STORMWATER REPORT
AND
DRAINAGE CALCULATIONS

DUTCHCO BUILDERS
HARTWELL AVENUE

in

Littleton, MA

September 25, 2023

File No. 23004.00

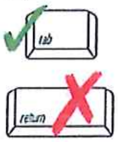
STORMWATER CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

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[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

9-25-23

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): SUBSURFACE INFILTRATION SYSTEMS

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality SINGLE FAMILY HOMES ("CLEAN RUNOFF")

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

  ☐ is within the Zone II or Interim Wellhead Protection Area

  ☐ is near or to other critical areas

  ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

  ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

N/A **Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)**

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist (continued)

N/A

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- [ ] The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.
- [ ] The project is ***not*** covered by a NPDES Construction General Permit.
- [ ] The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- [x] The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- [x] The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - [x] Name of the stormwater management system owners;
  - [x] Party responsible for operation and maintenance;
  - [x] Schedule for implementation of routine and non-routine maintenance tasks;
  - [x] Plan showing the location of all stormwater BMPs maintenance access areas;
  - [x] Description and delineation of public safety features;
  - [x] Estimated operation and maintenance budget; and
  - [x] Operation and Maintenance Log Form.
- [ ] The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - [ ] A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - [ ] A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- [ ] The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- [x] An Illicit Discharge Compliance Statement is attached;
- [ ] NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

STORMWATER REPORT

STORMWATER REPORT

DUTCHCO BUILDERS
HARTWELL AVENUE

in

Littleton, MA

September 25, 2023

Stormwater Report – Hartwell Avenue

Introduction

This Stormwater Report has been prepared in accordance with the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Standards and the Stormwater Management Handbook.

The project will consist of the construction of six single family homes with associated driveways, site grading and utilities on Hartwell Avenue in Littleton, MA.

Project Type

The project will consist of the construction of six single family homes with associated driveways, site grading and utilities on Hartwell Avenue in Littleton, MA.

The project will be designed as a new development.

LID Measures

The LID measures considered are minimizing disturbance to existing trees and site design practices including subsurface drainage systems and roof stone drip trenches.

Standard 1: No New Untreated Discharges

The project is designed so that there are no new stormwater point discharges that discharge untreated stormwater into, or cause erosion to, wetlands and waters. The site drainage system will consist of subsurface drainage systems and roof stone drip trenches.

Standard 2: Peak Rate Attenuation:

The project drainage system was designed to attenuate the peak discharge rates and volumes of runoff from the site. As stated in the "Drainage Calculations", through the use of the subsurface drainage systems the runoff rates and volumes for the post-development conditions can be effectively maintained at or below pre-development runoff rates and volumes off site. The calculations considered the 2, 10 and 100 year, 24 hour storm events. The calculations were completed using NRCS Technical Release 55.

Standard 3: Recharge

The site is located in an area of Quonset Soils (NRCS Soil Type A), Canton Soils (NRCS Soil Type B), Paxton Soils (NRCS Soil Type C) and Udorthents, Sandy (Using Soil Type A). The Soil type designations are from the NRCS web site soil survey. The proposed subsurface drainage systems will provide a total of approximately 3,744 C.F. of storage for recharge of runoff (as shown in the attached Recharge Volume Calculations within the drainage calculations). Therefore, standard 3 has been met.

Standard 4: Water Quality

The project consists of the construction of six single family homes with associated driveways, site grading and utilities. The single family home use is considered to produce "clean runoff". Therefore, the standard of 80% TSS removal has been met.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The project area does not contain a land use with higher potential pollutant loads.

Standard 6: Critical Areas

The stormwater management system proposed for the site does discharge directly to a priority Habitat Area designated by the Natural Heritage and Endangered Species program (NHESP). A submission to the NHESP was required and approval was received.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

The proposed project is not a redevelopment project.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

The site plans for the proposed subdivision indicate the proposed locations of the erosion controls and other information as required addressing the construction period erosion and sediment control. Additional information regarding the construction period protection, inspection, and maintenance of the stormwater management system can be found in the attached document "Stormwater Management System Inspection and Maintenance Plan – Hartwell Avenue, Littleton, MA" dated September 25, 2023.

The construction on the site will result in the disturbance of more than one acre of land therefore an NPDES Permit will be required for this project.

Standard 9: Operation and Maintenance Plan

Items required under Standard 9 are provided in the attached document"Stormwater Management System Inspection and Maintenance Plan – Hartwell Avenue, Littleton, MA" dated September 25, 2023. This document includes information pertaining to the protection, inspection, and maintenance of the installed stormwater management system both during and after the construction period.

Standard 10: Prohibition of Illicit Discharges

The proposed Hartwell Avenue project does not include any illicit discharges of stormwater or other source of illicit discharge. No use of the site will include discharges to the stormwater management system that include any wastewater discharges or discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

The project site plans show the locations of all components of the stormwater management system.

Owner's Signature

10/2/23

Date

Registered Professional Engineers Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Signature

9-25-23

Date

DRAINAGE CALCULATIONS

DRAINAGE DATA

PROJECT:	PROJECT NO.:	DATE:
Hartwell Avenue	23004	9/25/23

OBJECTIVE:

Calculate the overland storm water flows for the pre-development and post-development conditions and design a drainage system to control the peak runoff rates and volumes from the site for the 2, 10 and 100 year storm events.

STORM FREQUENCY:

2, 10 & 100 year storm events

SOIL TYPE/GROUP:

Quonset (262C)	(Soil Type A)
Canton (420C)	(Soil Type B)
Paxton (307C)	(Soil Type C)
Udorthents, Sandy (653) (Refer to soil testing on Lot 5 and Lot 6)	(Used soil type A)

CALCULATION METHOD:

SCS Method - TR 55

DRAINAGE SUMMARY:

Refer to next sheet.

INTRODUCTION

The overland flow drainage calculations were performed using the SCS method and TR-55.

The project area for the Dutchco Builders site is approximately 10.1 acres located on Hartwell Avenue in Littleton, MA. The existing site consists of a single family home with lawn, driveway and gravel area and a large woodland area. The proposed project will consist of the construction of six single family homes with associated driveways, lawn areas, site grading and utilities. The project area consists of moderate to gradual slopes which drain either toward the pond area, to the road or to the northerly low area.

The drainage system will consist of subsurface roof infiltration systems. The proposed subsurface roof infiltration systems have been designed to infiltrate the required amount of stormwater to meet standard 3 of the stormwater management regulations.

The drainage system has been designed in accordance with the Massachusetts DEP Storm Water Quality Standards. The following Best Management Practices (BMP) have been used on the site: Subsurface roof infiltration systems.

OBJECTIVE

Runoff rates and volumes for the watersheds listed in the following tables have been calculated for the 2, 10 and 100-year storms. The subsurface roof infiltration systems on lots 5 & 6 have been designed to maintain pre-development rates and volumes of runoff at or below the post-development conditions. The drainage from lots 1 through 4 does not leave the site, it enters the pond located on the property.

DRAINAGE SUMMARY:

Tables I through IV below are a summary of pre-development and post-development peak runoff rates and volumes to the design points. (please refer to the "Pre- & Post-Development subcatchment" maps for delineation of these areas).

The pre-development design points and post development design points are at the same location on each subcatchment map. Areas 1S and 10S compare overland runoff to the pond which is located on the property, therefore an increase in the rate of runoff to the pond on site is indicated in the calculations. Areas 2S and 20S compare overland runoff to the northerly low area. Areas 3S and 30S compare overland runoff to the road.

TABLE I

PRE-DEVELOPMENT CONDITIONS			
WATERSHED	*FLOW (CFS)*		
	2 year	10 year	100 year
1S	0.04	0.83	4.77
2S	1.06	2.97	6.32
3S	0.09	0.32	0.74

TABLE II

POST-DEVELOPMENT CONDITIONS				
WATERSHED	*COMPARED TO PRE-DEVELOPMENT WATERSHED*	*FLOW (CFS)*		
		2 year	10 year	100 year
10S	(1S)	0.12 (0.04)	2.45 (0.83)	11.53 (4.77)
20S	(2S)	0.68 (1.06)	2.44 (2.97)	5.80 (6.32)
30S	(3S)	0.09 (0.09)	0.24 (0.32)	0.51 (0.74)

(CFS) - CUBIC FEET PER SECOND

TABLE III

PRE-DEVELOPMENT CONDITIONS			
WATERSHED	*VOLUME (AF)*		
	2 year	10 year	100 year
1S	0.018	0.164	0.566
2S	0.118	0.285	0.583
3S	0.009	0.024	0.052

TABLE IV

POST-DEVELOPMENT CONDITIONS				
WATERSHED	*COMPARED TO PRE-DEVELOPMENT WATERSHED*	*VOLUME (AF)*		
		2 year	10 year	100 year
10S	(1S)	0.052 (0.018)	0.264 (0.164)	0.766 (0.566)
20S	(2S)	0.080 (0.118)	0.215 (0.285)	0.469 (0.583)
30S	(3S)	0.007 (0.009)	0.017 (0.024)	0.035 (0.052)

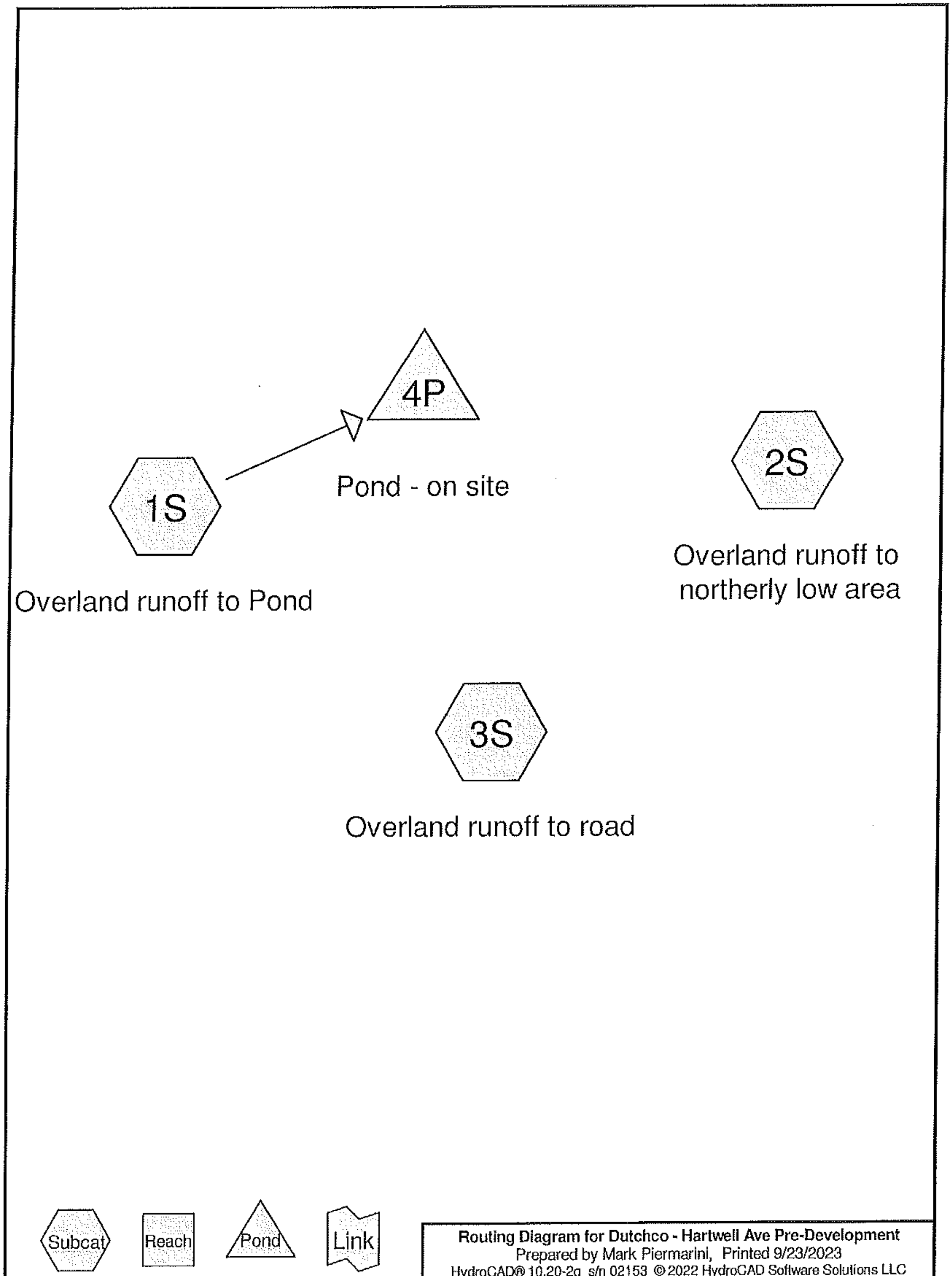
(AF) - ACRE FEET

<u>*CONCLUSION*</u>

Through the use of the proposed subsurface roof infiltration systems the runoff rates and volumes off site (subcatchments 20S and 30S) for the post-development condition can be effectively maintained at or below the pre-development runoff rates and volumes off site (subcatchments 2S and 3S).

EXISTING CONDITIONS

2 YEAR STORM



Routing Diagram for Dutchco - Hartwell Ave Pre-Development
Prepared by Mark Piermarini, Printed 9/23/2023
HydroCAD® 10.20-2g s/n 02153 © 2022 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.700	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S)
0.020	74	>75% Grass cover, Good, HSG C (2S)
0.280	85	Gravel roads, HSG B (2S)
0.100	89	Gravel roads, HSG C (1S)
0.230	98	Paved Driveway (2S)
0.030	98	Paved driveway (3S)
0.060	98	Roofs, HSG B (2S)
1.000	98	Water Surface (1S)
4.850	30	Woods, Good, HSG A (1S)
1.810	55	Woods, Good, HSG B (1S, 2S, 3S)
1.040	70	Woods, Good, HSG C (1S, 2S)
10.120	**52**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.850	HSG A	1S
2.850	HSG B	1S, 2S, 3S
1.160	HSG C	1S, 2S
0.000	HSG D	
1.260	Other	1S, 2S, 3S
10.120		**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	0.700	0.020	0.000	0.000	0.720	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.280	0.100	0.000	0.000	0.380	Gravel roads	1S, 2S
0.000	0.000	0.000	0.000	0.230	0.230	Paved Driveway	2S
0.000	0.000	0.000	0.000	0.030	0.030	Paved driveway	3S
0.000	0.060	0.000	0.000	0.000	0.060	Roofs	2S
0.000	0.000	0.000	0.000	1.000	1.000	Water Surface	1S
4.850	1.810	1.040	0.000	0.000	7.700	Woods, Good	1S, 2S, 3S
4.850	**2.850**	**1.160**	**0.000**	**1.260**	**10.120**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Overland runoff to Pond Runoff Area=7.140 ac 14.01% Impervious Runoff Depth>0.03"
Flow Length=290' Tc=16.5 min CN=46 Runoff=0.04 cfs 0.018 af

Subcatchment 2S: Overland runoff to northerly Runoff Area=2.700 ac 10.74% Impervious Runoff Depth>0.52"
Flow Length=438' Tc=16.8 min CN=66 Runoff=1.06 cfs 0.118 af

Subcatchment 3S: Overland runoff to road Runoff Area=0.280 ac 10.71% Impervious Runoff Depth>0.38"
Flow Length=130' Tc=7.0 min CN=62 Runoff=0.09 cfs 0.009 af

Pond 4P: Pond - on site Peak Elev=251.02' Storage=0.018 af Inflow=0.04 cfs 0.018 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 10.120 ac Runoff Volume = 0.145 af Average Runoff Depth = 0.17"
86.96% Pervious = 8.800 ac 13.04% Impervious = 1.320 ac

Summary for Subcatchment 1S: Overland runoff to Pond

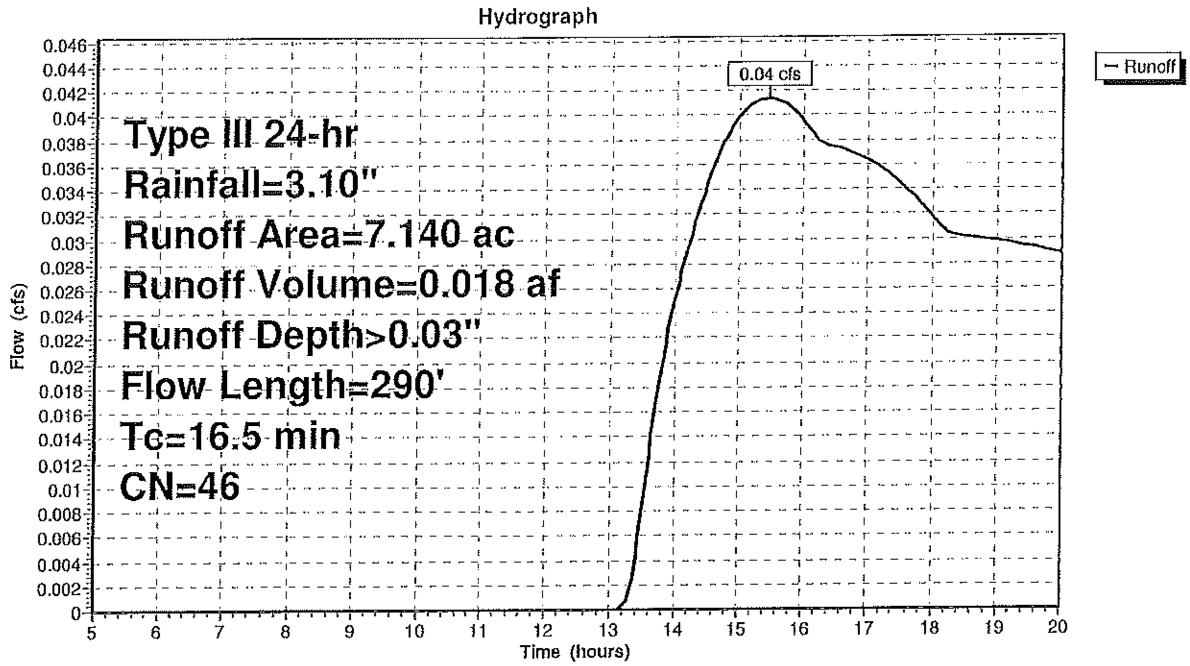
Runoff = 0.04 cfs @ 15.44 hrs, Volume= 0.018 af, Depth> 0.03"
Routed to Pond 4P : Pond - on site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.10"

	Area (ac)	CN	Description
*	1.000	98	Water Surface
	0.020	61	>75% Grass cover, Good, HSG B
	0.100	89	Gravel roads, HSG C
	0.690	70	Woods, Good, HSG C
	0.480	55	Woods, Good, HSG B
	4.850	30	Woods, Good, HSG A
	7.140	46	Weighted Average
	6.140		85.99% Pervious Area
	1.000		14.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	50	0.0200	0.07		**Sheet Flow, Path 1** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	50	0.0200	0.71		**Shallow Concentrated Flow, Path 2** Woodland Kv= 5.0 fps
2.8	190	0.0526	1.15		**Shallow Concentrated Flow, Path 3** Woodland Kv= 5.0 fps
16.5	290	Total			

Subcatchment 1S: Overland runoff to Pond



Hydrograph for Subcatchment 1S: Overland runoff to Pond

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00
5.25	0.19	0.00	0.00
5.50	0.20	0.00	0.00
5.75	0.21	0.00	0.00
6.00	0.22	0.00	0.00
6.25	0.24	0.00	0.00
6.50	0.25	0.00	0.00
6.75	0.26	0.00	0.00
7.00	0.28	0.00	0.00
7.25	0.30	0.00	0.00
7.50	0.32	0.00	0.00
7.75	0.33	0.00	0.00
8.00	0.35	0.00	0.00
8.25	0.37	0.00	0.00
8.50	0.40	0.00	0.00
8.75	0.42	0.00	0.00
9.00	0.45	0.00	0.00
9.25	0.48	0.00	0.00
9.50	0.51	0.00	0.00
9.75	0.55	0.00	0.00
10.00	0.59	0.00	0.00
10.25	0.63	0.00	0.00
10.50	0.67	0.00	0.00
10.75	0.72	0.00	0.00
11.00	0.78	0.00	0.00
11.25	0.84	0.00	0.00
11.50	0.92	0.00	0.00
11.75	1.10	0.00	0.00
12.00	1.55	0.00	0.00
12.25	2.00	0.00	0.00
12.50	2.18	0.00	0.00
12.75	2.26	0.00	0.00
13.00	2.32	0.00	0.00
13.25	2.38	0.00	0.00
13.50	2.43	0.00	0.01
13.75	2.47	0.00	0.02
14.00	2.51	0.00	0.03
14.25	2.55	0.00	0.03
14.50	2.59	0.00	0.03
14.75	2.62	0.01	0.04
15.00	2.65	0.01	0.04
15.25	2.68	0.01	**0.04**
15.50	2.70	0.01	**0.04**
15.75	2.73	0.01	0.04
16.00	2.75	0.01	0.04
16.25	2.77	0.01	0.04
16.50	2.78	0.02	0.04
16.75	2.80	0.02	0.04
17.00	2.82	0.02	0.04
17.25	2.84	0.02	0.04
17.50	2.85	0.02	0.03
17.75	2.86	0.02	0.03
18.00	2.88	0.02	0.03
18.25	2.89	0.02	0.03
18.50	2.90	0.02	0.03
18.75	2.91	0.03	0.03
19.00	2.92	0.03	0.03
19.25	2.94	0.03	0.03
19.50	2.95	0.03	0.03
19.75	2.96	0.03	0.03
20.00	**2.97**	**0.03**	0.03

Summary for Subcatchment 2S: Overland runoff to northerly low area

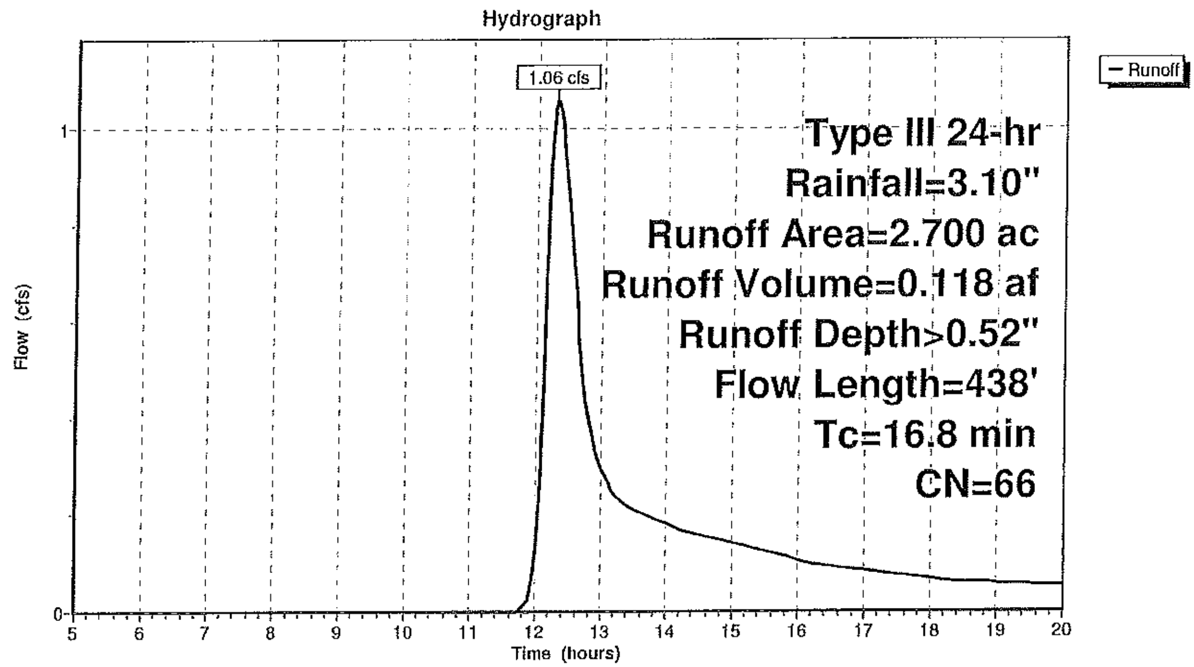
Runoff = 1.06 cfs @ 12.29 hrs, Volume= 0.118 af, Depth> 0.52"
Routed to nonexistent node 5P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.10"

	Area (ac)	CN	Description
*	0.230	98	Paved Driveway
	0.060	98	Roofs, HSG B
	0.280	85	Gravel roads, HSG B
	0.020	74	>75% Grass cover, Good, HSG C
	0.580	61	>75% Grass cover, Good, HSG B
	0.350	70	Woods, Good, HSG C
	1.180	55	Woods, Good, HSG B
	2.700	66	Weighted Average
	2.410		89.26% Pervious Area
	0.290		10.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0300	0.08		**Sheet Flow, Path 1** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	50	0.0500	4.54		**Shallow Concentrated Flow, Path 2** Paved Kv= 20.3 fps
1.8	168	0.0506	1.57		**Shallow Concentrated Flow, Path 3** Short Grass Pasture Kv= 7.0 fps
1.4	70	0.0143	0.84		**Shallow Concentrated Flow, Path 4** Short Grass Pasture Kv= 7.0 fps
2.7	100	0.0150	0.61		**Shallow Concentrated Flow, Path 5** Woodland Kv= 5.0 fps
16.8	438	Total			

Subcatchment 2S: Overland runoff to northerly low area



Hydrograph for Subcatchment 2S: Overland runoff to northerly low area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00
5.25	0.19	0.00	0.00
5.50	0.20	0.00	0.00
5.75	0.21	0.00	0.00
6.00	0.22	0.00	0.00
6.25	0.24	0.00	0.00
6.50	0.25	0.00	0.00
6.75	0.26	0.00	0.00
7.00	0.28	0.00	0.00
7.25	0.30	0.00	0.00
7.50	0.32	0.00	0.00
7.75	0.33	0.00	0.00
8.00	0.35	0.00	0.00
8.25	0.37	0.00	0.00
8.50	0.40	0.00	0.00
8.75	0.42	0.00	0.00
9.00	0.45	0.00	0.00
9.25	0.48	0.00	0.00
9.50	0.51	0.00	0.00
9.75	0.55	0.00	0.00
10.00	0.59	0.00	0.00
10.25	0.63	0.00	0.00
10.50	0.67	0.00	0.00
10.75	0.72	0.00	0.00
11.00	0.78	0.00	0.00
11.25	0.84	0.00	0.00
11.50	0.92	0.00	0.00
11.75	1.10	0.00	0.00
12.00	1.55	0.05	0.13
12.25	2.00	0.15	**1.04**
12.50	2.18	0.21	**0.82**
12.75	2.26	0.24	0.43
13.00	2.32	0.26	0.29
13.25	2.38	0.28	0.23
13.50	2.43	0.30	0.21
13.75	2.47	0.32	0.20
14.00	2.51	0.33	0.18
14.25	2.55	0.35	0.17
14.50	2.59	0.36	0.16
14.75	2.62	0.37	0.15
15.00	2.65	0.39	0.14
15.25	2.68	0.40	0.13
15.50	2.70	0.41	0.12
15.75	2.73	0.42	0.12
16.00	2.75	0.43	0.11
16.25	2.77	0.44	0.10
16.50	2.78	0.45	0.09
16.75	2.80	0.45	0.09
17.00	2.82	0.46	0.08
17.25	2.84	0.47	0.08
17.50	2.85	0.48	0.08
17.75	2.86	0.48	0.07
18.00	2.88	0.49	0.07
18.25	2.89	0.49	0.06
18.50	2.90	0.50	0.06
18.75	2.91	0.50	0.06
19.00	2.92	0.51	0.06
19.25	2.94	0.51	0.06
19.50	2.95	0.52	0.06
19.75	2.96	0.52	0.05
20.00	**2.97**	**0.53**	0.05

Summary for Subcatchment 3S: Overland runoff to road

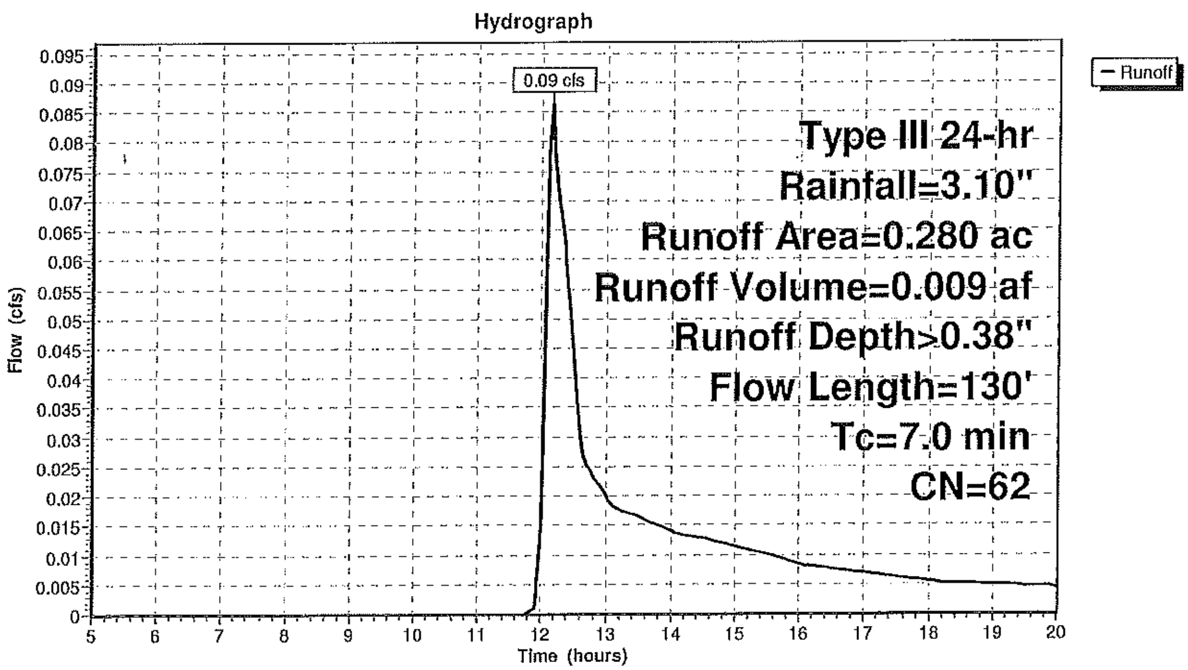
Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.009 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.10"

	Area (ac)	CN	Description
*	0.030	98	Paved driveway
	0.100	61	>75% Grass cover, Good, HSG B
	0.150	55	Woods, Good, HSG B
	0.280	62	Weighted Average
	0.250		89.29% Pervious Area
	0.030		10.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, Path 1** Grass: Short n= 0.150 P2= 3.10"
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, Path 2** Short Grass Pasture Kv= 7.0 fps
0.5	30	0.0333	0.91		**Shallow Concentrated Flow, Path 3** Woodland Kv= 5.0 fps
7.0	130	Total			

Subcatchment 3S: Overland runoff to road



Hydrograph for Subcatchment 3S: Overland runoff to road

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00
5.25	0.19	0.00	0.00
5.50	0.20	0.00	0.00
5.75	0.21	0.00	0.00
6.00	0.22	0.00	0.00
6.25	0.24	0.00	0.00
6.50	0.25	0.00	0.00
6.75	0.26	0.00	0.00
7.00	0.28	0.00	0.00
7.25	0.30	0.00	0.00
7.50	0.32	0.00	0.00
7.75	0.33	0.00	0.00
8.00	0.35	0.00	0.00
8.25	0.37	0.00	0.00
8.50	0.40	0.00	0.00
8.75	0.42	0.00	0.00
9.00	0.45	0.00	0.00
9.25	0.48	0.00	0.00
9.50	0.51	0.00	0.00
9.75	0.55	0.00	0.00
10.00	0.59	0.00	0.00
10.25	0.63	0.00	0.00
10.50	0.67	0.00	0.00
10.75	0.72	0.00	0.00
11.00	0.78	0.00	0.00
11.25	0.84	0.00	0.00
11.50	0.92	0.00	0.00
11.75	1.10	0.00	0.00
12.00	1.55	0.02	**0.01**
12.25	2.00	0.09	**0.07**
12.50	2.18	0.13	0.04
12.75	2.26	0.15	0.02
13.00	2.32	0.17	0.02
13.25	2.38	0.18	0.02
13.50	2.43	0.20	0.02
13.75	2.47	0.21	0.02
14.00	2.51	0.22	0.01
14.25	2.55	0.24	0.01
14.50	2.59	0.25	0.01
14.75	2.62	0.26	0.01
15.00	2.65	0.27	0.01
15.25	2.68	0.28	0.01
15.50	2.70	0.29	0.01
15.75	2.73	0.29	0.01
16.00	2.75	0.30	0.01
16.25	2.77	0.31	0.01
16.50	2.78	0.32	0.01
16.75	2.80	0.32	0.01
17.00	2.82	0.33	0.01
17.25	2.84	0.33	0.01
17.50	2.85	0.34	0.01
17.75	2.86	0.35	0.01
18.00	2.88	0.35	0.01
18.25	2.89	0.36	0.01
18.50	2.90	0.36	0.01
18.75	2.91	0.36	0.01
19.00	2.92	0.37	0.00
19.25	2.94	0.37	0.00
19.50	2.95	0.38	0.00
19.75	2.96	0.38	0.00
20.00	**2.97**	**0.39**	0.00

Summary for Pond 4P: Pond - on site

Inflow Area = 7.140 ac, 14.01% Impervious, Inflow Depth > 0.03"
Inflow = 0.04 cfs @ 15.44 hrs, Volume= 0.018 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

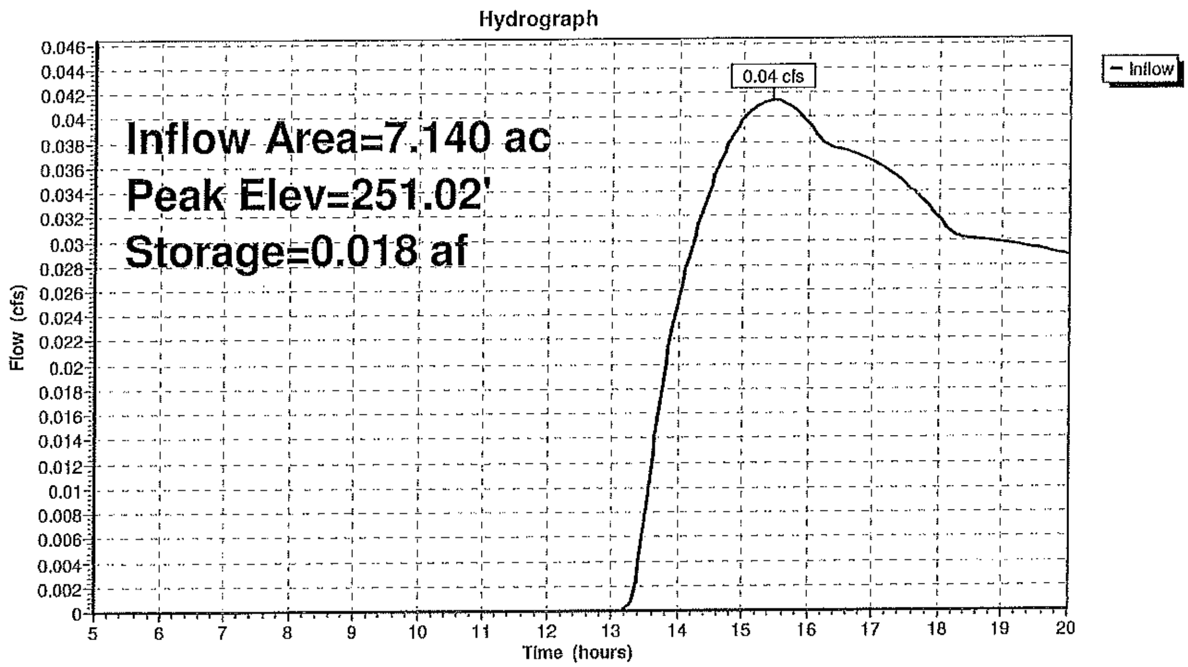
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 251.02' @ 20.00 hrs Surf.Area= 1.021 ac Storage= 0.018 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

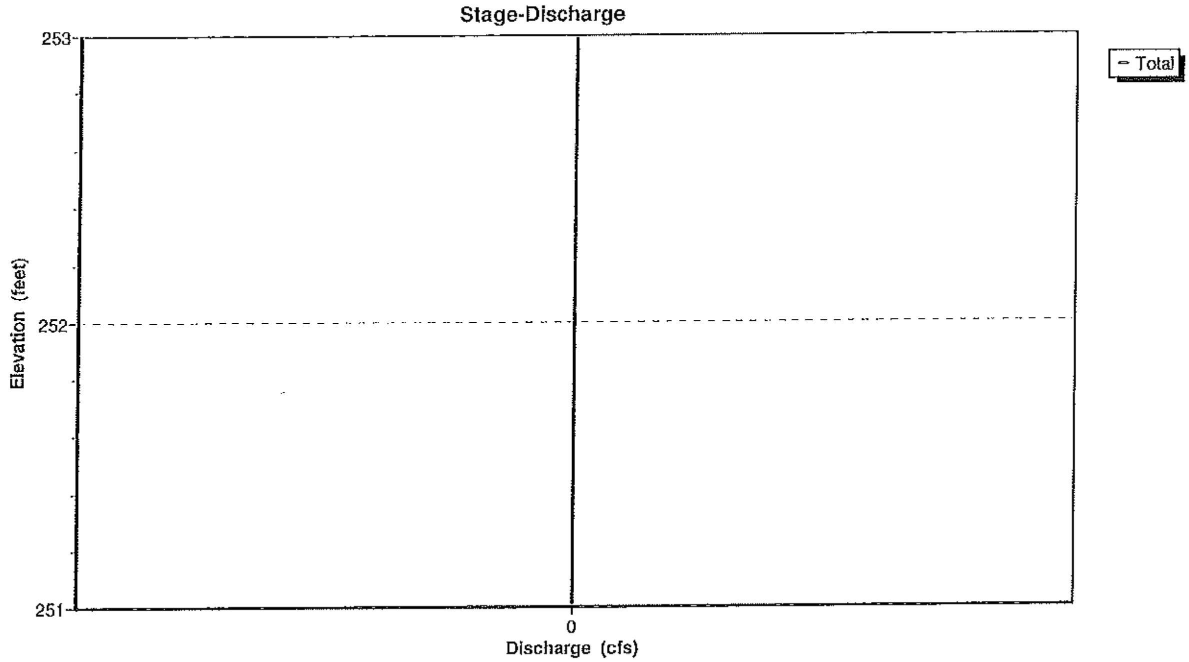
Volume	Invert	Avail.Storage	Storage Description
#1	251.00'	2.160 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
251.00	1.020	0.000	0.000
252.00	1.080	1.050	1.050
253.00	1.140	1.110	2.160

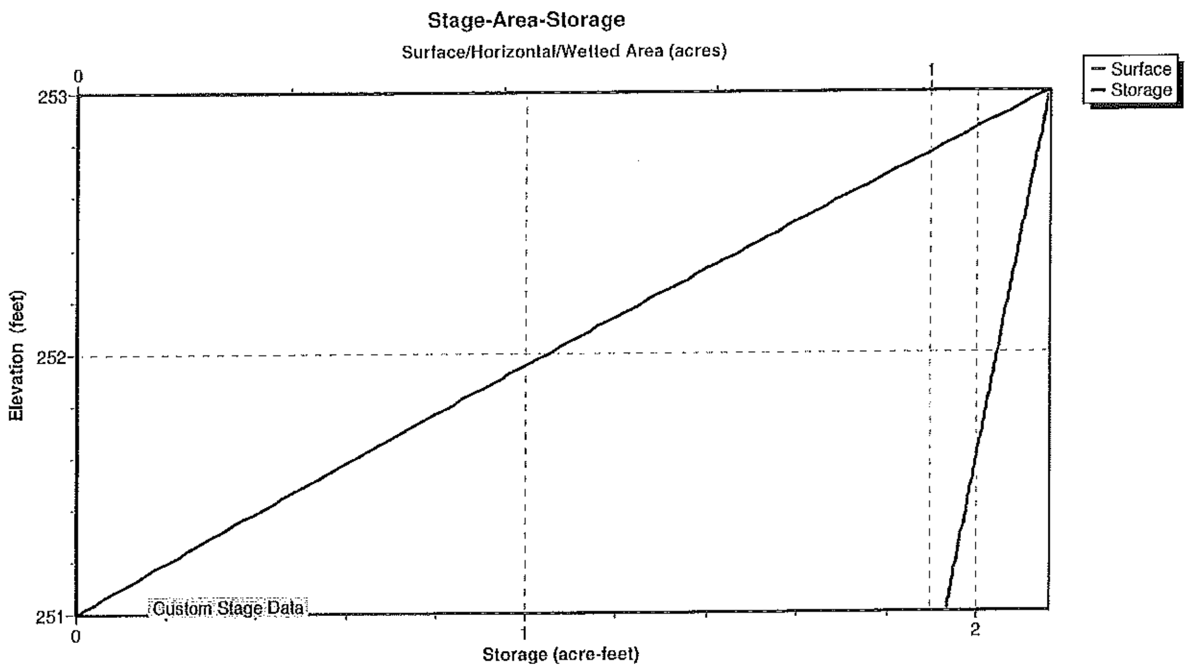
Pond 4P: Pond - on site



Pond 4P: Pond - on site



Pond 4P: Pond - on site



Hydrograph for Pond 4P: Pond - on site

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)
5.00	0.00	0.000	251.00
5.25	0.00	0.000	251.00
5.50	0.00	0.000	251.00
5.75	0.00	0.000	251.00
6.00	0.00	0.000	251.00
6.25	0.00	0.000	251.00
6.50	0.00	0.000	251.00
6.75	0.00	0.000	251.00
7.00	0.00	0.000	251.00
7.25	0.00	0.000	251.00
7.50	0.00	0.000	251.00
7.75	0.00	0.000	251.00
8.00	0.00	0.000	251.00
8.25	0.00	0.000	251.00
8.50	0.00	0.000	251.00
8.75	0.00	0.000	251.00
9.00	0.00	0.000	251.00
9.25	0.00	0.000	251.00
9.50	0.00	0.000	251.00
9.75	0.00	0.000	251.00
10.00	0.00	0.000	251.00
10.25	0.00	0.000	251.00
10.50	0.00	0.000	251.00
10.75	0.00	0.000	251.00
11.00	0.00	0.000	251.00
11.25	0.00	0.000	251.00
11.50	0.00	0.000	251.00
11.75	0.00	0.000	251.00
12.00	0.00	0.000	251.00
12.25	0.00	0.000	251.00
12.50	0.00	0.000	251.00
12.75	0.00	0.000	251.00
13.00	0.00	0.000	251.00
13.25	0.00	0.000	251.00
13.50	0.01	0.000	251.00
13.75	0.02	0.000	251.00
14.00	0.03	0.001	251.00
14.25	0.03	0.001	251.00
14.50	0.03	0.002	251.00
14.75	0.04	0.003	251.00
15.00	0.04	0.004	251.00
15.25	**0.04**	0.004	251.00
15.50	**0.04**	0.005	251.01
15.75	0.04	0.006	251.01
16.00	0.04	0.007	251.01
16.25	0.04	0.008	251.01
16.50	0.04	0.009	251.01
16.75	0.04	0.009	251.01
17.00	0.04	0.010	251.01
17.25	0.04	0.011	251.01
17.50	0.03	0.012	251.01
17.75	0.03	0.012	251.01
18.00	0.03	0.013	251.01
18.25	0.03	0.014	251.01
18.50	0.03	0.014	251.01
18.75	0.03	0.015	251.01
19.00	0.03	0.015	251.02
19.25	0.03	0.016	251.02
19.50	0.03	0.017	251.02
19.75	0.03	0.017	251.02
20.00	0.03	**0.018**	**251.02**

Stage-Discharge for Pond 4P: Pond - on site

Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)
251.00	**0.00**	251.53	0.00	252.06	0.00	252.59	0.00
251.01	0.00	251.54	0.00	252.07	0.00	252.60	0.00
251.02	0.00	251.55	0.00	252.08	0.00	252.61	0.00
251.03	0.00	251.56	0.00	252.09	0.00	252.62	0.00
251.04	0.00	251.57	0.00	252.10	0.00	252.63	0.00
251.05	0.00	251.58	0.00	252.11	0.00	252.64	0.00
251.06	0.00	251.59	0.00	252.12	0.00	252.65	0.00
251.07	0.00	251.60	0.00	252.13	0.00	252.66	0.00
251.08	0.00	251.61	0.00	252.14	0.00	252.67	0.00
251.09	0.00	251.62	0.00	252.15	0.00	252.68	0.00
251.10	0.00	251.63	0.00	252.16	0.00	252.69	0.00
251.11	0.00	251.64	0.00	252.17	0.00	252.70	0.00
251.12	0.00	251.65	0.00	252.18	0.00	252.71	0.00
251.13	0.00	251.66	0.00	252.19	0.00	252.72	0.00
251.14	0.00	251.67	0.00	252.20	0.00	252.73	0.00
251.15	0.00	251.68	0.00	252.21	0.00	252.74	0.00
251.16	0.00	251.69	0.00	252.22	0.00	252.75	0.00
251.17	0.00	251.70	0.00	252.23	0.00	252.76	0.00
251.18	0.00	251.71	0.00	252.24	0.00	252.77	0.00
251.19	0.00	251.72	0.00	252.25	0.00	252.78	0.00
251.20	0.00	251.73	0.00	252.26	0.00	252.79	0.00
251.21	0.00	251.74	0.00	252.27	0.00	252.80	0.00
251.22	0.00	251.75	0.00	252.28	0.00	252.81	0.00
251.23	0.00	251.76	0.00	252.29	0.00	252.82	0.00
251.24	0.00	251.77	0.00	252.30	0.00	252.83	0.00
251.25	0.00	251.78	0.00	252.31	0.00	252.84	0.00
251.26	0.00	251.79	0.00	252.32	0.00	252.85	0.00
251.27	0.00	251.80	0.00	252.33	0.00	252.86	0.00
251.28	0.00	251.81	0.00	252.34	0.00	252.87	0.00
251.29	0.00	251.82	0.00	252.35	0.00	252.88	0.00
251.30	0.00	251.83	0.00	252.36	0.00	252.89	0.00
251.31	0.00	251.84	0.00	252.37	0.00	252.90	0.00
251.32	0.00	251.85	0.00	252.38	0.00	252.91	0.00
251.33	0.00	251.86	0.00	252.39	0.00	252.92	0.00
251.34	0.00	251.87	0.00	252.40	0.00	252.93	0.00
251.35	0.00	251.88	0.00	252.41	0.00	252.94	0.00
251.36	0.00	251.89	0.00	252.42	0.00	252.95	0.00
251.37	0.00	251.90	0.00	252.43	0.00	252.96	0.00
251.38	0.00	251.91	0.00	252.44	0.00	252.97	0.00
251.39	0.00	251.92	0.00	252.45	0.00	252.98	0.00
251.40	0.00	251.93	0.00	252.46	0.00	252.99	0.00
251.41	0.00	251.94	0.00	252.47	0.00	253.00	0.00
251.42	0.00	251.95	0.00	252.48	0.00		
251.43	0.00	251.96	0.00	252.49	0.00		
251.44	0.00	251.97	0.00	252.50	0.00		
251.45	0.00	251.98	0.00	252.51	0.00		
251.46	0.00	251.99	0.00	252.52	0.00		
251.47	0.00	252.00	0.00	252.53	0.00		
251.48	0.00	252.01	0.00	252.54	0.00		
251.49	0.00	252.02	0.00	252.55	0.00		
251.50	0.00	252.03	0.00	252.56	0.00		
251.51	0.00	252.04	0.00	252.57	0.00		
251.52	0.00	252.05	0.00	252.58	0.00		

Stage-Area-Storage for Pond 4P: Pond - on site

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
251.00	1.020	0.000	252.06	1.084	1.115
251.02	1.021	0.020	252.08	1.085	1.137
251.04	1.022	0.041	252.10	1.086	1.158
251.06	1.024	0.061	252.12	1.087	1.180
251.08	1.025	0.082	252.14	1.088	1.202
251.10	1.026	0.102	252.16	1.090	1.224
251.12	1.027	0.123	252.18	1.091	1.245
251.14	1.028	0.143	252.20	1.092	1.267
251.16	1.030	0.164	252.22	1.093	1.289
251.18	1.031	0.185	252.24	1.094	1.311
251.20	1.032	0.205	252.26	1.096	1.333
251.22	1.033	0.226	252.28	1.097	1.355
251.24	1.034	0.247	252.30	1.098	1.377
251.26	1.036	0.267	252.32	1.099	1.399
251.28	1.037	0.288	252.34	1.100	1.421
251.30	1.038	0.309	252.36	1.102	1.443
251.32	1.039	0.329	252.38	1.103	1.465
251.34	1.040	0.350	252.40	1.104	1.487
251.36	1.042	0.371	252.42	1.105	1.509
251.38	1.043	0.392	252.44	1.106	1.531
251.40	1.044	0.413	252.46	1.108	1.553
251.42	1.045	0.434	252.48	1.109	1.575
251.44	1.046	0.455	252.50	1.110	1.598
251.46	1.048	0.476	252.52	1.111	1.620
251.48	1.049	0.497	252.54	1.112	1.642
251.50	1.050	0.517	252.56	1.114	1.664
251.52	1.051	0.539	252.58	1.115	1.686
251.54	1.052	0.560	252.60	1.116	1.709
251.56	1.054	0.581	252.62	1.117	1.731
251.58	1.055	0.602	252.64	1.118	1.753
251.60	1.056	0.623	252.66	1.120	1.776
251.62	1.057	0.644	252.68	1.121	1.798
251.64	1.058	0.665	252.70	1.122	1.821
251.66	1.060	0.686	252.72	1.123	1.843
251.68	1.061	0.707	252.74	1.124	1.866
251.70	1.062	0.729	252.76	1.126	1.888
251.72	1.063	0.750	252.78	1.127	1.911
251.74	1.064	0.771	252.80	1.128	1.933
251.76	1.066	0.793	252.82	1.129	1.956
251.78	1.067	0.814	252.84	1.130	1.978
251.80	1.068	0.835	252.86	1.132	2.001
251.82	1.069	0.857	252.88	1.133	2.024
251.84	1.070	0.878	252.90	1.134	2.046
251.86	1.072	0.899	252.92	1.135	2.069
251.88	1.073	0.921	252.94	1.136	2.092
251.90	1.074	0.942	252.96	1.138	2.114
251.92	1.075	0.964	252.98	1.139	2.137
251.94	1.076	0.985	253.00	**1.140**	**2.160**
251.96	1.078	1.007			
251.98	1.079	1.028			
252.00	1.080	1.050			
252.02	1.081	1.072			
252.04	1.082	1.093			

EXISTING CONDITIONS

10 YEAR STORM

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Overland runoff to Pond Runoff Area=7.140 ac 14.01% Impervious Runoff Depth>0.28"
Flow Length=290' Tc=16.5 min CN=46 Runoff=0.83 cfs 0.164 af

Subcatchment 2S: Overland runoff to northerly Runoff Area=2.700 ac 10.74% Impervious Runoff Depth>1.26"
Flow Length=438' Tc=16.8 min CN=66 Runoff=2.97 cfs 0.285 af

Subcatchment 3S: Overland runoff to road Runoff Area=0.280 ac 10.71% Impervious Runoff Depth>1.03"
Flow Length=130' Tc=7.0 min CN=62 Runoff=0.32 cfs 0.024 af

Pond 4P: Pond - on site Peak Elev=251.16' Storage=0.164 af Inflow=0.83 cfs 0.164 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 10.120 ac Runoff Volume = 0.473 af Average Runoff Depth = 0.56"
86.96% Pervious = 8.800 ac 13.04% Impervious = 1.320 ac

Summary for Subcatchment 1S: Overland runoff to Pond

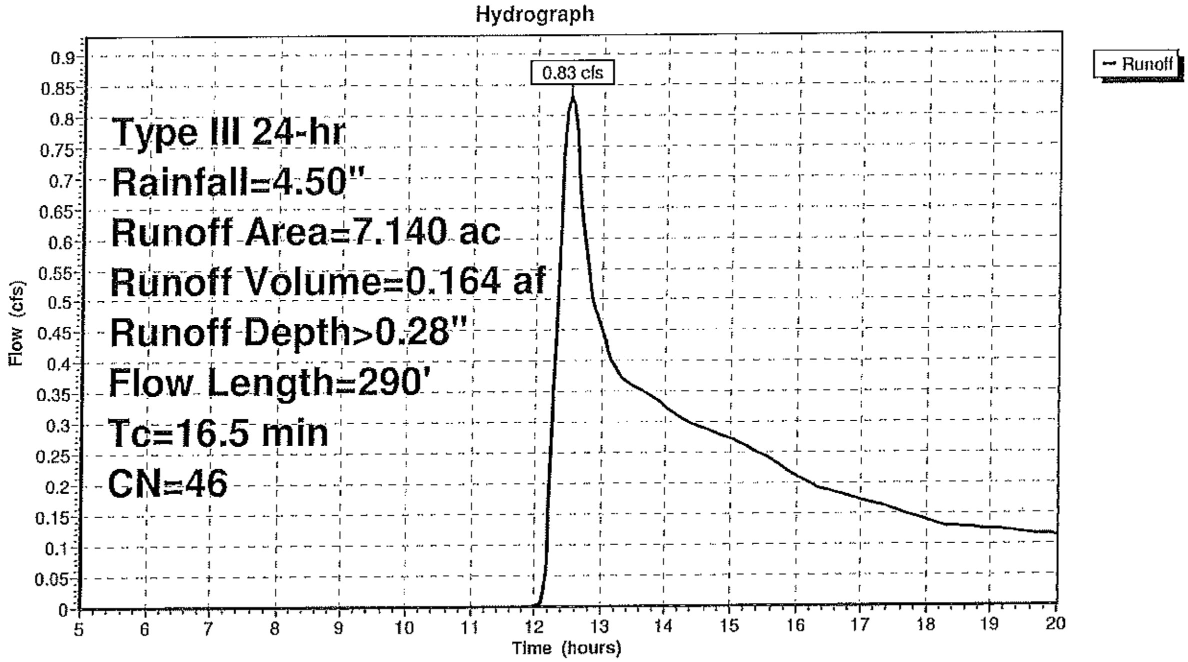
Runoff = 0.83 cfs @ 12.51 hrs, Volume= 0.164 af, Depth> 0.28"
Routed to Pond 4P : Pond - on site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=4.50"

	Area (ac)	CN	Description
*	1.000	98	Water Surface
	0.020	61	>75% Grass cover, Good, HSG B
	0.100	89	Gravel roads, HSG C
	0.690	70	Woods, Good, HSG C
	0.480	55	Woods, Good, HSG B
	4.850	30	Woods, Good, HSG A
	7.140	46	Weighted Average
	6.140		85.99% Pervious Area
	1.000		14.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	50	0.0200	0.07		**Sheet Flow, Path 1** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	50	0.0200	0.71		**Shallow Concentrated Flow, Path 2** Woodland Kv= 5.0 fps
2.8	190	0.0526	1.15		**Shallow Concentrated Flow, Path 3** Woodland Kv= 5.0 fps
16.5	290	Total			

Subcatchment 1S: Overland runoff to Pond



Hydrograph for Subcatchment 1S: Overland runoff to Pond

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.32	0.00	0.00
6.25	0.34	0.00	0.00
6.50	0.36	0.00	0.00
6.75	0.38	0.00	0.00
7.00	0.41	0.00	0.00
7.25	0.43	0.00	0.00
7.50	0.46	0.00	0.00
7.75	0.48	0.00	0.00
8.00	0.51	0.00	0.00
8.25	0.54	0.00	0.00
8.50	0.58	0.00	0.00
8.75	0.62	0.00	0.00
9.00	0.66	0.00	0.00
9.25	0.70	0.00	0.00
9.50	0.75	0.00	0.00
9.75	0.80	0.00	0.00
10.00	0.85	0.00	0.00
10.25	0.91	0.00	0.00
10.50	0.97	0.00	0.00
10.75	1.05	0.00	0.00
11.00	1.13	0.00	0.00
11.25	1.22	0.00	0.00
11.50	1.34	0.00	0.00
11.75	1.60	0.00	0.00
12.00	2.25	0.00	0.00
12.25	2.90	0.02	0.33
12.50	3.16	0.05	**0.83**
12.75	3.28	0.07	0.58
13.00	3.37	0.08	0.45
13.25	3.45	0.10	0.38
13.50	3.53	0.11	0.36
13.75	3.59	0.12	0.34
14.00	3.65	0.13	0.32
14.25	3.70	0.14	0.30
14.50	3.75	0.15	0.29
14.75	3.80	0.16	0.28
15.00	3.84	0.17	0.27
15.25	3.88	0.18	0.26
15.50	3.92	0.19	0.24
15.75	3.96	0.19	0.23
16.00	3.99	0.20	0.21
16.25	4.02	0.21	0.20
16.50	4.04	0.21	0.19
16.75	4.07	0.22	0.18
17.00	4.09	0.23	0.17
17.25	4.12	0.23	0.16
17.50	4.14	0.24	0.16
17.75	4.16	0.24	0.15
18.00	4.18	0.25	0.14
18.25	4.19	0.25	0.13
18.50	4.21	0.26	0.13
18.75	4.23	0.26	0.13
19.00	4.24	0.26	0.12
19.25	4.26	0.27	0.12
19.50	4.28	0.27	0.12
19.75	4.29	0.28	0.12
20.00	**4.31**	**0.28**	0.11

Summary for Subcatchment 2S: Overland runoff to northerly low area

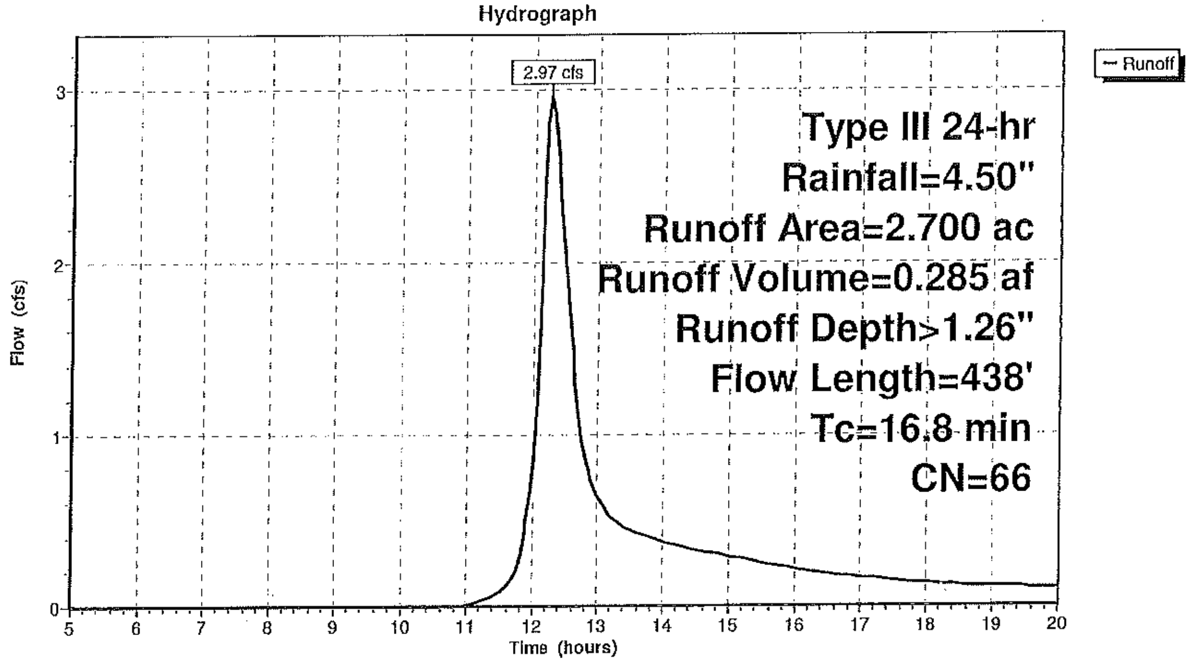
Runoff = 2.97 cfs @ 12.26 hrs, Volume= 0.285 af, Depth> 1.26"
Routed to nonexistent node 5P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=4.50"

	Area (ac)	CN	Description
*	0.230	98	Paved Driveway
	0.060	98	Roofs, HSG B
	0.280	85	Gravel roads, HSG B
	0.020	74	>75% Grass cover, Good, HSG C
	0.580	61	>75% Grass cover, Good, HSG B
	0.350	70	Woods, Good, HSG C
	1.180	55	Woods, Good, HSG B
	2.700	66	Weighted Average
	2.410		89.26% Pervious Area
	0.290		10.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0300	0.08		**Sheet Flow, Path 1** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	50	0.0500	4.54		**Shallow Concentrated Flow, Path 2** Paved Kv= 20.3 fps
1.8	168	0.0506	1.57		**Shallow Concentrated Flow, Path 3** Short Grass Pasture Kv= 7.0 fps
1.4	70	0.0143	0.84		**Shallow Concentrated Flow, Path 4** Short Grass Pasture Kv= 7.0 fps
2.7	100	0.0150	0.61		**Shallow Concentrated Flow, Path 5** Woodland Kv= 5.0 fps
16.8	438	Total			

Subcatchment 2S: Overland runoff to northerly low area



Hydrograph for Subcatchment 2S: Overland runoff to northerly low area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.32	0.00	0.00
6.25	0.34	0.00	0.00
6.50	0.36	0.00	0.00
6.75	0.38	0.00	0.00
7.00	0.41	0.00	0.00
7.25	0.43	0.00	0.00
7.50	0.46	0.00	0.00
7.75	0.48	0.00	0.00
8.00	0.51	0.00	0.00
8.25	0.54	0.00	0.00
8.50	0.58	0.00	0.00
8.75	0.62	0.00	0.00
9.00	0.66	0.00	0.00
9.25	0.70	0.00	0.00
9.50	0.75	0.00	0.00
9.75	0.80	0.00	0.00
10.00	0.85	0.00	0.00
10.25	0.91	0.00	0.00
10.50	0.97	0.00	0.00
10.75	1.05	0.00	0.00
11.00	1.13	0.00	0.01
11.25	1.22	0.01	0.03
11.50	1.34	0.02	0.08
11.75	1.60	0.06	0.22
12.00	2.25	0.23	0.87
12.25	2.90	0.50	**2.97**
12.50	3.16	0.62	1.96
12.75	3.28	0.68	0.97
13.00	3.37	0.73	0.63
13.25	3.45	0.78	0.50
13.50	3.53	0.81	0.44
13.75	3.59	0.85	0.41
14.00	3.65	0.88	0.37
14.25	3.70	0.91	0.34
14.50	3.75	0.94	0.32
14.75	3.80	0.97	0.30
15.00	3.84	0.99	0.29
15.25	3.88	1.02	0.27
15.50	3.92	1.04	0.25
15.75	3.96	1.06	0.23
16.00	3.99	1.08	0.21
16.25	4.02	1.10	0.19
16.50	4.04	1.11	0.18
16.75	4.07	1.13	0.17
17.00	4.09	1.14	0.17
17.25	4.12	1.16	0.16
17.50	4.14	1.17	0.15
17.75	4.16	1.18	0.14
18.00	4.18	1.19	0.13
18.25	4.19	1.20	0.12
18.50	4.21	1.21	0.12
18.75	4.23	1.22	0.12
19.00	4.24	1.24	0.11
19.25	4.26	1.25	0.11
19.50	4.28	1.25	0.11
19.75	4.29	1.26	0.11
20.00	**4.31**	**1.27**	0.10

Summary for Subcatchment 3S: Overland runoff to road

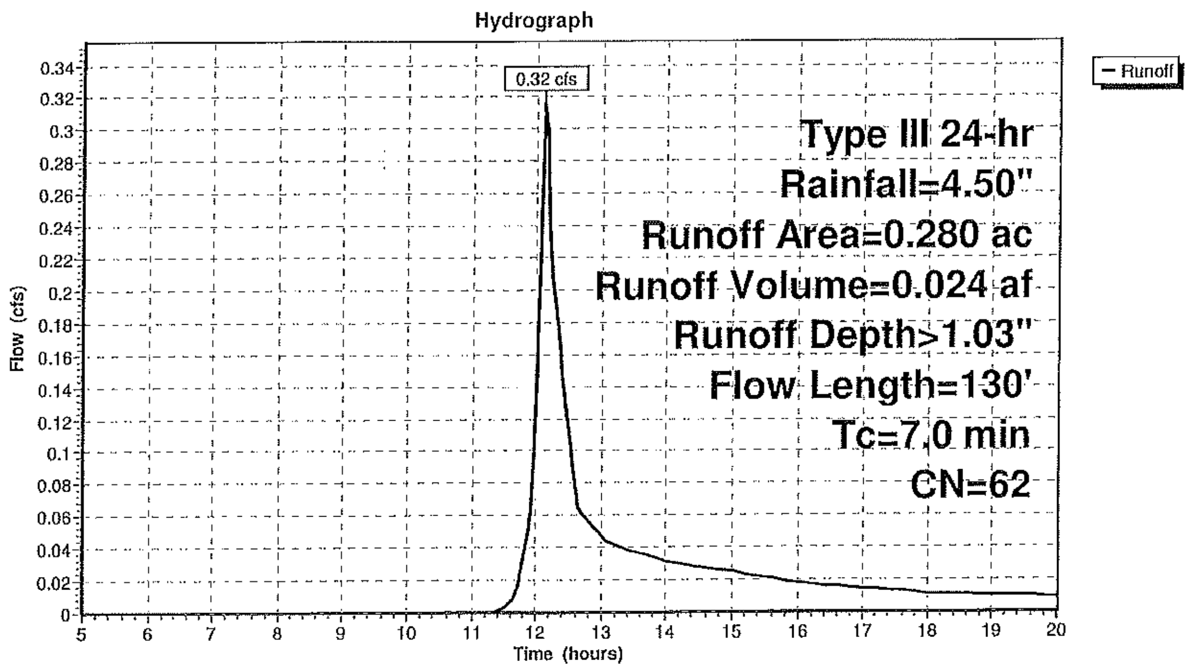
Runoff = 0.32 cfs @ 12.12 hrs, Volume= 0.024 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=4.50"

	Area (ac)	CN	Description
*	0.030	98	Paved driveway
	0.100	61	>75% Grass cover, Good, HSG B
	0.150	55	Woods, Good, HSG B
	0.280	62	Weighted Average
	0.250		89.29% Pervious Area
	0.030		10.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, Path 1** Grass: Short n= 0.150 P2= 3.10"
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, Path 2** Short Grass Pasture Kv= 7.0 fps
0.5	30	0.0333	0.91		**Shallow Concentrated Flow, Path 3** Woodland Kv= 5.0 fps
7.0	130	Total			

Subcatchment 3S: Overland runoff to road



Hydrograph for Subcatchment 3S: Overland runoff to road

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.32	0.00	0.00
6.25	0.34	0.00	0.00
6.50	0.36	0.00	0.00
6.75	0.38	0.00	0.00
7.00	0.41	0.00	0.00
7.25	0.43	0.00	0.00
7.50	0.46	0.00	0.00
7.75	0.48	0.00	0.00
8.00	0.51	0.00	0.00
8.25	0.54	0.00	0.00
8.50	0.58	0.00	0.00
8.75	0.62	0.00	0.00
9.00	0.66	0.00	0.00
9.25	0.70	0.00	0.00
9.50	0.75	0.00	0.00
9.75	0.80	0.00	0.00
10.00	0.85	0.00	0.00
10.25	0.91	0.00	0.00
10.50	0.97	0.00	0.00
10.75	1.05	0.00	0.00
11.00	1.13	0.00	0.00
11.25	1.22	0.00	0.00
11.50	1.34	0.00	0.00
11.75	1.60	0.02	0.02
12.00	2.25	0.15	**0.14**
12.25	2.90	0.36	**0.21**
12.50	3.16	0.46	0.11
12.75	3.28	0.52	0.06
13.00	3.37	0.56	0.05
13.25	3.45	0.59	0.04
13.50	3.53	0.63	0.04
13.75	3.59	0.66	0.03
14.00	3.65	0.69	0.03
14.25	3.70	0.71	0.03
14.50	3.75	0.74	0.03
14.75	3.80	0.76	0.03
15.00	3.84	0.78	0.02
15.25	3.88	0.80	0.02
15.50	3.92	0.82	0.02
15.75	3.96	0.84	0.02
16.00	3.99	0.86	0.02
16.25	4.02	0.87	0.02
16.50	4.04	0.89	0.02
16.75	4.07	0.90	0.02
17.00	4.09	0.91	0.01
17.25	4.12	0.93	0.01
17.50	4.14	0.94	0.01
17.75	4.16	0.95	0.01
18.00	4.18	0.96	0.01
18.25	4.19	0.97	0.01
18.50	4.21	0.98	0.01
18.75	4.23	0.99	0.01
19.00	4.24	1.00	0.01
19.25	4.26	1.01	0.01
19.50	4.28	1.01	0.01
19.75	4.29	1.02	0.01
20.00	**4.31**	**1.03**	0.01

Summary for Pond 4P: Pond - on site

Inflow Area = 7.140 ac, 14.01% Impervious, Inflow Depth > 0.28"
Inflow = 0.83 cfs @ 12.51 hrs, Volume= 0.164 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

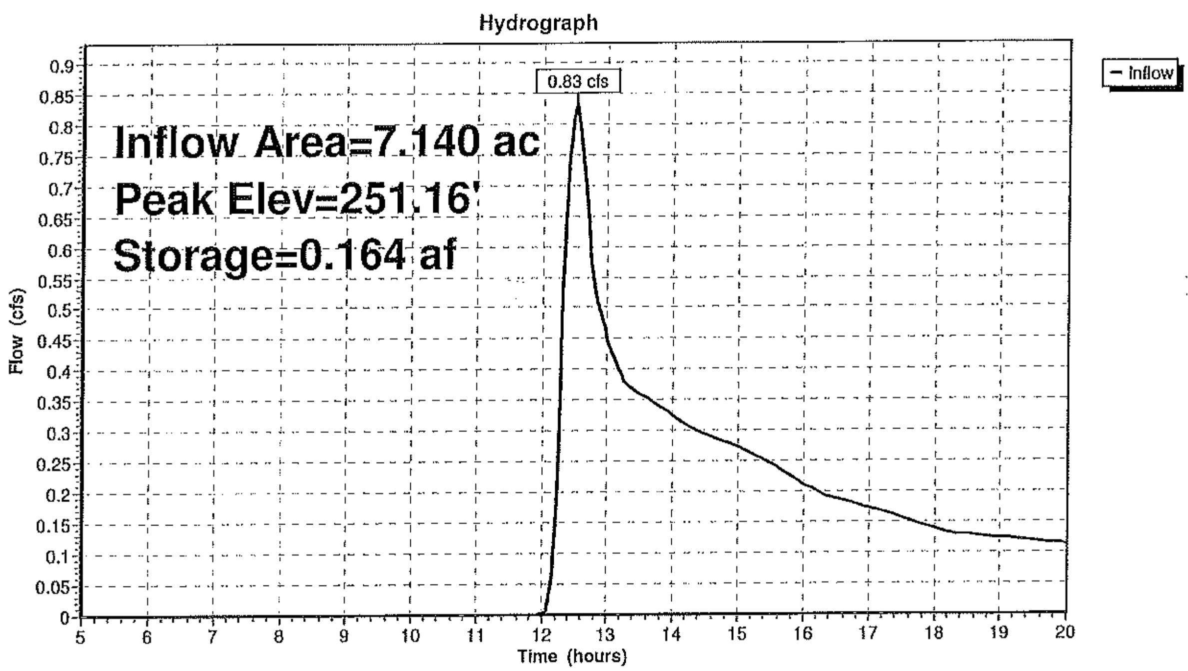
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 251.16' @ 20.00 hrs Surf.Area= 1.030 ac Storage= 0.164 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

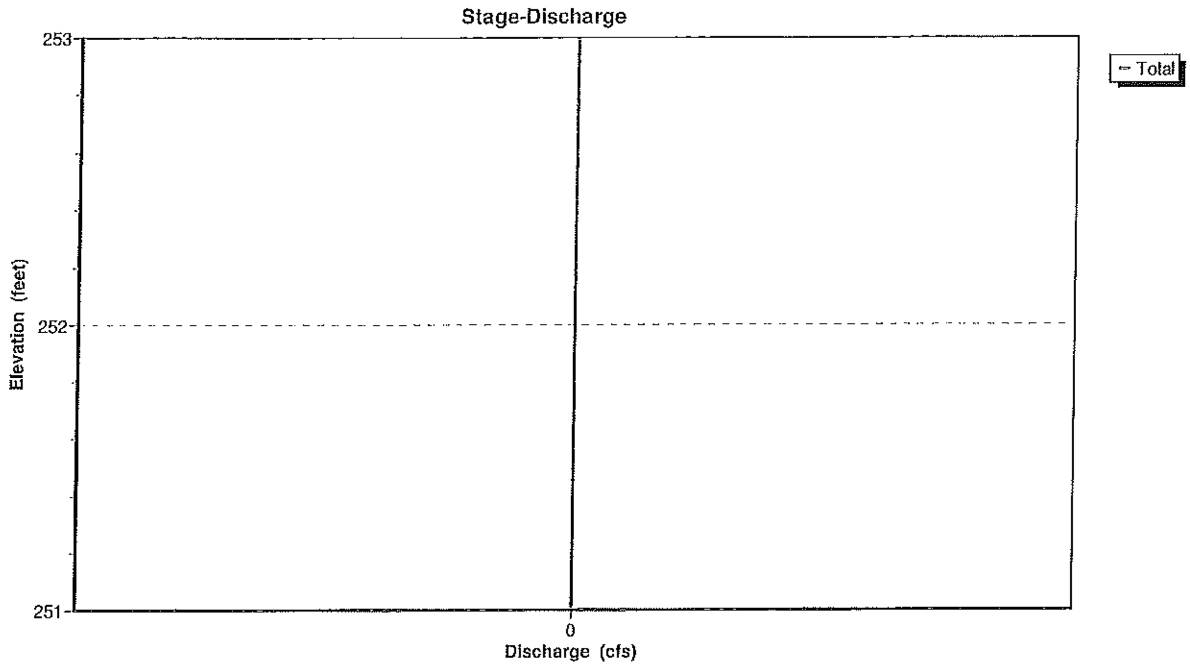
Volume	Invert	Avail.Storage	Storage Description
#1	251.00'	2.160 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
251.00	1.020	0.000	0.000
252.00	1.080	1.050	1.050
253.00	1.140	1.110	2.160

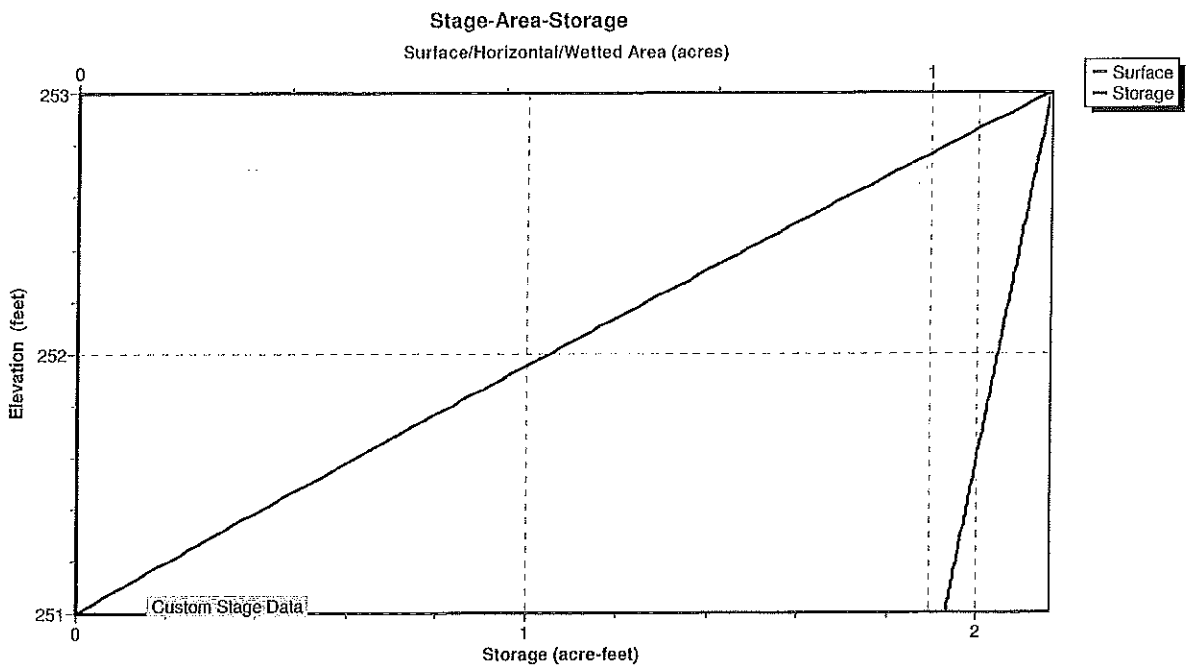
Pond 4P: Pond - on site



Pond 4P: Pond - on site



Pond 4P: Pond - on site



Hydrograph for Pond 4P: Pond - on site

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)
5.00	0.00	0.000	251.00
5.25	0.00	0.000	251.00
5.50	0.00	0.000	251.00
5.75	0.00	0.000	251.00
6.00	0.00	0.000	251.00
6.25	0.00	0.000	251.00
6.50	0.00	0.000	251.00
6.75	0.00	0.000	251.00
7.00	0.00	0.000	251.00
7.25	0.00	0.000	251.00
7.50	0.00	0.000	251.00
7.75	0.00	0.000	251.00
8.00	0.00	0.000	251.00
8.25	0.00	0.000	251.00
8.50	0.00	0.000	251.00
8.75	0.00	0.000	251.00
9.00	0.00	0.000	251.00
9.25	0.00	0.000	251.00
9.50	0.00	0.000	251.00
9.75	0.00	0.000	251.00
10.00	0.00	0.000	251.00
10.25	0.00	0.000	251.00
10.50	0.00	0.000	251.00
10.75	0.00	0.000	251.00
11.00	0.00	0.000	251.00
11.25	0.00	0.000	251.00
11.50	0.00	0.000	251.00
11.75	0.00	0.000	251.00
12.00	0.00	0.000	251.00
12.25	0.33	0.002	251.00
12.50	**0.83**	0.015	251.01
12.75	0.58	0.030	251.03
13.00	0.45	0.040	251.04
13.25	0.38	0.049	251.05
13.50	0.36	0.056	251.06
13.75	0.34	0.064	251.06
14.00	0.32	0.071	251.07
14.25	0.30	0.077	251.08
14.50	0.29	0.083	251.08
14.75	0.28	0.089	251.09
15.00	0.27	0.095	251.09
15.25	0.26	0.101	251.10
15.50	0.24	0.106	251.10
15.75	0.23	0.111	251.11
16.00	0.21	0.115	251.11
16.25	0.20	0.119	251.12
16.50	0.19	0.123	251.12
16.75	0.18	0.127	251.12
17.00	0.17	0.131	251.13
17.25	0.16	0.134	251.13
17.50	0.16	0.138	251.13
17.75	0.15	0.141	251.14
18.00	0.14	0.144	251.14
18.25	0.13	0.147	251.14
18.50	0.13	0.149	251.15
18.75	0.13	0.152	251.15
19.00	0.12	0.154	251.15
19.25	0.12	0.157	251.15
19.50	0.12	0.159	251.16
19.75	0.12	0.162	251.16
20.00	0.11	**0.164**	**251.16**

Stage-Discharge for Pond 4P: Pond - on site

Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)
251.00	0.00	251.53	0.00	252.06	0.00	252.59	0.00
251.01	0.00	251.54	0.00	252.07	0.00	252.60	0.00
251.02	0.00	251.55	0.00	252.08	0.00	252.61	0.00
251.03	0.00	251.56	0.00	252.09	0.00	252.62	0.00
251.04	0.00	251.57	0.00	252.10	0.00	252.63	0.00
251.05	0.00	251.58	0.00	252.11	0.00	252.64	0.00
251.06	0.00	251.59	0.00	252.12	0.00	252.65	0.00
251.07	0.00	251.60	0.00	252.13	0.00	252.66	0.00
251.08	0.00	251.61	0.00	252.14	0.00	252.67	0.00
251.09	0.00	251.62	0.00	252.15	0.00	252.68	0.00
251.10	0.00	251.63	0.00	252.16	0.00	252.69	0.00
251.11	0.00	251.64	0.00	252.17	0.00	252.70	0.00
251.12	0.00	251.65	0.00	252.18	0.00	252.71	0.00
251.13	0.00	251.66	0.00	252.19	0.00	252.72	0.00
251.14	0.00	251.67	0.00	252.20	0.00	252.73	0.00
251.15	0.00	251.68	0.00	252.21	0.00	252.74	0.00
251.16	0.00	251.69	0.00	252.22	0.00	252.75	0.00
251.17	0.00	251.70	0.00	252.23	0.00	252.76	0.00
251.18	0.00	251.71	0.00	252.24	0.00	252.77	0.00
251.19	0.00	251.72	0.00	252.25	0.00	252.78	0.00
251.20	0.00	251.73	0.00	252.26	0.00	252.79	0.00
251.21	0.00	251.74	0.00	252.27	0.00	252.80	0.00
251.22	0.00	251.75	0.00	252.28	0.00	252.81	0.00
251.23	0.00	251.76	0.00	252.29	0.00	252.82	0.00
251.24	0.00	251.77	0.00	252.30	0.00	252.83	0.00
251.25	0.00	251.78	0.00	252.31	0.00	252.84	0.00
251.26	0.00	251.79	0.00	252.32	0.00	252.85	0.00
251.27	0.00	251.80	0.00	252.33	0.00	252.86	0.00
251.28	0.00	251.81	0.00	252.34	0.00	252.87	0.00
251.29	0.00	251.82	0.00	252.35	0.00	252.88	0.00
251.30	0.00	251.83	0.00	252.36	0.00	252.89	0.00
251.31	0.00	251.84	0.00	252.37	0.00	252.90	0.00
251.32	0.00	251.85	0.00	252.38	0.00	252.91	0.00
251.33	0.00	251.86	0.00	252.39	0.00	252.92	0.00
251.34	0.00	251.87	0.00	252.40	0.00	252.93	0.00
251.35	0.00	251.88	0.00	252.41	0.00	252.94	0.00
251.36	0.00	251.89	0.00	252.42	0.00	252.95	0.00
251.37	0.00	251.90	0.00	252.43	0.00	252.96	0.00
251.38	0.00	251.91	0.00	252.44	0.00	252.97	0.00
251.39	0.00	251.92	0.00	252.45	0.00	252.98	0.00
251.40	0.00	251.93	0.00	252.46	0.00	252.99	0.00
251.41	0.00	251.94	0.00	252.47	0.00	253.00	0.00
251.42	0.00	251.95	0.00	252.48	0.00		
251.43	0.00	251.96	0.00	252.49	0.00		
251.44	0.00	251.97	0.00	252.50	0.00		
251.45	0.00	251.98	0.00	252.51	0.00		
251.46	0.00	251.99	0.00	252.52	0.00		
251.47	0.00	252.00	0.00	252.53	0.00		
251.48	0.00	252.01	0.00	252.54	0.00		
251.49	0.00	252.02	0.00	252.55	0.00		
251.50	0.00	252.03	0.00	252.56	0.00		
251.51	0.00	252.04	0.00	252.57	0.00		
251.52	0.00	252.05	0.00	252.58	0.00		

Stage-Area-Storage for Pond 4P: Pond - on site

Elevation (feet)	Surface (acres)	Storage (acre-feet)
251.00	1.020	0.000
251.02	1.021	0.020
251.04	1.022	0.041
251.06	1.024	0.061
251.08	1.025	0.082
251.10	1.026	0.102
251.12	1.027	0.123
251.14	1.028	0.143
251.16	1.030	0.164
251.18	1.031	0.185
251.20	1.032	0.205
251.22	1.033	0.226
251.24	1.034	0.247
251.26	1.036	0.267
251.28	1.037	0.288
251.30	1.038	0.309
251.32	1.039	0.329
251.34	1.040	0.350
251.36	1.042	0.371
251.38	1.043	0.392
251.40	1.044	0.413
251.42	1.045	0.434
251.44	1.046	0.455
251.46	1.048	0.476
251.48	1.049	0.497
251.50	1.050	0.517
251.52	1.051	0.539
251.54	1.052	0.560
251.56	1.054	0.581
251.58	1.055	0.602
251.60	1.056	0.623
251.62	1.057	0.644
251.64	1.058	0.665
251.66	1.060	0.686
251.68	1.061	0.707
251.70	1.062	0.729
251.72	1.063	0.750
251.74	1.064	0.771
251.76	1.066	0.793
251.78	1.067	0.814
251.80	1.068	0.835
251.82	1.069	0.857
251.84	1.070	0.878
251.86	1.072	0.899
251.88	1.073	0.921
251.90	1.074	0.942
251.92	1.075	0.964
251.94	1.076	0.985
251.96	1.078	1.007
251.98	1.079	1.028
252.00	1.080	1.050
252.02	1.081	1.072
252.04	1.082	1.093
252.06	1.084	1.115
252.08	1.085	1.137
252.10	1.086	1.158
252.12	1.087	1.180
252.14	1.088	1.202
252.16	1.090	1.224
252.18	1.091	1.245
252.20	1.092	1.267
252.22	1.093	1.289
252.24	1.094	1.311
252.26	1.096	1.333
252.28	1.097	1.355
252.30	1.098	1.377
252.32	1.099	1.399
252.34	1.100	1.421
252.36	1.102	1.443
252.38	1.103	1.465
252.40	1.104	1.487
252.42	1.105	1.509
252.44	1.106	1.531
252.46	1.108	1.553
252.48	1.109	1.575
252.50	1.110	1.598
252.52	1.111	1.620
252.54	1.112	1.642
252.56	1.114	1.664
252.58	1.115	1.686
252.60	1.116	1.709
252.62	1.117	1.731
252.64	1.118	1.753
252.66	1.120	1.776
252.68	1.121	1.798
252.70	1.122	1.821
252.72	1.123	1.843
252.74	1.124	1.866
252.76	1.126	1.888
252.78	1.127	1.911
252.80	1.128	1.933
252.82	1.129	1.956
252.84	1.130	1.978
252.86	1.132	2.001
252.88	1.133	2.024
252.90	1.134	2.046
252.92	1.135	2.069
252.94	1.136	2.092
252.96	1.138	2.114
252.98	1.139	2.137
253.00	**1.140**	**2.160**

EXISTING CONDITIONS

100 YEAR STORM

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Overland runoff to Pond Runoff Area=7.140 ac 14.01% Impervious Runoff Depth>0.95"
Flow Length=290' Tc=16.5 min CN=46 Runoff=4.77 cfs 0.566 af

Subcatchment 2S: Overland runoff to northerly Runoff Area=2.700 ac 10.74% Impervious Runoff Depth>2.59"
Flow Length=438' Tc=16.8 min CN=66 Runoff=6.32 cfs 0.583 af

Subcatchment 3S: Overland runoff to road Runoff Area=0.280 ac 10.71% Impervious Runoff Depth>2.24"
Flow Length=130' Tc=7.0 min CN=62 Runoff=0.74 cfs 0.052 af

Pond 4P: Pond - on site Peak Elev=251.55' Storage=0.566 af Inflow=4.77 cfs 0.566 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 10.120 ac Runoff Volume = 1.201 af Average Runoff Depth = 1.42"
86.96% Pervious = 8.800 ac 13.04% Impervious = 1.320 ac

Summary for Subcatchment 1S: Overland runoff to Pond

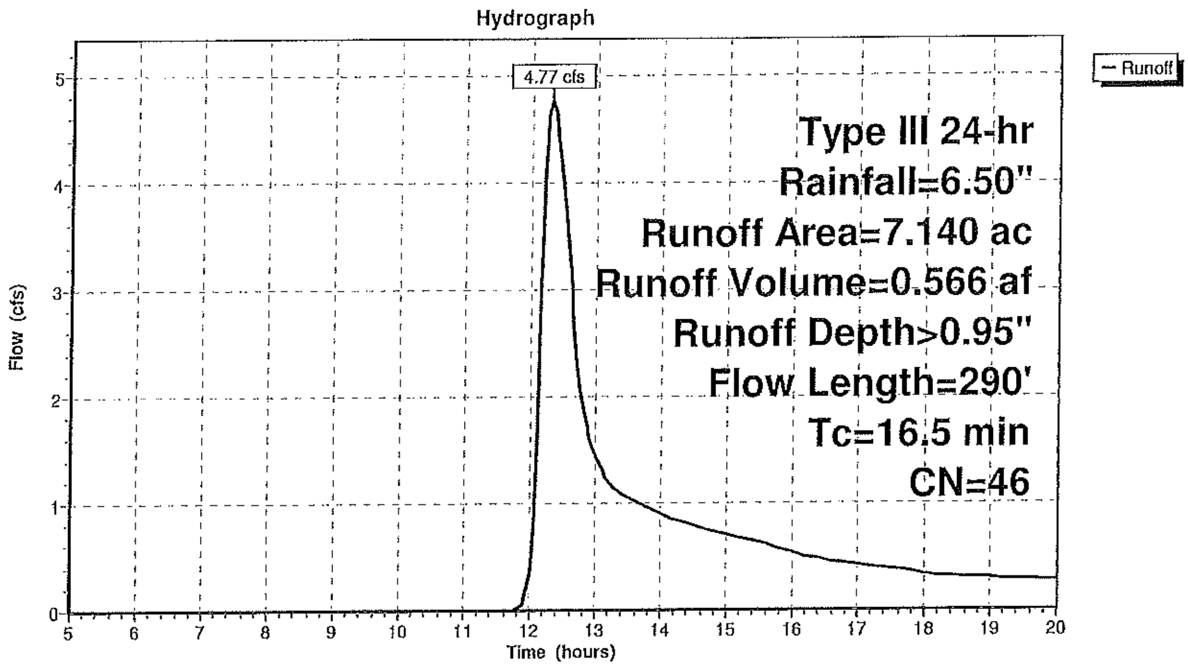
Runoff = 4.77 cfs @ 12.30 hrs, Volume= 0.566 af, Depth> 0.95"
Routed to Pond 4P : Pond - on site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.50"

	Area (ac)	CN	Description
*	1.000	98	Water Surface
	0.020	61	>75% Grass cover, Good, HSG B
	0.100	89	Gravel roads, HSG C
	0.690	70	Woods, Good, HSG C
	0.480	55	Woods, Good, HSG B
	4.850	30	Woods, Good, HSG A
	7.140	46	Weighted Average
	6.140		85.99% Pervious Area
	1.000		14.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	50	0.0200	0.07		**Sheet Flow, Path 1** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	50	0.0200	0.71		**Shallow Concentrated Flow, Path 2** Woodland Kv= 5.0 fps
2.8	190	0.0526	1.15		**Shallow Concentrated Flow, Path 3** Woodland Kv= 5.0 fps
16.5	290	Total			

Subcatchment 1S: Overland runoff to Pond



Hydrograph for Subcatchment 1S: Overland runoff to Pond

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.37	0.00	0.00
5.25	0.39	0.00	0.00
5.50	0.42	0.00	0.00
5.75	0.44	0.00	0.00
6.00	0.47	0.00	0.00
6.25	0.50	0.00	0.00
6.50	0.52	0.00	0.00
6.75	0.56	0.00	0.00
7.00	0.59	0.00	0.00
7.25	0.62	0.00	0.00
7.50	0.66	0.00	0.00
7.75	0.70	0.00	0.00
8.00	0.74	0.00	0.00
8.25	0.79	0.00	0.00
8.50	0.83	0.00	0.00
8.75	0.89	0.00	0.00
9.00	0.95	0.00	0.00
9.25	1.01	0.00	0.00
9.50	1.08	0.00	0.00
9.75	1.15	0.00	0.00
10.00	1.23	0.00	0.00
10.25	1.31	0.00	0.00
10.50	1.41	0.00	0.00
10.75	1.51	0.00	0.00
11.00	1.62	0.00	0.00
11.25	1.76	0.00	0.00
11.50	1.94	0.00	0.00
11.75	2.31	0.00	0.00
12.00	3.25	0.06	0.34
12.25	4.19	0.25	**4.63**
12.50	4.56	0.35	**3.88**
12.75	4.74	0.40	2.07
13.00	4.87	0.45	1.43
13.25	4.99	0.49	1.15
13.50	5.09	0.52	1.05
13.75	5.19	0.55	0.98
14.00	5.27	0.58	0.91
14.25	5.35	0.61	0.83
14.50	5.42	0.64	0.79
14.75	5.49	0.66	0.75
15.00	5.55	0.69	0.71
15.25	5.61	0.71	0.67
15.50	5.67	0.73	0.63
15.75	5.71	0.75	0.58
16.00	5.76	0.77	0.54
16.25	5.80	0.78	0.49
16.50	5.84	0.80	0.47
16.75	5.88	0.82	0.45
17.00	5.91	0.83	0.43
17.25	5.94	0.84	0.40
17.50	5.98	0.86	0.38
17.75	6.00	0.87	0.36
18.00	6.03	0.88	0.34
18.25	6.06	0.89	0.32
18.50	6.08	0.90	0.31
18.75	6.11	0.91	0.30
19.00	6.13	0.92	0.30
19.25	6.15	0.93	0.29
19.50	6.18	0.94	0.28
19.75	6.20	0.95	0.28
20.00	**6.22**	**0.96**	0.27

Summary for Subcatchment 2S: Overland runoff to northerly low area

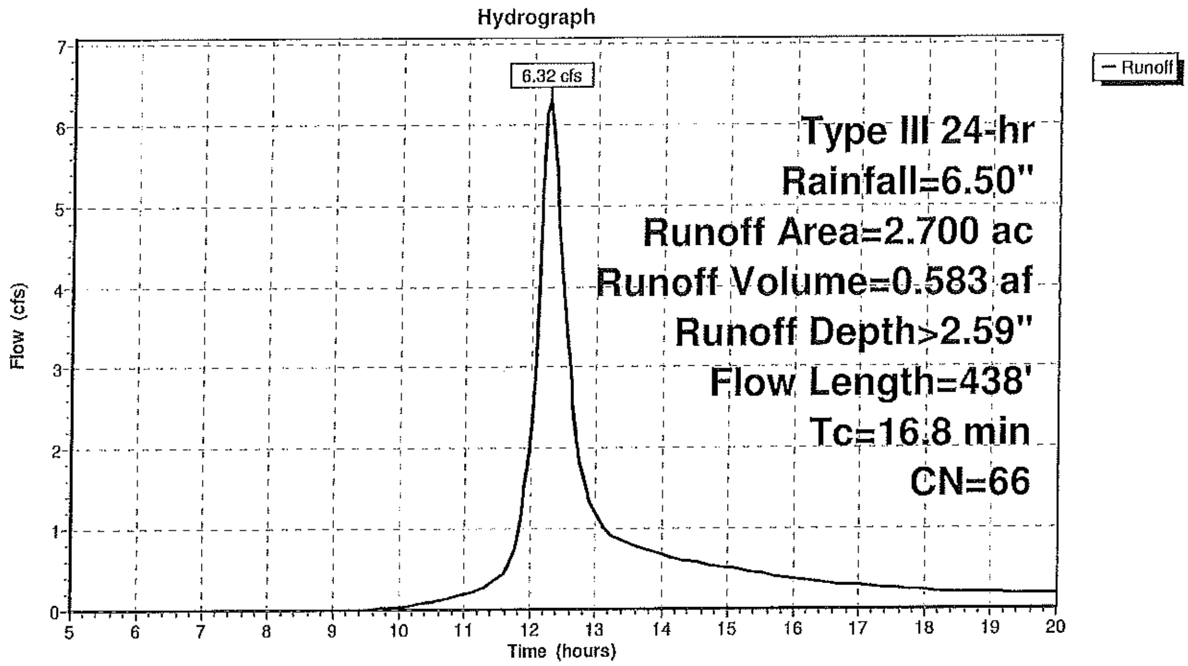
Runoff = 6.32 cfs @ 12.24 hrs, Volume= 0.583 af, Depth> 2.59"
Routed to nonexistent node 5P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.50"

	Area (ac)	CN	Description
*	0.230	98	Paved Driveway
	0.060	98	Roofs, HSG B
	0.280	85	Gravel roads, HSG B
	0.020	74	>75% Grass cover, Good, HSG C
	0.580	61	>75% Grass cover, Good, HSG B
	0.350	70	Woods, Good, HSG C
	1.180	55	Woods, Good, HSG B
	2.700	66	Weighted Average
	2.410		89.26% Pervious Area
	0.290		10.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0300	0.08		**Sheet Flow, Path 1** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	50	0.0500	4.54		**Shallow Concentrated Flow, Path 2** Paved Kv= 20.3 fps
1.8	168	0.0506	1.57		**Shallow Concentrated Flow, Path 3** Short Grass Pasture Kv= 7.0 fps
1.4	70	0.0143	0.84		**Shallow Concentrated Flow, Path 4** Short Grass Pasture Kv= 7.0 fps
2.7	100	0.0150	0.61		**Shallow Concentrated Flow, Path 5** Woodland Kv= 5.0 fps
16.8	438	Total			

Subcatchment 2S: Overland runoff to northerly low area



Hydrograph for Subcatchment 2S: Overland runoff to northerly low area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.37	0.00	0.00
5.25	0.39	0.00	0.00
5.50	0.42	0.00	0.00
5.75	0.44	0.00	0.00
6.00	0.47	0.00	0.00
6.25	0.50	0.00	0.00
6.50	0.52	0.00	0.00
6.75	0.56	0.00	0.00
7.00	0.59	0.00	0.00
7.25	0.62	0.00	0.00
7.50	0.66	0.00	0.00
7.75	0.70	0.00	0.00
8.00	0.74	0.00	0.00
8.25	0.79	0.00	0.00
8.50	0.83	0.00	0.00
8.75	0.89	0.00	0.00
9.00	0.95	0.00	0.00
9.25	1.01	0.00	0.00
9.50	1.08	0.00	0.00
9.75	1.15	0.00	0.01
10.00	1.23	0.01	0.04
10.25	1.31	0.01	0.06
10.50	1.41	0.03	0.10
10.75	1.51	0.04	0.14
11.00	1.62	0.06	0.19
11.25	1.76	0.09	0.26
11.50	1.94	0.14	0.40
11.75	2.31	0.25	0.77
12.00	3.25	0.67	2.28
12.25	4.19	1.20	**6.32**
12.50	4.56	1.44	3.86
12.75	4.74	1.55	1.83
13.00	4.87	1.64	1.18
13.25	4.99	1.72	0.91
13.50	5.09	1.79	0.81
13.75	5.19	1.86	0.74
14.00	5.27	1.92	0.68
14.25	5.35	1.97	0.62
14.50	5.42	2.02	0.58
14.75	5.49	2.07	0.54
15.00	5.55	2.11	0.51
15.25	5.61	2.16	0.48
15.50	5.67	2.20	0.44
15.75	5.71	2.23	0.41
16.00	5.76	2.26	0.37
16.25	5.80	2.29	0.34
16.50	5.84	2.32	0.32
16.75	5.88	2.35	0.31
17.00	5.91	2.38	0.29
17.25	5.94	2.40	0.27
17.50	5.98	2.42	0.26
17.75	6.00	2.44	0.24
18.00	6.03	2.46	0.23
18.25	6.06	2.48	0.21
18.50	6.08	2.50	0.21
18.75	6.11	2.52	0.20
19.00	6.13	2.54	0.20
19.25	6.15	2.56	0.19
19.50	6.18	2.57	0.19
19.75	6.20	2.59	0.18
20.00	**6.22**	**2.60**	0.18

Summary for Subcatchment 3S: Overland runoff to road

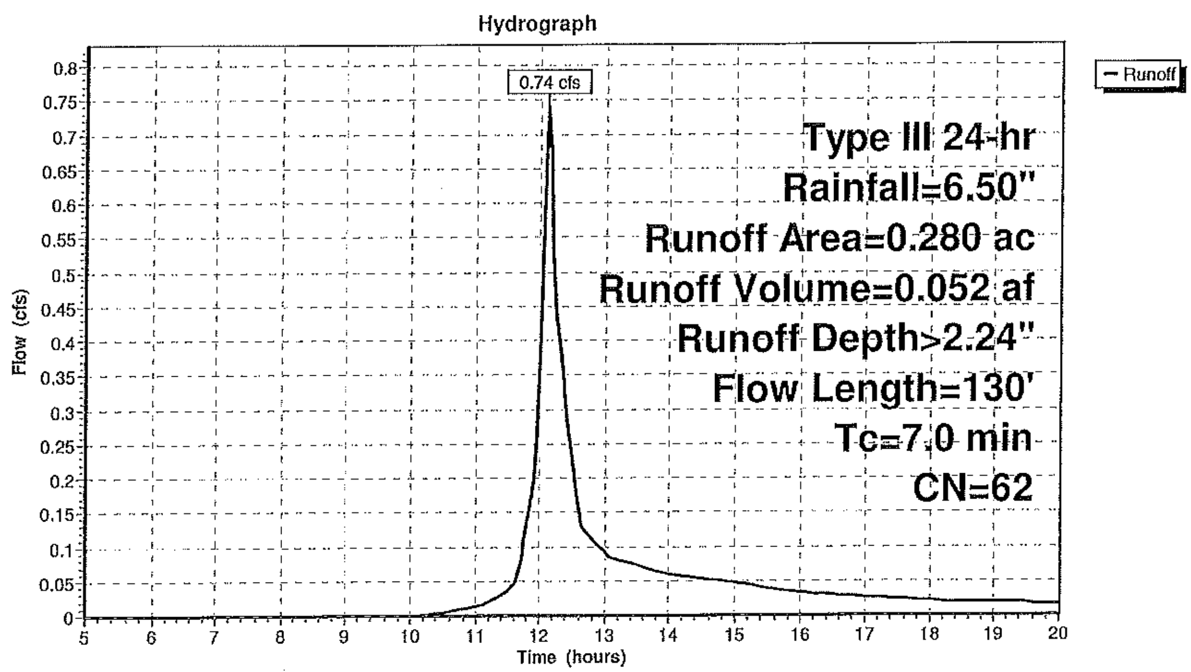
Runoff = 0.74 cfs @ 12.11 hrs, Volume= 0.052 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.50"

	Area (ac)	CN	Description
*	0.030	98	Paved driveway
	0.100	61	>75% Grass cover, Good, HSG B
	0.150	55	Woods, Good, HSG B
	0.280	62	Weighted Average
	0.250		89.29% Pervious Area
	0.030		10.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, Path 1** Grass: Short n= 0.150 P2= 3.10"
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, Path 2** Short Grass Pasture Kv= 7.0 fps
0.5	30	0.0333	0.91		**Shallow Concentrated Flow, Path 3** Woodland Kv= 5.0 fps
7.0	130	Total			

Subcatchment 3S: Overland runoff to road



Hydrograph for Subcatchment 3S: Overland runoff to road

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.37	0.00	0.00
5.25	0.39	0.00	0.00
5.50	0.42	0.00	0.00
5.75	0.44	0.00	0.00
6.00	0.47	0.00	0.00
6.25	0.50	0.00	0.00
6.50	0.52	0.00	0.00
6.75	0.56	0.00	0.00
7.00	0.59	0.00	0.00
7.25	0.62	0.00	0.00
7.50	0.66	0.00	0.00
7.75	0.70	0.00	0.00
8.00	0.74	0.00	0.00
8.25	0.79	0.00	0.00
8.50	0.83	0.00	0.00
8.75	0.89	0.00	0.00
9.00	0.95	0.00	0.00
9.25	1.01	0.00	0.00
9.50	1.08	0.00	0.00
9.75	1.15	0.00	0.00
10.00	1.23	0.00	0.00
10.25	1.31	0.00	0.00
10.50	1.41	0.01	0.00
10.75	1.51	0.01	0.01
11.00	1.62	0.02	0.01
11.25	1.76	0.04	0.02
11.50	1.94	0.07	0.04
11.75	2.31	0.16	0.11
12.00	3.25	0.50	**0.37**
12.25	4.19	0.97	**0.44**
12.50	4.56	1.18	0.22
12.75	4.74	1.28	0.12
13.00	4.87	1.36	0.09
13.25	4.99	1.43	0.08
13.50	5.09	1.50	0.07
13.75	5.19	1.56	0.07
14.00	5.27	1.61	0.06
14.25	5.35	1.66	0.06
14.50	5.42	1.70	0.05
14.75	5.49	1.75	0.05
15.00	5.55	1.79	0.05
15.25	5.61	1.83	0.04
15.50	5.67	1.86	0.04
15.75	5.71	1.90	0.04
16.00	5.76	1.93	0.03
16.25	5.80	1.96	0.03
16.50	5.84	1.98	0.03
16.75	5.88	2.01	0.03
17.00	5.91	2.03	0.03
17.25	5.94	2.05	0.03
17.50	5.98	2.07	0.02
17.75	6.00	2.09	0.02
18.00	6.03	2.11	0.02
18.25	6.06	2.13	0.02
18.50	6.08	2.15	0.02
18.75	6.11	2.16	0.02
19.00	6.13	2.18	0.02
19.25	6.15	2.20	0.02
19.50	6.18	2.21	0.02
19.75	6.20	2.23	0.02
20.00	**6.22**	**2.24**	0.02

Summary for Pond 4P: Pond - on site

Inflow Area = 7.140 ac, 14.01% Impervious, Inflow Depth > 0.95"
Inflow = 4.77 cfs @ 12.30 hrs, Volume= 0.566 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

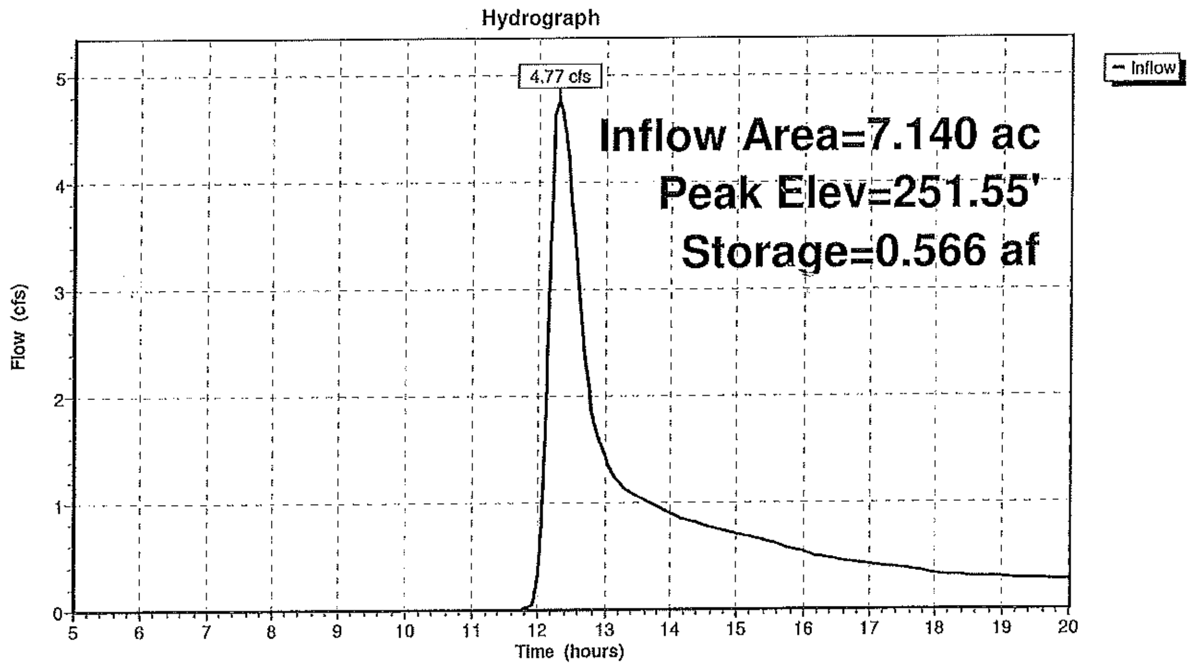
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 251.55' @ 20.00 hrs Surf.Area= 1.053 ac Storage= 0.566 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

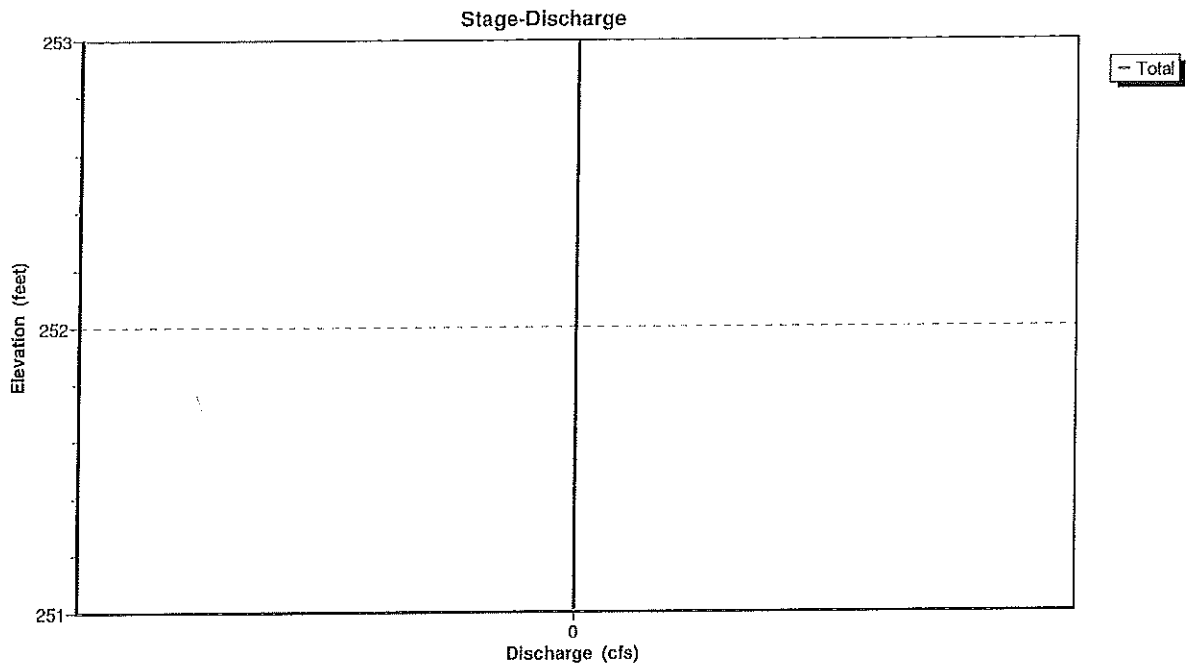
Volume	Invert	Avail.Storage	Storage Description
#1	251.00'	2.160 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
251.00	1.020	0.000	0.000
252.00	1.080	1.050	1.050
253.00	1.140	1.110	2.160

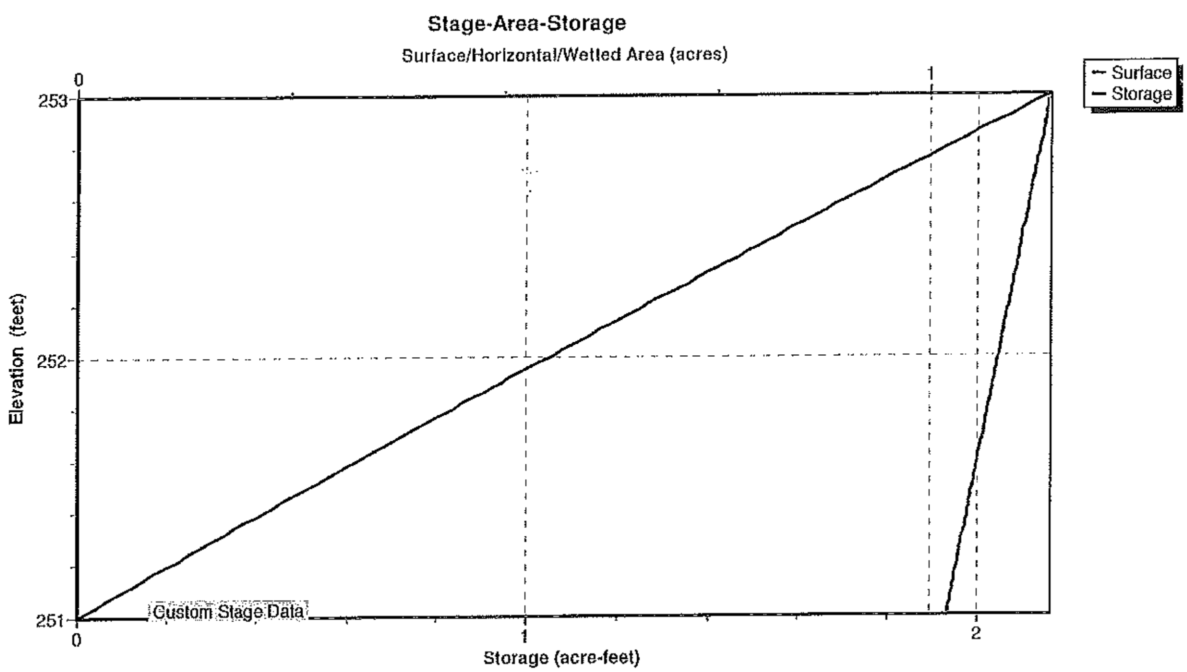
Pond 4P: Pond - on site



Pond 4P: Pond - on site



Pond 4P: Pond - on site



Hydrograph for Pond 4P: Pond - on site

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)
5.00	0.00	0.000	251.00
5.25	0.00	0.000	251.00
5.50	0.00	0.000	251.00
5.75	0.00	0.000	251.00
6.00	0.00	0.000	251.00
6.25	0.00	0.000	251.00
6.50	0.00	0.000	251.00
6.75	0.00	0.000	251.00
7.00	0.00	0.000	251.00
7.25	0.00	0.000	251.00
7.50	0.00	0.000	251.00
7.75	0.00	0.000	251.00
8.00	0.00	0.000	251.00
8.25	0.00	0.000	251.00
8.50	0.00	0.000	251.00
8.75	0.00	0.000	251.00
9.00	0.00	0.000	251.00
9.25	0.00	0.000	251.00
9.50	0.00	0.000	251.00
9.75	0.00	0.000	251.00
10.00	0.00	0.000	251.00
10.25	0.00	0.000	251.00
10.50	0.00	0.000	251.00
10.75	0.00	0.000	251.00
11.00	0.00	0.000	251.00
11.25	0.00	0.000	251.00
11.50	0.00	0.000	251.00
11.75	0.00	0.000	251.00
12.00	0.34	0.001	251.00
12.25	**4.63**	0.051	251.05
12.50	**3.88**	0.143	251.14
12.75	2.07	0.204	251.20
13.00	1.43	0.239	251.23
13.25	1.15	0.265	251.26
13.50	1.05	0.288	251.28
13.75	0.98	0.309	251.30
14.00	0.91	0.328	251.32
14.25	0.83	0.346	251.34
14.50	0.79	0.363	251.35
14.75	0.75	0.379	251.37
15.00	0.71	0.394	251.38
15.25	0.67	0.409	251.40
15.50	0.63	0.422	251.41
15.75	0.58	0.435	251.42
16.00	0.54	0.446	251.43
16.25	0.49	0.457	251.44
16.50	0.47	0.467	251.45
16.75	0.45	0.476	251.46
17.00	0.43	0.485	251.47
17.25	0.40	0.494	251.48
17.50	0.38	0.502	251.49
17.75	0.36	0.509	251.49
18.00	0.34	0.517	251.50
18.25	0.32	0.523	251.51
18.50	0.31	0.530	251.51
18.75	0.30	0.536	251.52
19.00	0.30	0.542	251.52
19.25	0.29	0.549	251.53
19.50	0.28	0.554	251.54
19.75	0.28	0.560	251.54
20.00	0.27	**0.566**	**251.55**

Stage-Discharge for Pond 4P: Pond - on site

Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)
251.00	0.00	251.53	0.00	252.06	0.00	252.59	0.00
251.01	0.00	251.54	0.00	252.07	0.00	252.60	0.00
251.02	0.00	251.55	0.00	252.08	0.00	252.61	0.00
251.03	0.00	251.56	0.00	252.09	0.00	252.62	0.00
251.04	0.00	251.57	0.00	252.10	0.00	252.63	0.00
251.05	0.00	251.58	0.00	252.11	0.00	252.64	0.00
251.06	0.00	251.59	0.00	252.12	0.00	252.65	0.00
251.07	0.00	251.60	0.00	252.13	0.00	252.66	0.00
251.08	0.00	251.61	0.00	252.14	0.00	252.67	0.00
251.09	0.00	251.62	0.00	252.15	0.00	252.68	0.00
251.10	0.00	251.63	0.00	252.16	0.00	252.69	0.00
251.11	0.00	251.64	0.00	252.17	0.00	252.70	0.00
251.12	0.00	251.65	0.00	252.18	0.00	252.71	0.00
251.13	0.00	251.66	0.00	252.19	0.00	252.72	0.00
251.14	0.00	251.67	0.00	252.20	0.00	252.73	0.00
251.15	0.00	251.68	0.00	252.21	0.00	252.74	0.00
251.16	0.00	251.69	0.00	252.22	0.00	252.75	0.00
251.17	0.00	251.70	0.00	252.23	0.00	252.76	0.00
251.18	0.00	251.71	0.00	252.24	0.00	252.77	0.00
251.19	0.00	251.72	0.00	252.25	0.00	252.78	0.00
251.20	0.00	251.73	0.00	252.26	0.00	252.79	0.00
251.21	0.00	251.74	0.00	252.27	0.00	252.80	0.00
251.22	0.00	251.75	0.00	252.28	0.00	252.81	0.00
251.23	0.00	251.76	0.00	252.29	0.00	252.82	0.00
251.24	0.00	251.77	0.00	252.30	0.00	252.83	0.00
251.25	0.00	251.78	0.00	252.31	0.00	252.84	0.00
251.26	0.00	251.79	0.00	252.32	0.00	252.85	0.00
251.27	0.00	251.80	0.00	252.33	0.00	252.86	0.00
251.28	0.00	251.81	0.00	252.34	0.00	252.87	0.00
251.29	0.00	251.82	0.00	252.35	0.00	252.88	0.00
251.30	0.00	251.83	0.00	252.36	0.00	252.89	0.00
251.31	0.00	251.84	0.00	252.37	0.00	252.90	0.00
251.32	0.00	251.85	0.00	252.38	0.00	252.91	0.00
251.33	0.00	251.86	0.00	252.39	0.00	252.92	0.00
251.34	0.00	251.87	0.00	252.40	0.00	252.93	0.00
251.35	0.00	251.88	0.00	252.41	0.00	252.94	0.00
251.36	0.00	251.89	0.00	252.42	0.00	252.95	0.00
251.37	0.00	251.90	0.00	252.43	0.00	252.96	0.00
251.38	0.00	251.91	0.00	252.44	0.00	252.97	0.00
251.39	0.00	251.92	0.00	252.45	0.00	252.98	0.00
251.40	0.00	251.93	0.00	252.46	0.00	252.99	0.00
251.41	0.00	251.94	0.00	252.47	0.00	253.00	0.00
251.42	0.00	251.95	0.00	252.48	0.00		
251.43	0.00	251.96	0.00	252.49	0.00		
251.44	0.00	251.97	0.00	252.50	0.00		
251.45	0.00	251.98	0.00	252.51	0.00		
251.46	0.00	251.99	0.00	252.52	0.00		
251.47	0.00	252.00	0.00	252.53	0.00		
251.48	0.00	252.01	0.00	252.54	0.00		
251.49	0.00	252.02	0.00	252.55	0.00		
251.50	0.00	252.03	0.00	252.56	0.00		
251.51	0.00	252.04	0.00	252.57	0.00		
251.52	0.00	252.05	0.00	252.58	0.00		

Stage-Area-Storage for Pond 4P: Pond - on site

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
251.00	1.020	0.000	252.06	1.084	1.115
251.02	1.021	0.020	252.08	1.085	1.137
251.04	1.022	0.041	252.10	1.086	1.158
251.06	1.024	0.061	252.12	1.087	1.180
251.08	1.025	0.082	252.14	1.088	1.202
251.10	1.026	0.102	252.16	1.090	1.224
251.12	1.027	0.123	252.18	1.091	1.245
251.14	1.028	0.143	252.20	1.092	1.267
251.16	1.030	0.164	252.22	1.093	1.289
251.18	1.031	0.185	252.24	1.094	1.311
251.20	1.032	0.205	252.26	1.096	1.333
251.22	1.033	0.226	252.28	1.097	1.355
251.24	1.034	0.247	252.30	1.098	1.377
251.26	1.036	0.267	252.32	1.099	1.399
251.28	1.037	0.288	252.34	1.100	1.421
251.30	1.038	0.309	252.36	1.102	1.443
251.32	1.039	0.329	252.38	1.103	1.465
251.34	1.040	0.350	252.40	1.104	1.487
251.36	1.042	0.371	252.42	1.105	1.509
251.38	1.043	0.392	252.44	1.106	1.531
251.40	1.044	0.413	252.46	1.108	1.553
251.42	1.045	0.434	252.48	1.109	1.575
251.44	1.046	0.455	252.50	1.110	1.598
251.46	1.048	0.476	252.52	1.111	1.620
251.48	1.049	0.497	252.54	1.112	1.642
251.50	1.050	0.517	252.56	1.114	1.664
251.52	1.051	0.539	252.58	1.115	1.686
251.54	1.052	0.560	252.60	1.116	1.709
251.56	1.054	0.581	252.62	1.117	1.731
251.58	1.055	0.602	252.64	1.118	1.753
251.60	1.056	0.623	252.66	1.120	1.776
251.62	1.057	0.644	252.68	1.121	1.798
251.64	1.058	0.665	252.70	1.122	1.821
251.66	1.060	0.686	252.72	1.123	1.843
251.68	1.061	0.707	252.74	1.124	1.866
251.70	1.062	0.729	252.76	1.126	1.888
251.72	1.063	0.750	252.78	1.127	1.911
251.74	1.064	0.771	252.80	1.128	1.933
251.76	1.066	0.793	252.82	1.129	1.956
251.78	1.067	0.814	252.84	1.130	1.978
251.80	1.068	0.835	252.86	1.132	2.001
251.82	1.069	0.857	252.88	1.133	2.024
251.84	1.070	0.878	252.90	1.134	2.046
251.86	1.072	0.899	252.92	1.135	2.069
251.88	1.073	0.921	252.94	1.136	2.092
251.90	1.074	0.942	252.96	1.138	2.114
251.92	1.075	0.964	252.98	1.139	2.137
251.94	1.076	0.985	253.00	**1.140**	**2.160**
251.96	1.078	1.007			
251.98	1.079	1.028			
252.00	1.080	1.050			
252.02	1.081	1.072			
252.04	1.082	1.093			