0.021
826.00	0.052	0.071	0.093	0.053
828.00	0.086	0.137	0.230	0.088
829.00	0.116	0.101	0.331	0.119
830.00	0.126	0.121	0.452	0.130

Device	Routing	Invert	Outlet Devices
#1	Discarded	822.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	825.90'	**15.0" Round Culvert** L= 82.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 825.90' / 825.16' S= 0.0089 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#3	Device 2	826.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	827.00'	**45.0 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	828.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	829.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.06 cfs @ 12.12 hrs HW=828.52' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=8.34 cfs @ 12.12 hrs HW=828.52' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 8.34 cfs @ 6.80 fps)
│ ├─**3=Orifice/Grate** (Passes < 0.64 cfs potential flow)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Passes < 1.92 cfs potential flow)
│ └─**5=Orifice/Grate** (Passes < 17.01 cfs potential flow)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: H Pre West



Summary for Pond 5P: H Pre East

Inflow Area = 20.187 ac, 39.80% Impervious, Inflow Depth = 2.58" for 10 YR event
Inflow = 57.98 cfs @ 12.09 hrs, Volume= 4.348 af
Outflow = 24.80 cfs @ 12.31 hrs, Volume= 5.041 af, Atten= 57%, Lag= 13.2 min
Discarded = 0.33 cfs @ 12.31 hrs, Volume= 1.473 af
Primary = 24.47 cfs @ 12.31 hrs, Volume= 3.568 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 846.00' Surf.Area= 0.300 ac Storage= 1.128 af
Peak Elev= 850.02' @ 12.31 hrs Surf.Area= 0.513 ac Storage= 2.762 af (1.634 af above start)

Plug-Flow detention time= 916.3 min calculated for 3.912 af (90% of inflow)
Center-of-Mass det. time= 640.6 min (1,436.6 - 796.0)

Volume	Invert	Avail.Storage	Storage Description
#1	840.00'	4.506 af	**H Pond East (Conic)** Listed below

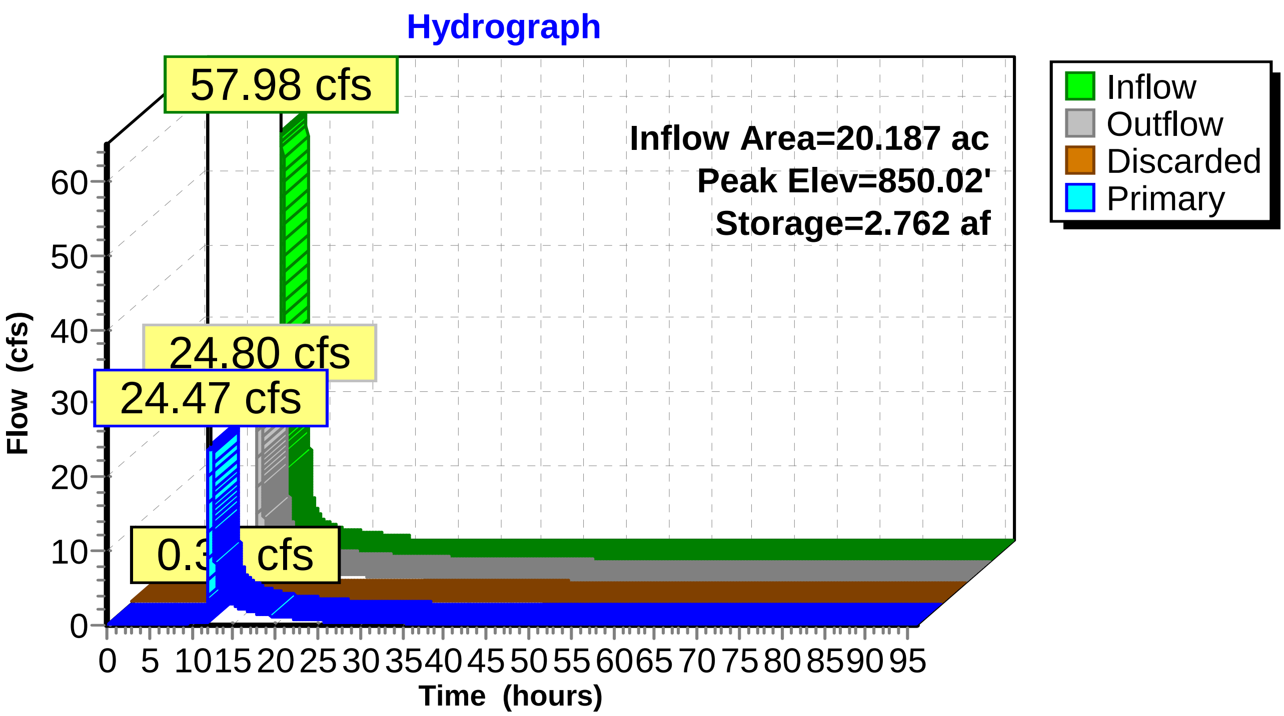
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
840.00	0.093	0.000	0.000	0.093
842.00	0.151	0.242	0.242	0.152
844.00	0.220	0.369	0.611	0.223
846.00	0.300	0.518	1.128	0.305
848.00	0.407	0.704	1.833	0.413
850.00	0.512	0.917	2.750	0.521
852.00	0.608	1.119	3.868	0.620
853.00	0.668	0.638	4.506	0.682

Device	Routing	Invert	Outlet Devices
#1	Discarded	840.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	841.00'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.00' / 835.64' S= 0.0443 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#3	Device 2	846.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	847.50'	**45.0 deg x 849.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	849.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	851.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.33 cfs @ 12.31 hrs HW=850.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=24.47 cfs @ 12.31 hrs HW=850.02' TW=0.00' (Dynamic Tailwater)
├**2=Culvert** (Inlet Controls 24.47 cfs @ 13.85 fps)
│├**3=Orifice/Grate** (Passes < 0.83 cfs potential flow)
│├**4=Sharp-Crested Vee/Trap Weir** (Passes < 11.30 cfs potential flow)
│└**5=Orifice/Grate** (Passes < 47.30 cfs potential flow)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: H Pre East

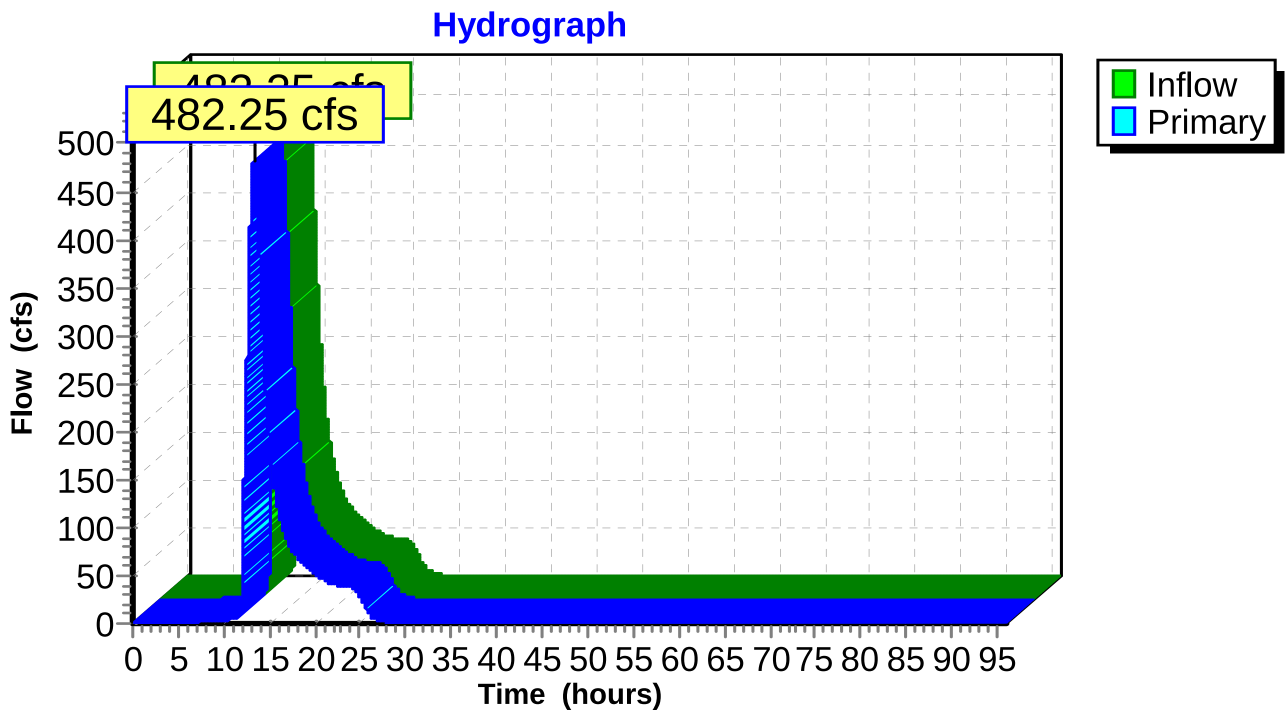


Summary for Link 24L: Out Pre NOI

Inflow	=	482.25 cfs @	13.35 hrs,	Volume=	138.150 af
Primary	=	482.25 cfs @	13.36 hrs,	Volume=	138.150 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 24L: Out Pre NOI



Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Sim-Route method - Pond routing by Sim-Route method w/Net Flows

Subcatchment 1S: Pre West 4 &5 Runoff Area=54.390 ac 16.07% Impervious Runoff Depth=3.69"
Flow Length=1,592' Tc=38.2 min CN=73/98 Runoff=143.87 cfs 16.726 af

Subcatchment 3S: Pret West 2 Runoff Area=19.170 ac 19.04% Impervious Runoff Depth=3.23"
Flow Length=1,118' Tc=36.8 min CN=66/98 Runoff=44.23 cfs 5.162 af

Subcatchment 4S: Pr e West 1 Runoff Area=15.200 ac 13.44% Impervious Runoff Depth=3.53"
Flow Length=1,386' Tc=15.5 min CN=72/98 Runoff=66.47 cfs 4.477 af

Subcatchment 5S: Pre West 3 Runoff Area=2.830 ac 15.55% Impervious Runoff Depth=3.04"
Flow Length=1,204' Tc=18.0 min CN=65/98 Runoff=9.62 cfs 0.716 af

Subcatchment 6S: H Pre Subdv W Runoff Area=3.343 ac 42.51% Impervious Runoff Depth=4.46"
Flow Length=1,048' Tc=11.7 min CN=74/98 Runoff=19.82 cfs 1.243 af

Subcatchment 7S: H Pre Subdv E Runoff Area=20.187 ac 39.80% Impervious Runoff Depth=4.33"
Flow Length=2,047' Tc=17.3 min CN=73/98 Runoff=98.07 cfs 7.288 af

Subcatchment 8S: H Pre Sub MISC Runoff Area=16.470 ac 1.52% Impervious Runoff Depth=3.01"
Flow Length=2,438' Tc=28.5 min CN=70/98 Runoff=43.88 cfs 4.132 af

Subcatchment 9S: Pre Central Runoff Area=170.950 ac 4.24% Impervious Runoff Depth=3.09"
Flow Length=5,764' Tc=93.5 min CN=70/98 Runoff=197.63 cfs 44.047 af

Subcatchment 10S: Out Pre East Runoff Area=803.280 ac 0.73% Impervious Runoff Depth=2.89"
Flow Length=12,536' Tc=116.7 min CN=69/98 Runoff=734.10 cfs 193.598 af

Reach 1R: Pre 4-5W Clvt Inflow=143.87 cfs 16.726 af
Outflow=143.87 cfs 16.726 af

Reach 2R: Out Pret West Inflow=99.65 cfs 25.868 af
Outflow=99.65 cfs 25.868 af

Reach 3R: Out Pre Central Inflow=231.95 cfs 56.793 af
Outflow=231.95 cfs 56.793 af

Pond 1P: Pre South Pond Peak Elev=823.62' Storage=6.565 af Inflow=210.46 cfs 26.176 af
Primary=99.65 cfs 25.868 af Secondary=0.79 cfs 0.312 af Outflow=99.65 cfs 26.180 af

Pond 2P: Pre North Pond Peak Elev=824.61' Storage=1.211 af Inflow=66.47 cfs 4.789 af
Primary=26.33 cfs 4.288 af Secondary=6.47 cfs 0.285 af Outflow=32.29 cfs 4.572 af

Pond 3P: Pre CClub Pond Peak Elev=821.00' Storage=0.030 af Inflow=14.25 cfs 1.001 af
Primary=14.19 cfs 1.001 af Secondary=0.00 cfs 0.000 af Outflow=14.19 cfs 1.001 af

Pond 4P: H Pre West Peak Elev=829.26' Storage=0.361 af Inflow=19.82 cfs 1.243 af
Discarded=0.08 cfs 0.181 af Primary=16.77 cfs 1.153 af Outflow=16.84 cfs 1.335 af

Pond 5P: H Pre East Peak Elev=851.68' Storage=3.687 af Inflow=98.07 cfs 7.288 af
Discarded=0.38 cfs 1.509 af Primary=56.56 cfs 6.460 af Outflow=56.94 cfs 7.969 af

Link 24L: Out Pre NOI Inflow=1,029.35 cfs 276.259 af
Primary=1,029.35 cfs 276.259 af

Total Runoff Area = 1,105.820 ac Runoff Volume = 277.389 af Average Runoff Depth = 3.01"
96.59% Pervious = 1,068.136 ac 3.41% Impervious = 37.684 ac

Summary for Subcatchment 1S: Pre West 4 &5

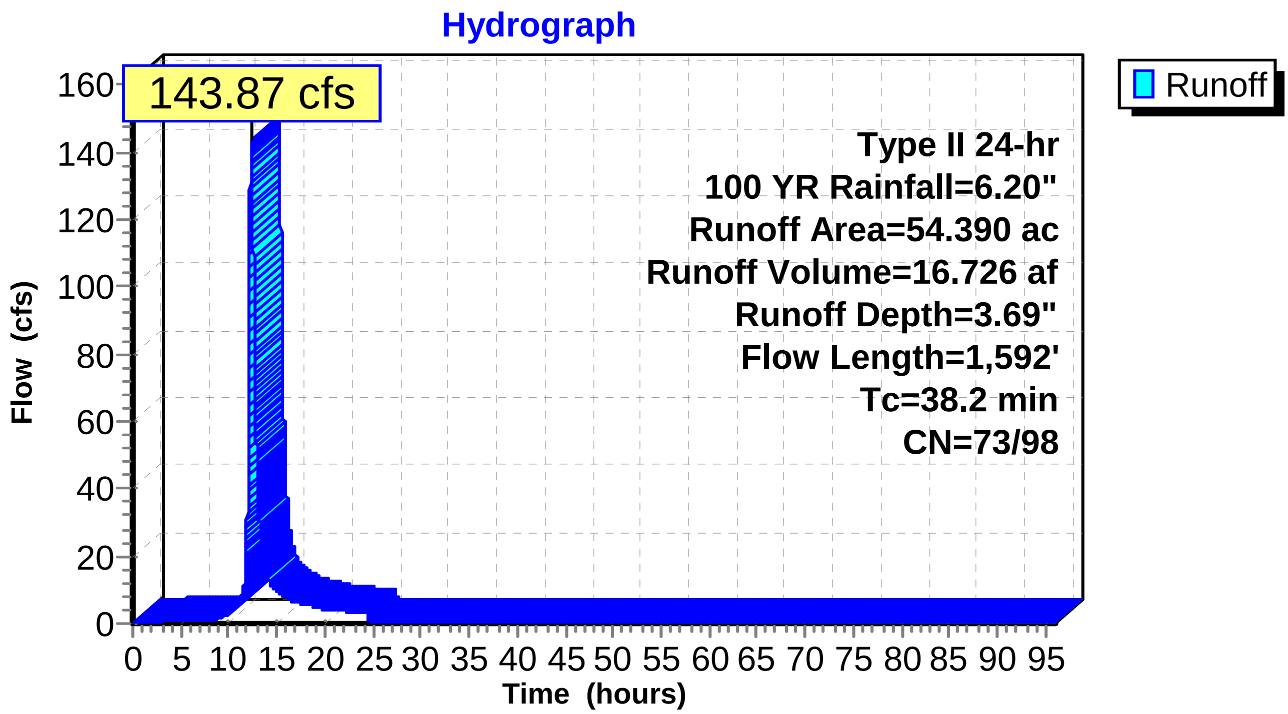
Runoff = 143.87 cfs @ 12.35 hrs, Volume= 16.726 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
22.690	80	1/2 acre lots, 25% imp, HSG C
11.210	70	Woods, Good, HSG C
1.910	70	Woods, Good, HSG C
11.950	80	1/2 acre lots, 25% imp, HSG C
5.240	74	>75% Grass cover, Good, HSG C
1.310	70	Woods, Good, HSG C
0.080	98	Paved roads w/curbs & sewers, HSG C
54.390	77	Weighted Average
45.650		83.93% Pervious Area
8.740		16.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0100	0.06		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
2.4	845	0.1300	5.80		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.5	647	0.0150	1.97		**Shallow Concentrated Flow, C -D** Unpaved Kv= 16.1 fps
38.2	1,592	Total			

Subcatchment 1S: Pre West 4 &5



Summary for Subcatchment 3S: Pret West 2

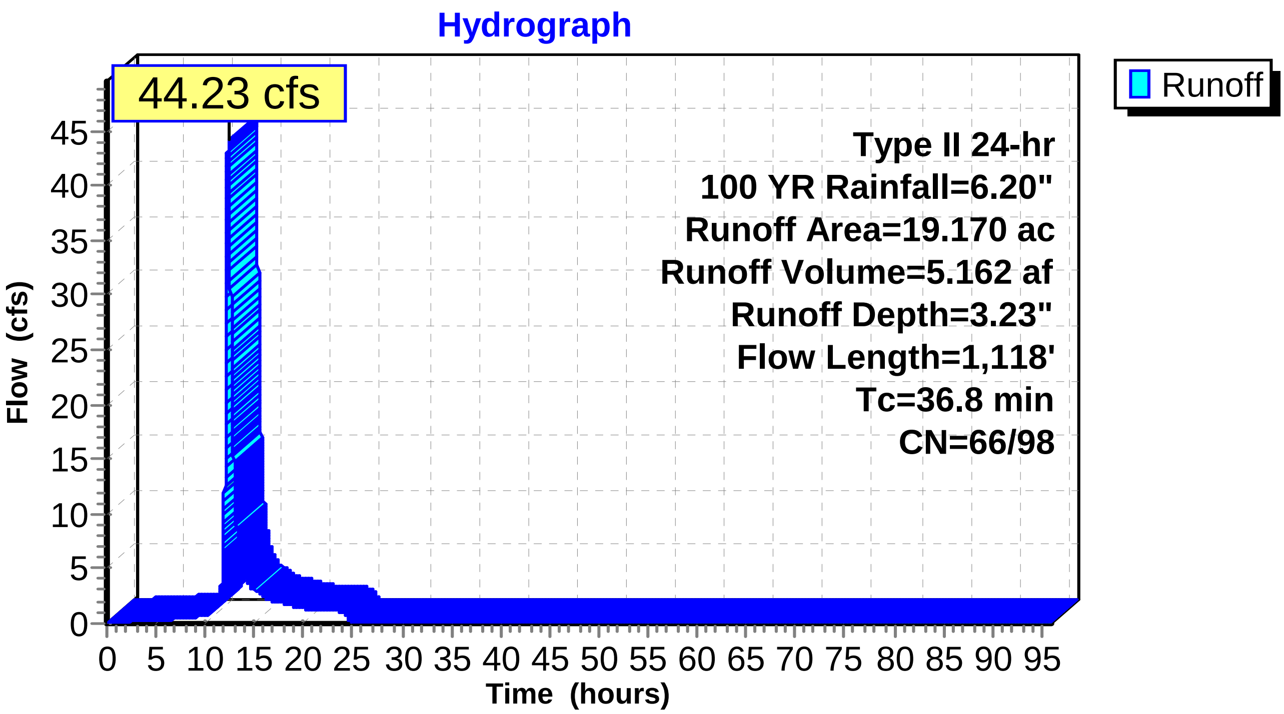
Runoff = 44.23 cfs @ 12.31 hrs, Volume= 5.162 af, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG D
0.100	55	Woods, Good, HSG B
0.650	70	Woods, Good, HSG C
0.660	77	Woods, Good, HSG D
0.320	98	Paved roads w/curbs & sewers, HSG D
0.620	65	Brush, Good, HSG C
1.970	65	Brush, Good, HSG C
2.620	98	Water Surface, HSG D
0.380	70	Brush, Fair, HSG C
0.640	98	Paved parking, HSG D
4.020	65	Brush, Good, HSG C
7.120	65	Brush, Good, HSG C
19.170	72	Weighted Average
15.520		80.96% Pervious Area
3.650		19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0800	0.13		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
7.9	240	0.0010	0.51		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.3	114	0.1580	6.40		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
15.4	664	0.0020	0.72		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
36.8	1,118	Total			

Subcatchment 3S: Pret West 2



Summary for Subcatchment 4S: Pr e West 1

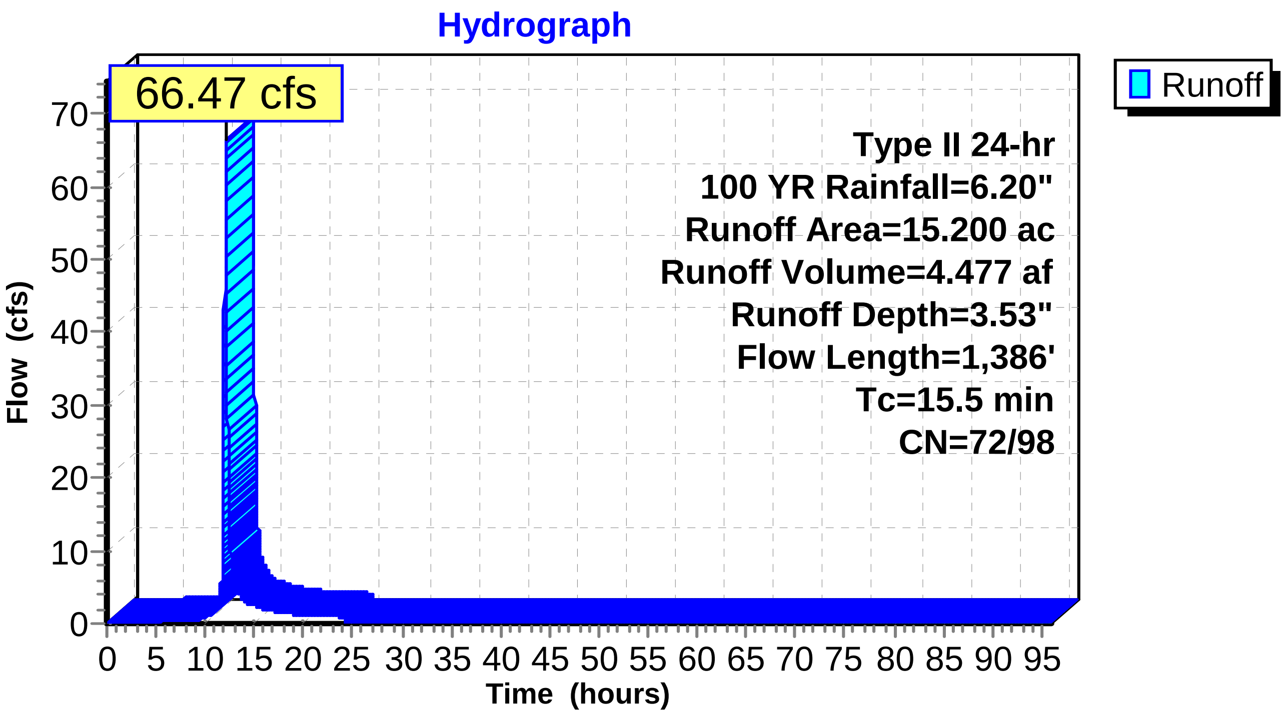
Runoff = 66.47 cfs @ 12.07 hrs, Volume= 4.477 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
3.220	83	1/4 acre lots, 38% imp, HSG C
1.960	70	Woods, Good, HSG C
0.240	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
4.610	70	Woods, Good, HSG C
2.690	74	>75% Grass cover, Good, HSG C
0.290	71	Meadow, non-grazed, HSG C
0.770	78	Meadow, non-grazed, HSG D
0.250	98	Water Surface, HSG D
0.330	65	Brush, Good, HSG C
0.510	73	Brush, Good, HSG D
15.200	75	Weighted Average
13.156		86.56% Pervious Area
2.044		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.1000	0.21		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.6	286	0.2450	7.97		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	399	0.2260	7.65		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
3.1	96	0.0010	0.51		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
2.9	505	0.0320	2.88		**Shallow Concentrated Flow, E - F** Unpaved Kv= 16.1 fps
15.5	1,386	Total			

Subcatchment 4S: Pr e West 1



Summary for Subcatchment 5S: Pre West 3

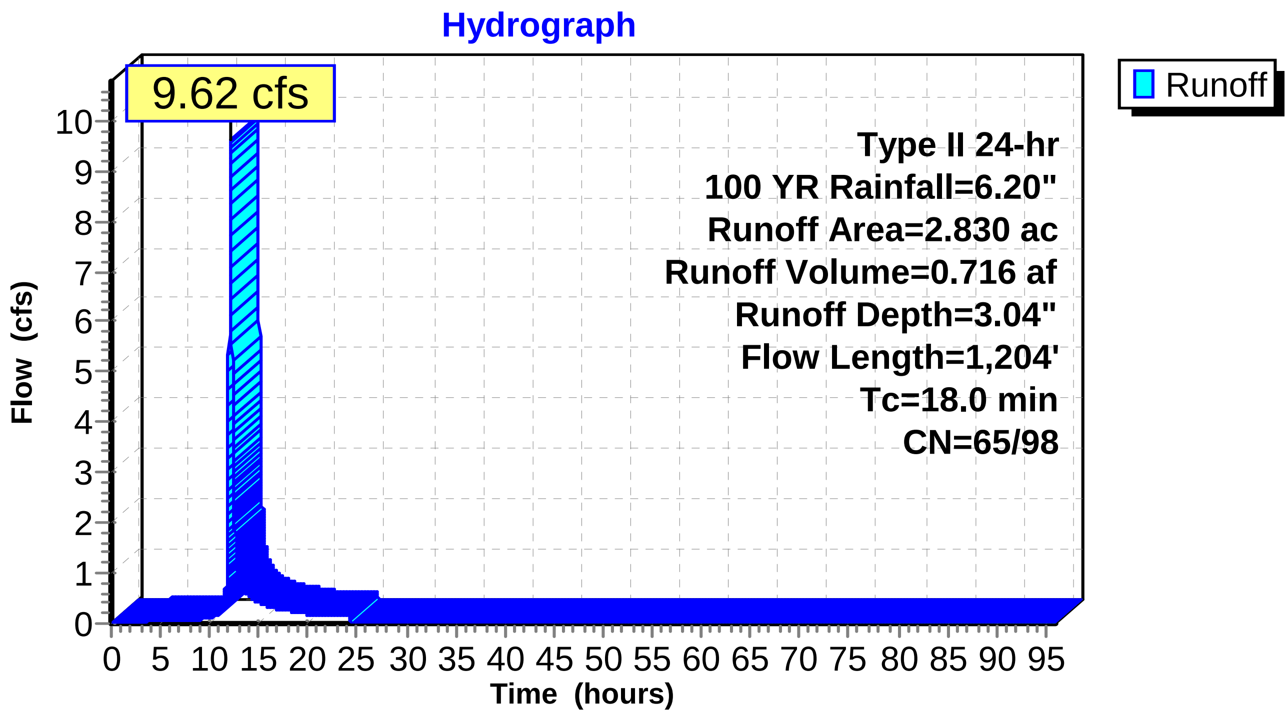
Runoff = 9.62 cfs @ 12.10 hrs, Volume= 0.716 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.070	78	Meadow, non-grazed, HSG D
0.610	70	Woods, Good, HSG C
0.140	98	Paved parking, HSG D
0.300	98	Paved parking, HSG D
0.770	65	Brush, Good, HSG C
0.500	73	Brush, Good, HSG D
0.440	48	Brush, Good, HSG B
2.830	70	Weighted Average
2.390		84.45% Pervious Area
0.440		15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.1200	0.15		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
0.5	174	0.1150	5.46		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.3	930	0.0230	2.44		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
18.0	1,204	Total			

Subcatchment 5S: Pre West 3



Summary for Subcatchment 6S: H Pre Subdv W

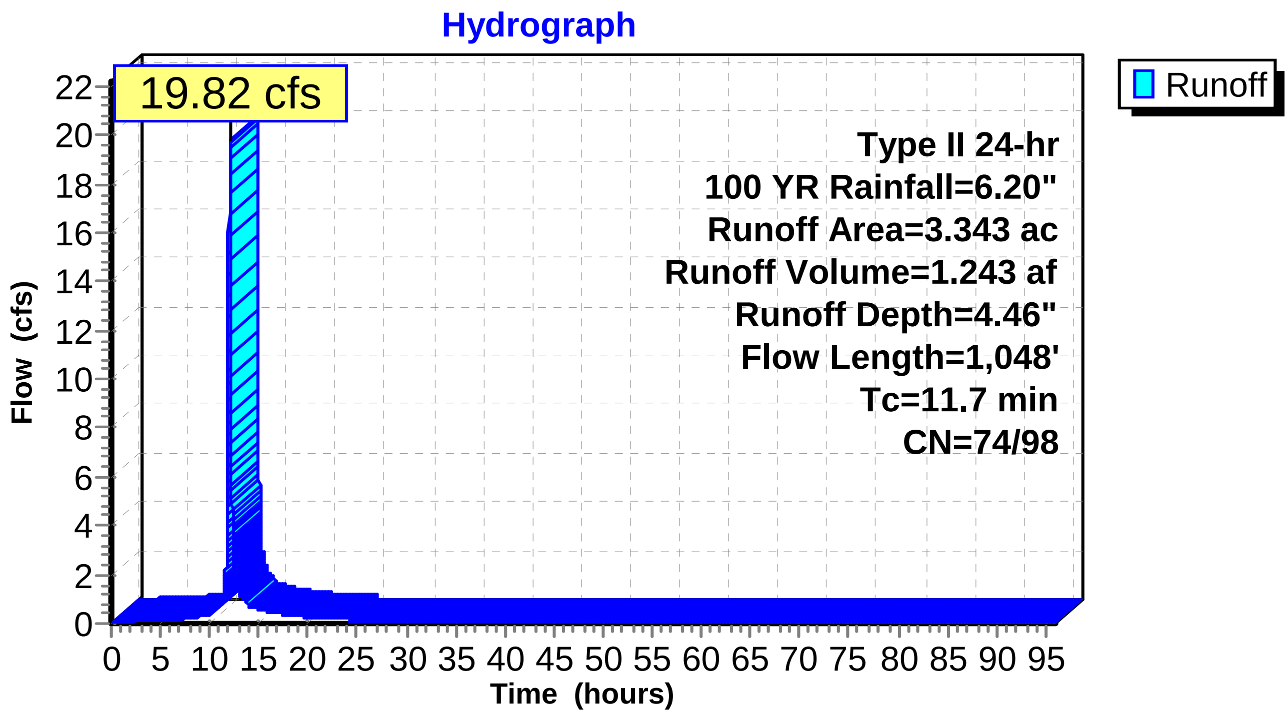
Runoff = 19.82 cfs @ 12.03 hrs, Volume= 1.243 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
1.829	74	>75% Grass cover, Good, HSG C
0.093	80	>75% Grass cover, Good, HSG D
0.439	98	Paved roads w/curbs & sewers, HSG D
0.982	98	Roofs, HSG D
3.343	84	Weighted Average
1.922		57.49% Pervious Area
1.421		42.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1100	0.22		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.5	187	0.1440	6.11		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	90	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.7	150	0.0520	3.67		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.2	68	0.1000	6.42		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.1	28	0.0100	5.48	4.38	**Channel Flow, F - G** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	131	0.1000	19.47	23.36	**Channel Flow, G - H** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
0.1	100	0.1550	28.05	50.49	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
1.2	110	0.0540	1.53	24.47	**Channel Flow, I - J** Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.240
0.2	84	0.0100	6.16	7.39	**Channel Flow, J - K** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
11.7	1,048	Total			

Subcatchment 6S: H Pre Subdv W



Summary for Subcatchment 7S: H Pre Subdv E

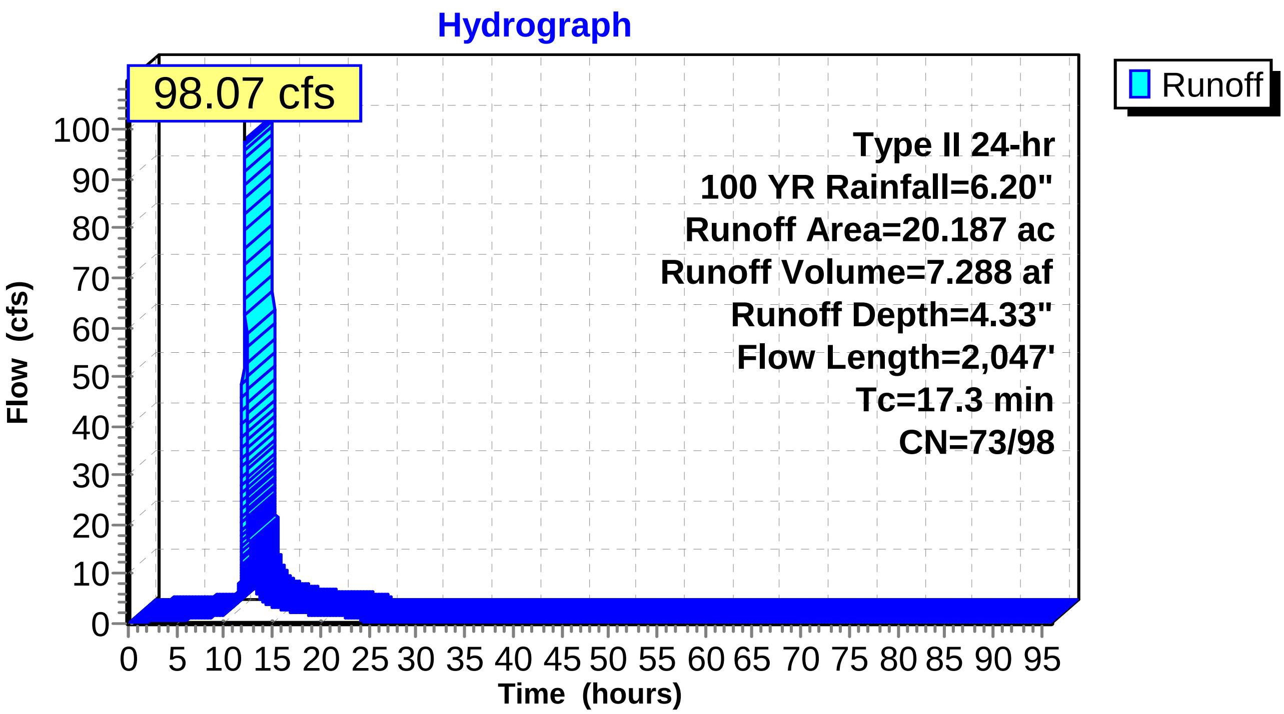
Runoff = 98.07 cfs @ 12.09 hrs, Volume= 7.288 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.206	55	Woods, Good, HSG B
0.531	70	Woods, Good, HSG C
0.925	61	>75% Grass cover, Good, HSG B
10.491	74	>75% Grass cover, Good, HSG C
2.961	98	Paved parking, HSG D
5.073	98	Roofs, HSG D
20.187	83	Weighted Average
12.153		60.20% Pervious Area
8.034		39.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	58	0.4300	0.33		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
10.1	42	0.0100	0.07		**Sheet Flow, B - C** n= 0.240 P2= 2.80"
0.7	67	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.8	158	0.0470	3.49		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.7	189	0.0530	4.67		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.2	87	0.1000	6.42		**Shallow Concentrated Flow, F - G** Paved Kv= 20.3 fps
0.0	29	0.0900	16.43	13.14	**Channel Flow, G - H** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	176	0.1000	22.53	40.55	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.2	116	0.0236	10.94	19.70	**Channel Flow, I - J** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.3	258	0.0239	13.02	40.35	**Channel Flow, J - K** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	81	0.0300	14.58	45.21	**Channel Flow, K - L** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
1.0	501	0.0100	8.42	26.10	**Channel Flow, L - M** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	185	0.0730	26.77	131.19	**Channel Flow, M - N** Area= 4.9 sf Perim= 7.8' r= 0.63' n= 0.011
0.1	100	0.0900	21.37	38.47	**Channel Flow, N - O** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
17.3	2,047	Total			

Subcatchment 7S: H Pre Subdv E



Summary for Subcatchment 8S: H Pre Sub MISC

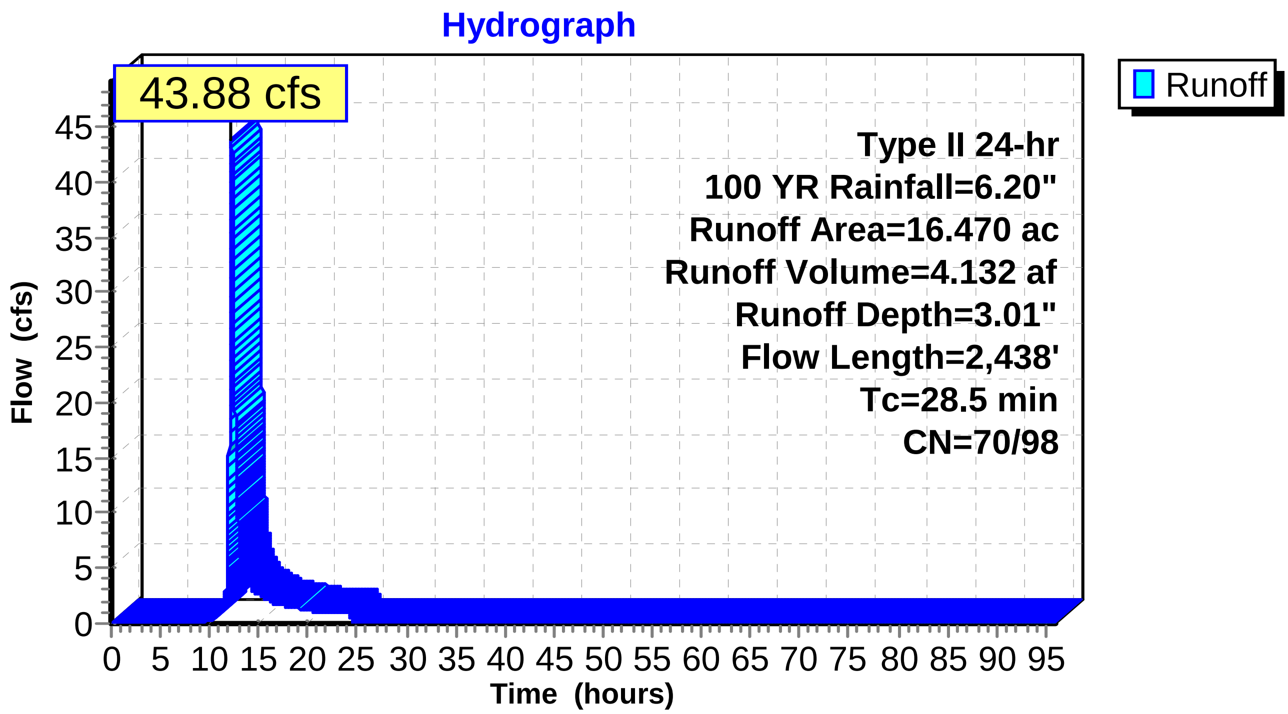
Runoff = 43.88 cfs @ 12.23 hrs, Volume= 4.132 af, Depth= 3.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.955	55	Woods, Good, HSG B
9.912	70	Woods, Good, HSG C
0.489	61	>75% Grass cover, Good, HSG B
4.449	74	>75% Grass cover, Good, HSG C
0.415	80	>75% Grass cover, Good, HSG D
0.250	98	Unconnected pavement, HSG D
16.470	71	Weighted Average
16.220		98.48% Pervious Area
0.250		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.1600	0.18		**Sheet Flow, A - B**
					n= 0.400 P2= 2.80"
1.2	672	0.3420	9.42		**Shallow Concentrated Flow, B - C**
					Unpaved Kv= 16.1 fps
5.8	230	0.0220	0.66	13.26	**Channel Flow, C - D**
					Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
0.9	460	0.0110	8.83	27.38	**Channel Flow, D - E**
					Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
3.8	322	0.1020	1.43	28.55	**Channel Flow, E -F**
					Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
1.5	348	0.0570	3.84		**Shallow Concentrated Flow, F - G**
					Unpaved Kv= 16.1 fps
1.5	256	0.0330	2.92		**Shallow Concentrated Flow, G - H**
					Unpaved Kv= 16.1 fps
28.5	2,438	Total			

Subcatchment 8S: H Pre Sub MISC



Summary for Subcatchment 9S: Pre Central

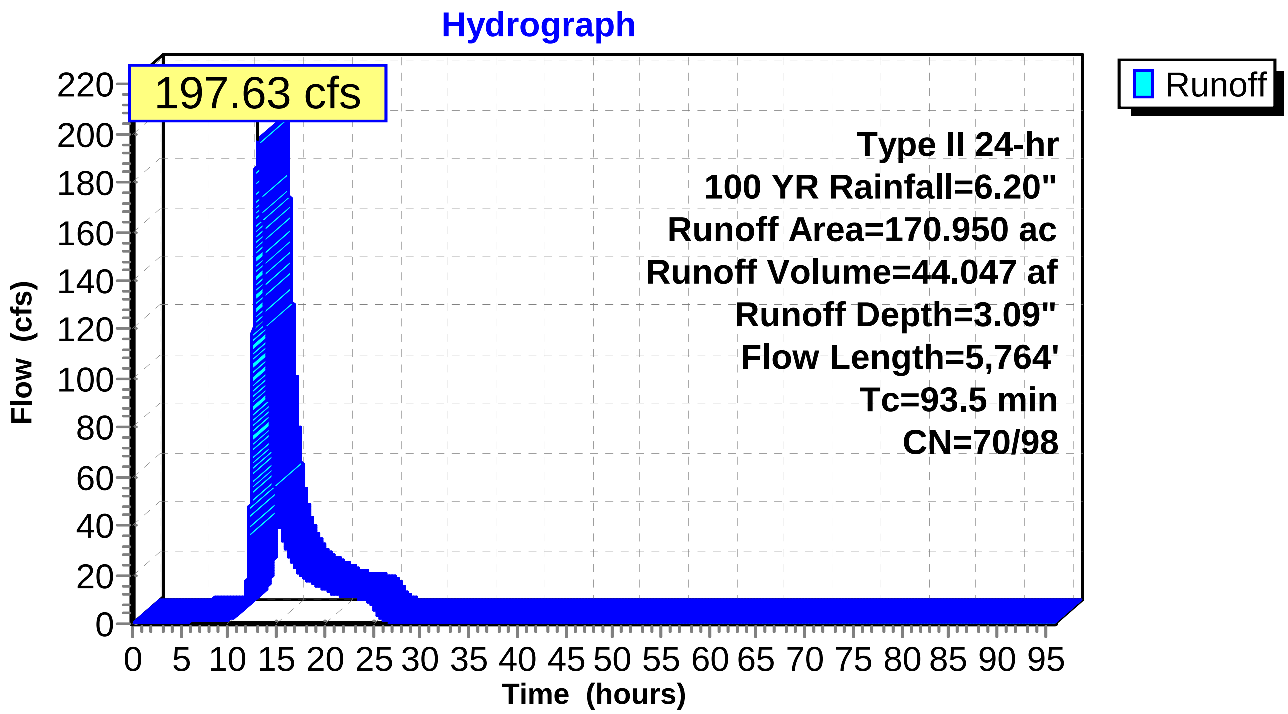
Runoff = 197.63 cfs @ 13.09 hrs, Volume= 44.047 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.900	98	Paved parking, HSG D
2.460	80	1/2 acre lots, 25% imp, HSG C
13.020	74	>75% Grass cover, Good, HSG C
33.500	74	>75% Grass cover, Good, HSG C
2.680	98	Paved parking, HSG D
43.100	70	Woods, Good, HSG C
2.880	71	Meadow, non-grazed, HSG C
0.150	98	Paved roads w/curbs & sewers, HSG D
19.240	74	>75% Grass cover, Good, HSG C
1.770	98	Paved parking, HSG D
2.160	74	>75% Grass cover, Good, HSG C
3.440	74	>75% Grass cover, Good, HSG C
0.120	98	Paved parking, HSG D
2.210	80	>75% Grass cover, Good, HSG D
28.430	61	>75% Grass cover, Good, HSG B
0.640	98	Paved parking, HSG D
0.380	98	Paved parking, HSG D
2.200	74	>75% Grass cover, Good, HSG C
6.660	61	>75% Grass cover, Good, HSG B
3.840	74	>75% Grass cover, Good, HSG C
0.810	61	>75% Grass cover, Good, HSG B
0.360	74	>75% Grass cover, Good, HSG C
170.950	71	Weighted Average
163.695		95.76% Pervious Area
7.255		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
6.4	2,043	0.1080	5.29		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.6	2,079	0.1060	5.24		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
57.5	1,542	0.0030	0.45	2.23	**Channel Flow, D - E** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
93.5	5,764	Total			

Subcatchment 9S: Pre Central



Summary for Subcatchment 10S: Out Pre East

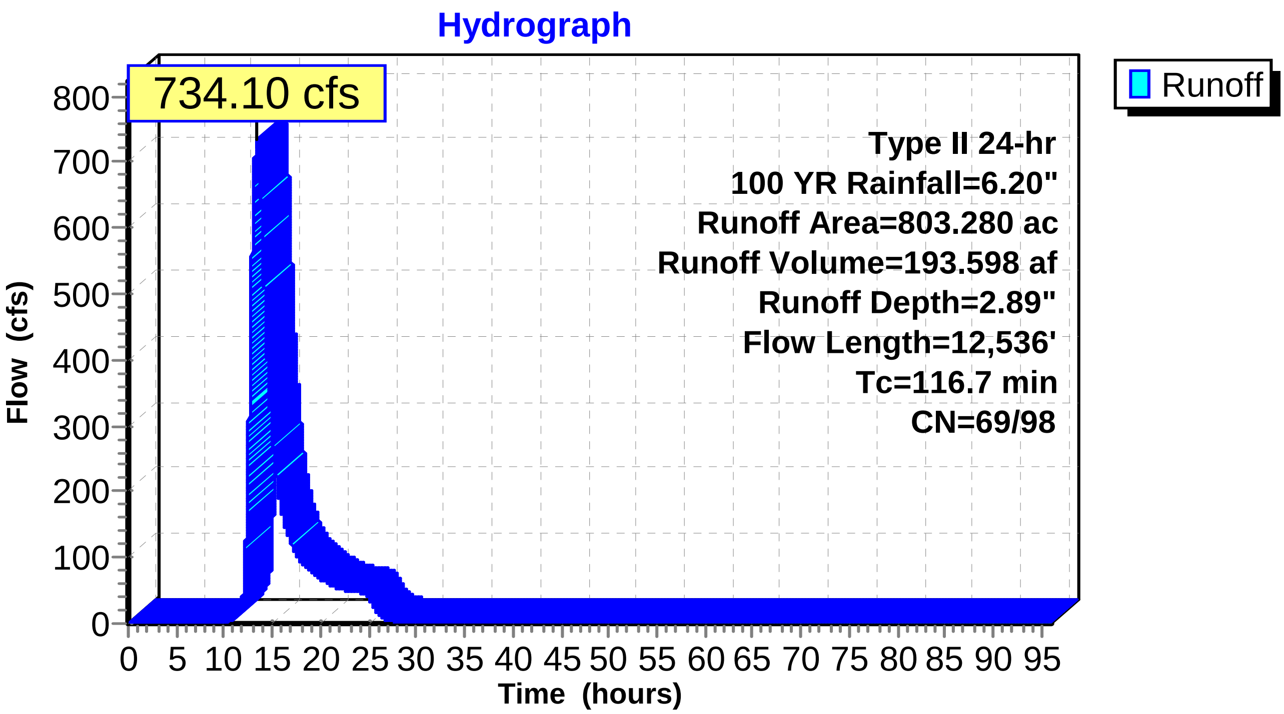
Runoff = 734.10 cfs @ 13.36 hrs, Volume= 193.598 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
11.850	77	Woods, Good, HSG D
5.000	78	Meadow, non-grazed, HSG D
8.390	30	Woods, Good, HSG A
0.390	55	Woods, Good, HSG B
2.250	98	Paved parking, HSG D
7.850	55	Woods, Good, HSG B
0.110	98	Paved parking, HSG D
353.100	70	Woods, Good, HSG C
105.000	71	Meadow, non-grazed, HSG C
3.380	30	Woods, Good, HSG A
9.290	30	Meadow, non-grazed, HSG A
1.750	98	Paved parking, HSG D
9.040	55	Woods, Good, HSG B
8.967	58	Meadow, non-grazed, HSG B
181.500	70	Woods, Good, HSG C
1.640	98	Paved parking, HSG D
93.673	74	>75% Grass cover, Good, HSG C
0.100	98	Roofs, HSG D
803.280	69	Weighted Average
797.430		99.27% Pervious Area
5.850		0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0500	0.10		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
9.0	2,298	0.0700	4.26		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
91.8	10,138	0.0510	1.84	9.21	**Channel Flow, C - D** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
116.7	12,536	Total			

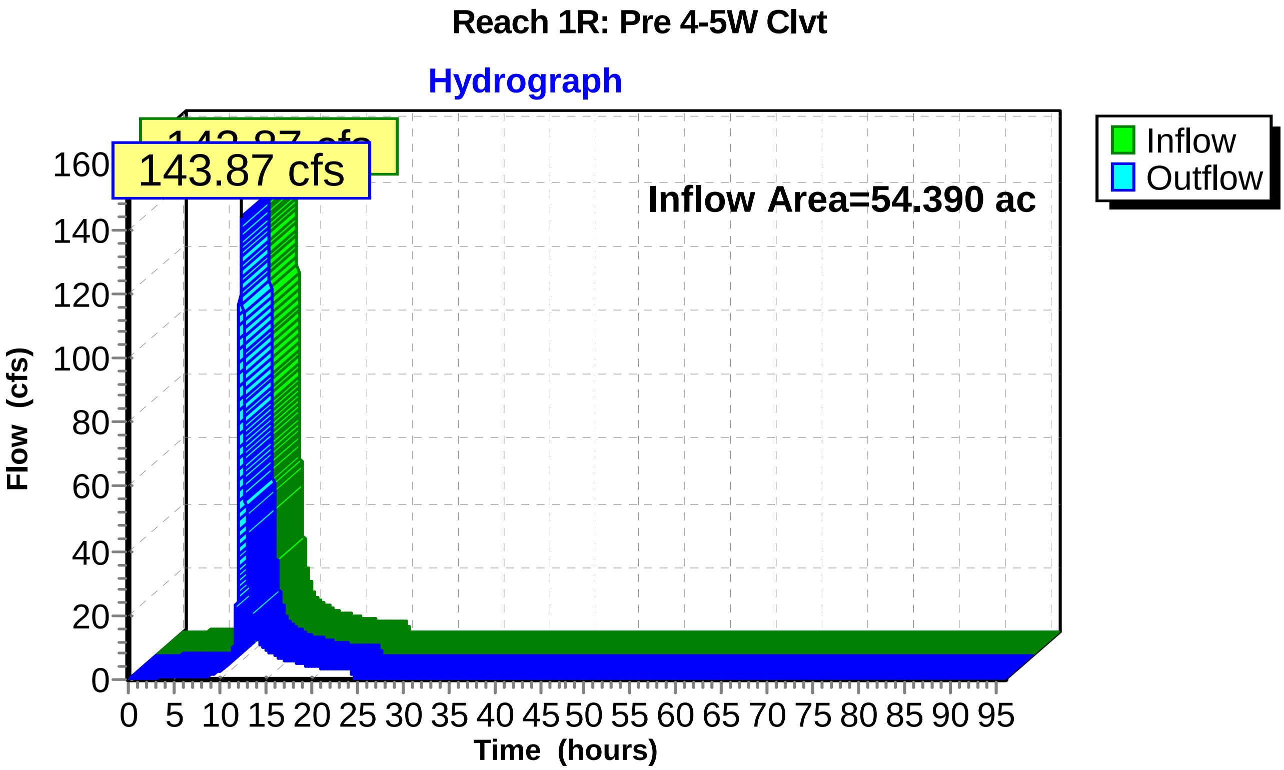
Subcatchment 10S: Out Pre East



Summary for Reach 1R: Pre 4-5W Clvt

Inflow Area =	54.390 ac,	16.07% Impervious,	Inflow Depth = 3.69"	for 100 YR event	
Inflow =	143.87 cfs @	12.35 hrs,	Volume=	16.726 af	
Outflow =	143.87 cfs @	12.36 hrs,	Volume=	16.726 af,	Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

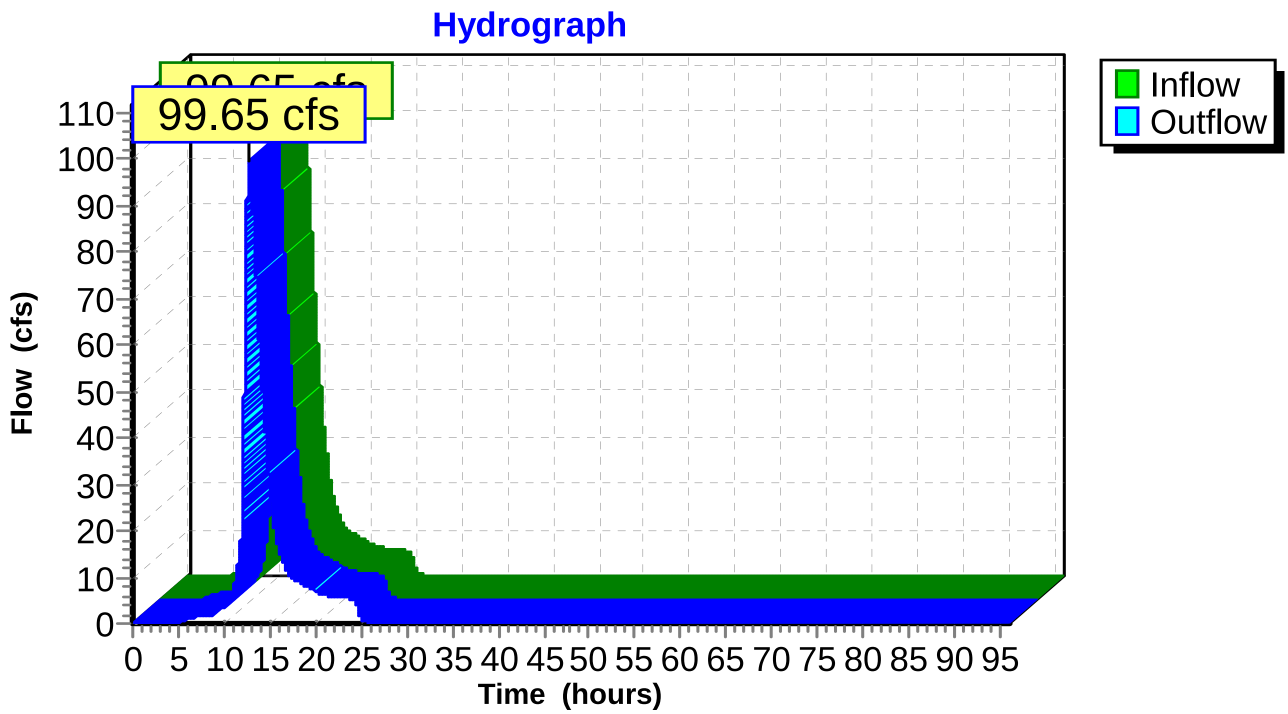


Summary for Reach 2R: Out Pret West

Inflow	=	99.65 cfs @	12.78 hrs,	Volume=	25.868 af
Outflow	=	99.65 cfs @	12.79 hrs,	Volume=	25.868 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

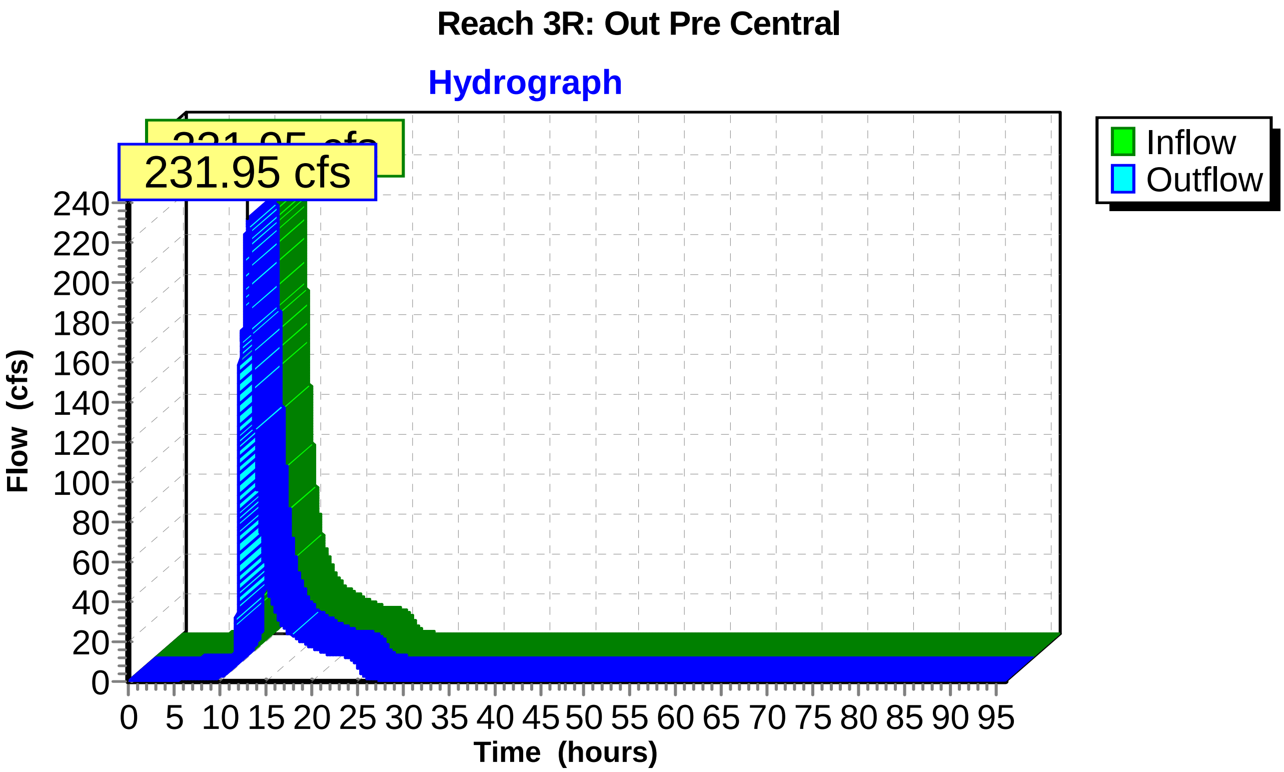
Reach 2R: Out Pret West



Summary for Reach 3R: Out Pre Central

Inflow	=	231.95 cfs @	12.99 hrs,	Volume=	56.793 af
Outflow	=	231.95 cfs @	13.00 hrs,	Volume=	56.793 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Summary for Pond 1P: Pre South Pond

Inflow	=	210.46 cfs @	12.34 hrs,	Volume=	26.176 af
Outflow	=	99.65 cfs @	12.78 hrs,	Volume=	26.180 af, Atten= 53%, Lag= 26.4 min
Primary	=	99.65 cfs @	12.78 hrs,	Volume=	25.868 af
Secondary	=	0.79 cfs @	4.78 hrs,	Volume=	0.312 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 823.62' @ 12.78 hrs Surf.Area= 5.311 ac Storage= 6.565 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 30.7 min (885.5 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	418.450 af	**PosSPond (Conic)** Listed below (Recalc)

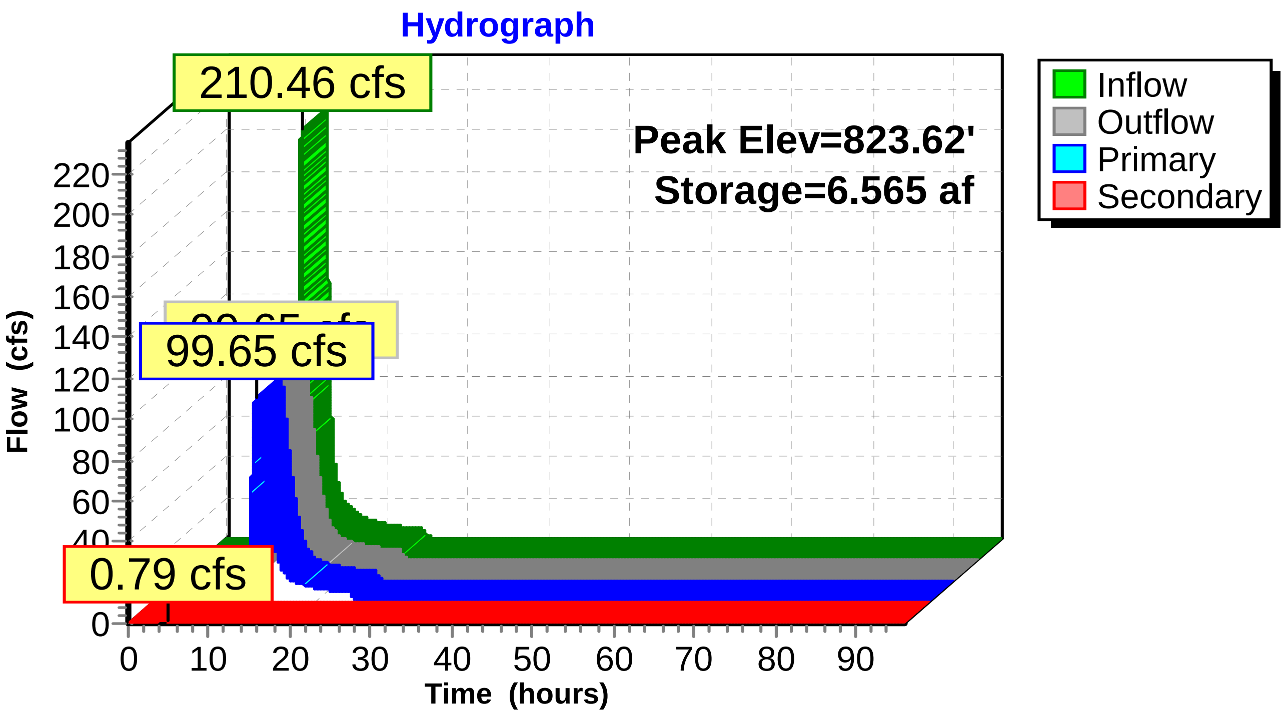
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
821.00	0.010	0.000	0.000	0.010
822.60	3.600	2.027	2.027	3.600
824.00	6.020	6.662	8.688	6.021
826.00	6.790	12.802	21.491	6.795
828.00	7.430	14.215	35.706	7.442
830.00	7.880	15.308	51.014	7.902
832.00	8.280	16.158	67.172	8.313
834.00	8.500	16.780	83.951	8.554
836.00	8.990	17.488	101.439	9.054
838.00	9.850	18.833	120.273	9.920
840.00	10.330	20.178	140.451	10.412
842.00	15.310	25.477	165.928	15.394
858.00	16.260	252.522	418.450	16.832

Device	Routing	Invert	Outlet Devices
#1	Primary	821.11'	**9.5' long x 100.0' 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
#2	Secondary	820.81'	**24.0" Round Culvert** L= 30.0' Ke= 0.200 Inlet / Outlet Invert= 819.81' / 820.81' S= -0.0333 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=99.65 cfs @ 12.78 hrs HW=823.62' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 99.65 cfs @ 4.17 fps)

Secondary OutFlow Max=0.79 cfs @ 4.78 hrs HW=821.13' TW=820.97' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.79 cfs @ 2.41 fps)

Pond 1P: Pre South Pond



Summary for Pond 2P: Pre North Pond

Inflow = 66.47 cfs @ 12.07 hrs, Volume= 4.789 af
Outflow = 32.29 cfs @ 12.21 hrs, Volume= 4.572 af, Atten= 51%, Lag= 8.0 min
Primary = 26.33 cfs @ 12.16 hrs, Volume= 4.288 af
Secondary = 6.47 cfs @ 12.25 hrs, Volume= 0.285 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.81' Surf.Area= 0.020 ac Storage= 0.006 af
Peak Elev= 824.61' @ 12.25 hrs Surf.Area= 0.614 ac Storage= 1.211 af (1.205 af above start)

Plug-Flow detention time= 187.4 min calculated for 4.599 af (95% of inflow)
Center-of-Mass det. time= 69.4 min (943.6 - 874.9)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	37.557 af	**PostNPond (Conic)** Listed below

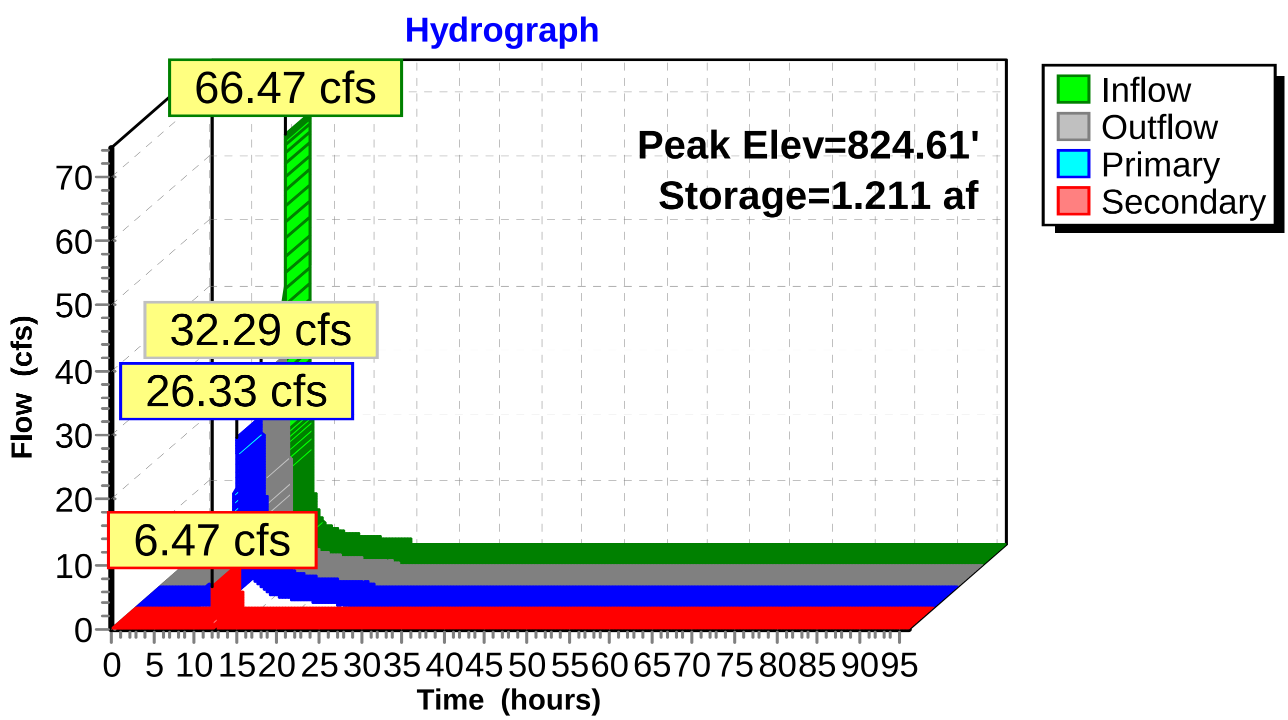
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
819.81	0.020	0.006	0.006	0.020
820.00	0.030	0.005	0.010	0.030
824.00	0.430	0.765	0.775	0.431
826.00	1.030	1.417	2.192	1.032
828.00	1.340	2.363	4.555	1.344
830.00	2.170	3.477	8.032	2.175
832.00	2.470	4.637	12.669	2.480
834.00	2.790	5.257	17.926	2.804
836.00	3.090	5.877	23.803	3.110
838.00	3.440	6.527	30.330	3.465
840.00	3.790	7.227	37.557	3.821

Device	Routing	Invert	Outlet Devices
#1	Primary	820.41'	**24.0" Round Culvert - Watson** L= 30.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 820.41' / 819.81' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Secondary	823.50'	**24.0" Round Culvert - Post Pipe** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 823.50' / 819.00' S= 0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=26.14 cfs @ 12.16 hrs HW=824.49' TW=822.58' (Dynamic Tailwater)
└─**1=Culvert - Watson** (Inlet Controls 26.14 cfs @ 8.32 fps)

Secondary OutFlow Max=6.47 cfs @ 12.25 hrs HW=824.61' TW=820.91' (Dynamic Tailwater)
└─**2=Culvert - Post Pipe** (Inlet Controls 6.47 cfs @ 3.59 fps)

Pond 2P: Pre North Pond



Summary for Pond 3P: Pre CClub Pond

Inflow =	14.25 cfs @	12.16 hrs, Volume=	1.001 af	
Outflow =	14.19 cfs @	12.18 hrs, Volume=	1.001 af,	Atten= 0%, Lag= 1.3 min
Primary =	14.19 cfs @	12.18 hrs, Volume=	1.001 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.42' Surf.Area= 0.010 ac Storage= 0.000 af
Peak Elev= 821.00' @ 12.18 hrs Surf.Area= 0.022 ac Storage= 0.030 af

Plug-Flow detention time= 3.4 min calculated for 1.001 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (804.9 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	1.167 af	**PostCClubPond (Conic)** Listed below (Recalc)

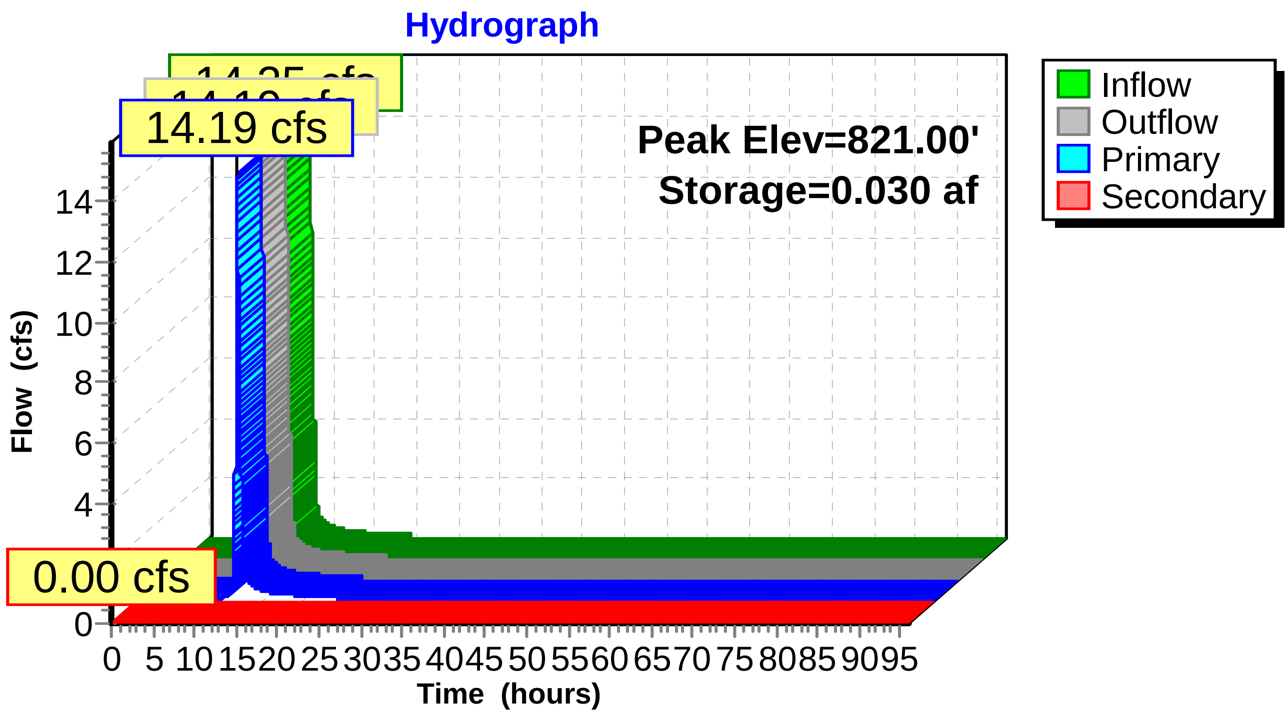
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
820.00	0.020	0.009	0.009	0.020
824.00	0.030	0.099	0.108	0.035
826.00	0.040	0.070	0.178	0.047
828.00	0.050	0.090	0.267	0.059
830.00	0.060	0.110	0.377	0.072
832.00	0.070	0.130	0.507	0.085
834.00	0.080	0.150	0.657	0.099
840.00	0.090	0.510	1.167	0.130

Device	Routing	Invert	Outlet Devices
#1	Primary	819.42'	**24.0" Round Culvert** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 819.42' / 817.75' S= 0.0334 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Primary	825.05'	**145.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#3	Secondary	823.50'	**24.0" Round Culvert** L= 210.0' Ke= 0.500 Inlet / Outlet Invert= 819.00' / 823.50' S= -0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=14.19 cfs @ 12.18 hrs HW=821.00' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 14.19 cfs @ 5.34 fps)
└─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.42' TW=819.81' (Dynamic Tailwater)
└─**3=Culvert** (Controls 0.00 cfs)

Pond 3P: Pre CClub Pond



Summary for Pond 4P: H Pre West

Inflow Area =	3.343 ac, 42.51% Impervious, Inflow Depth = 4.46" for 100 YR event			
Inflow =	19.82 cfs @	12.03 hrs, Volume=	1.243 af	
Outflow =	16.84 cfs @	12.09 hrs, Volume=	1.335 af,	Atten= 15%, Lag= 3.9 min
Discarded =	0.08 cfs @	12.09 hrs, Volume=	0.181 af	
Primary =	16.77 cfs @	12.09 hrs, Volume=	1.153 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 826.00' Surf.Area= 0.052 ac Storage= 0.093 af
Peak Elev= 829.26' @ 12.09 hrs Surf.Area= 0.119 ac Storage= 0.361 af (0.267 af above start)

Plug-Flow detention time= 249.8 min calculated for 1.241 af (100% of inflow)
Center-of-Mass det. time= 207.2 min (989.2 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1	822.00'	0.452 af	**H Pond West (Conic)** Listed below (Recalc)

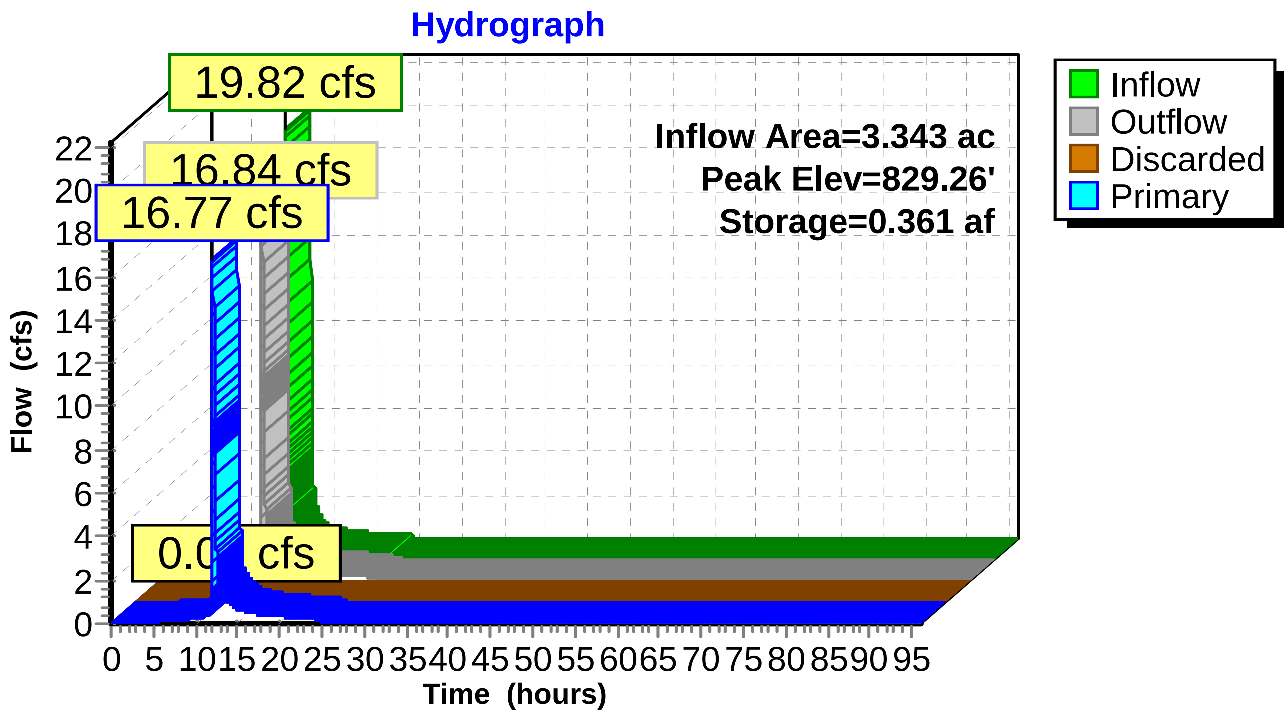
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
822.00	0.004	0.000	0.000	0.004
824.00	0.021	0.023	0.023	0.021
826.00	0.052	0.071	0.093	0.053
828.00	0.086	0.137	0.230	0.088
829.00	0.116	0.101	0.331	0.119
830.00	0.126	0.121	0.452	0.130

Device	Routing	Invert	Outlet Devices
#1	Discarded	822.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	825.90'	**15.0" Round Culvert** L= 82.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 825.90' / 825.16' S= 0.0089 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#3	Device 2	826.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	827.00'	**45.0 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	828.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	829.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.08 cfs @ 12.09 hrs HW=829.26' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=16.72 cfs @ 12.09 hrs HW=829.26' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 9.76 cfs @ 7.96 fps)
│ ├─**3=Orifice/Grate** (Passes < 0.74 cfs potential flow)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Passes < 2.64 cfs potential flow)
│ └─**5=Orifice/Grate** (Passes < 64.44 cfs potential flow)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 6.96 cfs @ 1.36 fps)

Pond 4P: H Pre West



Summary for Pond 5P: H Pre East

Inflow Area = 20.187 ac, 39.80% Impervious, Inflow Depth = 4.33" for 100 YR event
Inflow = 98.07 cfs @ 12.09 hrs, Volume= 7.288 af
Outflow = 56.94 cfs @ 12.25 hrs, Volume= 7.969 af, Atten= 42%, Lag= 9.6 min
Discarded = 0.38 cfs @ 12.25 hrs, Volume= 1.509 af
Primary = 56.56 cfs @ 12.25 hrs, Volume= 6.460 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 846.00' Surf.Area= 0.300 ac Storage= 1.128 af
Peak Elev= 851.68' @ 12.25 hrs Surf.Area= 0.592 ac Storage= 3.687 af (2.559 af above start)

Plug-Flow detention time= 568.7 min calculated for 6.840 af (94% of inflow)
Center-of-Mass det. time= 436.1 min (1,226.0 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1	840.00'	4.506 af	**H Pond East (Conic)** Listed below

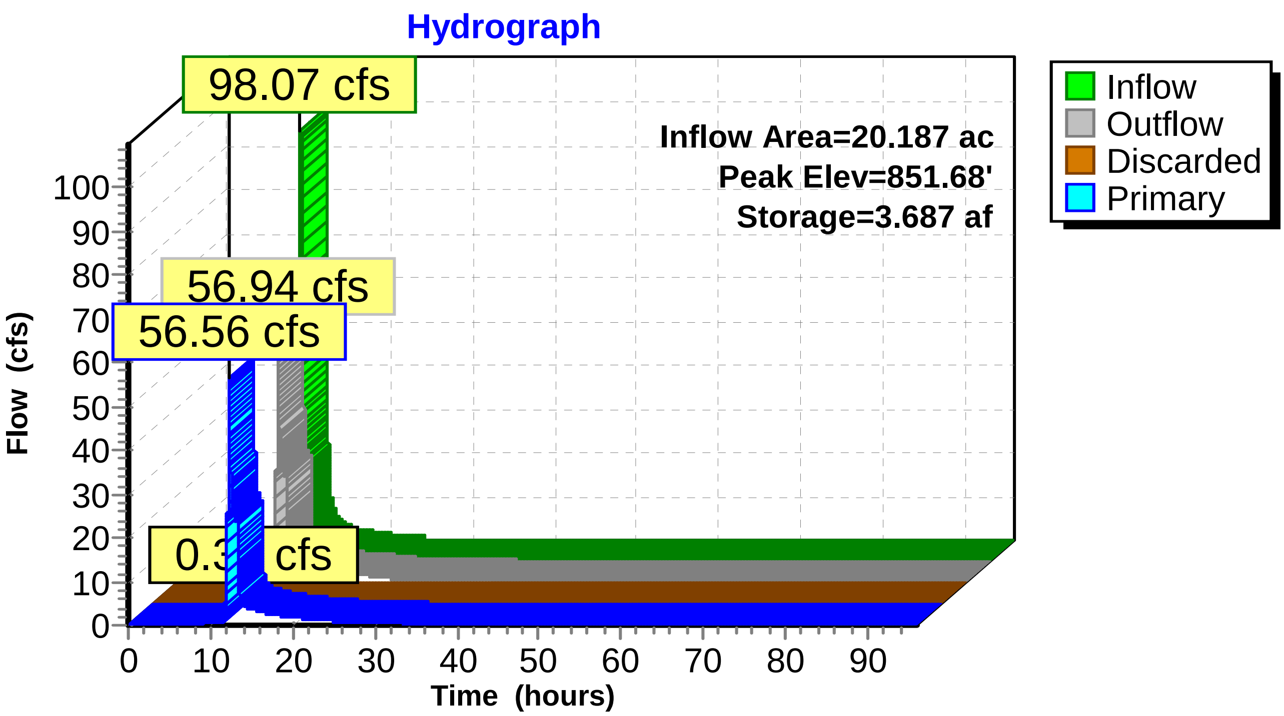
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
840.00	0.093	0.000	0.000	0.093
842.00	0.151	0.242	0.242	0.152
844.00	0.220	0.369	0.611	0.223
846.00	0.300	0.518	1.128	0.305
848.00	0.407	0.704	1.833	0.413
850.00	0.512	0.917	2.750	0.521
852.00	0.608	1.119	3.868	0.620
853.00	0.668	0.638	4.506	0.682

Device	Routing	Invert	Outlet Devices
#1	Discarded	840.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	841.00'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.00' / 835.64' S= 0.0443 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#3	Device 2	846.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	847.50'	**45.0 deg x 849.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	849.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	851.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.38 cfs @ 12.25 hrs HW=851.68' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.38 cfs)

Primary OutFlow Max=56.54 cfs @ 12.25 hrs HW=851.68' TW=0.00' (Dynamic Tailwater)
├**2=Culvert** (Inlet Controls 26.81 cfs @ 15.17 fps)
│├**3=Orifice/Grate** (Passes < 0.99 cfs potential flow)
│├**4=Sharp-Crested Vee/Trap Weir** (Passes < 39.84 cfs potential flow)
│└**5=Orifice/Grate** (Passes < 94.51 cfs potential flow)
└**6=Broad-Crested Rectangular Weir** (Weir Controls 29.73 cfs @ 2.20 fps)

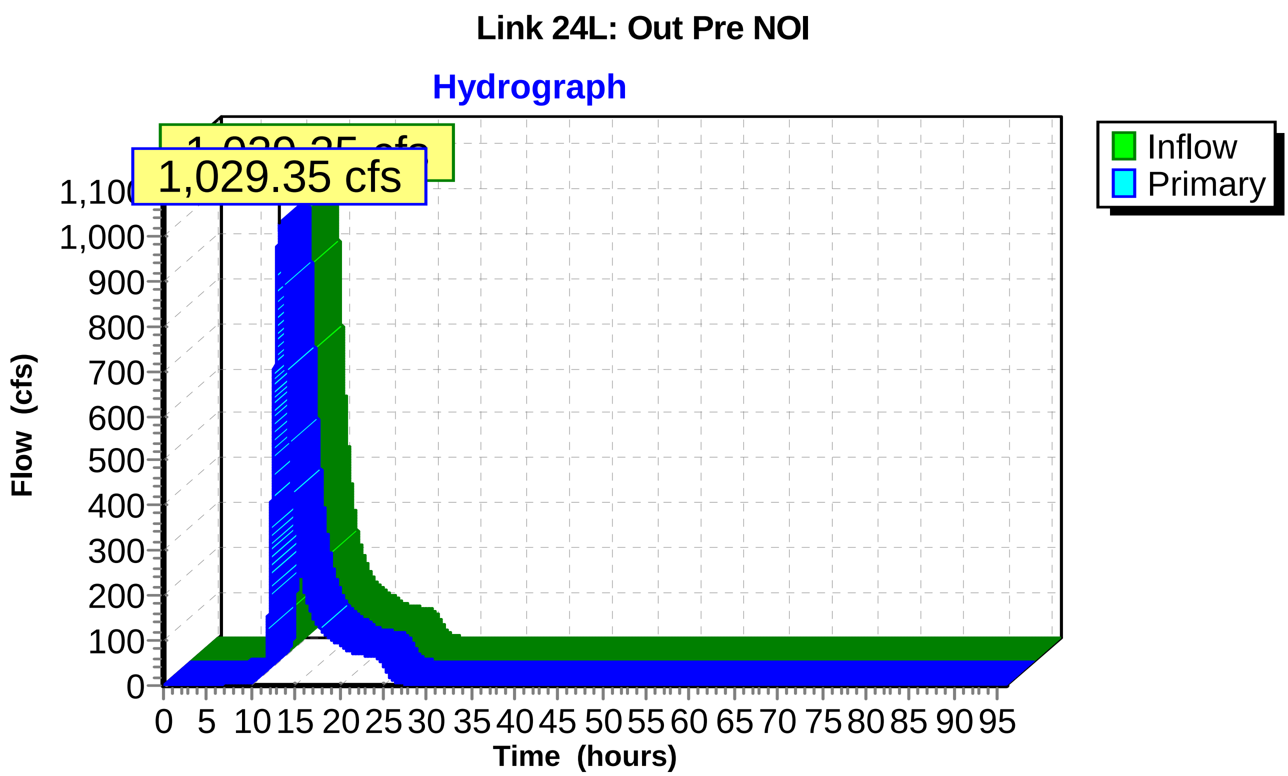
Pond 5P: H Pre East

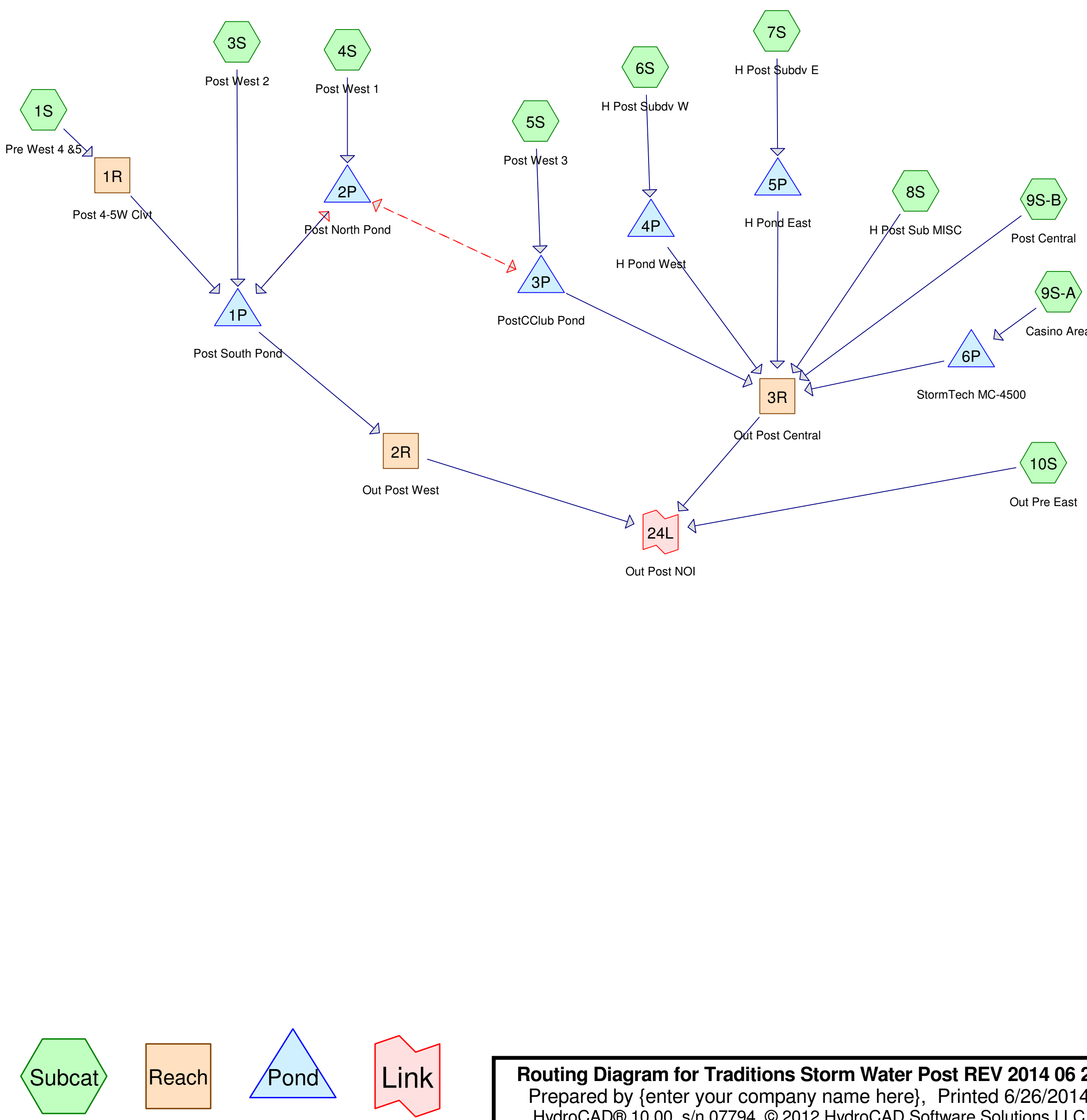


Summary for Link 24L: Out Pre NOI

Inflow	=	1,029.35 cfs @	13.23 hrs,	Volume=	276.259 af
Primary	=	1,029.35 cfs @	13.24 hrs,	Volume=	276.259 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs





Routing Diagram for Traditions Storm Water Post REV 2014 06 26
Prepared by {enter your company name here}, Printed 6/26/2014
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
37.100	80	1/2 acre lots, 25% imp, HSG C (1S, 9S-B)
3.220	83	1/4 acre lots, 38% imp, HSG C (4S)
40.314	61	>75% Grass cover, Good, HSG B (7S, 8S, 9S-A, 9S-B)
183.832	74	>75% Grass cover, Good, HSG C (1S, 4S, 6S, 7S, 8S, 9S-B, 10S)
2.718	80	>75% Grass cover, Good, HSG D (6S, 8S, 9S-B)
0.380	70	Brush, Fair, HSG C (3S)
0.440	48	Brush, Good, HSG B (5S)
14.830	65	Brush, Good, HSG C (3S, 4S, 5S)
1.010	73	Brush, Good, HSG D (4S, 5S)
9.290	30	Meadow, non-grazed, HSG A (10S)
8.967	58	Meadow, non-grazed, HSG B (10S)
108.170	71	Meadow, non-grazed, HSG C (4S, 9S-B, 10S)
5.840	78	Meadow, non-grazed, HSG D (4S, 5S, 10S)
26.621	98	Paved parking, HSG D (3S, 4S, 5S, 7S, 9S-A, 9S-B, 10S)
0.080	98	Paved roads w/curbs & sewers, HSG C (1S)
0.909	98	Paved roads w/curbs & sewers, HSG D (3S, 6S, 9S-B)
5.655	98	Roofs, HSG D (6S, 7S, 10S)
0.250	98	Unconnected pavement, HSG D (8S)
2.870	98	Water Surface, HSG D (3S, 4S)
11.770	30	Woods, Good, HSG A (10S)
18.541	55	Woods, Good, HSG B (3S, 7S, 8S, 10S)
610.403	70	Woods, Good, HSG C (1S, 3S, 4S, 5S, 7S, 8S, 9S-B, 10S)
12.510	77	Woods, Good, HSG D (3S, 10S)
1,105.720	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
21.060	HSG A	10S
68.262	HSG B	3S, 5S, 7S, 8S, 9S-A, 9S-B, 10S
958.015	HSG C	1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S-B, 10S
58.383	HSG D	3S, 4S, 5S, 6S, 7S, 8S, 9S-A, 9S-B, 10S
0.000	Other	
1,105.720		**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	37.100	0.000	0.000	37.100	1/2 acre lots, 25% imp	1S, 9S-B
0.000	0.000	3.220	0.000	0.000	3.220	1/4 acre lots, 38% imp	4S
0.000	40.314	183.832	2.718	0.000	226.864	>75% Grass cover, Good	1S, 4S, 6S, 7S, 8S, 9S-A, 9S-B, 10S
0.000	0.000	0.380	0.000	0.000	0.380	Brush, Fair	3S
0.000	0.440	14.830	1.010	0.000	16.280	Brush, Good	3S, 4S, 5S
9.290	8.967	108.170	5.840	0.000	132.267	Meadow, non-grazed	4S, 5S, 9S-B, 10S
0.000	0.000	0.000	26.621	0.000	26.621	Paved parking	3S, 4S, 5S, 7S, 9S-A, 9S-B,

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
0.000	0.000	0.080	0.909	0.000	0.989	Paved roads w/curbs & sewers	1S, 3S, 6S, 9S-B
0.000	0.000	0.000	5.655	0.000	5.655	Roofs	6S, 7S, 10S
0.000	0.000	0.000	0.250	0.000	0.250	Unconnected pavement	8S
0.000	0.000	0.000	2.870	0.000	2.870	Water Surface	3S, 4S
11.770	18.541	610.403	12.510	0.000	653.224	Woods, Good	1S, 3S, 4S, 5S, 7S, 8S, 9S-B, 10S
21.060	**68.262**	**958.015**	**58.383**	**0.000**	**1,105.720**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	819.81	820.81	30.0	-0.0333	0.011	24.0	0.0	0.0
2	2P	820.41	819.81	30.0	0.0200	0.011	24.0	0.0	0.0
3	2P	823.50	819.00	210.0	0.0214	0.011	24.0	0.0	0.0
4	3P	819.42	817.75	50.0	0.0334	0.011	24.0	0.0	0.0
5	3P	819.00	823.50	210.0	-0.0214	0.011	24.0	0.0	0.0
6	4P	825.90	825.16	82.8	0.0089	0.011	15.0	0.0	0.0
7	5P	841.00	835.64	121.0	0.0443	0.011	18.0	0.0	0.0

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Sim-Route method - Pond routing by Sim-Route method w/Net Flows

Subcatchment 1S: Pre West 4 &5 Runoff Area=54.390 ac 16.07% Impervious Runoff Depth=0.78"
Flow Length=1,592' Tc=38.2 min CN=73/98 Runoff=26.66 cfs 3.538 af

Subcatchment 3S: Post West 2 Runoff Area=19.170 ac 19.04% Impervious Runoff Depth=0.65"
Flow Length=1,118' Tc=36.8 min CN=66/98 Runoff=7.31 cfs 1.033 af

Subcatchment 4S: Post West 1 Runoff Area=15.200 ac 13.44% Impervious Runoff Depth=0.71"
Flow Length=1,386' Tc=15.5 min CN=72/98 Runoff=11.69 cfs 0.893 af

Subcatchment 5S: Post West 3 Runoff Area=2.830 ac 15.55% Impervious Runoff Depth=0.56"
Flow Length=1,204' Tc=18.0 min CN=65/98 Runoff=1.38 cfs 0.132 af

Subcatchment 6S: H Post Subdv W Runoff Area=3.343 ac 42.51% Impervious Runoff Depth=1.24"
Flow Length=1,048' Tc=11.7 min CN=74/98 Runoff=5.35 cfs 0.346 af

Subcatchment 7S: H Post Subdv E Runoff Area=20.187 ac 39.80% Impervious Runoff Depth=1.17"
Flow Length=2,047' Tc=17.3 min CN=73/98 Runoff=25.35 cfs 1.975 af

Subcatchment 8S: H Post Sub MISC Runoff Area=16.470 ac 1.52% Impervious Runoff Depth=0.44"
Flow Length=2,438' Tc=28.5 min CN=70/98 Runoff=4.72 cfs 0.597 af

Subcatchment 9S-A: Casino Area Runoff Area=12.900 ac 76.74% Impervious Runoff Depth=1.71"
Flow Length=550' Tc=24.8 min CN=61/98 Runoff=19.47 cfs 1.833 af

Subcatchment 9S-B: Post Central Runoff Area=157.950 ac 4.15% Impervious Runoff Depth=0.48"
Flow Length=5,764' Tc=93.5 min CN=70/98 Runoff=22.36 cfs 6.339 af

Subcatchment 10S: Out Pre East Runoff Area=803.280 ac 0.73% Impervious Runoff Depth=0.39"
Flow Length=12,536' Tc=116.7 min CN=69/98 Runoff=72.56 cfs 26.051 af

Reach 1R: Post 4-5W Clvt Inflow=26.66 cfs 3.538 af
Outflow=26.66 cfs 3.538 af

Reach 2R: Out Post West Inflow=25.28 cfs 5.262 af
Outflow=25.28 cfs 5.262 af

Reach 3R: Out Post Central Inflow=26.22 cfs 8.611 af
Outflow=26.22 cfs 8.611 af

Pond 1P: Post South Pond Peak Elev=822.12' Storage=0.739 af Inflow=37.73 cfs 5.562 af
Primary=25.28 cfs 5.262 af Secondary=0.56 cfs 0.315 af Outflow=25.28 cfs 5.577 af

Pond 2P: Post North Pond Peak Elev=822.13' Storage=0.418 af Inflow=11.69 cfs 1.208 af
Primary=6.56 cfs 0.991 af Secondary=0.00 cfs 0.000 af Outflow=6.56 cfs 0.991 af

Pond 3P: PostCClub Pond Peak Elev=819.85' Storage=0.006 af Inflow=1.38 cfs 0.132 af
Primary=1.35 cfs 0.132 af Secondary=0.00 cfs 0.000 af Outflow=1.35 cfs 0.132 af

Pond 4P: H Pond West Peak Elev=827.86' Storage=0.218 af Inflow=5.35 cfs 0.346 af
Discarded=0.05 cfs 0.168 af Primary=1.31 cfs 0.270 af Outflow=1.36 cfs 0.438 af

Pond 5P: H Pond East Peak Elev=848.57' Storage=2.093 af Inflow=25.35 cfs 1.975 af
Discarded=0.28 cfs 1.420 af Primary=1.97 cfs 1.272 af Outflow=2.24 cfs 2.693 af

Pond 6P: StormTech MC-4500 Peak Elev=864.09' Storage=0.703 af Inflow=19.47 cfs 1.833 af
Discarded=2.13 cfs 2.803 af Primary=0.04 cfs 0.002 af Outflow=2.17 cfs 2.805 af

Link 24L: Out Post NOI Inflow=111.06 cfs 39.924 af
Primary=111.06 cfs 39.924 af

Total Runoff Area = 1,105.720 ac Runoff Volume = 42.736 af Average Runoff Depth = 0.46"
95.76% Pervious = 1,058.836 ac 4.24% Impervious = 46.884 ac

Summary for Subcatchment 1S: Pre West 4 &5

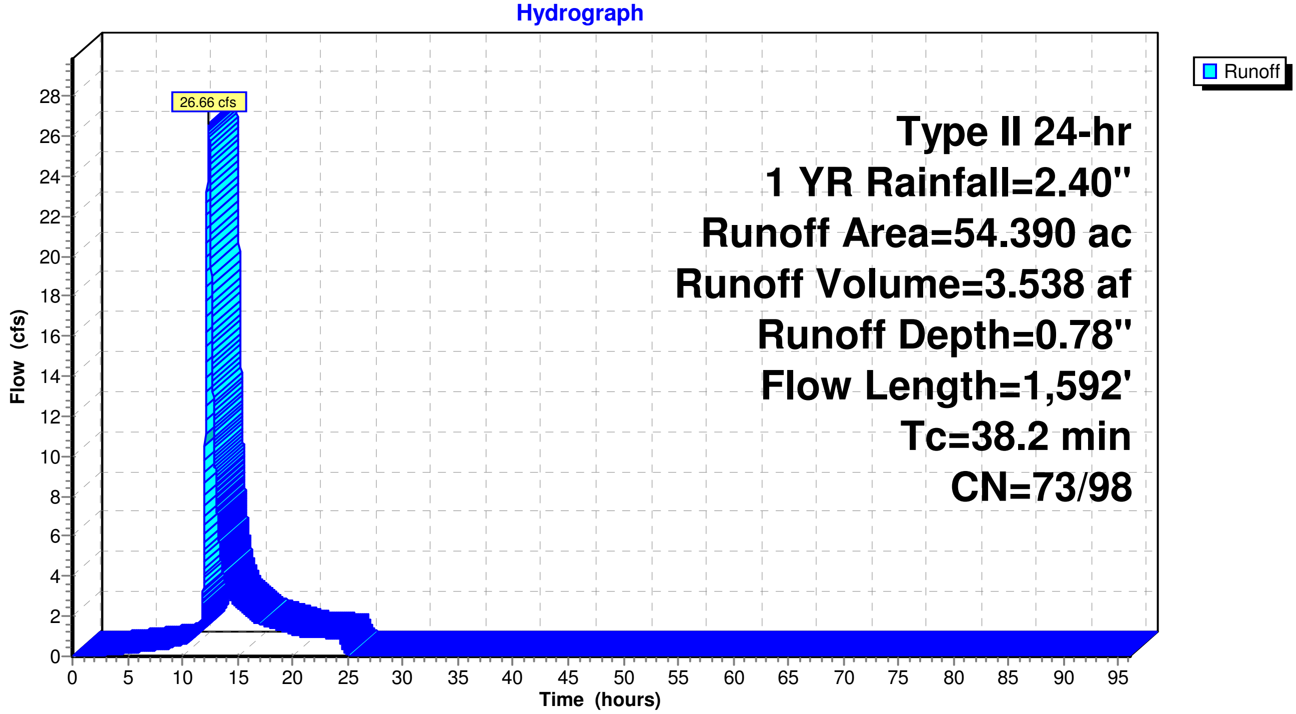
Runoff = 26.66 cfs @ 12.35 hrs, Volume= 3.538 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
22.690	80	1/2 acre lots, 25% imp, HSG C
11.210	70	Woods, Good, HSG C
1.910	70	Woods, Good, HSG C
11.950	80	1/2 acre lots, 25% imp, HSG C
5.240	74	>75% Grass cover, Good, HSG C
1.310	70	Woods, Good, HSG C
0.080	98	Paved roads w/curbs & sewers, HSG C
54.390	77	Weighted Average
45.650	73	83.93% Pervious Area
8.740	98	16.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0100	0.06		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
2.4	845	0.1300	5.80		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.5	647	0.0150	1.97		**Shallow Concentrated Flow, C -D** Unpaved Kv= 16.1 fps
38.2	1,592	Total			

Subcatchment 1S: Pre West 4 &5



Summary for Subcatchment 3S: Post West 2

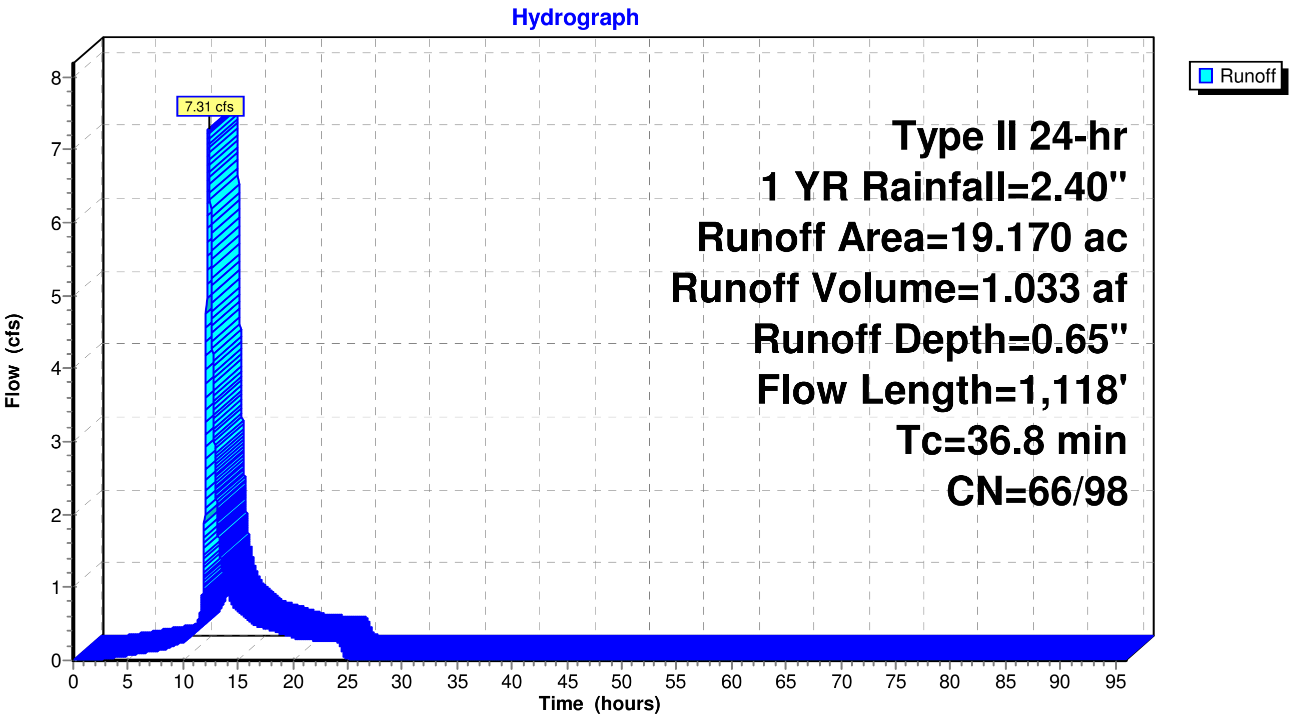
Runoff = 7.31 cfs @ 12.35 hrs, Volume= 1.033 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG D
0.100	55	Woods, Good, HSG B
0.650	70	Woods, Good, HSG C
0.660	77	Woods, Good, HSG D
0.320	98	Paved roads w/curbs & sewers, HSG D
0.620	65	Brush, Good, HSG C
1.970	65	Brush, Good, HSG C
2.620	98	Water Surface, HSG D
0.380	70	Brush, Fair, HSG C
0.640	98	Paved parking, HSG D
4.020	65	Brush, Good, HSG C
7.120	65	Brush, Good, HSG C
19.170	72	Weighted Average
15.520	66	80.96% Pervious Area
3.650	98	19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0800	0.13		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
7.9	240	0.0010	0.51		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.3	114	0.1580	6.40		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
15.4	664	0.0020	0.72		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
36.8	1,118	Total			

Subcatchment 3S: Post West 2



Summary for Subcatchment 4S: Post West 1

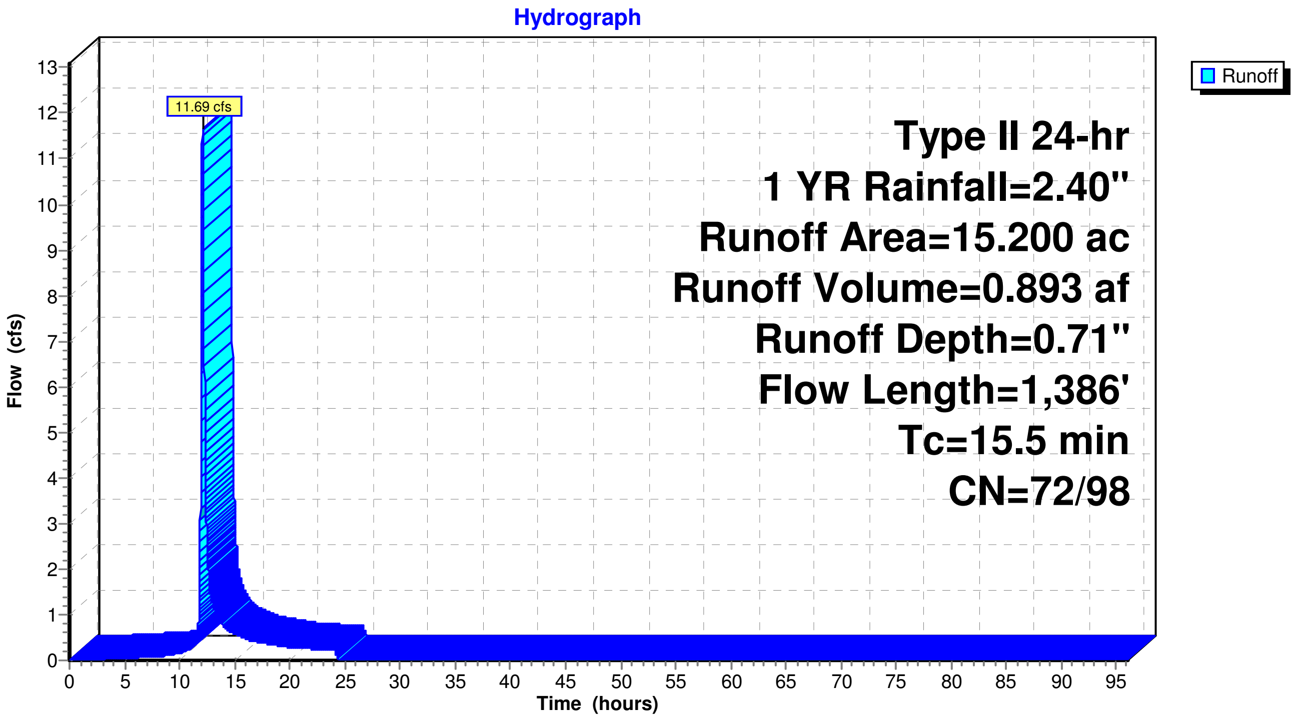
Runoff = 11.69 cfs @ 12.09 hrs, Volume= 0.893 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
3.220	83	1/4 acre lots, 38% imp, HSG C
1.960	70	Woods, Good, HSG C
0.240	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
4.610	70	Woods, Good, HSG C
2.690	74	>75% Grass cover, Good, HSG C
0.290	71	Meadow, non-grazed, HSG C
0.770	78	Meadow, non-grazed, HSG D
0.250	98	Water Surface, HSG D
0.330	65	Brush, Good, HSG C
0.510	73	Brush, Good, HSG D
15.200	75	Weighted Average
13.156	72	86.56% Pervious Area
2.044	98	13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.1000	0.21		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.6	286	0.2450	7.97		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	399	0.2260	7.65		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
3.1	96	0.0010	0.51		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
2.9	505	0.0320	2.88		**Shallow Concentrated Flow, E - F** Unpaved Kv= 16.1 fps
15.5	1,386	Total			

Subcatchment 4S: Post West 1



Summary for Subcatchment 5S: Post West 3

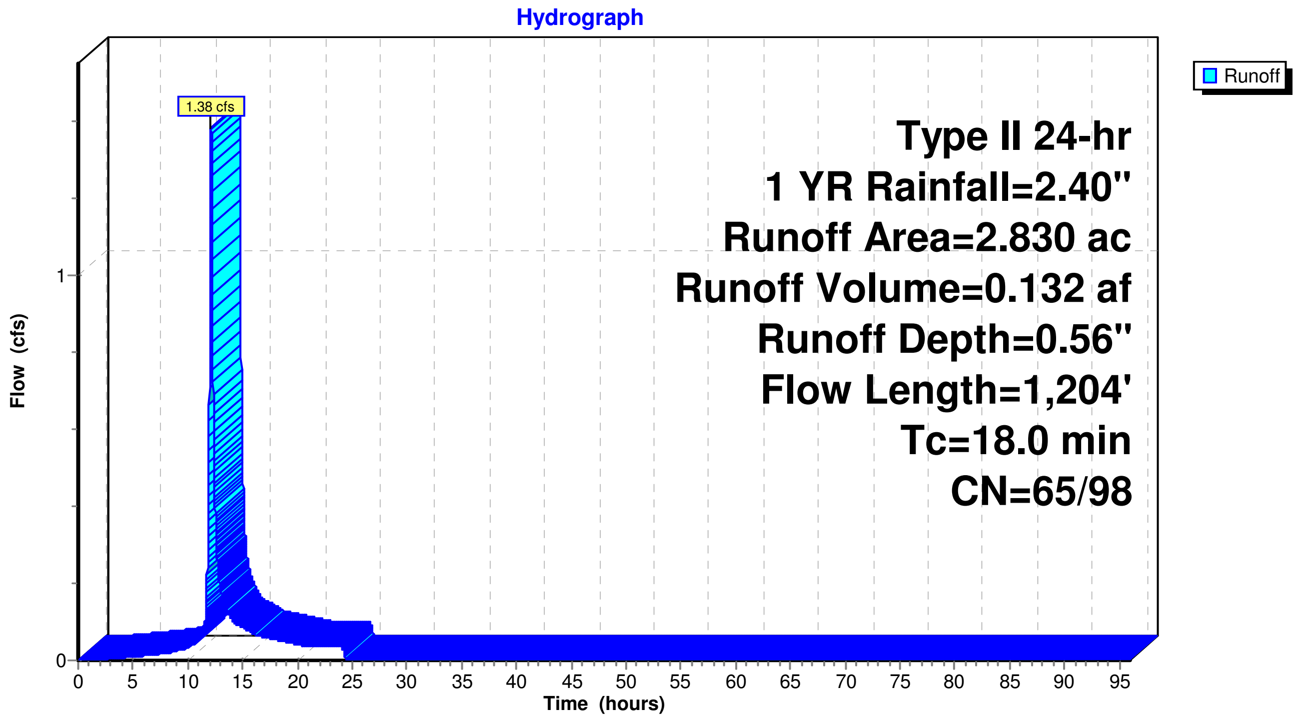
Runoff = 1.38 cfs @ 12.12 hrs, Volume= 0.132 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.070	78	Meadow, non-grazed, HSG D
0.610	70	Woods, Good, HSG C
0.140	98	Paved parking, HSG D
0.300	98	Paved parking, HSG D
0.770	65	Brush, Good, HSG C
0.500	73	Brush, Good, HSG D
0.440	48	Brush, Good, HSG B
2.830	70	Weighted Average
2.390	65	84.45% Pervious Area
0.440	98	15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.1200	0.15		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
0.5	174	0.1150	5.46		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.3	930	0.0230	2.44		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
18.0	1,204	Total			

Subcatchment 5S: Post West 3



Summary for Subcatchment 6S: H Post Subdv W

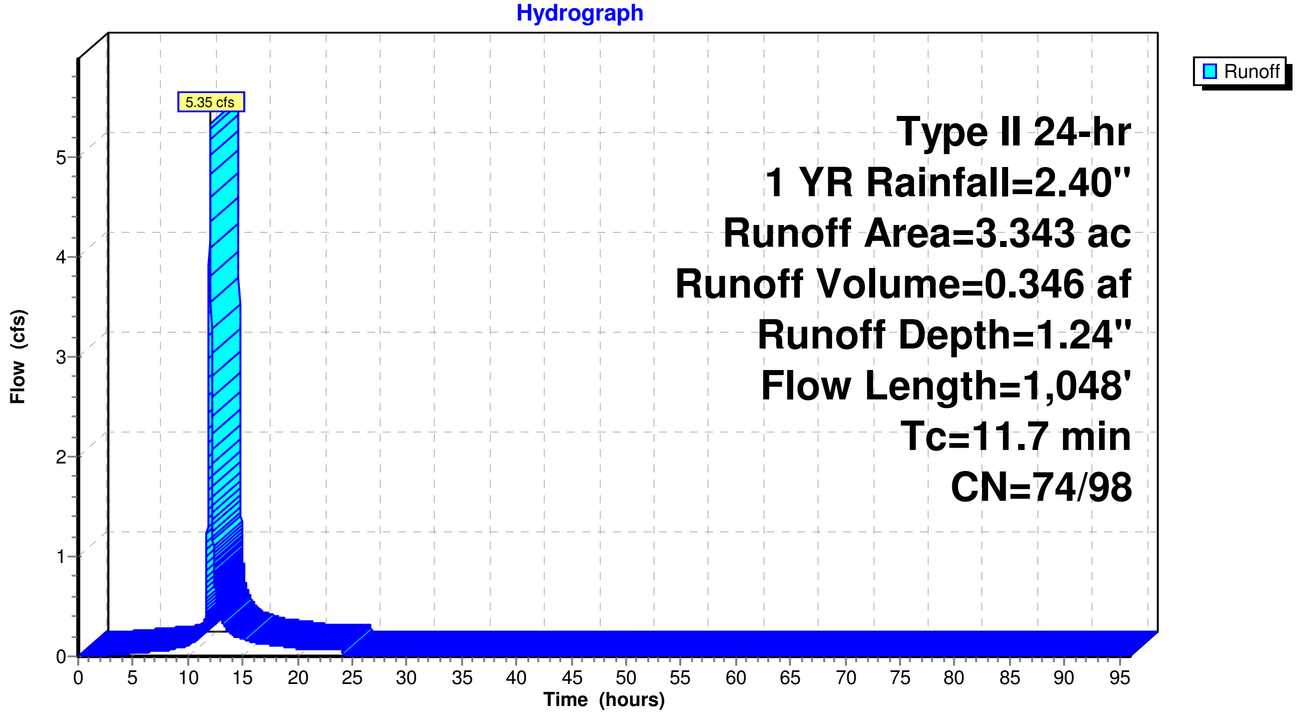
Runoff = 5.35 cfs @ 12.03 hrs, Volume= 0.346 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
1.829	74	>75% Grass cover, Good, HSG C
0.093	80	>75% Grass cover, Good, HSG D
0.439	98	Paved roads w/curbs & sewers, HSG D
0.982	98	Roofs, HSG D
3.343	84	Weighted Average
1.922	74	57.49% Pervious Area
1.421	98	42.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1100	0.22		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.5	187	0.1440	6.11		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	90	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.7	150	0.0520	3.67		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.2	68	0.1000	6.42		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.1	28	0.0100	5.48	4.38	**Channel Flow, F - G** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	131	0.1000	19.47	23.36	**Channel Flow, G - H** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
0.1	100	0.1550	28.05	50.49	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
1.2	110	0.0540	1.53	24.47	**Channel Flow, I - J** Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.240
0.2	84	0.0100	6.16	7.39	**Channel Flow, J - K** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
11.7	1,048	Total			

Subcatchment 6S: H Post Subdv W



Summary for Subcatchment 7S: H Post Subdv E

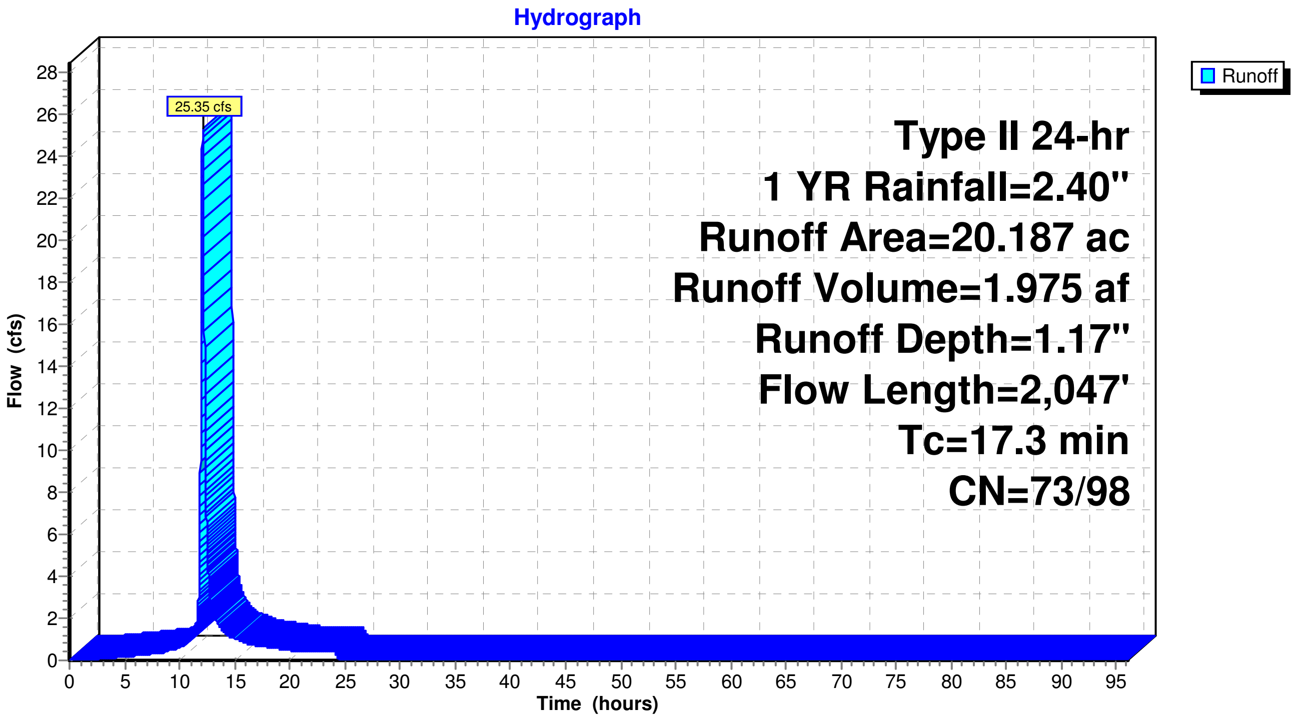
Runoff = 25.35 cfs @ 12.09 hrs, Volume= 1.975 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.206	55	Woods, Good, HSG B
0.531	70	Woods, Good, HSG C
0.925	61	>75% Grass cover, Good, HSG B
6.891	74	>75% Grass cover, Good, HSG C
3.461	98	Paved parking, HSG D
4.573	98	Roofs, HSG D
3.600	74	>75% Grass cover, Good, HSG C
20.187	83	Weighted Average
12.153	73	60.20% Pervious Area
8.034	98	39.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	58	0.4300	0.33		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
10.1	42	0.0100	0.07		**Sheet Flow, B - C** n= 0.240 P2= 2.80"
0.7	67	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.8	158	0.0470	3.49		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.7	189	0.0530	4.67		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.2	87	0.1000	6.42		**Shallow Concentrated Flow, F - G** Paved Kv= 20.3 fps
0.0	29	0.0900	16.43	13.14	**Channel Flow, G - H** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	176	0.1000	22.53	40.55	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.2	116	0.0236	10.94	19.70	**Channel Flow, I - J** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.3	258	0.0239	13.02	40.35	**Channel Flow, J - K** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	81	0.0300	14.58	45.21	**Channel Flow, K - L** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
1.0	501	0.0100	8.42	26.10	**Channel Flow, L - M** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	185	0.0730	26.77	131.19	**Channel Flow, M - N** Area= 4.9 sf Perim= 7.8' r= 0.63' n= 0.011
0.1	100	0.0900	21.37	38.47	**Channel Flow, N - O** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
17.3	2,047	Total			

Subcatchment 7S: H Post Subdv E



Summary for Subcatchment 8S: H Post Sub MISC

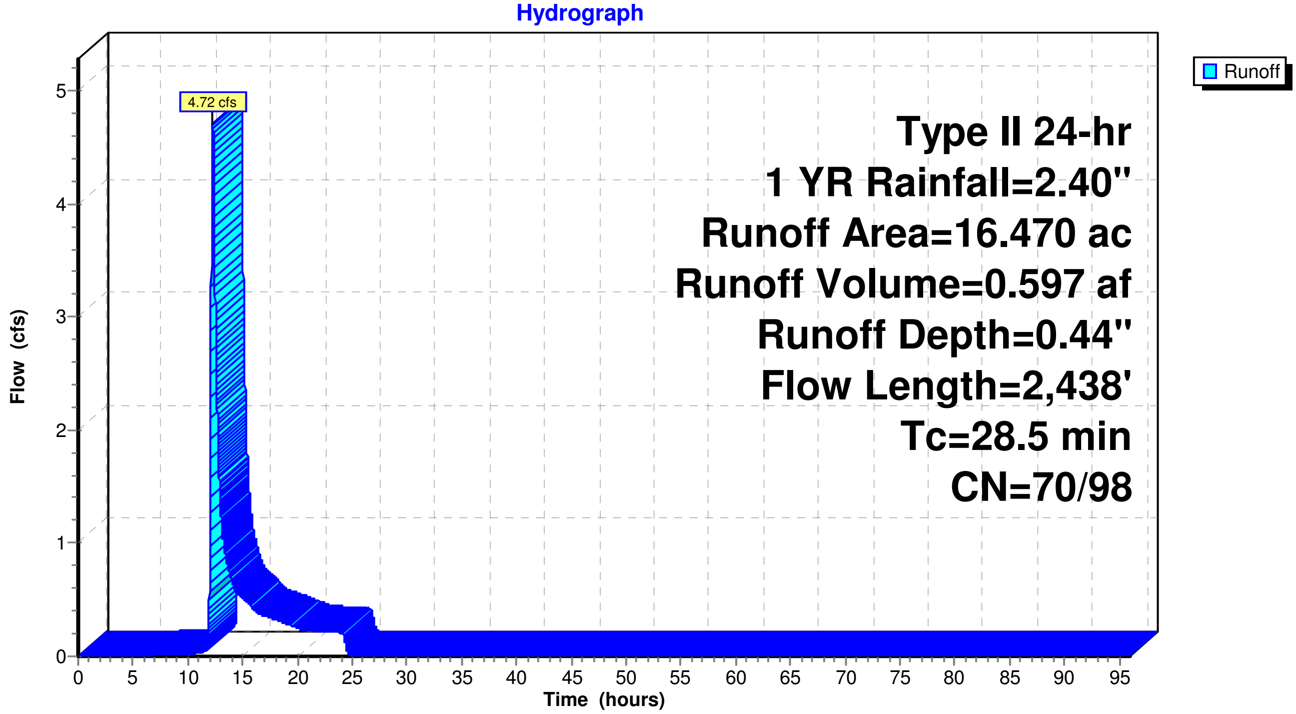
Runoff = 4.72 cfs @ 12.28 hrs, Volume= 0.597 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.955	55	Woods, Good, HSG B
9.912	70	Woods, Good, HSG C
0.489	61	>75% Grass cover, Good, HSG B
4.449	74	>75% Grass cover, Good, HSG C
0.415	80	>75% Grass cover, Good, HSG D
0.250	98	Unconnected pavement, HSG D
16.470	71	Weighted Average
16.220	70	98.48% Pervious Area
0.250	98	1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.1600	0.18		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.2	672	0.3420	9.42		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.8	230	0.0220	0.66	13.26	**Channel Flow, C - D** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
0.9	460	0.0110	8.83	27.38	**Channel Flow, D - E** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
3.8	322	0.1020	1.43	28.55	**Channel Flow, E -F** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
1.5	348	0.0570	3.84		**Shallow Concentrated Flow, F - G** Unpaved Kv= 16.1 fps
1.5	256	0.0330	2.92		**Shallow Concentrated Flow, G - H** Unpaved Kv= 16.1 fps
28.5	2,438	Total			

Subcatchment 8S: H Post Sub MISC



Summary for Subcatchment 9S-A: Casino Area

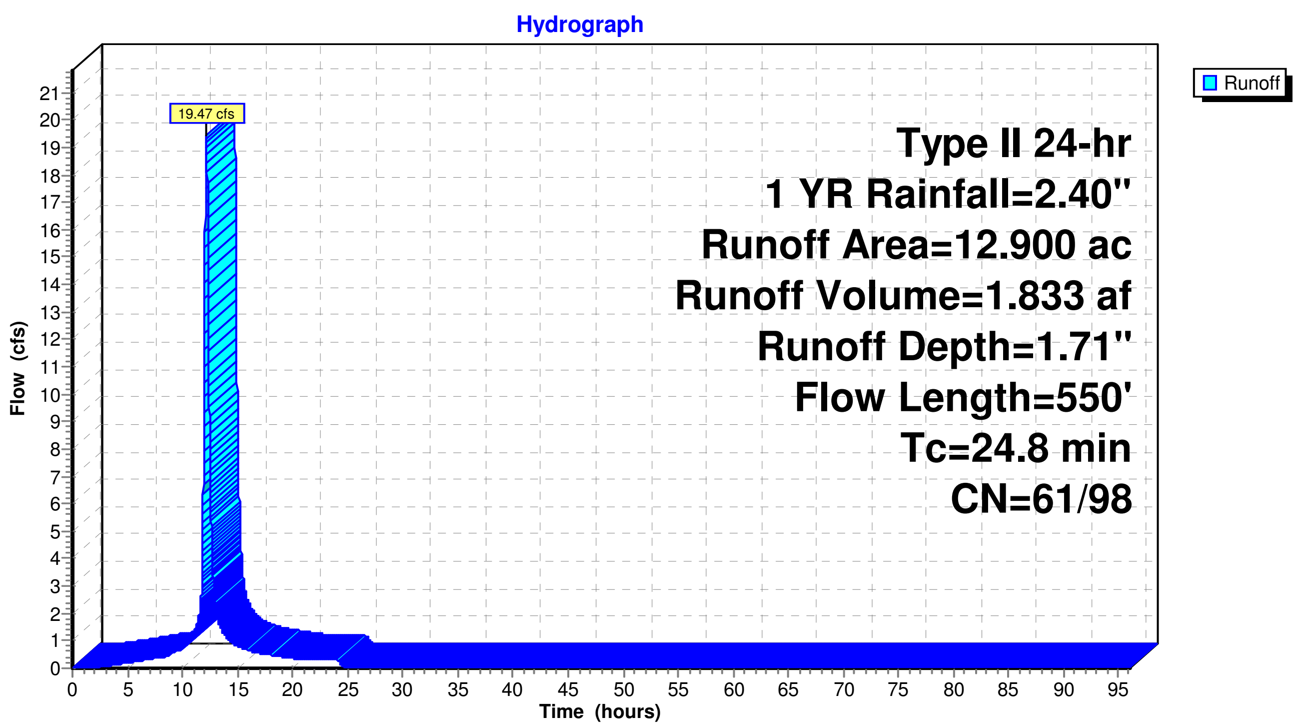
Runoff = 19.47 cfs @ 12.16 hrs, Volume= 1.833 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
9.900	98	Paved parking, HSG D
1.500	61	>75% Grass cover, Good, HSG B
1.500	61	>75% Grass cover, Good, HSG B
12.900	89	Weighted Average
3.000	61	23.26% Pervious Area
9.900	98	76.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.8	450	0.0400	4.06		**Shallow Concentrated Flow, B - C** Paved Kv= 20.3 fps
24.8	550	Total			

Subcatchment 9S-A: Casino Area



Summary for Subcatchment 9S-B: Post Central

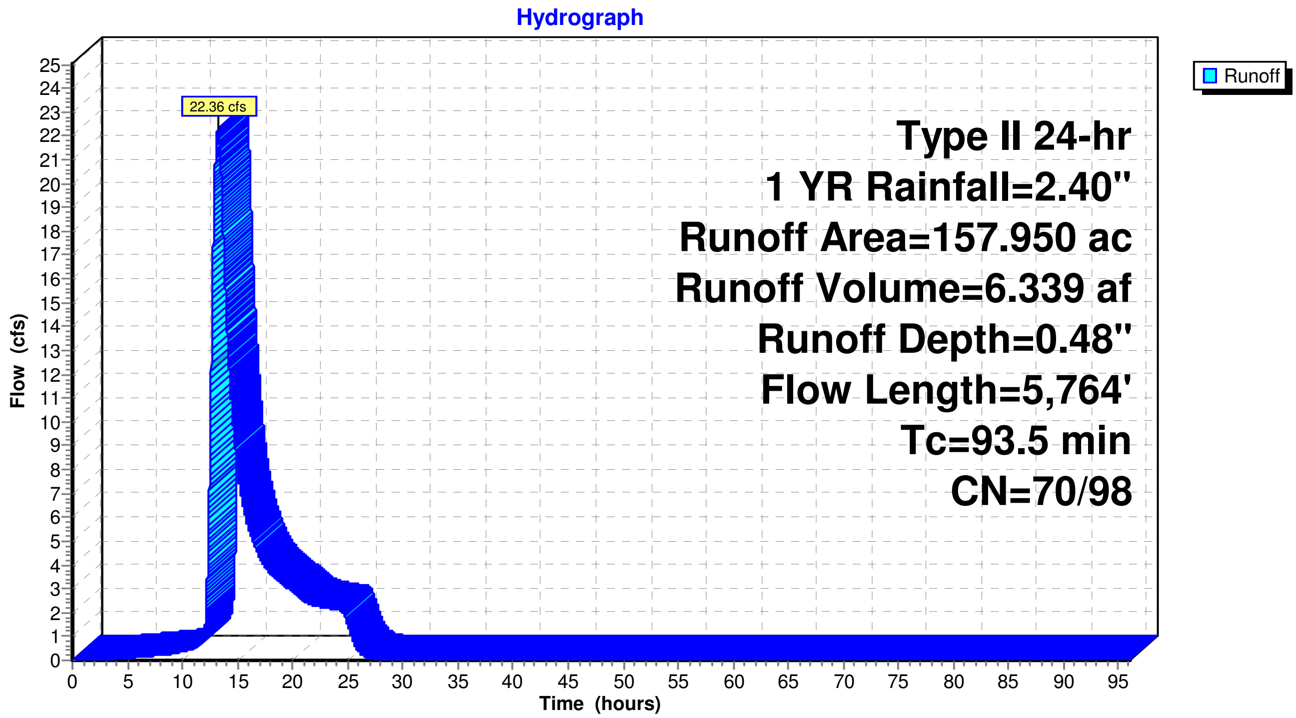
Runoff = 22.36 cfs @ 13.20 hrs, Volume= 6.339 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
0.900	98	Paved parking, HSG D
2.460	80	1/2 acre lots, 25% imp, HSG C
13.020	74	>75% Grass cover, Good, HSG C
21.200	74	>75% Grass cover, Good, HSG C
1.980	98	Paved parking, HSG D
43.100	70	Woods, Good, HSG C
2.880	71	Meadow, non-grazed, HSG C
0.150	98	Paved roads w/curbs & sewers, HSG D
19.240	74	>75% Grass cover, Good, HSG C
1.770	98	Paved parking, HSG D
2.160	74	>75% Grass cover, Good, HSG C
3.440	74	>75% Grass cover, Good, HSG C
0.120	98	Paved parking, HSG D
2.210	80	>75% Grass cover, Good, HSG D
28.430	61	>75% Grass cover, Good, HSG B
0.640	98	Paved parking, HSG D
0.380	98	Paved parking, HSG D
2.200	74	>75% Grass cover, Good, HSG C
6.660	61	>75% Grass cover, Good, HSG B
3.840	74	>75% Grass cover, Good, HSG C
0.810	61	>75% Grass cover, Good, HSG B
0.360	74	>75% Grass cover, Good, HSG C
157.950	71	Weighted Average
151.395	70	95.85% Pervious Area
6.555	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
6.4	2,043	0.1080	5.29		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.6	2,079	0.1060	5.24		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
57.5	1,542	0.0030	0.45	2.23	**Channel Flow, D - E** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
93.5	5,764	Total			

Subcatchment 9S-B: Post Central



Summary for Subcatchment 10S: Out Pre East

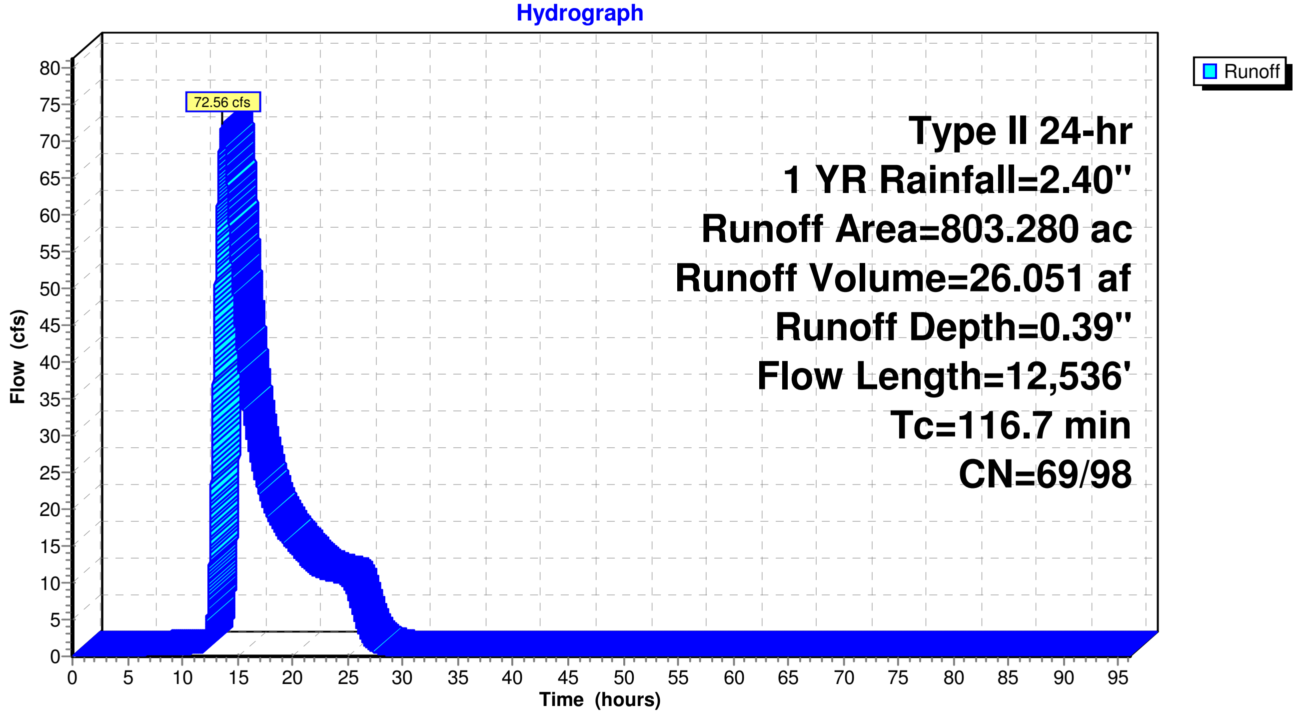
Runoff = 72.56 cfs @ 13.62 hrs, Volume= 26.051 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 YR Rainfall=2.40"

Area (ac)	CN	Description
11.850	77	Woods, Good, HSG D
5.000	78	Meadow, non-grazed, HSG D
8.390	30	Woods, Good, HSG A
0.390	55	Woods, Good, HSG B
2.250	98	Paved parking, HSG D
7.850	55	Woods, Good, HSG B
0.110	98	Paved parking, HSG D
353.100	70	Woods, Good, HSG C
105.000	71	Meadow, non-grazed, HSG C
3.380	30	Woods, Good, HSG A
9.290	30	Meadow, non-grazed, HSG A
1.750	98	Paved parking, HSG D
9.040	55	Woods, Good, HSG B
8.967	58	Meadow, non-grazed, HSG B
181.500	70	Woods, Good, HSG C
1.640	98	Paved parking, HSG D
93.673	74	>75% Grass cover, Good, HSG C
0.100	98	Roofs, HSG D
803.280	69	Weighted Average
797.430	69	99.27% Pervious Area
5.850	98	0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0500	0.10		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
9.0	2,298	0.0700	4.26		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
91.8	10,138	0.0510	1.84	9.21	**Channel Flow, C - D** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
116.7	12,536	Total			

Subcatchment 10S: Out Pre East



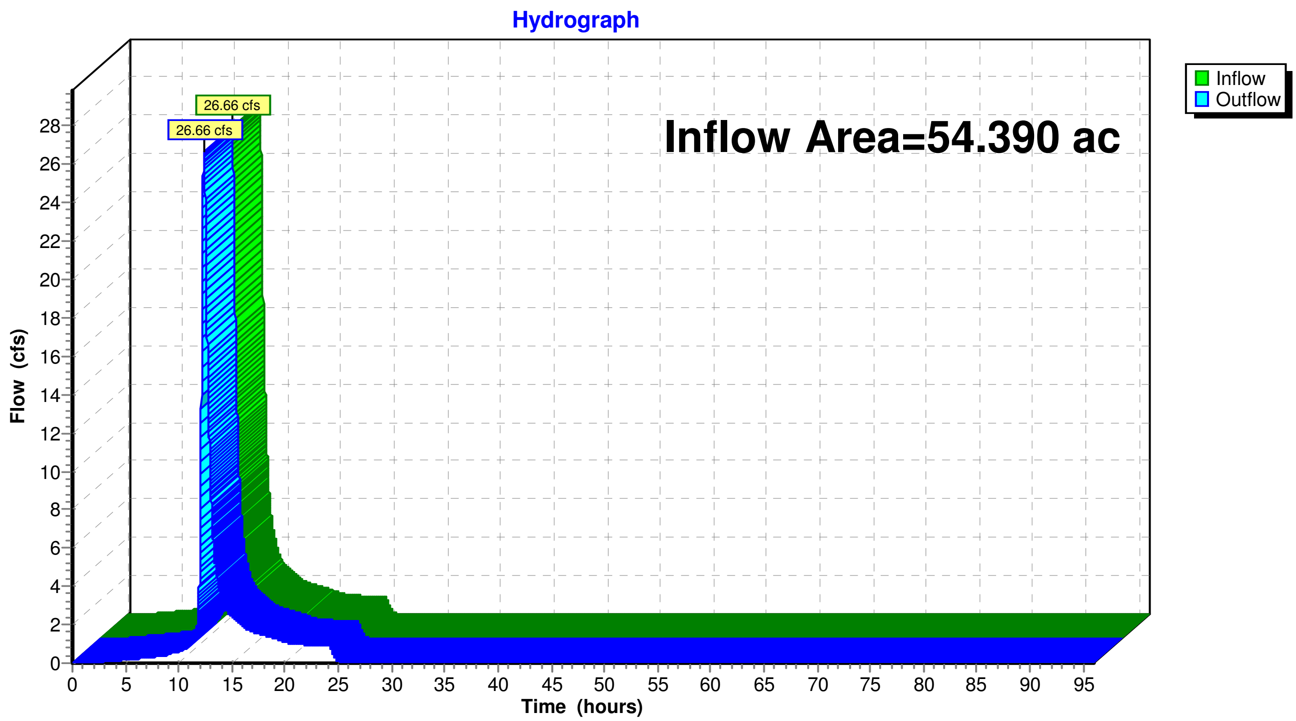
Summary for Reach 1R: Post 4-5W Clvt

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 54.390 ac, 16.07% Impervious, Inflow Depth = 0.78" for 1 YR event
Inflow = 26.66 cfs @ 12.35 hrs, Volume= 3.538 af
Outflow = 26.66 cfs @ 12.36 hrs, Volume= 3.538 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 1R: Post 4-5W Clvt



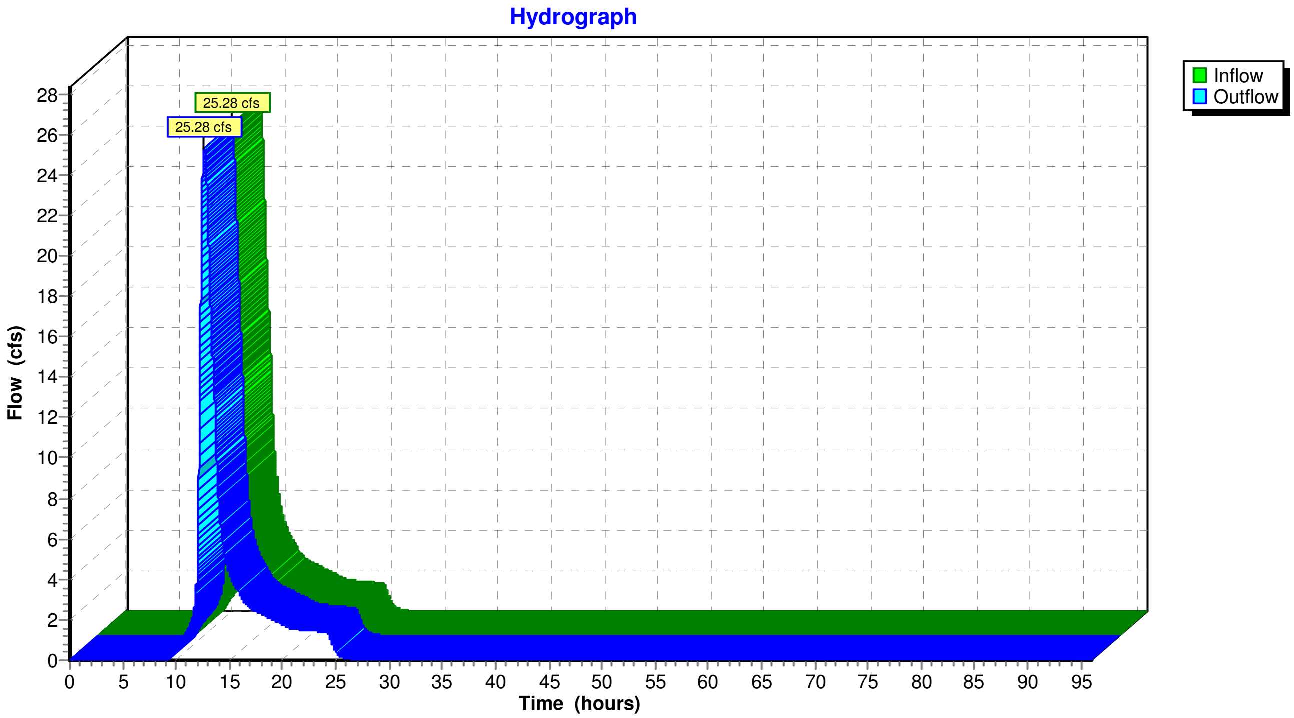
Summary for Reach 2R: Out Post West

[40] Hint: Not Described (Outflow=Inflow)

Inflow	=	25.28 cfs @ 12.64 hrs,	Volume=	5.262 af
Outflow	=	25.28 cfs @ 12.65 hrs,	Volume=	5.262 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 2R: Out Post West



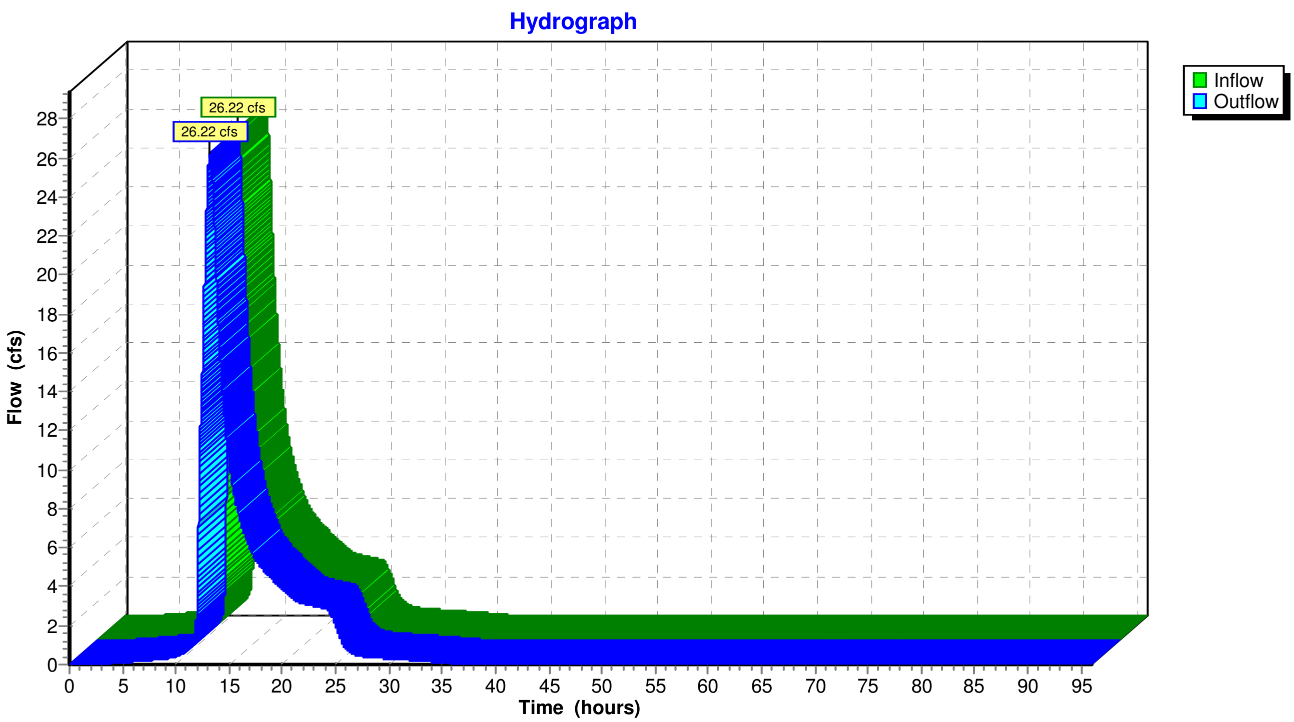
Summary for Reach 3R: Out Post Central

[40] Hint: Not Described (Outflow=Inflow)

Inflow	=	26.22 cfs @	13.19 hrs,	Volume=	8.611 af
Outflow	=	26.22 cfs @	13.20 hrs,	Volume=	8.611 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 3R: Out Post Central



Summary for Pond 1P: Post South Pond

[86] Warning: Oscillations may require smaller dt (severity=151)

Inflow	=	37.73 cfs @	12.32 hrs,	Volume=	5.562 af
Outflow	=	25.28 cfs @	12.64 hrs,	Volume=	5.577 af, Atten= 33%, Lag= 19.3 min
Primary	=	25.28 cfs @	12.64 hrs,	Volume=	5.262 af
Secondary	=	0.56 cfs @	8.91 hrs,	Volume=	0.315 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 822.12' @ 12.64 hrs Surf.Area= 1.837 ac Storage= 0.739 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.6 min (946.2 - 934.6)

Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	418.450 af	**PosSPond (Conic)** Listed below (Recalc)

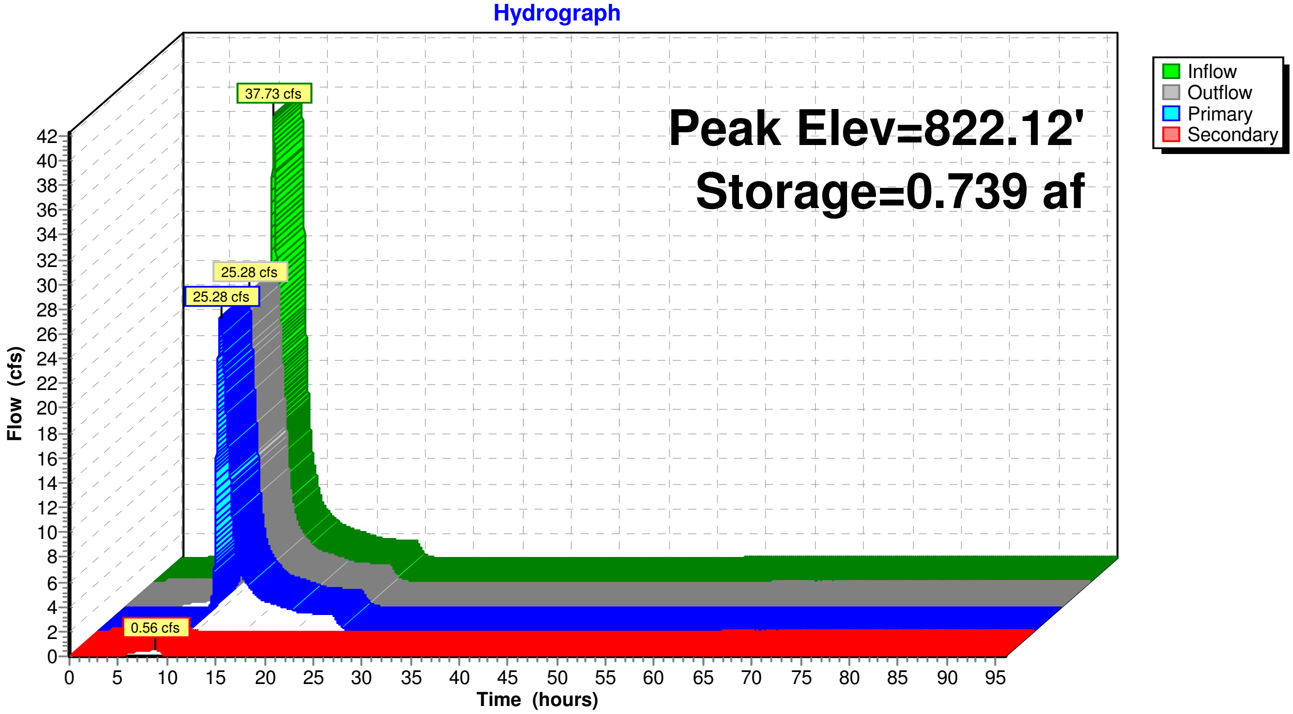
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
821.00	0.010	0.000	0.000	0.010
822.60	3.600	2.027	2.027	3.600
824.00	6.020	6.662	8.688	6.021
826.00	6.790	12.802	21.491	6.795
828.00	7.430	14.215	35.706	7.442
830.00	7.880	15.308	51.014	7.902
832.00	8.280	16.158	67.172	8.313
834.00	8.500	16.780	83.951	8.554
836.00	8.990	17.488	101.439	9.054
838.00	9.850	18.833	120.273	9.920
840.00	10.330	20.178	140.451	10.412
842.00	15.310	25.477	165.928	15.394
858.00	16.260	252.522	418.450	16.832

Device	Routing	Invert	Outlet Devices
#1	Primary	821.11'	**9.5' long x 100.0' 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
#2	Secondary	820.81'	**24.0" Round Culvert** L= 30.0' Ke= 0.200 Inlet / Outlet Invert= 819.81' / 820.81' S= -0.0333 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=25.27 cfs @ 12.64 hrs HW=822.12' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 25.27 cfs @ 2.64 fps)

Secondary OutFlow Max=0.55 cfs @ 8.91 hrs HW=821.11' TW=821.01' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 0.55 cfs @ 1.86 fps)

Pond 1P: Post South Pond



Summary for Pond 2P: Post North Pond

[86] Warning: Oscillations may require smaller dt (severity=722)

Inflow	=	11.69 cfs @	12.09 hrs,	Volume=	1.208 af
Outflow	=	6.56 cfs @	12.20 hrs,	Volume=	0.991 af, Atten= 44%, Lag= 6.5 min
Primary	=	6.56 cfs @	12.20 hrs,	Volume=	0.991 af
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.81' Surf.Area= 0.020 ac Storage= 0.006 af
Peak Elev= 822.13' @ 12.66 hrs Surf.Area= 0.243 ac Storage= 0.418 af (0.413 af above start)

Plug-Flow detention time= 680.9 min calculated for 1.023 af (82% of inflow)
Center-of-Mass det. time= 216.3 min (1,296.3 - 1,091.5)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	37.557 af	**PostNPond (Conic)** Listed below

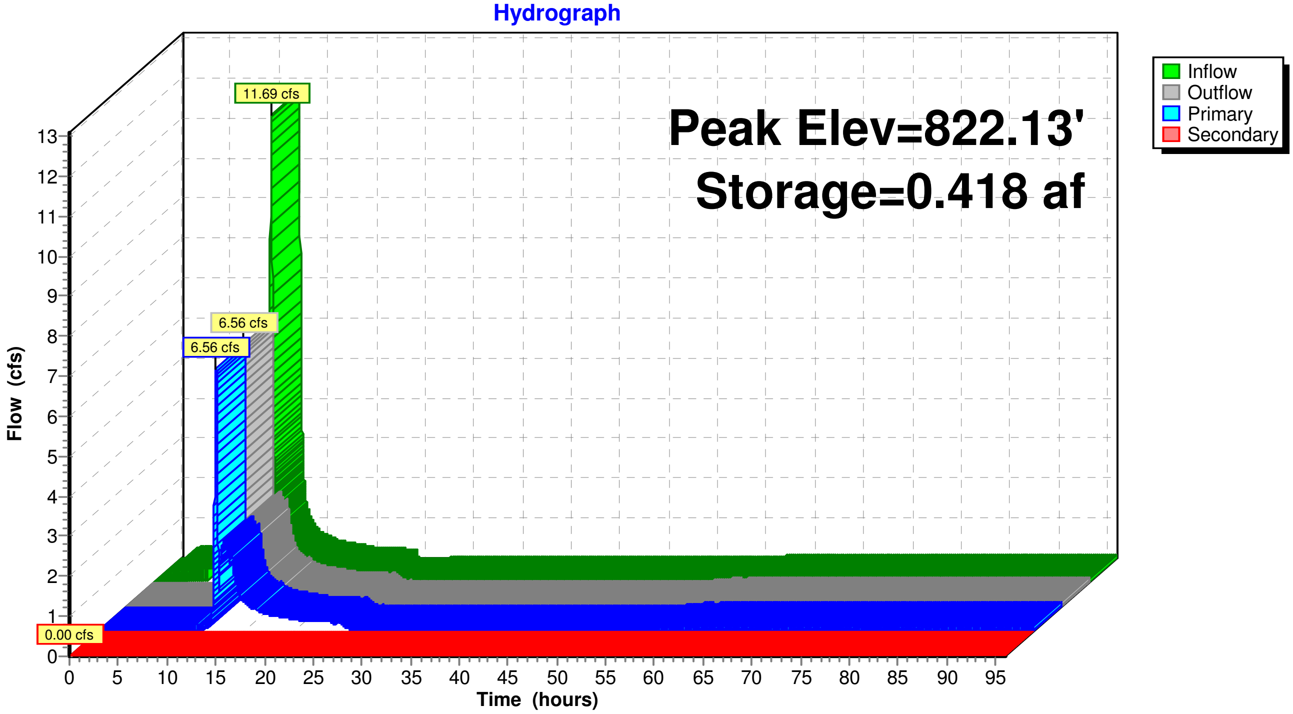
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
819.81	0.020	0.006	0.006	0.020
820.00	0.030	0.005	0.010	0.030
824.00	0.430	0.765	0.775	0.431
826.00	1.030	1.417	2.192	1.032
828.00	1.340	2.363	4.555	1.344
830.00	2.170	3.477	8.032	2.175
832.00	2.470	4.637	12.669	2.480
834.00	2.790	5.257	17.926	2.804
836.00	3.090	5.877	23.803	3.110
838.00	3.440	6.527	30.330	3.465
840.00	3.790	7.227	37.557	3.821

Device	Routing	Invert	Outlet Devices
#1	Primary	820.41'	**24.0" Round Culvert - Watson** L= 30.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 820.41' / 819.81' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Secondary	823.50'	**24.0" Round Culvert - Post Pipe** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 823.50' / 819.00' S= 0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=6.40 cfs @ 12.20 hrs HW=822.01' TW=821.78' (Dynamic Tailwater)
└─**1=Culvert - Watson** (Outlet Controls 6.40 cfs @ 3.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.81' TW=819.42' (Dynamic Tailwater)
└─**2=Culvert - Post Pipe** (Controls 0.00 cfs)

Pond 2P: Post North Pond



Summary for Pond 3P: PostCClub Pond

Inflow	=	1.38 cfs @	12.12 hrs,	Volume=	0.132 af
Outflow	=	1.35 cfs @	12.15 hrs,	Volume=	0.132 af, Atten= 2%, Lag= 2.0 min
Primary	=	1.35 cfs @	12.15 hrs,	Volume=	0.132 af
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.42' Surf.Area= 0.010 ac Storage= 0.000 af
Peak Elev= 819.85' @ 12.15 hrs Surf.Area= 0.017 ac Storage= 0.006 af

Plug-Flow detention time= 9.7 min calculated for 0.132 af (100% of inflow)
Center-of-Mass det. time= 9.6 min (847.7 - 838.1)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	1.167 af	**PostCClubPond (Conic)** Listed below (Recalc)

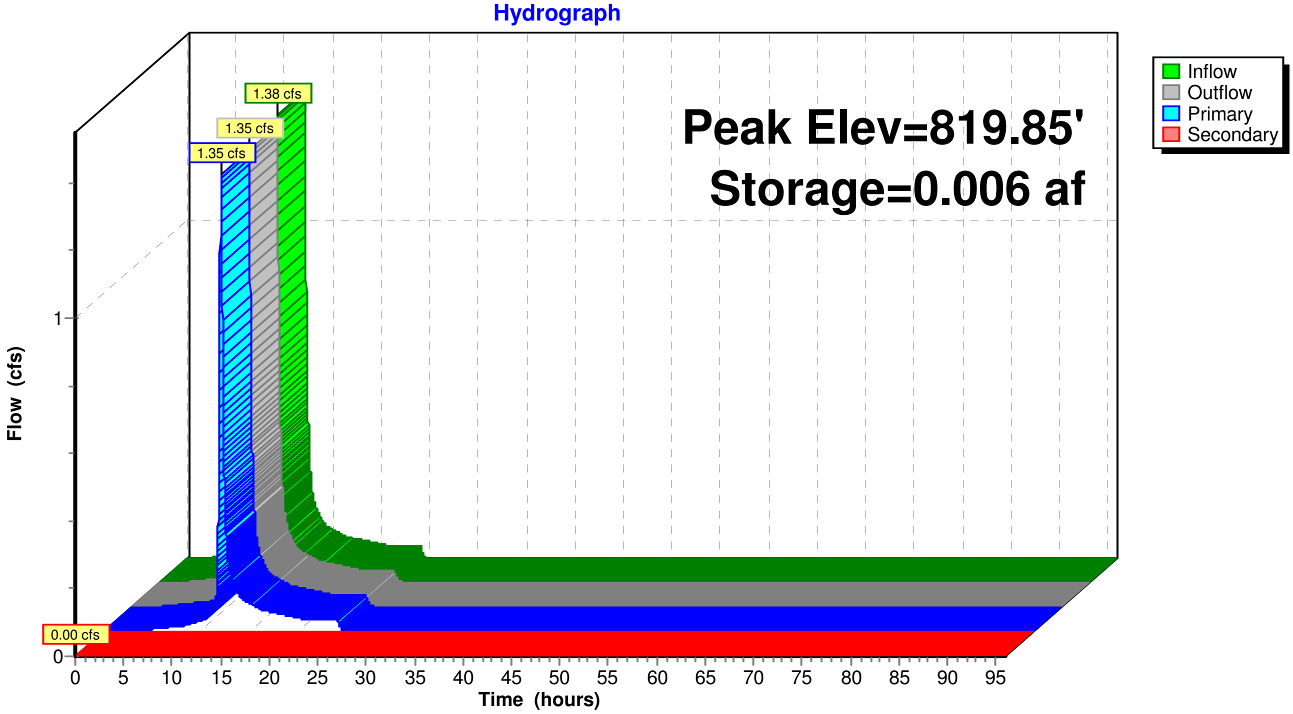
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
820.00	0.020	0.009	0.009	0.020
824.00	0.030	0.099	0.108	0.035
826.00	0.040	0.070	0.178	0.047
828.00	0.050	0.090	0.267	0.059
830.00	0.060	0.110	0.377	0.072
832.00	0.070	0.130	0.507	0.085
834.00	0.080	0.150	0.657	0.099
840.00	0.090	0.510	1.167	0.130

Device	Routing	Invert	Outlet Devices
#1	Primary	819.42'	**24.0" Round Culvert** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 819.42' / 817.75' S= 0.0334 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Primary	825.05'	**145.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#3	Secondary	823.50'	**24.0" Round Culvert** L= 210.0' Ke= 0.500 Inlet / Outlet Invert= 819.00' / 823.50' S= -0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=1.35 cfs @ 12.15 hrs HW=819.84' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.35 cfs @ 2.77 fps)
2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.42' TW=819.81' (Dynamic Tailwater)
3=Culvert (Controls 0.00 cfs)

Pond 3P: PostCClub Pond



Summary for Pond 4P: H Pond West

Inflow Area =	3.343 ac, 42.51% Impervious,	Inflow Depth = 1.24"	for 1 YR event	
Inflow =	5.35 cfs @	12.03 hrs, Volume=	0.346 af	
Outflow =	1.36 cfs @	12.28 hrs, Volume=	0.438 af,	Atten= 75%, Lag= 14.5 min
Discarded =	0.05 cfs @	12.28 hrs, Volume=	0.168 af	
Primary =	1.31 cfs @	12.28 hrs, Volume=	0.270 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 826.00' Surf.Area= 0.052 ac Storage= 0.093 af
Peak Elev= 827.86' @ 12.28 hrs Surf.Area= 0.083 ac Storage= 0.218 af (0.125 af above start)

Plug-Flow detention time= 714.2 min calculated for 0.344 af (100% of inflow)
Center-of-Mass det. time= 517.7 min (1,313.0 - 795.3)

Volume	Invert	Avail.Storage	Storage Description
#1	822.00'	0.452 af	**H Pond West (Conic)** Listed below (Recalc)

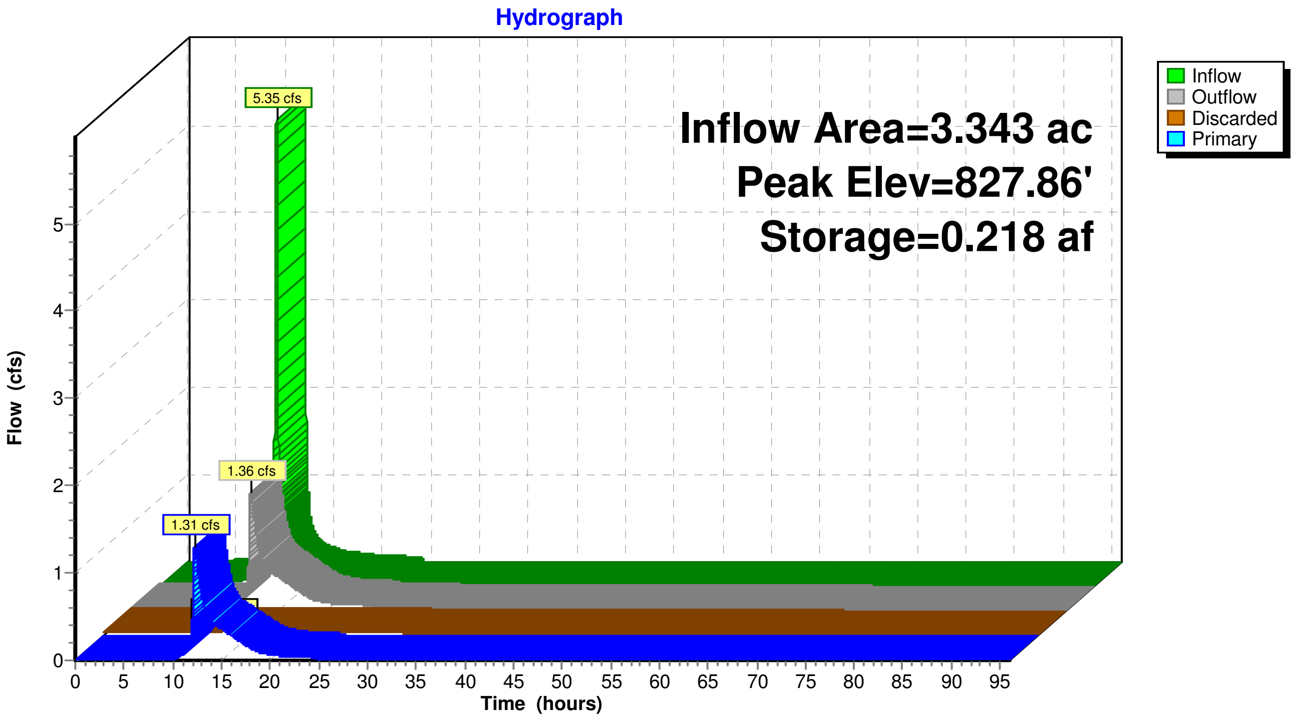
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
822.00	0.004	0.000	0.000	0.004
824.00	0.021	0.023	0.023	0.021
826.00	0.052	0.071	0.093	0.053
828.00	0.086	0.137	0.230	0.088
829.00	0.116	0.101	0.331	0.119
830.00	0.126	0.121	0.452	0.130

Device	Routing	Invert	Outlet Devices
#1	Discarded	822.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	825.90'	**15.0" Round Culvert** L= 82.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 825.90' / 825.16' S= 0.0089 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#3	Device 2	826.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	827.00'	**45.0 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	828.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	829.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.05 cfs @ 12.28 hrs HW=827.86' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.31 cfs @ 12.28 hrs HW=827.86' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Passes 1.31 cfs of 6.82 cfs potential flow)
│ ├─**3=Orifice/Grate** (Orifice Controls 0.55 cfs @ 6.26 fps)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.76 cfs @ 2.50 fps)
│ └─**5=Orifice/Grate** (Controls 0.00 cfs)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: H Pond West



Summary for Pond 5P: H Pond East

Inflow Area =	20.187 ac, 39.80% Impervious,	Inflow Depth = 1.17"	for 1 YR event		
Inflow =	25.35 cfs @	12.09 hrs,	Volume=	1.975 af	
Outflow =	2.24 cfs @	13.07 hrs,	Volume=	2.693 af,	Atten= 91%, Lag= 58.3 min
Discarded =	0.28 cfs @	13.07 hrs,	Volume=	1.420 af	
Primary =	1.97 cfs @	13.07 hrs,	Volume=	1.272 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 846.00' Surf.Area= 0.300 ac Storage= 1.128 af
Peak Elev= 848.57' @ 13.07 hrs Surf.Area= 0.437 ac Storage= 2.093 af (0.964 af above start)

Plug-Flow detention time= 1,949.2 min calculated for 1.564 af (79% of inflow)
Center-of-Mass det. time= 1,088.5 min (1,891.2 - 802.7)

Volume	Invert	Avail.Storage	Storage Description
#1	840.00'	4.506 af	**H Pond East (Conic)** Listed below

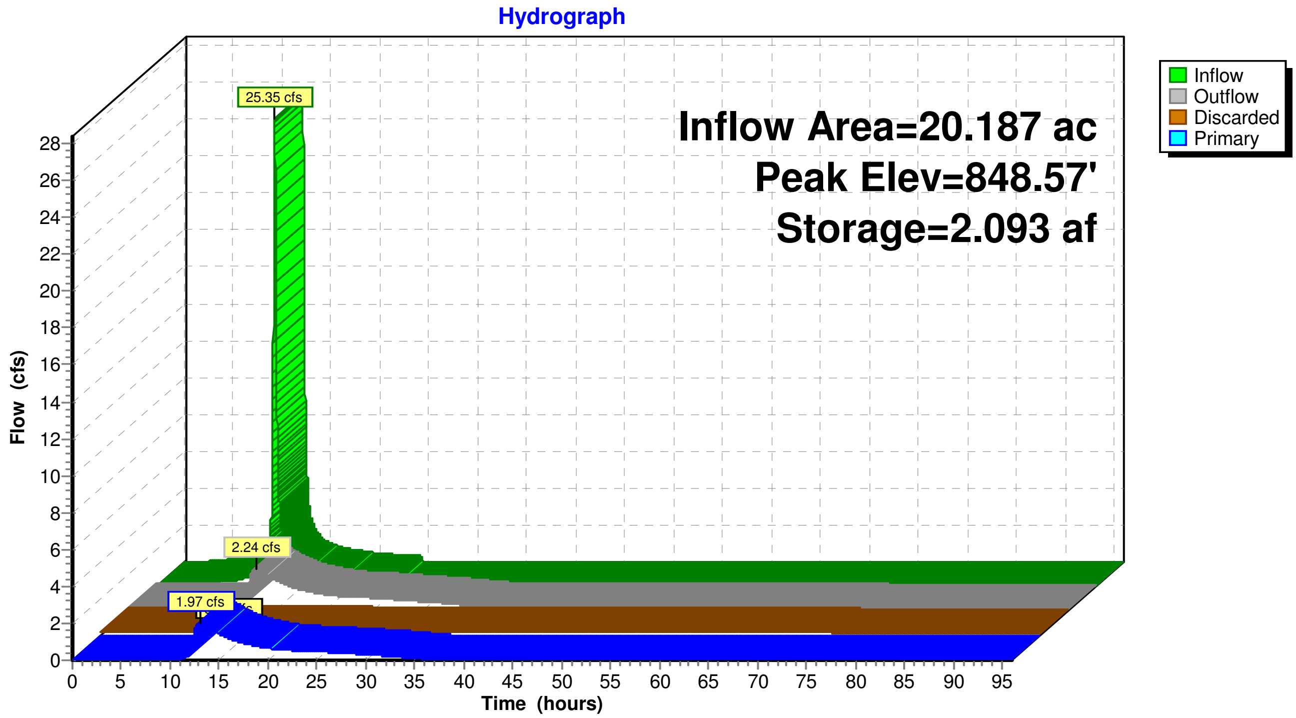
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
840.00	0.093	0.000	0.000	0.093
842.00	0.151	0.242	0.242	0.152
844.00	0.220	0.369	0.611	0.223
846.00	0.300	0.518	1.128	0.305
848.00	0.407	0.704	1.833	0.413
850.00	0.512	0.917	2.750	0.521
852.00	0.608	1.119	3.868	0.620
853.00	0.668	0.638	4.506	0.682

Device	Routing	Invert	Outlet Devices
#1	Discarded	840.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	841.00'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.00' / 835.64' S= 0.0443 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#3	Device 2	846.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	847.50'	**45.0 deg x 849.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	849.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	851.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.28 cfs @ 13.07 hrs HW=848.57' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=1.97 cfs @ 13.07 hrs HW=848.57' TW=0.00' (Dynamic Tailwater)
2=Culvert (Passes 1.97 cfs of 22.22 cfs potential flow)
3=Orifice/Grate (Orifice Controls 0.65 cfs @ 7.46 fps)
4=Sharp-Crested Vee/Trap Weir (Weir Controls 1.32 cfs @ 2.79 fps)
5=Orifice/Grate (Controls 0.00 cfs)
6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: H Pond East



Summary for Pond 6P: StormTech MC-4500

[86] Warning: Oscillations may require smaller dt (severity=784)

Inflow Area = 12.900 ac, 76.74% Impervious, Inflow Depth = 1.71" for 1 YR event
Inflow = 19.47 cfs @ 12.16 hrs, Volume= 1.833 af
Outflow = 2.17 cfs @ 13.06 hrs, Volume= 2.805 af, Atten= 89%, Lag= 53.5 min
Discarded = 2.13 cfs @ 13.06 hrs, Volume= 2.803 af
Primary = 0.04 cfs @ 13.06 hrs, Volume= 0.002 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 864.09' @ 13.06 hrs Surf.Area= 0.421 ac Storage= 0.703 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 55.7 min (837.0 - 781.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	861.75'	0.664 af	**55.75'W x 329.12'L x 6.75'H Field A** 2.843 af Overall - 1.183 af Embedded = 1.660 af x 40.0% Voids
#2A	862.50'	1.183 af	**ADS_StormTech MC-4500 +Cap** x 480 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.02'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.847 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	865.00'	**24.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	861.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	864.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=2.13 cfs @ 13.06 hrs HW=864.09' (Free Discharge)
└─**2=Exfiltration** (Controls 2.13 cfs)

Primary OutFlow Max=0.04 cfs @ 13.06 hrs HW=864.09' TW=0.00' (Dynamic Tailwater)
├─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.03 fps)

Pond 6P: StormTech MC-4500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.02'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

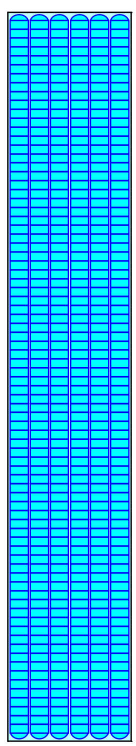
80 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 327.12' Row Length +12.0" End Stone x 2 = 329.12' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

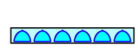
480 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 51,543.8 cf Chamber Storage

123,850.7 cf Field - 51,543.8 cf Chambers = 72,306.9 cf Stone x 40.0% Voids = 28,922.8 cf Stone Storage

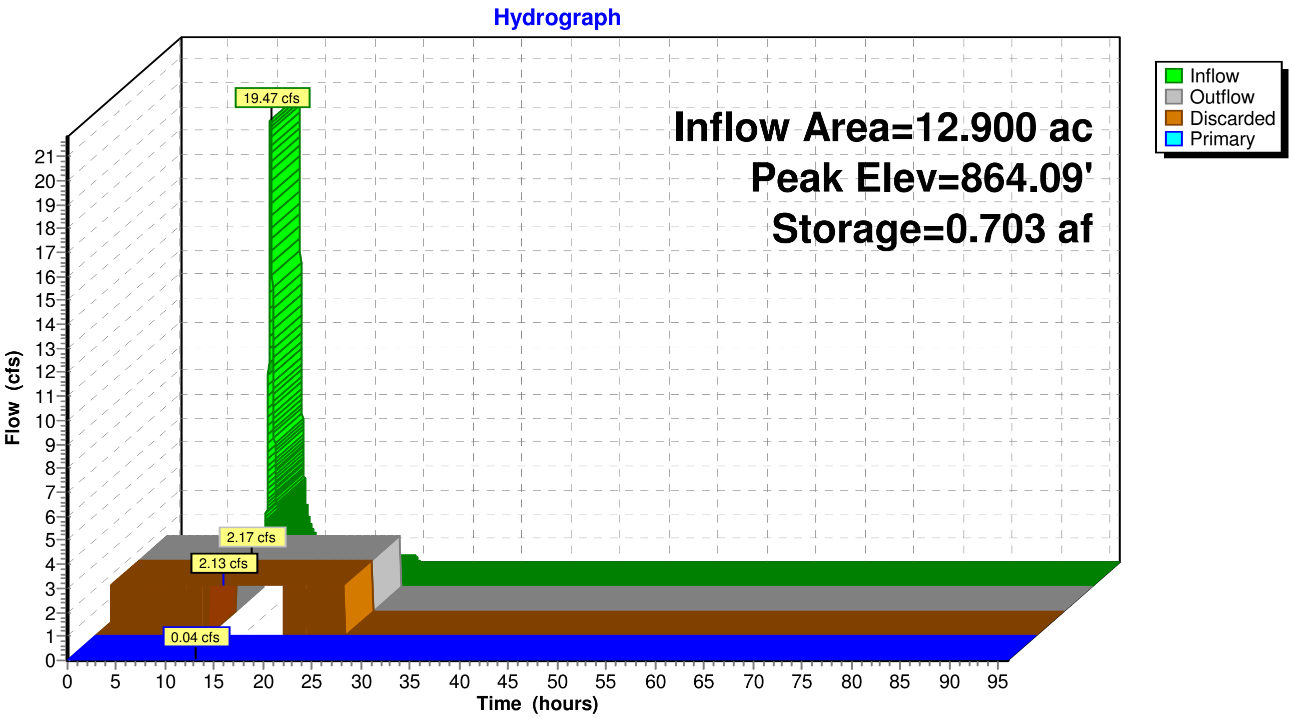
Chamber Storage + Stone Storage = 80,466.6 cf = 1.847 af
Overall Storage Efficiency = 65.0%

480 Chambers
4,587.1 cy Field
2,678.0 cy Stone





Pond 6P: StormTech MC-4500

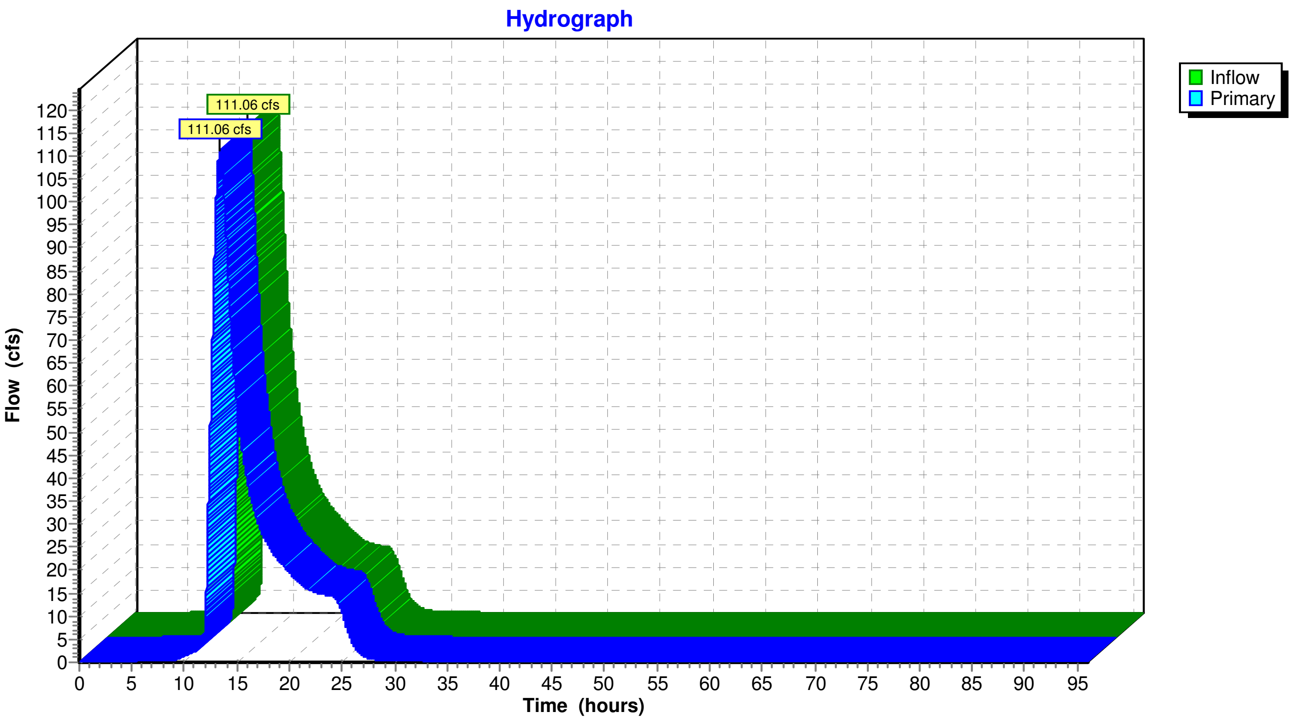


Summary for Link 24L: Out Post NOI

Inflow	=	111.06 cfs @	13.36 hrs,	Volume=	39.924 af
Primary	=	111.06 cfs @	13.37 hrs,	Volume=	39.924 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 24L: Out Post NOI



Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Sim-Route method - Pond routing by Sim-Route method w/Net Flows

Subcatchment 1S: Pre West 4 &5 Runoff Area=54.390 ac 16.07% Impervious Runoff Depth=2.04"
Flow Length=1,592' Tc=38.2 min CN=73/98 Runoff=77.60 cfs 9.250 af

Subcatchment 3S: Post West 2 Runoff Area=19.170 ac 19.04% Impervious Runoff Depth=1.73"
Flow Length=1,118' Tc=36.8 min CN=66/98 Runoff=22.46 cfs 2.767 af

Subcatchment 4S: Post West 1 Runoff Area=15.200 ac 13.44% Impervious Runoff Depth=1.92"
Flow Length=1,386' Tc=15.5 min CN=72/98 Runoff=35.40 cfs 2.431 af

Subcatchment 5S: Post West 3 Runoff Area=2.830 ac 15.55% Impervious Runoff Depth=1.58"
Flow Length=1,204' Tc=18.0 min CN=65/98 Runoff=4.76 cfs 0.374 af

Subcatchment 6S: H Post Subdv W Runoff Area=3.343 ac 42.51% Impervious Runoff Depth=2.69"
Flow Length=1,048' Tc=11.7 min CN=74/98 Runoff=11.90 cfs 0.749 af

Subcatchment 7S: H Post Subdv E Runoff Area=20.187 ac 39.80% Impervious Runoff Depth=2.58"
Flow Length=2,047' Tc=17.3 min CN=73/98 Runoff=57.98 cfs 4.348 af

Subcatchment 8S: H Post Sub MISC Runoff Area=16.470 ac 1.52% Impervious Runoff Depth=1.50"
Flow Length=2,438' Tc=28.5 min CN=70/98 Runoff=21.00 cfs 2.063 af

Subcatchment 9S-A: Casino Area Runoff Area=12.900 ac 76.74% Impervious Runoff Depth=3.26"
Flow Length=550' Tc=24.8 min CN=61/98 Runoff=36.57 cfs 3.500 af

Subcatchment 9S-B: Post Central Runoff Area=157.950 ac 4.15% Impervious Runoff Depth=1.57"
Flow Length=5,764' Tc=93.5 min CN=70/98 Runoff=88.01 cfs 20.647 af

Subcatchment 10S: Out Pre East Runoff Area=803.280 ac 0.73% Impervious Runoff Depth=1.42"
Flow Length=12,536' Tc=116.7 min CN=69/98 Runoff=336.12 cfs 94.861 af

Reach 1R: Post 4-5W Clvt Inflow=77.60 cfs 9.250 af
Outflow=77.60 cfs 9.250 af

Reach 2R: Out Post West Inflow=59.16 cfs 14.240 af
Outflow=59.16 cfs 14.240 af

Reach 3R: Out Post Central Inflow=104.67 cfs 28.135 af
Outflow=104.67 cfs 28.135 af

Pond 1P: Post South Pond Peak Elev=822.89' Storage=3.121 af Inflow=116.38 cfs 14.545 af
Primary=59.16 cfs 14.240 af Secondary=0.70 cfs 0.313 af Outflow=59.16 cfs 14.552 af

Pond 2P: Post North Pond Peak Elev=823.53' Storage=0.685 af Inflow=35.40 cfs 2.744 af
Primary=21.26 cfs 2.527 af Secondary=0.00 cfs 0.000 af Outflow=21.26 cfs 2.527 af

Pond 3P: PostCClub Pond Peak Elev=820.24' Storage=0.013 af Inflow=4.76 cfs 0.374 af
Primary=4.71 cfs 0.374 af Secondary=0.00 cfs 0.000 af Outflow=4.71 cfs 0.374 af

Pond 4P: H Pond West Peak Elev=828.52' Storage=0.278 af Inflow=11.90 cfs 0.749 af
Discarded=0.06 cfs 0.175 af Primary=8.34 cfs 0.666 af Outflow=8.40 cfs 0.841 af

Pond 5P: H Pond East Peak Elev=850.02' Storage=2.762 af Inflow=57.98 cfs 4.348 af
Discarded=0.33 cfs 1.473 af Primary=24.47 cfs 3.568 af Outflow=24.80 cfs 5.041 af

Pond 6P: StormTech MC-4500 Peak Elev=865.80' Storage=1.264 af Inflow=36.57 cfs 3.500 af
Discarded=2.13 cfs 3.260 af Primary=7.85 cfs 0.819 af Outflow=9.98 cfs 4.079 af

Link 24L: Out Post NOI Inflow=478.99 cfs 137.236 af
Primary=478.99 cfs 137.236 af

Total Runoff Area = 1,105.720 ac Runoff Volume = 140.990 af Average Runoff Depth = 1.53"
95.76% Pervious = 1,058.836 ac 4.24% Impervious = 46.884 ac

Summary for Subcatchment 1S: Pre West 4 &5

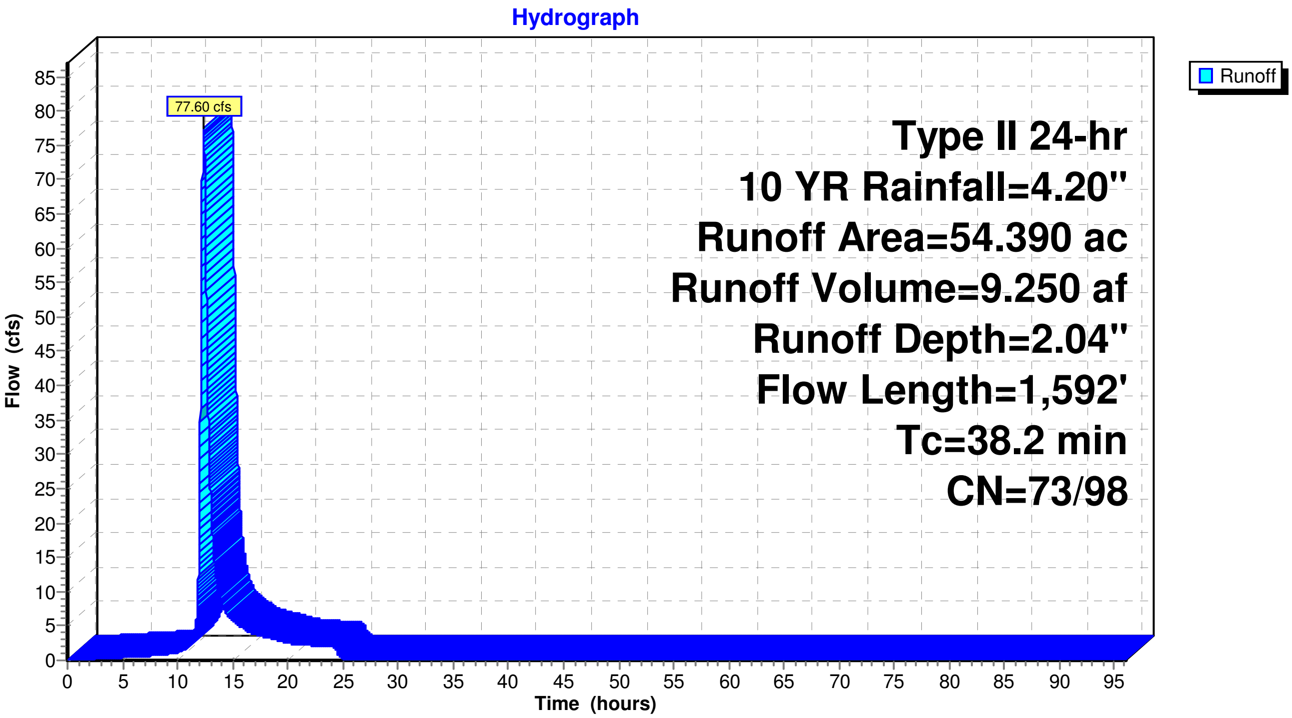
Runoff = 77.60 cfs @ 12.35 hrs, Volume= 9.250 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
22.690	80	1/2 acre lots, 25% imp, HSG C
11.210	70	Woods, Good, HSG C
1.910	70	Woods, Good, HSG C
11.950	80	1/2 acre lots, 25% imp, HSG C
5.240	74	>75% Grass cover, Good, HSG C
1.310	70	Woods, Good, HSG C
0.080	98	Paved roads w/curbs & sewers, HSG C
54.390	77	Weighted Average
45.650	73	83.93% Pervious Area
8.740	98	16.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0100	0.06		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
2.4	845	0.1300	5.80		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.5	647	0.0150	1.97		**Shallow Concentrated Flow, C -D** Unpaved Kv= 16.1 fps
38.2	1,592	Total			

Subcatchment 1S: Pre West 4 &5



Summary for Subcatchment 3S: Post West 2

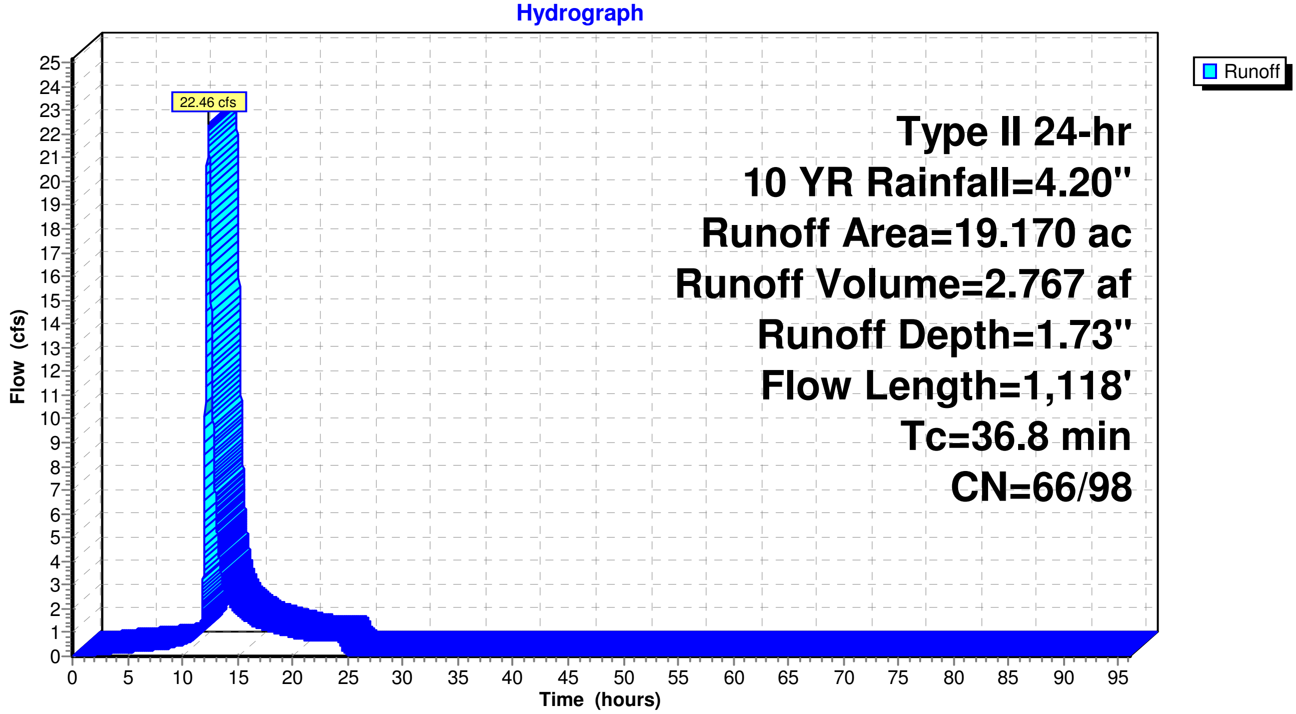
Runoff = 22.46 cfs @ 12.34 hrs, Volume= 2.767 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG D
0.100	55	Woods, Good, HSG B
0.650	70	Woods, Good, HSG C
0.660	77	Woods, Good, HSG D
0.320	98	Paved roads w/curbs & sewers, HSG D
0.620	65	Brush, Good, HSG C
1.970	65	Brush, Good, HSG C
2.620	98	Water Surface, HSG D
0.380	70	Brush, Fair, HSG C
0.640	98	Paved parking, HSG D
4.020	65	Brush, Good, HSG C
7.120	65	Brush, Good, HSG C
19.170	72	Weighted Average
15.520	66	80.96% Pervious Area
3.650	98	19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0800	0.13		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
7.9	240	0.0010	0.51		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.3	114	0.1580	6.40		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
15.4	664	0.0020	0.72		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
36.8	1,118	Total			

Subcatchment 3S: Post West 2



Summary for Subcatchment 4S: Post West 1

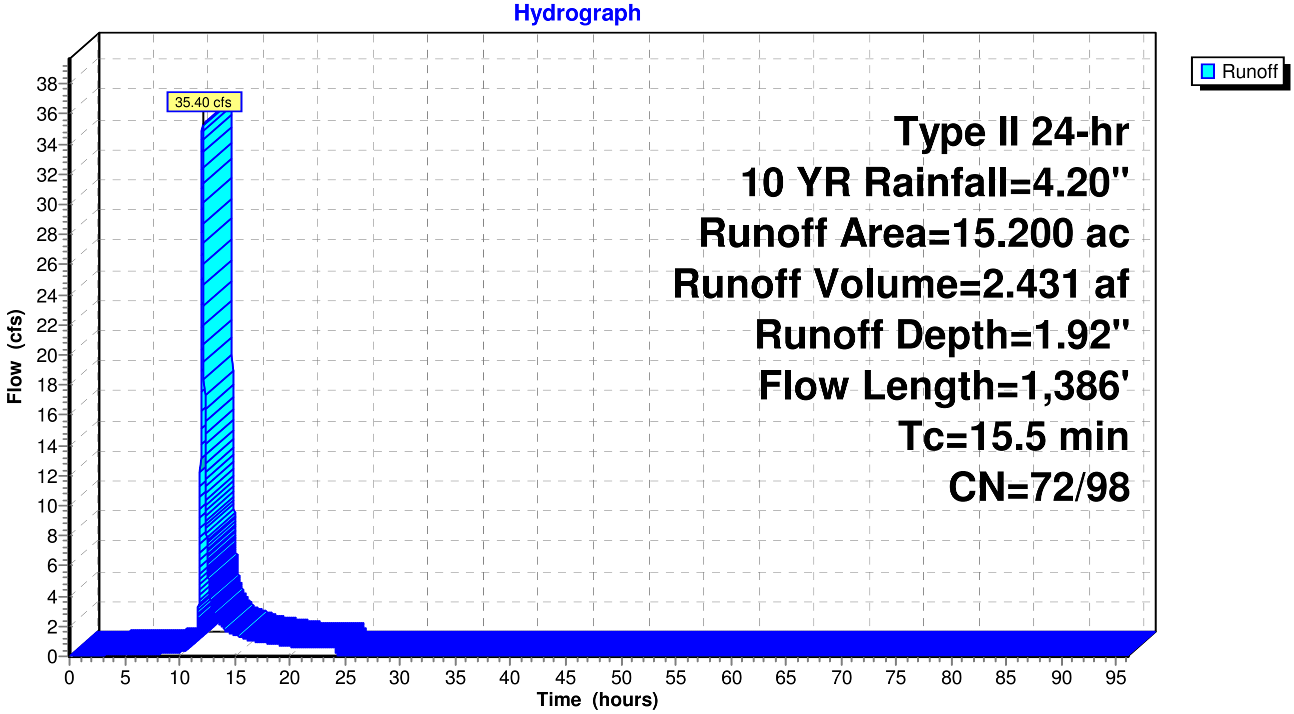
Runoff = 35.40 cfs @ 12.08 hrs, Volume= 2.431 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
3.220	83	1/4 acre lots, 38% imp, HSG C
1.960	70	Woods, Good, HSG C
0.240	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
4.610	70	Woods, Good, HSG C
2.690	74	>75% Grass cover, Good, HSG C
0.290	71	Meadow, non-grazed, HSG C
0.770	78	Meadow, non-grazed, HSG D
0.250	98	Water Surface, HSG D
0.330	65	Brush, Good, HSG C
0.510	73	Brush, Good, HSG D
15.200	75	Weighted Average
13.156	72	86.56% Pervious Area
2.044	98	13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.1000	0.21		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.6	286	0.2450	7.97		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	399	0.2260	7.65		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
3.1	96	0.0010	0.51		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
2.9	505	0.0320	2.88		**Shallow Concentrated Flow, E - F** Unpaved Kv= 16.1 fps
15.5	1,386	Total			

Subcatchment 4S: Post West 1



Summary for Subcatchment 5S: Post West 3

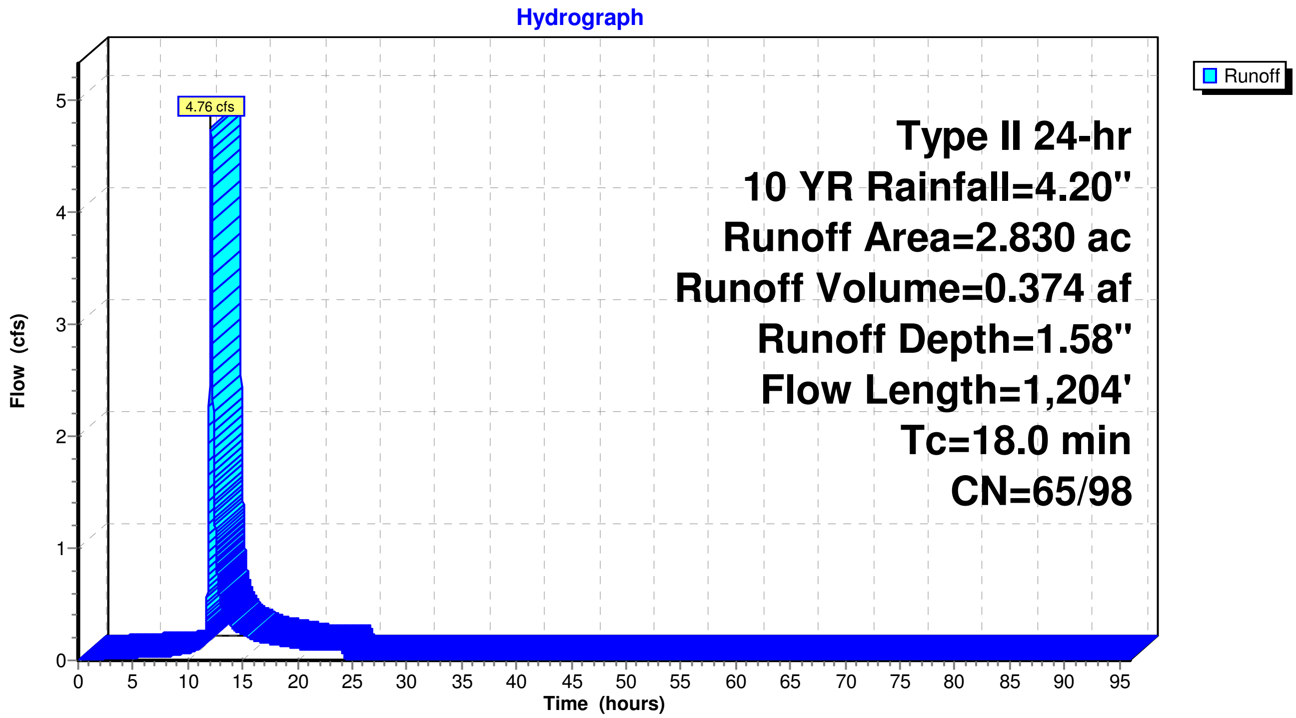
Runoff = 4.76 cfs @ 12.11 hrs, Volume= 0.374 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.070	78	Meadow, non-grazed, HSG D
0.610	70	Woods, Good, HSG C
0.140	98	Paved parking, HSG D
0.300	98	Paved parking, HSG D
0.770	65	Brush, Good, HSG C
0.500	73	Brush, Good, HSG D
0.440	48	Brush, Good, HSG B
2.830	70	Weighted Average
2.390	65	84.45% Pervious Area
0.440	98	15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.1200	0.15		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
0.5	174	0.1150	5.46		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.3	930	0.0230	2.44		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
18.0	1,204	Total			

Subcatchment 5S: Post West 3



Summary for Subcatchment 6S: H Post Subdv W

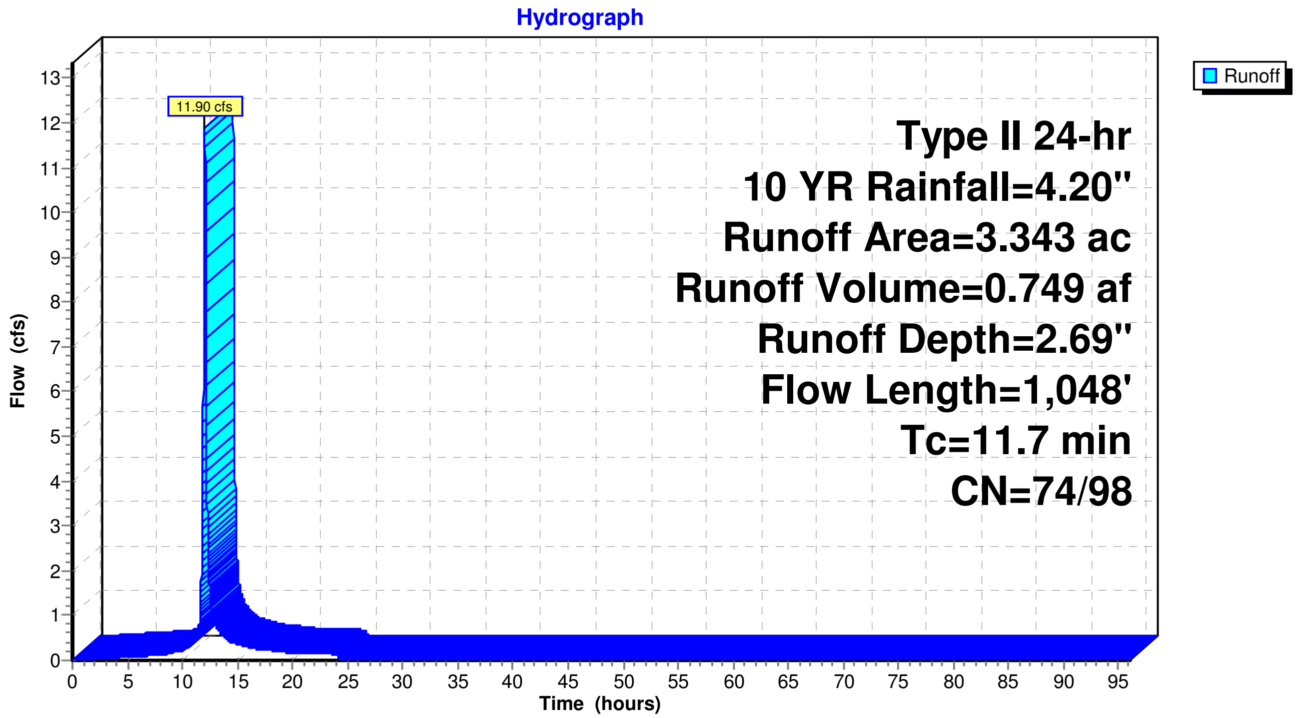
Runoff = 11.90 cfs @ 12.03 hrs, Volume= 0.749 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
1.829	74	>75% Grass cover, Good, HSG C
0.093	80	>75% Grass cover, Good, HSG D
0.439	98	Paved roads w/curbs & sewers, HSG D
0.982	98	Roofs, HSG D
3.343	84	Weighted Average
1.922	74	57.49% Pervious Area
1.421	98	42.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1100	0.22		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.5	187	0.1440	6.11		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	90	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.7	150	0.0520	3.67		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.2	68	0.1000	6.42		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.1	28	0.0100	5.48	4.38	**Channel Flow, F - G** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	131	0.1000	19.47	23.36	**Channel Flow, G - H** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
0.1	100	0.1550	28.05	50.49	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
1.2	110	0.0540	1.53	24.47	**Channel Flow, I - J** Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.240
0.2	84	0.0100	6.16	7.39	**Channel Flow, J - K** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
11.7	1,048	Total			

Subcatchment 6S: H Post Subdv W



Summary for Subcatchment 7S: H Post Subdv E

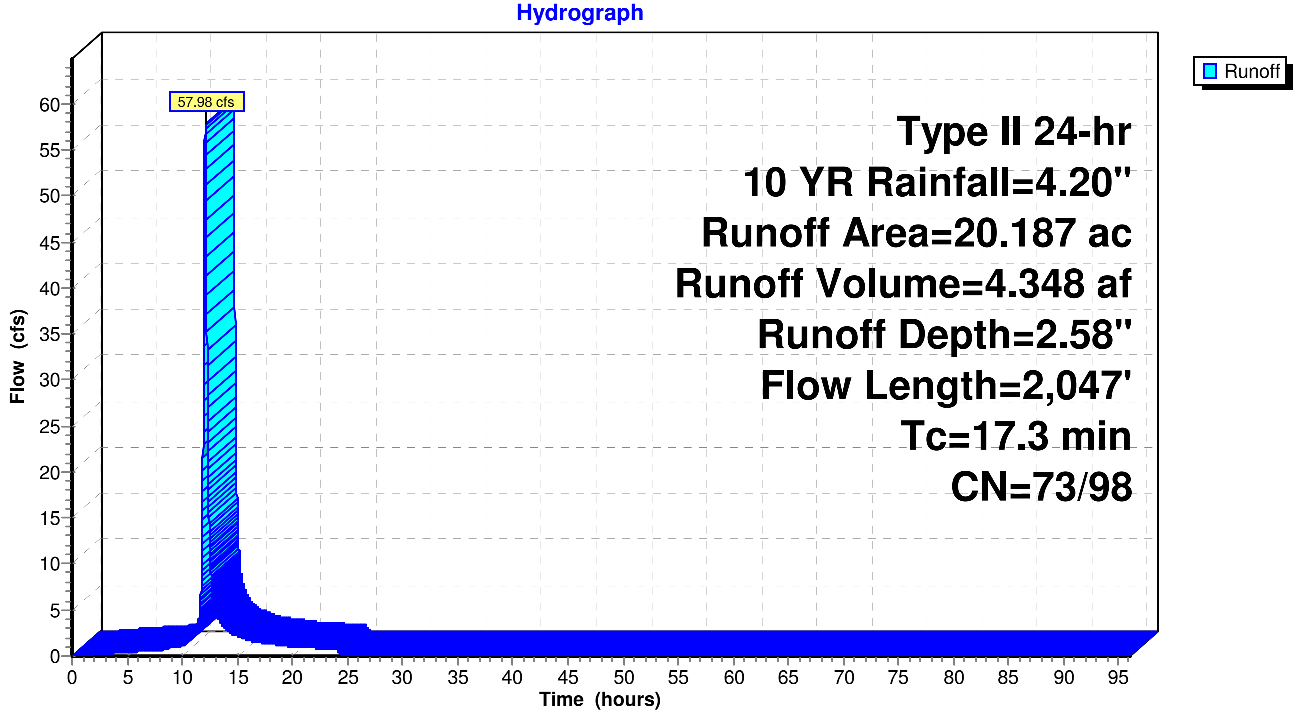
Runoff = 57.98 cfs @ 12.09 hrs, Volume= 4.348 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.206	55	Woods, Good, HSG B
0.531	70	Woods, Good, HSG C
0.925	61	>75% Grass cover, Good, HSG B
6.891	74	>75% Grass cover, Good, HSG C
3.461	98	Paved parking, HSG D
4.573	98	Roofs, HSG D
3.600	74	>75% Grass cover, Good, HSG C
20.187	83	Weighted Average
12.153	73	60.20% Pervious Area
8.034	98	39.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	58	0.4300	0.33		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
10.1	42	0.0100	0.07		**Sheet Flow, B - C** n= 0.240 P2= 2.80"
0.7	67	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.8	158	0.0470	3.49		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.7	189	0.0530	4.67		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.2	87	0.1000	6.42		**Shallow Concentrated Flow, F - G** Paved Kv= 20.3 fps
0.0	29	0.0900	16.43	13.14	**Channel Flow, G - H** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	176	0.1000	22.53	40.55	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.2	116	0.0236	10.94	19.70	**Channel Flow, I - J** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.3	258	0.0239	13.02	40.35	**Channel Flow, J - K** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	81	0.0300	14.58	45.21	**Channel Flow, K - L** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
1.0	501	0.0100	8.42	26.10	**Channel Flow, L - M** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	185	0.0730	26.77	131.19	**Channel Flow, M - N** Area= 4.9 sf Perim= 7.8' r= 0.63' n= 0.011
0.1	100	0.0900	21.37	38.47	**Channel Flow, N - O** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
17.3	2,047	Total			

Subcatchment 7S: H Post Subdv E



Summary for Subcatchment 8S: H Post Sub MISC

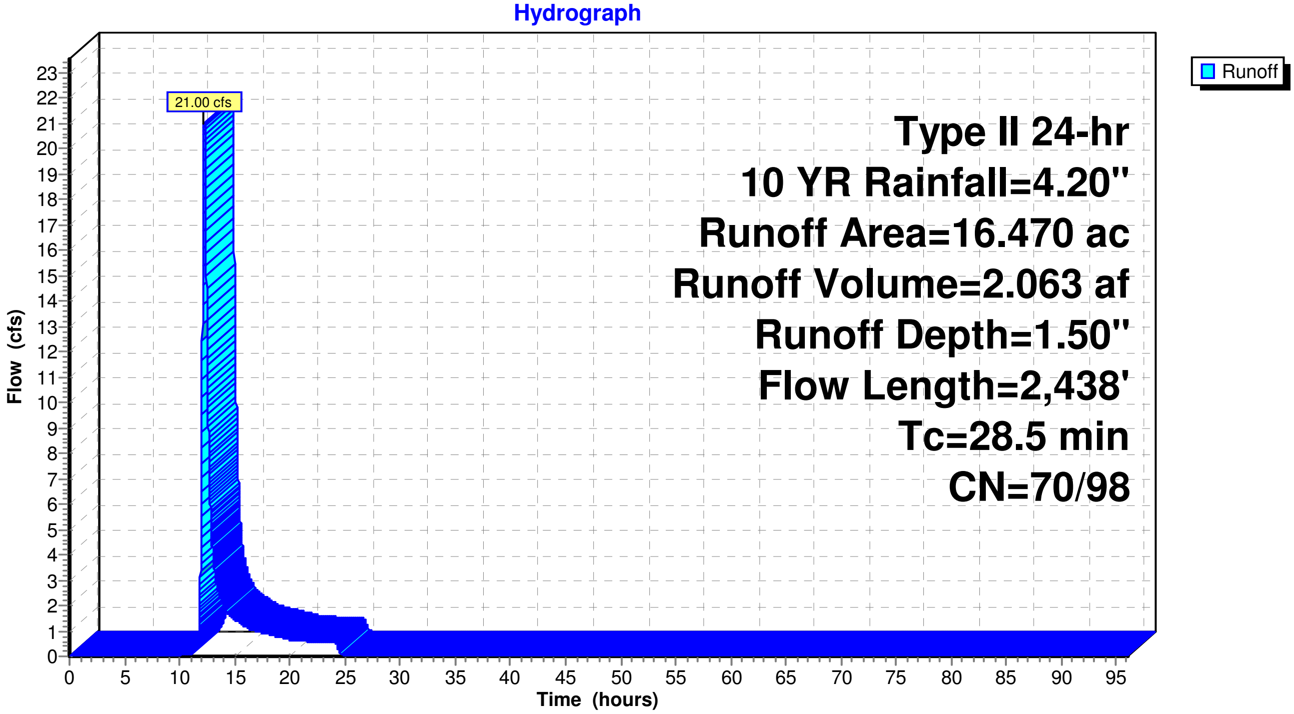
Runoff = 21.00 cfs @ 12.25 hrs, Volume= 2.063 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.955	55	Woods, Good, HSG B
9.912	70	Woods, Good, HSG C
0.489	61	>75% Grass cover, Good, HSG B
4.449	74	>75% Grass cover, Good, HSG C
0.415	80	>75% Grass cover, Good, HSG D
0.250	98	Unconnected pavement, HSG D
16.470	71	Weighted Average
16.220	70	98.48% Pervious Area
0.250	98	1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.1600	0.18		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.2	672	0.3420	9.42		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.8	230	0.0220	0.66	13.26	**Channel Flow, C - D** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
0.9	460	0.0110	8.83	27.38	**Channel Flow, D - E** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
3.8	322	0.1020	1.43	28.55	**Channel Flow, E -F** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
1.5	348	0.0570	3.84		**Shallow Concentrated Flow, F - G** Unpaved Kv= 16.1 fps
1.5	256	0.0330	2.92		**Shallow Concentrated Flow, G - H** Unpaved Kv= 16.1 fps
28.5	2,438	Total			

Subcatchment 8S: H Post Sub MISC



Summary for Subcatchment 9S-A: Casino Area

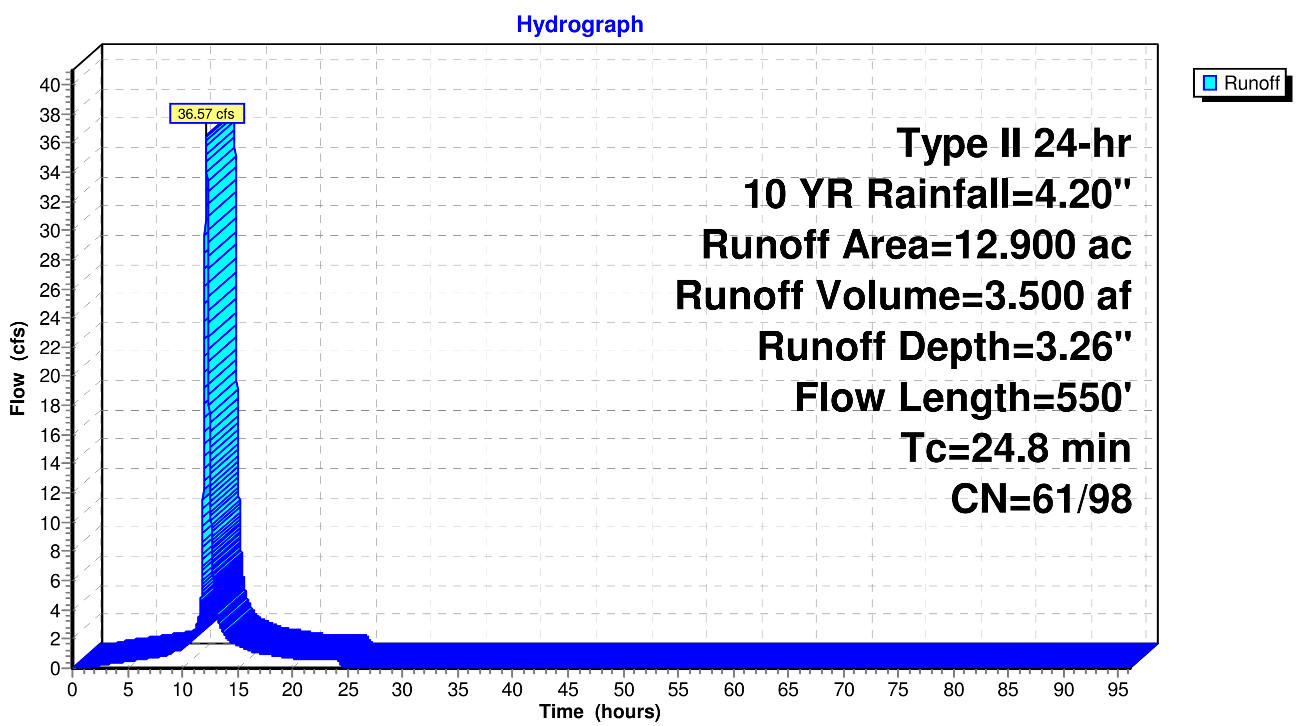
Runoff = 36.57 cfs @ 12.17 hrs, Volume= 3.500 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
9.900	98	Paved parking, HSG D
1.500	61	>75% Grass cover, Good, HSG B
1.500	61	>75% Grass cover, Good, HSG B
12.900	89	Weighted Average
3.000	61	23.26% Pervious Area
9.900	98	76.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.8	450	0.0400	4.06		**Shallow Concentrated Flow, B - C** Paved Kv= 20.3 fps
24.8	550	Total			

Subcatchment 9S-A: Casino Area



Summary for Subcatchment 9S-B: Post Central

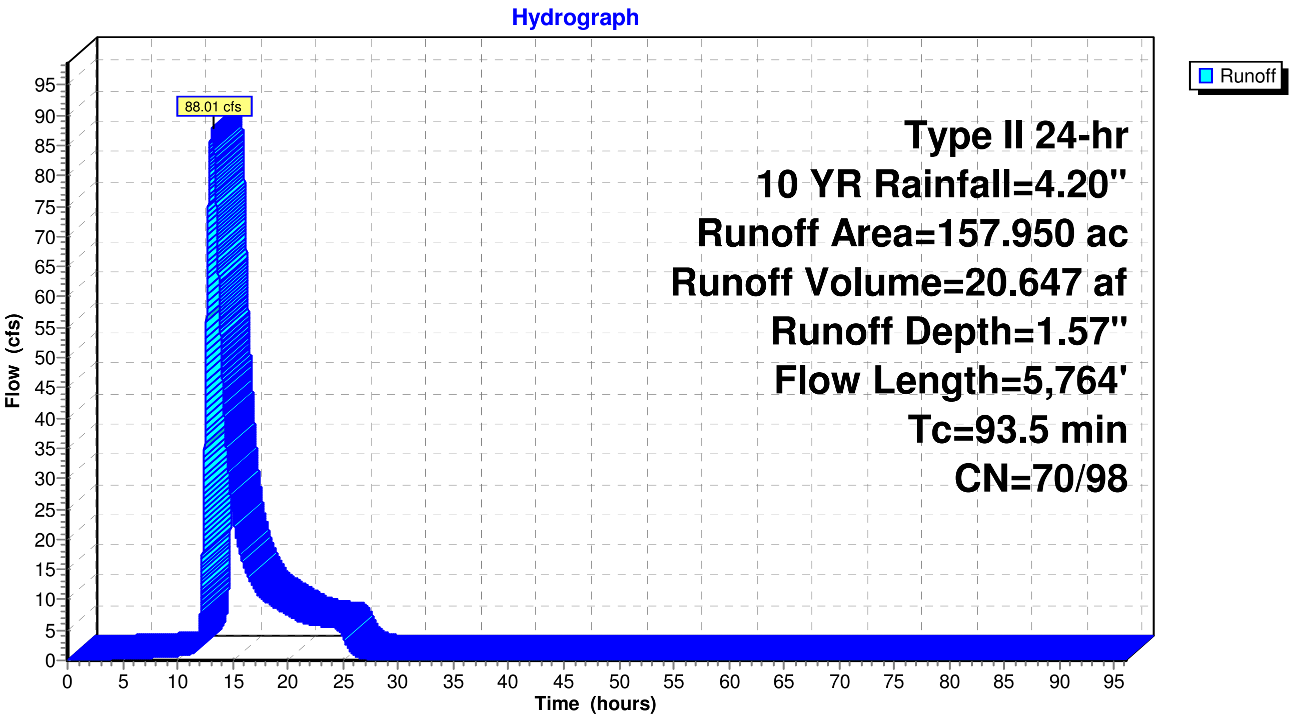
Runoff = 88.01 cfs @ 13.19 hrs, Volume= 20.647 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
0.900	98	Paved parking, HSG D
2.460	80	1/2 acre lots, 25% imp, HSG C
13.020	74	>75% Grass cover, Good, HSG C
21.200	74	>75% Grass cover, Good, HSG C
1.980	98	Paved parking, HSG D
43.100	70	Woods, Good, HSG C
2.880	71	Meadow, non-grazed, HSG C
0.150	98	Paved roads w/curbs & sewers, HSG D
19.240	74	>75% Grass cover, Good, HSG C
1.770	98	Paved parking, HSG D
2.160	74	>75% Grass cover, Good, HSG C
3.440	74	>75% Grass cover, Good, HSG C
0.120	98	Paved parking, HSG D
2.210	80	>75% Grass cover, Good, HSG D
28.430	61	>75% Grass cover, Good, HSG B
0.640	98	Paved parking, HSG D
0.380	98	Paved parking, HSG D
2.200	74	>75% Grass cover, Good, HSG C
6.660	61	>75% Grass cover, Good, HSG B
3.840	74	>75% Grass cover, Good, HSG C
0.810	61	>75% Grass cover, Good, HSG B
0.360	74	>75% Grass cover, Good, HSG C
157.950	71	Weighted Average
151.395	70	95.85% Pervious Area
6.555	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
6.4	2,043	0.1080	5.29		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.6	2,079	0.1060	5.24		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
57.5	1,542	0.0030	0.45	2.23	**Channel Flow, D - E** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
93.5	5,764	Total			

Subcatchment 9S-B: Post Central



Summary for Subcatchment 10S: Out Pre East

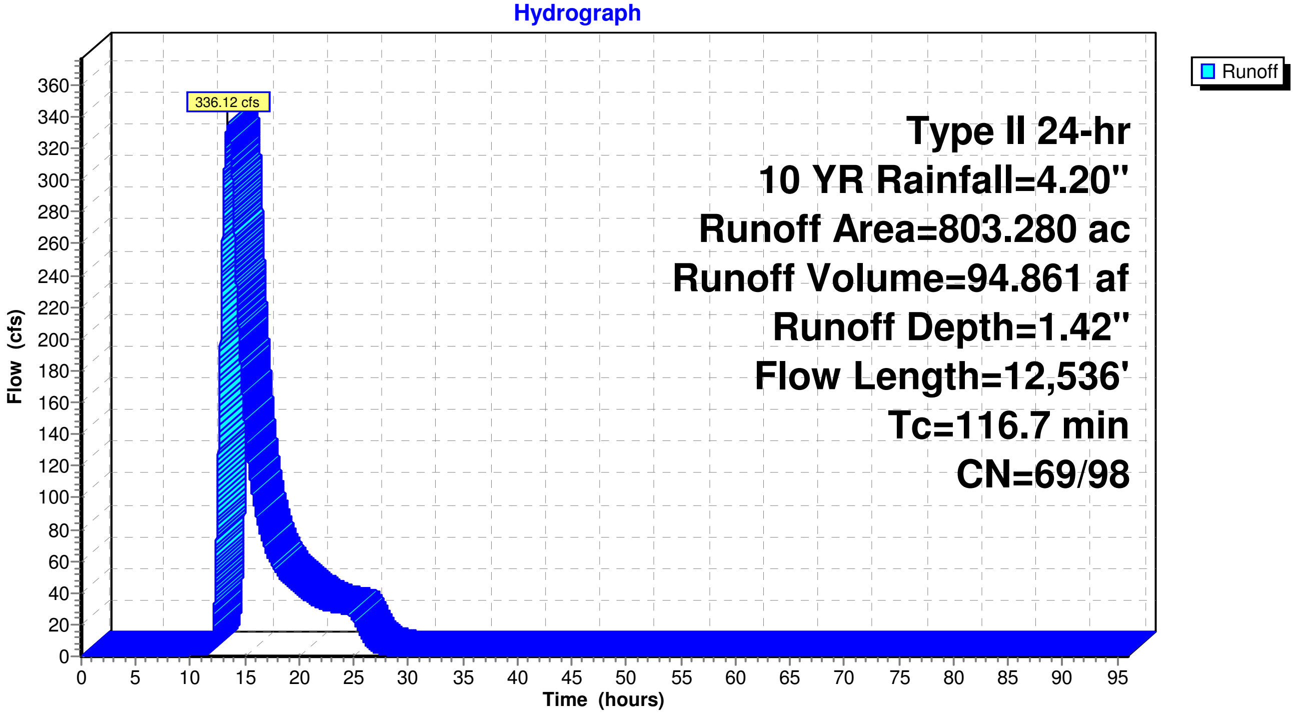
Runoff = 336.12 cfs @ 13.36 hrs, Volume= 94.861 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR Rainfall=4.20"

Area (ac)	CN	Description
11.850	77	Woods, Good, HSG D
5.000	78	Meadow, non-grazed, HSG D
8.390	30	Woods, Good, HSG A
0.390	55	Woods, Good, HSG B
2.250	98	Paved parking, HSG D
7.850	55	Woods, Good, HSG B
0.110	98	Paved parking, HSG D
353.100	70	Woods, Good, HSG C
105.000	71	Meadow, non-grazed, HSG C
3.380	30	Woods, Good, HSG A
9.290	30	Meadow, non-grazed, HSG A
1.750	98	Paved parking, HSG D
9.040	55	Woods, Good, HSG B
8.967	58	Meadow, non-grazed, HSG B
181.500	70	Woods, Good, HSG C
1.640	98	Paved parking, HSG D
93.673	74	>75% Grass cover, Good, HSG C
0.100	98	Roofs, HSG D
803.280	69	Weighted Average
797.430	69	99.27% Pervious Area
5.850	98	0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0500	0.10		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
9.0	2,298	0.0700	4.26		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
91.8	10,138	0.0510	1.84	9.21	**Channel Flow, C - D** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
116.7	12,536	Total			

Subcatchment 10S: Out Pre East



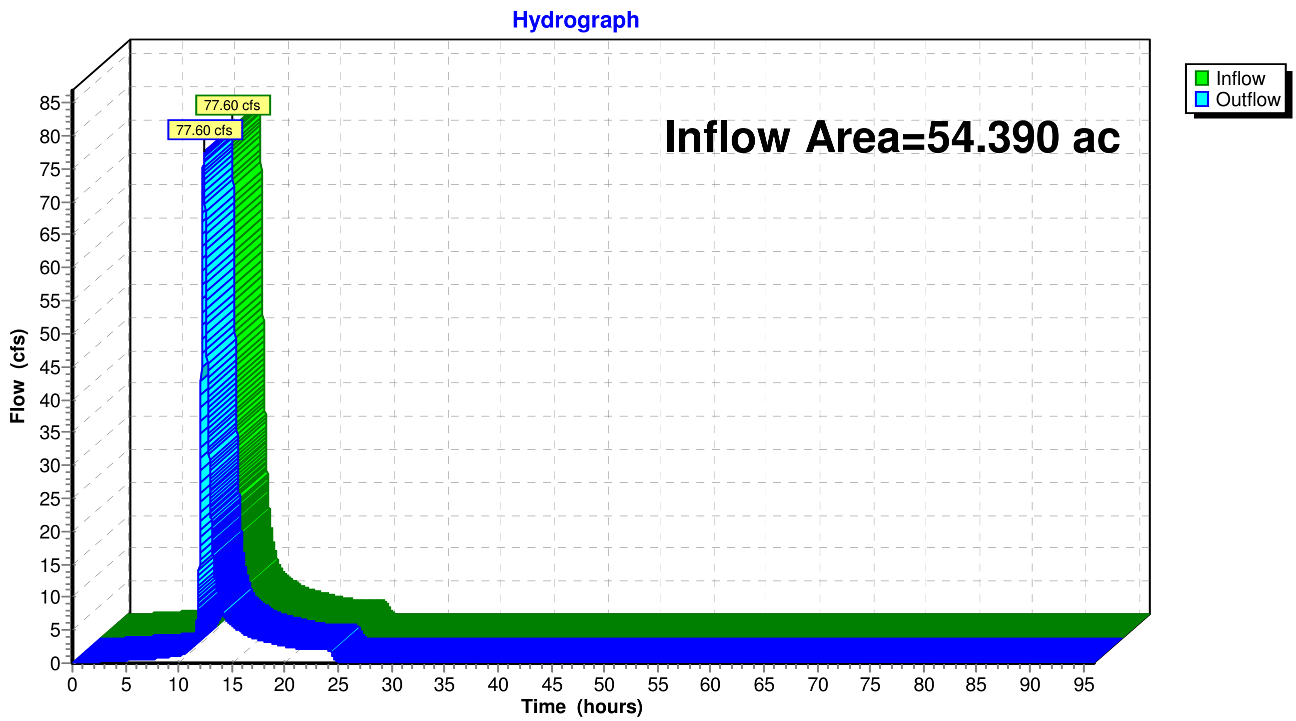
Summary for Reach 1R: Post 4-5W Clvt

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 54.390 ac, 16.07% Impervious, Inflow Depth = 2.04" for 10 YR event
Inflow = 77.60 cfs @ 12.35 hrs, Volume= 9.250 af
Outflow = 77.60 cfs @ 12.36 hrs, Volume= 9.250 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 1R: Post 4-5W Clvt



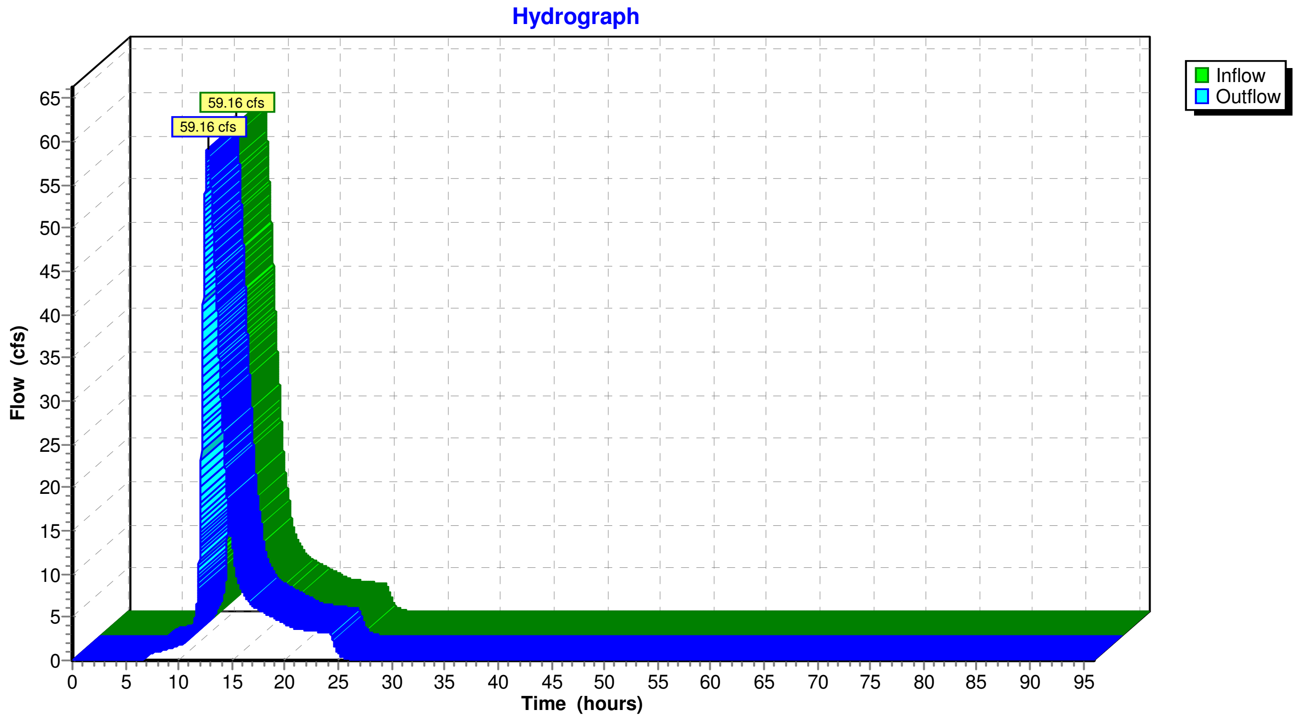
Summary for Reach 2R: Out Post West

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 59.16 cfs @ 12.72 hrs, Volume= 14.240 af
Outflow = 59.16 cfs @ 12.73 hrs, Volume= 14.240 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 2R: Out Post West



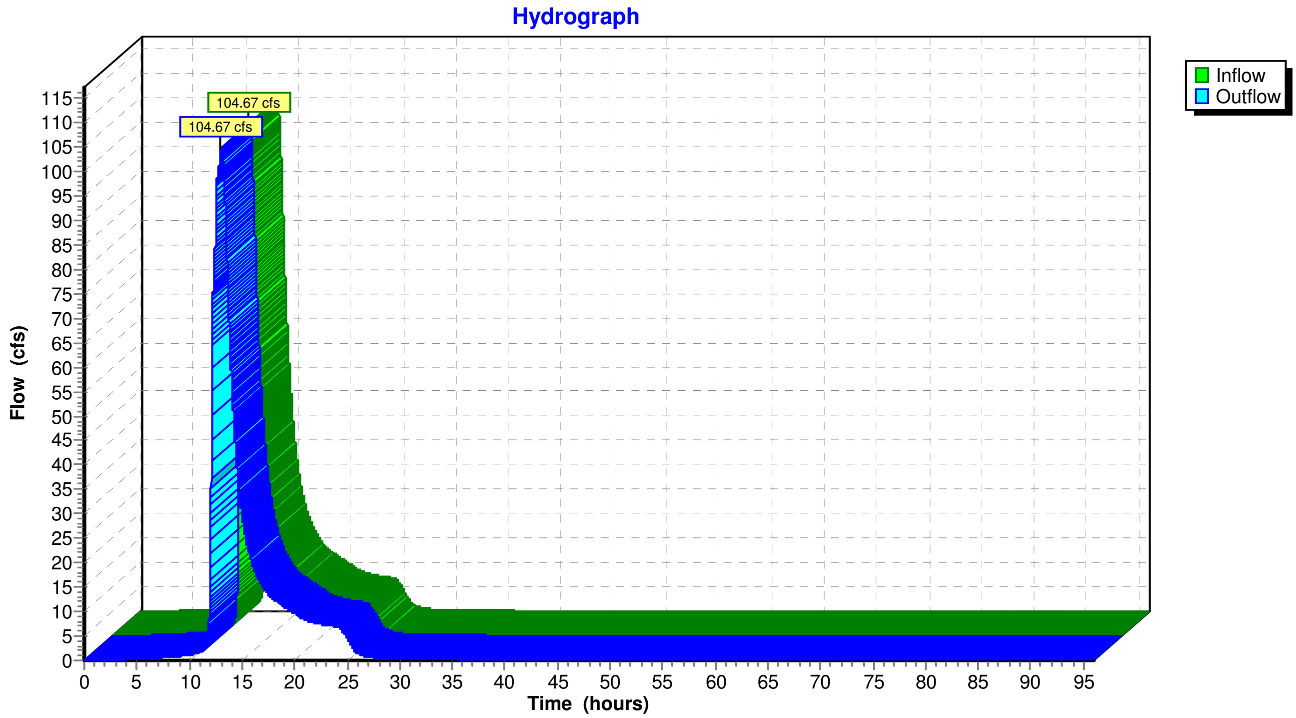
Summary for Reach 3R: Out Post Central

[40] Hint: Not Described (Outflow=Inflow)

Inflow	=	104.67 cfs @	12.99 hrs,	Volume=	28.135 af
Outflow	=	104.67 cfs @	13.00 hrs,	Volume=	28.135 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 3R: Out Post Central



Summary for Pond 1P: Post South Pond

[86] Warning: Oscillations may require smaller dt (severity=11)

Inflow	=	116.38 cfs @	12.32 hrs,	Volume=	14.545 af
Outflow	=	59.16 cfs @	12.72 hrs,	Volume=	14.552 af, Atten= 49%, Lag= 23.8 min
Primary	=	59.16 cfs @	12.72 hrs,	Volume=	14.240 af
Secondary	=	0.70 cfs @	6.15 hrs,	Volume=	0.313 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 822.89' @ 12.72 hrs Surf.Area= 4.045 ac Storage= 3.121 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 22.9 min (899.7 - 876.8)

Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	418.450 af	**PosSPond (Conic)** Listed below (Recalc)

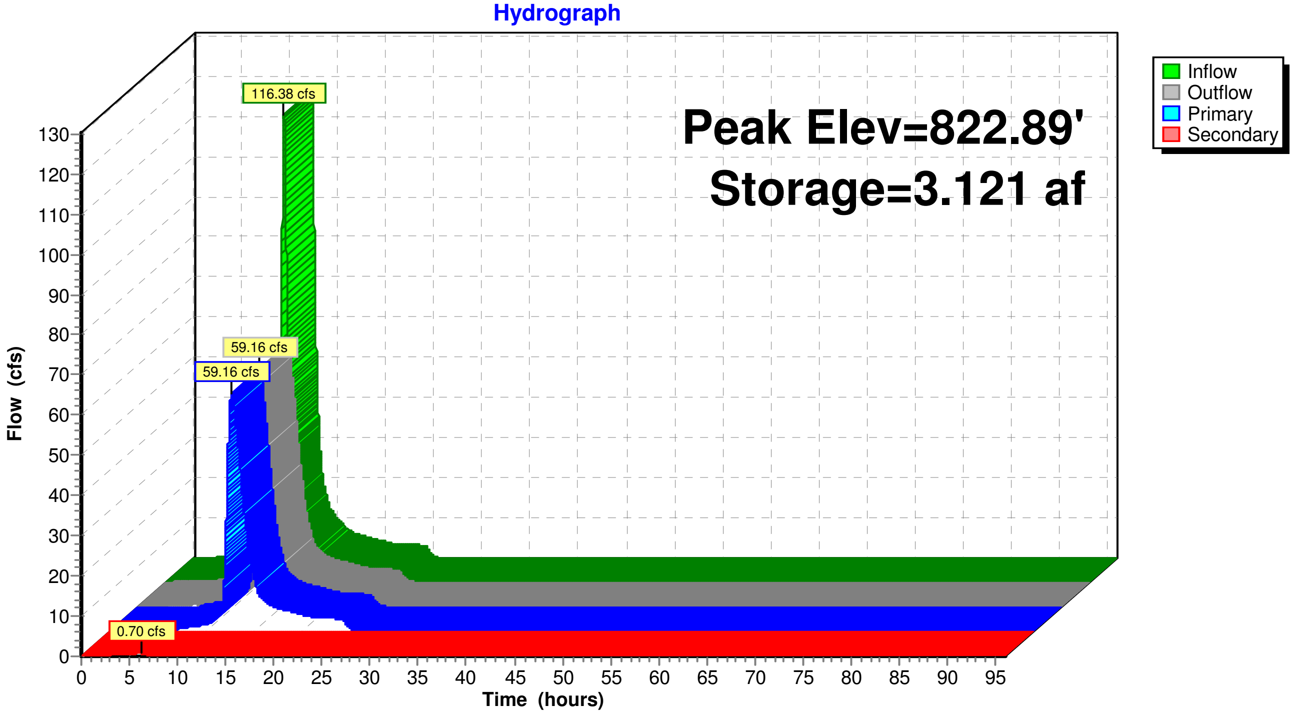
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
821.00	0.010	0.000	0.000	0.010
822.60	3.600	2.027	2.027	3.600
824.00	6.020	6.662	8.688	6.021
826.00	6.790	12.802	21.491	6.795
828.00	7.430	14.215	35.706	7.442
830.00	7.880	15.308	51.014	7.902
832.00	8.280	16.158	67.172	8.313
834.00	8.500	16.780	83.951	8.554
836.00	8.990	17.488	101.439	9.054
838.00	9.850	18.833	120.273	9.920
840.00	10.330	20.178	140.451	10.412
842.00	15.310	25.477	165.928	15.394
858.00	16.260	252.522	418.450	16.832

Device	Routing	Invert	Outlet Devices
#1	Primary	821.11'	**9.5' long x 100.0' 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
#2	Secondary	820.81'	**24.0" Round Culvert** L= 30.0' Ke= 0.200 Inlet / Outlet Invert= 819.81' / 820.81' S= -0.0333 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=59.16 cfs @ 12.72 hrs HW=822.89' TW=0.00' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 59.16 cfs @ 3.51 fps)

Secondary OutFlow Max=0.69 cfs @ 6.15 hrs HW=821.11' TW=820.96' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 0.69 cfs @ 2.33 fps)

Pond 1P: Post South Pond



Summary for Pond 2P: Post North Pond

[86] Warning: Oscillations may require smaller dt (severity=477)

Inflow	=	35.40 cfs @	12.08 hrs,	Volume=	2.744 af
Outflow	=	21.26 cfs @	12.18 hrs,	Volume=	2.527 af, Atten= 40%, Lag= 6.3 min
Primary	=	21.26 cfs @	12.18 hrs,	Volume=	2.527 af
Secondary	=	0.00 cfs @	12.22 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.81' Surf.Area= 0.020 ac Storage= 0.006 af
Peak Elev= 823.53' @ 12.22 hrs Surf.Area= 0.383 ac Storage= 0.685 af (0.679 af above start)

Plug-Flow detention time= 304.7 min calculated for 2.554 af (92% of inflow)
Center-of-Mass det. time= 99.6 min (1,028.6 - 931.4)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	37.557 af	**PostNPond (Conic)** Listed below

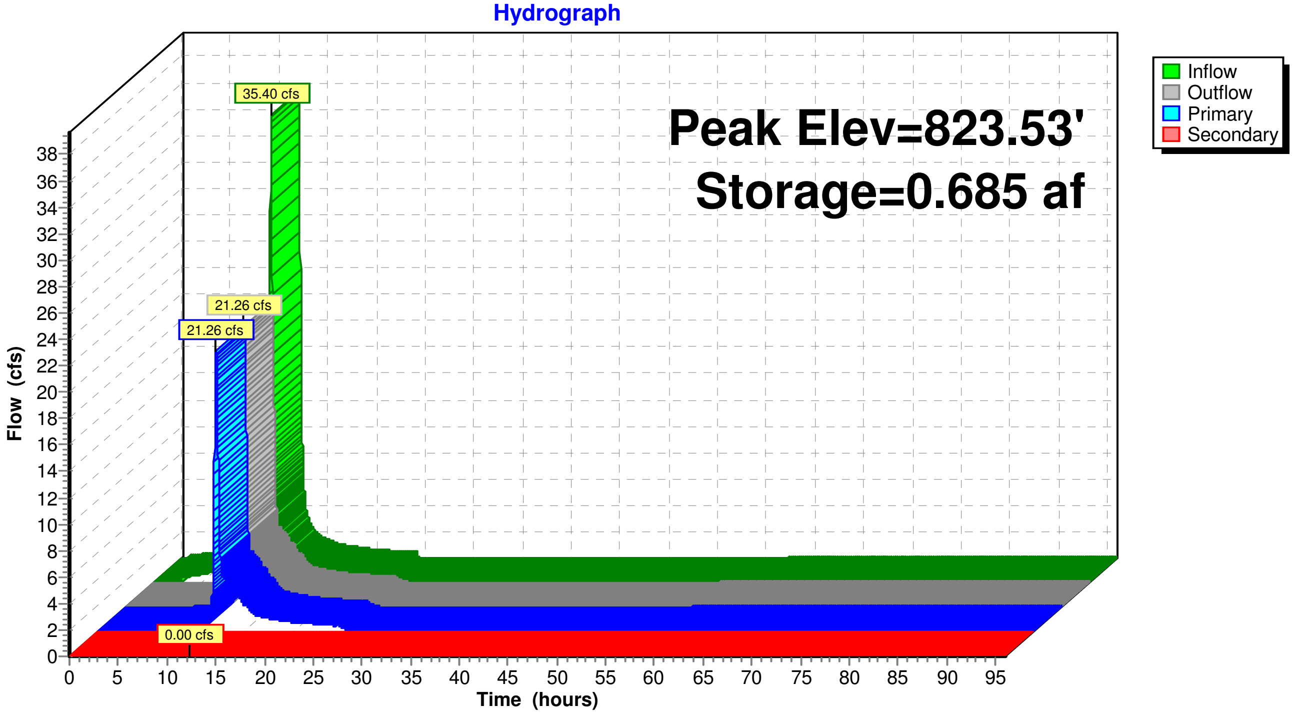
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
819.81	0.020	0.006	0.006	0.020
820.00	0.030	0.005	0.010	0.030
824.00	0.430	0.765	0.775	0.431
826.00	1.030	1.417	2.192	1.032
828.00	1.340	2.363	4.555	1.344
830.00	2.170	3.477	8.032	2.175
832.00	2.470	4.637	12.669	2.480
834.00	2.790	5.257	17.926	2.804
836.00	3.090	5.877	23.803	3.110
838.00	3.440	6.527	30.330	3.465
840.00	3.790	7.227	37.557	3.821

Device	Routing	Invert	Outlet Devices
#1	Primary	820.41'	**24.0" Round Culvert - Watson** L= 30.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 820.41' / 819.81' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Secondary	823.50'	**24.0" Round Culvert - Post Pipe** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 823.50' / 819.00' S= 0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=21.06 cfs @ 12.18 hrs HW=823.49' TW=822.24' (Dynamic Tailwater)
└─**1=Culvert - Watson** (Inlet Controls 21.06 cfs @ 6.70 fps)

Secondary OutFlow Max=0.00 cfs @ 12.22 hrs HW=823.53' TW=820.17' (Dynamic Tailwater)
└─**2=Culvert - Post Pipe** (Inlet Controls 0.00 cfs @ 0.55 fps)

Pond 2P: Post North Pond



Summary for Pond 3P: PostCClub Pond

Inflow	=	4.76 cfs @	12.11 hrs,	Volume=	0.374 af
Outflow	=	4.71 cfs @	12.14 hrs,	Volume=	0.374 af, Atten= 1%, Lag= 1.6 min
Primary	=	4.71 cfs @	12.14 hrs,	Volume=	0.374 af
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.42' Surf.Area= 0.010 ac Storage= 0.000 af
Peak Elev= 820.24' @ 12.14 hrs Surf.Area= 0.021 ac Storage= 0.013 af

Plug-Flow detention time= 5.8 min calculated for 0.374 af (100% of inflow)
Center-of-Mass det. time= 5.7 min (838.5 - 832.9)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	1.167 af	**PostCClubPond (Conic)** Listed below (Recalc)

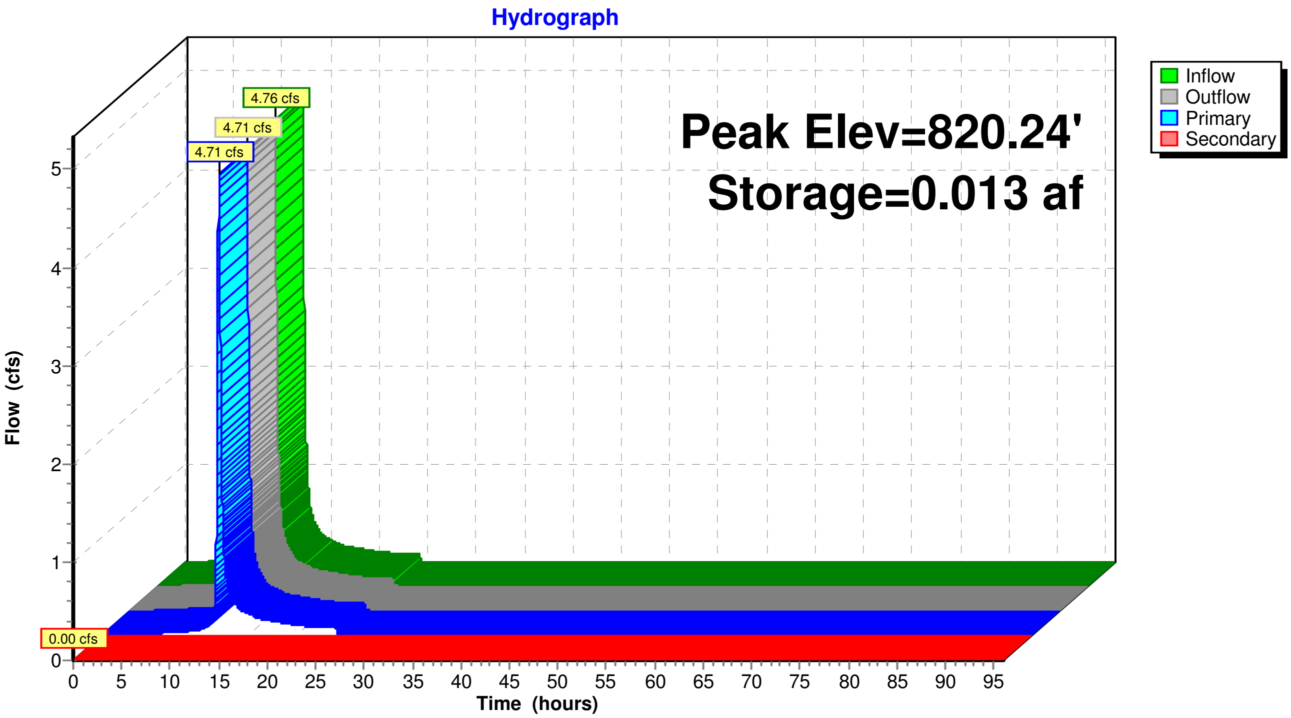
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
820.00	0.020	0.009	0.009	0.020
824.00	0.030	0.099	0.108	0.035
826.00	0.040	0.070	0.178	0.047
828.00	0.050	0.090	0.267	0.059
830.00	0.060	0.110	0.377	0.072
832.00	0.070	0.130	0.507	0.085
834.00	0.080	0.150	0.657	0.099
840.00	0.090	0.510	1.167	0.130

Device	Routing	Invert	Outlet Devices
#1	Primary	819.42'	**24.0" Round Culvert** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 819.42' / 817.75' S= 0.0334 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Primary	825.05'	**145.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#3	Secondary	823.50'	**24.0" Round Culvert** L= 210.0' Ke= 0.500 Inlet / Outlet Invert= 819.00' / 823.50' S= -0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=4.71 cfs @ 12.14 hrs HW=820.24' TW=0.00' (Dynamic Tailwater)
├─**1=Culvert** (Inlet Controls 4.71 cfs @ 3.86 fps)
└─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.42' TW=819.81' (Dynamic Tailwater)
└─**3=Culvert** (Controls 0.00 cfs)

Pond 3P: PostCClub Pond



Summary for Pond 4P: H Pond West

Inflow Area =	3.343 ac, 42.51% Impervious,	Inflow Depth = 2.69"	for 10 YR event
Inflow =	11.90 cfs @ 12.03 hrs,	Volume= 0.749 af	
Outflow =	8.40 cfs @ 12.12 hrs,	Volume= 0.841 af,	Atten= 29%, Lag= 5.6 min
Discarded =	0.06 cfs @ 12.12 hrs,	Volume= 0.175 af	
Primary =	8.34 cfs @ 12.12 hrs,	Volume= 0.666 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 826.00' Surf.Area= 0.052 ac Storage= 0.093 af
Peak Elev= 828.52' @ 12.12 hrs Surf.Area= 0.101 ac Storage= 0.278 af (0.185 af above start)

Plug-Flow detention time= 370.7 min calculated for 0.747 af (100% of inflow)
Center-of-Mass det. time= 299.1 min (1,087.3 - 788.1)

Volume	Invert	Avail.Storage	Storage Description
#1	822.00'	0.452 af	**H Pond West (Conic)** Listed below (Recalc)

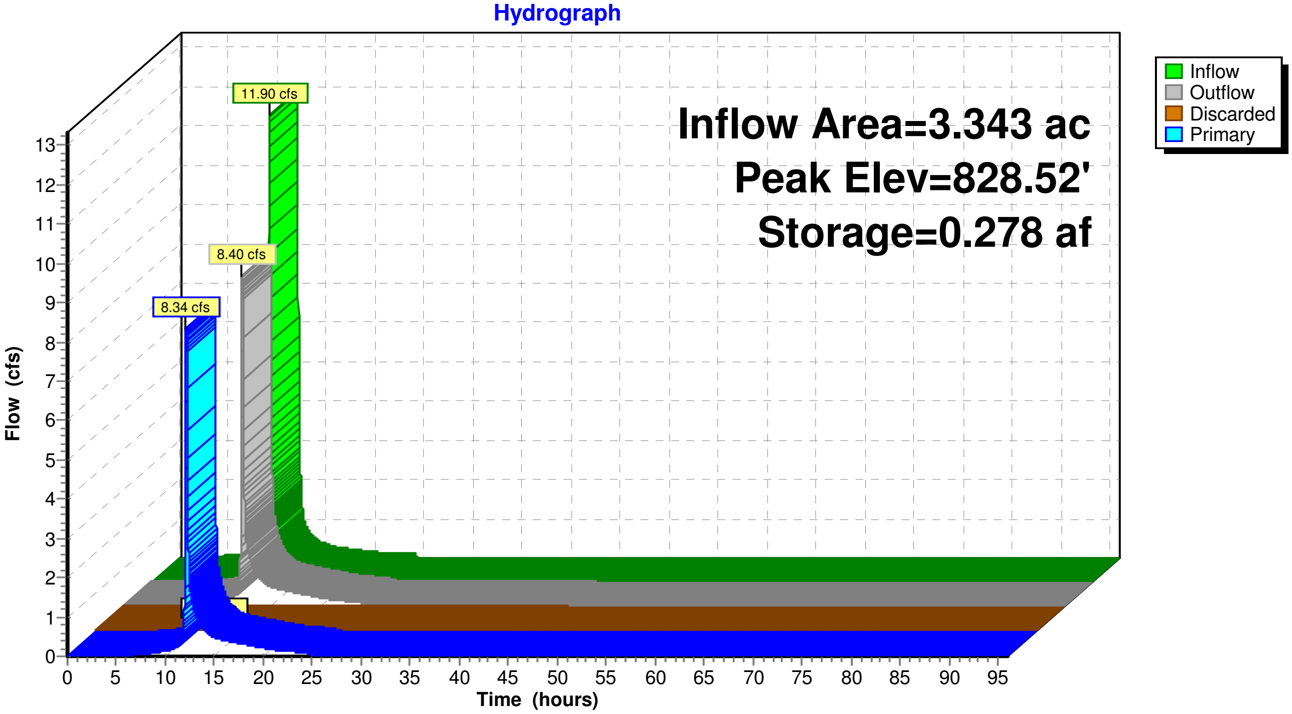
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
822.00	0.004	0.000	0.000	0.004
824.00	0.021	0.023	0.023	0.021
826.00	0.052	0.071	0.093	0.053
828.00	0.086	0.137	0.230	0.088
829.00	0.116	0.101	0.331	0.119
830.00	0.126	0.121	0.452	0.130

Device	Routing	Invert	Outlet Devices
#1	Discarded	822.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	825.90'	**15.0" Round Culvert** L= 82.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 825.90' / 825.16' S= 0.0089 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#3	Device 2	826.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	827.00'	**45.0 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	828.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	829.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.06 cfs @ 12.12 hrs HW=828.52' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=8.34 cfs @ 12.12 hrs HW=828.52' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 8.34 cfs @ 6.80 fps)
│ ├─**3=Orifice/Grate** (Passes < 0.64 cfs potential flow)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Passes < 1.92 cfs potential flow)
│ └─**5=Orifice/Grate** (Passes < 17.01 cfs potential flow)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: H Pond West



Summary for Pond 5P: H Pond East

Inflow Area = 20.187 ac, 39.80% Impervious, Inflow Depth = 2.58" for 10 YR event
Inflow = 57.98 cfs @ 12.09 hrs, Volume= 4.348 af
Outflow = 24.80 cfs @ 12.31 hrs, Volume= 5.041 af, Atten= 57%, Lag= 13.2 min
Discarded = 0.33 cfs @ 12.31 hrs, Volume= 1.473 af
Primary = 24.47 cfs @ 12.31 hrs, Volume= 3.568 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 846.00' Surf.Area= 0.300 ac Storage= 1.128 af
Peak Elev= 850.02' @ 12.31 hrs Surf.Area= 0.513 ac Storage= 2.762 af (1.634 af above start)

Plug-Flow detention time= 916.3 min calculated for 3.912 af (90% of inflow)
Center-of-Mass det. time= 640.6 min (1,436.6 - 796.0)

Volume	Invert	Avail.Storage	Storage Description
#1	840.00'	4.506 af	**H Pond East (Conic)** Listed below

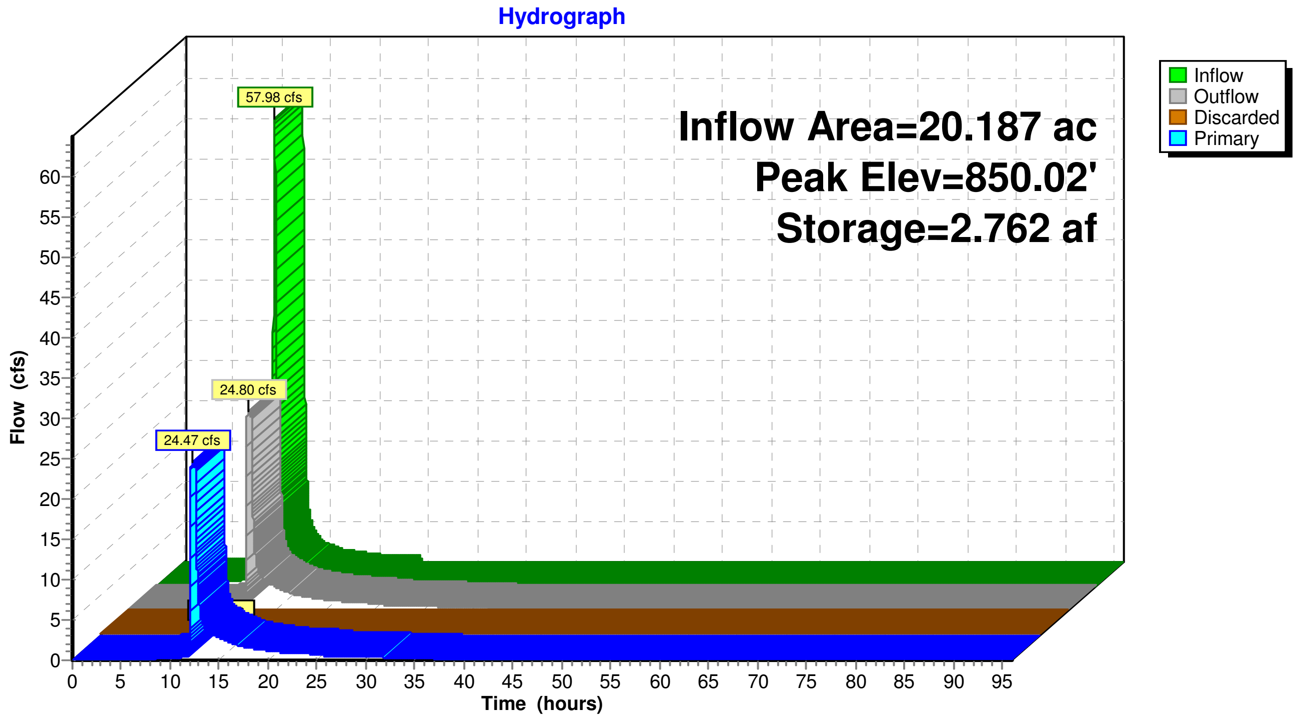
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
840.00	0.093	0.000	0.000	0.093
842.00	0.151	0.242	0.242	0.152
844.00	0.220	0.369	0.611	0.223
846.00	0.300	0.518	1.128	0.305
848.00	0.407	0.704	1.833	0.413
850.00	0.512	0.917	2.750	0.521
852.00	0.608	1.119	3.868	0.620
853.00	0.668	0.638	4.506	0.682

Device	Routing	Invert	Outlet Devices
#1	Discarded	840.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	841.00'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.00' / 835.64' S= 0.0443 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#3	Device 2	846.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	847.50'	**45.0 deg x 849.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	849.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	851.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.33 cfs @ 12.31 hrs HW=850.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=24.47 cfs @ 12.31 hrs HW=850.02' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 24.47 cfs @ 13.85 fps)
│ ├─**3=Orifice/Grate** (Passes < 0.83 cfs potential flow)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Passes < 11.30 cfs potential flow)
│ └─**5=Orifice/Grate** (Passes < 47.30 cfs potential flow)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: H Pond East



Summary for Pond 6P: StormTech MC-4500

[86] Warning: Oscillations may require smaller dt (severity=590)

Inflow Area = 12.900 ac, 76.74% Impervious, Inflow Depth = 3.26" for 10 YR event
Inflow = 36.57 cfs @ 12.17 hrs, Volume= 3.500 af
Outflow = 9.98 cfs @ 12.62 hrs, Volume= 4.079 af, Atten= 73%, Lag= 27.1 min
Discarded = 2.13 cfs @ 12.62 hrs, Volume= 3.260 af
Primary = 7.85 cfs @ 12.62 hrs, Volume= 0.819 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 865.80' @ 12.62 hrs Surf.Area= 0.421 ac Storage= 1.264 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 68.9 min (842.3 - 773.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	861.75'	0.664 af	**55.75'W x 329.12'L x 6.75'H Field A** 2.843 af Overall - 1.183 af Embedded = 1.660 af x 40.0% Voids
#2A	862.50'	1.183 af	**ADS_StormTech MC-4500 +Cap** x 480 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.02'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.847 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	865.00'	**24.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	861.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	864.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=2.13 cfs @ 12.62 hrs HW=865.80' (Free Discharge)
└─**2=Exfiltration** (Controls 2.13 cfs)

Primary OutFlow Max=7.85 cfs @ 12.62 hrs HW=865.80' TW=0.00' (Dynamic Tailwater)
├─**1=Orifice/Grate** (Orifice Controls 3.54 cfs @ 3.04 fps)
└─**3=Orifice/Grate** (Orifice Controls 4.31 cfs @ 5.48 fps)

Pond 6P: StormTech MC-4500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.02'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

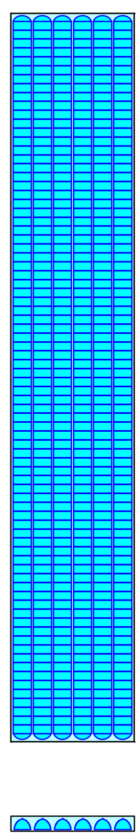
80 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 327.12' Row Length +12.0" End Stone x 2 = 329.12' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

480 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 51,543.8 cf Chamber Storage

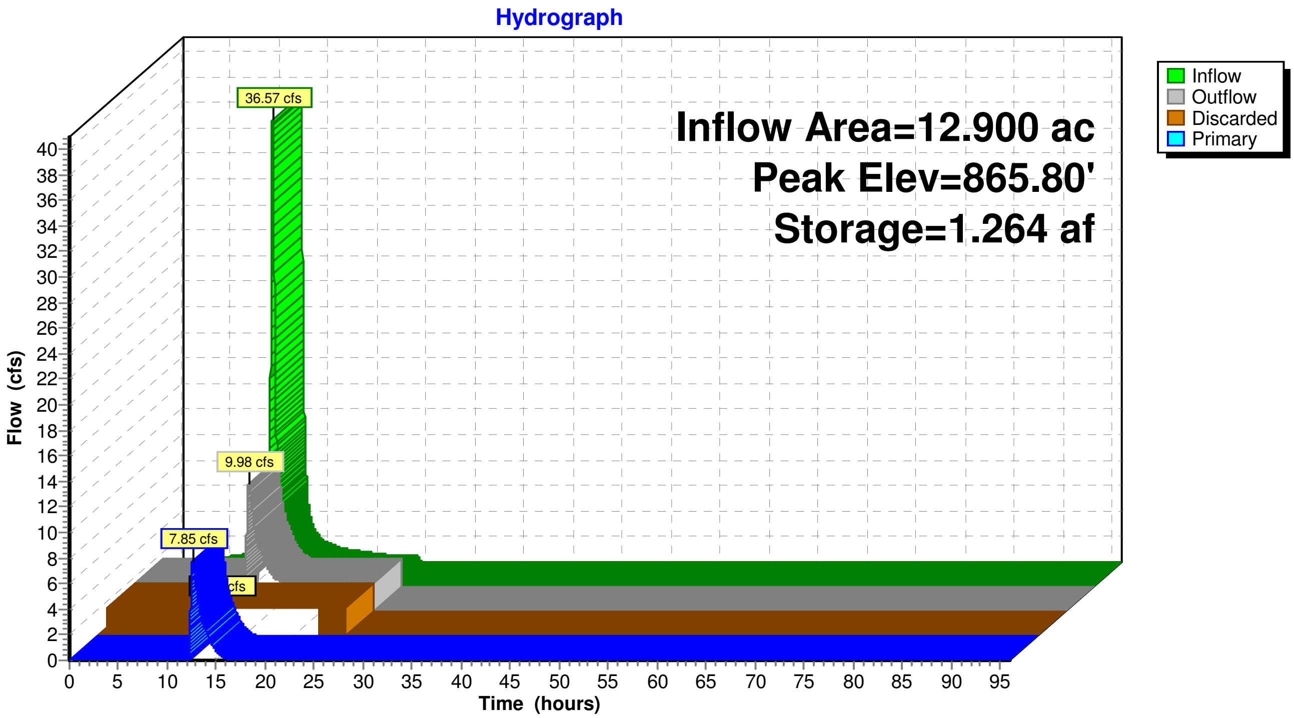
123,850.7 cf Field - 51,543.8 cf Chambers = 72,306.9 cf Stone x 40.0% Voids = 28,922.8 cf Stone Storage

Chamber Storage + Stone Storage = 80,466.6 cf = 1.847 af
Overall Storage Efficiency = 65.0%

480 Chambers
4,587.1 cy Field
2,678.0 cy Stone



Pond 6P: StormTech MC-4500

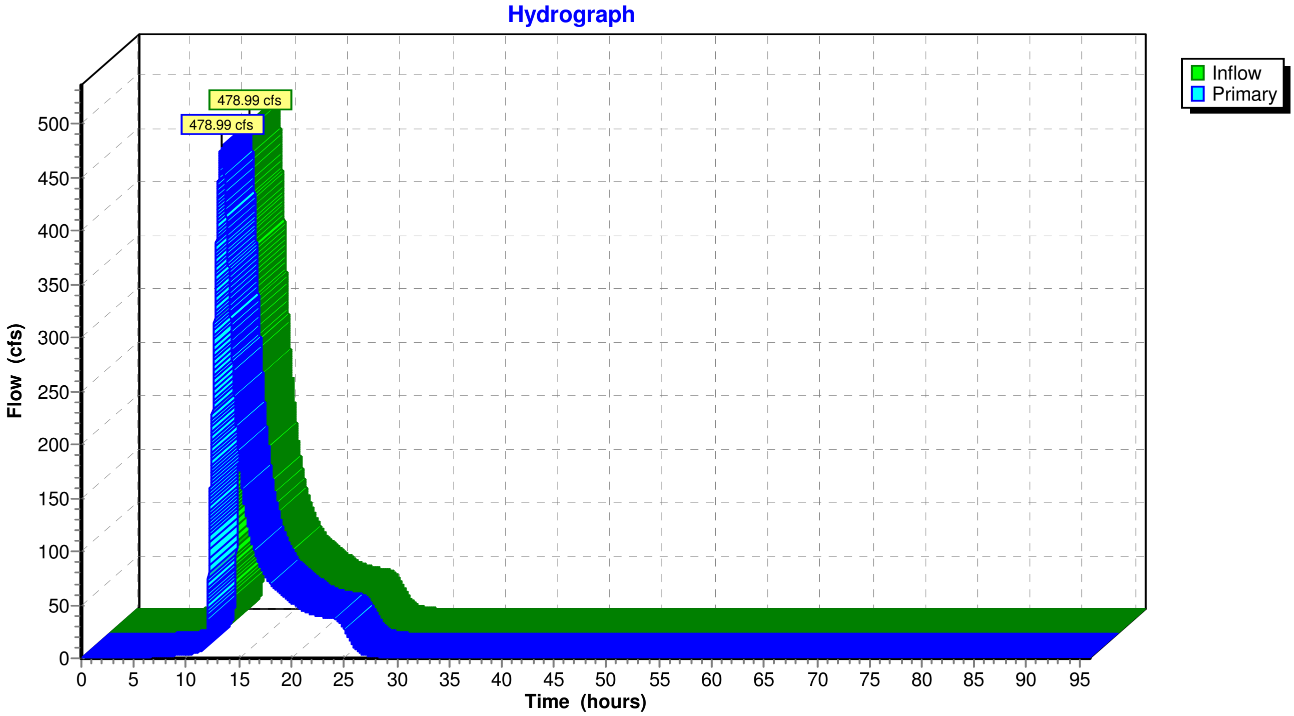


Summary for Link 24L: Out Post NOI

Inflow	=	478.99 cfs @	13.35 hrs,	Volume=	137.236 af
Primary	=	478.99 cfs @	13.36 hrs,	Volume=	137.236 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 24L: Out Post NOI



Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Sim-Route method - Pond routing by Sim-Route method w/Net Flows

Subcatchment 1S: Pre West 4 &5 Runoff Area=54.390 ac 16.07% Impervious Runoff Depth=3.69"
Flow Length=1,592' Tc=38.2 min CN=73/98 Runoff=143.87 cfs 16.726 af

Subcatchment 3S: Post West 2 Runoff Area=19.170 ac 19.04% Impervious Runoff Depth=3.23"
Flow Length=1,118' Tc=36.8 min CN=66/98 Runoff=44.23 cfs 5.162 af

Subcatchment 4S: Post West 1 Runoff Area=15.200 ac 13.44% Impervious Runoff Depth=3.53"
Flow Length=1,386' Tc=15.5 min CN=72/98 Runoff=66.47 cfs 4.477 af

Subcatchment 5S: Post West 3 Runoff Area=2.830 ac 15.55% Impervious Runoff Depth=3.04"
Flow Length=1,204' Tc=18.0 min CN=65/98 Runoff=9.62 cfs 0.716 af

Subcatchment 6S: H Post Subdv W Runoff Area=3.343 ac 42.51% Impervious Runoff Depth=4.46"
Flow Length=1,048' Tc=11.7 min CN=74/98 Runoff=19.82 cfs 1.243 af

Subcatchment 7S: H Post Subdv E Runoff Area=20.187 ac 39.80% Impervious Runoff Depth=4.33"
Flow Length=2,047' Tc=17.3 min CN=73/98 Runoff=98.07 cfs 7.288 af

Subcatchment 8S: H Post Sub MISC Runoff Area=16.470 ac 1.52% Impervious Runoff Depth=3.01"
Flow Length=2,438' Tc=28.5 min CN=70/98 Runoff=43.88 cfs 4.132 af

Subcatchment 9S-A: Casino Area Runoff Area=12.900 ac 76.74% Impervious Runoff Depth=5.07"
Flow Length=550' Tc=24.8 min CN=61/98 Runoff=56.97 cfs 5.453 af

Subcatchment 9S-B: Post Central Runoff Area=157.950 ac 4.15% Impervious Runoff Depth=3.09"
Flow Length=5,764' Tc=93.5 min CN=70/98 Runoff=182.45 cfs 40.660 af

Subcatchment 10S: Out Pre East Runoff Area=803.280 ac 0.73% Impervious Runoff Depth=2.89"
Flow Length=12,536' Tc=116.7 min CN=69/98 Runoff=734.10 cfs 193.598 af

Reach 1R: Post 4-5W Clvt Inflow=143.87 cfs 16.726 af
Outflow=143.87 cfs 16.726 af

Reach 2R: Out Post West Inflow=99.65 cfs 25.868 af
Outflow=99.65 cfs 25.868 af

Reach 3R: Out Post Central Inflow=227.96 cfs 55.554 af
Outflow=227.96 cfs 55.554 af

Pond 1P: Post South Pond Peak Elev=823.62' Storage=6.565 af Inflow=210.46 cfs 26.176 af
Primary=99.65 cfs 25.868 af Secondary=0.79 cfs 0.312 af Outflow=99.65 cfs 26.180 af

Pond 2P: Post North Pond Peak Elev=824.61' Storage=1.211 af Inflow=66.47 cfs 4.789 af
Primary=26.33 cfs 4.288 af Secondary=6.47 cfs 0.285 af Outflow=32.29 cfs 4.572 af

Pond 3P: PostCClub Pond Peak Elev=821.00' Storage=0.030 af Inflow=14.25 cfs 1.001 af
Primary=14.19 cfs 1.001 af Secondary=0.00 cfs 0.000 af Outflow=14.19 cfs 1.001 af

Pond 4P: H Pond West Peak Elev=829.26' Storage=0.361 af Inflow=19.82 cfs 1.243 af
Discarded=0.08 cfs 0.181 af Primary=16.77 cfs 1.153 af Outflow=16.84 cfs 1.335 af

Pond 5P: H Pond East Peak Elev=851.68' Storage=3.687 af Inflow=98.07 cfs 7.288 af
Discarded=0.38 cfs 1.509 af Primary=56.56 cfs 6.460 af Outflow=56.94 cfs 7.969 af

Pond 6P: StormTech MC-4500 Peak Elev=867.65' Storage=1.704 af Inflow=56.97 cfs 5.453 af
Discarded=2.14 cfs 3.630 af Primary=26.12 cfs 2.148 af Outflow=28.26 cfs 5.778 af

Link 24L: Out Post NOI Inflow=1,021.95 cfs 275.020 af
Primary=1,021.95 cfs 275.020 af

Total Runoff Area = 1,105.720 ac Runoff Volume = 279.456 af Average Runoff Depth = 3.03"
95.76% Pervious = 1,058.836 ac 4.24% Impervious = 46.884 ac

Summary for Subcatchment 1S: Pre West 4 &5

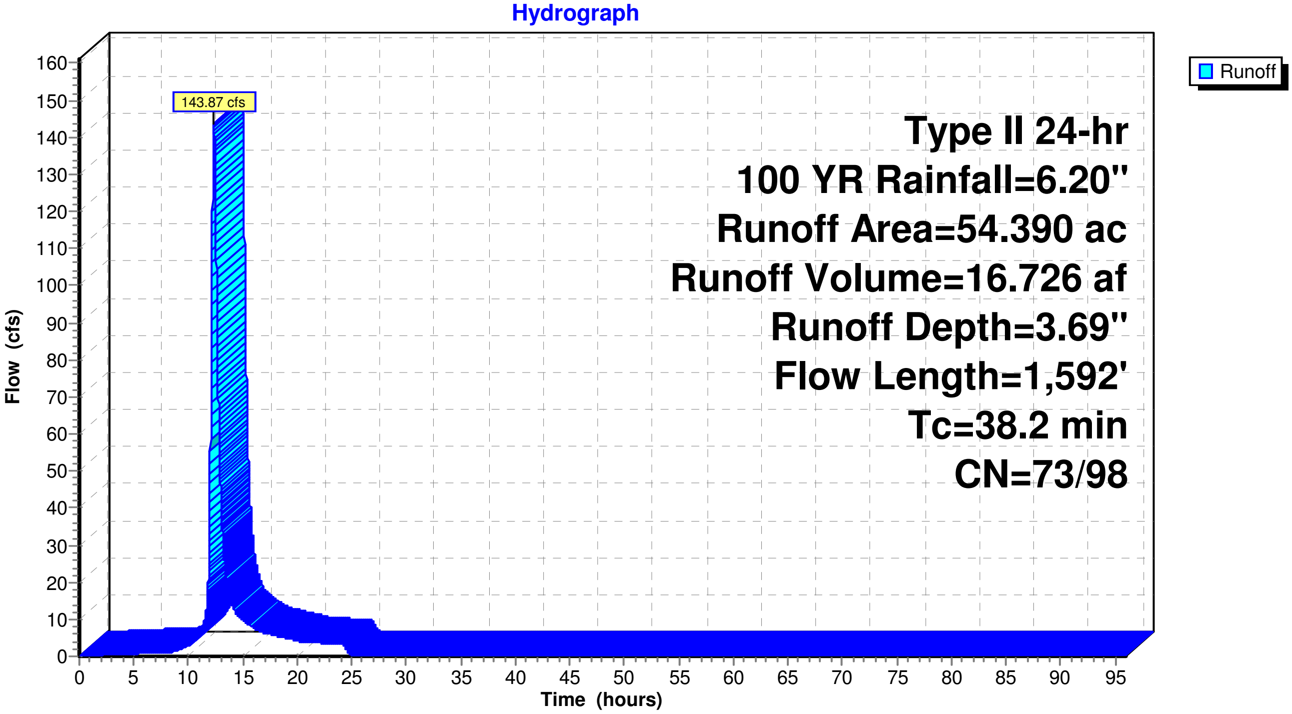
Runoff = 143.87 cfs @ 12.35 hrs, Volume= 16.726 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
22.690	80	1/2 acre lots, 25% imp, HSG C
11.210	70	Woods, Good, HSG C
1.910	70	Woods, Good, HSG C
11.950	80	1/2 acre lots, 25% imp, HSG C
5.240	74	>75% Grass cover, Good, HSG C
1.310	70	Woods, Good, HSG C
0.080	98	Paved roads w/curbs & sewers, HSG C
54.390	77	Weighted Average
45.650	73	83.93% Pervious Area
8.740	98	16.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0100	0.06		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
2.4	845	0.1300	5.80		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.5	647	0.0150	1.97		**Shallow Concentrated Flow, C -D** Unpaved Kv= 16.1 fps
38.2	1,592	Total			

Subcatchment 1S: Pre West 4 &5



Summary for Subcatchment 3S: Post West 2

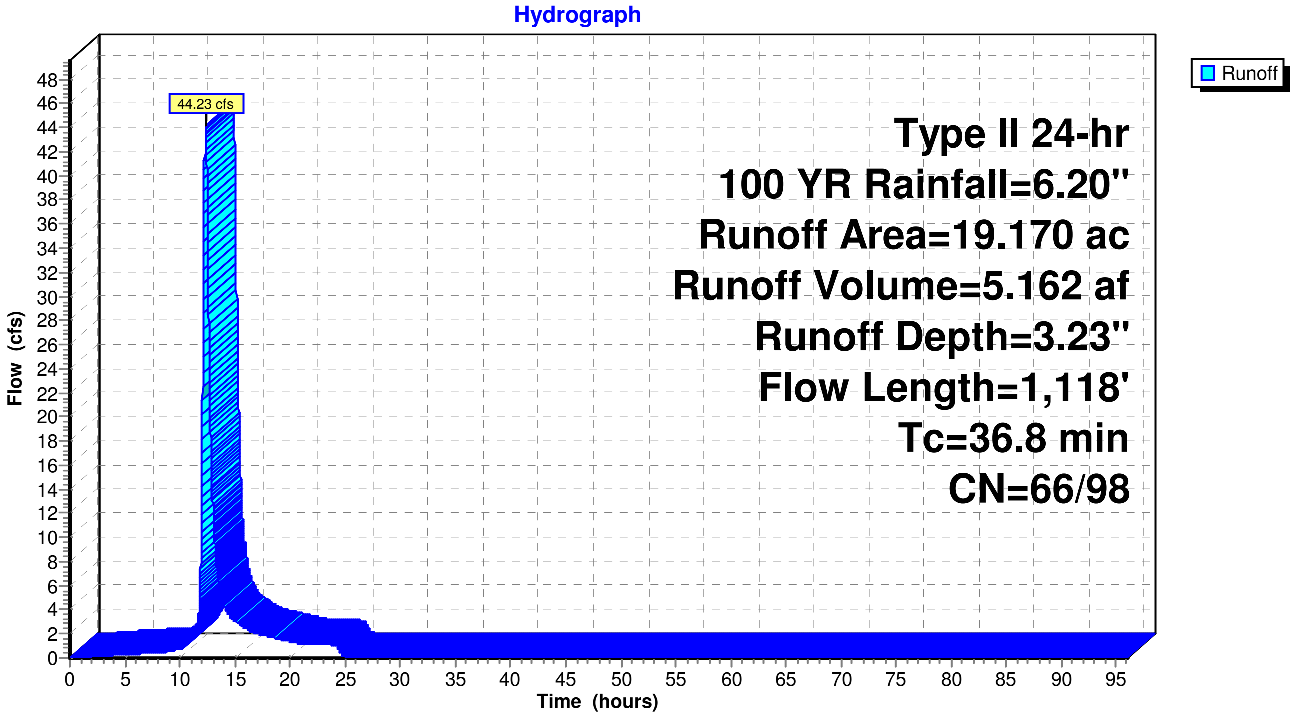
Runoff = 44.23 cfs @ 12.31 hrs, Volume= 5.162 af, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.070	98	Paved parking, HSG D
0.100	55	Woods, Good, HSG B
0.650	70	Woods, Good, HSG C
0.660	77	Woods, Good, HSG D
0.320	98	Paved roads w/curbs & sewers, HSG D
0.620	65	Brush, Good, HSG C
1.970	65	Brush, Good, HSG C
2.620	98	Water Surface, HSG D
0.380	70	Brush, Fair, HSG C
0.640	98	Paved parking, HSG D
4.020	65	Brush, Good, HSG C
7.120	65	Brush, Good, HSG C
19.170	72	Weighted Average
15.520	66	80.96% Pervious Area
3.650	98	19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0800	0.13		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
7.9	240	0.0010	0.51		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.3	114	0.1580	6.40		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
15.4	664	0.0020	0.72		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
36.8	1,118	Total			

Subcatchment 3S: Post West 2



Summary for Subcatchment 4S: Post West 1

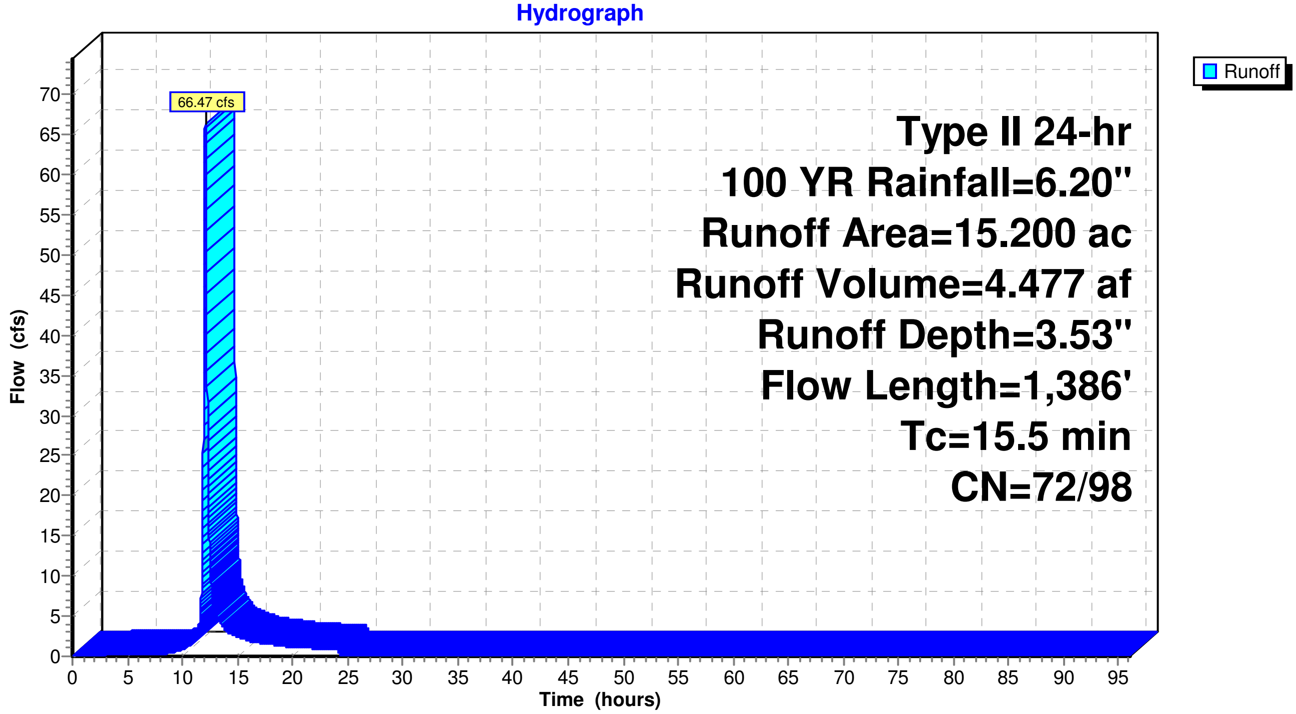
Runoff = 66.47 cfs @ 12.07 hrs, Volume= 4.477 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
3.220	83	1/4 acre lots, 38% imp, HSG C
1.960	70	Woods, Good, HSG C
0.240	98	Paved parking, HSG D
0.330	98	Paved parking, HSG D
4.610	70	Woods, Good, HSG C
2.690	74	>75% Grass cover, Good, HSG C
0.290	71	Meadow, non-grazed, HSG C
0.770	78	Meadow, non-grazed, HSG D
0.250	98	Water Surface, HSG D
0.330	65	Brush, Good, HSG C
0.510	73	Brush, Good, HSG D
15.200	75	Weighted Average
13.156	72	86.56% Pervious Area
2.044	98	13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.1000	0.21		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.6	286	0.2450	7.97		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	399	0.2260	7.65		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
3.1	96	0.0010	0.51		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
2.9	505	0.0320	2.88		**Shallow Concentrated Flow, E - F** Unpaved Kv= 16.1 fps
15.5	1,386	Total			

Subcatchment 4S: Post West 1



Summary for Subcatchment 5S: Post West 3

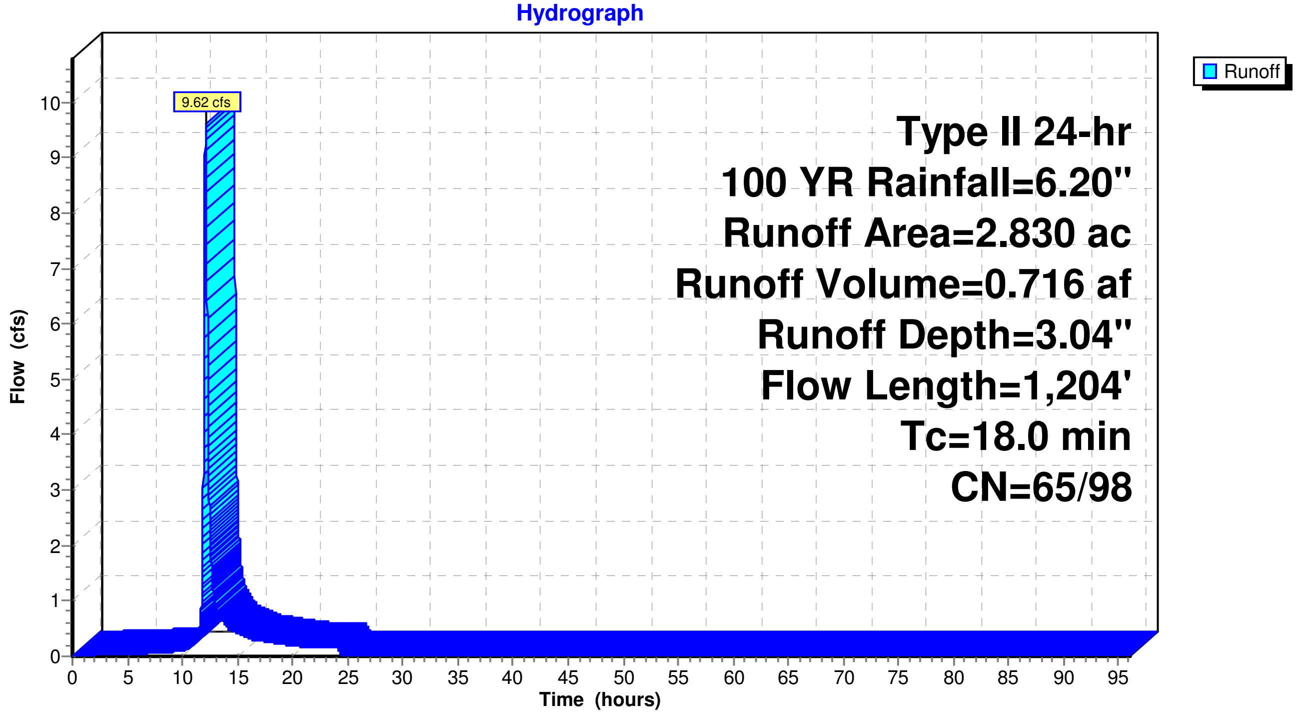
Runoff = 9.62 cfs @ 12.10 hrs, Volume= 0.716 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.070	78	Meadow, non-grazed, HSG D
0.610	70	Woods, Good, HSG C
0.140	98	Paved parking, HSG D
0.300	98	Paved parking, HSG D
0.770	65	Brush, Good, HSG C
0.500	73	Brush, Good, HSG D
0.440	48	Brush, Good, HSG B
2.830	70	Weighted Average
2.390	65	84.45% Pervious Area
0.440	98	15.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.1200	0.15		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
0.5	174	0.1150	5.46		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.3	930	0.0230	2.44		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
18.0	1,204	Total			

Subcatchment 5S: Post West 3



Summary for Subcatchment 6S: H Post Subdv W

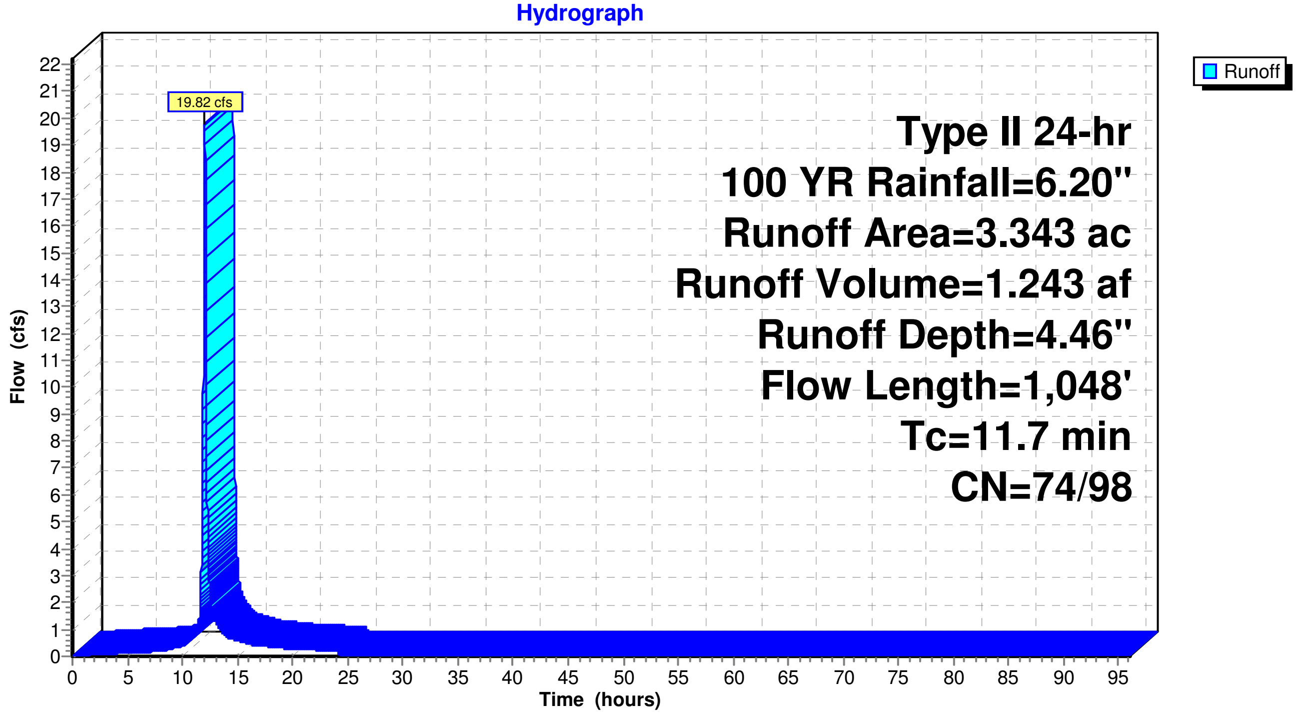
Runoff = 19.82 cfs @ 12.03 hrs, Volume= 1.243 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
1.829	74	>75% Grass cover, Good, HSG C
0.093	80	>75% Grass cover, Good, HSG D
0.439	98	Paved roads w/curbs & sewers, HSG D
0.982	98	Roofs, HSG D
3.343	84	Weighted Average
1.922	74	57.49% Pervious Area
1.421	98	42.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1100	0.22		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
0.5	187	0.1440	6.11		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
0.9	90	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.7	150	0.0520	3.67		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.2	68	0.1000	6.42		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.1	28	0.0100	5.48	4.38	**Channel Flow, F - G** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	131	0.1000	19.47	23.36	**Channel Flow, G - H** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
0.1	100	0.1550	28.05	50.49	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
1.2	110	0.0540	1.53	24.47	**Channel Flow, I - J** Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.240
0.2	84	0.0100	6.16	7.39	**Channel Flow, J - K** Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
11.7	1,048	Total			

Subcatchment 6S: H Post Subdv W



Summary for Subcatchment 7S: H Post Subdv E

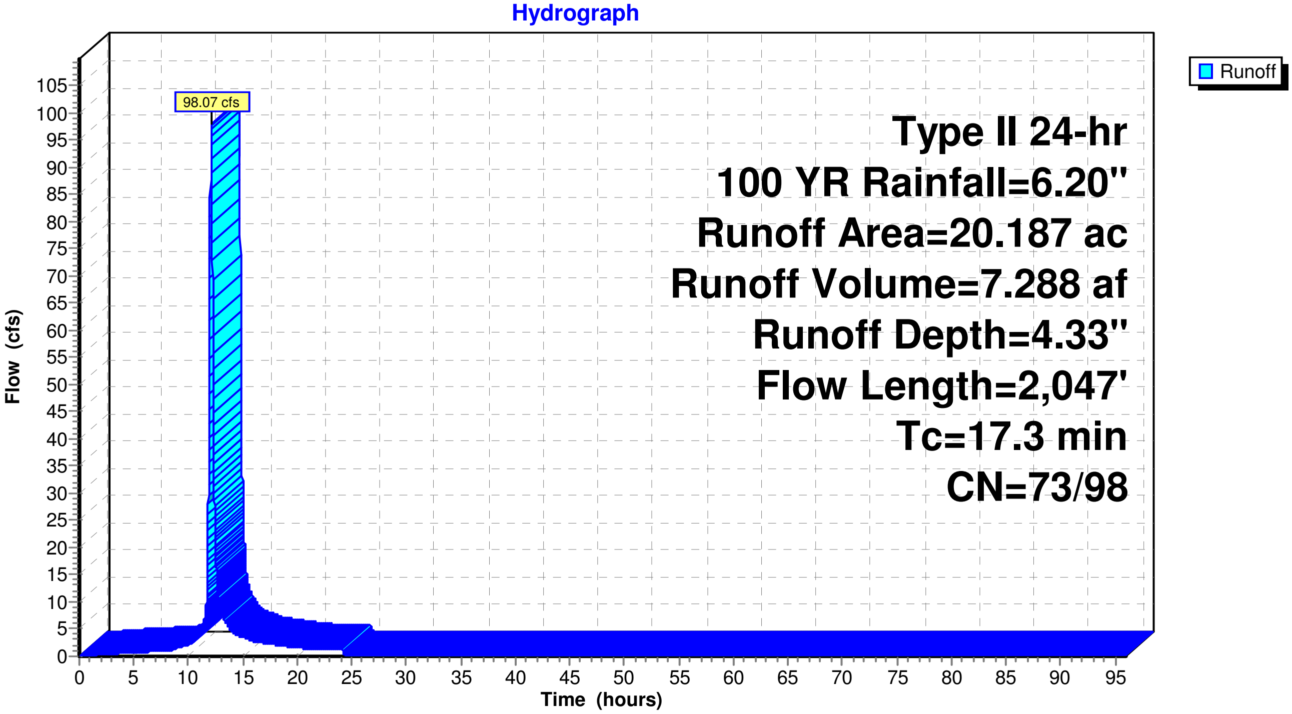
Runoff = 98.07 cfs @ 12.09 hrs, Volume= 7.288 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.206	55	Woods, Good, HSG B
0.531	70	Woods, Good, HSG C
0.925	61	>75% Grass cover, Good, HSG B
6.891	74	>75% Grass cover, Good, HSG C
3.461	98	Paved parking, HSG D
4.573	98	Roofs, HSG D
3.600	74	>75% Grass cover, Good, HSG C
20.187	83	Weighted Average
12.153	73	60.20% Pervious Area
8.034	98	39.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	58	0.4300	0.33		**Sheet Flow, A - B** n= 0.240 P2= 2.80"
10.1	42	0.0100	0.07		**Sheet Flow, B - C** n= 0.240 P2= 2.80"
0.7	67	0.0100	1.61		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
0.8	158	0.0470	3.49		**Shallow Concentrated Flow, D - E** Unpaved Kv= 16.1 fps
0.7	189	0.0530	4.67		**Shallow Concentrated Flow, E - F** Paved Kv= 20.3 fps
0.2	87	0.1000	6.42		**Shallow Concentrated Flow, F - G** Paved Kv= 20.3 fps
0.0	29	0.0900	16.43	13.14	**Channel Flow, G - H** Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.011
0.1	176	0.1000	22.53	40.55	**Channel Flow, H - I** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.2	116	0.0236	10.94	19.70	**Channel Flow, I - J** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.3	258	0.0239	13.02	40.35	**Channel Flow, J - K** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	81	0.0300	14.58	45.21	**Channel Flow, K - L** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
1.0	501	0.0100	8.42	26.10	**Channel Flow, L - M** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
0.1	185	0.0730	26.77	131.19	**Channel Flow, M - N** Area= 4.9 sf Perim= 7.8' r= 0.63' n= 0.011
0.1	100	0.0900	21.37	38.47	**Channel Flow, N - O** Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
17.3	2,047	Total			

Subcatchment 7S: H Post Subdv E



Summary for Subcatchment 8S: H Post Sub MISC

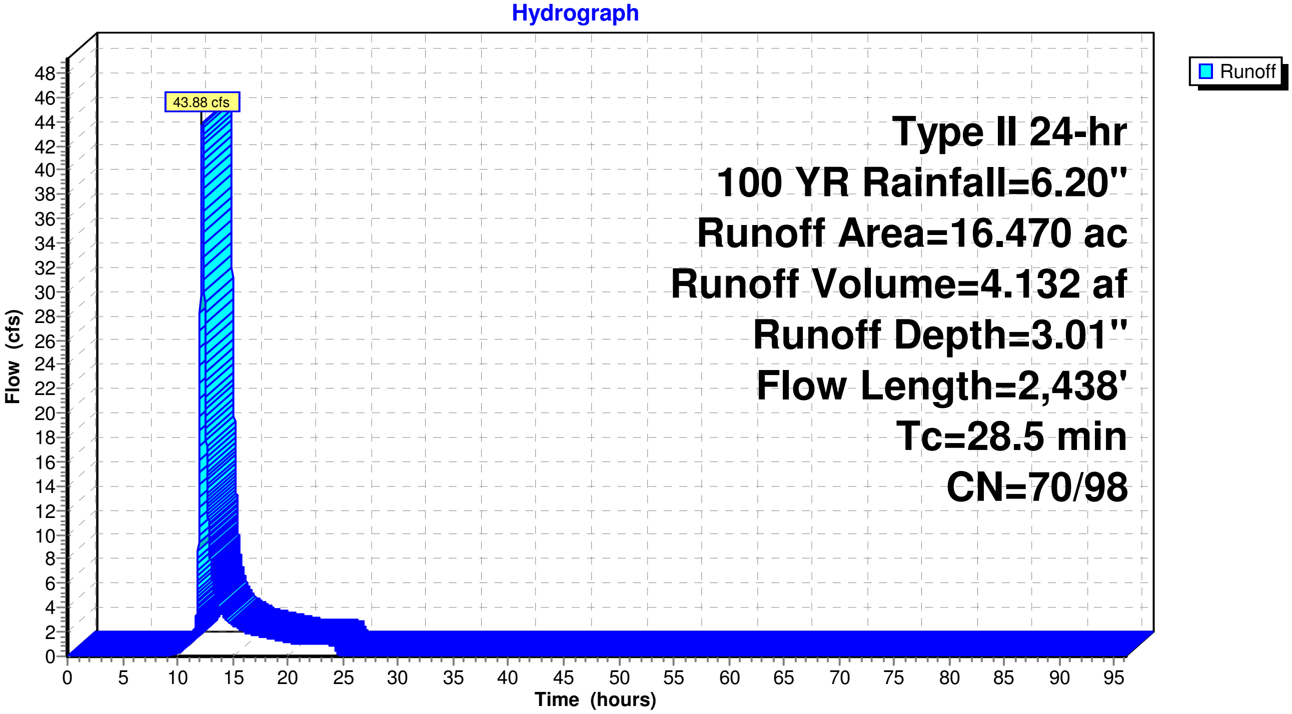
Runoff = 43.88 cfs @ 12.23 hrs, Volume= 4.132 af, Depth= 3.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.955	55	Woods, Good, HSG B
9.912	70	Woods, Good, HSG C
0.489	61	>75% Grass cover, Good, HSG B
4.449	74	>75% Grass cover, Good, HSG C
0.415	80	>75% Grass cover, Good, HSG D
0.250	98	Unconnected pavement, HSG D
16.470	71	Weighted Average
16.220	70	98.48% Pervious Area
0.250	98	1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.1600	0.18		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.2	672	0.3420	9.42		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
5.8	230	0.0220	0.66	13.26	**Channel Flow, C - D** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
0.9	460	0.0110	8.83	27.38	**Channel Flow, D - E** Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.011
3.8	322	0.1020	1.43	28.55	**Channel Flow, E -F** Area= 20.0 sf Perim= 32.6' r= 0.61' n= 0.240
1.5	348	0.0570	3.84		**Shallow Concentrated Flow, F - G** Unpaved Kv= 16.1 fps
1.5	256	0.0330	2.92		**Shallow Concentrated Flow, G - H** Unpaved Kv= 16.1 fps
28.5	2,438	Total			

Subcatchment 8S: H Post Sub MISC



Summary for Subcatchment 9S-A: Casino Area

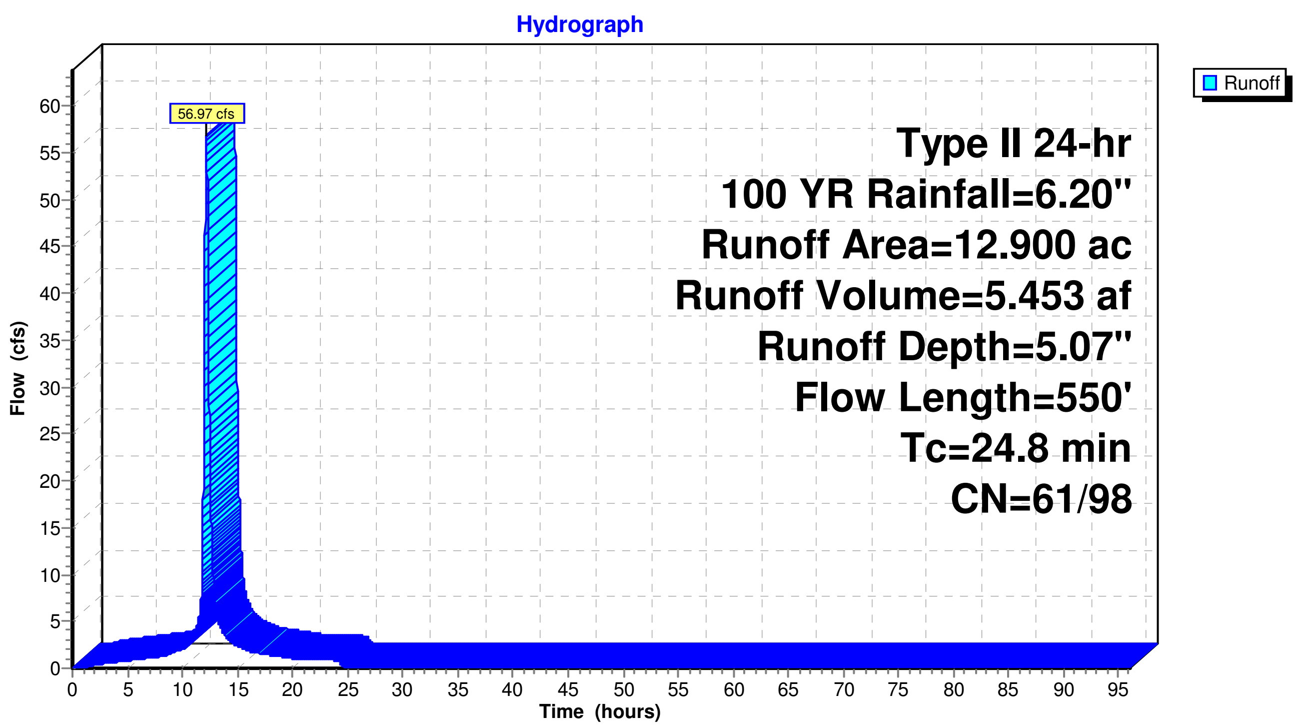
Runoff = 56.97 cfs @ 12.17 hrs, Volume= 5.453 af, Depth= 5.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
9.900	98	Paved parking, HSG D
1.500	61	>75% Grass cover, Good, HSG B
1.500	61	>75% Grass cover, Good, HSG B
12.900	89	Weighted Average
3.000	61	23.26% Pervious Area
9.900	98	76.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
1.8	450	0.0400	4.06		**Shallow Concentrated Flow, B - C** Paved Kv= 20.3 fps
24.8	550	Total			

Subcatchment 9S-A: Casino Area



Summary for Subcatchment 9S-B: Post Central

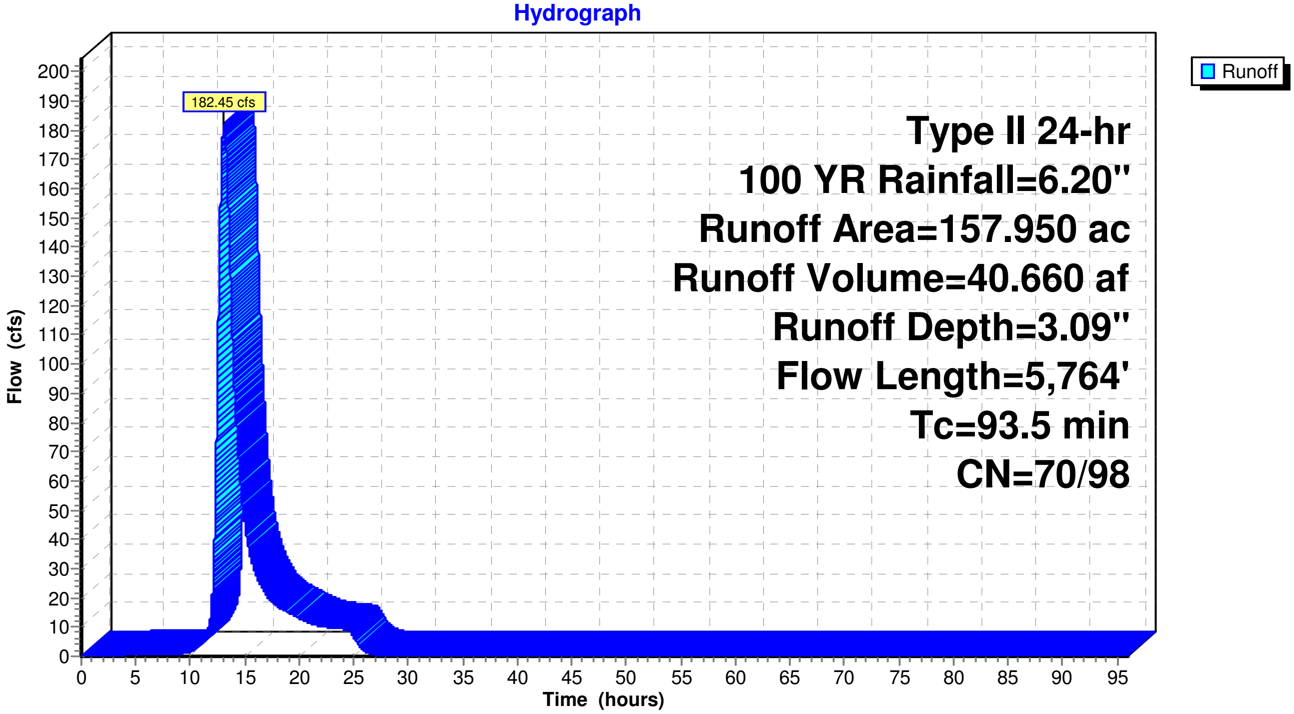
Runoff = 182.45 cfs @ 13.09 hrs, Volume= 40.660 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
0.900	98	Paved parking, HSG D
2.460	80	1/2 acre lots, 25% imp, HSG C
13.020	74	>75% Grass cover, Good, HSG C
21.200	74	>75% Grass cover, Good, HSG C
1.980	98	Paved parking, HSG D
43.100	70	Woods, Good, HSG C
2.880	71	Meadow, non-grazed, HSG C
0.150	98	Paved roads w/curbs & sewers, HSG D
19.240	74	>75% Grass cover, Good, HSG C
1.770	98	Paved parking, HSG D
2.160	74	>75% Grass cover, Good, HSG C
3.440	74	>75% Grass cover, Good, HSG C
0.120	98	Paved parking, HSG D
2.210	80	>75% Grass cover, Good, HSG D
28.430	61	>75% Grass cover, Good, HSG B
0.640	98	Paved parking, HSG D
0.380	98	Paved parking, HSG D
2.200	74	>75% Grass cover, Good, HSG C
6.660	61	>75% Grass cover, Good, HSG B
3.840	74	>75% Grass cover, Good, HSG C
0.810	61	>75% Grass cover, Good, HSG B
0.360	74	>75% Grass cover, Good, HSG C
157.950	71	Weighted Average
151.395	70	95.85% Pervious Area
6.555	98	4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	100	0.0200	0.07		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
6.4	2,043	0.1080	5.29		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
6.6	2,079	0.1060	5.24		**Shallow Concentrated Flow, C - D** Unpaved Kv= 16.1 fps
57.5	1,542	0.0030	0.45	2.23	**Channel Flow, D - E** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
93.5	5,764	Total			

Subcatchment 9S-B: Post Central



Summary for Subcatchment 10S: Out Pre East

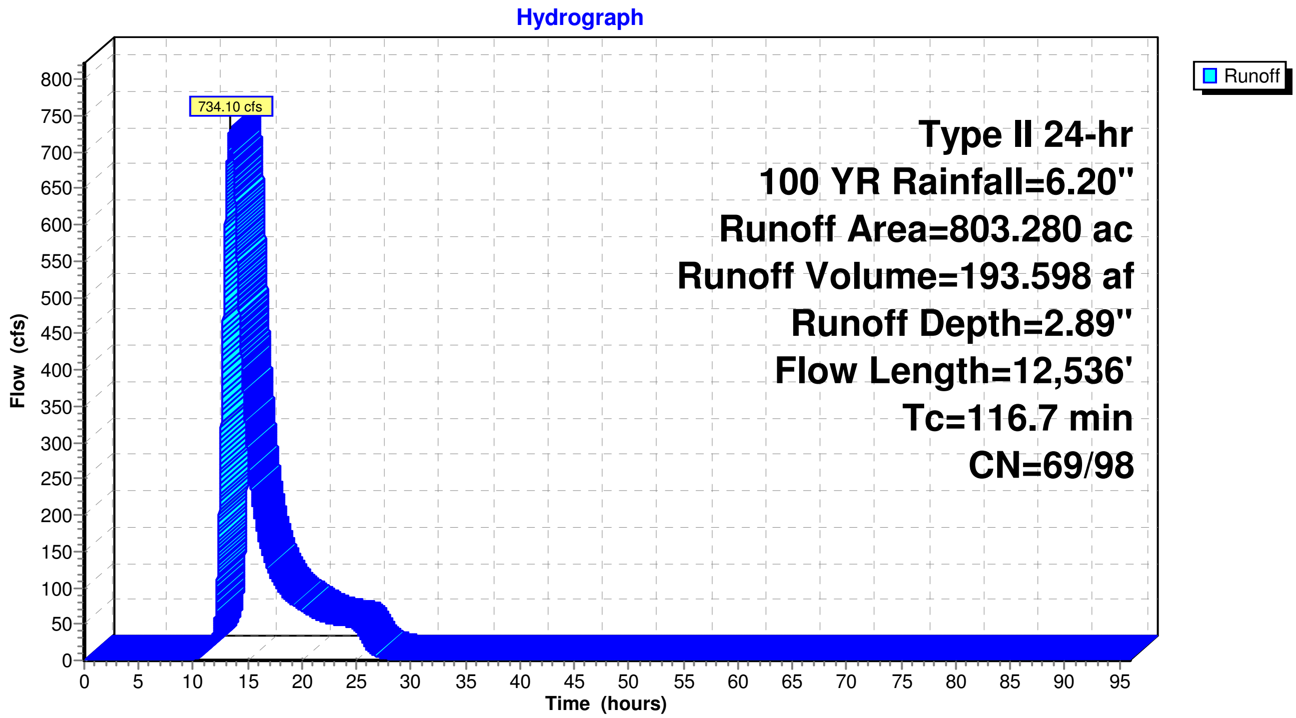
Runoff = 734.10 cfs @ 13.36 hrs, Volume= 193.598 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR Rainfall=6.20"

Area (ac)	CN	Description
11.850	77	Woods, Good, HSG D
5.000	78	Meadow, non-grazed, HSG D
8.390	30	Woods, Good, HSG A
0.390	55	Woods, Good, HSG B
2.250	98	Paved parking, HSG D
7.850	55	Woods, Good, HSG B
0.110	98	Paved parking, HSG D
353.100	70	Woods, Good, HSG C
105.000	71	Meadow, non-grazed, HSG C
3.380	30	Woods, Good, HSG A
9.290	30	Meadow, non-grazed, HSG A
1.750	98	Paved parking, HSG D
9.040	55	Woods, Good, HSG B
8.967	58	Meadow, non-grazed, HSG B
181.500	70	Woods, Good, HSG C
1.640	98	Paved parking, HSG D
93.673	74	>75% Grass cover, Good, HSG C
0.100	98	Roofs, HSG D
803.280	69	Weighted Average
797.430	69	99.27% Pervious Area
5.850	98	0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0500	0.10		**Sheet Flow, A - B** n= 0.400 P2= 2.80"
9.0	2,298	0.0700	4.26		**Shallow Concentrated Flow, B - C** Unpaved Kv= 16.1 fps
91.8	10,138	0.0510	1.84	9.21	**Channel Flow, C - D** Area= 5.0 sf Perim= 8.3' r= 0.60' n= 0.130
116.7	12,536	Total			

Subcatchment 10S: Out Pre East



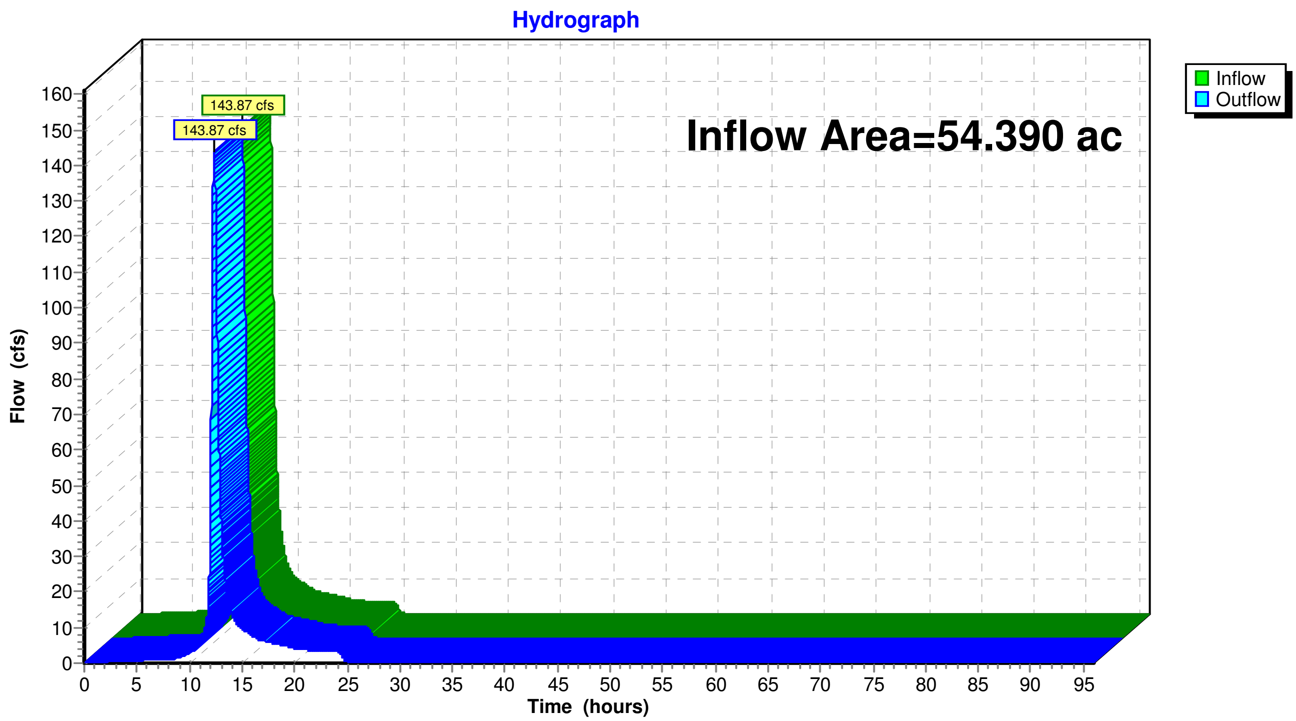
Summary for Reach 1R: Post 4-5W Clvt

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 54.390 ac, 16.07% Impervious, Inflow Depth = 3.69" for 100 YR event
Inflow = 143.87 cfs @ 12.35 hrs, Volume= 16.726 af
Outflow = 143.87 cfs @ 12.36 hrs, Volume= 16.726 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 1R: Post 4-5W Clvt



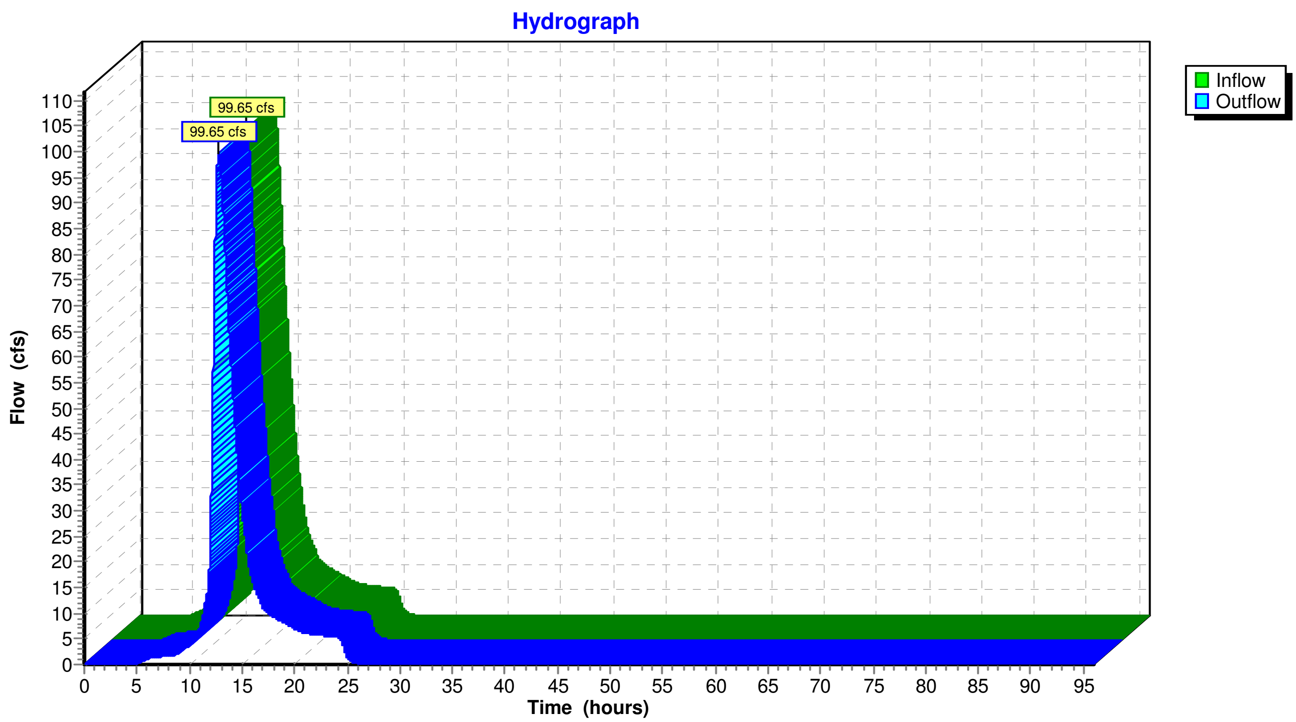
Summary for Reach 2R: Out Post West

[40] Hint: Not Described (Outflow=Inflow)

Inflow	=	99.65 cfs @	12.78 hrs,	Volume=	25.868 af
Outflow	=	99.65 cfs @	12.79 hrs,	Volume=	25.868 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 2R: Out Post West



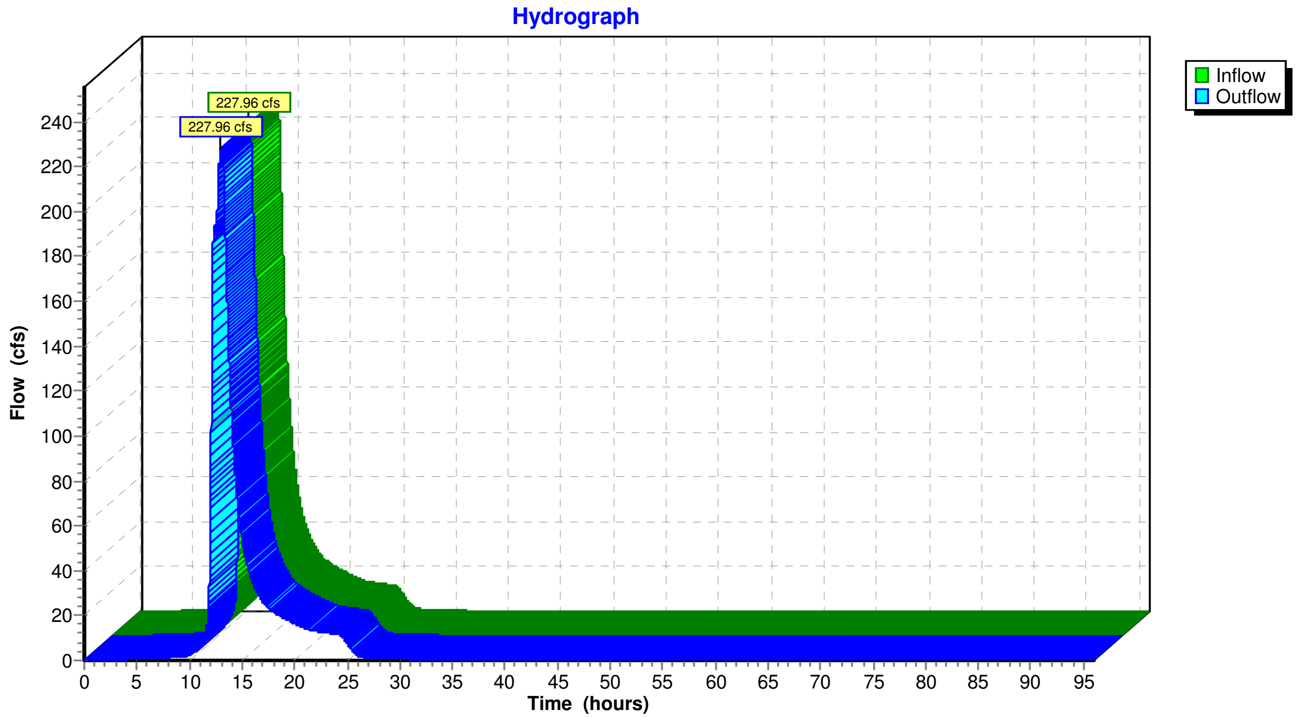
Summary for Reach 3R: Out Post Central

[40] Hint: Not Described (Outflow=Inflow)

Inflow	=	227.96 cfs @	12.99 hrs,	Volume=	55.554 af
Outflow	=	227.96 cfs @	13.00 hrs,	Volume=	55.554 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Reach 3R: Out Post Central



Summary for Pond 1P: Post South Pond

Inflow	=	210.46 cfs @	12.34 hrs,	Volume=	26.176 af
Outflow	=	99.65 cfs @	12.78 hrs,	Volume=	26.180 af, Atten= 53%, Lag= 26.4 min
Primary	=	99.65 cfs @	12.78 hrs,	Volume=	25.868 af
Secondary	=	0.79 cfs @	4.78 hrs,	Volume=	0.312 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 823.62' @ 12.78 hrs Surf.Area= 5.311 ac Storage= 6.565 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 30.7 min (885.5 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1	821.00'	418.450 af	**PosSPond (Conic)** Listed below (Recalc)

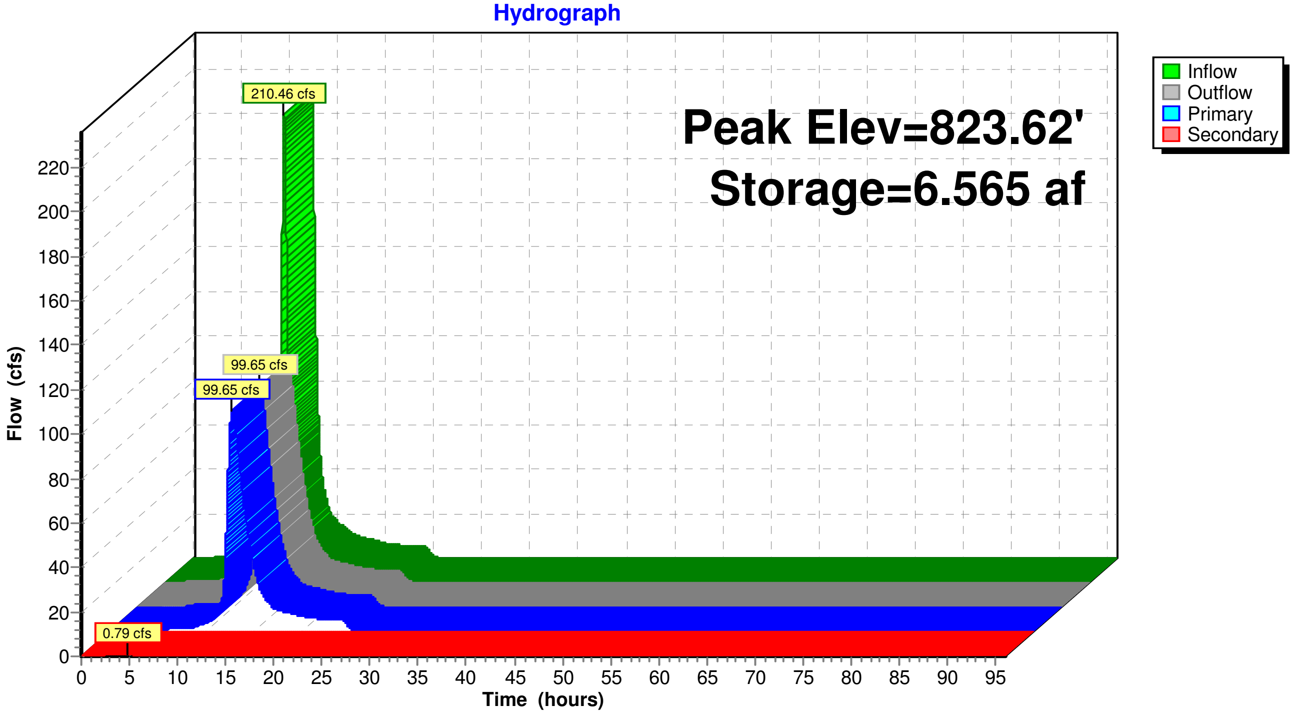
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
821.00	0.010	0.000	0.000	0.010
822.60	3.600	2.027	2.027	3.600
824.00	6.020	6.662	8.688	6.021
826.00	6.790	12.802	21.491	6.795
828.00	7.430	14.215	35.706	7.442
830.00	7.880	15.308	51.014	7.902
832.00	8.280	16.158	67.172	8.313
834.00	8.500	16.780	83.951	8.554
836.00	8.990	17.488	101.439	9.054
838.00	9.850	18.833	120.273	9.920
840.00	10.330	20.178	140.451	10.412
842.00	15.310	25.477	165.928	15.394
858.00	16.260	252.522	418.450	16.832

Device	Routing	Invert	Outlet Devices
#1	Primary	821.11'	**9.5' long x 100.0' 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
#2	Secondary	820.81'	**24.0" Round Culvert** L= 30.0' Ke= 0.200 Inlet / Outlet Invert= 819.81' / 820.81' S= -0.0333 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=99.65 cfs @ 12.78 hrs HW=823.62' TW=0.00' (Dynamic Tailwater)
└—**1=Broad-Crested Rectangular Weir** (Weir Controls 99.65 cfs @ 4.17 fps)

Secondary OutFlow Max=0.79 cfs @ 4.78 hrs HW=821.13' TW=820.97' (Dynamic Tailwater)
└—**2=Culvert** (Inlet Controls 0.79 cfs @ 2.41 fps)

Pond 1P: Post South Pond



Summary for Pond 2P: Post North Pond

[86] Warning: Oscillations may require smaller dt (severity=7)

Inflow	=	66.47 cfs @	12.07 hrs,	Volume=	4.789 af	
Outflow	=	32.29 cfs @	12.21 hrs,	Volume=	4.572 af,	Atten= 51%, Lag= 8.0 min
Primary	=	26.33 cfs @	12.16 hrs,	Volume=	4.288 af	
Secondary	=	6.47 cfs @	12.25 hrs,	Volume=	0.285 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.81' Surf.Area= 0.020 ac Storage= 0.006 af
Peak Elev= 824.61' @ 12.25 hrs Surf.Area= 0.614 ac Storage= 1.211 af (1.205 af above start)

Plug-Flow detention time= 187.4 min calculated for 4.599 af (95% of inflow)
Center-of-Mass det. time= 69.4 min (943.6 - 874.9)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	37.557 af	**PostNPond (Conic)** Listed below

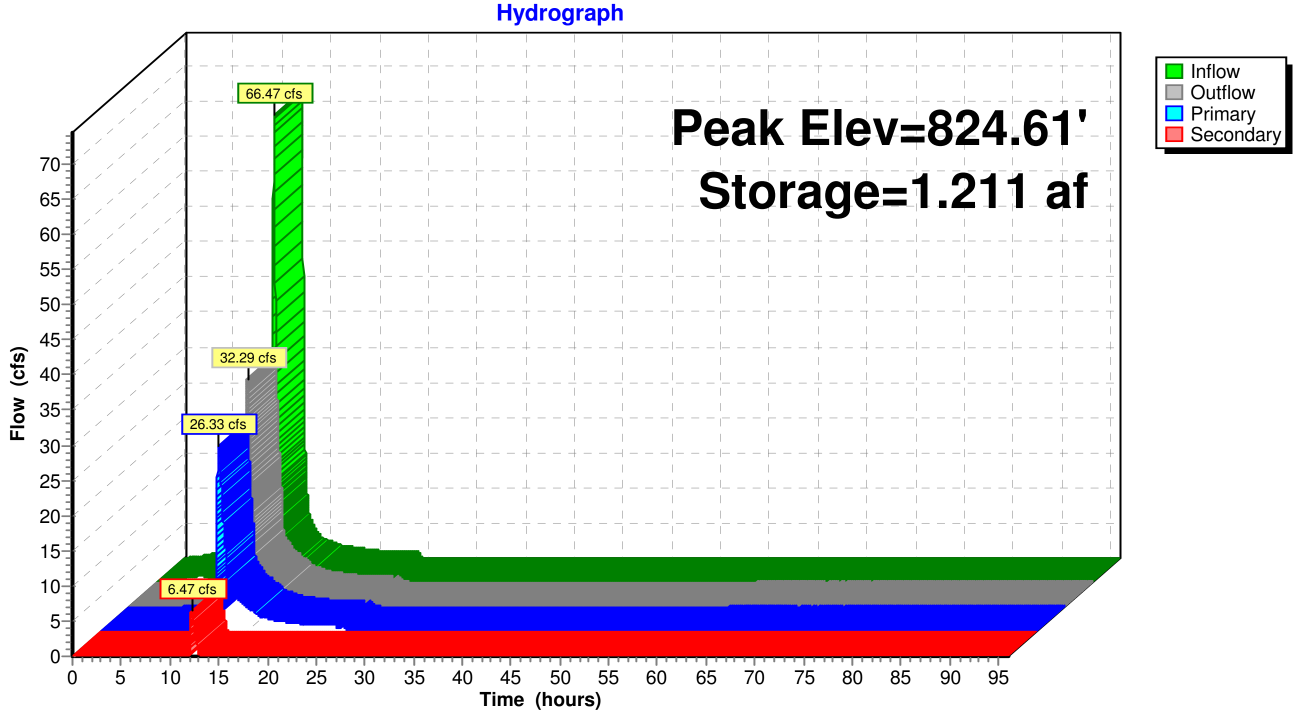
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
819.81	0.020	0.006	0.006	0.020
820.00	0.030	0.005	0.010	0.030
824.00	0.430	0.765	0.775	0.431
826.00	1.030	1.417	2.192	1.032
828.00	1.340	2.363	4.555	1.344
830.00	2.170	3.477	8.032	2.175
832.00	2.470	4.637	12.669	2.480
834.00	2.790	5.257	17.926	2.804
836.00	3.090	5.877	23.803	3.110
838.00	3.440	6.527	30.330	3.465
840.00	3.790	7.227	37.557	3.821

Device	Routing	Invert	Outlet Devices
#1	Primary	820.41'	**24.0" Round Culvert - Watson** L= 30.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 820.41' / 819.81' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Secondary	823.50'	**24.0" Round Culvert - Post Pipe** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 823.50' / 819.00' S= 0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=26.14 cfs @ 12.16 hrs HW=824.49' TW=822.58' (Dynamic Tailwater)
└─**1=Culvert - Watson** (Inlet Controls 26.14 cfs @ 8.32 fps)

Secondary OutFlow Max=6.47 cfs @ 12.25 hrs HW=824.61' TW=820.91' (Dynamic Tailwater)
└─**2=Culvert - Post Pipe** (Inlet Controls 6.47 cfs @ 3.59 fps)

Pond 2P: Post North Pond



Summary for Pond 3P: PostCClub Pond

Inflow	=	14.25 cfs @	12.16 hrs,	Volume=	1.001 af
Outflow	=	14.19 cfs @	12.18 hrs,	Volume=	1.001 af, Atten= 0%, Lag= 1.3 min
Primary	=	14.19 cfs @	12.18 hrs,	Volume=	1.001 af
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 819.42' Surf.Area= 0.010 ac Storage= 0.000 af
Peak Elev= 821.00' @ 12.18 hrs Surf.Area= 0.022 ac Storage= 0.030 af

Plug-Flow detention time= 3.4 min calculated for 1.001 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (804.9 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1	819.42'	1.167 af	**PostCClubPond (Conic)** Listed below (Recalc)

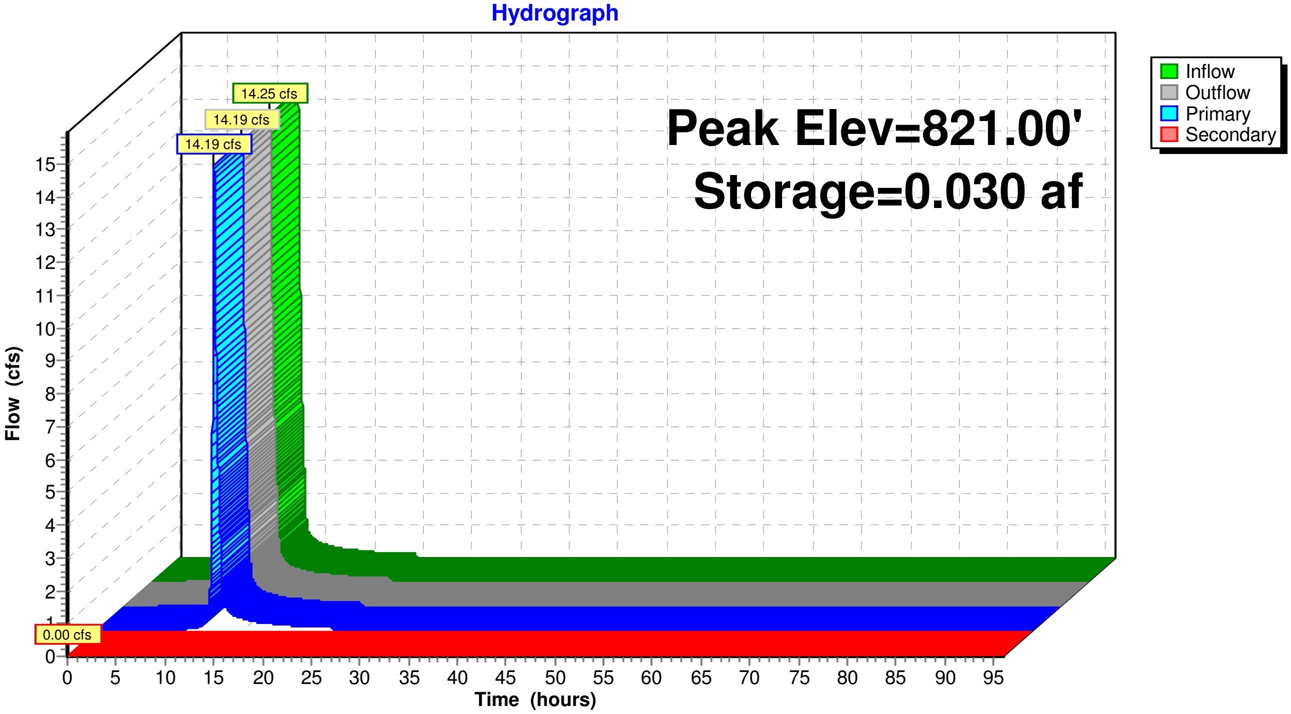
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
819.42	0.010	0.000	0.000	0.010
820.00	0.020	0.009	0.009	0.020
824.00	0.030	0.099	0.108	0.035
826.00	0.040	0.070	0.178	0.047
828.00	0.050	0.090	0.267	0.059
830.00	0.060	0.110	0.377	0.072
832.00	0.070	0.130	0.507	0.085
834.00	0.080	0.150	0.657	0.099
840.00	0.090	0.510	1.167	0.130

Device	Routing	Invert	Outlet Devices
#1	Primary	819.42'	**24.0" Round Culvert** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 819.42' / 817.75' S= 0.0334 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Primary	825.05'	**145.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#3	Secondary	823.50'	**24.0" Round Culvert** L= 210.0' Ke= 0.500 Inlet / Outlet Invert= 819.00' / 823.50' S= -0.0214 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=14.19 cfs @ 12.18 hrs HW=821.00' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 14.19 cfs @ 5.34 fps)
2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=819.42' TW=819.81' (Dynamic Tailwater)
3=Culvert (Controls 0.00 cfs)

Pond 3P: PostCClub Pond



Summary for Pond 4P: H Pond West

Inflow Area =	3.343 ac, 42.51% Impervious,	Inflow Depth = 4.46"	for 100 YR event	
Inflow =	19.82 cfs @	12.03 hrs, Volume=	1.243 af	
Outflow =	16.84 cfs @	12.09 hrs, Volume=	1.335 af,	Atten= 15%, Lag= 3.9 min
Discarded =	0.08 cfs @	12.09 hrs, Volume=	0.181 af	
Primary =	16.77 cfs @	12.09 hrs, Volume=	1.153 af	

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 826.00' Surf.Area= 0.052 ac Storage= 0.093 af
Peak Elev= 829.26' @ 12.09 hrs Surf.Area= 0.119 ac Storage= 0.361 af (0.267 af above start)

Plug-Flow detention time= 249.8 min calculated for 1.241 af (100% of inflow)
Center-of-Mass det. time= 207.2 min (989.2 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1	822.00'	0.452 af	**H Pond West (Conic)** Listed below (Recalc)

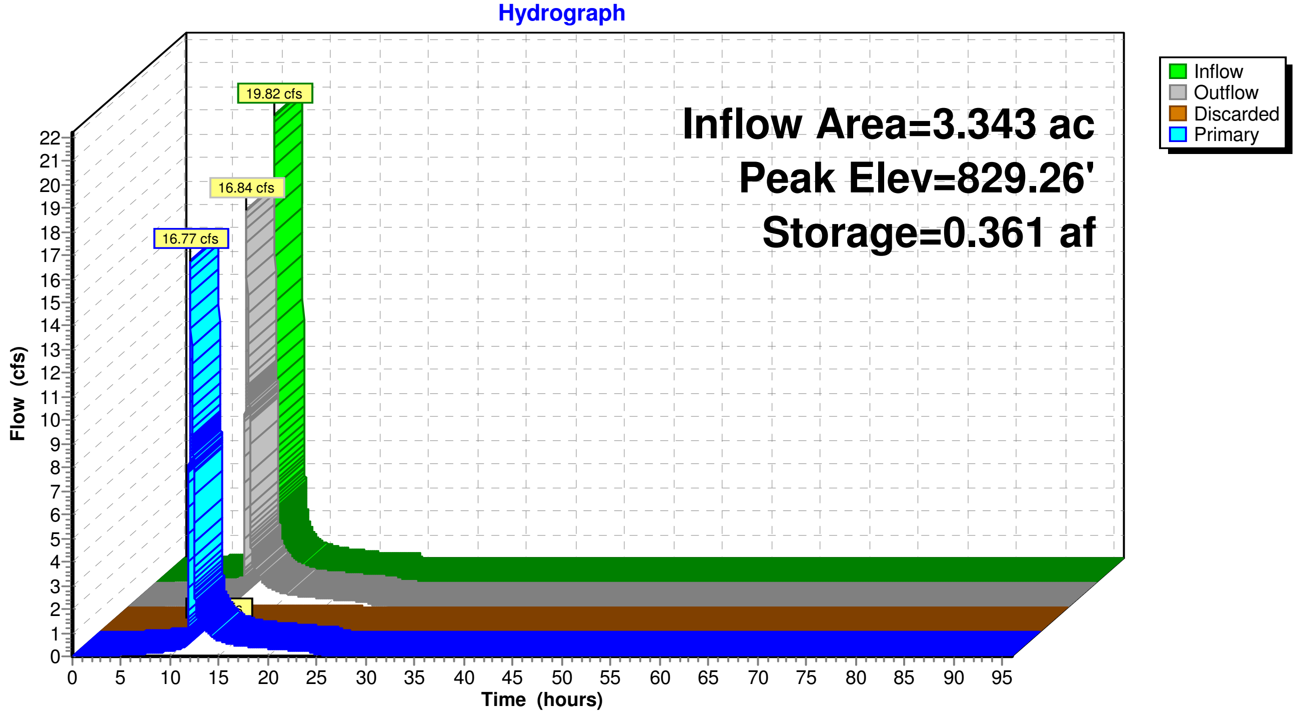
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
822.00	0.004	0.000	0.000	0.004
824.00	0.021	0.023	0.023	0.021
826.00	0.052	0.071	0.093	0.053
828.00	0.086	0.137	0.230	0.088
829.00	0.116	0.101	0.331	0.119
830.00	0.126	0.121	0.452	0.130

Device	Routing	Invert	Outlet Devices
#1	Discarded	822.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	825.90'	**15.0" Round Culvert** L= 82.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 825.90' / 825.16' S= 0.0089 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#3	Device 2	826.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	827.00'	**45.0 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	828.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	829.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.08 cfs @ 12.09 hrs HW=829.26' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=16.72 cfs @ 12.09 hrs HW=829.26' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 9.76 cfs @ 7.96 fps)
│ ├─**3=Orifice/Grate** (Passes < 0.74 cfs potential flow)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Passes < 2.64 cfs potential flow)
│ └─**5=Orifice/Grate** (Passes < 64.44 cfs potential flow)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 6.96 cfs @ 1.36 fps)

Pond 4P: H Pond West



Summary for Pond 5P: H Pond East

Inflow Area = 20.187 ac, 39.80% Impervious, Inflow Depth = 4.33" for 100 YR event
Inflow = 98.07 cfs @ 12.09 hrs, Volume= 7.288 af
Outflow = 56.94 cfs @ 12.25 hrs, Volume= 7.969 af, Atten= 42%, Lag= 9.6 min
Discarded = 0.38 cfs @ 12.25 hrs, Volume= 1.509 af
Primary = 56.56 cfs @ 12.25 hrs, Volume= 6.460 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 846.00' Surf.Area= 0.300 ac Storage= 1.128 af
Peak Elev= 851.68' @ 12.25 hrs Surf.Area= 0.592 ac Storage= 3.687 af (2.559 af above start)

Plug-Flow detention time= 568.7 min calculated for 6.840 af (94% of inflow)
Center-of-Mass det. time= 436.1 min (1,226.0 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1	840.00'	4.506 af	**H Pond East (Conic)** Listed below

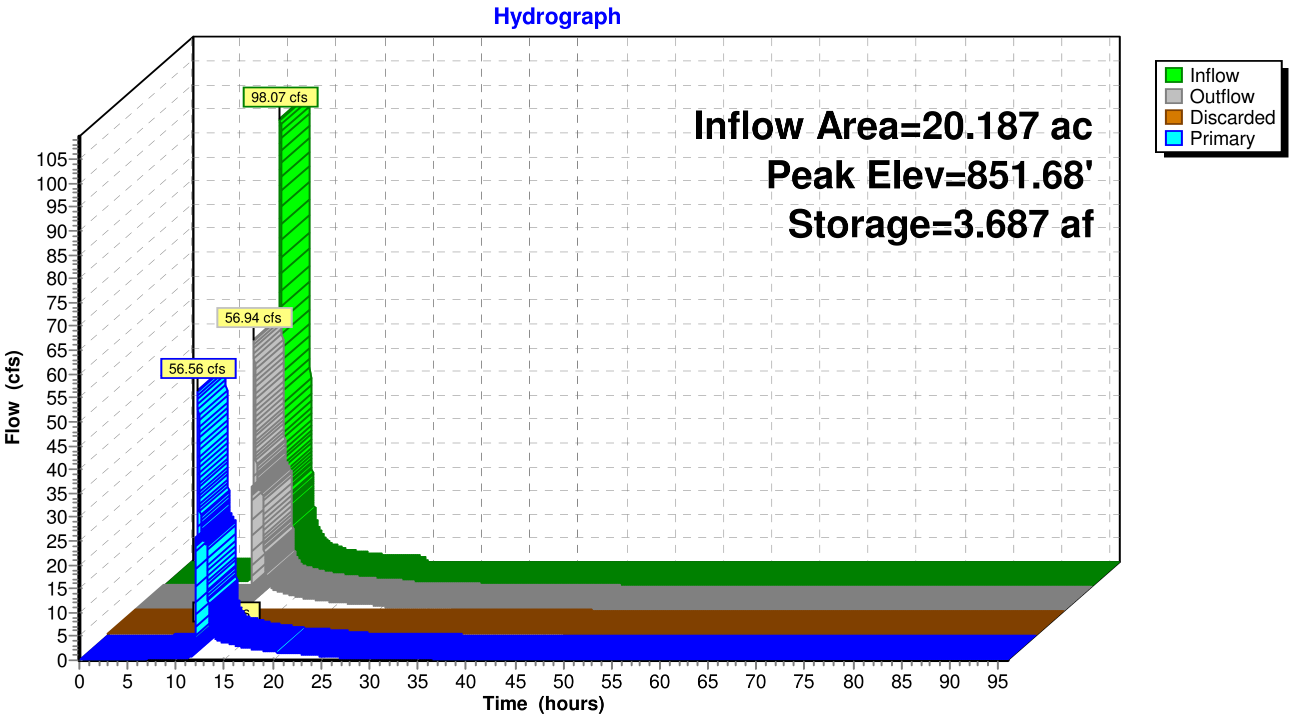
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
840.00	0.093	0.000	0.000	0.093
842.00	0.151	0.242	0.242	0.152
844.00	0.220	0.369	0.611	0.223
846.00	0.300	0.518	1.128	0.305
848.00	0.407	0.704	1.833	0.413
850.00	0.512	0.917	2.750	0.521
852.00	0.608	1.119	3.868	0.620
853.00	0.668	0.638	4.506	0.682

Device	Routing	Invert	Outlet Devices
#1	Discarded	840.00'	**0.630 in/hr Exfiltration over Horizontal area**
#2	Primary	841.00'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.00' / 835.64' S= 0.0443 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#3	Device 2	846.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	847.50'	**45.0 deg x 849.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.70 (C= 3.38)
#5	Device 2	849.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Primary	851.00'	**20.0' long x 100.0' 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

Discarded OutFlow Max=0.38 cfs @ 12.25 hrs HW=851.68' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.38 cfs)

Primary OutFlow Max=56.54 cfs @ 12.25 hrs HW=851.68' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 26.81 cfs @ 15.17 fps)
│ ├─**3=Orifice/Grate** (Passes < 0.99 cfs potential flow)
│ ├─**4=Sharp-Crested Vee/Trap Weir** (Passes < 39.84 cfs potential flow)
│ └─**5=Orifice/Grate** (Passes < 94.51 cfs potential flow)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 29.73 cfs @ 2.20 fps)

Pond 5P: H Pond East



Summary for Pond 6P: StormTech MC-4500

[86] Warning: Oscillations may require smaller dt (severity=409)

Inflow Area = 12.900 ac, 76.74% Impervious, Inflow Depth = 5.07" for 100 YR event
Inflow = 56.97 cfs @ 12.17 hrs, Volume= 5.453 af
Outflow = 28.26 cfs @ 12.43 hrs, Volume= 5.778 af, Atten= 50%, Lag= 15.9 min
Discarded = 2.14 cfs @ 12.43 hrs, Volume= 3.630 af
Primary = 26.12 cfs @ 12.43 hrs, Volume= 2.148 af

Routing by Sim-Route method w/Net Flows, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 867.65' @ 12.43 hrs Surf.Area= 0.421 ac Storage= 1.704 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 69.3 min (838.5 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	861.75'	0.664 af	**55.75'W x 329.12'L x 6.75'H Field A** 2.843 af Overall - 1.183 af Embedded = 1.660 af x 40.0% Voids
#2A	862.50'	1.183 af	**ADS_StormTech MC-4500 +Cap** x 480 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.02'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
		1.847 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	865.00'	**24.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	861.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	864.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=2.14 cfs @ 12.43 hrs HW=867.65' (Free Discharge)
└─**2=Exfiltration** (Controls 2.14 cfs)

Primary OutFlow Max=26.12 cfs @ 12.43 hrs HW=867.65' TW=0.00' (Dynamic Tailwater)
├─**1=Orifice/Grate** (Orifice Controls 19.41 cfs @ 6.18 fps)
└─**3=Orifice/Grate** (Orifice Controls 6.71 cfs @ 8.54 fps)

Pond 6P: StormTech MC-4500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.02'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

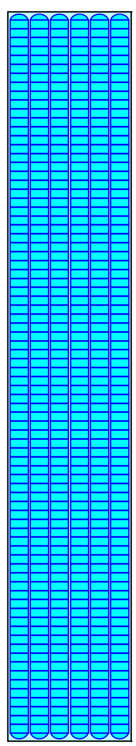
80 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 327.12' Row Length +12.0" End Stone x 2 = 329.12' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

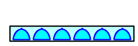
480 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 6 Rows = 51,543.8 cf Chamber Storage

123,850.7 cf Field - 51,543.8 cf Chambers = 72,306.9 cf Stone x 40.0% Voids = 28,922.8 cf Stone Storage

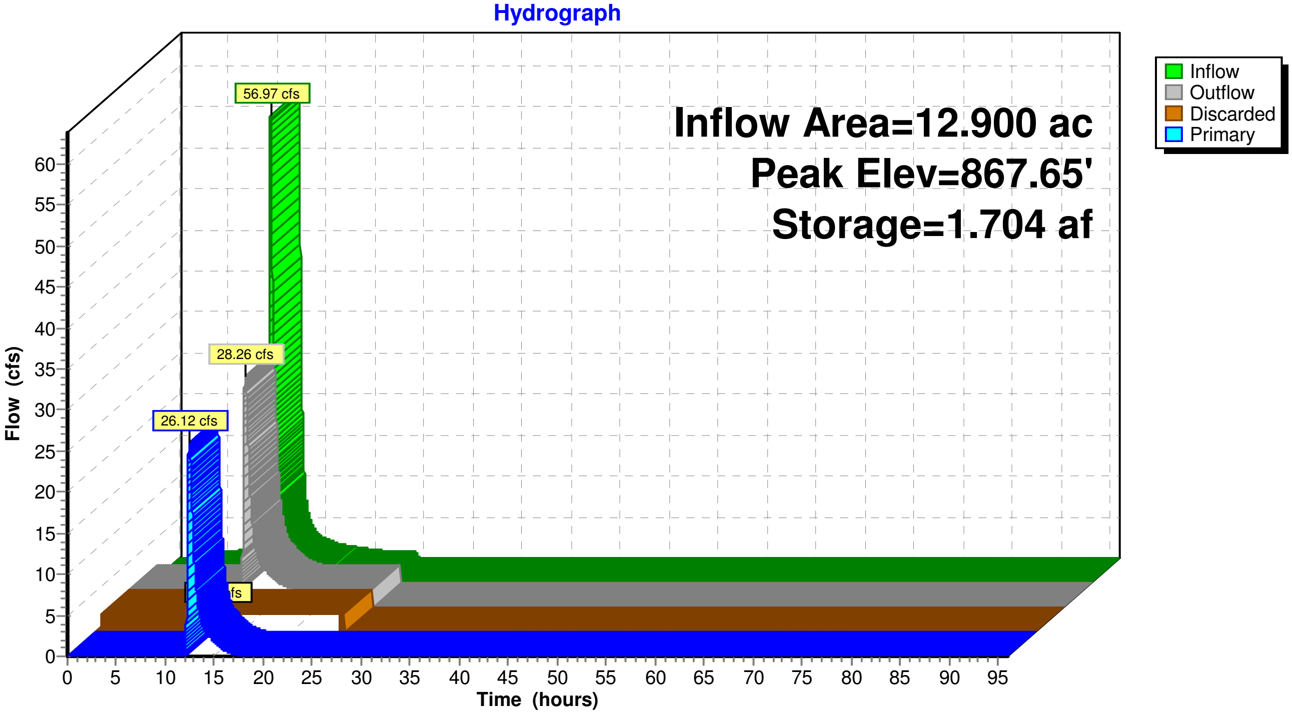
Chamber Storage + Stone Storage = 80,466.6 cf = 1.847 af
Overall Storage Efficiency = 65.0%

480 Chambers
4,587.1 cy Field
2,678.0 cy Stone





Pond 6P: StormTech MC-4500

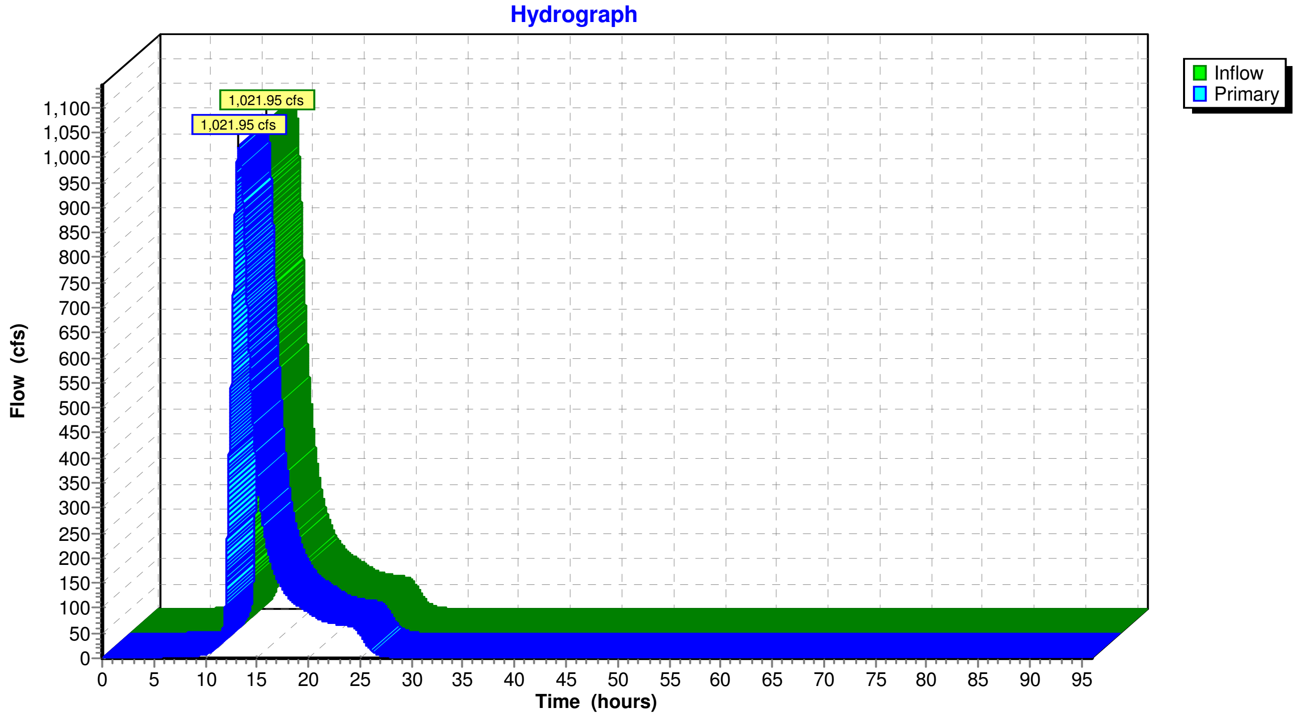


Summary for Link 24L: Out Post NOI

Inflow	=	1,021.95 cfs @	13.23 hrs,	Volume=	275.020 af
Primary	=	1,021.95 cfs @	13.24 hrs,	Volume=	275.020 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 24L: Out Post NOI



APPENDIX E
SOIL RESTORATION

5.1.6 Soil Restoration

Description

Soil Restoration is a required practice applied across areas of a development site where soils have been disturbed and will be vegetated in order to recover the original properties and porosity of the soil. Healthy soil is vital to a sustainable environment and landscape. A deep, well drained soil, rich in organic matter, absorbs rainwater, helps prevent flooding and soil erosion, filters out water pollutants, and promotes vigorous plant growth that requires less irrigation, pesticides, and fertilizer.

Soil Restoration is applied in the cleanup, restoration, and landscaping phase of construction followed by the permanent establishment of an appropriate, deep-rooted groundcover to help maintain the restored soil structure. Soil restoration includes mechanical decompaction, compost amendment, or both.

Many runoff reduction practices need Soil Restoration measures applied over and adjacent to the practice to achieve runoff reduction performance. (See typical compacted soil in Figure 5.15). Consult individual profile sheets for specific design criteria.

Figure 5. 15 Shows typical compacted soils that nearly reach the bulk density of concrete (Schueler et al 2000)

Key Benefits

- More marketable buildings and landscapes
- Less stormwater runoff, better water quality
- Healthier, aesthetically pleasing landscapes
- Increased porosity on redevelopment sites where impervious cover is converted to pervious
- Achieves performance standards on runoff reduction practices
- Decreases runoff volume generated and lowers the demand on runoff control structures
- Enhances direct groundwater recharge
- Promotes successful long-term revegetation by restoring soil organic matter, permeability, drainage and water holding capacity for healthy root system development of trees, shrubs and deep-rooted ground covers, minimizing lawn chemical requirements, plant drowning during wet periods, and burnout during dry periods

Typical Perceived Obstacles and Realities

- Higher cost due to soil restoration- *application of soil de-compaction and enhancement may have additional initial cost; however, they provide benefit in reducing the need for conveyance structures.*
- Space constraints and obstruction for use of equipment - *post construction space may limit the ability of some of the de-compaction equipment, however, alternative equipment and sensible planning help overcome this obstacle.*

Discussion

Tilling exposes compacted soil devoid of oxygen to air and recreates temporary air space. In addition, research has shown that the incorporation of organic compost, can greatly improve temporary water storage in the soil and subsequent runoff reduction through infiltration and evapotranspiration.

Soils that have a permanent high water table close to the surface (0-12 inches), either influenced by a clay or other highly impervious layer of material, may have bulk densities so naturally high that compaction has little added impact on infiltration (Lacey 2008). However, these soils will still benefit from the addition of compost. The water holding capacity, penetration, structural stability, and fertility of clay soils were improved with compost mixing (Avnimelech and Cohen 1988).

Table 5.3 describes various soil disturbance activities related to land development, soil types and the requirements for soil restoration for each activity. Soil Restoration or modification of curve numbers is a <u>required</u> practice. Restoration is applied across areas of a development site where soils have been compacted and will be vegetated according to the criteria defined in Table 5.3. If Soil Restoration is not applied according to these criteria, designers are required to:

a) Increase the calculated WQv by factoring in the compacted areas that have not been kept as impervious cover (including areas of cut or fill, heavy traffic areas on site, or Impervious Cover reduction in redevelopment projects unless aeration or full soil restoration is applied, per Table 5.3).
b) Change by one level the post-construction hydrologic soil group (HSG) to a less permeable group than the original condition. This is applied to all volumetric and discharge rate control computations.

Table 5.3 Soil Restoration Requirements

Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not required		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A &B	HSG C&D	Protect area from any ongoing construction activities.
	apply 6 inches of topsoil	Aerate* and apply 6 inches of topsoil	
Areas of cut or fill	HSG A &B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration **	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area
Redevelopment projects	Soil Restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.		

*Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.
** Per "Deep Ripping and De-compaction, DEC 2008".

Figure 5. 16 Soil aerator implement

Using this Practice

During periods of relatively low to moderate subsoil moisture, the disturbed subsoils are returned to rough grade and the following Soil Restoration steps applied:

1) Apply 3 inches of compost over subsoil
2) Till compost into subsoil to a depth of at least 12 inches using a cat-mounted ripper, tractor-mounted disc, or tiller, mixing, and circulating air and compost into subsoils
3) Rock-pick until uplifted stone/rock materials of four inches and larger size are cleaned off the site
4) Apply topsoil to a depth of 6 inches
5) Vegetate as required by approved plan.

Figure 5. 17 Soil aerator implement

At the end of the project an inspector should be able to push a 3/8" metal bar 12 inches into the soil just with body weight. Figures 5.16 and 5.17 show two attachments used for soil decompaction. Tilling (step 2 above) should not be performed within the drip line of any existing trees or over utility installations that are within 24 inches of the surface.

COMPOST SPECIFICATIONS

Compost shall be aged, from plant derived materials, free of viable weed seeds, have no visible free water or dust produced when handling, pass through a half inch screen and have a pH suitable to grow desired plants.

Maintenance

A simple maintenance agreement should identify where Soil Restoration is applied, where newly restored areas are/cannot be cleared, who the responsible parties are to ensure that routine vegetation improvements are made (i.e., thinning, invasive plant removal, etc.). Soil compost amendments within a filter strip or grass channel should be located in public right of way, or within a dedicated stormwater or drainage easement.

First year maintenance operations includes:

- Initial inspections for the first six months (once after each storm greater than half- inch)
- Reseeding to repair bare or eroding areas to assure grass stabilization
- Water once every three days for first month, and then provide a half inch of water per week during first year. Irrigation plan may be adjusted according to the rain event.
- Fertilization may be needed in the fall after the first growing season to increase plant vigor

Ongoing Maintenance:

Two points help ensure lasting results of decompaction:

1) Planting the appropriate ground cover with deep roots to maintain the soil structure
2) Keeping the site free of vehicular and foot traffic or other weight loads. Consider pedestrian footpaths. (Sometimes it may be necessary to de-thatch the turf every few years)

References/Further Resources

Avnimelech, Y. and M. Kochva, Y. Yotal, D. Shkedy. 1988. *THE USE OF COMPOST AS A SOIL AMENDMENT*

Balusek. 2003. *Quantifying decreases in stormwater runoff from deep-tilling, chisel-planting and compost amendments*. Dane County Land Conservation Department. Madison, Wisconsin. http://www.countyofdane.com/lwrd/landconservation/papers/quantifyingdecreasesinswrunoff.pdf

Chollak, T. and P. Rosenfeld. 1998. *Guidelines for Landscaping with Compost-Amended Soils/* City of Redmond Public Works. http://www.ci.redmond.wa.us/insidecityhall/publicworks

APPENDIX F
STORMWATER CONSTRUCTION SITE LOGBOOK

APPENDIX F

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

Properly completing forms such as those contained in Appendix F meet the inspection requirement of NYS-DEC SPDES GP for Construction Activities. Completed forms shall be kept on site at all times and made available to authorities upon request.

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name ____
Permit No. __________________________________ Date of Authorization ______________
Name of Operator ____
Prime Contractor ____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Operators Certification

"I certify under penalty of law that this document and all attachments were 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. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Name (please print): ____

Title _____________________________________ Date: _______________

Address: ____

Phone: _______________ Email: ___________________________________

Signature: ____

c. Qualified Professional's Credentials & Certification

“I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction.”

Name (please print): ____

Title ____ Date:___________

Address: ____

Phone: __________ Email: ____

Signature: ____

d. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_______________________________
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?______________
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?______________
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page ______
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? ___________________

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:
Inspection Forms will be filled out during the entire construction phase of the project.
Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

(4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

(6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

______________________________________ ________________________________
Inspector (print name) **Date 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.

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 & 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. Level Spreader
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales
Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

Runoff Control Practices (continued)

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

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 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2” x 4” frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation ___% of design capacity.

4. Temporary Sediment Trap
Yes No NA
[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
Sediment accumulation is ___% of design capacity.

5. Temporary Sediment Basin
Yes No NA
[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
Sediment accumulation is ___% of design capacity.

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.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason: