# JURISDICTIONAL ASSESSMENT OF DEPRESSION ON THE NORTH SIDE OF JOHN VERTENTE BLVD. EXTENSION

**PREPARED BY:**

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**LAKEVILLE, MA**

**NOVEMBER 4, 2019**

## 1.0 INTRODUCTION

It is proposed to construct a ground mounted, photovoltaic solar array off John Vertente Boulevard. There are Bordering Vegetated Wetlands and isolated vegetated depressions involved. This requires the submission of a Notice of Intent to the Dartmouth and New Bedford Conservation Commissions. This Narrative has been prepared in support of those Petitions.

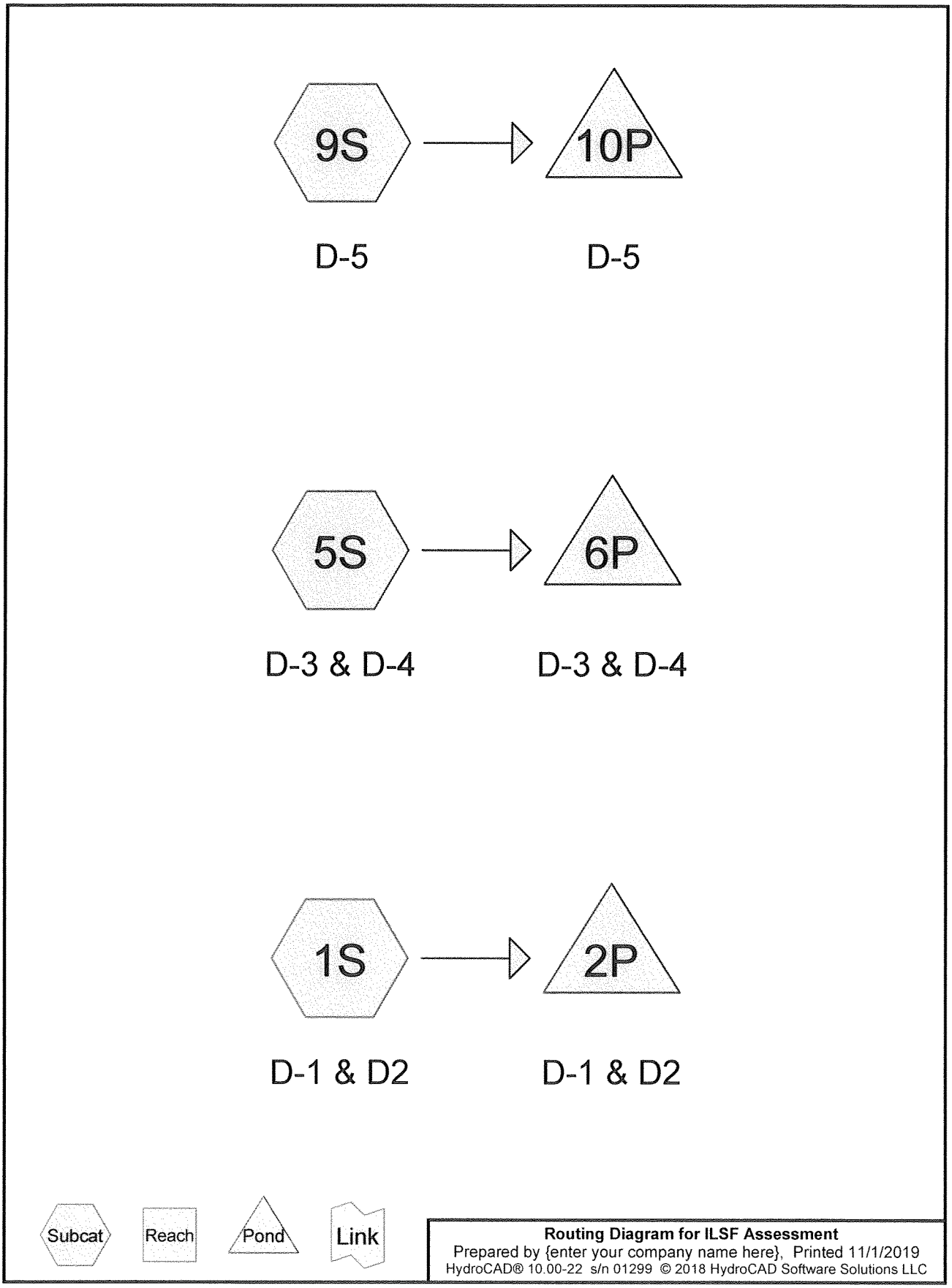
## 2.0 EXISTING CONDITIONS

The Site is a forty-two acre wooded parcel with over 1,300 feet of frontage on John Vertente Blvd. Eighteen acres are in New Bedford, and twenty-four acres are in Dartmouth. It is referenced as Map 85, Lots 8-3, 8-4 and 9 on the Dartmouth Assessor's maps. It is Map 135, Lots 1, 14, 15 and 47 in New Bedford. There are wetlands on all seven parcels. The soils include Paxton sandy loam which is in hydrologic Group C and Freetown and Scarboro muck which are in hydrologic soils Group D. The balance of the site is Windsor loamy sand, Hinckley gravely fine sand and Pipestone loamy sand, all of which are in hydrologic soil Group A. There are over a dozen areas where historic sand and gravel mining has occurred. Where these excavations intercepted the groundwater, wetland vegetation has developed. Some of these are jurisdictional and some are not. In order to determine if these depressions are jurisdictional with respect to the MA wetland regulations, a one year 24 hour design storm was calculated within the contributing drainage area assuming no infiltration within the inundated area. The topography for the majority of the site is from LIDAR, which is not precise enough for accurate volume determination, so a survey crew conducted on the ground topography in the depresssions. If the resultant volume exceeded a quarter acre foot and averaged a 6 inch depth, the depression was deemed jurisdictional. If the depression was jurisdictional, the computations were repeated using 7.0 inches of rainfall. The lateral extent of that volume established the limit of the Isolated Land Subject to Flooding (ILSF). Note that there is no buffer to ILSF with respect to the MA wetland regulations. Also note that there is no significance to the wetland flags that were placed around the depressions. Dartmouth has its own criteria for determining whether Isolated Land Subject to Flooding is jurisdictional. A 4.4 inch rainfall is calculated over the contributing drainage area. If that volume takes up an area of 1,000 square feet or more, it is considered jurisdictional. If it is jurisdictional, the lateral extent is derived by calculating the runoff volume from 7.1 inches of rainfall over the contributing drainage area. Refer to a set of plans entitled "Jurisdictional Isolated Land Subject to Flooding Assessment" dated November 1, 2019.

There are no certified vernal pools on site. MA GIS Oliver does show three vernal pools on site identified as # 1892, 1893 and 1894. Information on those vernal pools was requested from NHESP. NHESP agreed that the vernal pools are not located on the subject site, but are, in fact, located 1,000 feet to the south at the existing Aerovox site. There are several uncertified vernal pools on the site labeled as "Wetland 1" and "Wetland 2" on the plans. Both are located in Dartmouth approximately 600 feet north of John Vertente Boulevard. These were assessed by Matthew R. Burne in late April and early June 2019. He reported Wetland 1 qualified as a vernal pool but did not feel Wetland 2 qualified. Nevertheless, the proponent will voluntarily protect Wetland 2 as if it were certifiable as a vernal pool.

The appended hydrologic computations assess five depressions in Dartmouth designated as D-1

through D-5 and three depressions in New Bedford designated as NB-1 through NB-3. None of the New Bedford depressions are jurisdictional. Depressions D-1 and D-2 merged into a combined jurisdictional wetland shown as the grey shaded area on the plans. Depressions D-3 and D-4 also merged into a combined jurisdictional wetlands shown as the gray shaded area on the plans.


9S
10P
D-5
D-5
5S
6P
D-3 & D-4
D-3 & D-4
1S
2P
D-1 & D2
D-1 & D2
Subcat
Reach
Pond
Link
Routing Diagram for ILSF Assessment
Prepared by {enter your company name here}, Printed 11/1/2019
HydroCAD® 10.00-22 s/n 01299 © 2018 HydroCAD Software Solutions LLC

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.164 | 98 | Paved roads w/curbs & sewers, HSG A (1S) |
| 0.128 | 98 | Water Surface, HSG A (1S, 5S) |
| 5.295 | 30 | Woods, Good, HSG A (1S, 5S, 9S) |
| 0.014 | 70 | Woods, Good, HSG C (5S) |
| 0.519 | 77 | Woods, Good, HSG D (1S) |
| **6.120** | **37** | **TOTAL AREA** |

## Soil Listing (selected nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 5.586 | HSG A | 1S, 5S, 9S |
| 0.000 | HSG B | |
| 0.014 | HSG C | 5S |
| 0.519 | HSG D | 1S |
| 0.000 | Other | |
| **6.120** | | **TOTAL AREA** |

## Ground Covers (selected nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.164 | 0.000 | 0.000 | 0.000 | 0.000 | 0.164 | Paved roads w/curbs & sewers | 1S |
| 0.128 | 0.000 | 0.000 | 0.000 | 0.000 | 0.128 | Water Surface | 1S, 5S |
| 5.295 | 0.000 | 0.014 | 0.519 | 0.000 | 5.828 | Woods, Good | 1S, 5S, 9S |
| **5.586** | **0.000** | **0.014** | **0.519** | **0.000** | **6.120** | **TOTAL AREA** | |

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

**Subcatchment1S: D-1 & D2** Runoff Area=61,645 sf 12.84% Impervious Runoff Depth>0.63"
Flow Length=126' Tc=72.7 min CN=56 Runoff=0.33 cfs 0.075 af

**Subcatchment5S: D-3 & D-4** Runoff Area=36,990 sf 12.94% Impervious Runoff Depth>0.06"
Flow Length=132' Tc=85.0 min CN=39 Runoff=0.01 cfs 0.004 af

**Subcatchment9S: D-5** Runoff Area=167,935 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=633' Tc=116.4 min CN=30 Runoff=0.00 cfs 0.000 af

**Pond 2P: D-1 & D2** Peak Elev=91.81' Storage=3,254 cf Inflow=0.33 cfs 0.075 af
Outflow=0.00 cfs 0.000 af

**Pond 6P: D-3 & D-4** Peak Elev=90.04' Storage=186 cf Inflow=0.01 cfs 0.004 af
Outflow=0.00 cfs 0.000 af

**Pond 10P: D-5** Peak Elev=90.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

**Total Runoff Area = 6.120 ac Runoff Volume = 0.079 af Average Runoff Depth = 0.16"**
**95.24% Pervious = 5.828 ac 4.76% Impervious = 0.292 ac**

## Summary for Subcatchment 1S: D-1 & D2

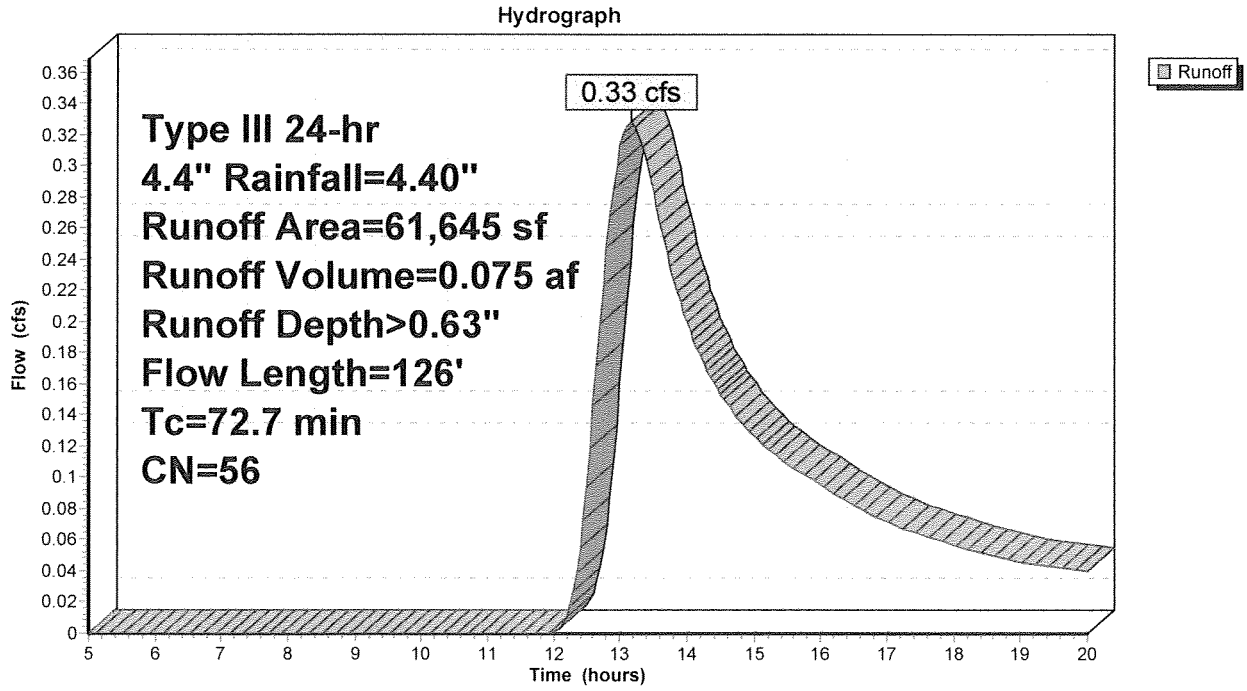
Runoff = 0.33 cfs @ 13.17 hrs, Volume= 0.075 af, Depth> 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 4.4" Rainfall=4.40"

| Area (sf) | CN | Description |
|---|---|---|
| 22,607 | 77 | Woods, Good, HSG D |
| 17,467 | 30 | Woods, Good, HSG A |
| 13,656 | 30 | Woods, Good, HSG A |
| 7,130 | 98 | Paved roads w/curbs & sewers, HSG A |
| 785 | 98 | Water Surface, HSG A |
| 61,645 | 56 | Weighted Average |
| 53,730 | | 87.16% Pervious Area |
| 7,915 | | 12.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 76 | 0.0260 | 0.81 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 71.1 | 50 | 0.0600 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 72.7 | 126 | Total | | | |

## Subcatchment 1S: D-1 & D2



## Summary for Subcatchment 5S: D-3 & D-4

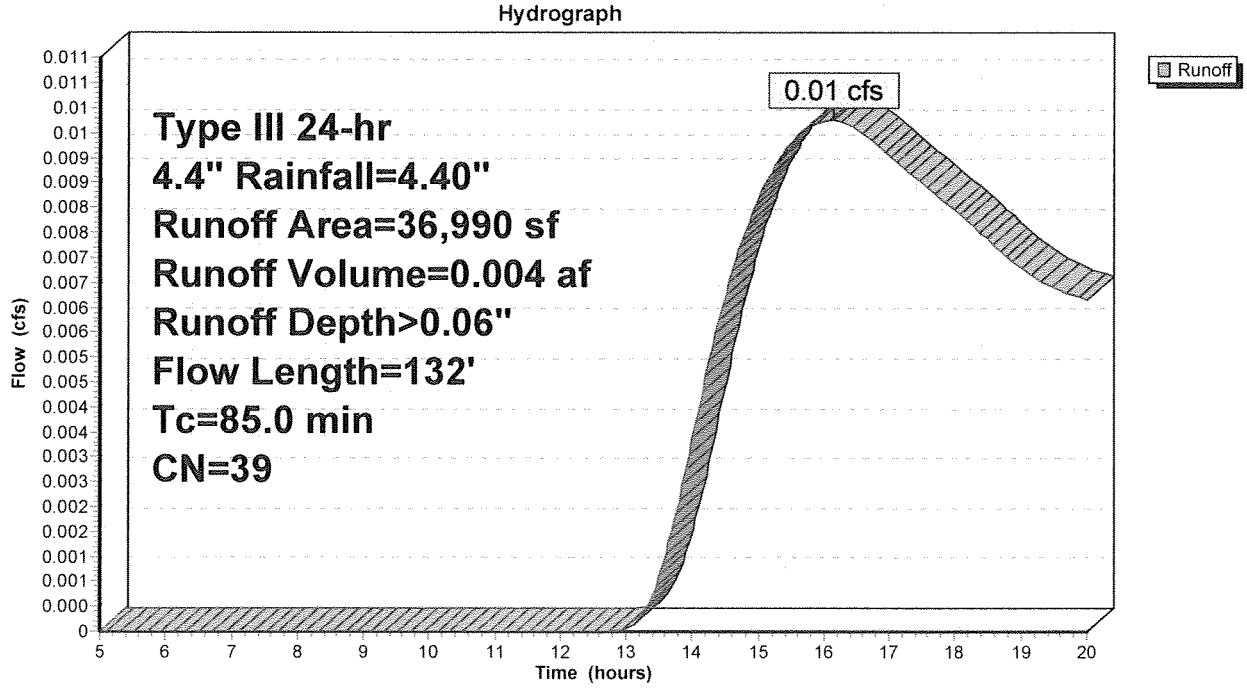
Runoff = 0.01 cfs @ 16.13 hrs, Volume= 0.004 af, Depth> 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 4.4" Rainfall=4.40"

| Area (sf) | CN | Description |
|---|---|---|
| 31,577 | 30 | Woods, Good, HSG A |
| 626 | 70 | Woods, Good, HSG C |
| 4,787 | 98 | Water Surface, HSG A |
| 36,990 | 39 | Weighted Average |
| 32,203 | | 87.06% Pervious Area |
| 4,787 | | 12.94% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 83.6 | 50 | 0.0400 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 1.4 | 82 | 0.0360 | 0.95 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 85.0 | 132 | Total | | | |

### Subcatchment 5S: D-3 & D-4



## Summary for Subcatchment 9S: D-5

[45] Hint: Runoff=Zero

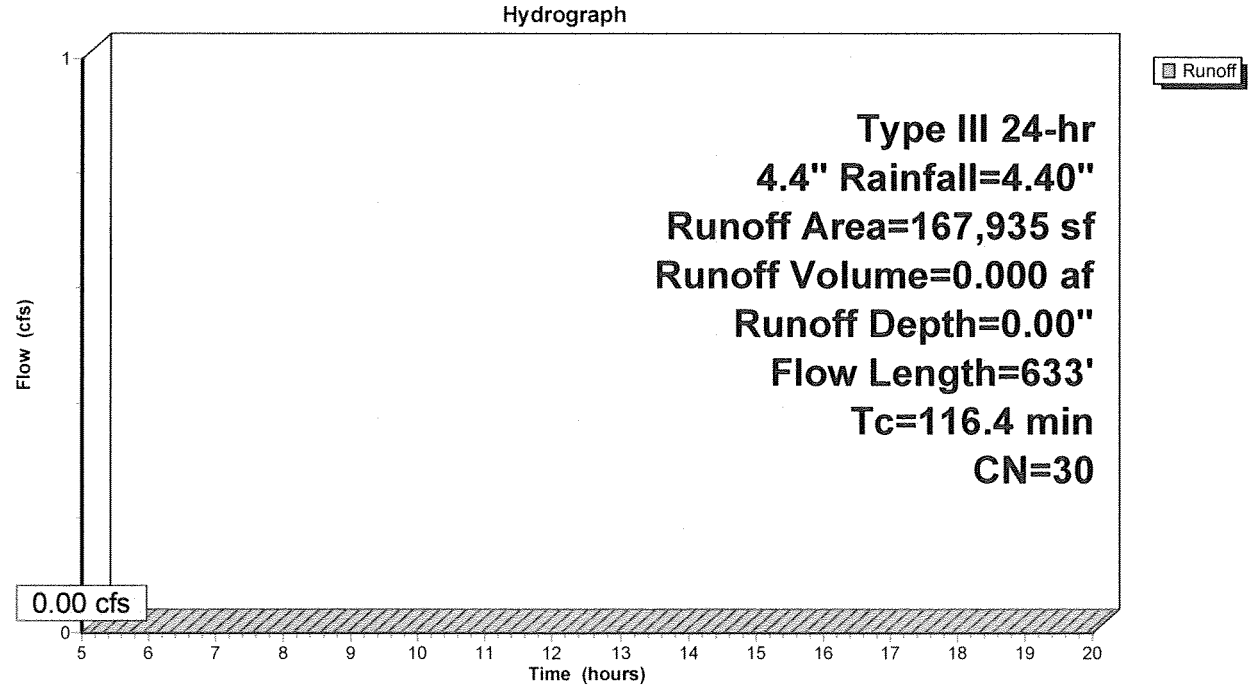
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 4.4" Rainfall=4.40"

| Area (sf) | CN | Description |
|---|---|---|
| 133,776 | 30 | Woods, Good, HSG A |
| 34,159 | 30 | Woods, Good, HSG A |
| 167,935 | 30 | Weighted Average |
| 167,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 83.6 | 50 | 0.0400 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 32.8 | 583 | 0.0035 | 0.30 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 116.4 | 633 | Total | | | |

### Subcatchment 9S: D-5



## Summary for Pond 2P: D-1 & D2

Inflow Area = 1.415 ac, 12.84% Impervious, Inflow Depth > 0.63" for 4.4" event
Inflow = 0.33 cfs @ 13.17 hrs, Volume= 0.075 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

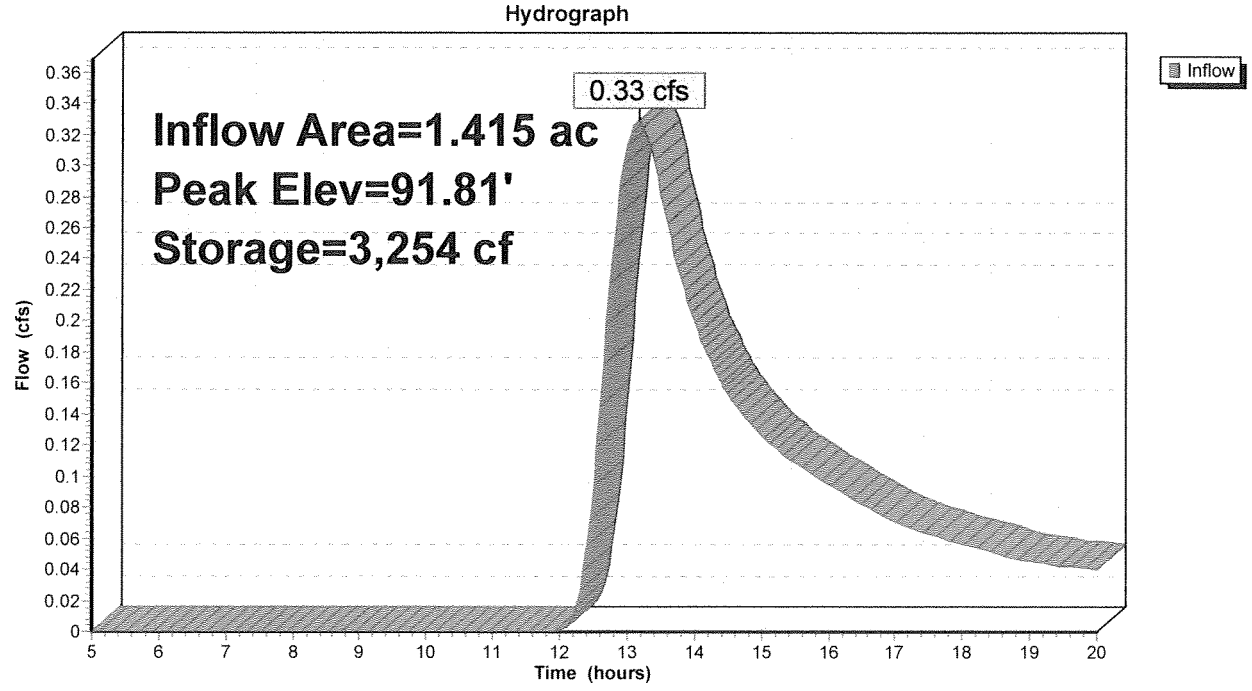
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.81' @ 20.00 hrs Surf.Area= 7,313 sf Storage= 3,254 cf

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

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 91.00' | 17,012 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 91.00 | 671 | 0 | 0 |
| 92.00 | 8,821 | 4,746 | 4,746 |
| 93.00 | 15,711 | 12,266 | 17,012 |

## Pond 2P: D-1 & D2



## Summary for Pond 6P: D-3 & D-4

Inflow Area = 0.849 ac, 12.94% Impervious, Inflow Depth > 0.06" for 4.4" event
Inflow = 0.01 cfs @ 16.13 hrs, Volume= 0.004 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

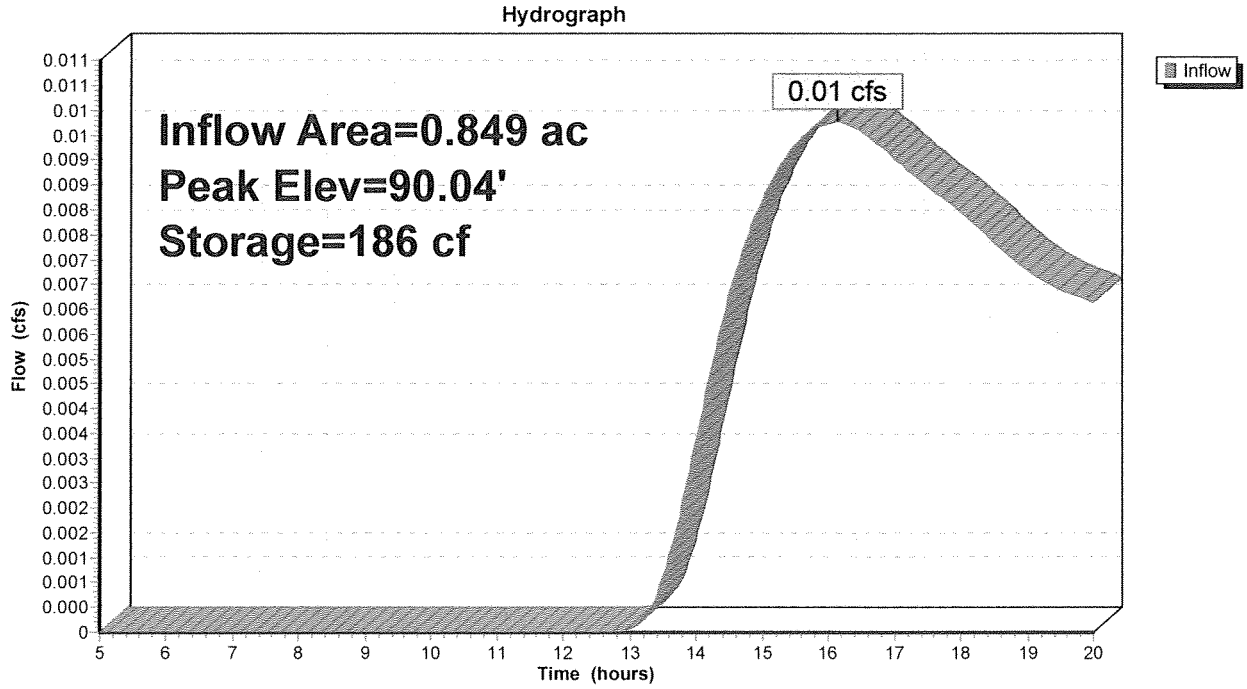
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.04' @ 20.00 hrs Surf.Area= 4,872 sf Storage= 186 cf

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

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 90.00' | 7,467 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 90.00 | 4,653 | 0 | 0 |
| 91.00 | 10,280 | 7,467 | 7,467 |

## Pond 6P: D-3 & D-4



## Summary for Pond 10P: D-5

Inflow Area = 3.855 ac, 0.00% Impervious, Inflow Depth = 0.00" for 4.4" event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

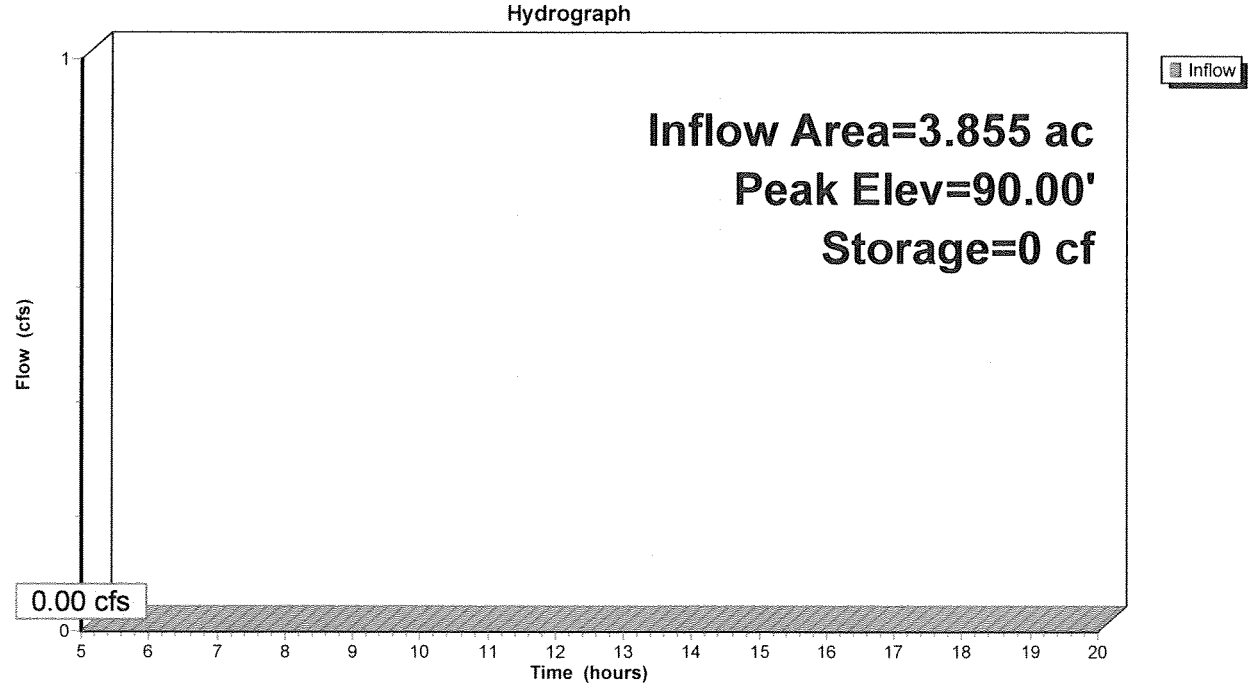
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.00' @ 5.00 hrs Surf.Area= 96 sf Storage= 0 cf

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

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 90.00' | 5,786 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 90.00 | 96 | 0 | 0 |
| 91.00 | 11,475 | 5,786 | 5,786 |

## Pond 10P: D-5



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

**Subcatchment1S: D-1 & D2** Runoff Area=61,645 sf 12.84% Impervious Runoff Depth>2.02"
Flow Length=126' Tc=72.7 min CN=56 Runoff=1.24 cfs 0.238 af

**Subcatchment5S: D-3 & D-4** Runoff Area=36,990 sf 12.94% Impervious Runoff Depth>0.65"
Flow Length=132' Tc=85.0 min CN=39 Runoff=0.16 cfs 0.046 af

**Subcatchment9S: D-5** Runoff Area=167,935 sf 0.00% Impervious Runoff Depth>0.15"
Flow Length=633' Tc=116.4 min CN=30 Runoff=0.11 cfs 0.048 af

**Pond 2P: D-1 & D2** Peak Elev=92.53' Storage=10,348 cf Inflow=1.24 cfs 0.238 af
Outflow=0.00 cfs 0.000 af

**Pond 6P: D-3 & D-4** Peak Elev=90.36' Storage=2,007 cf Inflow=0.16 cfs 0.046 af
Outflow=0.00 cfs 0.000 af

**Pond 10P: D-5** Peak Elev=90.60' Storage=2,082 cf Inflow=0.11 cfs 0.048 af
Outflow=0.00 cfs 0.000 af

**Total Runoff Area = 6.120 ac Runoff Volume = 0.332 af Average Runoff Depth = 0.65"**
**95.24% Pervious = 5.828 ac 4.76% Impervious = 0.292 ac**

## Summary for Subcatchment 1S: D-1 & D2

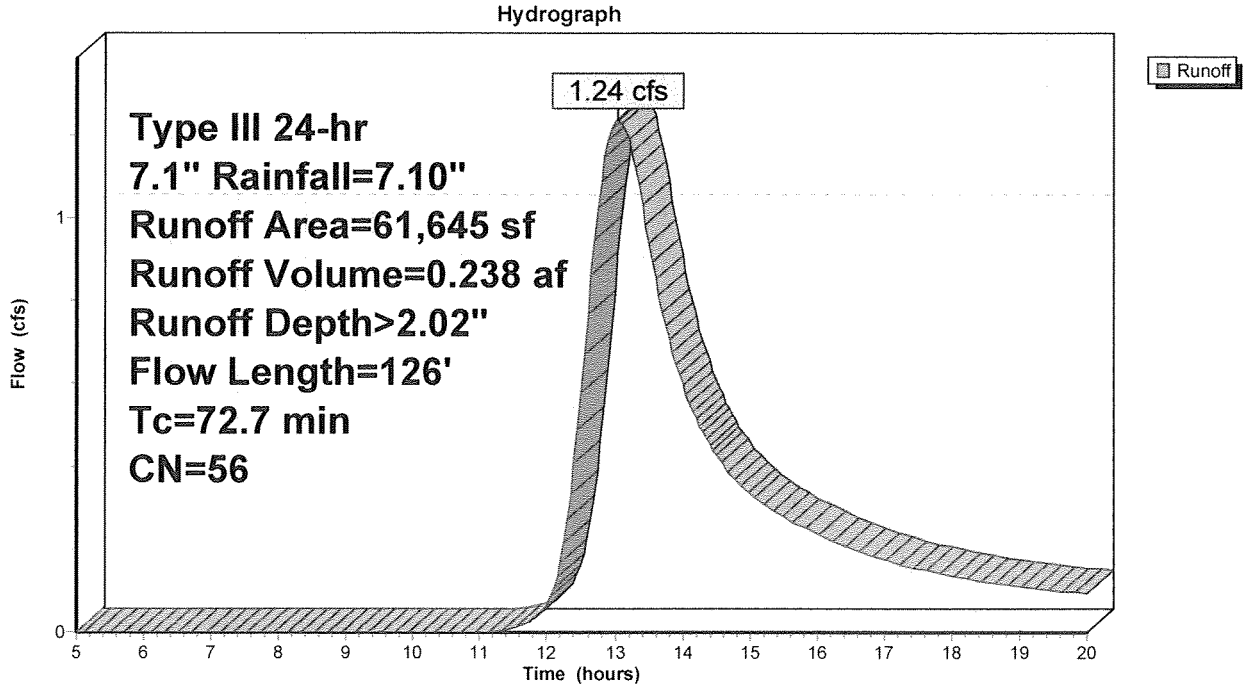
Runoff = 1.24 cfs @ 13.04 hrs, Volume= 0.238 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 7.1" Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 22,607 | 77 | Woods, Good, HSG D |
| 17,467 | 30 | Woods, Good, HSG A |
| 13,656 | 30 | Woods, Good, HSG A |
| 7,130 | 98 | Paved roads w/curbs & sewers, HSG A |
| 785 | 98 | Water Surface, HSG A |
| 61,645 | 56 | Weighted Average |
| 53,730 | | 87.16% Pervious Area |
| 7,915 | | 12.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 76 | 0.0260 | 0.81 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 71.1 | 50 | 0.0600 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 72.7 | 126 | Total | | | |

## Subcatchment 1S: D-1 & D2



## Summary for Subcatchment 5S: D-3 & D-4

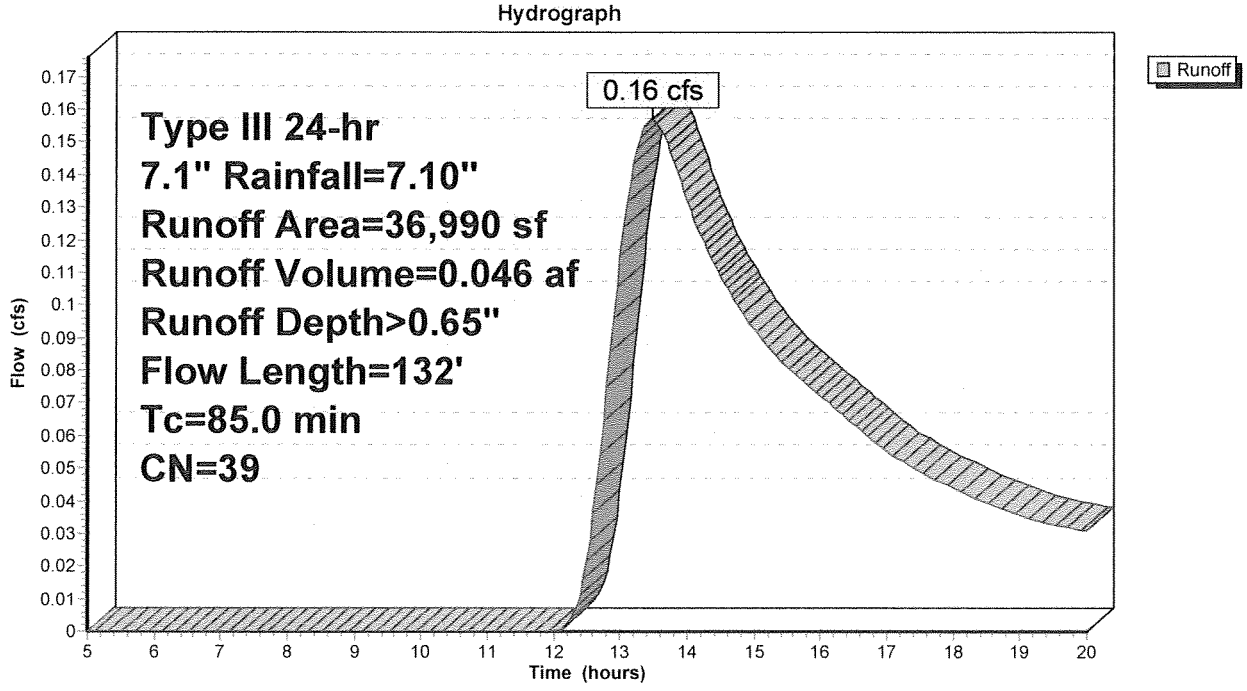
Runoff = 0.16 cfs @ 13.49 hrs, Volume= 0.046 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 7.1" Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 31,577 | 30 | Woods, Good, HSG A |
| 626 | 70 | Woods, Good, HSG C |
| 4,787 | 98 | Water Surface, HSG A |
| 36,990 | 39 | Weighted Average |
| 32,203 | | 87.06% Pervious Area |
| 4,787 | | 12.94% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 83.6 | 50 | 0.0400 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 1.4 | 82 | 0.0360 | 0.95 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 85.0 | 132 | Total | | | |

### Subcatchment 5S: D-3 & D-4



## Summary for Subcatchment 9S: D-5

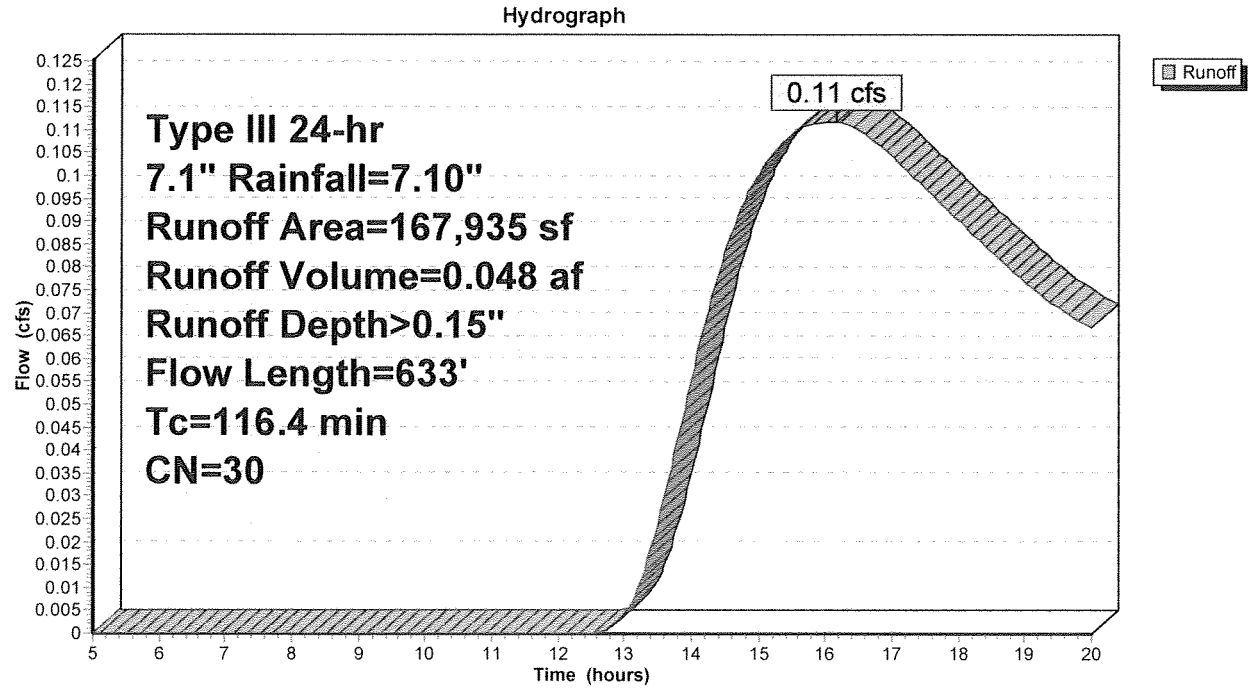
Runoff = 0.11 cfs @ 16.15 hrs, Volume= 0.048 af, Depth> 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 7.1" Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 133,776 | 30 | Woods, Good, HSG A |
| 34,159 | 30 | Woods, Good, HSG A |
| 167,935 | 30 | Weighted Average |
| 167,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 83.6 | 50 | 0.0400 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 32.8 | 583 | 0.0035 | 0.30 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 116.4 | 633 | Total | | | |

## Subcatchment 9S: D-5



## Summary for Pond 2P: D-1 & D2

Inflow Area = 1.415 ac, 12.84% Impervious, Inflow Depth > 2.02" for 7.1" event
Inflow = 1.24 cfs @ 13.04 hrs, Volume= 0.238 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

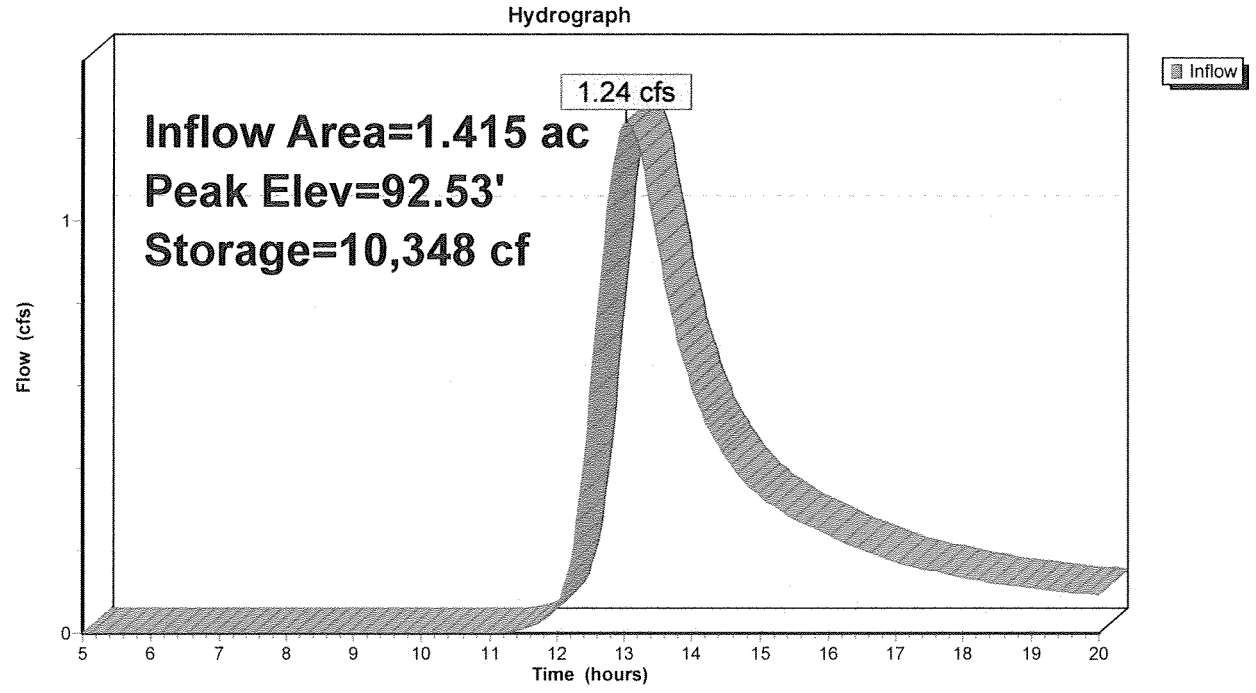
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.53' @ 20.00 hrs Surf.Area= 12,450 sf Storage= 10,348 cf

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

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 91.00' | 17,012 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 91.00 | 671 | 0 | 0 |
| 92.00 | 8,821 | 4,746 | 4,746 |
| 93.00 | 15,711 | 12,266 | 17,012 |

## Pond 2P: D-1 & D2



## Summary for Pond 6P: D-3 & D-4

Inflow Area = 0.849 ac, 12.94% Impervious, Inflow Depth > 0.65" for 7.1" event
Inflow = 0.16 cfs @ 13.49 hrs, Volume= 0.046 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

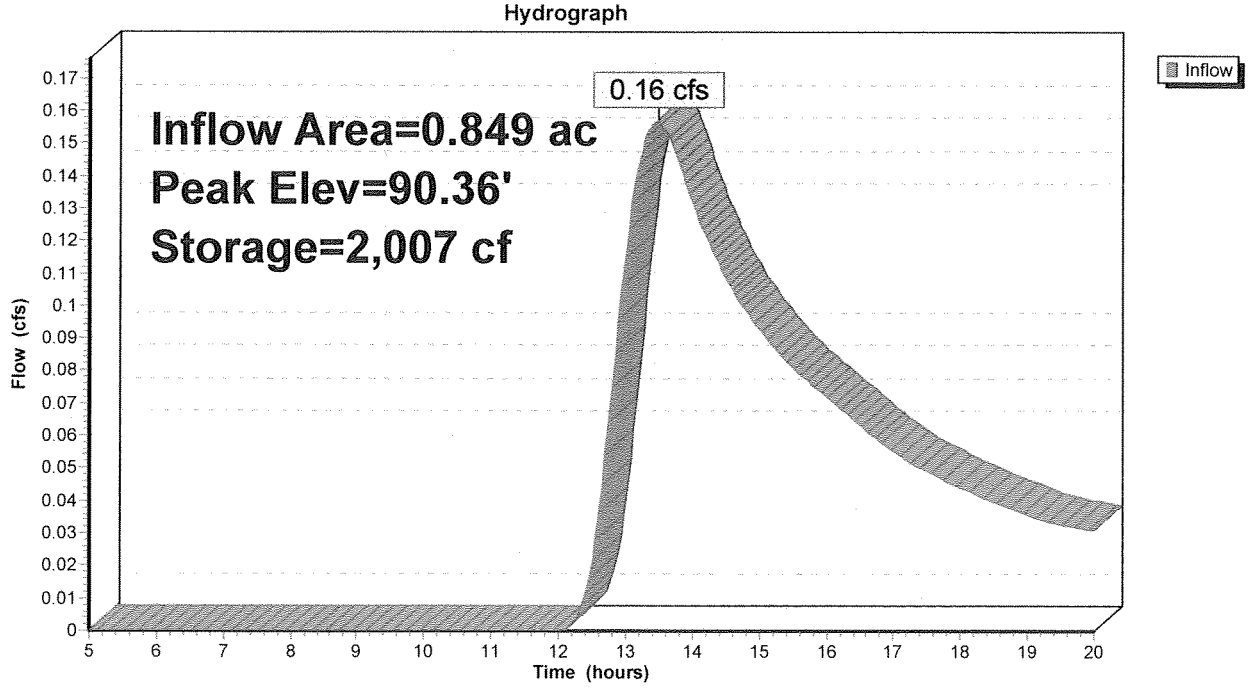
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.36' @ 20.00 hrs Surf.Area= 6,651 sf Storage= 2,007 cf

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

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 90.00' | 7,467 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 90.00 | 4,653 | 0 | 0 |
| 91.00 | 10,280 | 7,467 | 7,467 |

### Pond 6P: D-3 & D-4



## Summary for Pond 10P: D-5

Inflow Area = 3.855 ac, 0.00% Impervious, Inflow Depth > 0.15" for 7.1" event
Inflow = 0.11 cfs @ 16.15 hrs, Volume= 0.048 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

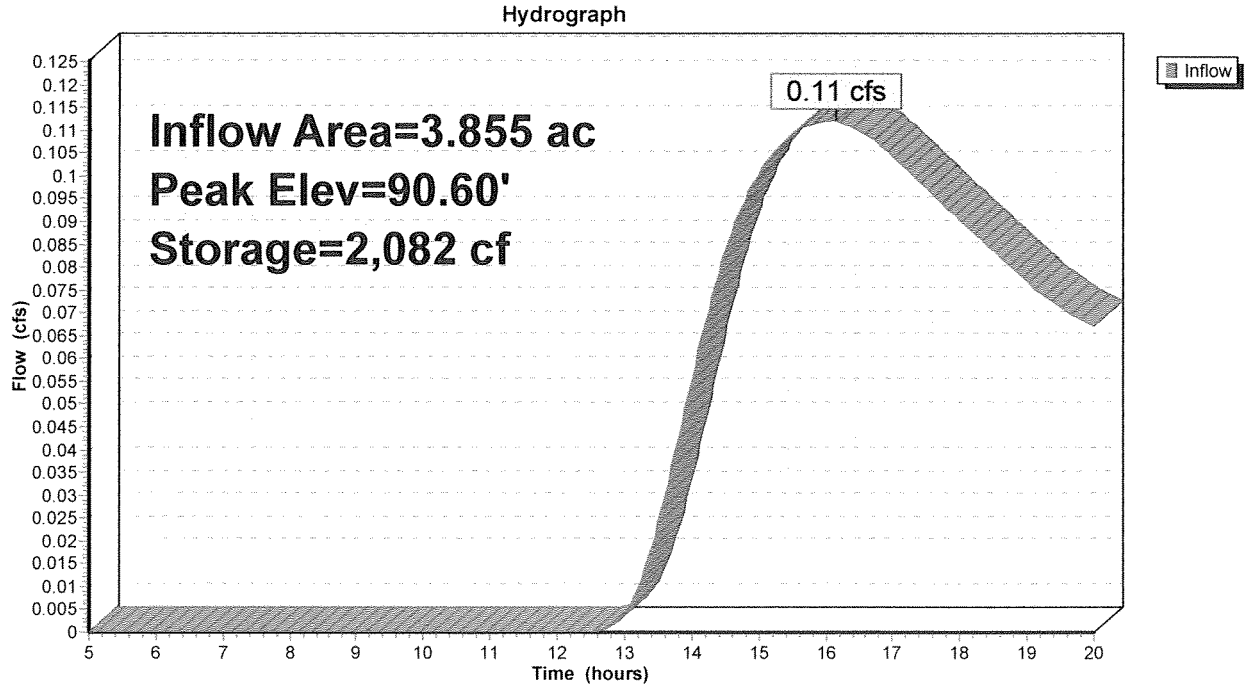
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.60' @ 20.00 hrs Surf.Area= 6,883 sf Storage= 2,082 cf

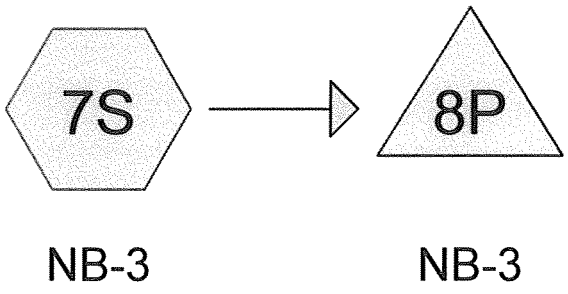
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

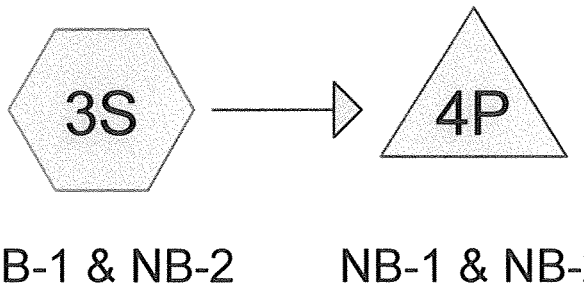
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 90.00' | 5,786 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 90.00 | 96 | 0 | 0 |
| 91.00 | 11,475 | 5,786 | 5,786 |

## Pond 10P: D-5






Subcat Reach Pond Link

**Routing Diagram for ILSF Assessment**
Prepared by {enter your company name here}, Printed 11/1/2019

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.030 | 98 | Paved roads w/curbs & sewers, HSG A (3S) |
| 0.041 | 98 | Water Surface, HSG A (3S, 7S) |
| 0.343 | 30 | Woods, Good, HSG A (3S, 7S) |
| 1.051 | 70 | Woods, Good, HSG C (3S, 7S) |
| **1.466** | **62** | **TOTAL AREA** |

## Soil Listing (selected nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.414 | HSG A | 3S, 7S |
| 0.000 | HSG B | |
| 1.051 | HSG C | 3S, 7S |
| 0.000 | HSG D | |
| 0.000 | Other | |
| **1.466** | | **TOTAL AREA** |

## Ground Covers (selected nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.030 | 0.000 | 0.000 | 0.000 | 0.000 | 0.030 | Paved roads w/curbs & sewers | 3S |
| 0.041 | 0.000 | 0.000 | 0.000 | 0.000 | 0.041 | Water Surface | 3S, 7S |
| 0.343 | 0.000 | 1.051 | 0.000 | 0.000 | 1.395 | Woods, Good | 3S, 7S |
| **0.414** | **0.000** | **1.051** | **0.000** | **0.000** | **1.466** | **TOTAL AREA** | |

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

**Subcatchment3S: NB-1 & NB-2** Runoff Area=38,576 sf 6.25% Impervious Runoff Depth>0.20"
Flow Length=71' Tc=83.8 min CN=63 Runoff=0.05 cfs 0.014 af

**Subcatchment7S: NB-3** Runoff Area=25,272 sf 2.70% Impervious Runoff Depth>0.15"
Flow Length=64' Tc=83.8 min CN=61 Runoff=0.02 cfs 0.007 af

**Pond 4P: NB-1 & NB-2** Peak Elev=90.63' Storage=627 cf Inflow=0.05 cfs 0.014 af
Outflow=0.00 cfs 0.000 af

**Pond 8P: NB-3** Peak Elev=90.72' Storage=322 cf Inflow=0.02 cfs 0.007 af
Outflow=0.00 cfs 0.000 af

**Total Runoff Area = 1.466 ac Runoff Volume = 0.022 af Average Runoff Depth = 0.18"**
**95.15% Pervious = 1.395 ac 4.85% Impervious = 0.071 ac**

## Summary for Subcatchment 3S: NB-1 & NB-2

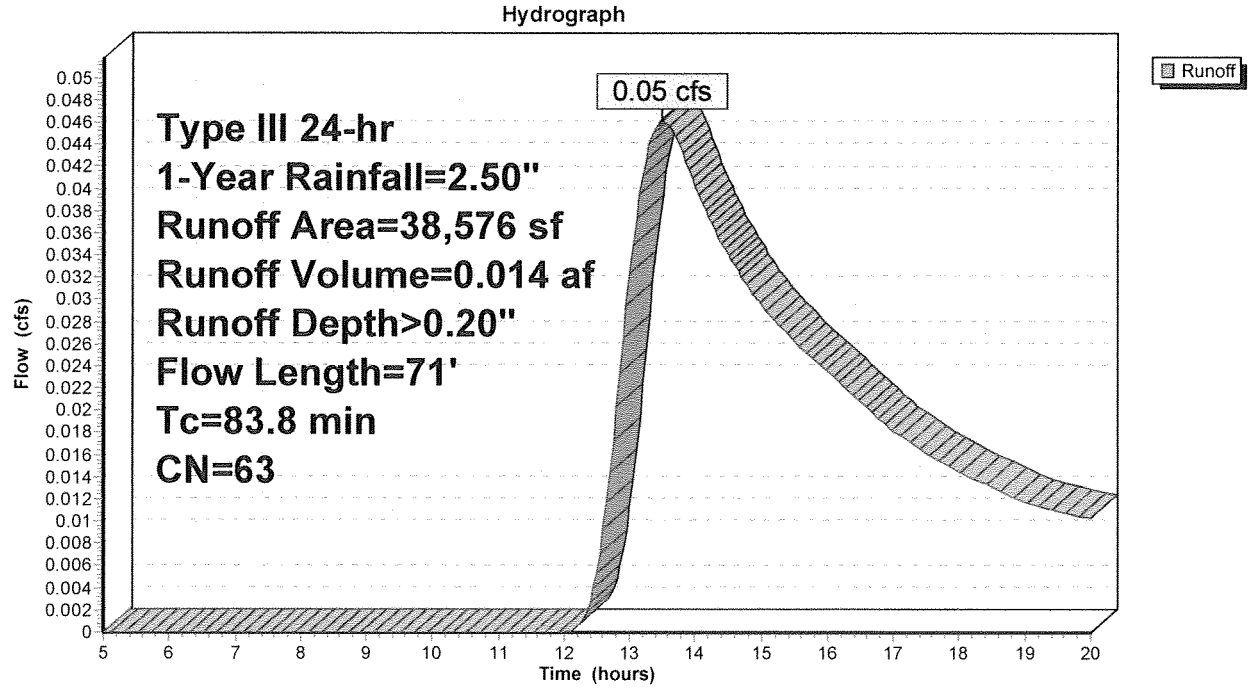
Runoff = 0.05 cfs @ 13.51 hrs, Volume= 0.014 af, Depth> 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 8,585 | 30 | Woods, Good, HSG A |
| 27,579 | 70 | Woods, Good, HSG C |
| 1,321 | 98 | Paved roads w/curbs & sewers, HSG A |
| 1,091 | 98 | Water Surface, HSG A |
| 38,576 | 63 | Weighted Average |
| 36,164 | | 93.75% Pervious Area |
| 2,412 | | 6.25% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.2 | 21 | 0.1000 | 1.58 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 83.6 | 50 | 0.0400 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 83.8 | 71 | Total | | | |

## Subcatchment 3S: NB-1 & NB-2



## Summary for Subcatchment 7S: NB-3

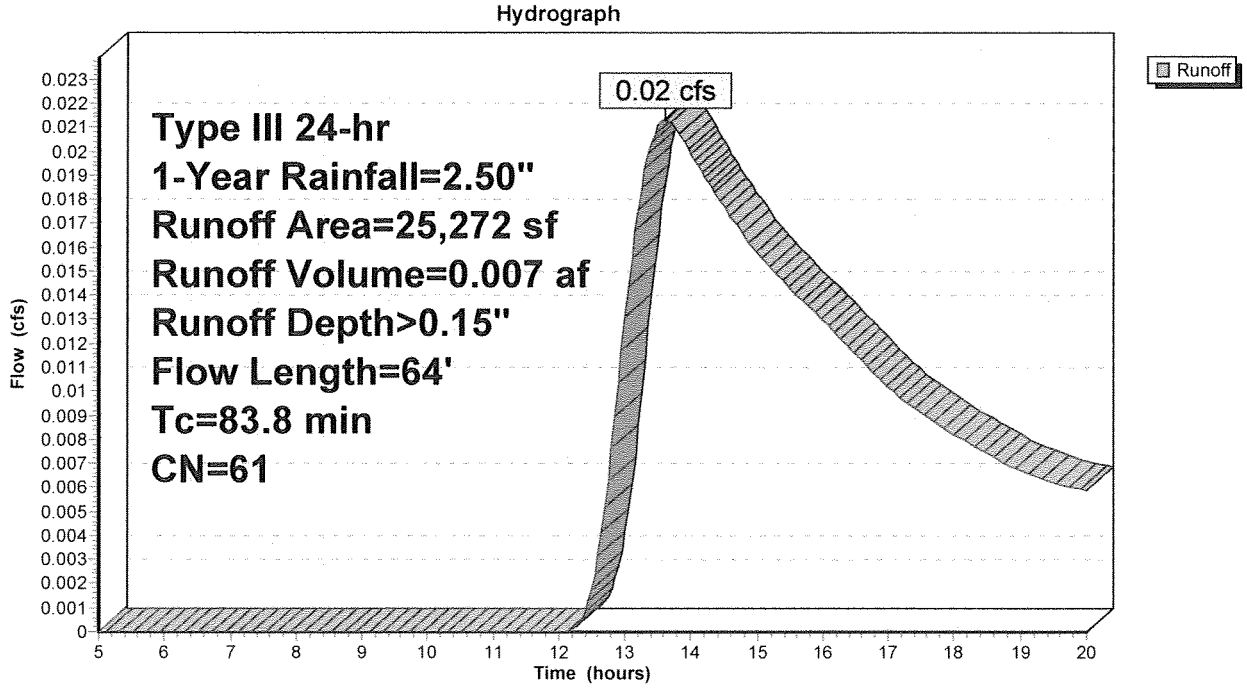
Runoff = 0.02 cfs @ 13.62 hrs, Volume= 0.007 af, Depth> 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 6,375 | 30 | Woods, Good, HSG A |
| 18,214 | 70 | Woods, Good, HSG C |
| 683 | 98 | Water Surface, HSG A |
| 25,272 | 61 | Weighted Average |
| 24,589 | | 97.30% Pervious Area |
| 683 | | 2.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 83.6 | 50 | 0.0400 | 0.01 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 0.04" |
| 0.2 | 14 | 0.0740 | 1.36 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 83.8 | 64 | Total | | | |

## Subcatchment 7S: NB-3



## Summary for Pond 4P: NB-1 & NB-2

Inflow Area = 0.886 ac, 6.25% Impervious, Inflow Depth > 0.20" for 1-Year event
Inflow = 0.05 cfs @ 13.51 hrs, Volume= 0.014 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.63' @ 20.00 hrs Surf.Area= 1,613 sf Storage= 627 cf

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

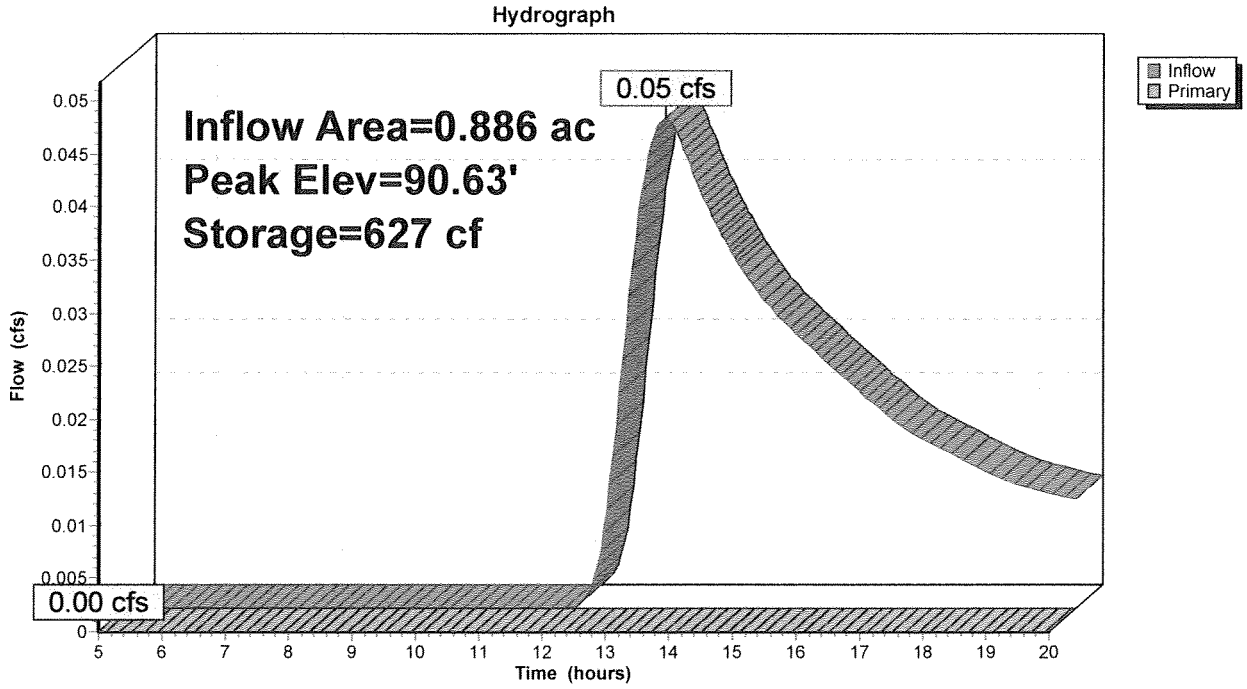
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 90.00' | 1,590 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 90.00 | 374 | 0 | 0 |
| 91.00 | 2,339 | 1,357 | 1,357 |
| 91.10 | 2,339 | 234 | 1,590 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 91.00' | **140.0' long x 5.0' breadth Broad-Crested Rectangular Weir**<br>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<br>Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 4P: NB-1 & NB-2



## Summary for Pond 8P: NB-3

Inflow Area = 0.580 ac, 2.70% Impervious, Inflow Depth > 0.15" for 1-Year event
Inflow = 0.02 cfs @ 13.62 hrs, Volume= 0.007 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.72' @ 20.00 hrs Surf.Area= 868 sf Storage= 322 cf

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

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 90.00' | 7,770 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 90.00 | 23 | 0 | 0 |
| 91.00 | 1,193 | 608 | 608 |
| 92.00 | 3,445 | 2,319 | 2,927 |
| 93.00 | 6,241 | 4,843 | 7,770 |

### Pond 8P: NB-3