Schuyler Business Park

HERKIMER COUNTY, NEW YORK

Stormwater Analysis

Prepared By:

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LANDSCAPE ARCHITECTURE, PC

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SCHUYLER BUSINESS PARK STORMWATER ANALYSIS

INTRODUCTION

This report is written to determine the changes in storm water runoff from pre to post developed conditions for the development of 3 industrial / manufacturing parcel in the Town of Schuyler, Herkimer County NY. This document can be used in the development of Storm Water Pollution Prevention Plans the follow the guidelines set forth in New York State Dept. of Environmental Conservation SPDES General Permit for Storm Water Discharges from Construction Activities Phase II, Permit No. GP-0-20-002, Dated: January 2020.

I. PROJECT DESCRIPTION

A. BACKGROUND INFORMATION

This project consists of the subdivision and development of a 188Acre parcel located off Drive-In Rd in the Town of Schuyler. The NYS Thruway borders the property to the south. An existing Schuyler Business development borders the site to the West. A mix farm fields, forested land and wetlands border to the North and East.

SOILS (refer to the Soils map in Appendix I)

Soil survey report is attached. Soils present on the site are a mix of Herkimer gravelly silt loam, Howard gravelly silt loam and Palmyra mix soils. These are generally moderately well drained soils suitable for storm water detention. The depth to ground water is approximately 24” to 72”. In areas where infiltration practices are proposed additional testing will be required to verify water table depth. Other soils present are Fredon soils which are in areas where wetlands may be present. Development in these areas will require further investigation for permitting with USACE.

II. EXISTING (PRE-DEVELOPED) CONDITIONS

Presently the property is an agricultural field with wooded areas on the North West and South East portions. According to the survey this property is generally flat with an average 2% slope across the property from East to West. Current storm water runoff is generally low because of the gentle slopes and dense coverage. See Calculations in Appendix II

III. PROPOSED CONDITIONS

The property will be divided into three parcels. One is 26Ac. with a 200,000sf building the second is 60Ac. with a 500,000 sf building and the third is 94ac with a 1,000,000 sf building. Total increase in impervious on the entire property which includes buildings and paving is approximately 66 Ac. Increase in impervious coverage over a site generates a large increase in runoff as shown in the chart below and in calculations in appendix II.

Mitigation: The increase in stormwater runoff will be mitigated using storm water detention ponds and where appropriate underground infiltration practices. Using green
infrastructure practices such as dryswales will also help meet the NYSDEC design guideline requirements.

B. CALCULATIONS

1. Curve Numbers: See Appendix II for HydroCAD Report

2. Pre and Post calculations- refer to Appendix II for detailed Calculations and printouts. Below is a summary table.

Table 1: Pre-Development Calculations (in cfs)

<table>
<thead>
<tr>
<th>STORM EVENT</th>
<th>1 YR.</th>
<th>10 YR.</th>
<th>100 YR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed 1</td>
<td>0</td>
<td>4.02</td>
<td>104.72</td>
</tr>
</tbody>
</table>

Table 2: Post-Development Calculations (in cfs)

<table>
<thead>
<tr>
<th>STORM EVENT</th>
<th>1 YR.</th>
<th>10 YR.</th>
<th>100 YR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed 1</td>
<td>26.68</td>
<td>71.60</td>
<td>293.41</td>
</tr>
<tr>
<td>Increase from Pre W1</td>
<td>26.68</td>
<td>67.58</td>
<td>188.69</td>
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APPENDICES
APPENDIX I

• Soil Report
Custom Soil Resource Report for Herkimer County, New York

Schuyler ny

July 30, 2019
Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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</tbody>
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil
scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.
Custom Soil Resource Report
Soil Map

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 18N WGS84

Soil Map may not be valid at this scale.

Map Scale: 1:8,010 if printed on A portrait (8.5" x 11") sheet.

N

0 100 200 300 400 500 600
0 360 720 1440 2160 Feet

Meters

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 18N WGS84
Custom Soil Resource Report

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

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 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Herkimer County, New York
Survey Area Data: Version 1, Mar 7, 2019

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

Date(s) aerial images were photographed: Apr 23, 2014—Sep 23, 2016

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

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad</td>
<td>Alluvial land</td>
<td>3.1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Cu</td>
<td>Cut and fill land</td>
<td>8.0</td>
<td>4.3%</td>
</tr>
<tr>
<td>Fr</td>
<td>Fredon fine sandy loam</td>
<td>8.6</td>
<td>4.6%</td>
</tr>
<tr>
<td>HHA</td>
<td>Herkimer gravelly silt loam, 0 to 3 percent slopes</td>
<td>134.8</td>
<td>72.9%</td>
</tr>
<tr>
<td>HkB</td>
<td>Herkimer gravelly silt loam, moderately well drained, 0 to 4 percent slopes</td>
<td>12.0</td>
<td>6.5%</td>
</tr>
<tr>
<td>HvA</td>
<td>Howard gravelly silt loam, 0 to 3 percent slopes</td>
<td>6.7</td>
<td>3.7%</td>
</tr>
<tr>
<td>HwD</td>
<td>Howard and Palmyra soils, 15 to 25 percent slopes</td>
<td>5.4</td>
<td>2.9%</td>
</tr>
<tr>
<td>PmF</td>
<td>Palmyra and Howard soils, 25 to 70 percent slopes</td>
<td>6.3</td>
<td>3.4%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td><strong>184.8</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

### 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.
Herkimer County, New York

Ad—Alluvial land

Map Unit Setting

National map unit symbol: 9svp
Elevation: 100 to 3,000 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 40 percent
Udifluvents and similar soils: 35 percent
Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the map unit.

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

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural 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 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

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

Typical profile
H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 70 inches: very gravelly sand

Properties and qualities
Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components
Wayland
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Hamlin
Percent of map unit: 5 percent
Hydric soil rating: No

Cohoctah
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Fresh water marsh
Percent of map unit: 5 percent
Landform: Marshes
Hydric soil rating: Yes

Teel
Percent of map unit: 5 percent
Hydric soil rating: No
Cu—Cut and fill land

Map Unit Setting

National map unit symbol: 9sw9
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the map unit.

Description of Udorthents

Typical profile
H1 - 0 to 4 inches: channery loam
H2 - 4 to 60 inches: very gravelly sandy loam

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately 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 in profile: 15 percent
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: Unranked

Hornell
Percent of map unit: 5 percent
Hydric soil rating: No

Sun
Percent of map unit: 5 percent
Landform: Depressions  
Hydric soil rating: Yes

Lansing  
Percent of map unit: 5 percent  
Hydric soil rating: No

Lamson  
Percent of map unit: 5 percent  
Landform: Depressions  
Hydric soil rating: Yes

Mohawk  
Percent of map unit: 5 percent  
Hydric soil rating: No

Fr—Fredon fine sandy loam

Map Unit Setting  
National map unit symbol: 9swg  
Elevation: 250 to 1,200 feet  
Mean annual precipitation: 41 to 50 inches  
Mean annual air temperature: 45 to 48 degrees F  
Frost-free period: 125 to 165 days  
Farmland classification: Prime farmland if drained

Map Unit Composition  
Fredon, poorly drained, and similar soils: 50 percent  
Fredon, somewhat poorly drained, and similar soils: 25 percent  
Minor components: 25 percent  
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fredon, Poorly Drained

Setting  
Landform: Valley trains, terraces  
Landform position (two-dimensional): Footslope  
Landform position (three-dimensional): Tread  
Down-slope shape: Concave  
Across-slope shape: Linear  
Parent material: Loamy over sandy and gravelly glacifluvial deposits

Typical profile  
H1 - 0 to 6 inches: fine sandy loam  
H2 - 6 to 15 inches: gravelly fine sandy loam  
H3 - 15 to 23 inches: very gravelly fine sandy loam  
H4 - 23 to 60 inches: stratified extremely gravelly loamy sand to sand

Properties and qualities  
Slope: 0 to 3 percent  
Depth to restrictive feature: More than 80 inches  
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 3w
- Hydrologic Soil Group: B/D
- Hydric soil rating: Yes

Description of Fredon, Somewhat Poorly Drained

Setting
- Landform: Valley trains, terraces
- Landform position (two-dimensional): Footslope
- Landform position (three-dimensional): Tread
- Down-slope shape: Concave
- Across-slope shape: Linear
- Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile
- H1 - 0 to 6 inches: fine sandy loam
- H2 - 6 to 15 inches: gravelly fine sandy loam
- H3 - 15 to 23 inches: very gravelly fine sandy loam
- H4 - 23 to 60 inches: stratified extremely gravelly loamy sand to sand

Properties and qualities
- Slope: 0 to 3 percent
- Depth to restrictive feature: More than 80 inches
- Natural drainage class: Somewhat poorly drained
- Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
- Depth to water table: About 6 to 18 inches
- Frequency of flooding: None
- Frequency of ponding: None
- Calcium carbonate, maximum in profile: 15 percent
- Available water storage in profile: Low (about 5.0 inches)

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 3w
- Hydrologic Soil Group: B/D
- Hydric soil rating: No

Minor Components

Phelps
- Percent of map unit: 5 percent
- Hydric soil rating: No

Palmyra
- Percent of map unit: 5 percent
- Hydric soil rating: No
Hermimer

Percent of map unit: 5 percent
Hydric soil rating: No

Howard

Percent of map unit: 5 percent
Hydric soil rating: No

Halsey

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

HhA—Hermimer gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9swr
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Hermimer and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hermimer

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy old alluvium derived from dark, calcareous shale and varying amounts of sandstone and limestone

Typical profile
H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 31 inches: gravelly silt loam
H3 - 31 to 46 inches: gravelly silt loam
H4 - 46 to 75 inches: channery loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile:  25 percent
Available water storage in profile:  Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated):  None specified
Land capability classification (nonirrigated):  1
Hydrologic Soil Group:  B
Hydric soil rating:  No

Minor Components

Palmyra
Percent of map unit:  5 percent
Hydric soil rating:  No

Howard
Percent of map unit:  5 percent
Hydric soil rating:  No

Fredon
Percent of map unit:  5 percent
Hydric soil rating:  No

Phelps
Percent of map unit:  5 percent
Hydric soil rating:  No

HkB—Herkimer gravelly silt loam, moderately well drained, 0 to 4 percent slopes

Map Unit Setting
National map unit symbol:  9swt
Mean annual precipitation:  41 to 50 inches
Mean annual air temperature:  45 to 48 degrees F
Frost-free period:  125 to 165 days
Farmland classification:  All areas are prime farmland

Map Unit Composition
Herkimer and similar soils:  80 percent
Minor components:  20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Herkimer
Setting
Landform:  Alluvial fans
Landform position (two-dimensional):  Summit
Landform position (three-dimensional):  Tread
Down-slope shape:  Concave
Across-slope shape: Convex
Parent material: Loamy old alluvium derived from dark, calcareous shale and varying amounts of sandstone and limestone

Typical profile
- H1 - 0 to 9 inches: gravelly silt loam
- H2 - 9 to 31 inches: gravelly silt loam
- H3 - 31 to 46 inches: gravelly silt loam
- H4 - 46 to 75 inches: channery loam

Properties and qualities
- Slope: 0 to 4 percent
- Depth to restrictive feature: More than 80 inches
- Natural 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 24 to 36 inches
- Frequency of flooding: None
- Frequency of ponding: None
- Calcium carbonate, maximum in profile: 25 percent
- Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 2w
- Hydrologic Soil Group: C
- Hydric soil rating: No

Minor Components
- Phelps
  - Percent of map unit: 5 percent
  - Hydric soil rating: No
- Palmyra
  - Percent of map unit: 5 percent
  - Hydric soil rating: No
- Fredon
  - Percent of map unit: 5 percent
  - Hydric soil rating: No
- Howard
  - Percent of map unit: 5 percent
  - Hydric soil rating: No

HvA—Howard gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting
- National map unit symbol: 9sxf
- Mean annual precipitation: 41 to 50 inches
- Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Howard and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard
Setting
Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: gravelly sandy loam
H3 - 13 to 29 inches: very gravelly sandy loam
H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components
Herkimer
Percent of map unit: 5 percent
Hydric soil rating: No

Phelps
Percent of map unit: 5 percent
Hydric soil rating: No

Hartland
Percent of map unit: 5 percent
Hydric soil rating: No
Fredon
  Percent of map unit: 5 percent
  Hydric soil rating: No

Agawam
  Percent of map unit: 5 percent
  Hydric soil rating: No

HwD—Howard and Palmyra soils, 15 to 25 percent slopes

Map Unit Setting
  National map unit symbol: 9sxj
  Mean annual precipitation: 41 to 50 inches
  Mean annual air temperature: 45 to 48 degrees F
  Frost-free period: 125 to 165 days
  Farmland classification: Not prime farmland

Map Unit Composition
  Howard and similar soils: 40 percent
  Palmyra and similar soils: 40 percent
  Minor components: 20 percent
  Estimates are based on observations, descriptions, and transects of the map unit.

Description of Howard

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, containing significant amounts of limestone

Typical profile
  H1 - 0 to 8 inches: gravelly silt loam
  H2 - 8 to 13 inches: gravelly sandy loam
  H3 - 13 to 29 inches: very gravelly sandy loam
  H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities
  Slope: 15 to 25 percent
  Depth to restrictive feature: More than 80 inches
  Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Palmyra

Setting
Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits, derived mainly from limestone and other sedimentary rocks

Typical profile
H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 17 inches: gravelly very fine sandy loam
H3 - 17 to 36 inches: gravelly silt loam
H4 - 36 to 60 inches: Error

Properties and qualities
Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components
Herkimer
Percent of map unit: 5 percent
Hydric soil rating: No

Phelps
Percent of map unit: 5 percent
Hydric soil rating: No

Fredon
Percent of map unit: 5 percent
Hydric soil rating: No

Hinckley
Percent of map unit: 5 percent
Hydric soil rating: No

PmF—Palmyra and Howard soils, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9syw
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Palmyra and similar soils: 40 percent
Howard and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palmyra

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits, derived mainly from limestone and other sedimentary rocks

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 17 inches: gravelly very fine sandy loam
H3 - 17 to 36 inches: gravelly silt loam
H4 - 36 to 60 inches: Error

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Howard

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, containing significant amounts of limestone

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: gravelly sandy loam
H3 - 13 to 29 inches: very gravelly sandy loam
H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities
Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components
Herkimer
Percent of map unit: 5 percent
Hydric soil rating: No

Windsor
Percent of map unit: 5 percent
Hydric soil rating: No

Phelps
Percent of map unit: 5 percent
Hydric soil rating: No

Hinckley
Percent of map unit: 5 percent
Hydric soil rating: No
References


APPENDIX II

CALCULATIONS
## Area Listing (selected nodes)

<table>
<thead>
<tr>
<th>Area (sq-ft)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,896,447</td>
<td>49</td>
<td>Pasture/grassland/range, Fair, HSG A (2S, 3S)</td>
</tr>
<tr>
<td>2,283,067</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A (1S, 2S, 3S)</td>
</tr>
<tr>
<td>8,179,514</td>
<td>47</td>
<td>TOTAL AREA</td>
</tr>
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</table>
Summary for Subcatchment 1S: Pre Watershed 1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>503,774</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>503,774</td>
<td>100.00%</td>
<td>Pervious Area</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>34.6</td>
<td>100</td>
<td>0.0084</td>
<td>0.05</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.47&quot;</td>
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<tr>
<td>13.6</td>
<td>374</td>
<td>0.0084</td>
<td>0.46</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>3.1</td>
<td>430</td>
<td>0.2197</td>
<td>2.34</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
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</tbody>
</table>

51.3 904 Total

Subcatchment 1S: Pre Watershed 1

Hydrograph

Runoff=0.00 cfs @ 0.00 hrs
Type II 24-hr
1 yr 24 hr Rainfall=2.16"
Runoff Area=503,774 sf
Runoff Volume=0 cf
Runoff Depth=0.00"
Flow Length=904'
Tc=51.3 min
CN=43
Summary for Subcatchment 2S: Pre Watershed 2

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>1,040,262</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>5,609,617</td>
<td>49</td>
<td>Pasture/grassland/range, Fair, HSG A</td>
</tr>
<tr>
<td>6,649,879</td>
<td>48</td>
<td>Weighted Average</td>
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<tr>
<td>6,649,879</td>
<td>100.00%</td>
<td>Pervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
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<th>Capacity (cfs)</th>
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<td>0.32</td>
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<td></td>
<td></td>
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<td>Fallow n= 0.050 P2= 2.47&quot;</td>
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<tr>
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<td>Unpaved Kv= 16.1 fps</td>
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</table>

25.0 2,450 Total

Subcatchment 2S: Pre Watershed 2

Hydrograph

Runoff=0.00 cfs @ 0.00 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"
Runoff Area=6,649,879 sf
Runoff Volume=0 cf
Runoff Depth=0.00"
Flow Length=2,450'
Slope=0.0151 '/'
Tc=25.0 min
CN=48
Summary for Subcatchment 3S: Pre Watershed 3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

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<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
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</table>

52.3 1,161 Total

Subcatchment 3S: Pre Watershed 3

Hydrograph

Runoff=0.00 cfs @ 0.00 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"
Runoff Area=1,025,861 sf
Runoff Volume=0 cf
Runoff Depth=0.00"
Flow Length=1,161'
Tc=52.3 min
CN=45
Summary for Subcatchment 1S: Pre Watershed 1

Runoff = 0.06 cfs @ 17.96 hrs, Volume = 2,194 cf, Depth = 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<th>Description</th>
</tr>
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<tbody>
<tr>
<td>503,774</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>503,774</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>34.6</td>
<td>100</td>
<td>0.0084</td>
<td>0.05</td>
<td></td>
<td>Sheet Flow,</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P2 = 2.47&quot;</td>
</tr>
<tr>
<td>13.6</td>
<td>374</td>
<td>0.0084</td>
<td>0.46</td>
<td></td>
<td>Shallow Concentrated Flow,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv = 5.0 fps</td>
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<tr>
<td>3.1</td>
<td>430</td>
<td>0.2197</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>Woodland Kv = 5.0 fps</td>
</tr>
</tbody>
</table>

51.3 904 Total

Subcatchment 1S: Pre Watershed 1

Runoff = 0.06 cfs @ 17.96 hrs
Type II 24-hr
10 yr 24 hr Rainfall = 3.51"
Runoff Area = 503,774 sf
Runoff Volume = 2,194 cf
Runoff Depth = 0.05"
Flow Length = 904'
Tc = 51.3 min
CN = 43
Summary for Subcatchment 2S: Pre Watershed 2

Runoff = 3.81 cfs @ 12.64 hrs, Volume = 82,124 cf, Depth = 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"

<table>
<thead>
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<td>Weighted Average</td>
</tr>
<tr>
<td>6,649,879</td>
<td>100</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2</td>
<td>100</td>
<td>0.0151</td>
<td>0.32</td>
<td></td>
<td>Sheet Flow, Fallow n = 0.050 P = 2.47&quot;</td>
</tr>
<tr>
<td>19.8</td>
<td>2,350</td>
<td>0.0151</td>
<td>1.98</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv = 16.1 fps</td>
</tr>
<tr>
<td>25.0</td>
<td>2,450</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subcatchment 2S: Pre Watershed 2

Hydrograph

Runoff = 3.81 cfs @ 12.64 hrs
Type II 24-hr
10 yr 24 hr Rainfall = 3.51"
Runoff Area = 6,649,879 sf
Runoff Volume = 82,124 cf
Runoff Depth = 0.15"
Flow Length = 2,450'
Slope = 0.0151 '/'
c = 25.0 min
CN = 48
Summary for Subcatchment 3S: Pre Watershed 3

Runoff = 0.21 cfs @ 14.35 hrs, Volume = 7,305 cf, Depth = 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>739,031</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>286,830</td>
<td>49</td>
<td>Pasture/grassland/range, Fair, HSG A</td>
</tr>
<tr>
<td>1,025,861</td>
<td>45</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,025,861</td>
<td>100</td>
<td>100.00% Pervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.6</td>
<td>100</td>
<td>0.0147</td>
<td>0.06</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n = 0.400 P2 = 2.47&quot;</td>
</tr>
<tr>
<td>19.7</td>
<td>716</td>
<td>0.0147</td>
<td>0.61</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kg = 5.0 fps</td>
</tr>
<tr>
<td>5.0</td>
<td>345</td>
<td>0.0527</td>
<td>1.15</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kg = 5.0 fps</td>
</tr>
<tr>
<td>52.3</td>
<td>1,161</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment 3S: Pre Watershed 3

Runoff = 0.21 cfs @ 14.35 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"
Runoff Area = 1,025,861 sf
Runoff Volume = 7,305 cf
Runoff Depth = 0.09"
Flow Length = 1,161' 
Tc = 52.3 min
CN = 45
Summary for Subcatchment 1S: Pre Watershed 1

Runoff = 2.25 cfs @ 12.71 hrs, Volume= 25,666 cf, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>503,774</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>503,774</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.6</td>
<td>100</td>
<td>0.0084</td>
<td>0.05</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.47&quot;</td>
</tr>
<tr>
<td>13.6</td>
<td>374</td>
<td>0.0084</td>
<td>0.46</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>3.1</td>
<td>430</td>
<td>0.2197</td>
<td>2.34</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
</tbody>
</table>

51.3 904 Total

Subcatchment 1S: Pre Watershed 1

Hydrograph

Runoff=2.25 cfs @ 12.71 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"
Runoff Area=503,774 sf
Runoff Volume=25,666 cf
Runoff Depth=0.61"
Flow Length=904'
Tc=51.3 min
CN=43
Summary for Subcatchment 2S: Pre Watershed 2

Runoff = 96.39 cfs @ 12.25 hrs, Volume = 510,555 cf, Depth = 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall = 5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,040,262 43</td>
<td>Woods/grass comb., Fair, HSG A</td>
<td></td>
</tr>
<tr>
<td>5,609,617 49</td>
<td>Pasture/grassland/range, Fair, HSG A</td>
<td></td>
</tr>
<tr>
<td>6,649,879 48</td>
<td>Weighted Average</td>
<td></td>
</tr>
<tr>
<td>6,649,879 100.00%</td>
<td>Pervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2</td>
<td>100</td>
<td>0.0151</td>
<td>0.32</td>
<td></td>
<td>Sheet Flow,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fallow n= 0.050 P2= 2.47&quot;</td>
</tr>
<tr>
<td>19.8</td>
<td>2,350</td>
<td>0.0151</td>
<td>1.98</td>
<td></td>
<td>Shallow Concentrated Flow,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
<tr>
<td>25.0</td>
<td>2,450</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment 2S: Pre Watershed 2

Runoff=96.39 cfs @ 12.25 hrs
Type II 24-hr
100 yr 24 hr Rainfall=5.82"
Runoff Area=6,649,879 sf
Runoff Volume=510,555 cf
Runoff Depth=0.92"  
Flow Length=2,450'
Slope=0.0151 '/
Tc=25.0 min
CN=48
Summary for Subcatchment 3S: Pre Watershed 3

Runoff = 6.08 cfs @ 12.67 hrs, Volume= 62,450 cf, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>739,031</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>286,830</td>
<td>49</td>
<td>Pasture/grassland/range, Fair, HSG A</td>
</tr>
<tr>
<td>1,025,861</td>
<td>45</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,025,861</td>
<td>100</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.6</td>
<td>100</td>
<td>0.0147</td>
<td>0.06</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.47&quot;</td>
</tr>
<tr>
<td>19.7</td>
<td>716</td>
<td>0.0147</td>
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<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>5.0</td>
<td>345</td>
<td>0.0527</td>
<td>1.15</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>52.3</td>
<td>1,161</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment 3S: Pre Watershed 3

Hydrograph

Runoff=6.08 cfs @ 12.67 hrs
Type II 24-hr
100 yr 24 hr Rainfall=5.82"
Runoff Area=1,025,861 sf
Runoff Volume=62,450 cf
Runoff Depth=0.73"
Flow Length=1,161'
Tc=52.3 min
CN=45
## Area Listing (selected nodes)

<table>
<thead>
<tr>
<th>Area (sq-ft)</th>
<th>CN</th>
<th>Description</th>
<th>Subcatchment-numbers</th>
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</thead>
<tbody>
<tr>
<td>2,382,439</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
<td>(3S, 4S, 5S, 6S)</td>
</tr>
<tr>
<td>953,333</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
<td>(2S)</td>
</tr>
<tr>
<td>2,888,603</td>
<td>98</td>
<td>Paved parking, HSG A</td>
<td>(3S, 4S, 5S)</td>
</tr>
<tr>
<td>1,955,139</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
<td>(1S, 2S, 5S, 6S)</td>
</tr>
<tr>
<td>8,179,514</td>
<td>60</td>
<td>TOTAL AREA</td>
<td></td>
</tr>
</tbody>
</table>
Summary for Subcatchment 1S: Post Watershed 1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>503,774</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>503,774</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.6</td>
<td>100</td>
<td>0.0084</td>
<td>0.05</td>
<td></td>
<td><strong>Sheet Flow,</strong> Woods: Light underbrush  n= 0.400   P2= 2.47&quot;</td>
</tr>
<tr>
<td>13.6</td>
<td>374</td>
<td>0.0084</td>
<td>0.46</td>
<td></td>
<td><strong>Shallow Concentrated Flow,</strong> Woodland   Kv= 5.0 fps</td>
</tr>
<tr>
<td>3.1</td>
<td>430</td>
<td>0.2197</td>
<td>2.34</td>
<td></td>
<td><strong>Shallow Concentrated Flow,</strong> Woodland   Kv= 5.0 fps</td>
</tr>
</tbody>
</table>

51.3 904 Total

Subcatchment 1S: Post Watershed 1

Hydrograph

Runoff=0.00 cfs @ 0.00 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"
Runoff Area=503,774 sf
Runoff Volume=0 cf
Runoff Depth=0.00"
Flow Length=904'
Tc=51.3 min
CN=43
Summary for Subcatchment 2S: Post Watershed 2a

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1,160,325</td>
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<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>953,333</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>2,113,658</td>
<td>39</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,113,658</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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</thead>
<tbody>
<tr>
<td>13.5</td>
<td>100</td>
<td>0.0886</td>
<td>0.12</td>
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<td><strong>Sheet Flow,</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 2.47&quot;</td>
</tr>
<tr>
<td>3.8</td>
<td>340</td>
<td>0.0886</td>
<td>1.49</td>
<td></td>
<td><strong>Shallow Concentrated Flow,</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>7.4</td>
<td>800</td>
<td>0.0125</td>
<td>1.80</td>
<td></td>
<td><strong>Shallow Concentrated Flow,</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

24.7 1,240 Total

Subcatchment 2S: Post Watershed 2a

Hydrograph

Runoff=0.00 cfs @ 0.00 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"
Runoff Area=2,113,658 sf
Runoff Volume=0 cf
Runoff Depth=0.00"
Flow Length=1,240'
Tc=24.7 min
CN=39
Summary for Subcatchment 3S: Post Watershed 2b

Runoff = 4.89 cfs @ 12.08 hrs, Volume= 19,874 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>475,153</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>476,019</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>951,172</td>
<td>68</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>476,019</td>
<td></td>
<td>50.05% Pervious Area</td>
</tr>
<tr>
<td>475,153</td>
<td></td>
<td>49.95% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2</td>
<td>100</td>
<td>0.0250</td>
<td>0.16</td>
<td></td>
<td>Sheet Flow,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short, n= 0.150, P2= 2.47&quot;</td>
</tr>
<tr>
<td>2.0</td>
<td>300</td>
<td>0.0250</td>
<td>2.55</td>
<td></td>
<td>Shallow Concentrated Flow,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved, Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

Subcatchment 3S: Post Watershed 2b

Runoff=4.89 cfs @ 12.08 hrs
Type II 24-hr
1 yr 24 hr Rainfall=2.16"
Runoff Area=951,172 sf
Runoff Volume=19,874 cf
Runoff Depth=0.25"
Flow Length=400'
Slope=0.0250 '
Tc=12.2 min
CN=68
Summary for Subcatchment 4S: Post Watershed 3a

Runoff = 21.79 cfs @ 12.42 hrs, Volume = 142,090 cf, Depth = 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>2,376,906</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>1,614,050</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
</tbody>
</table>

| 3,990,956 | 74  | Weighted Average              |
| 1,614,050 | 40.44% Pervious Area           |
| 2,376,906 | 59.56% Impervious Area         |

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.0</td>
<td>100</td>
<td>0.0136</td>
<td>0.13</td>
<td></td>
<td>Sheet Flow, Grass: Short n= 0.150 P2= 2.47&quot;</td>
</tr>
<tr>
<td>26.5</td>
<td>927</td>
<td>0.0136</td>
<td>0.58</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
</tbody>
</table>

| 39.5     | 1,027         |              |                   |                | Total                         |

Subcatchment 4S: Post Watershed 3a

Runoff = 21.79 cfs @ 12.42 hrs
Type II 24-hr
1 yr 24 hr Rainfall = 2.16"
Runoff Area = 3,990,956 sf
Runoff Volume = 142,090 cf
Runoff Depth = 0.43"
Flow Length = 1,027'
Slope = 0.0136 '/'
Tc = 39.5 min
CN = 74
Summary for Subcatchment 5S: Post Watershed 2c

Runoff = 0.00 cfs @ 0.00 hrs, Volume = 0 cf, Depth = 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall = 2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,740</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>36,544</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>193,090</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>302,374</td>
<td>47</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>265,830</td>
<td></td>
<td>87.91% Pervious Area</td>
</tr>
<tr>
<td>36,544</td>
<td></td>
<td>12.09% Impervious Area</td>
</tr>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
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<td>9.5</td>
<td>100</td>
<td>0.0300</td>
<td>0.18</td>
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<td>Sheet Flow, Grass: Short n = 0.150 P2 = 2.47&quot;</td>
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<tr>
<td>1.1</td>
<td>220</td>
<td>0.0400</td>
<td>3.22</td>
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<td>Shallow Concentrated Flow, Unpaved Kv = 16.1 fps</td>
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<table>
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<tr>
<td>10.6</td>
<td>320</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
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</table>

Subcatchment 5S: Post Watershed 2c

Hydrograph

Runoff = 0.00 cfs @ 0.00 hrs
Type II 24-hr 1 yr 24 hr Rainfall = 2.16"
Runoff Area = 302,374 sf
Runoff Volume = 0 cf
Runoff Depth = 0.00"
Flow Length = 320'
Tc = 10.6 min
CN = 47
Summary for Subcatchment 6S: Post Watershed 3b

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
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<td>218,300</td>
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<td>Woods/grass comb., Fair, HSG A</td>
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<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>98</td>
<td>Paved parking, HSG A</td>
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<tr>
<td>99,280</td>
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<td>&gt;75% Grass cover, Good, HSG A</td>
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<tr>
<td>317,580</td>
<td>42</td>
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<tr>
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<td>100</td>
<td>100.00% Pervious Area</td>
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<table>
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<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
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</thead>
<tbody>
<tr>
<td>8.5</td>
<td>100</td>
<td>0.0400</td>
<td>0.20</td>
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<td>Sheet Flow, Grass: Short n= 0.150 P2= 2.47&quot;</td>
</tr>
<tr>
<td>7.5</td>
<td>450</td>
<td>0.0400</td>
<td>1.00</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
</tbody>
</table>

16.0 550 Total

Subcatchment 6S: Post Watershed 3b

Runoff=0.00 cfs @ 0.00 hrs
Type II 24-hr 1 yr 24 hr Rainfall=2.16"
Runoff Area=317,580 sf
Runoff Volume=0 cf
Runoff Depth=0.00" Flow Length=550' Slope=0.0400 '/' Tc=16.0 min CN=42
Summary for Pond 7P: Pond 1

Inflow Area = 3,990,956 sf, 59.56% Impervious, Inflow Depth = 0.43" for 1 yr 24 hr event
Inflow = 21.79 cfs @ 12.42 hrs, Volume= 142,090 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 452.73' @ 26.26 hrs Surf.Area= 85,752 sf Storage= 142,090 cf

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

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>450.99'</td>
<td>629,130 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Surf.Area</th>
<th>Inc.Store</th>
<th>Cum.Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>(feet)</td>
<td>(sq-ft)</td>
<td>(cubic-feet)</td>
<td>(cubic-feet)</td>
</tr>
<tr>
<td>450.99</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>451.00</td>
<td>77,750</td>
<td>389</td>
<td>389</td>
</tr>
<tr>
<td>454.00</td>
<td>91,600</td>
<td>254,025</td>
<td>254,414</td>
</tr>
<tr>
<td>455.00</td>
<td>124,591</td>
<td>382,096</td>
<td>382,509</td>
</tr>
<tr>
<td>457.00</td>
<td>142,030</td>
<td>626,621</td>
<td>626,130</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices

| Device | Routing | Invert | | 10.0' long x 6.0' breadth Broad-Crested Rectangular Weir |
|--------|---------|--------|-------------------|
| #1     | Primary | 456.00' | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 |
|        |         |        | Coef. (English) 2.37 2.51 2.70 2.68 2.67 2.65 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83 |

| Device | Routing | Invert | | 10.0' long x 6.0' breadth Broad-Crested Rectangular Weir |
|--------|---------|--------|-------------------|
| #2     | Primary | 456.00' | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 |
|        |         |        | Coef. (English) 2.37 2.51 2.70 2.68 2.67 2.65 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83 |

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=450.99' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
Pond 7P: Pond 1

Hydrograph

Inflow Area=3,990,956 sf
Inflow=21.79 cfs @ 12.42 hrs
Primary=0.00 cfs @ 0.00 hrs
Peak Elev=452.73'
Storage=142,090 cf

Stage-Discharge

Broad-Crested Rectangular Weir + Broad-Crested Rectangular Weir

Elevation (feet)

Discharge (cfs)
Pond 7P: Pond 1

Stage/Area-Storage

Surface/Horizontal/Wetted Area (sq-ft)

Surface
Storage

Custom Stage Data

Elevation (feet)

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000 110,000 120,000 130,000 140,000

Storage (cubic-feet)

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000 110,000 120,000 130,000 140,000

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000 110,000 120,000 130,000 140,000
Summary for Pond 8P: Pond 2

Inflow Area = 951,172 sf, 49.95% Impervious, Inflow Depth = 0.25" for 1 yr 24 hr event
Inflow = 4.89 cfs @ 12.08 hrs, Volume= 19,874 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 447.82' @ 24.71 hrs    Surf.Area= 25,471 sf    Storage= 19,874 cf

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

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>446.99</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>447.00</td>
<td>22,463</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>449.00</td>
<td>29,760</td>
<td>52,223</td>
<td>52,335</td>
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<tr>
<td>450.00</td>
<td>41,882</td>
<td>88,156</td>
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</table>

Device Routing Invert Outlet Devices
#1 Primary 449.00' 8.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coeff. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=446.99' (Free Discharge)
↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
Pond 8P: Pond 2

**Hydrograph**

- **Inflow Area**: 951,172 sf
- **Inflow**: 4.89 cfs @ 12.08 hrs
- **Primary**: 0.00 cfs @ 0.00 hrs
- **Peak Elev**: 447.82'
- **Storage**: 19,874 cf

**Stage-Discharge**

- **Broad-Crested Rectangular Weir**

---

**Time (hours)**

- 30
- 29
- 28
- 27
- 26
- 25
- 24
- 23
- 22
- 21
- 20
- 19
- 18
- 17
- 16
- 15
- 14
- 13
- 12
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- 0

**Flow (cfs)**

- 5
- 4
- 3
- 2
- 1
- 0

**Elevation (feet)**

- 450
- 449
- 448
- 447
Summary for Subcatchment 1S: Post Watershed 1

Runoff = 0.06 cfs @ 17.96 hrs, Volume = 2,194 cf, Depth = 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>503,774</td>
<td>43</td>
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</tr>
<tr>
<td>503,774</td>
<td>100.00%</td>
<td>Pervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>34.6</td>
<td>100</td>
<td>0.0084</td>
<td>0.05</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n = 0.400 P2 = 2.47&quot;</td>
</tr>
<tr>
<td>13.6</td>
<td>374</td>
<td>0.0084</td>
<td>0.46</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv = 5.0 fps</td>
</tr>
<tr>
<td>3.1</td>
<td>430</td>
<td>0.2197</td>
<td>2.34</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv = 5.0 fps</td>
</tr>
</tbody>
</table>

| Tc = 51.3 min, CN = 43 |

Subcatchment 1S: Post Watershed 1

Hydrograph

- Runoff = 0.06 cfs @ 17.96 hrs
- Type II 24-hr
- 10 yr 24 hr Rainfall = 3.51"
- Runoff Area = 503,774 sf
- Runoff Volume = 2,194 cf
- Runoff Depth = 0.05"
- Flow Length = 904'
Summary for Subcatchment 2S: Post Watershed 2a

Runoff = 0.09 cfs @ 24.02 hrs, Volume = 1,602 cf, Depth = 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"

<table>
<thead>
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<tr>
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<tr>
<td>953,333</td>
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<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>2,113,658</td>
<td>39</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,113,658</td>
<td>100</td>
<td>100.00% Pervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tbody>
<tr>
<td>13.5</td>
<td>100</td>
<td>0.0886</td>
<td>0.12</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n = 0.400 P2 = 2.47&quot;</td>
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<tr>
<td>3.8</td>
<td>340</td>
<td>0.0886</td>
<td>1.49</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv = 5.0 fps</td>
</tr>
<tr>
<td>7.4</td>
<td>800</td>
<td>0.0125</td>
<td>1.80</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv = 16.1 fps</td>
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</table>

24.7 1,240 Total

Subcatchment 2S: Post Watershed 2a

Hydrograph

Runoff = 0.09 cfs @ 24.02 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"
Runoff Area = 2,113,658 sf
Runoff Volume = 1,602 cf
Runoff Depth = 0.01"
Flow Length = 1,240'
Tc = 24.7 min
CN = 39
Summary for Subcatchment 3S: Post Watershed 2b

Runoff  =  26.27 cfs @ 12.05 hrs, Volume= 71,900 cf, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall=3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
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<td>Woods/grass comb., Fair, HSG A</td>
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<tr>
<td>0</td>
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<tr>
<td>475,153</td>
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<td>Paved parking, HSG A</td>
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<tr>
<td>476,019</td>
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<td>&gt;75% Grass cover, Good, HSG A</td>
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<tr>
<td>951,172</td>
<td>68</td>
<td>Weighted Average</td>
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<tr>
<td>476,019</td>
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<td>50.05% Pervious Area</td>
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<tr>
<td>475,153</td>
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<td>49.95% Impervious Area</td>
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<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<td>10.2</td>
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<tr>
<td>2.0</td>
<td>300</td>
<td>0.0250</td>
<td>2.55</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv= 16.1 fps</td>
</tr>
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12.2 400 Total

Subcatchment 3S: Post Watershed 2b

Runoff=26.27 cfs @ 12.05 hrs
Type II 24-hr
10 yr 24 hr Rainfall=3.51"
Runoff Area=951,172 sf
Runoff Volume=71,900 cf
Runoff Depth=0.91"
Flow Length=400'
Slope=0.0250 '
Tc=12.2 min
CN=68
Summary for Subcatchment 4S: Post Watershed 3a

Runoff = 77.48 cfs @ 12.38 hrs, Volume= 414,667 cf, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall=3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>2,376,906</td>
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<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>1,614,050</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>3,990,956</td>
<td>74</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,614,050</td>
<td>40.44%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>2,376,906</td>
<td>59.56%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.0</td>
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<td>0.0136</td>
<td>0.13</td>
<td></td>
<td>Sheet Flow, Grass: Short n= 0.150 P2= 2.47&quot;</td>
</tr>
<tr>
<td>26.5</td>
<td>927</td>
<td>0.0136</td>
<td>0.58</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>39.5</td>
<td>1,027</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
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Subcatchment 4S: Post Watershed 3a

Runoff=77.48 cfs @ 12.38 hrs

Type II 24-hr

10 yr 24 hr Rainfall=3.51"

Runoff Area=3,990,956 sf

Runoff Volume=414,667 cf

Runoff Depth=1.25"

Flow Length=1,027"

Slope=0.0136 '/'

Tc=39.5 min

CN=74
Summary for Subcatchment 5S: Post Watershed 2c

Runoff = 0.13 cfs @ 12.47 hrs, Volume = 3,165 cf, Depth = 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall = 3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,740</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>36,544</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>193,090</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>302,374</td>
<td>47</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>265,830</td>
<td>87</td>
<td>87.91% Pervious Area</td>
</tr>
<tr>
<td>36,544</td>
<td></td>
<td>12.09% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>9.5</td>
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<td>0.0300</td>
<td>0.18</td>
<td></td>
<td>Sheet Flow, Grass: Short n= 0.150 P2= 2.47&quot;</td>
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<tr>
<td>1.1</td>
<td>220</td>
<td>0.0400</td>
<td>3.22</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv= 16.1 fps</td>
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</tbody>
</table>

10.6 320 Total

Subcatchment 5S: Post Watershed 2c

Hydrograph

Runoff=0.13 cfs @ 12.47 hrs
Type II 24-hr 10 yr 24 hr Rainfall=3.51"
Runoff Area=302,374 sf
Runoff Volume=3,165 cf
Runoff Depth=0.13"
Flow Length=320'
c=10.6 min
CN=47
Summary for Subcatchment 6S: Post Watershed 3b

Runoff = 0.03 cfs @ 18.08 hrs, Volume= 1,017 cf, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 yr 24 hr Rainfall=3.51"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>218,300</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>99,280</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>317,580</td>
<td>42</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>317,580</td>
<td>100</td>
<td>100.00% Pervious Area</td>
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<table>
<thead>
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<th>Slope (ft/ft)</th>
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<th>Capacity (cfs)</th>
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<td>8.5</td>
<td>100</td>
<td>0.0400</td>
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<td>Sheet Flow, Grass: Short  n= 0.150   P2= 2.47&quot;</td>
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<tr>
<td>7.5</td>
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<td>0.0400</td>
<td>1.00</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland  Kv= 5.0 fps</td>
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</table>

16.0 550 Total

Subcatchment 6S: Post Watershed 3b

Runoff=0.03 cfs @ 18.08 hrs
Type II 24-hr
10 yr 24 hr Rainfall=3.51"
Runoff Area=317,580 sf
Runoff Volume=1,017 cf
Runoff Depth=0.04"
Flow Length=550'
Slope=0.0400 '/'
Tc=16.0 min
CN=42
Summary for Pond 7P: Pond 1

Inflow Area = 3,990,956 sf, 59.56% Impervious, Inflow Depth = 1.25" for 10 yr 24 hr event
Inflow = 77.48 cfs @ 12.38 hrs, Volume= 414,667 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 455.41' @ 26.26 hrs Surf.Area= 128,189 sf Storage= 414,663 cf

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

<table>
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<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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<tbody>
<tr>
<td>#1</td>
<td>450.99’</td>
<td>629,130 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>450.99</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>451.00</td>
<td>77,750</td>
<td>389</td>
<td>389</td>
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<tr>
<td>454.00</td>
<td>91,600</td>
<td>254,025</td>
<td>254,414</td>
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<tr>
<td>455.00</td>
<td>124,591</td>
<td>108,096</td>
<td>362,509</td>
</tr>
<tr>
<td>457.00</td>
<td>142,030</td>
<td>266,621</td>
<td>629,130</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices

| #1 | Primary | 456.00’ | 10.0’ long x 6.0’ breadth Broad-Crested Rectangular Weir |
|    |        |         | Head (feet) 0.20 0.40 0.60 1.00 1.20 1.40 1.60 1.80 2.00 |
|    |        |         | 2.50 3.00 3.50 4.00 4.50 5.00 5.50 |
|    |        |         | Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 |
|    |        |         | 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83 |

| #2 | Primary | 456.00’ | 10.0’ long x 6.0’ breadth Broad-Crested Rectangular Weir |
|    |        |         | Head (feet) 0.20 0.40 0.60 1.00 1.20 1.40 1.60 1.80 2.00 |
|    |        |         | 2.50 3.00 3.50 4.00 4.50 5.00 5.50 |
|    |        |         | Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 |
|    |        |         | 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83 |

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=450.99’ (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
Pond 7P: Pond 1

Hydrograph

- **Inflow Area**: 3,990,956 sf
- **Inflow**: 77.48 cfs @ 12.38 hrs
- **Primary**: 0.00 cfs @ 0.00 hrs
- **Peak Elev**: 455.41'
- **Storage**: 414,663 cf

Stage-Discharge

- **Broad-Crested Rectangular Weir**
Pond 7P: Pond 1

Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)

Storage (cubic-feet)

Custom Stage Data
Summary for Pond 8P: Pond 2

Inflow Area = 951,172 sf, 49.95% Impervious, Inflow Depth = 0.91" for 10 yr 24 hr event

Inflow = 26.27 cfs @ 12.05 hrs, Volume= 71,900 cf
Outflow = 0.73 cfs @ 18.57 hrs, Volume= 19,310 cf, Attenuation= 97%, Lag= 390.8 min
Primary = 0.73 cfs @ 18.57 hrs, Volume= 19,310 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 449.11' @ 18.57 hrs Surf.Area= 31,143 sf Storage= 55,809 cf

Plug-Flow detention time= 533.6 min calculated for 19,303 cf (27% of inflow)
Center-of-Mass det. time= 375.6 min (1,254.0 - 878.4 )

Volume Invert Avail.Storage Storage Description
#1 446.99' 88,156 cf Custom Stage Data (Prismatic) Listed below (Recalc)

<table>
<thead>
<tr>
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<tr>
<td>446.99</td>
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<tr>
<td>447.00</td>
<td>22,463</td>
<td>112</td>
<td>112</td>
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<td>449.00</td>
<td>29,760</td>
<td>52,223</td>
<td>52,335</td>
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<tr>
<td>450.00</td>
<td>41,882</td>
<td>35,821</td>
<td>88,156</td>
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Device Routing Invert Outlet Devices
#1 Primary 449.00’ 8.0' long x 5.0' breadth Broad-Crested Rectangular Weir

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary Outflow Max=0.72 cfs @ 18.57 hrs HW=449.11’ (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.72 cfs @ 0.79 fps)
Inflow Area=951,172 sf
Inflow=26.27 cfs @ 12.05 hrs
Primary=0.73 cfs @ 18.57 hrs
Peak Elev=449.11'
Storage=55,809 cf
Pond 8P: Pond 2

Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)

Elevation (feet)

Custom Stage Data
Summary for Subcatchment 1S: Post Watershed 1

Runoff = 2.25 cfs @ 12.71 hrs, Volume = 25,666 cf, Depth = 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall = 5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>Woods/grass comb., Fair, HSG A</td>
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<tr>
<td>503,774</td>
<td>100.00%</td>
<td>Pervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>34.6</td>
<td>100</td>
<td>0.0084</td>
<td>0.05</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n = 0.400 P2 = 2.47&quot;</td>
</tr>
<tr>
<td>13.6</td>
<td>374</td>
<td>0.0084</td>
<td>0.46</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland Kv = 5.0 fps</td>
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<tr>
<td>3.1</td>
<td>430</td>
<td>0.2197</td>
<td>2.34</td>
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<td>Shallow Concentrated Flow, Woodland Kv = 5.0 fps</td>
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51.3 904 Total

Subcatchment 1S: Post Watershed 1

Runoff = 2.25 cfs @ 12.71 hrs

Type II 24-hr 100 yr 24 hr Rainfall = 5.82"
Runoff Area = 503,774 sf
Runoff Volume = 25,666 cf
Runoff Depth = 0.61"
Flow Length = 904'
Tc = 51.3 min
CN = 43
Summary for Subcatchment 2S: Post Watershed 2a

Runoff = 5.91 cfs @ 12.33 hrs, Volume = 69,616 cf, Depth = 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"

<table>
<thead>
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<td>953,333</td>
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<tr>
<td>2,113,658</td>
<td>39</td>
<td>Weighted Average</td>
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<tr>
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<td>100.00% Pervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
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<th>Capacity (cfs)</th>
<th>Description</th>
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<td>13.5</td>
<td>100</td>
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<td>0.12</td>
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<td>Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.47&quot;</td>
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<tr>
<td>3.8</td>
<td>340</td>
<td>0.0866</td>
<td>1.49</td>
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<td>Shallow Concentrated Flow, Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>7.4</td>
<td>800</td>
<td>0.0125</td>
<td>1.80</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv= 16.1 fps</td>
</tr>
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</table>

24.7 1,240 Total

Subcatchment 2S: Post Watershed 2a

Runoff=5.91 cfs @ 12.33 hrs
Type II 24-hr
100 yr 24 hr Rainfall=5.82"
Runoff Area=2,113,658 sf
Runoff Volume=69,616 cf
Runoff Depth=0.40"
Flow Length=1,240'
Tc=24.7 min
CN=39
Summary for Subcatchment 3S: Post Watershed 2b

Runoff = 77.04 cfs @ 12.05 hrs, Volume= 196,847 cf, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
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<tr>
<td>475,153</td>
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<tr>
<td>476,019</td>
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<tr>
<td>951,172</td>
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<td>Weighted Average</td>
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<tr>
<td>476,019</td>
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<tr>
<td>475,153</td>
<td>49.95% Impervious Area</td>
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<table>
<thead>
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<th>Tc (min)</th>
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<th>Velocity (ft/sec)</th>
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<tr>
<td>2.0</td>
<td>300</td>
<td>0.0250</td>
<td>2.55</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv= 16.1 fps</td>
</tr>
<tr>
<td>12.2</td>
<td>400</td>
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<td></td>
<td>Total</td>
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Subcatchment 3S: Post Watershed 2b

Runoff=77.04 cfs @ 12.05 hrs
Type II 24-hr
100 yr 24 hr Rainfall=5.82"
Runoff Area=951,172 sf
Runoff Volume=196,847 cf
Runoff Depth=2.48"
Flow Length=400'
Slope=0.0250 '/'
Tc=12.2 min
CN=68
Summary for Subcatchment 4S: Post Watershed 3a

Runoff = 198.91 cfs @ 12.37 hrs, Volume = 1,009,080 cf, Depth = 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall = 5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>2,376,906</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>1,614,050</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>3,990,956</td>
<td>74</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,614,050</td>
<td>40.44%</td>
<td>Pervious Area</td>
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<tr>
<td>2,376,906</td>
<td>59.56%</td>
<td>Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
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<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<td>0.58</td>
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<td>Shallow Concentrated Flow, Woodland Kv = 5.0 fps</td>
</tr>
<tr>
<td>39.5</td>
<td>1,027</td>
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<td></td>
<td></td>
<td>Total</td>
</tr>
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**Subcatchment 4S: Post Watershed 3a**

Runoff = 198.91 cfs @ 12.37 hrs
Type II 24-hr
100 yr 24 hr Rainfall = 5.82"
Runoff Area = 3,990,956 sf
Runoff Volume = 1,009,080 cf
Runoff Depth = 3.03"
Flow Length = 1,027'
Slope = 0.0136 '
Tc = 39.5 min
CN = 74
Summary for Subcatchment 5S: Post Watershed 2c

Runoff = 6.81 cfs @ 12.05 hrs, Volume= 21,574 cf, Depth= 0.86”

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>36,544</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>193,090</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>302,374</td>
<td>47</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>265,830</td>
<td></td>
<td>87.91% Pervious Area</td>
</tr>
<tr>
<td>36,544</td>
<td></td>
<td>12.09% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5</td>
<td>100</td>
<td>0.0300</td>
<td>0.18</td>
<td></td>
<td>Sheet Flow, Grass: Short n= 0.150 P2= 2.47”</td>
</tr>
<tr>
<td>1.1</td>
<td>220</td>
<td>0.0400</td>
<td>3.22</td>
<td></td>
<td>Shallow Concentrated Flow, Unpaved Kv= 16.1 fps</td>
</tr>
<tr>
<td>10.6</td>
<td>320</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
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Subcatchment 5S: Post Watershed 2c

Runoff=6.81 cfs @ 12.05 hrs
Type II 24-hr
100 yr 24 hr Rainfall=5.82"
Runoff Area=302,374 sf
Runoff Volume=21,574 cf
Runoff Depth=0.86"
Flow Length=320'
Tc=10.6 min
CN=47
Summary for Subcatchment 6S: Post Watershed 3b

Runoff = 2.49 cfs @ 12.14 hrs, Volume= 14,673 cf, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr 24 hr Rainfall=5.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>218,300</td>
<td>43</td>
<td>Woods/grass comb., Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>Brush, Fair, HSG A</td>
</tr>
<tr>
<td>0</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>99,280</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>317,580</td>
<td>42</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>317,580</td>
<td>100.00%</td>
<td>Pervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5</td>
<td>100</td>
<td>0.0400</td>
<td>0.20</td>
<td></td>
<td>Sheet Flow, Grass: Short  n= 0.150   P2= 2.47&quot;</td>
</tr>
<tr>
<td>7.5</td>
<td>450</td>
<td>0.0400</td>
<td>1.00</td>
<td></td>
<td>Shallow Concentrated Flow, Woodland   Kv= 5.0 fps</td>
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</tbody>
</table>

16.0 550 Total

Subcatchment 6S: Post Watershed 3b

Hydrograph

Runoff=2.49 cfs @ 12.14 hrs
Type II 24-hr
100 yr 24 hr Rainfall=5.82"
Runoff Area=317,580 sf
Runoff Volume=14,673 cf
Runoff Depth=0.55"
Flow Length=550'
Slope=0.0400 '/'
Tc=16.0 min
CN=42
Summary for Pond 7P: Pond 1

Inflow Area = 3,990,956 sf, 59.56% Impervious, Inflow Depth = 3.03" for 100 yr 24 hr event
Inflow = 198.91 cfs @ 12.37 hrs, Volume= 1,009,080 cf
Outflow = 30.70 cfs @ 13.55 hrs, Volume= 513,440 cf, Atten= 85%, Lag= 71.0 min
Primary = 30.70 cfs @ 13.55 hrs, Volume= 513,440 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 456.69' @ 13.55 hrs Surf.Area= 139,306 sf Storage= 585,189 cf

Plug-Flow detention time= 306.8 min calculated for 513,269 cf (51% of inflow)
Center-of-Mass det. time= 184.8 min (1,042.9 - 858.1)

Volume Invert Avail.Storage Storage Description
#1 450.99' 629,130 cf Custom Stage Data (Prismatic) Listed below (Recalc)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>450.99</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>451.00</td>
<td>77,750</td>
<td>389</td>
<td>389</td>
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<tr>
<td>454.00</td>
<td>91,600</td>
<td>254,025</td>
<td>254,414</td>
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<tr>
<td>455.00</td>
<td>124,591</td>
<td>108,096</td>
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<tr>
<td>457.00</td>
<td>142,030</td>
<td>266,621</td>
<td>629,130</td>
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</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 456.00' 10.0' long x 6.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.67 2.65 2.65 2.65
2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

#2 Primary 456.00' 10.0' long x 6.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.37 2.51 2.70 2.68 2.67 2.65 2.65 2.65
2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=30.69 cfs @ 13.55 hrs HW=456.69' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 15.35 cfs @ 2.23 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 15.35 cfs @ 2.23 fps)
Pond 7P: Pond 1

Hydrograph

Inflow Area=3,990,956 sf
Inflow=198.91 cfs @ 12.37 hrs
Primary=30.70 cfs @ 13.55 hrs
Peak Elev=456.69'
Storage=585,189 cf

Stage-Discharge

Broad-Crested Rectangular Weir + Broad-Crested Rectangular Weir
Summary for Pond 8P: Pond 2

Inflow Area = 951,172 sf, 49.95% Impervious, Inflow Depth = 2.48" for 100 yr 24 hr event
Inflow = 77.04 cfs @ 12.05 hrs, Volume= 196,847 cf
Outflow = 17.28 cfs @ 12.33 hrs, Volume= 144,204 cf, Atten= 78%, Lag= 17.2 min
Primary = 17.28 cfs @ 12.33 hrs, Volume= 144,204 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 449.87' @ 12.33 hrs Surf.Area= 40,257 sf Storage= 82,652 cf

Plug-Flow detention time= 196.6 min calculated for 144,156 cf (73% of inflow)
Center-of-Mass det. time= 95.1 min (942.1 - 847.0)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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</thead>
<tbody>
<tr>
<td>#1</td>
<td>446.99'</td>
<td>88,156 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>446.99</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>447.00</td>
<td>22,463</td>
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<td>449.00</td>
<td>29,760</td>
<td>52,223</td>
<td>52,335</td>
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<tr>
<td>450.00</td>
<td>41,882</td>
<td>35,821</td>
<td>88,156</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 449.00' 8.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=17.28 cfs @ 12.33 hrs HW=449.87" (Free Discharge)
↑1=Broad-Crested Rectangular Weir (Weir Controls 17.28 cfs @ 2.49 fps)
Pond 8P: Pond 2

Inflow Area = 951,172 sf
Inflow = 77.04 cfs @ 12.05 hrs
Primary = 17.28 cfs @ 12.33 hrs
Peak Elev = 449.87'
Storage = 82,652 cf

Pond 8P: Pond 2

Stage-Discharge

Discharge (cfs)

Elevation (feet)
Pond 8P: Pond 2

Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)

Storage (cubic-feet)

Elevation (feet)

Custom Stage Data