

APPLICATION FOR CONSIDERATION OF PLANNING REQUEST

Stillwater Township
13636 90th Street North
Stillwater, Minnesota 55082
PHONE: 651/439-4120

ESCROW: \$3,000.00
FEE: \$380.00

Make checks payable to Stillwater Township.

Receipt No

Street Location of Property: <u>XXXXX Partridge Road North</u>		Receipt No
Legal Description of Property: <u>See Attached</u>		
Parcel Identification Number (PIN): <u>03.030.20.14.0003</u>		
Fee Owner:	Name: <u>William J. Keefer and Mary M. Keefer</u>	Phone: <u>651-269-7416</u>
	Address: <u>5340 Oakgreen Avenue North</u>	
	City/State: <u>Stillwater</u>	Zip: <u>MN</u> Email: <u>keefe033@yahoo.com</u>
Applicant (if other than owner):		
	Name: <u>Mick Lynskey</u>	Phone: <u>651-210-0075</u>
	Address: <u>PO Box 36, 118 South Main Street</u>	
	City/State: <u>Stillwater</u>	Zip: <u>MN</u> Email: <u>mick@lynkeyclark.com</u>
Type of Request:	<input type="checkbox"/> Conditional Use Permit (CUP)	<input type="checkbox"/> Variance
	<input checked="" type="checkbox"/> Subdivision, Major	<input type="checkbox"/> EIS or EAW
	<input type="checkbox"/> Subdivision, Minor	<input type="checkbox"/> PUD
	<input type="checkbox"/> Rezoning	<input type="checkbox"/> Interim Use Permit (IUP)
	<input type="checkbox"/> Comprehensive Plan Amendment	<input type="checkbox"/> Other: _____
Description of Request: <u>Subdivide a 42.55 acre parcel into (4) lots. Lot averaging ordinance uses a 10 acre density which in this case allows for up to (4) total lots with a minimum lot size of 2 acres. We are requesting (4) lots ranging from 7-12 acres. No variances are required or requested for this application.</u>		
Present Zoning Classification: <u>A-4</u>		
Existing Use of the Property: <u>Vacant Land, Agriculture</u>		
Has a request for Rezoning, Variance or Special Use Permit on the subject site or any part thereof been previously sought? <u>NO</u> When? <u>Not Applicable</u>		

For Minor or Major Subdivision Requests, you must provide the name and contact information for the Registered Professional Engineer and Registered Land Surveyor that are currently licensed in Minnesota who will complete the required plans, surveys and documents required for subdivision:

Registered Professional Engineer: Steve Johnston @ Elan
Contact Information (email or phone): sjohnston@elanlab.com
Registered Land Surveyor: Dan Thurmes @ Cornerstone
Contact Information (email or phone): dan@cssurvey.net

In connection with your Application for a Planning Request, your signature constitutes permission for a representative of Stillwater Township, its employee, or designee, to enter upon your property, during normal business hours, for the purpose of evaluating your request. If you wish to be present during such inspection, please contact this office.

I hereby apply for consideration of the above described request and declare that the information and materials submitted with this application are complete and accurate. I understand that no application shall be considered complete unless accompanied by fees and escrows as required by Township

ordinance. Applications for projects requiring more than one type of review shall include the cumulative total of all application fees specified for each type of review.

I hereby certify that I have read this application and state that the above information is correct and that I am the owner or the duly authorized agent of the owner. I agree that all work will comply with all ordinances and codes of the Township of Stillwater, the State of Minnesota, and rulings of the Zoning and Building Departments.

I understand that applicants are required to reimburse the Township for a processing fee (escrow) to cover all out-of-pocket costs incurred for reviewing and administering the application. Those costs shall include, but are not limited to, parcel searches, publication and mailing of notices, review by the Township's engineering, legal, and planning consultants, other legal costs, and recording fees. An escrow deposit to cover the processing fees will be collected by the Township at the time of application. This amount is an estimate of the typical processing fee required for most applications for this use. The Township may require applicants to increase the amount of the required escrow deposit at any time if the Township's costs are reasonably expected to exceed the minimum amount due to the specific costs related to processing this application. Any balance remaining after the application review is complete will be refunded to the applicant. No interest is paid on escrow deposits.

I understand that the Township's Planner, Engineer and Attorney do not represent the applicant. The Township's staff may provide a limited amount of general information (up to one hour) to help applicants to understand permit forms, required submittals, and the permit process. An applicant should not rely upon the Township's staff to help to design the desired project or prepare the necessary submittals. An applicant may need to retain his or her own professional planner, engineer, architect, or attorney to complete the required submittals or assist the applicant during the Township's review process.

I agree to make reimbursement within thirty (30) days of the date of the Township's invoice and notice of costs. In the event I do not reimburse the Township in a prompt manner, the Township may certify the uncollected charges to the County Auditor pursuant to Minn. Stat. 366.012.

Please note: If the fee owner is not the applicant, the applicant must provide written authorization by the fee owner in order for this application to be considered complete.

Signature of Applicant: *Mick Lynskey* Date: 04/16/2019
Authentisign 4/16/2019 2:58:50 PM CDT

Owner (if different from applicant) *William J. Keefer* Date: 04/16/2019
Authentisign 4/16/2019 2:58:50 PM CDT

Mary M. Keefer Date: 04/17/2019
Authentisign 4/17/2019 12:08:47 PM CDT

For Town Use Only:		Date Filed: _____
Fee and Escrow Amounts Paid in Full: <input type="checkbox"/> Yes OR <input type="checkbox"/> No	Total Amount (See Above): _____	
Accepted as Complete on: _____	Received By: _____	
Approved <input type="checkbox"/> Denied <input type="checkbox"/> by the Planning Commission on _____		
Approved <input type="checkbox"/> Denied <input type="checkbox"/> by the Town Board on _____		

LEGAL DESCRIPTION:



That part of the Southeast Quarter of the Northeast Quarter and that part of Government Lot 3 all in Section 3, Township 30, Range 20, Washington County, Minnesota which lies easterly of the centerline of Partridge Road North EXCEPT the south 140.00 feet thereof and EXCEPT the north 404.24 feet of the south 544.24 feet of the east 400.08 feet thereof.



901 N 3rd St, Suite 120
Minneapolis, MN 55401
tel 612.260.7980
fax 612.260.7990
www.elanlab.com

TECHNICAL MEMORANDUM

DATE: November 27, 2018

TO: Mick Lynskey
Bill Keefer

FROM: Steve Johnston, PE

RE: **Keefer Property**
Stillwater Township, MN

INTRODUCTION

This report summarizes the existing drainage conditions for the property located at the SE corner of 116th Street N and Partridge Street N. The property will be divided into 4 lots. This drainage study was performed to determine the high water level in the basins located within these 4 lots.

EXISTING CONDITIONS

The existing property is 42.55 acres. The property is bordered to the North by 116th Street N and to the West by Partridge Street N. The site is currently undeveloped and is located within the Carnelian-Marine-St. Croix Watershed.

The property has two outfalls. The property drains West to the ditch along Partridge Street N. This drainage eventually drains into Little Carnelian Lake. The property also drains to a basin just East of the site.

Based on the NRCS report (see attached), soils on-site and in the off-site areas draining to the site primarily consist of silt loam and sandy loam soils.

DRAINAGE REVIEW

The existing drainage conditions have been analyzed using HydroCAD, refer to the attached report for additional information. The Atlas 14 Precipitation depths for the 2, 10, and 100-year 24 hour events at this location are 2.80", 4.16", and 7.14", respectively.

Four basins are located within the property boundaries. The high water elevations modeled in each basin are listed in Table 1. Basins A, B, and C have been modeled using an infiltration rate of 0.3 in/hr based on the HSG B soils indicated in each basin on the NRCS Soils Report. Basin J has been modeled using an infiltration rate of 0.2 in/hr based on the HSG C soils indicated in the basin on the NRCS Soils Report. None of the basins on-site are listed as wetlands by the National Wetlands Inventory.

Table 1: Peak Elevations in on-site basins.

Basin	100-year HWL	Peak Basin Depth (ft)
A	917.0	1.0
B	901.8	1.8
C	882.6	4.6
J	876.9	4.9

The lowest floor elevation of any home adjacent to these basins shall be set at a minimum of two feet above the HWL.

CONCLUSION

The drainage study should meet district modeling requirements. If you have any questions or need additional information regarding this report, please feel free to contact me at sjohnston@elanlab.com or 612-260-7982.

CERTIFICATION

This report has been prepared by me or under my direct supervision and I am a duly licensed Professional Engineer under the laws of the State of Minnesota.



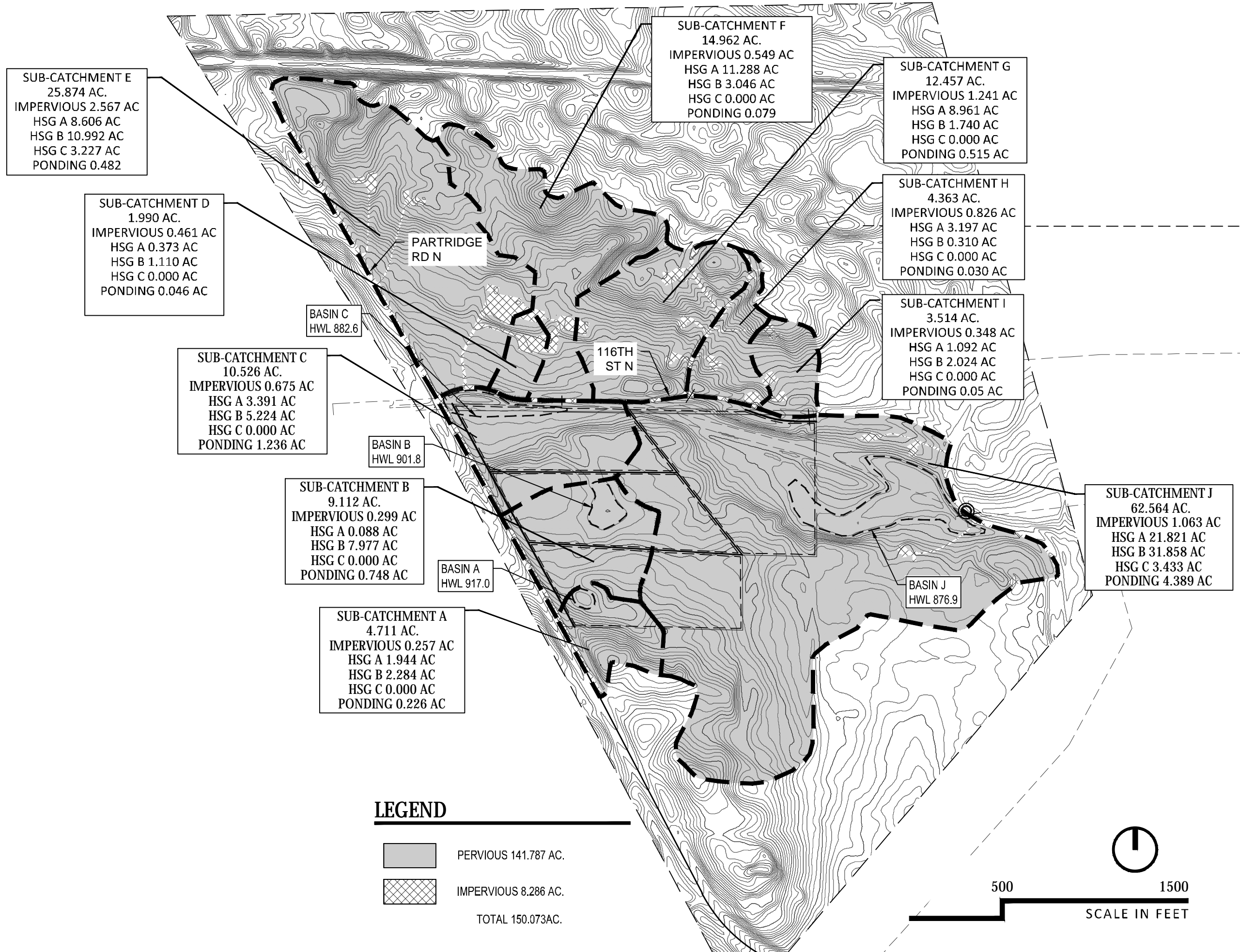
Stephen M. Johnston

November 27, 2018

License # 18914

Encl: Existing Drainage Map
HydroCAD Report
NRCS Soils Report

cc: Élan File No.: LYN17006



SUB-CATCHMENT E
25.874 AC.
IMPERVIOUS 2.567 AC
HSG A 8.606 AC
HSG B 10.992 AC
HSG C 3.227 AC
PONDING 0.482

SUB-CATCHMENT D
1.990 AC.
IMPERVIOUS 0.461 AC
HSG A 0.373 AC
HSG B 1.110 AC
HSG C 0.000 AC
PONDING 0.046 AC

SUB-CATCHMENT C
10.526 AC.
IMPERVIOUS 0.675 AC
HSG A 3.391 AC
HSG B 5.224 AC
HSG C 0.000 AC
PONDING 1.236 AC

SUB-CATCHMENT B
9.112 AC.
IMPERVIOUS 0.299 AC
HSG A 0.088 AC
HSG B 7.977 AC
HSG C 0.000 AC
PONDING 0.748 AC

SUB-CATCHMENT A
4.711 AC.
IMPERVIOUS 0.257 AC
HSG A 1.944 AC
HSG B 2.284 AC
HSG C 0.000 AC
PONDING 0.226 AC

SUB-CATCHMENT F
14.962 AC.
IMPERVIOUS 0.549 AC
HSG A 11.288 AC
HSG B 3.046 AC
HSG C 0.000 AC
PONDING 0.079

SUB-CATCHMENT G
12.457 AC.
IMPERVIOUS 1.241 AC
HSG A 8.961 AC
HSG B 1.740 AC
HSG C 0.000 AC
PONDING 0.515 AC

SUB-CATCHMENT H
4.363 AC.
IMPERVIOUS 0.826 AC
HSG A 3.197 AC
HSG B 0.310 AC
HSG C 0.000 AC
PONDING 0.030 AC

SUB-CATCHMENT I
3.514 AC.
IMPERVIOUS 0.348 AC
HSG A 1.092 AC
HSG B 2.024 AC
HSG C 0.000 AC
PONDING 0.05 AC

SUB-CATCHMENT J
62.564 AC.
IMPERVIOUS 1.063 AC
HSG A 21.821 AC
HSG B 31.858 AC
HSG C 3.433 AC
PONDING 4.389 AC



BASIN C
HWL 882.6

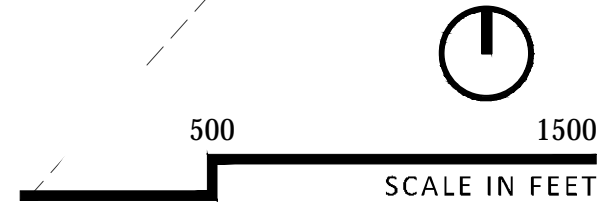
BASIN B
HWL 901.8

BASIN A
HWL 917.0

BASIN J
HWL 876.9

LEGEND

-  PERVIOUS 141.787 AC.
-  IMPERVIOUS 8.286 AC.
- TOTAL 150.073AC.

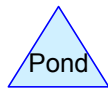
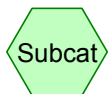
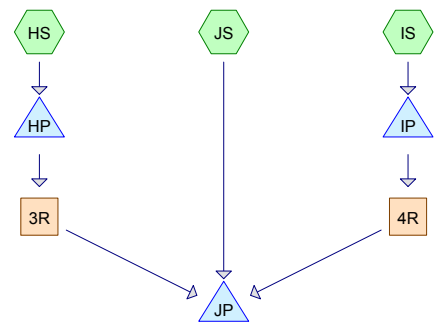
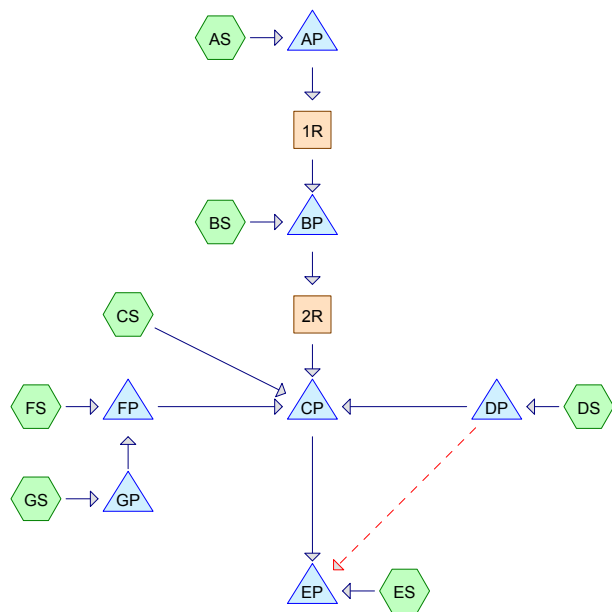


KEEFEER PROPERTY
STILLWATER TOWNSHIP, MINNESOTA
LYN17006

EXISTING DRAINAGE MAP
11/27/18

901 N 3rd STREET, SUITE 120
MINNEAPOLIS, MN 55401
P 612.260.7980 | www.etanlab.com
F 612.260.7990





Routing Diagram for 20181127_LYN06
 Prepared by {enter your company name here}, Printed 11/27/2018
 HydroCAD® 10.00-19 s/n 07437 © 2016 HydroCAD Software Solutions LLC

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentAS: Runoff Area=4.711 ac 10.25% Impervious Runoff Depth=0.07"
 Flow Length=610' Tc=10.2 min CN=51 Runoff=0.04 cfs 0.029 af

SubcatchmentBS: Runoff Area=9.112 ac 11.49% Impervious Runoff Depth=0.32"
 Flow Length=510' Tc=12.3 min CN=62 Runoff=2.58 cfs 0.244 af

SubcatchmentCS: Runoff Area=10.526 ac 18.16% Impervious Runoff Depth=0.17"
 Flow Length=880' Tc=26.6 min CN=56 Runoff=0.43 cfs 0.146 af

SubcatchmentDS: Runoff Area=1.990 ac 25.48% Impervious Runoff Depth=0.35"
 Flow Length=500' Tc=6.5 min CN=63 Runoff=0.92 cfs 0.058 af

SubcatchmentES: Runoff Area=25.874 ac 11.78% Impervious Runoff Depth=0.14"
 Flow Length=1,410' Tc=25.3 min CN=55 Runoff=0.79 cfs 0.312 af

SubcatchmentFS: Runoff Area=14.962 ac 4.20% Impervious Runoff Depth=0.00"
 Flow Length=1,430' Tc=26.7 min CN=39 Runoff=0.00 cfs 0.000 af

SubcatchmentGS: Runoff Area=12.457 ac 14.10% Impervious Runoff Depth=0.00"
 Flow Length=660' Tc=14.7 min CN=43 Runoff=0.01 cfs 0.002 af

SubcatchmentHS: Runoff Area=4.363 ac 19.62% Impervious Runoff Depth=0.01"
 Flow Length=460' Tc=12.0 min CN=45 Runoff=0.01 cfs 0.004 af

SubcatchmentIS: Runoff Area=3.514 ac 11.33% Impervious Runoff Depth=0.13"
 Flow Length=565' Tc=11.7 min CN=54 Runoff=0.09 cfs 0.037 af

SubcatchmentJS: Runoff Area=62.564 ac 8.71% Impervious Runoff Depth=0.09"
 Flow Length=1,265' Tc=53.4 min CN=52 Runoff=0.68 cfs 0.466 af

Reach 1R: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.150 L=530.0' S=0.0283 '/' Capacity=5.34 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.150 L=730.0' S=0.0314 '/' Capacity=17.78 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Avg. Flow Depth=0.00' Max Vel=0.07 fps Inflow=0.01 cfs 0.003 af
 n=0.150 L=1,550.0' S=0.0085 '/' Capacity=228.24 cfs Outflow=0.00 cfs 0.003 af

Reach 4R: Avg. Flow Depth=0.02' Max Vel=0.11 fps Inflow=0.08 cfs 0.036 af
 n=0.150 L=840.0' S=0.0244 '/' Capacity=197.46 cfs Outflow=0.04 cfs 0.036 af

Pond AP: Peak Elev=916.02' Storage=84 cf Inflow=0.04 cfs 0.029 af
 Discarded=0.03 cfs 0.029 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.029 af

Pond BP: Peak Elev=900.83' Storage=6,346 cf Inflow=2.58 cfs 0.244 af
 Discarded=0.11 cfs 0.244 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.244 af

Pond CP: Peak Elev=879.19' Storage=6,760 cf Inflow=0.84 cfs 0.203 af
Discarded=0.05 cfs 0.203 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.203 af

Pond DP: Peak Elev=882.33' Storage=105 cf Inflow=0.92 cfs 0.058 af
Discarded=0.00 cfs 0.001 af Primary=0.80 cfs 0.058 af Secondary=0.00 cfs 0.000 af Outflow=0.81 cfs 0.058 af

Pond EP: Peak Elev=879.47' Storage=263 cf Inflow=0.79 cfs 0.312 af
Discarded=0.01 cfs 0.006 af Primary=0.76 cfs 0.306 af Outflow=0.77 cfs 0.312 af

Pond FP: Peak Elev=881.40' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond GP: Peak Elev=880.00' Storage=0 cf Inflow=0.01 cfs 0.002 af
Discarded=0.01 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.002 af

Pond HP: Peak Elev=887.34' Storage=1 cf Inflow=0.01 cfs 0.004 af
Discarded=0.00 cfs 0.000 af Primary=0.01 cfs 0.003 af Outflow=0.01 cfs 0.004 af

Pond IP: Peak Elev=893.93' Storage=10 cf Inflow=0.09 cfs 0.037 af
Discarded=0.00 cfs 0.001 af Primary=0.08 cfs 0.036 af Outflow=0.09 cfs 0.037 af

Pond JP: Peak Elev=872.77' Storage=16,273 cf Inflow=0.71 cfs 0.505 af
Outflow=0.16 cfs 0.505 af

Total Runoff Area = 150.073 ac Runoff Volume = 1.297 af Average Runoff Depth = 0.10"
89.28% Pervious = 133.986 ac 10.72% Impervious = 16.087 ac

Summary for Subcatchment AS:

Runoff = 0.04 cfs @ 13.41 hrs, Volume= 0.029 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.257	98	IMPERVIOUS
* 1.944	30	HSG A Soil
* 2.284	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.226	98	PONDING
4.711	51	Weighted Average
4.228	45	89.75% Pervious Area
0.483	98	10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	130	0.1400	0.41		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
1.2	225	0.0440	3.15		Shallow Concentrated Flow, SCF 1 Grassed Waterway Kv= 15.0 fps
3.7	255	0.0160	1.14		Shallow Concentrated Flow, SCF 2 Cultivated Straight Rows Kv= 9.0 fps
10.2	610	Total			

Summary for Subcatchment BS:

Runoff = 2.58 cfs @ 12.08 hrs, Volume= 0.244 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.299	98	IMPERVIOUS
* 0.088	30	HSG A Soil
* 7.977	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.748	98	PONDING
9.112	62	Weighted Average
8.065	58	88.51% Pervious Area
1.047	98	11.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0400	0.19		Sheet Flow, SF 4 Cultivated: Residue>20% n= 0.170 P2= 2.80"
2.0	150	0.0200	1.27		Shallow Concentrated Flow, SCF 5 Cultivated Straight Rows Kv= 9.0 fps
1.1	160	0.0750	2.46		Shallow Concentrated Flow, SCF 6 Cultivated Straight Rows Kv= 9.0 fps
0.4	100	0.2000	4.02		Shallow Concentrated Flow, SCF 7 Cultivated Straight Rows Kv= 9.0 fps
12.3	510	Total			

Summary for Subcatchment CS:

Runoff = 0.43 cfs @ 12.41 hrs, Volume= 0.146 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.675	98	IMPERVIOUS
* 3.391	30	HSG A Soil
* 5.224	58	HSG B Soil
* 0.000	71	HSG C Soil
* 1.236	98	PONDING
10.526	56	Weighted Average
8.615	47	81.84% Pervious Area
1.911	98	18.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	120	0.0170	0.17		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
2.2	120	0.0170	0.91		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
0.6	100	0.1600	2.80		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
12.3	540	0.0110	0.73		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
26.6	880	Total			

Summary for Subcatchment DS:

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 0.058 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.461	98	IMPERVIOUS
* 0.373	30	HSG A Soil
* 1.110	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.046	98	PONDING
1.990	63	Weighted Average
1.483	51	74.52% Pervious Area
0.507	98	25.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0300	1.51		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 2.80"
2.3	210	0.0480	1.53		Shallow Concentrated Flow, SCF 1 Short Grass Pasture Kv= 7.0 fps
3.1	190	0.0210	1.01		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
6.5	500	Total			

Summary for Subcatchment ES:

Runoff = 0.79 cfs @ 12.51 hrs, Volume= 0.312 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 2.567	98	IMPERVIOUS
* 8.606	30	HSG A Soil
* 10.992	58	HSG B Soil
* 3.227	71	HSG C Soil
* 0.482	98	PONDING
25.874	55	Weighted Average
22.825	49	88.22% Pervious Area
3.049	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	135	0.0300	0.22		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
3.3	285	0.0420	1.43		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.3	270	0.0810	1.99		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
9.6	720	0.0320	1.25		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
25.3	1,410	Total			

Summary for Subcatchment FS:

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.549	98	IMPERVIOUS
* 11.288	30	HSG A Soil
* 3.046	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.079	98	PONDING
14.962	39	Weighted Average
14.334	36	95.80% Pervious Area
0.628	98	4.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	140	0.0210	0.19		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
10.4	840	0.0370	1.35		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0220	3.01		Shallow Concentrated Flow, SCF 3 Paved Kv= 20.3 fps
3.8	360	0.0500	1.57		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
26.7	1,430	Total			

Summary for Subcatchment GS:

Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 1.241	98	IMPERVIOUS
* 8.961	30	HSG A Soil
* 1.740	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.515	98	PONDING
12.457	43	Weighted Average
10.701	35	85.90% Pervious Area
1.756	98	14.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	130	0.0310	0.20		Sheet Flow, SF 1 Grass: Short n= 0.150 P2= 2.80"
1.7	250	0.1280	2.50		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.2	280	0.0930	2.13		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
14.7	660	Total			

Summary for Subcatchment HS:

Runoff = 0.01 cfs @ 24.02 hrs, Volume= 0.004 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.826	98	IMPERVIOUS
* 3.197	30	HSG A Soil
* 0.310	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.030	98	PONDING
4.363	45	Weighted Average
3.507	32	80.38% Pervious Area
0.856	98	19.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	140	0.0570	0.26		Sheet Flow, SF 1 Grass: Short n= 0.150 P2= 2.80"
0.9	130	0.1080	2.30		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.1	190	0.0460	1.50		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
12.0	460	Total			

Summary for Subcatchment IS:

Runoff = 0.09 cfs @ 12.39 hrs, Volume= 0.037 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 0.348	98	IMPERVIOUS
* 1.092	30	HSG A Soil
* 2.024	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.050	98	PONDING
3.514	54	Weighted Average
3.116	48	88.67% Pervious Area
0.398	98	11.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0400	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.80"
1.0	165	0.1450	2.67		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.8	300	0.0670	1.81		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
11.7	565	Total			

Summary for Subcatchment JS:

Runoff = 0.68 cfs @ 13.83 hrs, Volume= 0.466 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Area (ac)	CN	Description
* 1.063	98	IMPERVIOUS
* 21.821	30	HSG A Soil
* 31.858	58	HSG B Soil
* 3.433	71	HSG C Soil
* 4.389	98	PONDING
62.564	52	Weighted Average
57.112	48	91.29% Pervious Area
5.452	98	8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0050	0.09		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.80"
9.4	280	0.0050	0.49		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
11.0	350	0.0057	0.53		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
6.7	250	0.0080	0.63		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
8.1	285	0.0070	0.59		Shallow Concentrated Flow, SCF 5 Short Grass Pasture Kv= 7.0 fps
53.4	1,265	Total			

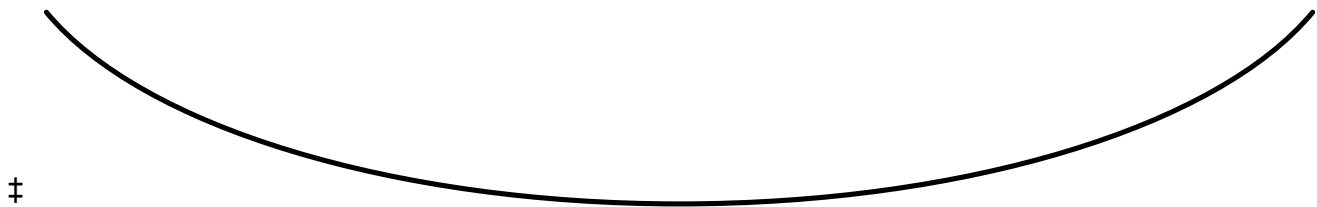
Summary for Reach 1R:

Inflow Area = 4.711 ac, 10.25% Impervious, Inflow Depth = 0.00" for 2 YR 24 HR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 5.34 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 530.0' Slope= 0.0283 '/'
Inlet Invert= 915.00', Outlet Invert= 900.00'



Summary for Reach 2R:

Inflow Area = 13.823 ac, 11.07% Impervious, Inflow Depth = 0.00" for 2 YR 24 HR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 13.3 sf, Capacity= 17.78 cfs

20.00' x 1.00' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 730.0' Slope= 0.0314 '/'
Inlet Invert= 900.90', Outlet Invert= 878.00'



Summary for Reach 3R:

Inflow Area = 4.363 ac, 19.62% Impervious, Inflow Depth = 0.01" for 2 YR 24 HR event
Inflow = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 24.18 hrs, Volume= 0.003 af, Atten= 44%, Lag= 9.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.07 fps, Min. Travel Time= 384.2 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 384.2 min

Peak Storage= 90 cf @ 24.18 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 2.00' Flow Area= 180.0 sf, Capacity= 228.24 cfs

70.00' x 2.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 '/' Top Width= 110.00'
Length= 1,550.0' Slope= 0.0085 '/'
Inlet Invert= 885.20', Outlet Invert= 872.00'



Summary for Reach 4R:

Inflow Area = 3.514 ac, 11.33% Impervious, Inflow Depth = 0.12" for 2 YR 24 HR event
Inflow = 0.08 cfs @ 12.43 hrs, Volume= 0.036 af
Outflow = 0.04 cfs @ 15.45 hrs, Volume= 0.036 af, Atten= 52%, Lag= 181.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.11 fps, Min. Travel Time= 124.2 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 124.2 min

Peak Storage= 303 cf @ 15.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 112.0 sf, Capacity= 197.46 cfs

20.00' x 2.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 18.0 '/' Top Width= 92.00'
Length= 840.0' Slope= 0.0244 '/'
Inlet Invert= 892.50', Outlet Invert= 872.00'



Summary for Pond AP:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=82)

Inflow Area = 4.711 ac, 10.25% Impervious, Inflow Depth = 0.07" for 2 YR 24 HR event
 Inflow = 0.04 cfs @ 13.41 hrs, Volume= 0.029 af
 Outflow = 0.03 cfs @ 17.53 hrs, Volume= 0.029 af, Atten= 23%, Lag= 247.1 min
 Discarded = 0.03 cfs @ 17.53 hrs, Volume= 0.029 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 916.02' @ 17.53 hrs Surf.Area= 4,433 sf Storage= 84 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 26.0 min (1,086.6 - 1,060.5)

Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	20,915 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.00	4,315	0	0
918.00	16,600	20,915	20,915

Device	Routing	Invert	Outlet Devices
#1	Primary	916.60'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	916.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.03 cfs @ 17.53 hrs HW=916.02' (Free Discharge)
 ↑2=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=916.00' TW=915.00' (Dynamic Tailwater)
 ↑1=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond BP:

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.83' @ 23.58 hrs

Inflow Area = 13.823 ac, 11.07% Impervious, Inflow Depth = 0.21" for 2 YR 24 HR event
 Inflow = 2.58 cfs @ 12.08 hrs, Volume= 0.244 af
 Outflow = 0.11 cfs @ 23.58 hrs, Volume= 0.244 af, Atten= 96%, Lag= 690.0 min
 Discarded = 0.11 cfs @ 23.58 hrs, Volume= 0.244 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 900.83' @ 23.58 hrs Surf.Area= 15,112 sf Storage= 6,346 cf

Plug-Flow detention time= 777.2 min calculated for 0.244 af (100% of inflow)
 Center-of-Mass det. time= 777.3 min (1,710.0 - 932.7)

Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	36,320 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	170	0	0
902.00	36,150	36,320	36,320

Device	Routing	Invert	Outlet Devices
#1	Primary	900.90'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	900.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.11 cfs @ 23.58 hrs HW=900.83' (Free Discharge)

↑**2=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=900.00' TW=900.90' (Dynamic Tailwater)

↑**1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond CP:

[62] Hint: Exceeded Reach 2R OUTLET depth by 1.19' @ 24.32 hrs

Inflow Area = 53.758 ac, 11.78% Impervious, Inflow Depth = 0.05" for 2 YR 24 HR event
 Inflow = 0.84 cfs @ 12.04 hrs, Volume= 0.203 af
 Outflow = 0.05 cfs @ 24.32 hrs, Volume= 0.203 af, Atten= 94%, Lag= 736.9 min
 Discarded = 0.05 cfs @ 24.32 hrs, Volume= 0.203 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 879.19' @ 24.32 hrs Surf.Area= 7,267 sf Storage= 6,760 cf

Plug-Flow detention time= 1,373.8 min calculated for 0.203 af (100% of inflow)
 Center-of-Mass det. time= 1,373.9 min (2,351.1 - 977.1)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	180,070 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	4,130	0	0
880.00	9,420	13,550	13,550
882.00	27,160	36,580	50,130
884.00	102,780	129,940	180,070

Device	Routing	Invert	Outlet Devices
#1	Discarded	878.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	879.90'	15.0" Round Culvert

#3 Primary 882.00' L= 52.0' RCP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 879.90' / 879.70' S= 0.0038 '/' Cc= 0.900
 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
20.0' long x 1.00' rise Sharp-Crested Rectangular Weir
 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.05 cfs @ 24.32 hrs HW=879.19' (Free Discharge)
 1=Exfiltration (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=878.00' TW=879.10' (Dynamic Tailwater)
 2=Culvert (Controls 0.00 cfs)
 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond DP:

Inflow Area = 1.990 ac, 25.48% Impervious, Inflow Depth = 0.35" for 2 YR 24 HR event
 Inflow = 0.92 cfs @ 12.01 hrs, Volume= 0.058 af
 Outflow = 0.81 cfs @ 12.04 hrs, Volume= 0.058 af, Atten= 12%, Lag= 1.9 min
 Discarded = 0.00 cfs @ 12.04 hrs, Volume= 0.001 af
 Primary = 0.80 cfs @ 12.04 hrs, Volume= 0.058 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 882.33' @ 12.04 hrs Surf.Area= 489 sf Storage= 105 cf

Plug-Flow detention time= 2.0 min calculated for 0.058 af (100% of inflow)
 Center-of-Mass det. time= 2.0 min (922.8 - 920.7)

Volume	Invert	Avail.Storage	Storage Description
#1	881.90'	2,520 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.90	0	0	0
884.00	2,400	2,520	2,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	881.90'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	881.90'	15.0" Round Culvert L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 881.90' / 881.50' S= 0.0080 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Secondary	883.30'	20.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.00 cfs @ 12.04 hrs HW=882.33' (Free Discharge)

↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.80 cfs @ 12.04 hrs HW=882.33' TW=878.05' (Dynamic Tailwater)

↑2=Culvert (Barrel Controls 0.80 cfs @ 3.22 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=881.90' TW=879.10' (Dynamic Tailwater)

↑3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond EP:

Inflow Area = 79.632 ac, 11.78% Impervious, Inflow Depth = 0.05" for 2 YR 24 HR event
 Inflow = 0.79 cfs @ 12.51 hrs, Volume= 0.312 af
 Outflow = 0.77 cfs @ 12.63 hrs, Volume= 0.312 af, Atten= 3%, Lag= 7.4 min
 Discarded = 0.01 cfs @ 12.63 hrs, Volume= 0.006 af
 Primary = 0.76 cfs @ 12.63 hrs, Volume= 0.306 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 879.47' @ 12.63 hrs Surf.Area= 1,411 sf Storage= 263 cf

Plug-Flow detention time= 5.5 min calculated for 0.312 af (100% of inflow)
 Center-of-Mass det. time= 5.5 min (1,015.6 - 1,010.1)

Volume	Invert	Avail.Storage	Storage Description
#1	879.10'	71,325 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.10	0	0	0
882.00	10,990	15,935	15,935
884.00	44,400	55,390	71,325

Device	Routing	Invert	Outlet Devices
#1	Discarded	879.10'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	879.10'	20.0" Round Culvert L= 76.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 879.10' / 877.60' S= 0.0197 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 2.18 sf
#3	Primary	882.40'	Asymmetrical Weir, C= 3.27 Offset (feet) 0.00 70.00 200.00 320.00 Height (feet) 1.60 0.00 0.00 1.60

Discarded OutFlow Max=0.01 cfs @ 12.63 hrs HW=879.47' (Free Discharge)

↑1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.76 cfs @ 12.63 hrs HW=879.47' (Free Discharge)

↑2=Culvert (Inlet Controls 0.76 cfs @ 2.08 fps)

↑3=Asymmetrical Weir (Controls 0.00 cfs)

Summary for Pond FP:

Inflow Area = 27.419 ac, 8.69% Impervious, Inflow Depth = 0.00" for 2 YR 24 HR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 881.40' @ 0.00 hrs Surf.Area= 0 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	881.40'	6,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.40	0	0	0
884.00	5,380	6,994	6,994

Device	Routing	Invert	Outlet Devices
#1	Discarded	881.40'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	881.40'	15.0" Round Culvert L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 881.40' / 881.20' S= 0.0040 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=881.40' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=881.40' TW=878.00' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond GP:

Inflow Area = 12.457 ac, 14.10% Impervious, Inflow Depth = 0.00" for 2 YR 24 HR event
 Inflow = 0.01 cfs @ 24.03 hrs, Volume= 0.002 af
 Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 24.03 hrs, Volume= 0.002 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 880.00' @ 23.70 hrs Surf.Area= 2,240 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	93,550 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	2,240	0	0
882.00	16,770	19,010	19,010
884.00	26,180	42,950	61,960
885.00	37,000	31,590	93,550

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	884.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.02 cfs @ 24.03 hrs HW=880.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.00' TW=881.40' (Dynamic Tailwater)
 ↑2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond HP:

Inflow Area = 4.363 ac, 19.62% Impervious, Inflow Depth = 0.01" for 2 YR 24 HR event
 Inflow = 0.01 cfs @ 24.02 hrs, Volume= 0.004 af
 Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.7 min
 Discarded = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af
 Primary = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 887.34' @ 24.03 hrs Surf.Area= 32 sf Storage= 1 cf

Plug-Flow detention time= 1.3 min calculated for 0.004 af (100% of inflow)
 Center-of-Mass det. time= 1.3 min (1,250.0 - 1,248.7)

Volume	Invert	Avail.Storage	Storage Description
#1	887.30'	3,173 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.30	0	0	0
890.00	2,350	3,173	3,173

Device	Routing	Invert	Outlet Devices
#1	Discarded	887.30'	0.800 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	887.30'	15.0" Round Culvert L= 83.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 887.30' / 885.20' S= 0.0253 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 24.03 hrs HW=887.34' (Free Discharge)

↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.01 cfs @ 24.03 hrs HW=887.34' TW=885.20' (Dynamic Tailwater)

↑2=Culvert (Inlet Controls 0.01 cfs @ 0.66 fps)

Summary for Pond IP:

Inflow Area = 3.514 ac, 11.33% Impervious, Inflow Depth = 0.13" for 2 YR 24 HR event
 Inflow = 0.09 cfs @ 12.39 hrs, Volume= 0.037 af
 Outflow = 0.09 cfs @ 12.43 hrs, Volume= 0.037 af, Atten= 0%, Lag= 2.3 min
 Discarded = 0.00 cfs @ 12.43 hrs, Volume= 0.001 af
 Primary = 0.08 cfs @ 12.43 hrs, Volume= 0.036 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 893.93' @ 12.43 hrs Surf.Area= 159 sf Storage= 10 cf

Plug-Flow detention time= 2.0 min calculated for 0.037 af (100% of inflow)

Center-of-Mass det. time= 2.0 min (1,012.9 - 1,010.9)

Volume	Invert	Avail.Storage	Storage Description
#1	893.80'	2,926 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
893.80	0	0	0
896.00	2,660	2,926	2,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	893.80'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	893.80'	15.0" Round Culvert L= 83.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.80' / 892.50' S= 0.0157 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 12.43 hrs HW=893.93' (Free Discharge)

↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.08 cfs @ 12.43 hrs HW=893.93' TW=892.51' (Dynamic Tailwater)

↑2=Culvert (Inlet Controls 0.08 cfs @ 1.23 fps)

Summary for Pond JP:

[62] Hint: Exceeded Reach 3R OUTLET depth by 0.77' @ 24.86 hrs

[62] Hint: Exceeded Reach 4R OUTLET depth by 0.77' @ 24.95 hrs

20181127_LYN06

Type II 24-hr 2 YR 24 HR Rainfall=2.80"

Prepared by {enter your company name here}

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Inflow Area = 70.441 ac, 9.52% Impervious, Inflow Depth = 0.09" for 2 YR 24 HR event
 Inflow = 0.71 cfs @ 13.83 hrs, Volume= 0.505 af
 Outflow = 0.16 cfs @ 24.86 hrs, Volume= 0.505 af, Atten= 78%, Lag= 661.5 min
 Discarded = 0.16 cfs @ 24.86 hrs, Volume= 0.505 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 872.77' @ 24.86 hrs Surf.Area= 33,105 sf Storage= 16,273 cf

Plug-Flow detention time= 1,177.0 min calculated for 0.505 af (100% of inflow)
 Center-of-Mass det. time= 1,177.0 min (2,266.1 - 1,089.1)

Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	689,970 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	8,990	0	0
874.00	71,370	80,360	80,360
876.00	141,925	213,295	293,655
878.00	254,390	396,315	689,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	872.00'	0.200 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.16 cfs @ 24.86 hrs HW=872.77' (Free Discharge)
 ↑1=Exfiltration (Controls 0.16 cfs)

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentAS: Runoff Area=4.711 ac 10.25% Impervious Runoff Depth=0.42"
 Flow Length=610' Tc=10.2 min CN=51 Runoff=1.76 cfs 0.166 af

SubcatchmentBS: Runoff Area=9.112 ac 11.49% Impervious Runoff Depth=0.95"
 Flow Length=510' Tc=12.3 min CN=62 Runoff=11.05 cfs 0.721 af

SubcatchmentCS: Runoff Area=10.526 ac 18.16% Impervious Runoff Depth=0.64"
 Flow Length=880' Tc=26.6 min CN=56 Runoff=4.36 cfs 0.563 af

SubcatchmentDS: Runoff Area=1.990 ac 25.48% Impervious Runoff Depth=1.01"
 Flow Length=500' Tc=6.5 min CN=63 Runoff=3.34 cfs 0.167 af

SubcatchmentES: Runoff Area=25.874 ac 11.78% Impervious Runoff Depth=0.59"
 Flow Length=1,410' Tc=25.3 min CN=55 Runoff=9.75 cfs 1.283 af

SubcatchmentFS: Runoff Area=14.962 ac 4.20% Impervious Runoff Depth=0.06"
 Flow Length=1,430' Tc=26.7 min CN=39 Runoff=0.10 cfs 0.080 af

SubcatchmentGS: Runoff Area=12.457 ac 14.10% Impervious Runoff Depth=0.15"
 Flow Length=660' Tc=14.7 min CN=43 Runoff=0.30 cfs 0.160 af

SubcatchmentHS: Runoff Area=4.363 ac 19.62% Impervious Runoff Depth=0.21"
 Flow Length=460' Tc=12.0 min CN=45 Runoff=0.23 cfs 0.077 af

SubcatchmentIS: Runoff Area=3.514 ac 11.33% Impervious Runoff Depth=0.55"
 Flow Length=565' Tc=11.7 min CN=54 Runoff=1.95 cfs 0.161 af

SubcatchmentJS: Runoff Area=62.564 ac 8.71% Impervious Runoff Depth=0.46"
 Flow Length=1,265' Tc=53.4 min CN=52 Runoff=9.38 cfs 2.418 af

Reach 1R: Avg. Flow Depth=0.06' Max Vel=0.20 fps Inflow=0.06 cfs 0.025 af
 n=0.150 L=530.0' S=0.0283 '/' Capacity=5.34 cfs Outflow=0.06 cfs 0.025 af

Reach 2R: Avg. Flow Depth=0.24' Max Vel=0.52 fps Inflow=1.17 cfs 0.399 af
 n=0.150 L=730.0' S=0.0314 '/' Capacity=17.78 cfs Outflow=0.84 cfs 0.399 af

Reach 3R: Avg. Flow Depth=0.01' Max Vel=0.07 fps Inflow=0.22 cfs 0.075 af
 n=0.150 L=1,550.0' S=0.0085 '/' Capacity=228.24 cfs Outflow=0.06 cfs 0.075 af

Reach 4R: Avg. Flow Depth=0.08' Max Vel=0.28 fps Inflow=1.77 cfs 0.160 af
 n=0.150 L=840.0' S=0.0244 '/' Capacity=197.46 cfs Outflow=0.48 cfs 0.160 af

Pond AP: Peak Elev=916.62' Storage=3,819 cf Inflow=1.76 cfs 0.166 af
 Discarded=0.06 cfs 0.141 af Primary=0.06 cfs 0.025 af Outflow=0.12 cfs 0.166 af

Pond BP: Peak Elev=901.15' Storage=12,061 cf Inflow=11.05 cfs 0.746 af
 Discarded=0.15 cfs 0.347 af Primary=1.17 cfs 0.399 af Outflow=1.31 cfs 0.746 af

Pond CP: Peak Elev=880.51' Storage=19,559 cf Inflow=5.15 cfs 1.205 af
Discarded=0.10 cfs 0.401 af Primary=1.20 cfs 0.779 af Outflow=1.30 cfs 1.180 af

Pond DP: Peak Elev=882.81' Storage=472 cf Inflow=3.34 cfs 0.167 af
Discarded=0.01 cfs 0.001 af Primary=2.88 cfs 0.166 af Secondary=0.00 cfs 0.000 af Outflow=2.89 cfs 0.167 af

Pond EP: Peak Elev=880.50' Storage=3,715 cf Inflow=9.75 cfs 2.062 af
Discarded=0.04 cfs 0.018 af Primary=7.88 cfs 2.044 af Outflow=7.92 cfs 2.062 af

Pond FP: Peak Elev=881.57' Storage=28 cf Inflow=0.10 cfs 0.080 af
Discarded=0.00 cfs 0.002 af Primary=0.10 cfs 0.078 af Outflow=0.10 cfs 0.080 af

Pond GP: Peak Elev=880.89' Storage=4,828 cf Inflow=0.30 cfs 0.160 af
Discarded=0.06 cfs 0.160 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.160 af

Pond HP: Peak Elev=887.51' Storage=20 cf Inflow=0.23 cfs 0.077 af
Discarded=0.00 cfs 0.002 af Primary=0.22 cfs 0.075 af Outflow=0.23 cfs 0.077 af

Pond IP: Peak Elev=894.45' Storage=255 cf Inflow=1.95 cfs 0.161 af
Discarded=0.01 cfs 0.001 af Primary=1.77 cfs 0.160 af Outflow=1.77 cfs 0.161 af

Pond JP: Peak Elev=874.25' Storage=99,069 cf Inflow=9.85 cfs 2.652 af
Outflow=0.39 cfs 2.054 af

Total Runoff Area = 150.073 ac Runoff Volume = 5.795 af Average Runoff Depth = 0.46"
89.28% Pervious = 133.986 ac 10.72% Impervious = 16.087 ac

Summary for Subcatchment AS:

Runoff = 1.76 cfs @ 12.06 hrs, Volume= 0.166 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.257	98	IMPERVIOUS
* 1.944	30	HSG A Soil
* 2.284	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.226	98	PONDING
4.711	51	Weighted Average
4.228	45	89.75% Pervious Area
0.483	98	10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	130	0.1400	0.41		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
1.2	225	0.0440	3.15		Shallow Concentrated Flow, SCF 1 Grassed Waterway Kv= 15.0 fps
3.7	255	0.0160	1.14		Shallow Concentrated Flow, SCF 2 Cultivated Straight Rows Kv= 9.0 fps
10.2	610	Total			

Summary for Subcatchment BS:

Runoff = 11.05 cfs @ 12.06 hrs, Volume= 0.721 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.299	98	IMPERVIOUS
* 0.088	30	HSG A Soil
* 7.977	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.748	98	PONDING
9.112	62	Weighted Average
8.065	58	88.51% Pervious Area
1.047	98	11.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0400	0.19		Sheet Flow, SF 4 Cultivated: Residue>20% n= 0.170 P2= 2.80"
2.0	150	0.0200	1.27		Shallow Concentrated Flow, SCF 5 Cultivated Straight Rows Kv= 9.0 fps
1.1	160	0.0750	2.46		Shallow Concentrated Flow, SCF 6 Cultivated Straight Rows Kv= 9.0 fps
0.4	100	0.2000	4.02		Shallow Concentrated Flow, SCF 7 Cultivated Straight Rows Kv= 9.0 fps
12.3	510	Total			

Summary for Subcatchment CS:

Runoff = 4.36 cfs @ 12.27 hrs, Volume= 0.563 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.675	98	IMPERVIOUS
* 3.391	30	HSG A Soil
* 5.224	58	HSG B Soil
* 0.000	71	HSG C Soil
* 1.236	98	PONDING
10.526	56	Weighted Average
8.615	47	81.84% Pervious Area
1.911	98	18.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	120	0.0170	0.17		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
2.2	120	0.0170	0.91		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
0.6	100	0.1600	2.80		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
12.3	540	0.0110	0.73		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
26.6	880	Total			

Summary for Subcatchment DS:

Runoff = 3.34 cfs @ 11.99 hrs, Volume= 0.167 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.461	98	IMPERVIOUS
* 0.373	30	HSG A Soil
* 1.110	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.046	98	PONDING
1.990	63	Weighted Average
1.483	51	74.52% Pervious Area
0.507	98	25.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0300	1.51		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 2.80"
2.3	210	0.0480	1.53		Shallow Concentrated Flow, SCF 1 Short Grass Pasture Kv= 7.0 fps
3.1	190	0.0210	1.01		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
6.5	500	Total			

Summary for Subcatchment ES:

Runoff = 9.75 cfs @ 12.25 hrs, Volume= 1.283 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 2.567	98	IMPERVIOUS
* 8.606	30	HSG A Soil
* 10.992	58	HSG B Soil
* 3.227	71	HSG C Soil
* 0.482	98	PONDING
25.874	55	Weighted Average
22.825	49	88.22% Pervious Area
3.049	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	135	0.0300	0.22		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
3.3	285	0.0420	1.43		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.3	270	0.0810	1.99		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
9.6	720	0.0320	1.25		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
25.3	1,410	Total			

Summary for Subcatchment FS:

Runoff = 0.10 cfs @ 15.69 hrs, Volume= 0.080 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.549	98	IMPERVIOUS
* 11.288	30	HSG A Soil
* 3.046	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.079	98	PONDING
14.962	39	Weighted Average
14.334	36	95.80% Pervious Area
0.628	98	4.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	140	0.0210	0.19		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
10.4	840	0.0370	1.35		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0220	3.01		Shallow Concentrated Flow, SCF 3 Paved Kv= 20.3 fps
3.8	360	0.0500	1.57		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
26.7	1,430	Total			

Summary for Subcatchment GS:

Runoff = 0.30 cfs @ 12.53 hrs, Volume= 0.160 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 1.241	98	IMPERVIOUS
* 8.961	30	HSG A Soil
* 1.740	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.515	98	PONDING
12.457	43	Weighted Average
10.701	35	85.90% Pervious Area
1.756	98	14.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	130	0.0310	0.20		Sheet Flow, SF 1 Grass: Short n= 0.150 P2= 2.80"
1.7	250	0.1280	2.50		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.2	280	0.0930	2.13		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
14.7	660	Total			

Summary for Subcatchment HS:

Runoff = 0.23 cfs @ 12.15 hrs, Volume= 0.077 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.826	98	IMPERVIOUS
* 3.197	30	HSG A Soil
* 0.310	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.030	98	PONDING
4.363	45	Weighted Average
3.507	32	80.38% Pervious Area
0.856	98	19.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	140	0.0570	0.26		Sheet Flow, SF 1 Grass: Short n= 0.150 P2= 2.80"
0.9	130	0.1080	2.30		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.1	190	0.0460	1.50		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
12.0	460	Total			

Summary for Subcatchment IS:

Runoff = 1.95 cfs @ 12.07 hrs, Volume= 0.161 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 0.348	98	IMPERVIOUS
* 1.092	30	HSG A Soil
* 2.024	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.050	98	PONDING
3.514	54	Weighted Average
3.116	48	88.67% Pervious Area
0.398	98	11.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0400	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.80"
1.0	165	0.1450	2.67		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.8	300	0.0670	1.81		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
11.7	565	Total			

Summary for Subcatchment JS:

Runoff = 9.38 cfs @ 12.75 hrs, Volume= 2.418 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 YR 24 HR Rainfall=4.16"

Area (ac)	CN	Description
* 1.063	98	IMPERVIOUS
* 21.821	30	HSG A Soil
* 31.858	58	HSG B Soil
* 3.433	71	HSG C Soil
* 4.389	98	PONDING
62.564	52	Weighted Average
57.112	48	91.29% Pervious Area
5.452	98	8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0050	0.09		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.80"
9.4	280	0.0050	0.49		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
11.0	350	0.0057	0.53		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
6.7	250	0.0080	0.63		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
8.1	285	0.0070	0.59		Shallow Concentrated Flow, SCF 5 Short Grass Pasture Kv= 7.0 fps
53.4	1,265	Total			

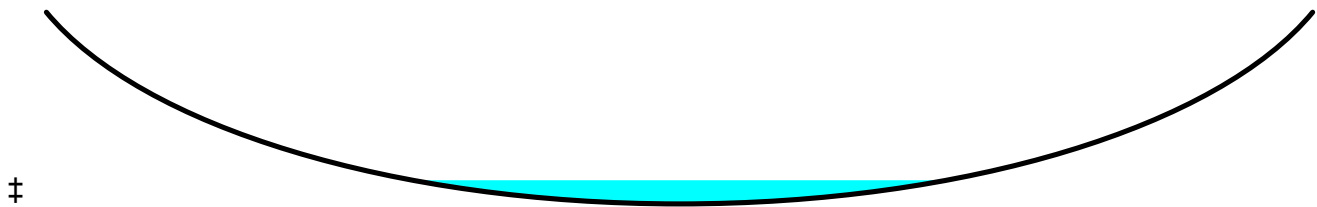
Summary for Reach 1R:

Inflow Area = 4.711 ac, 10.25% Impervious, Inflow Depth = 0.06" for 10 YR 24 HR event
Inflow = 0.06 cfs @ 17.13 hrs, Volume= 0.025 af
Outflow = 0.06 cfs @ 18.03 hrs, Volume= 0.025 af, Atten= 10%, Lag= 54.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.20 fps, Min. Travel Time= 44.6 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 113.9 min

Peak Storage= 152 cf @ 18.03 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 5.34 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 530.0' Slope= 0.0283 1'
Inlet Invert= 915.00', Outlet Invert= 900.00'



Summary for Reach 2R:

[80] Warning: Exceeded Pond BP by 0.90' @ 64.00 hrs (0.00 cfs 0.031 af)

Inflow Area = 13.823 ac, 11.07% Impervious, Inflow Depth = 0.35" for 10 YR 24 HR event
Inflow = 1.17 cfs @ 12.27 hrs, Volume= 0.399 af
Outflow = 0.84 cfs @ 13.26 hrs, Volume= 0.399 af, Atten= 28%, Lag= 59.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.52 fps, Min. Travel Time= 23.3 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 62.4 min

Peak Storage= 1,173 cf @ 13.26 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 13.3 sf, Capacity= 17.78 cfs

20.00' x 1.00' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 730.0' Slope= 0.0314 1'
Inlet Invert= 900.90', Outlet Invert= 878.00'



Summary for Reach 3R:

Inflow Area = 4.363 ac, 19.62% Impervious, Inflow Depth = 0.21" for 10 YR 24 HR event
Inflow = 0.22 cfs @ 12.18 hrs, Volume= 0.075 af
Outflow = 0.06 cfs @ 19.14 hrs, Volume= 0.075 af, Atten= 75%, Lag= 418.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.07 fps, Min. Travel Time= 384.2 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 384.2 min

Peak Storage= 1,290 cf @ 19.14 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 2.00' Flow Area= 180.0 sf, Capacity= 228.24 cfs

70.00' x 2.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 ' / ' Top Width= 110.00'
Length= 1,550.0' Slope= 0.0085 ' / '
Inlet Invert= 885.20', Outlet Invert= 872.00'



Summary for Reach 4R:

Inflow Area = 3.514 ac, 11.33% Impervious, Inflow Depth = 0.54" for 10 YR 24 HR event
Inflow = 1.77 cfs @ 12.11 hrs, Volume= 0.160 af
Outflow = 0.48 cfs @ 12.52 hrs, Volume= 0.160 af, Atten= 73%, Lag= 24.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.28 fps, Min. Travel Time= 50.5 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 101.9 min

Peak Storage= 1,458 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 2.00' Flow Area= 112.0 sf, Capacity= 197.46 cfs

20.00' x 2.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 18.0 ' / ' Top Width= 92.00'
Length= 840.0' Slope= 0.0244 ' / '
Inlet Invert= 892.50', Outlet Invert= 872.00'



Summary for Pond AP:

Inflow Area = 4.711 ac, 10.25% Impervious, Inflow Depth = 0.42" for 10 YR 24 HR event
 Inflow = 1.76 cfs @ 12.06 hrs, Volume= 0.166 af
 Outflow = 0.12 cfs @ 17.13 hrs, Volume= 0.166 af, Atten= 93%, Lag= 304.0 min
 Discarded = 0.06 cfs @ 17.13 hrs, Volume= 0.141 af
 Primary = 0.06 cfs @ 17.13 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 916.62' @ 17.13 hrs Surf.Area= 8,095 sf Storage= 3,819 cf

Plug-Flow detention time= 684.5 min calculated for 0.166 af (100% of inflow)
 Center-of-Mass det. time= 684.6 min (1,624.5 - 939.9)

Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	20,915 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.00	4,315	0	0
918.00	16,600	20,915	20,915

Device	Routing	Invert	Outlet Devices
#1	Primary	916.60'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	916.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.06 cfs @ 17.13 hrs HW=916.62' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.06 cfs @ 17.13 hrs HW=916.62' TW=915.05' (Dynamic Tailwater)
 ↑**1=Sharp-Crested Rectangular Weir**(Weir Controls 0.06 cfs @ 0.41 fps)

Summary for Pond BP:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)
 [62] Hint: Exceeded Reach 1R OUTLET depth by 1.15' @ 13.24 hrs

Inflow Area = 13.823 ac, 11.07% Impervious, Inflow Depth = 0.65" for 10 YR 24 HR event
 Inflow = 11.05 cfs @ 12.06 hrs, Volume= 0.746 af
 Outflow = 1.31 cfs @ 12.27 hrs, Volume= 0.746 af, Atten= 88%, Lag= 12.4 min
 Discarded = 0.15 cfs @ 13.24 hrs, Volume= 0.347 af
 Primary = 1.17 cfs @ 12.27 hrs, Volume= 0.399 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 901.15' @ 13.24 hrs Surf.Area= 20,832 sf Storage= 12,061 cf

Plug-Flow detention time= 459.5 min calculated for 0.746 af (100% of inflow)
 Center-of-Mass det. time= 459.6 min (1,356.7 - 897.1)

Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	36,320 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	170	0	0
902.00	36,150	36,320	36,320

Device	Routing	Invert	Outlet Devices
#1	Primary	900.90'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	900.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.15 cfs @ 13.24 hrs HW=901.15' (Free Discharge)
 ↑2=Exfiltration (Controls 0.15 cfs)

Primary OutFlow Max=1.17 cfs @ 12.27 hrs HW=901.04' TW=901.01' (Dynamic Tailwater)
 ↑1=Sharp-Crested Rectangular Weir(Weir Controls 1.17 cfs @ 0.83 fps)

Summary for Pond CP:

[62] Hint: Exceeded Reach 2R OUTLET depth by 2.31' @ 15.52 hrs

Inflow Area = 53.758 ac, 11.78% Impervious, Inflow Depth = 0.27" for 10 YR 24 HR event
 Inflow = 5.15 cfs @ 12.27 hrs, Volume= 1.205 af
 Outflow = 1.30 cfs @ 15.10 hrs, Volume= 1.180 af, Atten= 75%, Lag= 170.0 min
 Discarded = 0.10 cfs @ 15.10 hrs, Volume= 0.401 af
 Primary = 1.20 cfs @ 15.10 hrs, Volume= 0.779 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 880.51' @ 15.10 hrs Surf.Area= 13,976 sf Storage= 19,559 cf

Plug-Flow detention time= 739.8 min calculated for 1.180 af (98% of inflow)
 Center-of-Mass det. time= 728.8 min (1,689.1 - 960.3)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	180,070 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	4,130	0	0
880.00	9,420	13,550	13,550
882.00	27,160	36,580	50,130
884.00	102,780	129,940	180,070

Device	Routing	Invert	Outlet Devices
#1	Discarded	878.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	879.90'	15.0" Round Culvert L= 52.0' RCP, square edge headwall, Ke= 0.500

#3 Primary 882.00' Inlet / Outlet Invert= 879.90' / 879.70' S= 0.0038 '/' Cc= 0.900
 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
20.0' long x 1.00' rise Sharp-Crested Rectangular Weir
 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.10 cfs @ 15.10 hrs HW=880.51' (Free Discharge)

↑1=Exfiltration (Controls 0.10 cfs)

Primary OutFlow Max=1.20 cfs @ 15.10 hrs HW=880.51' TW=879.78' (Dynamic Tailwater)

↑2=Culvert (Barrel Controls 1.20 cfs @ 2.93 fps)

↑3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond DP:

Inflow Area = 1.990 ac, 25.48% Impervious, Inflow Depth = 1.01" for 10 YR 24 HR event
 Inflow = 3.34 cfs @ 11.99 hrs, Volume= 0.167 af
 Outflow = 2.89 cfs @ 12.03 hrs, Volume= 0.167 af, Atten= 14%, Lag= 2.3 min
 Discarded = 0.01 cfs @ 12.03 hrs, Volume= 0.001 af
 Primary = 2.88 cfs @ 12.03 hrs, Volume= 0.166 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 882.81' @ 12.03 hrs Surf.Area= 1,039 sf Storage= 472 cf

Plug-Flow detention time= 2.2 min calculated for 0.167 af (100% of inflow)

Center-of-Mass det. time= 2.2 min (879.4 - 877.3)

Volume	Invert	Avail.Storage	Storage Description
#1	881.90'	2,520 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.90	0	0	0
884.00	2,400	2,520	2,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	881.90'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	881.90'	15.0" Round Culvert L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 881.90' / 881.50' S= 0.0080 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Secondary	883.30'	20.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.01 cfs @ 12.03 hrs HW=882.81' (Free Discharge)

↑1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=2.88 cfs @ 12.03 hrs HW=882.81' TW=878.33' (Dynamic Tailwater)

↑2=Culvert (Barrel Controls 2.88 cfs @ 4.21 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=881.90' TW=879.10' (Dynamic Tailwater)

↑3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond EP:

[80] Warning: Exceeded Pond CP by 1.38' @ 12.23 hrs (0.54 cfs 0.036 af)

Inflow Area = 79.632 ac, 11.78% Impervious, Inflow Depth = 0.31" for 10 YR 24 HR event
 Inflow = 9.75 cfs @ 12.25 hrs, Volume= 2.062 af
 Outflow = 7.92 cfs @ 12.39 hrs, Volume= 2.062 af, Atten= 19%, Lag= 8.2 min
 Discarded = 0.04 cfs @ 12.39 hrs, Volume= 0.018 af
 Primary = 7.88 cfs @ 12.39 hrs, Volume= 2.044 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 880.50' @ 12.39 hrs Surf.Area= 5,306 sf Storage= 3,715 cf

Plug-Flow detention time= 6.3 min calculated for 2.062 af (100% of inflow)
 Center-of-Mass det. time= 6.3 min (1,002.6 - 996.3)

Volume	Invert	Avail.Storage	Storage Description
#1	879.10'	71,325 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.10	0	0	0
882.00	10,990	15,935	15,935
884.00	44,400	55,390	71,325

Device	Routing	Invert	Outlet Devices
#1	Discarded	879.10'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	879.10'	20.0" Round Culvert L= 76.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 879.10' / 877.60' S= 0.0197 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 2.18 sf
#3	Primary	882.40'	Asymmetrical Weir, C= 3.27 Offset (feet) 0.00 70.00 200.00 320.00 Height (feet) 1.60 0.00 0.00 1.60

Discarded OutFlow Max=0.04 cfs @ 12.39 hrs HW=880.50' (Free Discharge)

↑1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=7.88 cfs @ 12.39 hrs HW=880.50' (Free Discharge)

↑2=Culvert (Inlet Controls 7.88 cfs @ 4.03 fps)

↑3=Asymmetrical Weir (Controls 0.00 cfs)

Summary for Pond FP:

Inflow Area = 27.419 ac, 8.69% Impervious, Inflow Depth = 0.03" for 10 YR 24 HR event
 Inflow = 0.10 cfs @ 15.69 hrs, Volume= 0.080 af
 Outflow = 0.10 cfs @ 15.76 hrs, Volume= 0.080 af, Atten= 0%, Lag= 4.3 min
 Discarded = 0.00 cfs @ 15.76 hrs, Volume= 0.002 af
 Primary = 0.10 cfs @ 15.76 hrs, Volume= 0.078 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 881.57' @ 15.76 hrs Surf.Area= 342 sf Storage= 28 cf

Plug-Flow detention time= 4.8 min calculated for 0.080 af (100% of inflow)
 Center-of-Mass det. time= 4.8 min (1,134.3 - 1,129.5)

Volume	Invert	Avail.Storage	Storage Description
#1	881.40'	6,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.40	0	0	0
884.00	5,380	6,994	6,994

Device	Routing	Invert	Outlet Devices
#1	Discarded	881.40'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	881.40'	15.0" Round Culvert L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 881.40' / 881.20' S= 0.0040 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 15.76 hrs HW=881.57' (Free Discharge)

↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.10 cfs @ 15.76 hrs HW=881.57' TW=880.50' (Dynamic Tailwater)

↑2=Culvert (Barrel Controls 0.10 cfs @ 1.52 fps)

Summary for Pond GP:

Inflow Area = 12.457 ac, 14.10% Impervious, Inflow Depth = 0.15" for 10 YR 24 HR event
 Inflow = 0.30 cfs @ 12.53 hrs, Volume= 0.160 af
 Outflow = 0.06 cfs @ 24.20 hrs, Volume= 0.160 af, Atten= 80%, Lag= 700.0 min
 Discarded = 0.06 cfs @ 24.20 hrs, Volume= 0.160 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 880.89' @ 24.20 hrs Surf.Area= 8,670 sf Storage= 4,828 cf

Plug-Flow detention time= 911.3 min calculated for 0.160 af (100% of inflow)
 Center-of-Mass det. time= 911.4 min (1,942.6 - 1,031.2)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	93,550 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	2,240	0	0
882.00	16,770	19,010	19,010
884.00	26,180	42,950	61,960
885.00	37,000	31,590	93,550

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	884.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.06 cfs @ 24.20 hrs HW=880.89' (Free Discharge)
 ↑1=Exfiltration (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.00' TW=881.40' (Dynamic Tailwater)
 ↑2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond HP:

Inflow Area = 4.363 ac, 19.62% Impervious, Inflow Depth = 0.21" for 10 YR 24 HR event
 Inflow = 0.23 cfs @ 12.15 hrs, Volume= 0.077 af
 Outflow = 0.23 cfs @ 12.18 hrs, Volume= 0.077 af, Atten= 3%, Lag= 1.8 min
 Discarded = 0.00 cfs @ 12.18 hrs, Volume= 0.002 af
 Primary = 0.22 cfs @ 12.18 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 887.51' @ 12.18 hrs Surf.Area= 187 sf Storage= 20 cf

Plug-Flow detention time= 1.4 min calculated for 0.077 af (100% of inflow)
 Center-of-Mass det. time= 1.4 min (1,000.9 - 999.5)

Volume	Invert	Avail.Storage	Storage Description
#1	887.30'	3,173 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.30	0	0	0
890.00	2,350	3,173	3,173

Device	Routing	Invert	Outlet Devices
#1	Discarded	887.30'	0.800 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	887.30'	15.0" Round Culvert L= 83.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 887.30' / 885.20' S= 0.0253 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 12.18 hrs HW=887.51' (Free Discharge)

↑1=**Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.22 cfs @ 12.18 hrs HW=887.51' TW=885.20' (Dynamic Tailwater)

↑2=**Culvert** (Inlet Controls 0.22 cfs @ 1.58 fps)

Summary for Pond IP:

Inflow Area =	3.514 ac, 11.33% Impervious, Inflow Depth = 0.55" for 10 YR 24 HR event
Inflow =	1.95 cfs @ 12.07 hrs, Volume= 0.161 af
Outflow =	1.77 cfs @ 12.11 hrs, Volume= 0.161 af, Atten= 9%, Lag= 2.4 min
Discarded =	0.01 cfs @ 12.11 hrs, Volume= 0.001 af
Primary =	1.77 cfs @ 12.11 hrs, Volume= 0.160 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 894.45' @ 12.11 hrs Surf.Area= 785 sf Storage= 255 cf

Plug-Flow detention time= 2.1 min calculated for 0.161 af (100% of inflow)

Center-of-Mass det. time= 2.1 min (924.2 - 922.1)

Volume	Invert	Avail.Storage	Storage Description
#1	893.80'	2,926 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
893.80	0	0	0
896.00	2,660	2,926	2,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	893.80'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	893.80'	15.0" Round Culvert L= 83.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.80' / 892.50' S= 0.0157 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.01 cfs @ 12.11 hrs HW=894.45' (Free Discharge)

↑1=**Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=1.76 cfs @ 12.11 hrs HW=894.45' TW=892.54' (Dynamic Tailwater)

↑2=**Culvert** (Inlet Controls 1.76 cfs @ 2.74 fps)

Summary for Pond JP:

[62] Hint: Exceeded Reach 3R OUTLET depth by 2.24' @ 25.00 hrs

[62] Hint: Exceeded Reach 4R OUTLET depth by 2.23' @ 25.20 hrs

Inflow Area = 70.441 ac, 9.52% Impervious, Inflow Depth = 0.45" for 10 YR 24 HR event
 Inflow = 9.85 cfs @ 12.71 hrs, Volume= 2.652 af
 Outflow = 0.39 cfs @ 24.96 hrs, Volume= 2.054 af, Atten= 96%, Lag= 734.8 min
 Discarded = 0.39 cfs @ 24.96 hrs, Volume= 2.054 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 874.25' @ 24.96 hrs Surf.Area= 80,086 sf Storage= 99,069 cf

Plug-Flow detention time= 2,142.7 min calculated for 2.053 af (77% of inflow)
 Center-of-Mass det. time= 2,037.6 min (3,023.9 - 986.3)

Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	689,970 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	8,990	0	0
874.00	71,370	80,360	80,360
876.00	141,925	213,295	293,655
878.00	254,390	396,315	689,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	872.00'	0.200 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.39 cfs @ 24.96 hrs HW=874.25' (Free Discharge)

↑1=Exfiltration (Controls 0.39 cfs)

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentAS: Runoff Area=4.711 ac 10.25% Impervious Runoff Depth=1.84"
 Flow Length=610' Tc=10.2 min CN=51 Runoff=12.45 cfs 0.721 af

SubcatchmentBS: Runoff Area=9.112 ac 11.49% Impervious Runoff Depth=2.90"
 Flow Length=510' Tc=12.3 min CN=62 Runoff=37.32 cfs 2.205 af

SubcatchmentCS: Runoff Area=10.526 ac 18.16% Impervious Runoff Depth=2.31"
 Flow Length=880' Tc=26.6 min CN=56 Runoff=21.34 cfs 2.026 af

SubcatchmentDS: Runoff Area=1.990 ac 25.48% Impervious Runoff Depth=3.01"
 Flow Length=500' Tc=6.5 min CN=63 Runoff=10.52 cfs 0.498 af

SubcatchmentES: Runoff Area=25.874 ac 11.78% Impervious Runoff Depth=2.21"
 Flow Length=1,410' Tc=25.3 min CN=55 Runoff=51.39 cfs 4.772 af

SubcatchmentFS: Runoff Area=14.962 ac 4.20% Impervious Runoff Depth=0.82"
 Flow Length=1,430' Tc=26.7 min CN=39 Runoff=6.33 cfs 1.021 af

SubcatchmentGS: Runoff Area=12.457 ac 14.10% Impervious Runoff Depth=1.14"
 Flow Length=660' Tc=14.7 min CN=43 Runoff=13.99 cfs 1.179 af

SubcatchmentHS: Runoff Area=4.363 ac 19.62% Impervious Runoff Depth=1.30"
 Flow Length=460' Tc=12.0 min CN=45 Runoff=6.78 cfs 0.474 af

SubcatchmentIS: Runoff Area=3.514 ac 11.33% Impervious Runoff Depth=2.12"
 Flow Length=565' Tc=11.7 min CN=54 Runoff=10.36 cfs 0.620 af

SubcatchmentJS: Runoff Area=62.564 ac 8.71% Impervious Runoff Depth=1.93"
 Flow Length=1,265' Tc=53.4 min CN=52 Runoff=60.97 cfs 10.060 af

Reach 1R: Avg. Flow Depth=0.47' Max Vel=0.77 fps Inflow=7.41 cfs 0.573 af
 n=0.150 L=530.0' S=0.0283 '/' Capacity=5.34 cfs Outflow=4.65 cfs 0.573 af

Reach 2R: Avg. Flow Depth=0.86' Max Vel=1.20 fps Inflow=15.33 cfs 2.381 af
 n=0.150 L=730.0' S=0.0314 '/' Capacity=17.78 cfs Outflow=12.70 cfs 2.381 af

Reach 3R: Avg. Flow Depth=0.07' Max Vel=0.15 fps Inflow=5.63 cfs 0.469 af
 n=0.150 L=1,550.0' S=0.0085 '/' Capacity=228.24 cfs Outflow=0.71 cfs 0.469 af

Reach 4R: Avg. Flow Depth=0.29' Max Vel=0.60 fps Inflow=7.16 cfs 0.617 af
 n=0.150 L=840.0' S=0.0244 '/' Capacity=197.46 cfs Outflow=4.51 cfs 0.617 af

Pond AP: Peak Elev=916.96' Storage=7,001 cf Inflow=12.45 cfs 0.721 af
 Discarded=0.07 cfs 0.148 af Primary=7.41 cfs 0.573 af Outflow=7.48 cfs 0.721 af

Pond BP: Peak Elev=901.83' Storage=30,334 cf Inflow=37.57 cfs 2.778 af
 Discarded=0.23 cfs 0.398 af Primary=15.33 cfs 2.381 af Outflow=15.55 cfs 2.778 af

Pond CP: Peak Elev=882.61' Storage=73,687 cf Inflow=39.08 cfs 5.876 af
Discarded=0.37 cfs 0.503 af Primary=20.38 cfs 5.343 af Outflow=20.74 cfs 5.846 af

Pond DP: Peak Elev=883.47' Storage=1,407 cf Inflow=10.52 cfs 0.498 af
Discarded=0.01 cfs 0.003 af Primary=5.74 cfs 0.458 af Secondary=4.64 cfs 0.038 af Outflow=10.39 cfs 0.498 af

Pond EP: Peak Elev=882.57' Storage=24,958 cf Inflow=51.39 cfs 10.153 af
Discarded=0.15 cfs 0.057 af Primary=49.34 cfs 10.097 af Outflow=49.49 cfs 10.153 af

Pond FP: Peak Elev=883.00' Storage=2,654 cf Inflow=6.33 cfs 1.021 af
Discarded=0.02 cfs 0.009 af Primary=4.98 cfs 1.012 af Outflow=5.00 cfs 1.021 af

Pond GP: Peak Elev=883.29' Storage=44,647 cf Inflow=13.99 cfs 1.179 af
Discarded=0.17 cfs 0.937 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.937 af

Pond HP: Peak Elev=888.83' Storage=1,023 cf Inflow=6.78 cfs 0.474 af
Discarded=0.03 cfs 0.005 af Primary=5.63 cfs 0.469 af Outflow=5.66 cfs 0.474 af

Pond IP: Peak Elev=895.89' Storage=2,646 cf Inflow=10.36 cfs 0.620 af
Discarded=0.02 cfs 0.003 af Primary=7.16 cfs 0.617 af Outflow=7.18 cfs 0.620 af

Pond JP: Peak Elev=876.90' Storage=443,493 cf Inflow=64.87 cfs 11.146 af
Outflow=0.98 cfs 5.557 af

Total Runoff Area = 150.073 ac Runoff Volume = 23.577 af Average Runoff Depth = 1.89"
89.28% Pervious = 133.986 ac 10.72% Impervious = 16.087 ac

Summary for Subcatchment AS:

Runoff = 12.45 cfs @ 12.03 hrs, Volume= 0.721 af, Depth= 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.257	98	IMPERVIOUS
* 1.944	30	HSG A Soil
* 2.284	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.226	98	PONDING
4.711	51	Weighted Average
4.228	45	89.75% Pervious Area
0.483	98	10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	130	0.1400	0.41		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
1.2	225	0.0440	3.15		Shallow Concentrated Flow, SCF 1 Grassed Waterway Kv= 15.0 fps
3.7	255	0.0160	1.14		Shallow Concentrated Flow, SCF 2 Cultivated Straight Rows Kv= 9.0 fps
10.2	610	Total			

Summary for Subcatchment BS:

Runoff = 37.32 cfs @ 12.05 hrs, Volume= 2.205 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.299	98	IMPERVIOUS
* 0.088	30	HSG A Soil
* 7.977	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.748	98	PONDING
9.112	62	Weighted Average
8.065	58	88.51% Pervious Area
1.047	98	11.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0400	0.19		Sheet Flow, SF 4 Cultivated: Residue>20% n= 0.170 P2= 2.80"
2.0	150	0.0200	1.27		Shallow Concentrated Flow, SCF 5 Cultivated Straight Rows Kv= 9.0 fps
1.1	160	0.0750	2.46		Shallow Concentrated Flow, SCF 6 Cultivated Straight Rows Kv= 9.0 fps
0.4	100	0.2000	4.02		Shallow Concentrated Flow, SCF 7 Cultivated Straight Rows Kv= 9.0 fps
12.3	510	Total			

Summary for Subcatchment CS:

Runoff = 21.34 cfs @ 12.21 hrs, Volume= 2.026 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.675	98	IMPERVIOUS
* 3.391	30	HSG A Soil
* 5.224	58	HSG B Soil
* 0.000	71	HSG C Soil
* 1.236	98	PONDING
10.526	56	Weighted Average
8.615	47	81.84% Pervious Area
1.911	98	18.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	120	0.0170	0.17		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
2.2	120	0.0170	0.91		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
0.6	100	0.1600	2.80		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
12.3	540	0.0110	0.73		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
26.6	880	Total			

Summary for Subcatchment DS:

Runoff = 10.52 cfs @ 11.98 hrs, Volume= 0.498 af, Depth= 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.461	98	IMPERVIOUS
* 0.373	30	HSG A Soil
* 1.110	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.046	98	PONDING
1.990	63	Weighted Average
1.483	51	74.52% Pervious Area
0.507	98	25.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0300	1.51		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 2.80"
2.3	210	0.0480	1.53		Shallow Concentrated Flow, SCF 1 Short Grass Pasture Kv= 7.0 fps
3.1	190	0.0210	1.01		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
6.5	500	Total			

Summary for Subcatchment ES:

Runoff = 51.39 cfs @ 12.20 hrs, Volume= 4.772 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 2.567	98	IMPERVIOUS
* 8.606	30	HSG A Soil
* 10.992	58	HSG B Soil
* 3.227	71	HSG C Soil
* 0.482	98	PONDING
25.874	55	Weighted Average
22.825	49	88.22% Pervious Area
3.049	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	135	0.0300	0.22		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
3.3	285	0.0420	1.43		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.3	270	0.0810	1.99		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
9.6	720	0.0320	1.25		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
25.3	1,410	Total			

Summary for Subcatchment FS:

Runoff = 6.33 cfs @ 12.29 hrs, Volume= 1.021 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.549	98	IMPERVIOUS
* 11.288	30	HSG A Soil
* 3.046	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.079	98	PONDING
14.962	39	Weighted Average
14.334	36	95.80% Pervious Area
0.628	98	4.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	140	0.0210	0.19		Sheet Flow, SF 1 Range n= 0.130 P2= 2.80"
10.4	840	0.0370	1.35		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0220	3.01		Shallow Concentrated Flow, SCF 3 Paved Kv= 20.3 fps
3.8	360	0.0500	1.57		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
26.7	1,430	Total			

Summary for Subcatchment GS:

Runoff = 13.99 cfs @ 12.10 hrs, Volume= 1.179 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 1.241	98	IMPERVIOUS
* 8.961	30	HSG A Soil
* 1.740	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.515	98	PONDING
12.457	43	Weighted Average
10.701	35	85.90% Pervious Area
1.756	98	14.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	130	0.0310	0.20		Sheet Flow, SF 1 Grass: Short n= 0.150 P2= 2.80"
1.7	250	0.1280	2.50		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.2	280	0.0930	2.13		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
14.7	660	Total			

Summary for Subcatchment HS:

Runoff = 6.78 cfs @ 12.06 hrs, Volume= 0.474 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.826	98	IMPERVIOUS
* 3.197	30	HSG A Soil
* 0.310	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.030	98	PONDING
4.363	45	Weighted Average
3.507	32	80.38% Pervious Area
0.856	98	19.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	140	0.0570	0.26		Sheet Flow, SF 1 Grass: Short n= 0.150 P2= 2.80"
0.9	130	0.1080	2.30		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.1	190	0.0460	1.50		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
12.0	460	Total			

Summary for Subcatchment IS:

Runoff = 10.36 cfs @ 12.05 hrs, Volume= 0.620 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 0.348	98	IMPERVIOUS
* 1.092	30	HSG A Soil
* 2.024	58	HSG B Soil
* 0.000	71	HSG C Soil
* 0.050	98	PONDING
3.514	54	Weighted Average
3.116	48	88.67% Pervious Area
0.398	98	11.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0400	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.80"
1.0	165	0.1450	2.67		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
2.8	300	0.0670	1.81		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
11.7	565	Total			

Summary for Subcatchment JS:

Runoff = 60.97 cfs @ 12.63 hrs, Volume= 10.060 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 YR 24 HR Rainfall=7.14"

Area (ac)	CN	Description
* 1.063	98	IMPERVIOUS
* 21.821	30	HSG A Soil
* 31.858	58	HSG B Soil
* 3.433	71	HSG C Soil
* 4.389	98	PONDING
62.564	52	Weighted Average
57.112	48	91.29% Pervious Area
5.452	98	8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0050	0.09		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.80"
9.4	280	0.0050	0.49		Shallow Concentrated Flow, SCF 2 Short Grass Pasture Kv= 7.0 fps
11.0	350	0.0057	0.53		Shallow Concentrated Flow, SCF 3 Short Grass Pasture Kv= 7.0 fps
6.7	250	0.0080	0.63		Shallow Concentrated Flow, SCF 4 Short Grass Pasture Kv= 7.0 fps
8.1	285	0.0070	0.59		Shallow Concentrated Flow, SCF 5 Short Grass Pasture Kv= 7.0 fps
53.4	1,265	Total			

Summary for Reach 1R:

[55] Hint: Peak inflow is 139% of Manning's capacity

Inflow Area = 4.711 ac, 10.25% Impervious, Inflow Depth = 1.46" for 100 YR 24 HR event
Inflow = 7.41 cfs @ 12.13 hrs, Volume= 0.573 af
Outflow = 4.65 cfs @ 12.28 hrs, Volume= 0.573 af, Atten= 37%, Lag= 9.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.77 fps, Min. Travel Time= 11.5 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 56.2 min

Peak Storage= 3,214 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 0.50' Flow Area= 6.7 sf, Capacity= 5.34 cfs

20.00' x 0.50' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 530.0' Slope= 0.0283 1'
Inlet Invert= 915.00', Outlet Invert= 900.00'



Summary for Reach 2R:

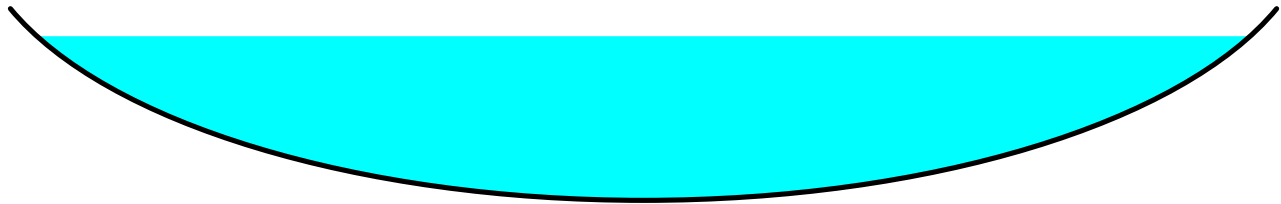
[80] Warning: Exceeded Pond BP by 0.90' @ 65.68 hrs (0.00 cfs 0.031 af)

Inflow Area = 13.823 ac, 11.07% Impervious, Inflow Depth = 2.07" for 100 YR 24 HR event
Inflow = 15.33 cfs @ 12.14 hrs, Volume= 2.381 af
Outflow = 12.70 cfs @ 12.36 hrs, Volume= 2.381 af, Atten= 17%, Lag= 13.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.20 fps, Min. Travel Time= 10.1 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 42.3 min

Peak Storage= 7,710 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 1.00' Flow Area= 13.3 sf, Capacity= 17.78 cfs

20.00' x 1.00' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 730.0' Slope= 0.0314 1'
Inlet Invert= 900.90', Outlet Invert= 878.00'



Summary for Reach 3R:

Inflow Area = 4.363 ac, 19.62% Impervious, Inflow Depth = 1.29" for 100 YR 24 HR event
 Inflow = 5.63 cfs @ 12.12 hrs, Volume= 0.469 af
 Outflow = 0.71 cfs @ 13.18 hrs, Volume= 0.469 af, Atten= 87%, Lag= 63.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.15 fps, Min. Travel Time= 171.4 min
 Avg. Velocity = 0.08 fps, Avg. Travel Time= 341.4 min

Peak Storage= 7,284 cf @ 13.18 hrs
 Average Depth at Peak Storage= 0.07'
 Bank-Full Depth= 2.00' Flow Area= 180.0 sf, Capacity= 228.24 cfs

70.00' x 2.00' deep channel, n= 0.150 Sheet flow over Short Grass
 Side Slope Z-value= 10.0 '/' Top Width= 110.00'
 Length= 1,550.0' Slope= 0.0085 '/'
 Inlet Invert= 885.20', Outlet Invert= 872.00'



Summary for Reach 4R:

Inflow Area = 3.514 ac, 11.33% Impervious, Inflow Depth = 2.11" for 100 YR 24 HR event
 Inflow = 7.16 cfs @ 12.13 hrs, Volume= 0.617 af
 Outflow = 4.51 cfs @ 12.35 hrs, Volume= 0.617 af, Atten= 37%, Lag= 12.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.60 fps, Min. Travel Time= 23.2 min
 Avg. Velocity = 0.17 fps, Avg. Travel Time= 80.4 min

Peak Storage= 6,269 cf @ 12.35 hrs
 Average Depth at Peak Storage= 0.29'
 Bank-Full Depth= 2.00' Flow Area= 112.0 sf, Capacity= 197.46 cfs

20.00' x 2.00' deep channel, n= 0.150 Sheet flow over Short Grass
 Side Slope Z-value= 18.0 '/' Top Width= 92.00'
 Length= 840.0' Slope= 0.0244 '/'
 Inlet Invert= 892.50', Outlet Invert= 872.00'



Summary for Pond AP:

Inflow Area = 4.711 ac, 10.25% Impervious, Inflow Depth = 1.84" for 100 YR 24 HR event
 Inflow = 12.45 cfs @ 12.03 hrs, Volume= 0.721 af
 Outflow = 7.48 cfs @ 12.13 hrs, Volume= 0.721 af, Atten= 40%, Lag= 5.8 min
 Discarded = 0.07 cfs @ 12.13 hrs, Volume= 0.148 af
 Primary = 7.41 cfs @ 12.13 hrs, Volume= 0.573 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 916.96' @ 12.13 hrs Surf.Area= 10,229 sf Storage= 7,001 cf

Plug-Flow detention time= 178.1 min calculated for 0.721 af (100% of inflow)
 Center-of-Mass det. time= 178.3 min (1,055.2 - 876.9)

Volume	Invert	Avail.Storage	Storage Description
#1	916.00'	20,915 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.00	4,315	0	0
918.00	16,600	20,915	20,915

Device	Routing	Invert	Outlet Devices
#1	Primary	916.60'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	916.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.07 cfs @ 12.13 hrs HW=916.96' (Free Discharge)
 ↑2=Exfiltration (Controls 0.07 cfs)

Primary OutFlow Max=7.40 cfs @ 12.13 hrs HW=916.96' TW=915.34' (Dynamic Tailwater)
 ↑1=Sharp-Crested Rectangular Weir(Weir Controls 7.40 cfs @ 2.06 fps)

Summary for Pond BP:

[62] Hint: Exceeded Reach 1R OUTLET depth by 1.39' @ 12.07 hrs

Inflow Area = 13.823 ac, 11.07% Impervious, Inflow Depth = 2.41" for 100 YR 24 HR event
 Inflow = 37.57 cfs @ 12.05 hrs, Volume= 2.778 af
 Outflow = 15.55 cfs @ 12.14 hrs, Volume= 2.778 af, Atten= 59%, Lag= 5.3 min
 Discarded = 0.23 cfs @ 12.33 hrs, Volume= 0.398 af
 Primary = 15.33 cfs @ 12.14 hrs, Volume= 2.381 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 901.83' @ 12.33 hrs Surf.Area= 33,037 sf Storage= 30,334 cf

Plug-Flow detention time= 160.0 min calculated for 2.778 af (100% of inflow)
 Center-of-Mass det. time= 160.2 min (1,023.2 - 863.0)

Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	36,320 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	170	0	0
902.00	36,150	36,320	36,320

Device	Routing	Invert	Outlet Devices
#1	Primary	900.90'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	900.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.23 cfs @ 12.33 hrs HW=901.83' (Free Discharge)
 ↳ **2=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=15.32 cfs @ 12.14 hrs HW=901.73' TW=901.59' (Dynamic Tailwater)
 ↳ **1=Sharp-Crested Rectangular Weir**(Weir Controls 15.32 cfs @ 1.88 fps)

Summary for Pond CP:

[62] Hint: Exceeded Reach 2R OUTLET depth by 3.91' @ 13.72 hrs

Inflow Area = 53.758 ac, 11.78% Impervious, Inflow Depth = 1.31" for 100 YR 24 HR event
 Inflow = 39.08 cfs @ 12.26 hrs, Volume= 5.876 af
 Outflow = 20.74 cfs @ 12.77 hrs, Volume= 5.846 af, Atten= 47%, Lag= 30.8 min
 Discarded = 0.37 cfs @ 12.73 hrs, Volume= 0.503 af
 Primary = 20.38 cfs @ 12.77 hrs, Volume= 5.343 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 882.61' @ 12.73 hrs Surf.Area= 50,190 sf Storage= 73,687 cf

Plug-Flow detention time= 213.2 min calculated for 5.845 af (99% of inflow)
 Center-of-Mass det. time= 210.2 min (1,115.2 - 905.0)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	180,070 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	4,130	0	0
880.00	9,420	13,550	13,550
882.00	27,160	36,580	50,130
884.00	102,780	129,940	180,070

Device	Routing	Invert	Outlet Devices
#1	Discarded	878.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	879.90'	15.0" Round Culvert L= 52.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 879.90' / 879.70' S= 0.0038 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Primary	882.00'	20.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.37 cfs @ 12.73 hrs HW=882.61' (Free Discharge)

↑1=Exfiltration (Controls 0.37 cfs)

Primary OutFlow Max=20.38 cfs @ 12.77 hrs HW=882.61' TW=882.51' (Dynamic Tailwater)

↑2=Culvert (Inlet Controls 1.82 cfs @ 1.48 fps)

↑3=Sharp-Crested Rectangular Weir (Weir Controls 18.56 cfs @ 1.54 fps)

Summary for Pond DP:

Inflow Area =	1.990 ac, 25.48% Impervious, Inflow Depth = 3.01" for 100 YR 24 HR event
Inflow =	10.52 cfs @ 11.98 hrs, Volume= 0.498 af
Outflow =	10.39 cfs @ 11.99 hrs, Volume= 0.498 af, Atten= 1%, Lag= 0.7 min
Discarded =	0.01 cfs @ 11.99 hrs, Volume= 0.003 af
Primary =	5.74 cfs @ 11.99 hrs, Volume= 0.458 af
Secondary =	4.64 cfs @ 11.99 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 883.47' @ 11.99 hrs Surf.Area= 1,793 sf Storage= 1,407 cf

Plug-Flow detention time= 3.4 min calculated for 0.498 af (100% of inflow)

Center-of-Mass det. time= 3.4 min (846.0 - 842.6)

Volume	Invert	Avail.Storage	Storage Description
#1	881.90'	2,520 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.90	0	0	0
884.00	2,400	2,520	2,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	881.90'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	881.90'	15.0" Round Culvert

#3 Secondary 883.30' L= 50.0' RCP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 881.90' / 881.50' S= 0.0080 '/' Cc= 0.900
 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
20.0' long x 1.00' rise Sharp-Crested Rectangular Weir
 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.01 cfs @ 11.99 hrs HW=883.47' (Free Discharge)
 ↑1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=5.74 cfs @ 11.99 hrs HW=883.47' TW=879.35' (Dynamic Tailwater)
 ↑2=Culvert (Inlet Controls 5.74 cfs @ 4.68 fps)

Secondary OutFlow Max=4.62 cfs @ 11.99 hrs HW=883.47' TW=880.71' (Dynamic Tailwater)
 ↑3=Sharp-Crested Rectangular Weir (Weir Controls 4.62 cfs @ 1.37 fps)

Summary for Pond EP:

[80] Warning: Exceeded Pond CP by 1.53' @ 12.15 hrs (13.39 cfs 0.906 af)

Inflow Area = 79.632 ac, 11.78% Impervious, Inflow Depth = 1.53" for 100 YR 24 HR event
 Inflow = 51.39 cfs @ 12.20 hrs, Volume= 10.153 af
 Outflow = 49.49 cfs @ 12.26 hrs, Volume= 10.153 af, Atten= 4%, Lag= 3.2 min
 Discarded = 0.15 cfs @ 12.26 hrs, Volume= 0.057 af
 Primary = 49.34 cfs @ 12.26 hrs, Volume= 10.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 882.57' @ 12.26 hrs Surf.Area= 20,548 sf Storage= 24,958 cf

Plug-Flow detention time= 11.8 min calculated for 10.152 af (100% of inflow)
 Center-of-Mass det. time= 11.8 min (947.6 - 935.8)

Volume	Invert	Avail.Storage	Storage Description
#1	879.10'	71,325 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.10	0	0	0
882.00	10,990	15,935	15,935
884.00	44,400	55,390	71,325

Device	Routing	Invert	Outlet Devices
#1	Discarded	879.10'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	879.10'	20.0" Round Culvert L= 76.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 879.10' / 877.60' S= 0.0197 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 2.18 sf
#3	Primary	882.40'	Asymmetrical Weir, C= 3.27 Offset (feet) 0.00 70.00 200.00 320.00 Height (feet) 1.60 0.00 0.00 1.60

Discarded OutFlow Max=0.15 cfs @ 12.26 hrs HW=882.57' (Free Discharge)

↑1=Exfiltration (Controls 0.15 cfs)

Primary OutFlow Max=49.30 cfs @ 12.26 hrs HW=882.57' (Free Discharge)

↑2=Culvert (Inlet Controls 17.06 cfs @ 7.82 fps)

↑3=Asymmetrical Weir (Weir Controls 32.24 cfs @ 1.25 fps)

Summary for Pond FP:

Inflow Area = 27.419 ac, 8.69% Impervious, Inflow Depth = 0.45" for 100 YR 24 HR event
 Inflow = 6.33 cfs @ 12.29 hrs, Volume= 1.021 af
 Outflow = 5.00 cfs @ 12.42 hrs, Volume= 1.021 af, Atten= 21%, Lag= 7.3 min
 Discarded = 0.02 cfs @ 12.60 hrs, Volume= 0.009 af
 Primary = 4.98 cfs @ 12.42 hrs, Volume= 1.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 883.00' @ 12.60 hrs Surf.Area= 3,314 sf Storage= 2,654 cf

Plug-Flow detention time= 8.7 min calculated for 1.021 af (100% of inflow)
 Center-of-Mass det. time= 8.7 min (954.9 - 946.2)

Volume	Invert	Avail.Storage	Storage Description
#1	881.40'	6,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.40	0	0	0
884.00	5,380	6,994	6,994

Device	Routing	Invert	Outlet Devices
#1	Discarded	881.40'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	881.40'	15.0" Round Culvert L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 881.40' / 881.20' S= 0.0040 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.02 cfs @ 12.60 hrs HW=883.00' (Free Discharge)

↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=4.97 cfs @ 12.42 hrs HW=882.96' TW=882.23' (Dynamic Tailwater)

↑2=Culvert (Barrel Controls 4.97 cfs @ 4.17 fps)

Summary for Pond GP:

Inflow Area = 12.457 ac, 14.10% Impervious, Inflow Depth = 1.14" for 100 YR 24 HR event
 Inflow = 13.99 cfs @ 12.10 hrs, Volume= 1.179 af
 Outflow = 0.17 cfs @ 24.24 hrs, Volume= 0.937 af, Atten= 99%, Lag= 728.2 min
 Discarded = 0.17 cfs @ 24.24 hrs, Volume= 0.937 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 883.29' @ 24.24 hrs Surf.Area= 22,858 sf Storage= 44,647 cf

Plug-Flow detention time= 2,206.5 min calculated for 0.937 af (79% of inflow)
 Center-of-Mass det. time= 2,114.8 min (3,026.8 - 912.0)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	93,550 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	2,240	0	0
882.00	16,770	19,010	19,010
884.00	26,180	42,950	61,960
885.00	37,000	31,590	93,550

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	884.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Discarded OutFlow Max=0.17 cfs @ 24.24 hrs HW=883.29' (Free Discharge)
 ↑1=Exfiltration (Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.00' TW=881.40' (Dynamic Tailwater)
 ↑2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond HP:

Inflow Area = 4.363 ac, 19.62% Impervious, Inflow Depth = 1.30" for 100 YR 24 HR event
 Inflow = 6.78 cfs @ 12.06 hrs, Volume= 0.474 af
 Outflow = 5.66 cfs @ 12.12 hrs, Volume= 0.474 af, Atten= 17%, Lag= 3.5 min
 Discarded = 0.03 cfs @ 12.12 hrs, Volume= 0.005 af
 Primary = 5.63 cfs @ 12.12 hrs, Volume= 0.469 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 888.83' @ 12.12 hrs Surf.Area= 1,334 sf Storage= 1,023 cf

Plug-Flow detention time= 1.8 min calculated for 0.474 af (100% of inflow)
 Center-of-Mass det. time= 1.8 min (902.1 - 900.3)

Volume	Invert	Avail.Storage	Storage Description
#1	887.30'	3,173 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.30	0	0	0
890.00	2,350	3,173	3,173

Device	Routing	Invert	Outlet Devices
#1	Discarded	887.30'	0.800 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	887.30'	15.0" Round Culvert L= 83.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 887.30' / 885.20' S= 0.0253 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.03 cfs @ 12.12 hrs HW=888.83' (Free Discharge)

↑1=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=5.63 cfs @ 12.12 hrs HW=888.83' TW=885.23' (Dynamic Tailwater)

↑2=Culvert (Inlet Controls 5.63 cfs @ 4.59 fps)

Summary for Pond IP:

Inflow Area =	3.514 ac, 11.33% Impervious, Inflow Depth = 2.12" for 100 YR 24 HR event
Inflow =	10.36 cfs @ 12.05 hrs, Volume= 0.620 af
Outflow =	7.18 cfs @ 12.13 hrs, Volume= 0.620 af, Atten= 31%, Lag= 5.2 min
Discarded =	0.02 cfs @ 12.13 hrs, Volume= 0.003 af
Primary =	7.16 cfs @ 12.13 hrs, Volume= 0.617 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 895.89' @ 12.13 hrs Surf.Area= 2,530 sf Storage= 2,646 cf

Plug-Flow detention time= 3.1 min calculated for 0.620 af (100% of inflow)

Center-of-Mass det. time= 3.1 min (872.6 - 869.5)

Volume	Invert	Avail.Storage	Storage Description
#1	893.80'	2,926 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
893.80	0	0	0
896.00	2,660	2,926	2,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	893.80'	0.300 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'
#2	Primary	893.80'	15.0" Round Culvert L= 83.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.80' / 892.50' S= 0.0157 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=895.89' (Free Discharge)

↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=7.15 cfs @ 12.13 hrs HW=895.89' TW=892.72' (Dynamic Tailwater)

↑2=Culvert (Inlet Controls 7.15 cfs @ 5.83 fps)

Summary for Pond JP:

[62] Hint: Exceeded Reach 3R OUTLET depth by 4.87' @ 25.14 hrs

[62] Hint: Exceeded Reach 4R OUTLET depth by 4.87' @ 25.41 hrs

Inflow Area = 70.441 ac, 9.52% Impervious, Inflow Depth = 1.90" for 100 YR 24 HR event
 Inflow = 64.87 cfs @ 12.58 hrs, Volume= 11.146 af
 Outflow = 0.98 cfs @ 25.01 hrs, Volume= 5.557 af, Atten= 98%, Lag= 745.7 min
 Discarded = 0.98 cfs @ 25.01 hrs, Volume= 5.557 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 876.90' @ 25.01 hrs Surf.Area= 192,339 sf Storage= 443,493 cf

Plug-Flow detention time= 2,345.3 min calculated for 5.557 af (50% of inflow)
 Center-of-Mass det. time= 2,189.6 min (3,113.0 - 923.4)

Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	689,970 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	8,990	0	0
874.00	71,370	80,360	80,360
876.00	141,925	213,295	293,655
878.00	254,390	396,315	689,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	872.00'	0.200 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 850.00'

Discarded OutFlow Max=0.98 cfs @ 25.01 hrs HW=876.90' (Free Discharge)

↑1=Exfiltration (Controls 0.98 cfs)



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Washington County, Minnesota**

Stillwater Township



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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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

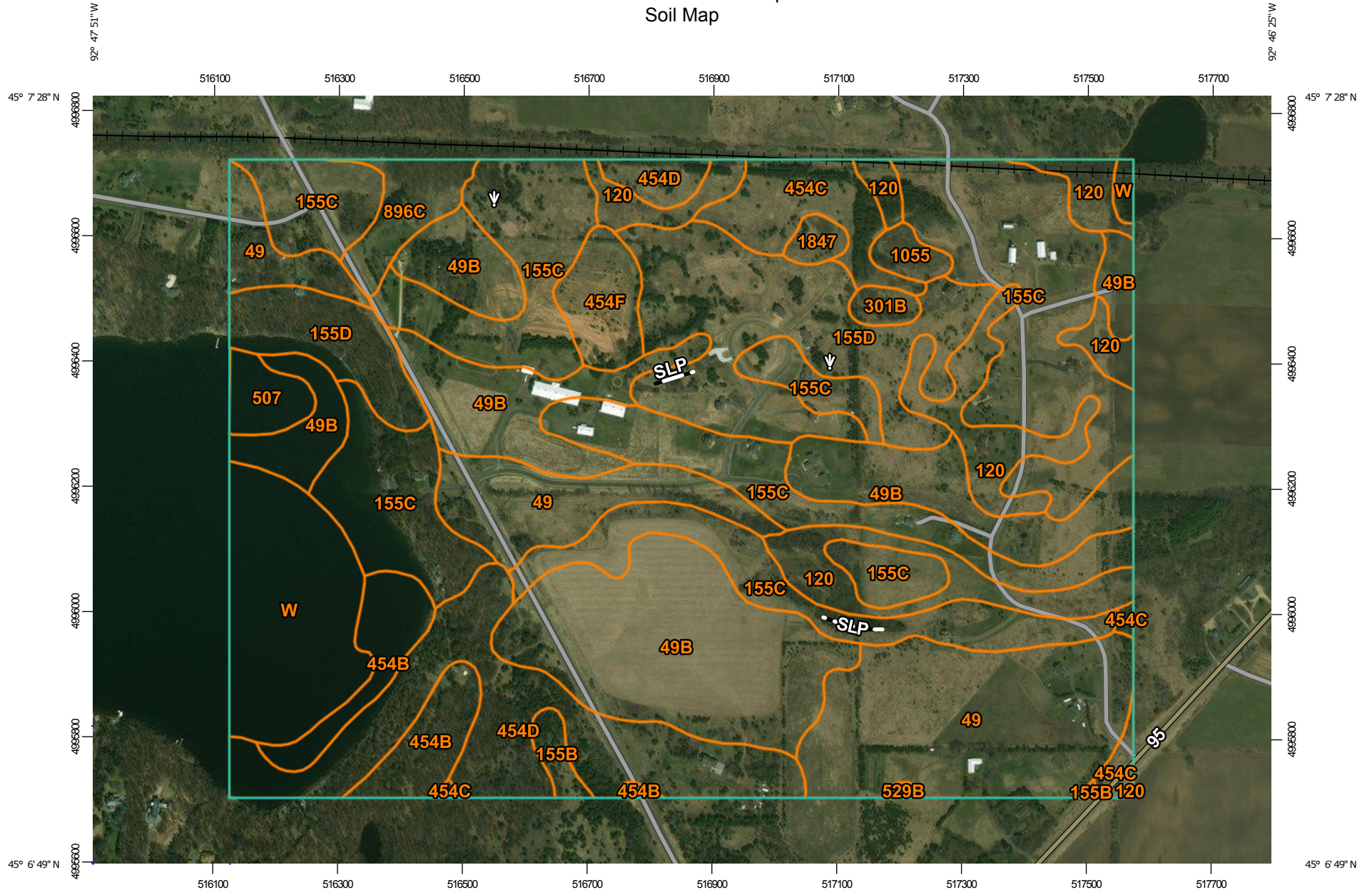
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

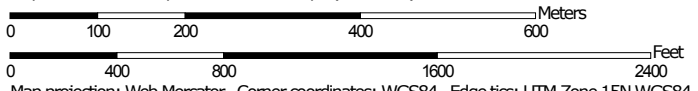
Soil Map

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.

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Map Scale: 1:8,630 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

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

Soil Survey Area: Washington County, Minnesota
 Survey Area Data: Version 14, Oct 9, 2018

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

Date(s) aerial images were photographed: May 9, 2013—Jun 6, 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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49	Antigo silt loam, 0 to 2 percent slopes	46.0	12.6%
49B	Antigo silt loam, 2 to 6 percent slopes	66.7	18.2%
120	Brill silt loam	25.6	7.0%
155B	Chetek sandy loam, 0 to 6 percent slopes	1.8	0.5%
155C	Chetek sandy loam, 6 to 12 percent slopes	96.8	26.4%
155D	Chetek sandy loam, 12 to 25 percent slopes	38.2	10.4%
301B	Lindstrom silt loam, 2 to 4 percent slopes	1.5	0.4%
454B	Mahtomedi loamy sand, 0 to 6 percent slopes	11.5	3.1%
454C	Mahtomedi loamy sand, 6 to 12 percent slopes	10.1	2.8%
454D	Mahtomedi loamy sand, 12 to 25 percent slopes	29.4	8.0%
454F	Mahtomedi loamy sand, 25 to 40 percent slopes	5.8	1.6%
507	Poskin silt loam	3.4	0.9%
529B	Ripon silt loam, 2 to 6 percent slopes	0.3	0.1%
896C	Mahtomedi-Kingsley complex, 3 to 12 percent slopes	5.3	1.5%
1055	Aquolls and Histosols, ponded	1.9	0.5%
1847	Barronett silt loam, sandy substratum	1.5	0.4%
W	Water	20.6	5.6%
Totals for Area of Interest		366.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the

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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

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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.

Washington County, Minnesota

49—Antigo silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tnz7
Elevation: 690 to 1,900 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 80 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Antigo

Setting

Landform: Flats, terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Loess and/or silty glaciofluvial deposits over loamy glaciofluvial deposits over stratified sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 12 inches: silt loam
B/E - 12 to 19 inches: silt loam
Bt1 - 19 to 28 inches: silt loam
2Bt2 - 28 to 31 inches: loam
2Bt3 - 31 to 33 inches: very gravelly sandy loam
3C - 33 to 79 inches: stratified sand to very gravelly coarse sand

Properties and qualities

Slope: 0 to 2 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 (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Forage suitability group: Mod AWC, adequately drained (G090BY005WI)

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Other vegetative classification: Acer saccharum/Hydrophyllum (AH), Acer saccharum/Viola-Osmorhiza (AViO)
Hydric soil rating: No

Minor Components

Billyboy

Percent of map unit: 8 percent
Landform: Flats, terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Acer saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum/Hydrophyllum (AH), Acer saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-Osmorhiza (AViO)
Hydric soil rating: No

Sconsin

Percent of map unit: 5 percent
Landform: Flats, terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Acer saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum/Hydrophyllum (AH), Acer saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-Osmorhiza (AViO)
Hydric soil rating: No

Rosholt

Percent of map unit: 3 percent
Landform: Flats, terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Other vegetative classification: Acer saccharum/Vaccinium-Desmodium (AVDe), Acer saccharum/Athyrium (AAt), Acer saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum-Quercus/Viburnum=(Vaccinium) (AQVb-V)
Hydric soil rating: No

Brill

Percent of map unit: 2 percent
Landform: Flats, terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Acer saccharum/Athyrium (AAt), Acer saccharum/Caulophyllum-Circaea (ACaCi)
Hydric soil rating: No

Ossmer

Percent of map unit: 2 percent
Landform: Flats, terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear

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Other vegetative classification: Acer saccharum/Hydrophyllum (AH), Acer saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-Osmorhiza (AViO), Tsuga/Maianthemum-Coptis (TMC)
Hydric soil rating: No

49B—Antigo silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2tnz8
Elevation: 740 to 1,900 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 80 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Antigo

Setting

Landform: Terraces, flats, hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess and/or silty glaciofluvial deposits over loamy glaciofluvial deposits over stratified sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 12 inches: silt loam
B/E - 12 to 19 inches: silt loam
Bt1 - 19 to 28 inches: silt loam
2Bt2 - 28 to 31 inches: loam
2Bt3 - 31 to 33 inches: very gravelly sandy loam
3C - 33 to 79 inches: stratified sand to very gravelly coarse sand

Properties and qualities

Slope: 2 to 6 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 (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Forage suitability group: Mod AWC, adequately drained (G090BY005WI)

Other vegetative classification: Acer saccharum/Hydrophyllum (AH), Acer saccharum/Viola-Osmorhiza (AViO)

Hydric soil rating: No

Minor Components

Billyboy

Percent of map unit: 5 percent

Landform: Hillslopes, terraces, flats

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope, tread, rise

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Acer saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum/Hydrophyllum (AH), Acer saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-Osmorhiza (AViO)

Hydric soil rating: No

Sconsin

Percent of map unit: 5 percent

Landform: Hillslopes, terraces, flats

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, tread, rise

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Acer saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum/Hydrophyllum (AH), Acer saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-Osmorhiza (AViO)

Hydric soil rating: No

Rosholt

Percent of map unit: 5 percent

Landform: Hillslopes, flats, terraces

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Interfluve, side slope, riser, rise

Down-slope shape: Convex

Across-slope shape: Convex

Other vegetative classification: Acer saccharum/Vaccinium-Desmodium (AVDe), Acer saccharum/Athyrium (AAf), Acer saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum-Quercus/Viburnum=(Vaccinium) (AQVb-V)

Hydric soil rating: No

Brill

Percent of map unit: 3 percent

Landform: Hillslopes, terraces, flats

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, tread, rise

Down-slope shape: Linear

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Across-slope shape: Linear

Other vegetative classification: Acer saccharum/Athyrium (AAt), Acer saccharum/
Caulophyllum-Circaea (ACaCi)

Hydric soil rating: No

Ossmer

Percent of map unit: 2 percent

Landform: Hillslopes, terraces, flats

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope, tread, talf

Down-slope shape: Concave

Across-slope shape: Linear

Other vegetative classification: Acer saccharum/Hydrophyllum (AH), Acer
saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-Osmorhiza
(AViO), Tsuga/Maianthemum-Coptis (TMC)

Hydric soil rating: No

120—Brill silt loam

Map Unit Setting

National map unit symbol: 1t93l

Elevation: 800 to 1,950 feet

Mean annual precipitation: 27 to 33 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 135 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Brill and similar soils: 90 percent

Minor components: 10 percent

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

Description of Brill

Setting

Landform: Drainageways on outwash plains

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Loess over outwash

Typical profile

A - 0 to 3 inches: silt loam

E - 3 to 11 inches: silt loam

B/E - 11 to 14 inches: silt loam

Bt - 14 to 35 inches: silt loam

2C - 35 to 60 inches: stratified sand to coarse sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

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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 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: C

Forage suitability group: Sloping Upland, Acid (G090XN006MN)

Hydric soil rating: No

Minor Components

Antigo

Percent of map unit: 5 percent

Hydric soil rating: No

Barronett

Percent of map unit: 5 percent

Landform: Drainageways on lake plains, depressions on lake plains

Hydric soil rating: Yes

155B—Chetek sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1t93w

Elevation: 800 to 1,950 feet

Mean annual precipitation: 27 to 33 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 135 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Chetek and similar soils: 90 percent

Minor components: 10 percent

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

Description of Chetek

Setting

Landform: Outwash plains

Landform position (two-dimensional): Backslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Outwash

Typical profile

Ap - 0 to 8 inches: sandy loam

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E - 8 to 14 inches: loam
Bt - 14 to 19 inches: gravelly sandy loam
2BC,2C - 19 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Forage suitability group: Sandy (G090XN022MN)
Hydric soil rating: No

Minor Components

Poskin

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

Kingsley

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

155C—Chetek sandy loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 1t93x
Elevation: 800 to 1,950 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Chetek and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chetek

Setting

Landform: Pitted outwash plains

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Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Outwash

Typical profile

Ap - 0 to 8 inches: sandy loam
E - 8 to 14 inches: loam
Bt - 14 to 19 inches: gravelly sandy loam
2BC,2C - 19 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Forage suitability group: Sandy (G090XN022MN)
Hydric soil rating: No

Minor Components

Poskin

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

Kingsley

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

155D—Chetek sandy loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 1t93y
Elevation: 800 to 1,950 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Chetek and similar soils: 90 percent

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Minor components: 10 percent

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

Description of Chetek

Setting

Landform: Pitted outwash plains

Landform position (two-dimensional): Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Outwash

Typical profile

Ap - 0 to 8 inches: sandy loam

E - 8 to 14 inches: loam

Bt - 14 to 19 inches: gravelly sandy loam

2BC,2C - 19 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 12 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A

Forage suitability group: Sandy (G090XN022MN)

Hydric soil rating: No

Minor Components

Poskin

Percent of map unit: 5 percent

Hydric soil rating: No

Kingsley

Percent of map unit: 5 percent

Hydric soil rating: No

301B—Lindstrom silt loam, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: 1t94r

Mean annual precipitation: 27 to 33 inches

Mean annual air temperature: 39 to 46 degrees F

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Frost-free period: 135 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Lindstrom and similar soils: 90 percent

Minor components: 10 percent

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

Description of Lindstrom

Setting

Landform: Loess hills

Landform position (two-dimensional): Footslope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Colluvium

Typical profile

Ap - 0 to 9 inches: silt loam

A,AB - 9 to 37 inches: silt loam

Bw - 37 to 58 inches: silt loam

C - 58 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 4 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

Available water storage in profile: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Forage suitability group: Sloping Upland, Acid (G090XN006MN)

Hydric soil rating: No

Minor Components

Otter

Percent of map unit: 4 percent

Landform: Drainageways on loess hills

Hydric soil rating: Yes

Richwood

Percent of map unit: 3 percent

Hydric soil rating: No

Ripon

Percent of map unit: 3 percent

Hydric soil rating: No

454B—Mahtomedi loamy sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1t95j
Elevation: 670 to 1,600 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Mahtomedi and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mahtomedi

Setting

Landform: Outwash plains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Outwash

Typical profile

Ap - 0 to 8 inches: loamy sand
Bw - 8 to 30 inches: gravelly coarse sand
C - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Forage suitability group: Sandy (G090XN022MN)
Hydric soil rating: No

Minor Components

Antigo

Percent of map unit: 3 percent
Hydric soil rating: No

Brill

Percent of map unit: 3 percent
Hydric soil rating: No

Demontreville

Percent of map unit: 2 percent
Hydric soil rating: No

Kingsley

Percent of map unit: 2 percent
Hydric soil rating: No

454C—Mahtomedi loamy sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 1t95k
Elevation: 670 to 1,600 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Mahtomedi and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mahtomedi

Setting

Landform: Outwash plains
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Outwash

Typical profile

Ap - 0 to 8 inches: loamy sand
Bw - 8 to 30 inches: gravelly coarse sand
C - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained

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Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Forage suitability group: Sandy (G090XN022MN)

Hydric soil rating: No

Minor Components

Antigo

Percent of map unit: 3 percent

Hydric soil rating: No

Brill

Percent of map unit: 3 percent

Hydric soil rating: No

Demontreville

Percent of map unit: 2 percent

Hydric soil rating: No

Kingsley

Percent of map unit: 2 percent

Hydric soil rating: No

454D—Mahtomedi loamy sand, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 1t95l

Elevation: 670 to 1,600 feet

Mean annual precipitation: 27 to 33 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 135 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Mahtomedi and similar soils: 90 percent

Minor components: 10 percent

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

Description of Mahtomedi

Setting

Landform: Outwash plains

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Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Outwash

Typical profile

A - 0 to 5 inches: loamy sand
E - 5 to 8 inches: sand
Bw - 8 to 30 inches: gravelly coarse sand
C - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy (G090XN022MN)
Hydric soil rating: No

Minor Components

Antigo

Percent of map unit: 4 percent
Hydric soil rating: No

Demontreville

Percent of map unit: 3 percent
Hydric soil rating: No

Kingsley

Percent of map unit: 3 percent
Hydric soil rating: No

454F—Mahtomedi loamy sand, 25 to 40 percent slopes

Map Unit Setting

National map unit symbol: 1t95m
Elevation: 670 to 1,600 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days

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Farmland classification: Not prime farmland

Map Unit Composition

Mahtomedi and similar soils: 90 percent

Minor components: 10 percent

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

Description of Mahtomedi

Setting

Landform: Outwash plains

Landform position (two-dimensional): Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Outwash

Typical profile

A - 0 to 3 inches: loamy sand

Bw - 3 to 23 inches: gravelly coarse sand

C - 23 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 40 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Forage suitability group: Not Suited (G090XN024MN)

Hydric soil rating: No

Minor Components

Demontreville

Percent of map unit: 5 percent

Hydric soil rating: No

Kingsley

Percent of map unit: 5 percent

Hydric soil rating: No

507—Poskin silt loam

Map Unit Setting

National map unit symbol: 1t961
Elevation: 800 to 1,950 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Poskin and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poskin

Setting

Landform: Drainageways on outwash plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium over outwash

Typical profile

Ap,A - 0 to 13 inches: silt loam
Bt - 13 to 28 inches: silt loam
BC - 28 to 33 inches: loam
2C - 33 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 2 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 (0.57 to 1.98 in/hr)
Depth to water table: About 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Forage suitability group: Level Swale, Acid (G090XN005MN)
Hydric soil rating: No

Minor Components

Antigo

Percent of map unit: 3 percent
Hydric soil rating: No

Barronett, sandy substratum

Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Hydric soil rating: Yes

Brill

Percent of map unit: 2 percent
Hydric soil rating: No

Rosholt

Percent of map unit: 2 percent
Hydric soil rating: No

529B—Ripon silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1t963
Elevation: 700 to 1,950 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ripon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ripon

Setting

Landform: Hills, terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over limestone bedrock

Typical profile

A - 0 to 10 inches: silt loam
Bt - 10 to 28 inches: silt loam
2R - 28 to 32 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Custom Soil Resource Report

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 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: 5 percent
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Forage suitability group: Sloping Upland, Low AWC, Acid (G090XN008MN)
Hydric soil rating: No

Minor Components

Channahon

Percent of map unit: 4 percent
Hydric soil rating: No

Whalan

Percent of map unit: 3 percent
Hydric soil rating: No

Waukegan

Percent of map unit: 3 percent
Hydric soil rating: No

896C—Mahtomedi-Kingsley complex, 3 to 12 percent slopes

Map Unit Setting

National map unit symbol: 1t96q
Elevation: 670 to 1,600 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Mahtomedi and similar soils: 60 percent
Kingsley and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mahtomedi

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder

Custom Soil Resource Report

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Outwash

Typical profile

Ap - 0 to 8 inches: loamy sand
Bw - 8 to 30 inches: gravelly coarse sand
C - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy (G090XN022MN)
Hydric soil rating: No

Description of Kingsley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Till

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt - 8 to 39 inches: sandy loam
C - 39 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 12 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 low to moderately high (0.14 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Forage suitability group: Sloping Upland, Acid (G090XN006MN)

Hydric soil rating: No

Minor Components

Demontreville

Percent of map unit: 2 percent

Hydric soil rating: No

Santiago

Percent of map unit: 1 percent

Hydric soil rating: No

Ronneby

Percent of map unit: 1 percent

Hydric soil rating: No

Poskin

Percent of map unit: 1 percent

Hydric soil rating: No

1055—Aquolls and Histosols, ponded

Map Unit Setting

National map unit symbol: 1t970

Elevation: 700 to 1,600 feet

Mean annual precipitation: 27 to 33 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 135 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Histosols, ponded, and similar soils: 50 percent

Aquolls, ponded, and similar soils: 50 percent

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

Description of Histosols, Ponded

Setting

Landform: Depressions on moraines

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Organic materials

Typical profile

Oa1 - 0 to 8 inches: muck

Oa2 - 8 to 60 inches: muck

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 5.95 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Available water storage in profile: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w

Hydrologic Soil Group: A/D

Forage suitability group: Not Suited (G090XN024MN)

Hydric soil rating: Yes

Description of Aquolls, Ponded

Setting

Landform: Depressions on moraines

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Till

Typical profile

A - 0 to 42 inches: silty clay loam

Bg - 42 to 50 inches: clay loam

Cg - 50 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 1 percent

Available water storage in profile: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w

Hydrologic Soil Group: B/D

Forage suitability group: Not Suited (G090XN024MN)

Hydric soil rating: Yes

1847—Barronett silt loam, sandy substratum

Map Unit Setting

National map unit symbol: 1t977

Custom Soil Resource Report

Elevation: 800 to 1,950 feet
Mean annual precipitation: 27 to 33 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Barronett, sandy substratum, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barronett, Sandy Substratum

Setting

Landform: Drainageways on outwash plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium over outwash

Typical profile

A - 0 to 17 inches: silt loam
Bt - 17 to 42 inches: silt loam
2BC - 42 to 50 inches: loamy sand
2C - 50 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 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 (0.57 to 1.98 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Forage suitability group: Ponded If Not Drained (G090XN013MN)
Hydric soil rating: Yes

Minor Components

Poskin

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

Brill

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

Markey

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

W—Water

Map Unit Composition

Water: 100 percent

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

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