

**SADDLE CREEK ESTATES
PRELIMINARY DRAINAGE PLAN**

**PENDING
TO BE HEARD
AT 6/7/2016
DRAINAGE BOARD
MEETING**

APRIL-MAY 2016



**CASH WAGNER
& ASSOCIATES, PC**
CONSULTING ENGINEERS • LAND SURVEYORS

DATE: 04.29.16

ATTENTION: Jeff Mueller

PROJECT NO.: 15-2184

COMPANY: Vanderburgh County
Surveyor

REFERENCE: Saddle Creek Estates

ADDRESS: Civic Center Complex -
Room 325

YOUR FILE NO.:

CITY, ST, ZIP: Evansville, IN 47708

PHONE:

THE FOLLOWING ITEMS:

COPIES:	ORIG./LAST REV. DATE:	DESCRIPTION:
1	04.28.16	Road & Storm Details (Sheet C-111)
1	04.28.16	Drainage Details (Sheet C-112)
1		Public Hearing Notice & Green Receipts

LETTER OF TRANSMITTAL

ARE TRANSMITTED:

- PER YOUR REQUEST
- FOR YOUR FILES
- FOR REVIEW & COMMENT
- OTHER

FOR YOUR:

- APPROVAL
- USE
- INFORMATION
- OTHER

VIA:

- COURIER
- FOR PICK UP
- USPS
- NEXT DAY
- FED EX
- UPS
- DHL
- SATURDAY DELIVERY
- TRACKING # _____
- OTHER DELIVERED

COMMENTS:

If you have any questions or comments, please give me a call. Thank you

414 CITADEL CIRCLE
SUITE 8
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
GMERITT@CASHWAGGNER.COM

FROM:

GLEN MERITT, JR., P.E.

cc: File

RECEIVED BY THE
VANDERBURGH COUNTY
SURVEYOR'S OFFICE

5/2/16

Mueller, Jeffrey

From: Glen Meritt <GMeritt@cashwagner.com>
Sent: Tuesday, May 03, 2016 1:08 PM
To: Mueller, Jeffrey
Subject: RE: Saddle Creek
Attachments: doc03260720160503131337.pdf

Jeff,

Attached is the information you requested. I added the storm sewer information in the second full paragraph of page two in the drainage report. If you need anything else please let me know.

Sincerely,

Glen Meritt Jr.
Cash Wagner & Associates, PC
414 Citadel Circle – Suite B
Evansville, IN 47715
Office: 1-812-401-5561
Fax: 1-812-401-5563
Cell: 1-812-774-2988

[Click here](#) to upload files.

From: Mueller, Jeffrey [mailto:jmueller@vanderburghsurveyor.com]
Sent: Monday, May 02, 2016 4:42 PM
To: Glen Meritt <GMeritt@cashwagner.com>
Cc: Stoll, John <JStoll@vanderburghgov.org>
Subject: RE: Saddle Creek

Glen,

Attached are the updated comments. This is what I still need.

- A chart with the list of all the pipes and the material to be used. You could also just state that all pipes are planned to be _____. Do list what is anticipated for the 2 larger pipes that will cross the road (box culvert?)
- Give me a couple of cross sections of the existing stream (these can be cut from AutoCAD and do not have to be field shot). Give me a location sheet of the cross sections-you can provide on 8 ½ by 11.

Since everything will just be a couple of sheets, you can email-be sure to put you PE on what you submit. The office will be closed tomorrow. Call if you have any questions. Unless John has any issues, once you provide the above, we will be good to go on 5/10.

Jeff

**RECEIVED BY THE
VANDERBURGH COUNTY
SURVEYOR'S OFFICE**

5/4/2016

From: Glen Meritt [<mailto:GMeritt@cashwagner.com>]

Sent: Monday, May 02, 2016 11:39 AM

To: Mueller, Jeffrey

Subject: Saddle Creek

Jeff,

Attached is the updated hydrograph for the developed 25-year flow leaving the site.

Sincerely,

Glen Meritt Jr.
Cash Wagner & Associates, PC
414 Citadel Circle – Suite B
Evansville, IN 47715
Office: 1-812-401-5561
Fax: 1-812-401-5563
Cell: 1-812-774-2988



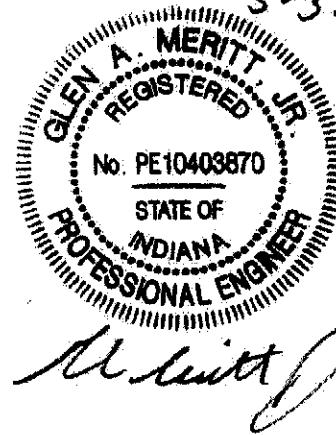
**CASH WAGGNER
& ASSOCIATES, PC**

CONSULTING ENGINEERS • LAND SURVEYORS

May 3, 2016

Mr. Jeff Mueller
Vanderburgh County Surveyor
Room 325 Civic Center - 1 NW Martin Luther King Jr. Blvd.
Evansville, IN 47708

**RE: Preliminary Drainage Report
Saddle Creek Estates
Baumgart Road
Our Project #: 15-2184**



Mr. Mueller:

Below is a summary of the drainage calculations for the above-referenced project.

SITE DESCRIPTION

This development consists of a single family residential subdivision with 131 lots and its associated improvements (i.e. roads, utilities). This subdivision is located on a 75.94-acre parcel that lies on the west side of Baumgart Road approximately 1,200 feet southwest of the Browning Road and Baumgart Road intersection. This project will be constructed in multiple phases with construction starting on the east end at Baumgart Road. Detention Basin #2 will be constructed during the first phase of construction. All improvements within developed sub-basin #1 will either be piped or a temporary swale will need to be constructed to direct the runoff to Detention Basin #2. Once any improvements are constructed within developed sub-basin #3, Detention Basin #1 will be constructed. For the portion of the subdivision that is heavily wooded, the 50' right-of-way and adjoining 15' on both sides of the right-of-way will be cleared to allow the roadway and utilities to be constructed. For the area of the subdivision that is an existing cultivated field, the majority of the property will be disturbed during construction.

No regulated drains, inlets or outfalls exist on this site. An existing sanitary sewer is located on the subject property. The sanitary sewer starts at the southwest corner of the property and runs along the south property line to the existing ditch located just inside the woods. From this point it follows the existing ditch through the woods to the north property line. No existing combined sewers or outfalls are located on this site. No known wells, septic tanks systems or outfalls exist on this site. No seeps, springs, sinkholes, caves, shafts, faults or other such geological features are visible or of record on this site.

DRAINAGE PATTERNS

The west 23.38-acres (UN-1) which was previously utilized as a cultivated field drains in a southwesterly direction and exits the property via a ditch along the south property line near the southwest corner of the site. The remaining 52.56-acres (UN-

2) contains 44.62- acres which is heavily wooded and 7.94-acres of cultivated field that drains and to an existing ditch that meanders through the wooded area and exits the site near the southwest corner of the wooded area. See attached Undeveloped Sub-basin Exhibit for the locations of the sub-basin.

The 25-year flows were calculated for the entire 75.94-acre development. Undetained runoff will account for 29.06-acres and 46.88-acres will be collected by the two detention basins. There is also 19.57-acres of off-site runoff that will be collected between the two detention basins. The residential subdivision was divided into 6 developed sub-basins and four off-site sub-basins. Sub-basin #1 and OS-4 will be collected by Detention Basin #2 while sub-basin #2, #4 & #5 will be allowed to exit the site undetained. Sub-basin #3 and OS-1 will be collected by Detention Basin #1 while sub-basin #6 will be allowed to exit the site undetained. Off-site sub-basins #2 and #3 will continue to drain to the existing ditches that will be left undisturbed with the exception of the street culverts. Runoff from the following sub-basins will be allowed to exit the site undetained: #2, #4, #5 and #6. See attached Developed Sub-basin Exhibit for the locations of each sub-basin.

A drainage swale and storm sewer network will be installed within the development to capture the storm water runoff and convey it to one of the two detention basins located on site. All storm sewers will be constructed with reinforced concrete pipe. P-603 will require a 6' x 4' concrete box culvert and P-605 will require a 42" diameter concrete pipe culvert under Road #2. Several of the wooded lots on the east end of the subdivision will have to be graded from the rear of the lot to the front of the lot. I have shown 10 foot drainage easements along these property lines to allow side yard swales to be constructed when the homes are built which will divert the upstream runoff away from the homes. The primary outlet and emergency spillway of Detention Basin #1 will discharge to the existing ditch located at the southwest corner of the site near the confluence of Little Pigeon Creek. The primary outlet and emergency spillway of Detention Basin #2 will discharge into the existing ditch that is located on the west side of the detention basin. All runoff ultimately discharges to Little Pigeon Creek.

CALCULATIONS

For Detention Basins #1 and #2 a hydrologic and hydraulic analyses was performed using HydroCAD Stormwater Modeling System, version 9.1, developed by HydroCAD Software Solutions LLC. HydroCAD is capable of modeling the hydrology and hydraulics of stormwater runoff using the hydrology techniques developed by the NRCS and various other accepted H&H calculation techniques. The program calculates the peak runoff rates and total runoff volume for each sub-basin and routes the resulting hydrographs through the network of storm pipes, inlets and basins defined in the model. The program routes the various converging flows together, taking into account differences in time of concentration and travel time through the network structures to accurately calculate peak and total discharge rates for sizing of the detention basin outlet structures.

Peak discharge and total runoff volume calculations were performed using the NRCS (formerly SCS) Curve Number Method. Rainfall data was obtained from the Type II



CASH WAGGNER & ASSOCIATES, PC

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FAX: 812.401.5563

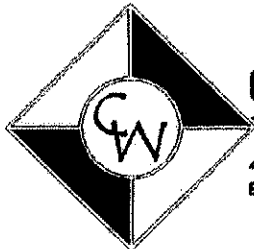
24-hr storm for Vanderburgh County. The watershed sub-basin areas for each detention basin were then combined into one large sub-basin for each storm sewer run to simplify the modeling process. The weighted developed runoff Curve Number, C_N , for each sub-basin was determined for the proposed conditions based on land use and hydrologic soil group rating. The models of the proposed drainage system were subjected to H&H analyses for the 25-year return period storm event.

The outlet structure for each detention basin was sized for the 25-year design storm event while allowing a discharge rate less than the undeveloped 10-year storm event from the system minus the undetained 25-year runoff plus the 25-year off-site runoff. The emergency spillways for both detention basins were designed to convey the 100-year storm flow.

Below is a summary of the detention basin design elements:

		NOTES
Detention Basin #1 Developed Q(25)	82.40 - cfs	
Detention Basin #1 Undeveloped Q(10)	65.20 - cfs	Undeveloped Sub-basin UN-1
Undetained Developed Q(25)	6.80 - cfs	#6
Off-Site Developed Q(25)	10.16 - cfs	Off-Site Sub-basin OS-1
Allowable Detention Basin Release Rate	68.56 - cfs	Undeveloped Q(10) - Undetained Developed Q(25) + Off-Site Q(25)
<i>Proposed Detention Basin Release Rate</i>	<i>4.98 - cfs</i>	<i>Detention Basin #1 Primary Spillway</i>
<i>Outlet Structure</i>	<i>78-LF of 15" R.C.P.</i>	<i>P-601</i>
Outlet I.E.	392.50	
25-year Storage Vol. Elev.	393.84	
HW (25-yr. elev. - I.E.)	1.34 - ft.	
Minimum Top/Bank	394.50	

		NOTES
Detention Basin #2 Developed Q(25)	111.33 - cfs	#1 + OS-4 (HydroCAD)
Detention Basin #2 Undeveloped Q(10)	85.34 - cfs	Undeveloped Sub-basin UN-2
Undetained Developed Q(25)	78.81 - cfs	#2, #4 & #5
Off-Site Developed Q(25)	44.20 - cfs	Off-Site Sub-basin OS-4
Allowable Detention Basin Release Rate	50.73 - cfs	Undeveloped Q(10) - Undetained Developed Q(25) + Off-Site Q(25)
<i>Proposed Detention Basin Release Rate</i>	<i>25.23 - cfs</i>	<i>Detention Basin #2 Primary Outlet</i>



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<i>Primary Outlet Structure</i>	<i>45-LF of 24" R.C.P.</i>	<i>P-531</i>
Primary Outlet I.E.	406.00	
25-year Storage Vol. Elev.	409.78	
HW (25-yr. elev. - I.E.)	3.78 - ft.	
Minimum Top/Bank	410.50	

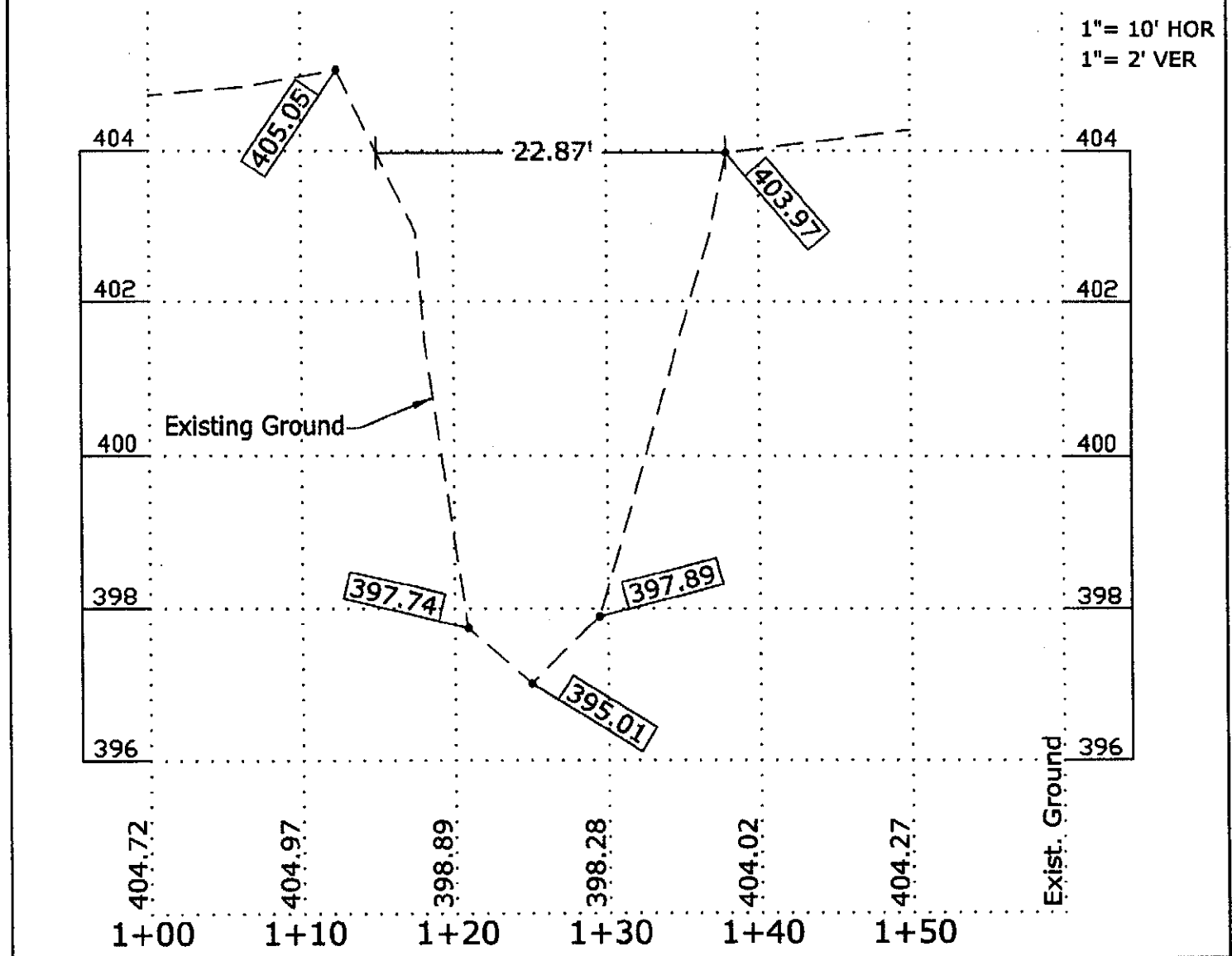
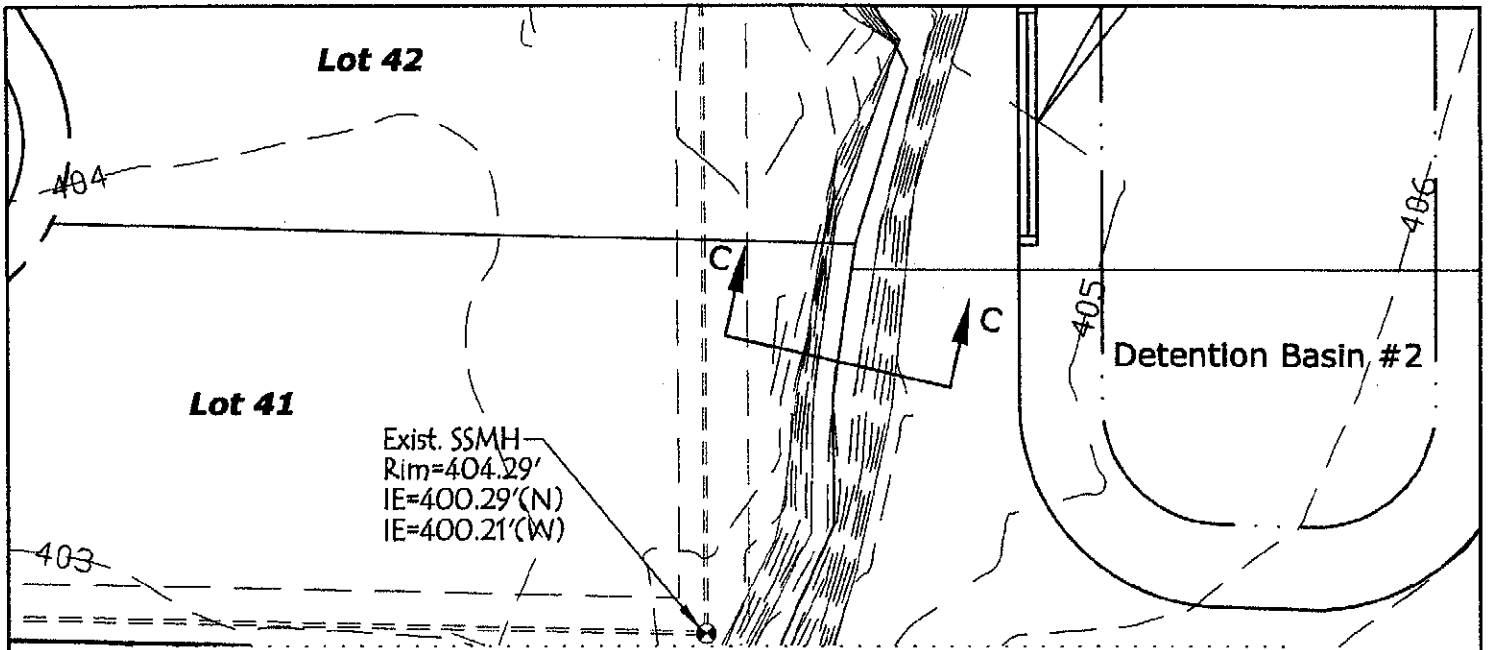
W:\152184\Civil\Drainage\PREL DRAINAGE REPORT.doc



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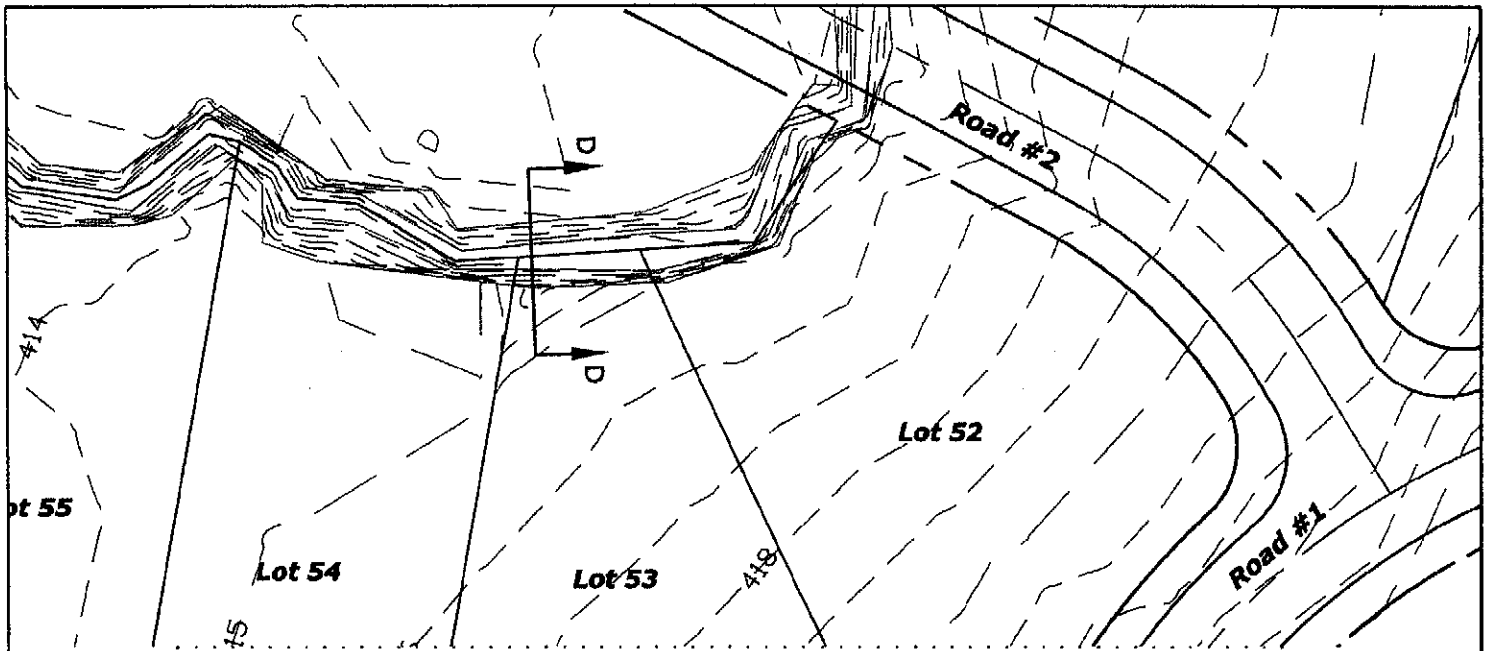


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& ASSOCIATES, PC**

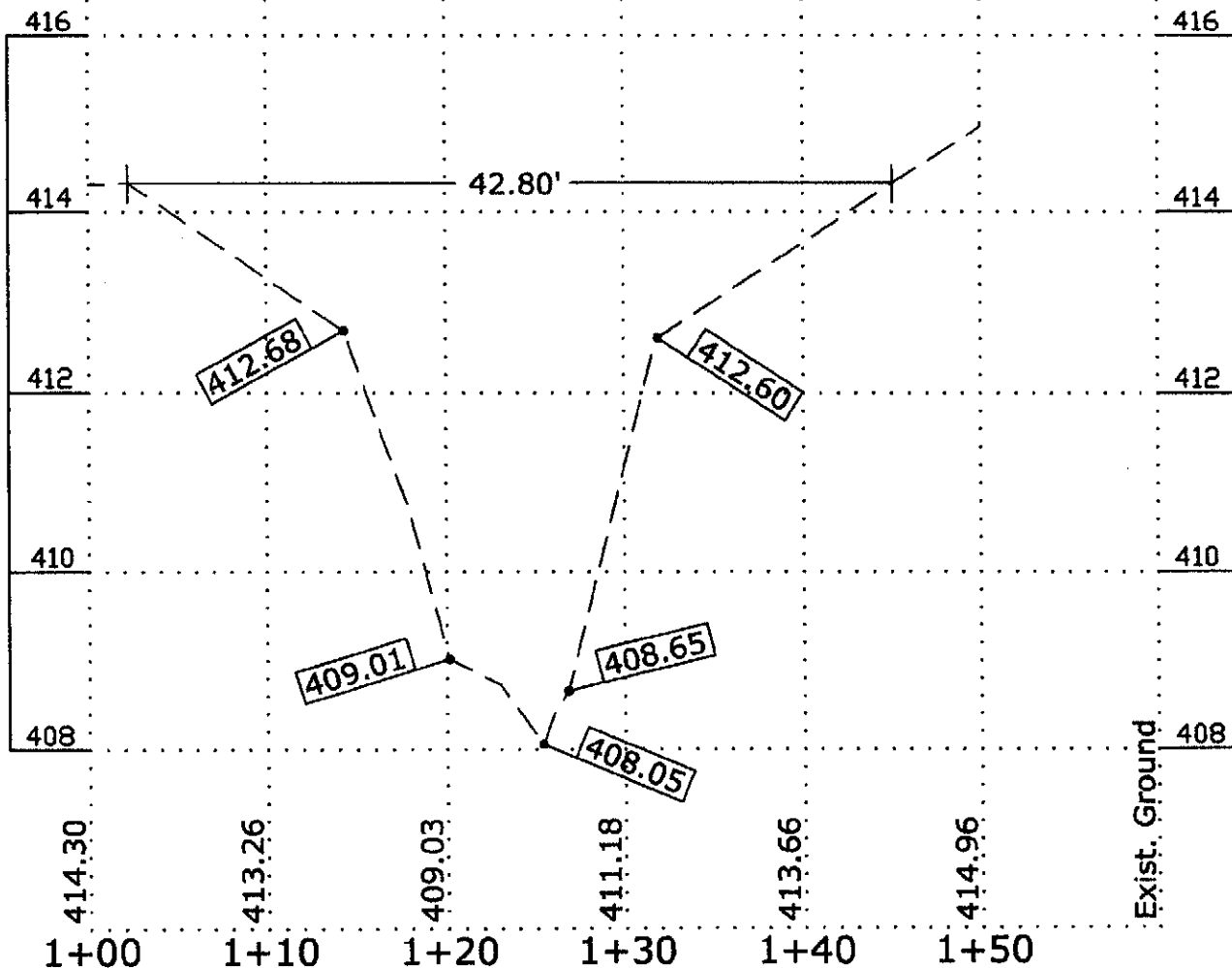
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414 CITADEL CIRCLE, SUITE B, EVANSVILLE, IN 47715

**SADDLE CREEK ESTATES
STREAM CROSS SECTION "C-C"
BAUMGART ROAD
EVANSVILLE, INDIANA**

SHEET NO.:	1
PROJECT NO.:	15-2184
FILENAME:	2184 BASE
DESIGNED BY:	G.A.M.
DATE:	05.03.16



1" = 10' HOR
1" = 2' VER



**NOTICE OF PUBLIC HEARING
FOR MAJOR SUBDIVISION PLATS AND
MINOR SUBDIVISION PLATS (GOING TO PUBLIC HEARING)**

TO: Adjoining Property Owner
FROM: CWK Investments - McCutchanville, LLC
DATE: March 28, 2016
SUBJECT: Notice of public hearing on "Saddle Creek Estates"

Notice is hereby given that the Area Plan Commission, on Thursday, the 12th day of May, 2016 at 4:00 p.m. in the City Council Chambers (Room 301): City-County Building, Civic Center Complex, Evansville, will hold a public hearing on Saddle Creek Estates for primary approval. The proposed subdivision involves 128 lots on the northwest side of Baumgart Road to the west of Browning Road and it extends to the west near the southern extension of Havenwood Meadows Drive, in Vanderburgh County, Indiana. A reduced copy of the plat is enclosed, along with the Area Plan Commission (APC) subdivision comment form. The purpose of the form is to provide an opportunity for public comment on the proposed subdivision prior to the APC meeting. Comments can be placed on the form and sent by mail to the Area Plan Commission, or the form can be downloaded from the APC website (www.evansvilleapc.com) and e-mailed to the APC office. Click on the "Contact Us" button on the APC website to e-mail digital comments. You can also call the APC staff at (812) 435-5226 prior to the Plan Commission meeting to ask questions or express any concerns.

Be advised that, according to State law, the Area Plan Commission can only consider comments relating to the standards and requirements in the Subdivision Code. This Code is available for review in the APC office at the Civic Center, Room 312; and is also on the APC website.

The drainage plan for Saddle Creek Estates will be reviewed by the County Drainage Board (Room 301), Civic Center Complex on the 10th day of May, 2016 at 4:00 p.m. (after the County Commissioner's meeting). This meeting is the forum for the public to express drainage concerns.

Developer of Subdivision

CWK Investments - McCutchanville, LLC
C. Wayne Kinney
Phone 812-760-1365

Enclosures

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82-04-21-002-567,010-019
Virginia R. Church, Trustee
1035 Suwannee Drive
Evansville, IN 47725

Use for instructions

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Total Postage & Fees		

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82-04-21-002-827,011-019
Brian D. & Darla K. Hoover
909 Raphael Drive
Evansville, IN 47725

Use for instructions

2529 5062 2000 0212 7714

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1. Article Addressed to:
 82-04-21-002-, 13.008-019
 82-04-21-002-, 14.005-019
 Martha Jane Baumgart, Kenneth Charles Baumgart
 & Thomas Edward Baumgart
 9800 Baumgart Road
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
[Signature] Agent Address
 B. Received by (Printed Name) *[Signature]* C. Date of Delivery
 D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
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1. Article Addressed to:
 82-04-21-003-528.001-019
 Gerald F. Clements, Jr. &
 Denise K. Clements
 10020 Baumgart Road
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
[Signature] Agent Address
 B. Received by (Printed Name) *[Signature]* C. Date of Delivery
 D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
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1. Article Addressed to:
 82-04-20-002-113.020-019
 82-04-21-002-115.038-019
 Bernard F & Susan K Flittner, Trustee
 PO Box 2711
 Evansville, IN 47728

COMPLETE THIS SECTION ON DELIVERY

A. Signature
[Signature] Agent Address
 B. Received by (Printed Name) *[Signature]* C. Date of Delivery
 D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
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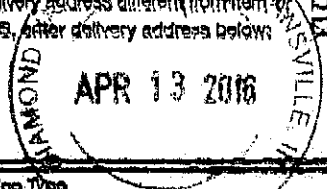
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1. Article Addressed to:

82-04-21-002-115.034-019
 Flavion & Kathleen Elpers
 10111 Baumgart Road
 Evansville, IN 47725

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- A. Signature
**Kathleen Elpers* Agent Address
- B. Received by (Printed Name) *Kathleen Elpers* C. Date of Delivery
- D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:



3. Service Type
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1. Article Addressed to:

82-04-21-002-115.035-019
 Brent & Hannah Carter
 10119 Baumgart Road
 Evansville, IN 47725

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- A. Signature
**Hannah Carter* Agent Address
- B. Received by (Printed Name) *Hannah Carter* C. Date of Delivery *4-7-16*
- D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
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7014 2120 0002 7905 6707

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1. Article Addressed to:

82-04-21-002-115.032-019
 Keith A. & Connie J. Sermersheim
 10125 Baumgart Road
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

- A. Signature
**Connie J. Sermersheim* Agent Address
- B. Received by (Printed Name) *Connie J. Sermersheim* C. Date of Delivery
- D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery
4. Restricted Delivery? (Extra Fee) Yes

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5/2/16 CA

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1. Article Addressed to:

82-04-21-002-115.029-019
 Samuel A. & Hilda S. Tieken
 10131 Baumgart Road
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]
 B. Received by (Printed Name) C. Date of Delivery
 SAMUEL A. TIEKEN 7-5-16
 D. Is delivery address different from Item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery
 4. Restricted Delivery? (Extra Fee) Yes

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1. Article Addressed to:

82-04 21-002-852.002-019
 Thomas C. & Julia A. Boettcher
 10340 Browning Road
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]
 B. Received by (Printed Name) C. Date of Delivery
 Thomas Boettcher
 D. Is delivery address different from Item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
 Certified Mail® Priority Mail Express™
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 Insured Mail Collect on Delivery
 4. Restricted Delivery? (Extra Fee) Yes

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1. Article Addressed to:

82-04-21-002-115.028-019
 Steven G. Becker, Trustee
 10400 Browning Road
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]
 B. Received by (Printed Name) C. Date of Delivery
 Steven G. Becker
 D. Is delivery address different from Item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
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1. Article Addressed to:

82-04-21-002-538.016-019
 James D. & Luanne M. Flikkema
 10323 Wilmington Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *[Signature]* Agent Addressee

B. Received by (Printed Name) *[Signature]* C. Date of Delivery
 4-7-16

D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery

4. Restricted Delivery? (Extra Fee) Yes

2. Article Number 7014 2120 0002 7905 6875

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1. Article Addressed to:

82-04-21-002-538.015-019
 David I. & Michele N. Malitz
 10300 Wilmington Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *[Signature]* Agent Addressee

B. Received by (Printed Name) *[Signature]* C. Date of Delivery

D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery

4. Restricted Delivery? (Extra Fee) Yes

2. Article Number 7014 2120 0002 7905 6882

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-538.014-019
 Katherine M. Leahy Hein & Christopher
 10324 Wilmington Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *[Signature]* Agent Addressee

B. Received by (Printed Name) *[Signature]* C. Date of Delivery

D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery

4. Restricted Delivery? (Extra Fee) Yes

2. Article Number 7014 2120 0002 7905 6899

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-538.027-019
 Bentwood Estates Owners
 10431 Wilmington Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]

B. Received by (Printed Name) *LEASIE BARKER* C. Date of Delivery *4-8-16*

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) Yes

2. Article Number 7014 2120 0002 7905 6844

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-567.006-019
 Joseph C. Whitehead
 10405 Old Plantation Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]

B. Received by (Printed Name) *JOSEPH WHITEHEAD* C. Date of Delivery *4-7-16*

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) Yes

2. Article Number 7014 2120 0002 7905 6851

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-567.008-019
 Terry H. & Tracey L. Vibbert
 1125 Suwannee Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]

B. Received by (Printed Name) *TRACEY VIBBERT* C. Date of Delivery *4-7-16*

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery

4. Restricted Delivery? (Extra Fee) Yes

2. Article Number 7014 2120 0002 7905 6868

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-567.009-019
 L. Faye Powell, Trust
 1101 Suwannee Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *Faye Powell* Agent Addressee

B. Received by (Printed Name) *FAYE POWELL* C. Date of Delivery *4-7-16*

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
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4. Restricted Delivery? (Extra Fee) Yes

2. Article Number
7014 2120 0002 7905 6813

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-567.011-019
 William F. & Susanne S. Johnson
 1025 Suwannee Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *[Signature]* Agent Addressee

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery

4. Restricted Delivery? (Extra Fee) Yes

2. Article Number
7014 2120 0002 7905 6837

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- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.014-019
 Kenneth H. & Sharon A. Seib
 10313 Havenwood Meadows Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *Sharon Seib* Agent Addressee

B. Received by (Printed Name) C. Date of Delivery *4-7-16*

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail® Priority Mail Express™
 Registered Return Receipt for Merchandise
 Insured Mail Collect on Delivery

4. Restricted Delivery? (Extra Fee) Yes

2. Article Number
7014 2120 0002 7905 6783

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.013-019
 Shawn R. Clark
 929 Raphael Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *Shawn Clark* Agent Addressee

B. Received by (Printed Name) *Shawn Clark* C. Date of Delivery

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail[®] Priority Mail Express[™]
 Registered Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) Yes

2. Article Description

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.012-019
 Nicholas A. & Mallory J. Crowley
 919 Raphael Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *Nicholas Crowley* Agent Addressee

B. Received by (Printed Name) *Nicholas Crowley* C. Date of Delivery *4-7-14*

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail[®] Priority Mail Express[™]
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4. Restricted Delivery? (Extra Fee) Yes

2. Article Description

7014 2120 0002 7905 6806

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.010-019
 Jacob T. Schiff &
 Kathryn Proctor-Schiff
 905 Raphael Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 X *Kathryn Proctor-Schiff* Agent Addressee

B. Received by (Printed Name) *Kathryn Proctor-Schiff* C. Date of Delivery

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail[®] Priority Mail Express[™]
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4. Restricted Delivery? (Extra Fee) Yes

2. Article Description

7014 2120 0002 7905 6769

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.009-019
 David M. & Rebecca Hammer
 6524 Newburgh Road
 Evansville, IN 47715

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

E. Service Type
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4. Restricted Delivery? (Extra Fee) Yes

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.008-019
 Jason M. & Lindsay A. Halbig
 845 Raphael Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]

B. Received by (Printed Name) C. Date of Delivery
[Signature]

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

E. Service Type
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4. Restricted Delivery? (Extra Fee) Yes

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

82-04-21-002-827.007-019
 Jeff & Jennifer Michele
 10324 Bernadette Drive
 Evansville, IN 47725

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent Addressee
[Signature]

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

E. Service Type
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 Registered Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) Yes

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SENDER COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY																
<ul style="list-style-type: none"> ■ Complete items 1, 2, and 3. ■ Print your name and address on the reverse so that we can return the card to you. ■ Attach this card to the back of the mailpiece, or on the front if space permits. 	<p>A. Signature <input checked="" type="checkbox"/> X <i>Gerald David Robinson</i> <input checked="" type="checkbox"/> Agent <input type="checkbox"/> Addressee</p> <p>B. Received by (Printed Name) _____ C. Date of Delivery _____</p>																
<p>1. Article Addressed to:</p> <p>82-04-21-002-827,009-019 Gerald David Robinson 901 Raphael Drive Evansville, IN 47725</p>  <p>9590 9403 0473 5173 9400 08</p>	<p>2. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input checked="" type="checkbox"/> No</p> 																
<p>2. Article Number (Transfer from service label)</p> <p>7014 2120 0002 7905 7193</p>	<p>3. Service Type</p> <table border="0"> <tr> <td><input type="checkbox"/> Adult Signature</td> <td><input type="checkbox"/> Priority Mail Express</td> </tr> <tr> <td><input checked="" type="checkbox"/> Adult Signature Restricted Delivery</td> <td><input checked="" type="checkbox"/> Registered Mail™</td> </tr> <tr> <td><input checked="" type="checkbox"/> Certified Mail®</td> <td><input type="checkbox"/> Registered Mail Restricted Delivery</td> </tr> <tr> <td><input checked="" type="checkbox"/> Certified Mail Restricted Delivery</td> <td><input checked="" type="checkbox"/> Return Receipt for Merchandise</td> </tr> <tr> <td><input type="checkbox"/> Collect on Delivery</td> <td><input type="checkbox"/> Signature Confirmation</td> </tr> <tr> <td><input type="checkbox"/> Collect on Delivery Restricted Delivery</td> <td><input type="checkbox"/> Signature Confirmation Restricted Delivery</td> </tr> <tr> <td><input type="checkbox"/> Insured Mail</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)</td> <td></td> </tr> </table>	<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express	<input checked="" type="checkbox"/> Adult Signature Restricted Delivery	<input checked="" type="checkbox"/> Registered Mail™	<input checked="" type="checkbox"/> Certified Mail®	<input type="checkbox"/> Registered Mail Restricted Delivery	<input checked="" type="checkbox"/> Certified Mail Restricted Delivery	<input checked="" type="checkbox"/> Return Receipt for Merchandise	<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation	<input type="checkbox"/> Collect on Delivery Restricted Delivery	<input type="checkbox"/> Signature Confirmation Restricted Delivery	<input type="checkbox"/> Insured Mail		<input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)	
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<input checked="" type="checkbox"/> Certified Mail Restricted Delivery	<input checked="" type="checkbox"/> Return Receipt for Merchandise																
<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation																
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<input type="checkbox"/> Insured Mail																	
<input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)																	

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Subdivision Ajoiner's List- April 12, 2016

82-04-21-002-113.008-019 - 82-04-21-002-114.005-019 Martha Jane Baumgart, Kenneth Charles Baumgart & Thomas Edward Baumgart 9800 Baumgart Road - Evansville, IN 47725	82-04-21-002-528.001-019 Gerald F. Clements, Jr. & Denise K. Clements 10020 Baumgart Road Evansville, IN 47725	82-04-20-002-113.020-019 82-04-21-002-115.038-019 Bernard F & Susan K Flittner, Trustee PO Box 2711 Evansville, IN 47728
82-04-21-002-115.034-019 - Flavien & Kathleen Elpers 10111 Baumgart Road Evansville, IN 47725	82-04-21-002-115.035-019 Brent & Hannah Carter 10119 Baumgart Road Evansville, IN 47725	82-04-21-002-115.032-019 Keith A. & Connie J. Sermersheim 10125 Baumgart Road Evansville, IN 47725
82-04-21-002-115.029-019 - Samuel A. & Hilda S. Ticken 10131 Baumgart Road Evansville, IN 47725	82-04-21-002-852.002-019 Thomas C. & Julia A. Boettcher 10340 Browning Road Evansville, IN 47725	82-04-21-002-115.028-019 Steven G. Becker, Trustee 10400 Browning Road Evansville, IN 47725
82-04-21-002-538.016-019 - James D. & Luanne M. Flikkema 10323 Wilmington Drive Evansville, IN 47725	82-04-21-002-538.015-019 David I. & Michele N. Malitz 10300 Wilmington Drive Evansville, IN 47725	82-04-21-002-538.014-019 Katherine M. Leahy Hein & Christopher 10324 Wilmington Drive Evansville, IN 47725
82-04-21-002-538.027-019 - Bentwood Estates Owners 10431 Wilmington Drive Evansville, IN 47725	82-04-21-002-567.006-019 Joseph C. Whitehead 10405 Old Plantation Drive Evansville, IN 47725	82-04-21-002-567.008-019 Terry H. & Tracey L. Vibbert 1125 Suwannee Drive Evansville, IN 47725
82-04-21-002-567.009-019 - L. Faye Powell, Trust 1101 Suwannee Drive Evansville, IN 47725	82-04-21-002-567.010-019 Virginia R. Church, Trustee 1035 Suwannee Drive Evansville, IN 47725	82-04-21-002-567.011-019 William F. & Susanne S. Johnson 1025 Suwannee Drive Evansville, IN 47725
82-04-21-002-827.014-019 - Kenneth H. & Sharon A. Seib 10313 Havenwood Meadows Drive Evansville, IN 47725	82-04-21-002-827.013-019 Shawn R. Clark 929 Raphael Drive Evansville, IN 47725	82-04-21-002-827.012-019 Nicholas A. & Mallory J. Crowley 919 Raphael Drive Evansville, IN 47725
82-04-21-002-827.011-019 - Brian D. & Darla K. Hoover 909 Raphael Drive Evansville, IN 47725	82-04-21-002-827.010-019 Jacob T. Schiff & Kathryn Proctor-Schiff 905 Raphael Drive Evansville, IN 47725	82-04-21-002-827.009-019 David M. & Rebecca Hammer 6524 Newburgh Road Evansville, IN 47715
82-04-21-002-827.008-019 - Jason M. & Lindsay A. Halbig 845 Raphael Drive Evansville, IN 47725	82-04-21-002-827.007-019 Jeff & Jennifer Michel 10324 Bernadette Drive Evansville, IN 47725	82-04-21-002-827.009-019 Gerald David Roberson 901 Raphael Drive Evansville, IN 47725

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5/2/16 CA



CASH WAGGNER
& ASSOCIATES, PC
 CONSULTING ENGINEERS • LAND SURVEYORS

April 28, 2016

Mr. Jeff Mueller
 Vanderburgh County Surveyor
 Room 325 Civic Center - 1 NW Martin Luther King Jr. Blvd.
 Evansville, IN 47708

**RE: Preliminary Drainage Report
 Saddle Creek Estates
 Baumgart Road
 Our Project #: 15-2184**



Mr. Mueller:

Below is a summary of the drainage calculations for the above-referenced project.

SITE DESCRIPTION

This development consists of a single family residential subdivision with 131 lots and its associated improvements (i.e. roads, utilities). This subdivision is located on a 75.94-acre parcel that lies on the west side of Baumgart Road approximately 1,200 feet southwest of the Browning Road and Baumgart Road intersection. This project will be constructed in multiple phases with construction starting on the east end at Baumgart Road. Detention Basin #2 will be constructed during the first phase of construction. All improvements within developed sub-basin #1 will either be piped or a temporary swale will need to be constructed to direct the runoff to Detention Basin #2. Once any improvements are constructed within developed sub-basin #3, Detention Basin #1 will be constructed. For the portion of the subdivision that is heavily wooded, the 50' right-of-way and adjoining 15' on both sides of the right-of-way will be cleared to allow the roadway and utilities to be constructed. For the area of the subdivision that is an existing cultivated field, the majority of the property will be disturbed during construction.

No regulated drains, inlets or outfalls exist on this site. An existing sanitary sewer is located on the subject property. The sanitary sewer starts at the southwest corner of the property and runs along the south property line to the existing ditch located just inside the woods. From this point it follows the existing ditch through the woods to the north property line. No existing combined sewers or outfalls are located on this site. No known wells, septic tanks systems or outfalls exist on this site. No seeps, springs, sinkholes, caves, shafts, faults or other such geological features are visible or of record on this site.

DRAINAGE PATTERNS

The west 23.38-acres (UN-1) which was previously utilized as a cultivated field drains in a southwesterly direction and exits the property via a ditch along the south property line near the southwest corner of the site. The remaining 52.56-acres (UN-

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2) contains 44.62- acres which is heavily wooded and 7.94-acres of cultivated field that drains and to an existing ditch that meanders through the wooded area and exits the site near the southwest corner of the wooded area. See attached Undeveloped Sub-basin Exhibit for the locations of the sub-basin.

The 25-year flows were calculated for the entire 75.94-acre development. Undetained runoff will account for 29.06-acres and 46.88-acres will be collected by the two detention basins. There is also 19.57-acres of off-site runoff that will be collected between the two detention basins. The residential subdivision was divided into 6 developed sub-basins and four off-site sub-basins. Sub-basin #1 and OS-4 will be collected by Detention Basin #2 while sub-basin #2, #4 & #5 will be allowed to exit the site undetained. Sub-basin #3 and OS-1 will be collected by Detention Basin #1 while sub-basin #6 will be allowed to exit the site undetained. Off-site sub-basins #2 and #3 will continue to drain to the existing ditches that will be left undisturbed with the exception of the street culverts. Runoff from the following sub-basins will be allowed to exit the site undetained: #2, #4, #5 and #6. See attached Developed Sub-basin Exhibit for the locations of each sub-basin.

A drainage swale and storm sewer network will be installed within the development to capture the storm water runoff and convey it to one of the two detention basins located on site. All storm sewers will be constructed with reinforced concrete pipe. Several of the wooded lots on the east end of the subdivision will have to be graded from the rear of the lot to the front of the lot. I have shown 10 foot drainage easements along these property lines to allow side yard swales to be constructed when the homes are built which will divert the upstream runoff away from the homes. The primary outlet and emergency spillway of Detention Basin #1 will discharge to the existing ditch located at the southwest corner of the site near the confluence of Little Pigeon Creek. The primary outlet and emergency spillway of Detention Basin #2 will discharge into the existing ditch that is located on the west side of the detention basin. All runoff ultimately discharges to Little Pigeon Creek.

CALCULATIONS

For Detention Basins #1 and #2 a hydrologic and hydraulic analyses was performed using HydroCAD Stormwater Modeling System, version 9.1, developed by HydroCAD Software Solutions LLC. HydroCAD is capable of modeling the hydrology and hydraulics of stormwater runoff using the hydrology techniques developed by the NRCS and various other accepted H&H calculation techniques. The program calculates the peak runoff rates and total runoff volume for each sub-basin and routes the resulting hydrographs through the network of storm pipes, inlets and basins defined in the model. The program routes the various converging flows together, taking into account differences in time of concentration and travel time through the network structures to accurately calculate peak and total discharge rates for sizing of the detention basin outlet structures.

Peak discharge and total runoff volume calculations were performed using the NRCS (formerly SCS) Curve Number Method. Rainfall data was obtained from the Type II 24-hr storm for Vanderburgh County. The watershed sub-basin areas for each detention basin were then combined into one large sub-basin for each storm sewer



CASH WAGGNER & ASSOCIATES, PC

414 CITADEL CIRCLE, STE. B
EVANSVILLE, IN 47715

PH: 812.401.5561
FAX: 812.401.5563

run to simplify the modeling process. The weighted developed runoff Curve Number, C_N , for each sub-basin was determined for the proposed conditions based on land use and hydrologic soil group rating. The models of the proposed drainage system were subjected to H&H analyses for the 25-year return period storm event.

The outlet structure for each detention basin was sized for the 25-year design storm event while allowing a discharge rate less than the undeveloped 10-year storm event from the system minus the undetained 25-year runoff plus the 25-year off-site runoff. The emergency spillways for both detention basins were designed to convey the 100-year storm flow.

Below is a summary of the detention basin design elements:

		NOTES
Detention Basin #1 Developed Q(25)	82.40 - cfs	
Detention Basin #1 Undeveloped Q(10)	65.20 - cfs	Undeveloped Sub-basin UN-1
Undetained Developed Q(25)	6.80 - cfs	#6
Off-Site Developed Q(25)	10.16 - cfs	Off-Site Sub-basin OS-1
Allowable Detention Basin Release Rate	68.56 - cfs	Undeveloped Q(10) - Undetained Developed Q(25) + Off-Site Q(25)
<i>Proposed Detention Basin Release Rate</i>	<i>4.98 - cfs</i>	<i>Detention Basin #1 Primary Spillway</i>
<i>Outlet Structure</i>	<i>78-LF of 15" R.C.P.</i>	<i>P-601</i>
Outlet I.E.	392.50	
25-year Storage Vol. Elev.	393.84	
HW (25-yr. elev. - I.E.)	1.34 - ft.	
Minimum Top/Bank	394.50	

		NOTES
Detention Basin #2 Developed Q(25)	111.33 - cfs	#1 + OS-4 (HydroCAD)
Detention Basin #2 Undeveloped Q(10)	85.34 - cfs	Undeveloped Sub-basin UN-2
Undetained Developed Q(25)	78.81 - cfs	#2, #4 & #5
Off-Site Developed Q(25)	44.20 - cfs	Off-Site Sub-basin OS-4
Allowable Detention Basin Release Rate	50.73 - cfs	Undeveloped Q(10) - Undetained Developed Q(25) + Off-Site Q(25)
<i>Proposed Detention Basin Release Rate</i>	<i>25.23 - cfs</i>	<i>Detention Basin #2 Primary Outlet</i>
<i>Primary Outlet Structure</i>	<i>45-LF of 24" R.C.P.</i>	<i>P-531</i>
Primary Outlet I.E.	406.00	



CASH WAGGNER & ASSOCIATES, PC

414 CITADEL CIRCLE, STE. B
EVANSVILLE, IN 47715

PH: 812.401.5561
FAX: 812.401.5563

25-year Storage Vol. Elev.	409.78	
HW (25-yr. elev. - I.E.)	3.78 - ft.	
Minimum Top/Bank	410.50	

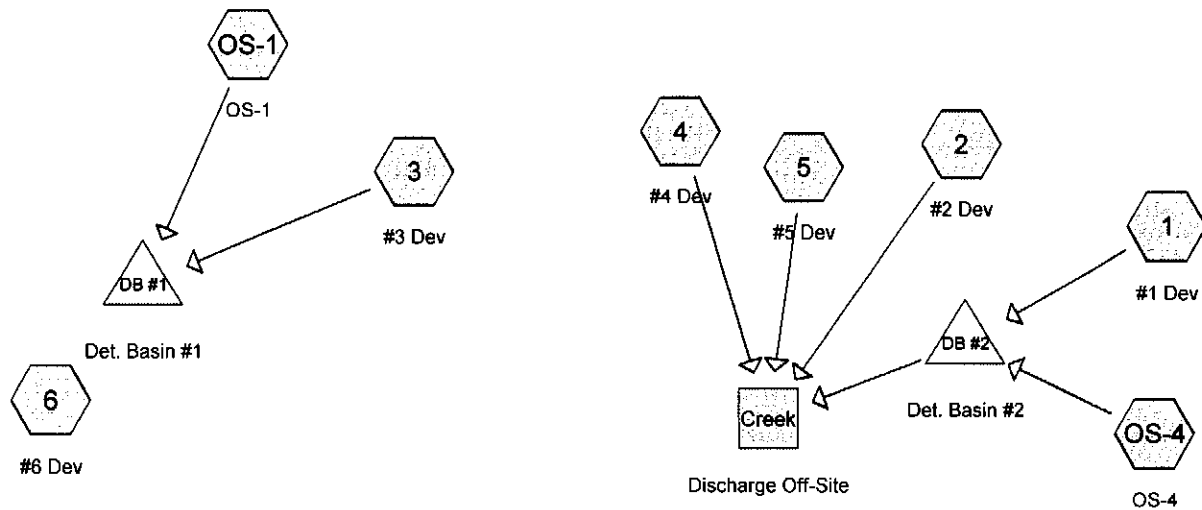
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EVANVILLE, IN 47715

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FAX: 812.401.5563



APPLICANT INFORMATION FORM 801

Project Name: Saddle Creek Estates

Approximate Location: Located on the west side of Baumgart Road approximately 600 feet southwest of Browning Road and Baumgart Road intersection.

Applicant Name: CWK Investments - McCutchanville, LLC

Applicant is (check one) Individual (s)
 Partnership or legal LLC
 Corporation

Applicant Address: 9210 Petersburgh Road
City: Evansville
State: Indiana
Zip Code: 47725

Email: lcarter@innovativecg.com

For Individual (s)

I (we) do hereby certify that the Information contained on this application is to true and correct. I (we) further understand that upon completion of the project that an as built drawing or certification statement as required by the Vanderburgh County Code will be submitted as required and that failure to provide such certification could result in fines under Section 13.04.110 and/or make me (us) ineligible for future drainage plan approvals until such time as an as built drawing or certification is submitted.

Signature _____

Date [Click here to enter a date.](#)

Signature _____

Date [Click here to enter a date.](#)

For Partnership (s)

I (we) do hereby certify that the Information contained on this application is to true and correct. I (we) further understand that upon completion of the project that an as built drawing or certification statement as required by the Vanderburgh County Code will be submitted as required and that failure to provide such certification could result in fines under Section 13.04.110 and/or make me (us) ineligible for future drainage plan approvals until such time as an as built drawing or certification is submitted.

Signature of Senior or Managing Partner C. Wayne Kinney
Printed Name C. WAYNE KINNEY
Date 3-24-2016

If partnership does not have a Senior or Managing Partner than signatures of all partners

Signature _____ Date _____
Printed Name _____

Signature _____ Date _____
Printed Name _____

Signature _____ Date _____
Printed Name _____

Signature _____ Date _____
Printed Name _____

Signature _____ Date _____
Printed Name _____

For Corporation

I do hereby certify that the information contained on this application is true and correct. I further understand that upon completion of the project that an as built drawing or certification statement as required by the Vanderburgh County Code will be submitted as required and that failure to provide such certification could result in fines under Section 13.04.110 and/or make the corporation ineligible for future drainage plan approvals until such time as an as built drawing or certification is submitted.

Signature _____ Date _____
Printed Name _____

Title _____ (note if not a vice president or above of applicant company, than attached a Delegation of Authority)











U.S. Fish and Wildlife Service

National Wetlands Inventory

Baumgart Road

Dec 28, 2015

Wetlands

-  Freshwater Emergent
-  Freshwater Forest/Shrub
-  Estuarine and Marine Deepwater
-  Estuarine and Marine
-  Freshwater Pond
-  Lake
-  Riverine
-  Other



This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or completeness of the base data shown on this map. All wetlands on this map should be used in accordance with the appropriate federal and state laws that apply to the wetlands shown on this map.

User Remarks:



MAP SCALE 1" = 500'



METER

NATIONAL FLOOD INSURANCE PROGRAM

PANEL #01080

FIRM
FLOOD INSURANCE RATE MAP
VANDERBURGH COUNTY,
INDIANA
AND INCORPORATED AREAS

PANEL 108 OF 275
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

DATE: 03/17/2011
DRAWN BY: J. D. [unreadable]
CHECKED BY: [unreadable]
APPROVED BY: [unreadable]

Note to User: The Map Number shown below should be used when placing map orders. The Community Number shown below should be used on insurance applications for the subject community.



MAP NUMBER
18163C01080

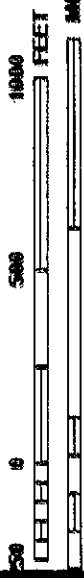
EFFECTIVE DATE
MARCH 17, 2011

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT OneLine. This map does not reflect changes or amendments which may have been made subsequent to the date on file with the National Flood Insurance Program. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Show at www.fema.gov



MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0168D

FIRM
FLOOD INSURANCE RATE MAP
VANDERBURGH COUNTY,
INDIANA
AND INCORPORATED AREAS

PANEL 108 OF 275
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

SCALE
COMMUNITY
DORCHESTER TOWNSHIP
VANDERBURGH COUNTY

MAP NUMBER 15163C0108D
EFFECTIVE DATE MARCH 17, 2011

MAP NUMBER 15163C0108D
EFFECTIVE DATE MARCH 17, 2011



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-811 One-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.nfsc.kenn.gov

NOTE: AREA SHOWN ON THIS
PAGE IS LOCATED WITHIN TOWNSHIP
E03011, RANGE 10 WEST



United States
Department of
Agriculture

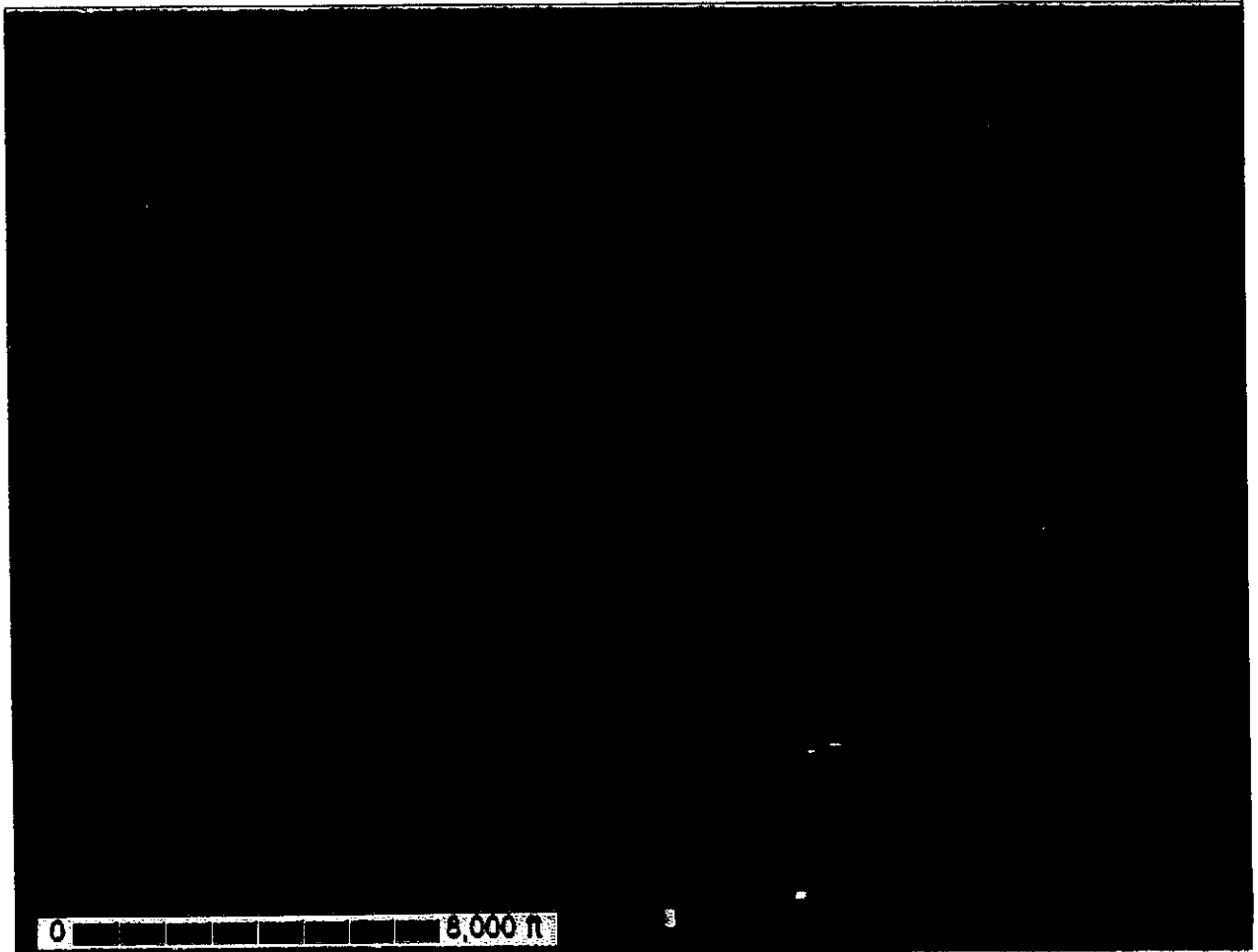
NRCS

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 Vanderburgh County, Indiana

Saddle Creek



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

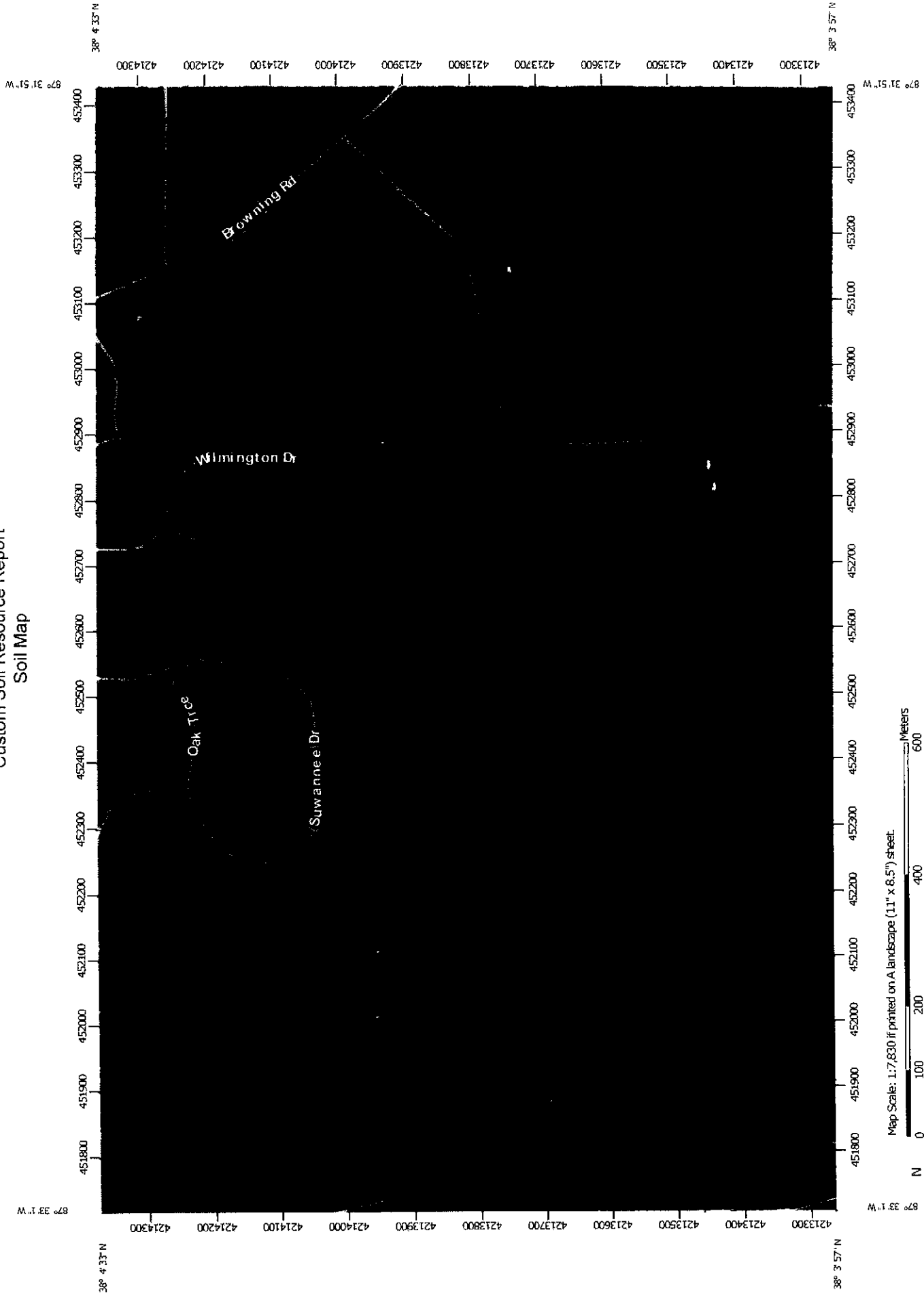
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree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

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









































Soil Map

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

Custom Soil Resource Report Soil Map



MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Area of Interest (AOI)		Stony Spot
	Soils		Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
	Special Point Features		
	Blowout	Water Features	
	Borrow Pit		Streams and Canals
	Clay Spot		
	Closed Depression		Transportation
	Gravel Pit		Rails
	Gravelly Spot		Interstate Highways
	Landfill		US Routes
	Lava Flow		Major Roads
	Marsh or swamp		Local Roads
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Vanderburgh County, Indiana
 Survey Area Data: Version 15, Sep 11, 2015

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

Date(s) aerial images were photographed: Data not available.

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

Vanderburgh County, Indiana (IN163)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ba	Bartle silt loam	9.5	12.3%
Bo	Bonnie silt loam	5.7	7.4%
HoB2	Hosmer silt loam, 2 to 6 percent slopes, eroded	7.4	9.7%
HoC2	Hosmer silt loam, 6 to 12 percent slopes, eroded	0.5	0.7%
HoC3	Hosmer silt loam, 6 to 12 percent slopes, severely eroded	13.4	17.4%
MuB2	Muren silt loam, 2 to 6 percent slopes, eroded	12.0	15.6%
WeE2	Wellston silt loam, 18 to 25 percent slopes, eroded	9.0	11.7%
Wm	Wilbur silt loam	11.8	15.4%
ZaD3	Zanesville silt loam, 12 to 18 percent slopes, severely eroded	7.5	9.7%
Totals for Area of Interest		76.7	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used.

Custom Soil Resource Report

Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Vanderburgh County, Indiana

Ba—Bartle silt loam

Map Unit Setting

National map unit symbol: 5gbg
Elevation: 340 to 700 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Bartle and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bartle

Setting

Landform: Stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over loamy alluvium

Typical profile

Ap - 0 to 11 inches: silt loam
BE - 11 to 17 inches: silt loam
Bt - 17 to 30 inches: silty clay loam
Btx - 30 to 55 inches: silt loam
BC - 55 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to fragipan
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Minor Components

Peoga

Percent of map unit: 3 percent

Custom Soil Resource Report

Landform: Depressions

Other vegetative classification: Trees/Timber (Woody Vegetation)

Bo—Bonnie silt loam

Map Unit Setting

National map unit symbol: 5gbj

Elevation: 340 to 700 feet

Mean annual precipitation: 40 to 46 inches

Mean annual air temperature: 52 to 57 degrees F

Frost-free period: 170 to 210 days

Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Bonnie and similar soils: 100 percent

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

Description of Bonnie

Setting

Landform: Backswamps, flood plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluvium

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Acid silty alluvium

Typical profile

Ap - 0 to 9 inches: silt loam

Cg1 - 9 to 31 inches: silt loam

Cg2 - 31 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: Frequent

Frequency of ponding: Frequent

Available water storage in profile: Very high (about 12.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Other vegetative classification: Trees/Timber (Woody Vegetation)

HoB2—Hosmer silt loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5gbr
Elevation: 340 to 1,000 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hosmer and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hosmer

Setting

Landform: Loess hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 23 inches: silt loam
Btx - 23 to 50 inches: silt loam
2Btx - 50 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

HoC2—Hosmer silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5gbt
Elevation: 340 to 700 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Hosmer and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hosmer

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 23 inches: silt loam
Btx - 23 to 50 inches: silt loam
2Btx - 50 to 80 inches: silt loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

HoC3—Hosmer silt loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 5gbv
Elevation: 340 to 700 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Hosmer, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hosmer, Severely Eroded

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 15 inches: silt loam
Btx - 15 to 39 inches: silt loam
2BC - 39 to 80 inches: silt loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 10 to 26 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

MuB2—Muren silt loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5gc9
Elevation: 340 to 700 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Muren and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Muren

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 54 inches: silty clay loam
C - 54 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Other vegetative classification: Trees/Timber (Woody Vegetation)

WeE2—Wellston silt loam, 18 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5gct
Elevation: 350 to 1,000 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Wellston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wellston

Setting

Landform: Structural benches, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy residuum over shale

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 26 inches: silt loam
2Bt - 26 to 35 inches: loam
2BC - 35 to 44 inches: channery loam
2Cr - 44 to 60 inches: weathered bedrock

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.60 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 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: Trees/Timber (Woody Vegetation)

Wm—Wilbur silt loam

Map Unit Setting

National map unit symbol: 5gcy

Elevation: 340 to 500 feet

Mean annual precipitation: 40 to 46 inches

Mean annual air temperature: 52 to 57 degrees F

Frost-free period: 170 to 210 days

Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Wilbur and similar soils: 100 percent

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

Description of Wilbur

Setting

Landform: Flood plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty alluvium

Typical profile

Ap - 0 to 7 inches: silt loam

Bw - 7 to 32 inches: silt loam

Cg - 32 to 60 inches: stratified silt loam to loam to sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Negligible

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

Depth to water table: About 18 to 30 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D

Other vegetative classification: Trees/Timber (Woody Vegetation)

ZaD3—Zanesville silt loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 5gd3
Elevation: 350 to 1,000 feet
Mean annual precipitation: 40 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Zanesville, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zanesville, Severely Eroded

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy residuum over sandstone and shale

Typical profile

Ap - 0 to 6 inches: silt loam
Bt - 6 to 18 inches: silt loam
Btx - 18 to 43 inches: silt loam
2Bt - 43 to 51 inches: loam
2Cr - 51 to 80 inches: weathered bedrock

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 14 to 20 inches to fragipan; 47 to 80 inches to paralithic bedrock
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)



UN-1



OS-2



UN-2



#2 Dev



#4 Dev



#3 Dev



OS-1



Det. Basin #1



#6 Dev



Det. Basin #2



#1 Dev



#5 Dev



OS-4



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
44.620	70	Woods, Good, HSG C (UN-2)
15.420	71	Meadow, non-grazed, HSG C (OS-1, OS-4)
2.470	73	Woods, Fair, HSG C (OS-1)
33.820	79	1 acre lots, 20% imp, HSG C (OS-2)
18.290	80	1/2 acre lots, 25% imp, HSG C (2)
17.900	81	1/3 acre lots, 30% imp, HSG C (1)
19.160	82	Row crops, SR + CR, Good, HSG C (UN-1)
39.780	83	1/4 acre lots, 38% imp, HSG C (3, 4, 5, 6)
4.220	85	Row crops, SR + CR, Good, HSG D (UN-1)
7.940	85	Row crops, straight row, Good, HSG C (UN-2)
1.160	98	Paved parking, HSG C (OS-1, OS-4)
0.520	98	Water Surface, HSG C (OS-1, OS-4)
205.300		TOTAL AREA

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Type II 24-hr 25-Year Rainfall=5.40"

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Summary for Pond DB #1: Det. Basin #1

Inflow Area = 32.680 ac, 35.79% Impervious, Inflow Depth > 3.21" for 25-Year event
 Inflow = 82.40 cfs @ 12.32 hrs, Volume= 8.738 af
 Outflow = 4.98 cfs @ 15.34 hrs, Volume= 3.027 af, Atten= 94%, Lag= 181.3 min
 Primary = 4.98 cfs @ 15.34 hrs, Volume= 3.027 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 393.84' @ 15.34 hrs Surf.Area= 210,158 sf Storage= 273,835 cf

Plug-Flow detention time= 268.6 min calculated for 3.027 af (35% of inflow)
 Center-of-Mass det. time= 176.7 min (972.2 - 795.5)

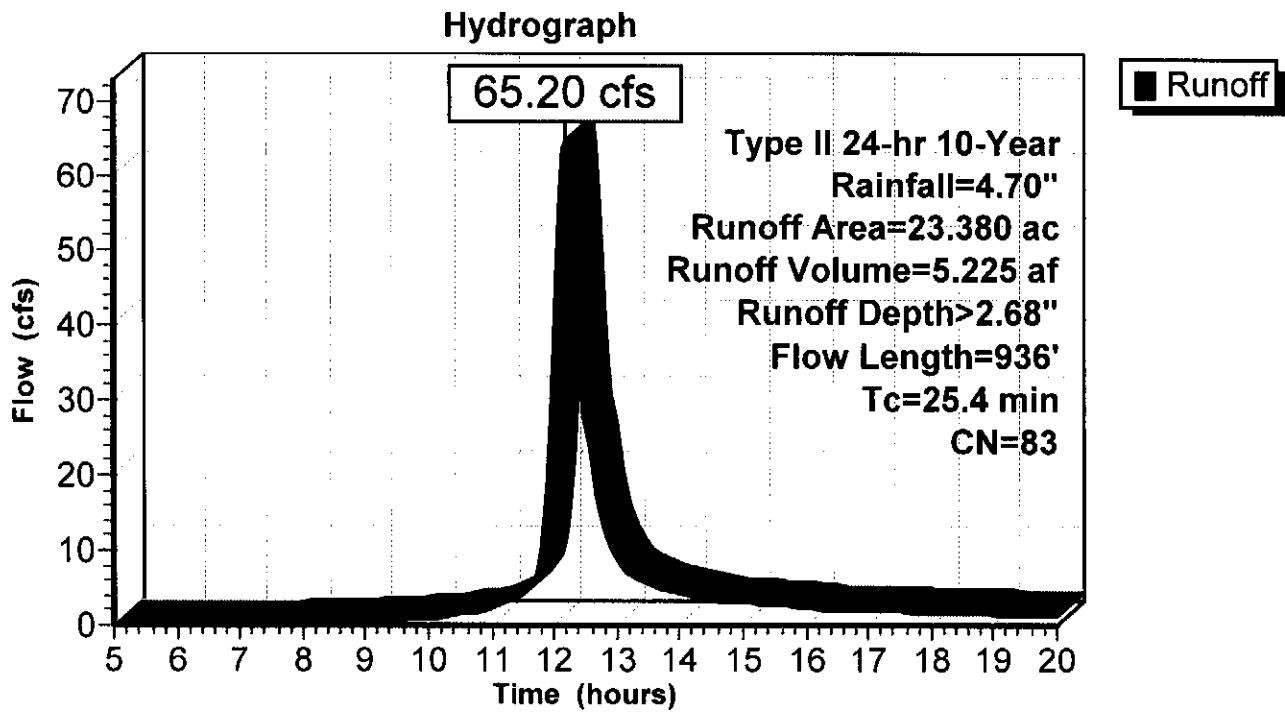
Volume	Invert	Avail.Storage	Storage Description
#1	392.50'	415,051 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
392.50	199,698	0	0
393.00	203,588	100,822	100,822
394.00	211,444	207,516	308,338
394.50	215,409	106,713	415,051

Device	Routing	Invert	Outlet Devices
#1	Primary	392.50'	15.0" Round Culvert L= 78.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 392.50' / 390.00' S= 0.0321 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=4.98 cfs @ 15.34 hrs HW=393.84' (Free Discharge)
 ←1=Culvert (Inlet Controls 4.98 cfs @ 4.06 fps)

Subcatchment UN-1: UN-1



Hydrograph for Subcatchment UN-1: UN-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.30	0.00	0.00	7.60	0.52	0.01	0.16
5.05	0.30	0.00	0.00	7.65	0.53	0.01	0.17
5.10	0.30	0.00	0.00	7.70	0.53	0.01	0.18
5.15	0.31	0.00	0.00	7.75	0.54	0.01	0.19
5.20	0.31	0.00	0.00	7.80	0.54	0.01	0.20
5.25	0.32	0.00	0.00	7.85	0.55	0.01	0.21
5.30	0.32	0.00	0.00	7.90	0.55	0.01	0.22
5.35	0.32	0.00	0.00	7.95	0.56	0.01	0.23
5.40	0.33	0.00	0.00	8.00	0.56	0.01	0.24
5.45	0.33	0.00	0.00	8.05	0.57	0.01	0.25
5.50	0.33	0.00	0.00	8.10	0.57	0.01	0.26
5.55	0.34	0.00	0.00	8.15	0.58	0.01	0.28
5.60	0.34	0.00	0.00	8.20	0.59	0.01	0.29
5.65	0.35	0.00	0.00	8.25	0.59	0.01	0.30
5.70	0.35	0.00	0.00	8.30	0.60	0.02	0.31
5.75	0.36	0.00	0.00	8.35	0.60	0.02	0.33
5.80	0.36	0.00	0.00	8.40	0.61	0.02	0.34
5.85	0.36	0.00	0.00	8.45	0.62	0.02	0.36
5.90	0.37	0.00	0.00	8.50	0.62	0.02	0.38
5.95	0.37	0.00	0.00	8.55	0.63	0.02	0.39
6.00	0.38	0.00	0.00	8.60	0.63	0.02	0.41
6.05	0.38	0.00	0.00	8.65	0.64	0.02	0.43
6.10	0.38	0.00	0.00	8.70	0.65	0.02	0.45
6.15	0.39	0.00	0.00	8.75	0.65	0.03	0.48
6.20	0.39	0.00	0.00	8.80	0.66	0.03	0.50
6.25	0.40	0.00	0.00	8.85	0.67	0.03	0.52
6.30	0.40	0.00	0.00	8.90	0.68	0.03	0.54
6.35	0.41	0.00	0.00	8.95	0.68	0.03	0.57
6.40	0.41	0.00	0.00	9.00	0.69	0.03	0.59
6.45	0.42	0.00	0.00	9.05	0.70	0.04	0.62
6.50	0.42	0.00	0.00	9.10	0.71	0.04	0.64
6.55	0.42	0.00	0.00	9.15	0.71	0.04	0.67
6.60	0.43	0.00	0.00	9.20	0.72	0.04	0.70
6.65	0.43	0.00	0.00	9.25	0.73	0.04	0.72
6.70	0.44	0.00	0.01	9.30	0.74	0.04	0.75
6.75	0.44	0.00	0.01	9.35	0.74	0.05	0.77
6.80	0.45	0.00	0.01	9.40	0.75	0.05	0.79
6.85	0.45	0.00	0.02	9.45	0.76	0.05	0.81
6.90	0.46	0.00	0.03	9.50	0.77	0.05	0.83
6.95	0.46	0.00	0.04	9.55	0.77	0.05	0.85
7.00	0.47	0.00	0.04	9.60	0.78	0.06	0.87
7.05	0.47	0.00	0.05	9.65	0.79	0.06	0.89
7.10	0.47	0.00	0.06	9.70	0.80	0.06	0.91
7.15	0.48	0.00	0.07	9.75	0.81	0.06	0.93
7.20	0.48	0.00	0.08	9.80	0.81	0.07	0.96
7.25	0.49	0.00	0.09	9.85	0.82	0.07	0.98
7.30	0.49	0.00	0.10	9.90	0.83	0.07	1.01
7.35	0.50	0.00	0.11	9.95	0.84	0.08	1.05
7.40	0.50	0.00	0.12	10.00	0.85	0.08	1.09
7.45	0.51	0.00	0.13	10.05	0.86	0.08	1.12
7.50	0.51	0.01	0.14	10.10	0.87	0.08	1.17
7.55	0.52	0.01	0.15	10.15	0.88	0.09	1.21

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Type II 24-hr 10-Year Rainfall=4.70"

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Hydrograph for Subcatchment UN-1: UN-1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
10.20	0.89	0.09	1.26	12.80	3.57	1.91	12.53
10.25	0.90	0.10	1.31	12.85	3.58	1.93	11.31
10.30	0.91	0.10	1.36	12.90	3.60	1.94	10.33
10.35	0.92	0.10	1.41	12.95	3.61	1.95	9.52
10.40	0.93	0.11	1.47	13.00	3.63	1.97	8.86
10.45	0.95	0.11	1.53	13.05	3.64	1.98	8.30
10.50	0.96	0.12	1.60	13.10	3.66	1.99	7.82
10.55	0.97	0.12	1.67	13.15	3.67	2.00	7.40
10.60	0.98	0.13	1.74	13.20	3.68	2.01	7.03
10.65	1.00	0.13	1.81	13.25	3.70	2.02	6.69
10.70	1.01	0.14	1.89	13.30	3.71	2.04	6.39
10.75	1.03	0.14	1.97	13.35	3.72	2.05	6.13
10.80	1.04	0.15	2.06	13.40	3.73	2.06	5.92
10.85	1.06	0.15	2.16	13.45	3.74	2.07	5.74
10.90	1.07	0.16	2.26	13.50	3.76	2.08	5.57
10.95	1.09	0.17	2.37	13.55	3.77	2.08	5.41
11.00	1.10	0.18	2.49	13.60	3.78	2.09	5.26
11.05	1.12	0.18	2.61	13.65	3.79	2.10	5.12
11.10	1.14	0.19	2.73	13.70	3.80	2.11	4.98
11.15	1.16	0.20	2.87	13.75	3.81	2.12	4.85
11.20	1.18	0.21	3.02	13.80	3.82	2.13	4.73
11.25	1.20	0.22	3.18	13.85	3.83	2.14	4.61
11.30	1.23	0.23	3.36	13.90	3.84	2.14	4.50
11.35	1.25	0.24	3.57	13.95	3.85	2.15	4.39
11.40	1.28	0.26	3.81	14.00	3.85	2.16	4.29
11.45	1.30	0.27	4.06	14.05	3.86	2.17	4.19
11.50	1.33	0.29	4.34	14.10	3.87	2.17	4.09
11.55	1.37	0.31	4.64	14.15	3.88	2.18	3.99
11.60	1.44	0.35	4.99	14.20	3.89	2.19	3.90
11.65	1.54	0.40	5.51	14.25	3.90	2.20	3.82
11.70	1.67	0.48	6.40	14.30	3.90	2.20	3.74
11.75	1.82	0.57	7.95	14.35	3.91	2.21	3.67
11.80	2.02	0.71	10.46	14.40	3.92	2.22	3.61
11.85	2.31	0.91	14.17	14.45	3.93	2.22	3.56
11.90	2.67	1.19	19.45	14.50	3.94	2.23	3.51
11.95	2.98	1.43	26.84	14.55	3.94	2.24	3.46
12.00	3.12	1.54	36.50	14.60	3.95	2.24	3.42
12.05	3.16	1.58	47.48	14.65	3.96	2.25	3.39
12.10	3.21	1.61	57.55	14.70	3.97	2.26	3.35
12.15	3.25	1.65	63.94	14.75	3.98	2.26	3.31
12.20	3.28	1.68	65.03	14.80	3.98	2.27	3.28
12.25	3.32	1.71	61.45	14.85	3.99	2.28	3.24
12.30	3.35	1.73	54.87	14.90	4.00	2.28	3.21
12.35	3.38	1.76	46.93	14.95	4.00	2.29	3.18
12.40	3.41	1.78	39.18	15.00	4.01	2.30	3.14
12.45	3.43	1.80	32.72	15.05	4.02	2.30	3.11
12.50	3.45	1.82	27.76	15.10	4.03	2.31	3.08
12.55	3.47	1.84	23.85	15.15	4.03	2.31	3.05
12.60	3.49	1.85	20.67	15.20	4.04	2.32	3.01
12.65	3.51	1.87	18.03	15.25	4.05	2.33	2.98
12.70	3.53	1.88	15.84	15.30	4.05	2.33	2.95
12.75	3.55	1.90	14.02	15.35	4.06	2.34	2.91

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Type II 24-hr 10-Year Rainfall=4.70"

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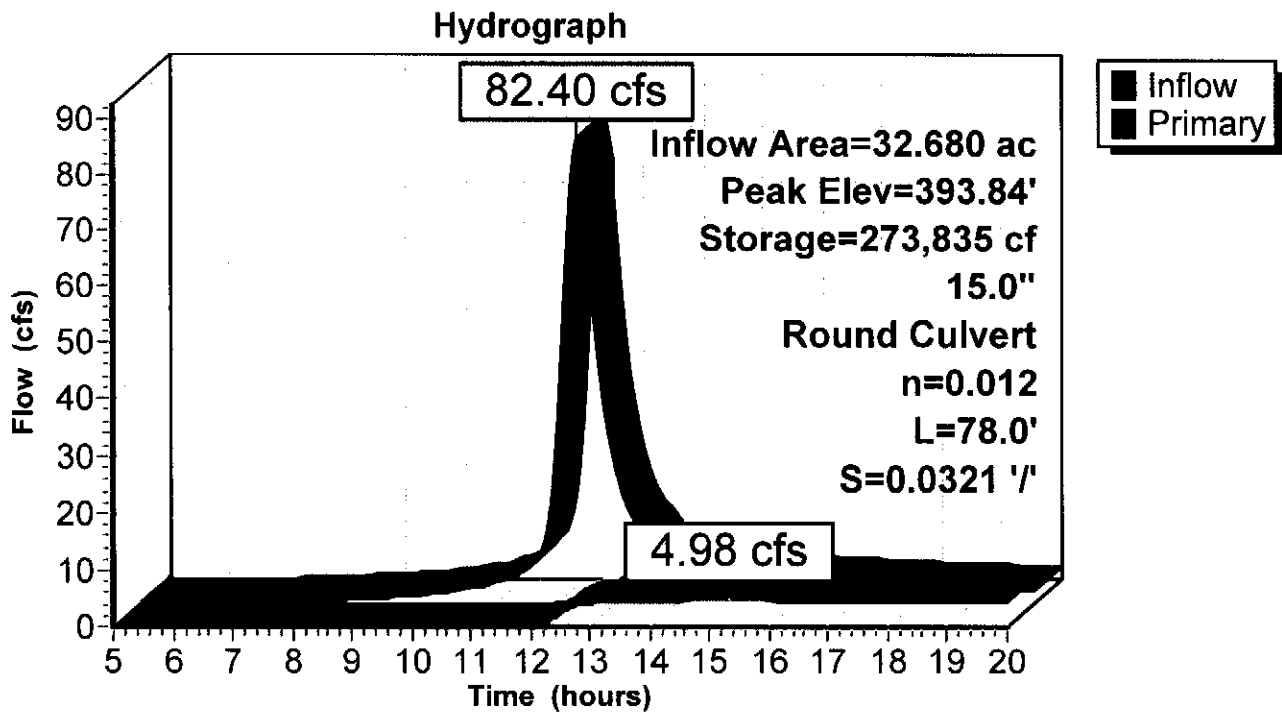
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Hydrograph for Subcatchment UN-1: UN-1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
15.40	4.07	2.34	2.88	18.00	4.33	2.57	1.85
15.45	4.07	2.35	2.85	18.05	4.33	2.58	1.84
15.50	4.08	2.35	2.82	18.10	4.34	2.58	1.83
15.55	4.08	2.36	2.78	18.15	4.34	2.58	1.82
15.60	4.09	2.36	2.75	18.20	4.35	2.59	1.81
15.65	4.10	2.37	2.72	18.25	4.35	2.59	1.79
15.70	4.10	2.38	2.69	18.30	4.35	2.60	1.78
15.75	4.11	2.38	2.65	18.35	4.36	2.60	1.77
15.80	4.11	2.39	2.62	18.40	4.36	2.60	1.76
15.85	4.12	2.39	2.59	18.45	4.37	2.61	1.75
15.90	4.13	2.40	2.55	18.50	4.37	2.61	1.73
15.95	4.13	2.40	2.52	18.55	4.37	2.61	1.72
16.00	4.14	2.40	2.49	18.60	4.38	2.62	1.71
16.05	4.14	2.41	2.46	18.65	4.38	2.62	1.70
16.10	4.15	2.41	2.42	18.70	4.39	2.62	1.69
16.15	4.15	2.42	2.39	18.75	4.39	2.63	1.67
16.20	4.16	2.42	2.36	18.80	4.39	2.63	1.66
16.25	4.16	2.43	2.33	18.85	4.40	2.63	1.65
16.30	4.17	2.43	2.30	18.90	4.40	2.64	1.64
16.35	4.17	2.44	2.28	18.95	4.40	2.64	1.63
16.40	4.18	2.44	2.26	19.00	4.41	2.64	1.61
16.45	4.18	2.45	2.24	19.05	4.41	2.65	1.60
16.50	4.19	2.45	2.22	19.10	4.41	2.65	1.59
16.55	4.19	2.46	2.20	19.15	4.42	2.65	1.58
16.60	4.20	2.46	2.19	19.20	4.42	2.66	1.57
16.65	4.20	2.46	2.17	19.25	4.43	2.66	1.55
16.70	4.21	2.47	2.16	19.30	4.43	2.66	1.54
16.75	4.21	2.47	2.15	19.35	4.43	2.67	1.53
16.80	4.22	2.48	2.14	19.40	4.44	2.67	1.52
16.85	4.22	2.48	2.12	19.45	4.44	2.67	1.51
16.90	4.23	2.49	2.11	19.50	4.44	2.67	1.49
16.95	4.23	2.49	2.10	19.55	4.45	2.68	1.48
17.00	4.24	2.49	2.09	19.60	4.45	2.68	1.47
17.05	4.24	2.50	2.08	19.65	4.45	2.68	1.46
17.10	4.25	2.50	2.06	19.70	4.46	2.69	1.45
17.15	4.25	2.51	2.05	19.75	4.46	2.69	1.43
17.20	4.26	2.51	2.04	19.80	4.46	2.69	1.42
17.25	4.26	2.52	2.03	19.85	4.47	2.69	1.41
17.30	4.27	2.52	2.02	19.90	4.47	2.70	1.40
17.35	4.27	2.52	2.01	19.95	4.47	2.70	1.39
17.40	4.28	2.53	1.99	20.00	4.47	2.70	1.37
17.45	4.28	2.53	1.98				
17.50	4.28	2.54	1.97				
17.55	4.29	2.54	1.96				
17.60	4.29	2.54	1.95				
17.65	4.30	2.55	1.94				
17.70	4.30	2.55	1.92				
17.75	4.31	2.55	1.91				
17.80	4.31	2.56	1.90				
17.85	4.32	2.56	1.89				
17.90	4.32	2.57	1.88				
17.95	4.32	2.57	1.86				

Pond DB #1: Det. Basin #1



Hydrograph for Pond DB #1: Det. Basin #1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	392.50	0.00
5.05	0.00	0	392.50	0.00
5.10	0.00	0	392.50	0.00
5.15	0.00	0	392.50	0.00
5.20	0.00	0	392.50	0.00
5.25	0.00	0	392.50	0.00
5.30	0.00	0	392.50	0.00
5.35	0.00	0	392.50	0.00
5.40	0.00	0	392.50	0.00
5.45	0.00	0	392.50	0.00
5.50	0.00	0	392.50	0.00
5.55	0.00	0	392.50	0.00
5.60	0.00	0	392.50	0.00
5.65	0.00	0	392.50	0.00
5.70	0.00	0	392.50	0.00
5.75	0.00	0	392.50	0.00
5.80	0.00	0	392.50	0.00
5.85	0.00	0	392.50	0.00
5.90	0.00	0	392.50	0.00
5.95	0.00	0	392.50	0.00
6.00	0.00	0	392.50	0.00
6.05	0.00	0	392.50	0.00
6.10	0.00	1	392.50	0.00
6.15	0.01	2	392.50	0.00
6.20	0.01	3	392.50	0.00
6.25	0.01	5	392.50	0.00
6.30	0.02	8	392.50	0.00
6.35	0.03	12	392.50	0.00
6.40	0.03	18	392.50	0.00
6.45	0.04	25	392.50	0.00
6.50	0.05	34	392.50	0.00
6.55	0.06	44	392.50	0.00
6.60	0.08	57	392.50	0.00
6.65	0.09	71	392.50	0.00
6.70	0.10	88	392.50	0.00
6.75	0.11	107	392.50	0.00
6.80	0.13	129	392.50	0.00
6.85	0.14	152	392.50	0.00
6.90	0.15	178	392.50	0.00
6.95	0.17	207	392.50	0.00
7.00	0.18	238	392.50	0.00
7.05	0.19	272	392.50	0.00
7.10	0.21	308	392.50	0.00
7.15	0.22	347	392.50	0.00
7.20	0.24	388	392.50	0.00
7.25	0.25	432	392.50	0.00
7.30	0.27	479	392.50	0.00
7.35	0.28	528	392.50	0.00
7.40	0.30	580	392.50	0.00
7.45	0.31	635	392.50	0.00
7.50	0.33	693	392.50	0.00
7.55	0.34	754	392.50	0.00

Hydrograph for Pond DB #1: Det. Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
7.60	0.36	817	392.50	0.00
7.65	0.38	884	392.50	0.00
7.70	0.39	953	392.50	0.00
7.75	0.41	1,025	392.51	0.00
7.80	0.43	1,100	392.51	0.00
7.85	0.44	1,178	392.51	0.00
7.90	0.46	1,259	392.51	0.00
7.95	0.48	1,343	392.51	0.00
8.00	0.50	1,431	392.51	0.00
8.05	0.51	1,521	392.51	0.00
8.10	0.53	1,615	392.51	0.00
8.15	0.55	1,712	392.51	0.00
8.20	0.57	1,813	392.51	0.00
8.25	0.59	1,916	392.51	0.00
8.30	0.61	2,024	392.51	0.00
8.35	0.63	2,135	392.51	0.00
8.40	0.65	2,250	392.51	0.00
8.45	0.67	2,369	392.51	0.00
8.50	0.70	2,493	392.51	0.00
8.55	0.73	2,621	392.51	0.00
8.60	0.76	2,754	392.51	0.00
8.65	0.79	2,892	392.51	0.00
8.70	0.82	3,036	392.52	0.00
8.75	0.85	3,186	392.52	0.00
8.80	0.89	3,342	392.52	0.00
8.85	0.92	3,504	392.52	0.00
8.90	0.96	3,673	392.52	0.00
8.95	1.00	3,849	392.52	0.00
9.00	1.04	4,031	392.52	0.00
9.05	1.08	4,221	392.52	0.00
9.10	1.12	4,418	392.52	0.00
9.15	1.16	4,623	392.52	0.00
9.20	1.21	4,836	392.52	0.00
9.25	1.25	5,056	392.53	0.00
9.30	1.29	5,284	392.53	0.00
9.35	1.34	5,520	392.53	0.00
9.40	1.38	5,764	392.53	0.00
9.45	1.42	6,015	392.53	0.01
9.50	1.46	6,273	392.53	0.01
9.55	1.50	6,538	392.53	0.01
9.60	1.53	6,810	392.53	0.01
9.65	1.57	7,088	392.54	0.01
9.70	1.60	7,372	392.54	0.01
9.75	1.64	7,662	392.54	0.01
9.80	1.67	7,959	392.54	0.01
9.85	1.71	8,262	392.54	0.01
9.90	1.75	8,572	392.54	0.01
9.95	1.80	8,890	392.54	0.01
10.00	1.85	9,216	392.55	0.01
10.05	1.90	9,551	392.55	0.01
10.10	1.96	9,896	392.55	0.01
10.15	2.02	10,252	392.55	0.01

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Type II 24-hr 25-Year Rainfall=5.40"

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Hydrograph for Pond DB #1: Det. Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
10.20	2.08	10,618	392.55	0.01
10.25	2.16	10,997	392.56	0.02
10.30	2.23	11,389	392.56	0.02
10.35	2.31	11,794	392.56	0.02
10.40	2.39	12,214	392.56	0.02
10.45	2.48	12,649	392.56	0.02
10.50	2.58	13,101	392.57	0.02
10.55	2.67	13,569	392.57	0.02
10.60	2.78	14,056	392.57	0.03
10.65	2.89	14,561	392.57	0.03
10.70	3.00	15,087	392.58	0.03
10.75	3.13	15,633	392.58	0.03
10.80	3.25	16,202	392.58	0.03
10.85	3.39	16,793	392.58	0.04
10.90	3.53	17,410	392.59	0.04
10.95	3.69	18,053	392.59	0.04
11.00	3.85	18,724	392.59	0.04
11.05	4.02	19,425	392.60	0.05
11.10	4.21	20,157	392.60	0.05
11.15	4.40	20,923	392.60	0.05
11.20	4.61	21,724	392.61	0.06
11.25	4.83	22,563	392.61	0.06
11.30	5.08	23,443	392.62	0.07
11.35	5.35	24,368	392.62	0.07
11.40	5.64	25,343	392.63	0.08
11.45	5.97	26,373	392.63	0.09
11.50	6.32	27,463	392.64	0.09
11.55	6.71	28,619	392.64	0.10
11.60	7.16	29,848	392.65	0.11
11.65	7.72	31,166	392.66	0.12
11.70	8.55	32,608	392.66	0.13
11.75	9.80	34,235	392.67	0.14
11.80	11.73	36,146	392.68	0.16
11.85	14.61	38,486	392.69	0.18
11.90	18.86	41,463	392.71	0.21
11.95	24.97	45,367	392.73	0.25
12.00	33.33	50,564	392.75	0.30
12.05	43.42	57,410	392.79	0.39
12.10	54.39	66,133	392.83	0.50
12.15	64.88	76,761	392.88	0.67
12.20	73.64	89,089	392.94	0.88
12.25	79.49	102,689	393.01	1.14
12.30	82.21	117,009	393.08	1.44
12.35	81.71	131,472	393.15	1.77
12.40	79.13	145,598	393.22	2.11
12.45	74.51	159,016	393.28	2.44
12.50	68.86	171,452	393.34	2.76
12.55	62.36	182,738	393.40	3.05
12.60	55.56	192,778	393.45	3.31
12.65	49.14	201,586	393.49	3.53
12.70	43.50	209,270	393.53	3.72
12.75	38.72	215,985	393.56	3.89

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Type II 24-hr 25-Year Rainfall=5.40"

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Hydrograph for Pond DB #1: Det. Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
12.80	34.70	221,881	393.59	4.03
12.85	31.23	227,078	393.61	4.14
12.90	28.19	231,670	393.63	4.25
12.95	25.52	235,732	393.65	4.33
13.00	23.22	239,332	393.67	4.40
13.05	21.21	242,532	393.69	4.47
13.10	19.48	245,386	393.70	4.52
13.15	17.98	247,941	393.71	4.56
13.20	16.67	250,235	393.72	4.60
13.25	15.55	252,305	393.73	4.63
13.30	14.55	254,179	393.74	4.66
13.35	13.70	255,881	393.75	4.68
13.40	12.93	257,433	393.76	4.70
13.45	12.25	258,850	393.76	4.73
13.50	11.65	260,148	393.77	4.75
13.55	11.10	261,339	393.78	4.77
13.60	10.62	262,434	393.78	4.79
13.65	10.18	263,442	393.79	4.81
13.70	9.78	264,372	393.79	4.82
13.75	9.42	265,231	393.80	4.84
13.80	9.08	266,024	393.80	4.85
13.85	8.76	266,755	393.80	4.86
13.90	8.45	267,428	393.81	4.88
13.95	8.17	268,046	393.81	4.89
14.00	7.90	268,613	393.81	4.90
14.05	7.66	269,131	393.81	4.90
14.10	7.44	269,606	393.82	4.91
14.15	7.23	270,042	393.82	4.92
14.20	7.06	270,442	393.82	4.93
14.25	6.88	270,809	393.82	4.93
14.30	6.72	271,145	393.82	4.94
14.35	6.57	271,452	393.82	4.94
14.40	6.43	271,731	393.83	4.95
14.45	6.30	271,986	393.83	4.95
14.50	6.18	272,217	393.83	4.96
14.55	6.07	272,427	393.83	4.96
14.60	5.97	272,618	393.83	4.96
14.65	5.88	272,791	393.83	4.97
14.70	5.80	272,948	393.83	4.97
14.75	5.71	273,089	393.83	4.97
14.80	5.64	273,216	393.83	4.97
14.85	5.57	273,330	393.83	4.98
14.90	5.50	273,431	393.83	4.98
14.95	5.44	273,520	393.83	4.98
15.00	5.38	273,597	393.84	4.98
15.05	5.32	273,663	393.84	4.98
15.10	5.25	273,718	393.84	4.98
15.15	5.20	273,762	393.84	4.98
15.20	5.14	273,796	393.84	4.98
15.25	5.08	273,819	393.84	4.98
15.30	5.03	273,832	393.84	4.98
15.35	4.97	273,835	393.84	4.98

Hydrograph for Pond DB #1: Det. Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
15.40	4.92	273,828	393.84	4.98
15.45	4.86	273,811	393.84	4.98
15.50	4.81	273,784	393.84	4.98
15.55	4.75	273,747	393.84	4.98
15.60	4.70	273,701	393.84	4.98
15.65	4.64	273,645	393.84	4.98
15.70	4.59	273,580	393.84	4.98
15.75	4.54	273,505	393.83	4.98
15.80	4.48	273,420	393.83	4.98
15.85	4.43	273,326	393.83	4.97
15.90	4.37	273,223	393.83	4.97
15.95	4.32	273,110	393.83	4.97
16.00	4.27	272,988	393.83	4.97
16.05	4.21	272,857	393.83	4.97
16.10	4.16	272,716	393.83	4.96
16.15	4.10	272,566	393.83	4.96
16.20	4.05	272,406	393.83	4.96
16.25	4.00	272,238	393.83	4.96
16.30	3.95	272,061	393.83	4.95
16.35	3.90	271,876	393.83	4.95
16.40	3.85	271,683	393.83	4.95
16.45	3.81	271,482	393.83	4.94
16.50	3.77	271,275	393.82	4.94
16.55	3.73	271,062	393.82	4.94
16.60	3.70	270,843	393.82	4.93
16.65	3.67	270,619	393.82	4.93
16.70	3.64	270,390	393.82	4.93
16.75	3.61	270,157	393.82	4.92
16.80	3.59	269,919	393.82	4.92
16.85	3.56	269,678	393.82	4.91
16.90	3.54	269,433	393.82	4.91
16.95	3.52	269,185	393.81	4.91
17.00	3.49	268,933	393.81	4.90
17.05	3.47	268,678	393.81	4.90
17.10	3.45	268,421	393.81	4.89
17.15	3.43	268,160	393.81	4.89
17.20	3.41	267,896	393.81	4.88
17.25	3.39	267,630	393.81	4.88
17.30	3.37	267,360	393.81	4.87
17.35	3.35	267,088	393.80	4.87
17.40	3.33	266,813	393.80	4.86
17.45	3.31	266,535	393.80	4.86
17.50	3.29	266,255	393.80	4.86
17.55	3.27	265,972	393.80	4.85
17.60	3.25	265,686	393.80	4.85
17.65	3.23	265,398	393.80	4.84
17.70	3.21	265,107	393.79	4.84
17.75	3.19	264,813	393.79	4.83
17.80	3.17	264,517	393.79	4.83
17.85	3.15	264,219	393.79	4.82
17.90	3.14	263,917	393.79	4.82
17.95	3.12	263,614	393.79	4.81

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Type II 24-hr 25-Year Rainfall=5.40"

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Hydrograph for Pond DB #1: Det. Basin #1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
18.00	3.10	263,307	393.79	4.80
18.05	3.08	262,999	393.78	4.80
18.10	3.06	262,687	393.78	4.79
18.15	3.04	262,373	393.78	4.79
18.20	3.02	262,057	393.78	4.78
18.25	3.00	261,738	393.78	4.78
18.30	2.98	261,417	393.78	4.77
18.35	2.96	261,093	393.78	4.77
18.40	2.94	260,767	393.77	4.76
18.45	2.92	260,438	393.77	4.75
18.50	2.90	260,107	393.77	4.75
18.55	2.88	259,773	393.77	4.74
18.60	2.86	259,437	393.77	4.74
18.65	2.84	259,099	393.77	4.73
18.70	2.82	258,758	393.76	4.73
18.75	2.81	258,414	393.76	4.72
18.80	2.78	258,068	393.76	4.71
18.85	2.77	257,720	393.76	4.71
18.90	2.75	257,369	393.76	4.70
18.95	2.73	257,016	393.76	4.70
19.00	2.71	256,660	393.75	4.69
19.05	2.69	256,301	393.75	4.69
19.10	2.67	255,940	393.75	4.68
19.15	2.65	255,576	393.75	4.68
19.20	2.63	255,210	393.75	4.67
19.25	2.61	254,841	393.75	4.66
19.30	2.59	254,470	393.74	4.66
19.35	2.57	254,096	393.74	4.65
19.40	2.55	253,719	393.74	4.65
19.45	2.53	253,340	393.74	4.64
19.50	2.51	252,959	393.74	4.64
19.55	2.49	252,575	393.73	4.63
19.60	2.47	252,188	393.73	4.63
19.65	2.45	251,799	393.73	4.62
19.70	2.43	251,407	393.73	4.61
19.75	2.41	251,013	393.73	4.61
19.80	2.39	250,617	393.73	4.60
19.85	2.37	250,217	393.72	4.60
19.90	2.35	249,816	393.72	4.59
19.95	2.33	249,411	393.72	4.59
20.00	2.31	249,005	393.72	4.58

2184 HydroCAD BASE

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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Stage-Discharge for Pond DB #1: Det. Basin #1

<u>Elevation (feet)</u>	<u>Primary (cfs)</u>
392.50	0.00
392.60	0.05
392.70	0.19
392.80	0.42
392.90	0.73
393.00	1.10
393.10	1.54
393.20	2.01
393.30	2.53
393.40	3.06
393.50	3.58
393.60	4.08
393.70	4.52
393.80	4.85
393.90	5.20
394.00	5.53
394.10	5.83
394.20	6.13
394.30	6.41
394.40	6.67
394.50	6.93

Stage-Area-Storage for Pond DB #1: Det. Basin #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
392.50	199,698	0
392.60	200,476	20,009
392.70	201,254	40,095
392.80	202,032	60,260
392.90	202,810	80,502
393.00	203,588	100,822
393.10	204,374	121,220
393.20	205,159	141,696
393.30	205,945	162,251
393.40	206,730	182,885
393.50	207,516	203,598
393.60	208,302	224,388
393.70	209,087	245,258
393.80	209,873	266,206
393.90	210,658	287,232
394.00	211,444	308,338
394.10	212,237	329,522
394.20	213,030	350,785
394.30	213,823	372,128
394.40	214,616	393,549
394.50	215,409	415,051

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Prepared by HP

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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Summary for Subcatchment 3: #3 Dev

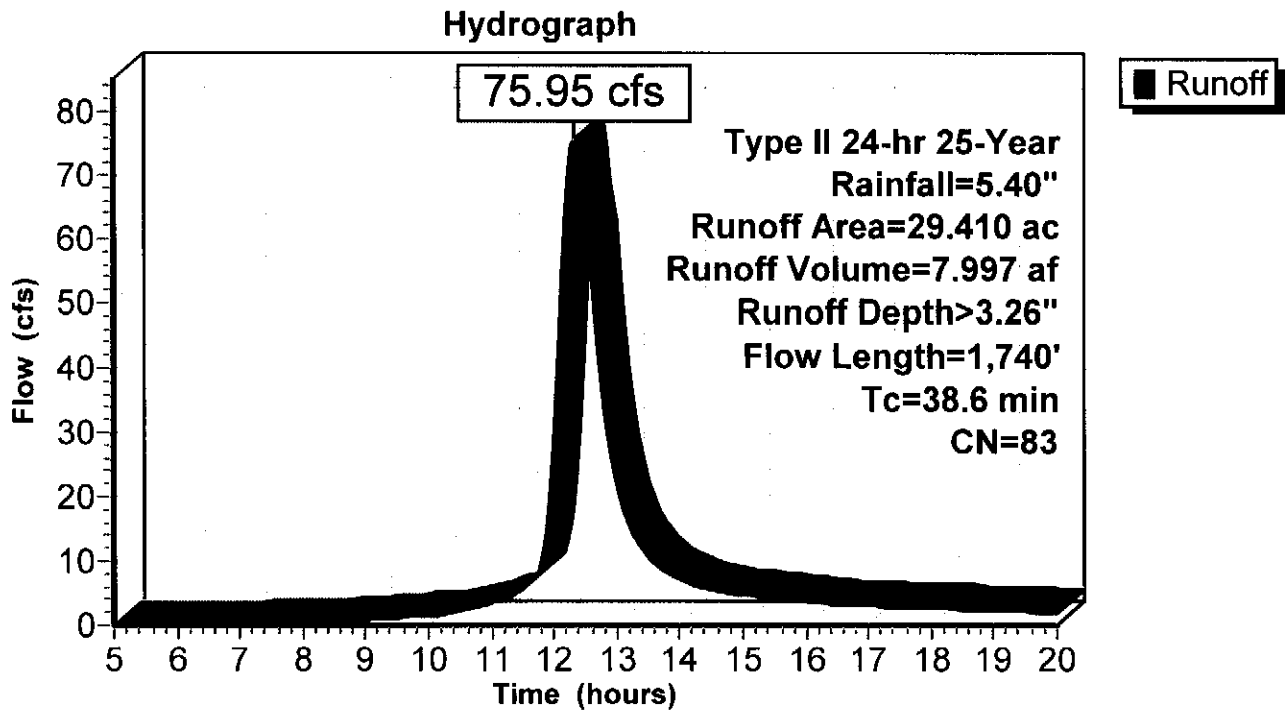
Runoff = 75.95 cfs @ 12.34 hrs, Volume= 7.997 af, Depth> 3.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
29.410	83	1/4 acre lots, 38% imp, HSG C
18.234		62.00% Pervious Area
11.176		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	60	0.0092	0.05		Sheet Flow, Sheet Flow Woods Woods: Light underbrush n= 0.400 P2= 3.30"
14.1	108	0.0091	0.13		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"
2.4	247	0.0071	1.71		Shallow Concentrated Flow, Shallow Concentrated Flow Paved Kv= 20.3 fps
2.9	1,325	0.0142	7.67	13.56	Pipe Channel, Storm Sewer 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
38.6	1,740	Total			

Subcatchment 3: #3 Dev



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Type II 24-hr 25-Year Rainfall=5.40"

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Summary for Subcatchment 6: #6 Dev

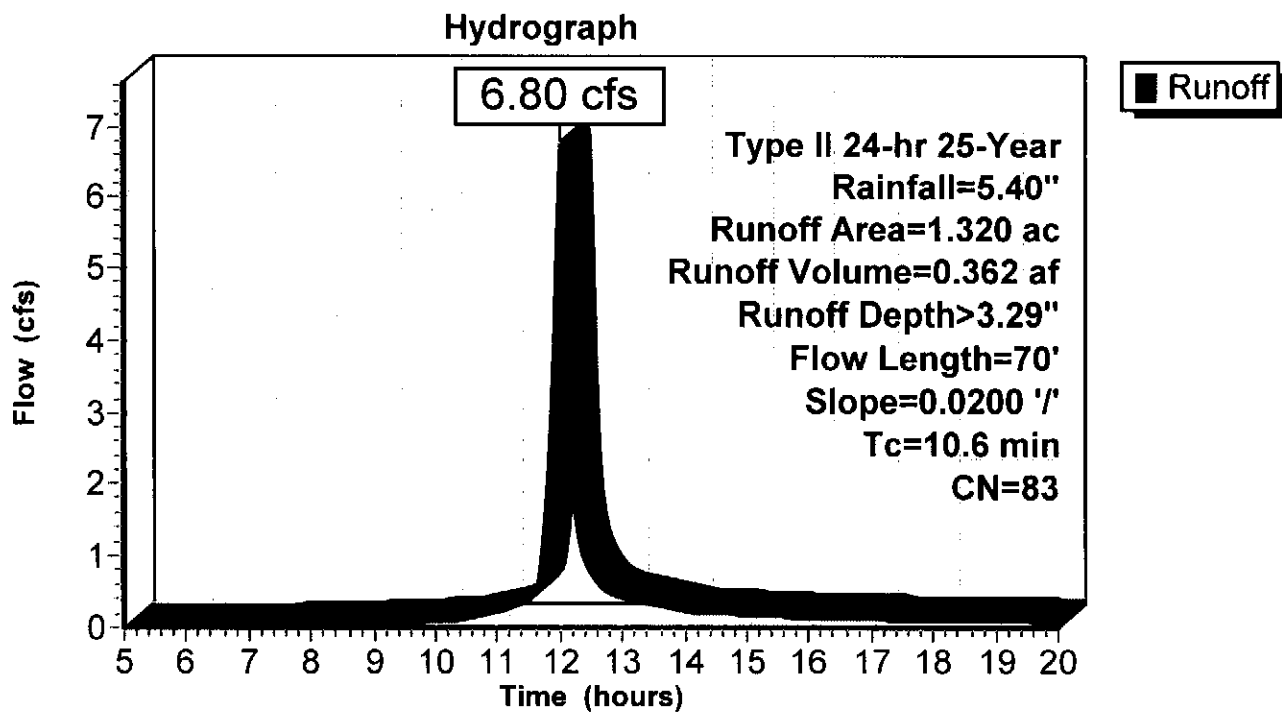
Runoff = 6.80 cfs @ 12.02 hrs, Volume= 0.362 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
1.320	83	1/4 acre lots, 38% imp, HSG C
0.818		62.00% Pervious Area
0.502		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	70	0.0200	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.30"

Subcatchment 6: #6 Dev



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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Summary for Subcatchment OS-1: OS-1

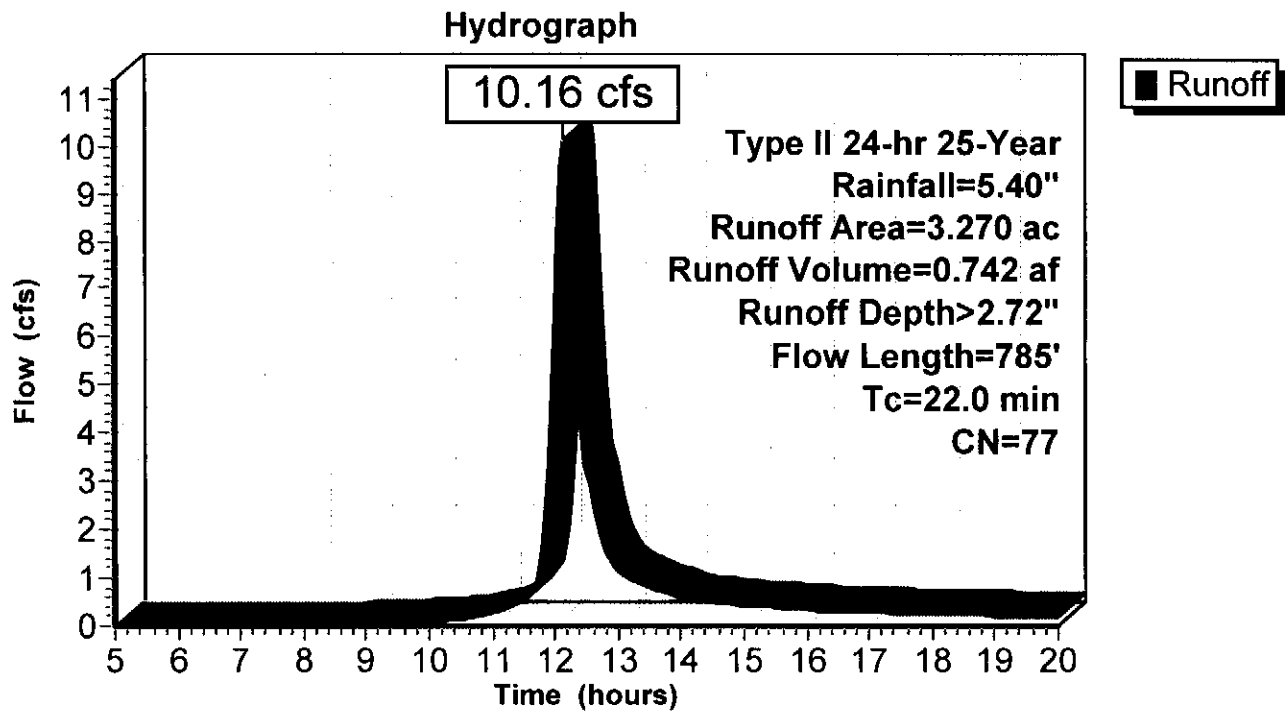
Runoff = 10.16 cfs @ 12.15 hrs, Volume= 0.742 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
0.280	71	Meadow, non-grazed, HSG C
0.500	98	Paved parking, HSG C
0.020	98	Water Surface, HSG C
2.470	73	Woods, Fair, HSG C
3.270	77	Weighted Average
2.750		84.10% Pervious Area
0.520		15.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0933	0.27		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.30"
3.2	300	0.0500	1.57		Shallow Concentrated Flow, Shallow Concentrated Short Grass Pasture Kv= 7.0 fps
0.5	185	0.0378	5.87	17.62	Channel Flow, Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.035 Earth, dense weeds
22.0	785	Total			

Subcatchment OS-1: OS-1



2184 HydroCAD BASE

Type II 24-hr 10-Year Rainfall=4.70"

Prepared by HP

Printed 4/27/2016

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Summary for Subcatchment UN-1: UN-1

Runoff = 65.20 cfs @ 12.19 hrs, Volume= 5.225 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
19.160	82	Row crops, SR + CR, Good, HSG C
4.220	85	Row crops, SR + CR, Good, HSG D
23.380	83	Weighted Average
23.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	300	0.0417	0.26		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.30"
4.6	300	0.0147	1.09		Shallow Concentrated Flow, Shallow Concentrated Cultivated Straight Rows Kv= 9.0 fps
1.7	336	0.0063	3.38	6.75	Channel Flow, Area= 2.0 sf Perim= 4.0' r= 0.50' n= 0.022 Earth, clean & straight
25.4	936	Total			

Hydrograph for Reach Creek UN: Creek Undev

UN-2 +
OS-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	7.60	0.00		0.00
5.05	0.00		0.00	7.65	0.00		0.00
5.10	0.00		0.00	7.70	0.00		0.00
5.15	0.00		0.00	7.75	0.00		0.00
5.20	0.00		0.00	7.80	0.00		0.00
5.25	0.00		0.00	7.85	0.00		0.00
5.30	0.00		0.00	7.90	0.00		0.00
5.35	0.00		0.00	7.95	0.00		0.00
5.40	0.00		0.00	8.00	0.00		0.00
5.45	0.00		0.00	8.05	0.00		0.00
5.50	0.00		0.00	8.10	0.00		0.00
5.55	0.00		0.00	8.15	0.00		0.00
5.60	0.00		0.00	8.20	0.00		0.00
5.65	0.00		0.00	8.25	0.00		0.00
5.70	0.00		0.00	8.30	0.00		0.00
5.75	0.00		0.00	8.35	0.00		0.00
5.80	0.00		0.00	8.40	0.00		0.00
5.85	0.00		0.00	8.45	0.00		0.00
5.90	0.00		0.00	8.50	0.00		0.00
5.95	0.00		0.00	8.55	0.00		0.00
6.00	0.00		0.00	8.60	0.00		0.00
6.05	0.00		0.00	8.65	0.00		0.00
6.10	0.00		0.00	8.70	0.00		0.00
6.15	0.00		0.00	8.75	0.00		0.00
6.20	0.00		0.00	8.80	0.00		0.00
6.25	0.00		0.00	8.85	0.00		0.00
6.30	0.00		0.00	8.90	0.00		0.00
6.35	0.00		0.00	8.95	0.00		0.00
6.40	0.00		0.00	9.00	0.00		0.00
6.45	0.00		0.00	9.05	0.00		0.00
6.50	0.00		0.00	9.10	0.00		0.00
6.55	0.00		0.00	9.15	0.00		0.00
6.60	0.00		0.00	9.20	0.00		0.00
6.65	0.00		0.00	9.25	0.00		0.00
6.70	0.00		0.00	9.30	0.00		0.00
6.75	0.00		0.00	9.35	0.00		0.00
6.80	0.00		0.00	9.40	0.00		0.00
6.85	0.00		0.00	9.45	0.00		0.00
6.90	0.00		0.00	9.50	0.00		0.00
6.95	0.00		0.00	9.55	0.00		0.00
7.00	0.00		0.00	9.60	0.01		0.01
7.05	0.00		0.00	9.65	0.01		0.01
7.10	0.00		0.00	9.70	0.02		0.02
7.15	0.00		0.00	9.75	0.03		0.03
7.20	0.00		0.00	9.80	0.04		0.04
7.25	0.00		0.00	9.85	0.05		0.05
7.30	0.00		0.00	9.90	0.07		0.07
7.35	0.00		0.00	9.95	0.09		0.09
7.40	0.00		0.00	10.00	0.12		0.12
7.45	0.00		0.00	10.05	0.15		0.15
7.50	0.00		0.00	10.10	0.19		0.19
7.55	0.00		0.00	10.15	0.24		0.24

UNDEVELOPED

ACTUAL
ALLOWABLE
SLIGHTLY
HIGHER AS
OS-4 WOULD
BE 25 YR
STORM

Hydrograph for Reach Creek UN: Creek Undev (continued)

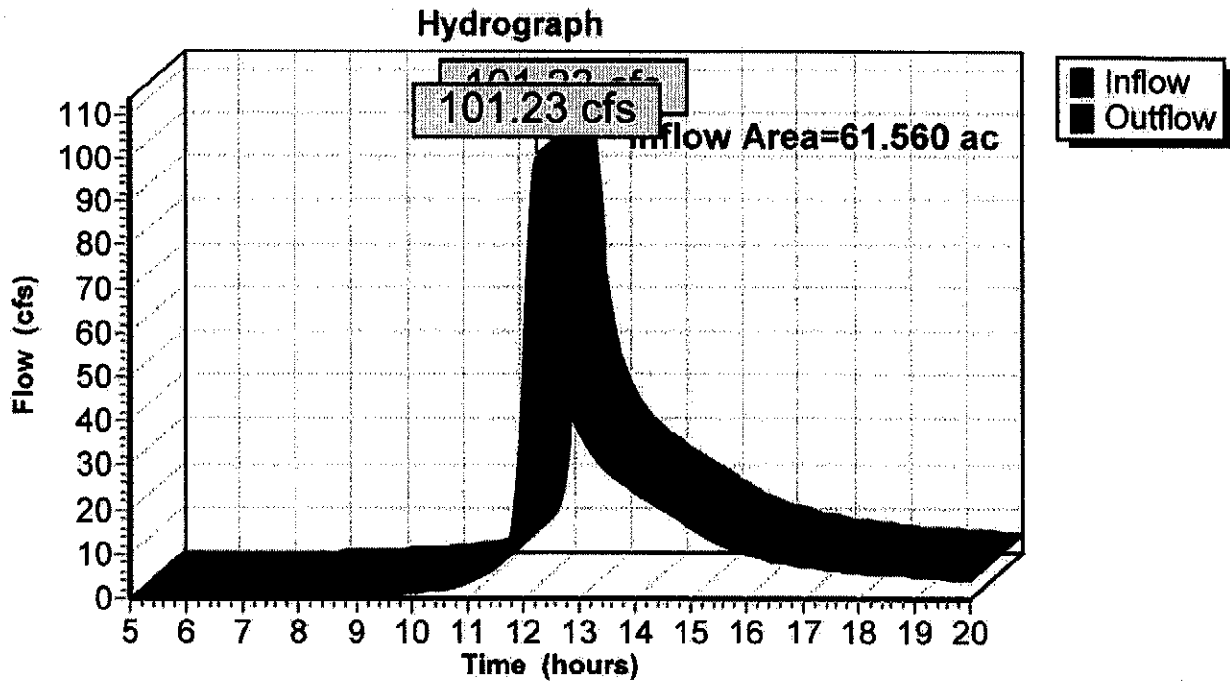
Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
10.20	0.28		0.28	12.80	32.78		32.78
10.25	0.34		0.34	12.85	29.64		29.64
10.30	0.40		0.40	12.90	27.01		27.01
10.35	0.46		0.46	12.95	24.79		24.79
10.40	0.53		0.53	13.00	22.92		22.92
10.45	0.60		0.60	13.05	21.34		21.34
10.50	0.68		0.68	13.10	20.00		20.00
10.55	0.77		0.77	13.15	18.84		18.84
10.60	0.85		0.85	13.20	17.82		17.82
10.65	0.95		0.95	13.25	16.94		16.94
10.70	1.05		1.05	13.30	16.16		16.16
10.75	1.16		1.16	13.35	15.47		15.47
10.80	1.28		1.28	13.40	14.85		14.85
10.85	1.41		1.41	13.45	14.30		14.30
10.90	1.54		1.54	13.50	13.79		13.79
10.95	1.69		1.69	13.55	13.31		13.31
11.00	1.85		1.85	13.60	12.87		12.87
11.05	2.02		2.02	13.65	12.47		12.47
11.10	2.20		2.20	13.70	12.10		12.10
11.15	2.39		2.39	13.75	11.77		11.77
11.20	2.60		2.60	13.80	11.47		11.47
11.25	2.84		2.84	13.85	11.18		11.18
11.30	3.10		3.10	13.90	10.90		10.90
11.35	3.39		3.39	13.95	10.64		10.64
11.40	3.72		3.72	14.00	10.39		10.39
11.45	4.08		4.08	14.05	10.15		10.15
11.50	4.49		4.49	14.10	9.91		9.91
11.55	4.93		4.93	14.15	9.69		9.69
11.60	5.45		5.45	14.20	9.47		9.47
11.65	6.19		6.19	14.25	9.26		9.26
11.70	7.37		7.37	14.30	9.07		9.07
11.75	9.38		9.38	14.35	8.90		8.90
11.80	12.62		12.62	14.40	8.75		8.75
11.85	17.69		17.69	14.45	8.60		8.60
11.90	25.31		25.31	14.50	8.48		8.48
11.95	36.67		36.67	14.55	8.37		8.37
12.00	52.41		52.41	14.60	8.26		8.26
12.05	71.48		71.48	14.65	8.16		8.16
12.10	90.64		90.64	14.70	8.07		8.07
12.15	105.80		105.80	14.75	7.98		7.98
12.20	113.96		113.96	14.80	7.90		7.90
12.25	114.59		114.59	14.85	7.82		7.82
12.30	109.14		109.14	14.90	7.74		7.74
12.35	100.31		100.31	14.95	7.66		7.66
12.40	89.75		89.75	15.00	7.58		7.58
12.45	78.88		78.88	15.05	7.51		7.51
12.50	68.48		68.48	15.10	7.43		7.43
12.55	59.42		59.42	15.15	7.35		7.35
12.60	52.07		52.07	15.20	7.28		7.28
12.65	46.01		46.01	15.25	7.20		7.20
12.70	40.90		40.90	15.30	7.13		7.13
12.75	36.52		36.52	15.35	7.05		7.05

Hydrograph for Reach Creek UN: Creek Undev (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
15.40	6.98		6.98	18.00	4.54		4.54
15.45	6.90		6.90	18.05	4.51		4.51
15.50	6.83		6.83	18.10	4.48		4.48
15.55	6.75		6.75	18.15	4.46		4.46
15.60	6.68		6.68	18.20	4.43		4.43
15.65	6.60		6.60	18.25	4.40		4.40
15.70	6.53		6.53	18.30	4.37		4.37
15.75	6.45		6.45	18.35	4.35		4.35
15.80	6.37		6.37	18.40	4.32		4.32
15.85	6.30		6.30	18.45	4.29		4.29
15.90	6.22		6.22	18.50	4.26		4.26
15.95	6.14		6.14	18.55	4.23		4.23
16.00	6.07		6.07	18.60	4.20		4.20
16.05	5.99		5.99	18.65	4.18		4.18
16.10	5.91		5.91	18.70	4.15		4.15
16.15	5.84		5.84	18.75	4.12		4.12
16.20	5.76		5.76	18.80	4.09		4.09
16.25	5.69		5.69	18.85	4.06		4.06
16.30	5.62		5.62	18.90	4.04		4.04
16.35	5.56		5.56	18.95	4.01		4.01
16.40	5.51		5.51	19.00	3.98		3.98
16.45	5.46		5.46	19.05	3.95		3.95
16.50	5.41		5.41	19.10	3.92		3.92
16.55	5.37		5.37	19.15	3.89		3.89
16.60	5.33		5.33	19.20	3.86		3.86
16.65	5.30		5.30	19.25	3.84		3.84
16.70	5.27		5.27	19.30	3.81		3.81
16.75	5.23		5.23	19.35	3.78		3.78
16.80	5.20		5.20	19.40	3.75		3.75
16.85	5.17		5.17	19.45	3.72		3.72
16.90	5.14		5.14	19.50	3.69		3.69
16.95	5.11		5.11	19.55	3.66		3.66
17.00	5.09		5.09	19.60	3.64		3.64
17.05	5.06		5.06	19.65	3.61		3.61
17.10	5.03		5.03	19.70	3.58		3.58
17.15	5.00		5.00	19.75	3.55		3.55
17.20	4.98		4.98	19.80	3.52		3.52
17.25	4.95		4.95	19.85	3.49		3.49
17.30	4.92		4.92	19.90	3.46		3.46
17.35	4.89		4.89	19.95	3.43		3.43
17.40	4.87		4.87	20.00	3.40		3.40
17.45	4.84		4.84				
17.50	4.81		4.81				
17.55	4.78		4.78				
17.60	4.76		4.76				
17.65	4.73		4.73				
17.70	4.70		4.70				
17.75	4.68		4.68				
17.80	4.65		4.65				
17.85	4.62		4.62				
17.90	4.59		4.59				
17.95	4.57		4.57				

Reach Creek: Discharge Off-Site

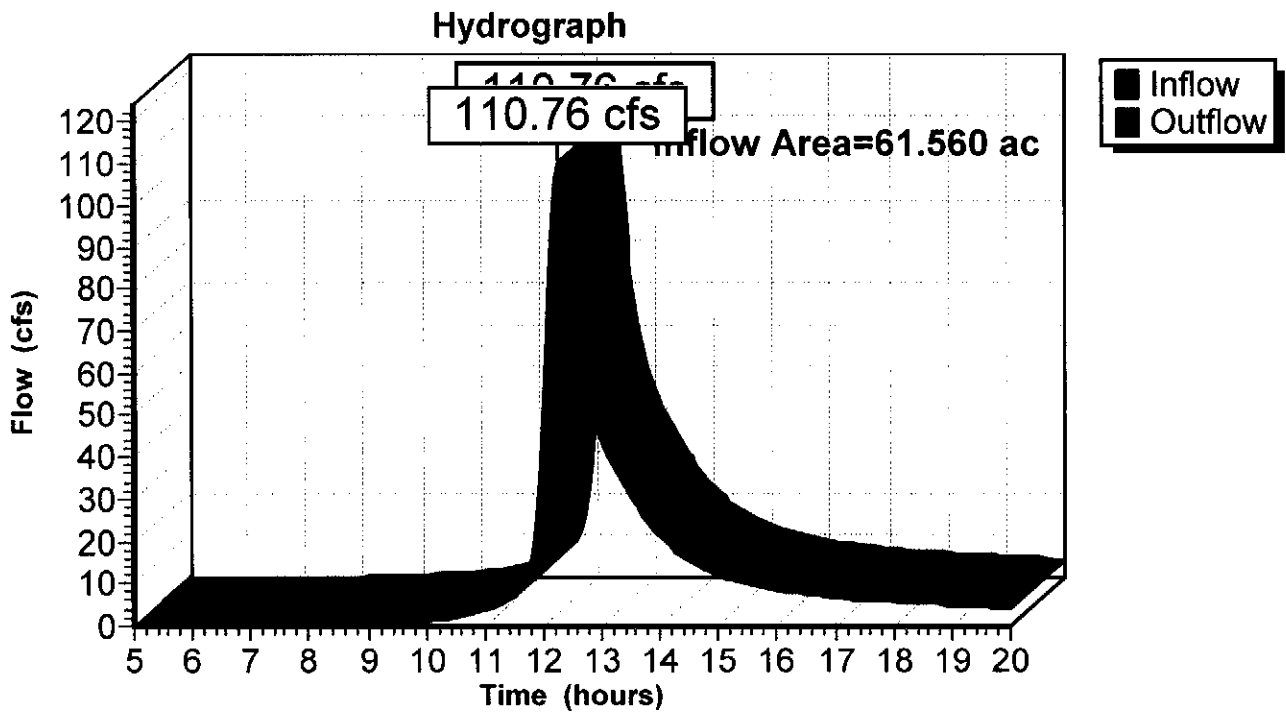
Basin #2 + #2 + #4 + #5
 | | |
 DEV DEV DEV



Reach Discharge: Discharge Off-Site

REVISED
BY 5/2

Basin #2 + #2 + #4 + #5



Summary for Reach Creek: Discharge Off-Site

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 61.560 ac, 23.73% Impervious, Inflow Depth > 2.80" for 25-Year event
Inflow = 101.23 cfs @ 12.26 hrs, Volume= 14.341 af
Outflow = 101.23 cfs @ 12.26 hrs, Volume= 14.341 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Hydrograph for Reach Creek: Discharge Off-Site

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	7.60	0.21		0.21
5.05	0.00		0.00	7.65	0.22		0.22
5.10	0.00		0.00	7.70	0.24		0.24
5.15	0.00		0.00	7.75	0.25		0.25
5.20	0.00		0.00	7.80	0.27		0.27
5.25	0.00		0.00	7.85	0.28		0.28
5.30	0.00		0.00	7.90	0.29		0.29
5.35	0.00		0.00	7.95	0.31		0.31
5.40	0.00		0.00	8.00	0.32		0.32
5.45	0.00		0.00	8.05	0.34		0.34
5.50	0.00		0.00	8.10	0.35		0.35
5.55	0.00		0.00	8.15	0.37		0.37
5.60	0.00		0.00	8.20	0.38		0.38
5.65	0.00		0.00	8.25	0.40		0.40
5.70	0.00		0.00	8.30	0.42		0.42
5.75	0.00		0.00	8.35	0.44		0.44
5.80	0.00		0.00	8.40	0.46		0.46
5.85	0.00		0.00	8.45	0.48		0.48
5.90	0.00		0.00	8.50	0.50		0.50
5.95	0.00		0.00	8.55	0.52		0.52
6.00	0.00		0.00	8.60	0.55		0.55
6.05	0.00		0.00	8.65	0.57		0.57
6.10	0.00		0.00	8.70	0.60		0.60
6.15	0.00		0.00	8.75	0.63		0.63
6.20	0.01		0.01	8.80	0.66		0.66
6.25	0.01		0.01	8.85	0.69		0.69
6.30	0.01		0.01	8.90	0.72		0.72
6.35	0.01		0.01	8.95	0.76		0.76
6.40	0.02		0.02	9.00	0.79		0.79
6.45	0.02		0.02	9.05	0.83		0.83
6.50	0.03		0.03	9.10	0.86		0.86
6.55	0.03		0.03	9.15	0.90		0.90
6.60	0.03		0.03	9.20	0.94		0.94
6.65	0.04		0.04	9.25	0.98		0.98
6.70	0.04		0.04	9.30	1.01		1.01
6.75	0.05		0.05	9.35	1.05		1.05
6.80	0.05		0.05	9.40	1.09		1.09
6.85	0.06		0.06	9.45	1.12		1.12
6.90	0.06		0.06	9.50	1.16		1.16
6.95	0.07		0.07	9.55	1.19		1.19
7.00	0.07		0.07	9.60	1.22		1.22
7.05	0.08		0.08	9.65	1.26		1.26
7.10	0.09		0.09	9.70	1.29		1.29
7.15	0.10		0.10	9.75	1.33		1.33
7.20	0.11		0.11	9.80	1.36		1.36
7.25	0.12		0.12	9.85	1.40		1.40
7.30	0.13		0.13	9.90	1.45		1.45
7.35	0.14		0.14	9.95	1.50		1.50
7.40	0.16		0.16	10.00	1.56		1.56
7.45	0.17		0.17	10.05	1.62		1.62
7.50	0.18		0.18	10.10	1.69		1.69
7.55	0.20		0.20	10.15	1.75		1.75

Hydrograph for Reach Creek: Discharge Off-Site (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
10.20	1.83		1.83	12.80	46.05		46.05
10.25	1.90		1.90	12.85	43.65		43.65
10.30	1.99		1.99	12.90	41.60		41.60
10.35	2.08		2.08	12.95	39.84		39.84
10.40	2.17		2.17	13.00	38.32		38.32
10.45	2.27		2.27	13.05	37.01		37.01
10.50	2.38		2.38	13.10	35.86		35.86
10.55	2.49		2.49	13.15	34.83		34.83
10.60	2.61		2.61	13.20	33.89		33.89
10.65	2.74		2.74	13.25	33.04		33.04
10.70	2.87		2.87	13.30	32.25		32.25
10.75	3.01		3.01	13.35	31.51		31.51
10.80	3.16		3.16	13.40	30.83		30.83
10.85	3.32		3.32	13.45	30.18		30.18
10.90	3.50		3.50	13.50	29.57		29.57
10.95	3.69		3.69	13.55	28.98		28.98
11.00	3.89		3.89	13.60	28.42		28.42
11.05	4.10		4.10	13.65	27.88		27.88
11.10	4.33		4.33	13.70	27.37		27.37
11.15	4.57		4.57	13.75	26.88		26.88
11.20	4.82		4.82	13.80	26.39		26.39
11.25	5.11		5.11	13.85	25.92		25.92
11.30	5.42		5.42	13.90	25.44		25.44
11.35	5.77		5.77	13.95	24.98		24.98
11.40	6.16		6.16	14.00	24.52		24.52
11.45	6.59		6.59	14.05	24.06		24.06
11.50	7.06		7.06	14.10	23.60		23.60
11.55	7.58		7.58	14.15	23.15		23.15
11.60	8.17		8.17	14.20	22.70		22.70
11.65	8.93		8.93	14.25	22.25		22.25
11.70	10.05		10.05	14.30	21.81		21.81
11.75	11.84		11.84	14.35	21.38		21.38
11.80	14.67		14.67	14.40	20.96		20.96
11.85	19.02		19.02	14.45	20.54		20.54
11.90	25.43		25.43	14.50	20.14		20.14
11.95	34.66		34.66	14.55	19.79		19.79
12.00	47.15		47.15	14.60	19.45		19.45
12.05	62.12		62.12	14.65	19.07		19.07
12.10	76.94		76.94	14.70	18.68		18.68
12.15	89.76		89.76	14.75	18.28		18.28
12.20	98.19		98.19	14.80	17.87		17.87
12.25	101.18		101.18	14.85	17.47		17.47
12.30	99.45		99.45	14.90	17.07		17.07
12.35	94.41		94.41	14.95	16.67		16.67
12.40	87.28		87.28	15.00	16.28		16.28
12.45	79.42		79.42	15.05	15.90		15.90
12.50	71.89		71.89	15.10	15.53		15.53
12.55	65.43		65.43	15.15	15.17		15.17
12.60	60.19		60.19	15.20	14.82		14.82
12.65	55.83		55.83	15.25	14.48		14.48
12.70	52.09		52.09	15.30	14.15		14.15
12.75	48.85		48.85	15.35	13.83		13.83

Hydrograph for Reach Creek: Discharge Off-Site (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
15.40	13.53		13.53	18.00	6.34		6.34
15.45	13.23		13.23	18.05	6.28		6.28
15.50	12.94		12.94	18.10	6.23		6.23
15.55	12.66		12.66	18.15	6.18		6.18
15.60	12.39		12.39	18.20	6.13		6.13
15.65	12.13		12.13	18.25	6.08		6.08
15.70	11.88		11.88	18.30	6.03		6.03
15.75	11.63		11.63	18.35	5.98		5.98
15.80	11.40		11.40	18.40	5.93		5.93
15.85	11.17		11.17	18.45	5.88		5.88
15.90	10.94		10.94	18.50	5.84		5.84
15.95	10.73		10.73	18.55	5.79		5.79
16.00	10.52		10.52	18.60	5.74		5.74
16.05	10.32		10.32	18.65	5.70		5.70
16.10	10.12		10.12	18.70	5.65		5.65
16.15	9.93		9.93	18.75	5.61		5.61
16.20	9.74		9.74	18.80	5.56		5.56
16.25	9.56		9.56	18.85	5.52		5.52
16.30	9.39		9.39	18.90	5.48		5.48
16.35	9.23		9.23	18.95	5.43		5.43
16.40	9.08		9.08	19.00	5.39		5.39
16.45	8.93		8.93	19.05	5.35		5.35
16.50	8.79		8.79	19.10	5.31		5.31
16.55	8.66		8.66	19.15	5.27		5.27
16.60	8.53		8.53	19.20	5.23		5.23
16.65	8.41		8.41	19.25	5.19		5.19
16.70	8.30		8.30	19.30	5.14		5.14
16.75	8.19		8.19	19.35	5.10		5.10
16.80	8.09		8.09	19.40	5.06		5.06
16.85	7.99		7.99	19.45	5.02		5.02
16.90	7.89		7.89	19.50	4.98		4.98
16.95	7.79		7.79	19.55	4.94		4.94
17.00	7.70		7.70	19.60	4.91		4.91
17.05	7.62		7.62	19.65	4.87		4.87
17.10	7.53		7.53	19.70	4.83		4.83
17.15	7.45		7.45	19.75	4.79		4.79
17.20	7.37		7.37	19.80	4.75		4.75
17.25	7.29		7.29	19.85	4.71		4.71
17.30	7.22		7.22	19.90	4.68		4.68
17.35	7.14		7.14	19.95	4.64		4.64
17.40	7.07		7.07	20.00	4.60		4.60
17.45	7.01		7.01				
17.50	6.94		6.94				
17.55	6.87		6.87				
17.60	6.81		6.81				
17.65	6.74		6.74				
17.70	6.68		6.68				
17.75	6.62		6.62				
17.80	6.56		6.56				
17.85	6.50		6.50				
17.90	6.45		6.45				
17.95	6.39		6.39				

2184 HydroCAD BASE

Prepared by HP

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Type II 24-hr 10-Year Rainfall=4.70"

Printed 4/27/2016

Summary for Subcatchment UN-2: UN-2

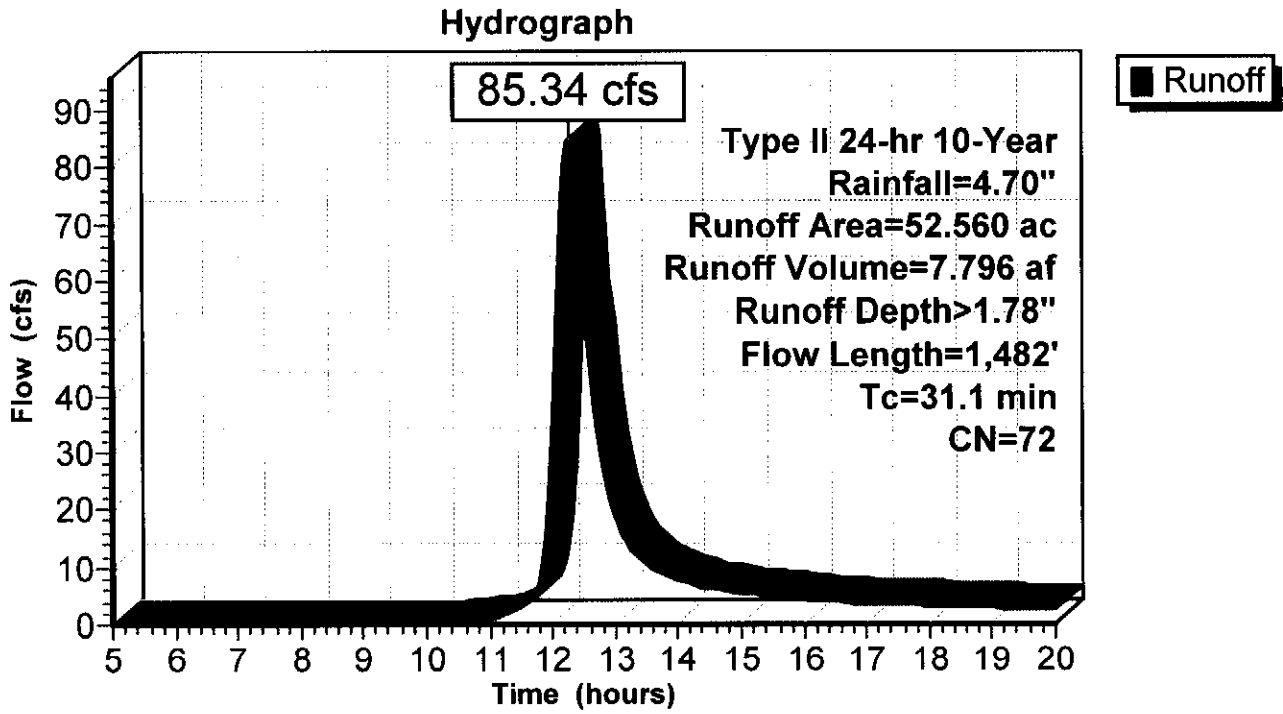
Runoff = 85.34 cfs @ 12.27 hrs, Volume= 7.796 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
7.940	85	Row crops, straight row, Good, HSG C
44.620	70	Woods, Good, HSG C
52.560	72	Weighted Average
52.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	300	0.1367	0.21		Sheet Flow, Sheet Flow
					Woods: Light underbrush n= 0.400 P2= 3.30"
5.5	300	0.0333	0.91		Shallow Concentrated Flow, Shallow Concentrated
					Woodland Kv= 5.0 fps
2.0	882	0.0215	7.26	72.63	Channel Flow,
					Area= 10.0 sf Perim= 10.0' r= 1.00'
					n= 0.030 Earth, clean & winding
31.1	1,482	Total			

Subcatchment UN-2: UN-2



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Type II 24-hr 10-Year Rainfall=4.70"

Printed 4/28/2016

Hydrograph for Subcatchment UN-2: UN-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.30	0.00	0.00	7.60	0.52	0.00	0.00
5.05	0.30	0.00	0.00	7.65	0.53	0.00	0.00
5.10	0.30	0.00	0.00	7.70	0.53	0.00	0.00
5.15	0.31	0.00	0.00	7.75	0.54	0.00	0.00
5.20	0.31	0.00	0.00	7.80	0.54	0.00	0.00
5.25	0.32	0.00	0.00	7.85	0.55	0.00	0.00
5.30	0.32	0.00	0.00	7.90	0.55	0.00	0.00
5.35	0.32	0.00	0.00	7.95	0.56	0.00	0.00
5.40	0.33	0.00	0.00	8.00	0.56	0.00	0.00
5.45	0.33	0.00	0.00	8.05	0.57	0.00	0.00
5.50	0.33	0.00	0.00	8.10	0.57	0.00	0.00
5.55	0.34	0.00	0.00	8.15	0.58	0.00	0.00
5.60	0.34	0.00	0.00	8.20	0.59	0.00	0.00
5.65	0.35	0.00	0.00	8.25	0.59	0.00	0.00
5.70	0.35	0.00	0.00	8.30	0.60	0.00	0.00
5.75	0.36	0.00	0.00	8.35	0.60	0.00	0.00
5.80	0.36	0.00	0.00	8.40	0.61	0.00	0.00
5.85	0.36	0.00	0.00	8.45	0.62	0.00	0.00
5.90	0.37	0.00	0.00	8.50	0.62	0.00	0.00
5.95	0.37	0.00	0.00	8.55	0.63	0.00	0.00
6.00	0.38	0.00	0.00	8.60	0.63	0.00	0.00
6.05	0.38	0.00	0.00	8.65	0.64	0.00	0.00
6.10	0.38	0.00	0.00	8.70	0.65	0.00	0.00
6.15	0.39	0.00	0.00	8.75	0.65	0.00	0.00
6.20	0.39	0.00	0.00	8.80	0.66	0.00	0.00
6.25	0.40	0.00	0.00	8.85	0.67	0.00	0.00
6.30	0.40	0.00	0.00	8.90	0.68	0.00	0.00
6.35	0.41	0.00	0.00	8.95	0.68	0.00	0.00
6.40	0.41	0.00	0.00	9.00	0.69	0.00	0.00
6.45	0.42	0.00	0.00	9.05	0.70	0.00	0.00
6.50	0.42	0.00	0.00	9.10	0.71	0.00	0.00
6.55	0.42	0.00	0.00	9.15	0.71	0.00	0.00
6.60	0.43	0.00	0.00	9.20	0.72	0.00	0.00
6.65	0.43	0.00	0.00	9.25	0.73	0.00	0.00
6.70	0.44	0.00	0.00	9.30	0.74	0.00	0.00
6.75	0.44	0.00	0.00	9.35	0.74	0.00	0.00
6.80	0.45	0.00	0.00	9.40	0.75	0.00	0.00
6.85	0.45	0.00	0.00	9.45	0.76	0.00	0.00
6.90	0.46	0.00	0.00	9.50	0.77	0.00	0.00
6.95	0.46	0.00	0.00	9.55	0.77	0.00	0.00
7.00	0.47	0.00	0.00	9.60	0.78	0.00	0.00
7.05	0.47	0.00	0.00	9.65	0.79	0.00	0.00
7.10	0.47	0.00	0.00	9.70	0.80	0.00	0.00
7.15	0.48	0.00	0.00	9.75	0.81	0.00	0.00
7.20	0.48	0.00	0.00	9.80	0.81	0.00	0.00
7.25	0.49	0.00	0.00	9.85	0.82	0.00	0.01
7.30	0.49	0.00	0.00	9.90	0.83	0.00	0.02
7.35	0.50	0.00	0.00	9.95	0.84	0.00	0.03
7.40	0.50	0.00	0.00	10.00	0.85	0.00	0.04
7.45	0.51	0.00	0.00	10.05	0.86	0.00	0.06
7.50	0.51	0.00	0.00	10.10	0.87	0.00	0.09
7.55	0.52	0.00	0.00	10.15	0.88	0.00	0.12

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Type II 24-hr 10-Year Rainfall=4.70"

Printed 4/28/2016

Hydrograph for Subcatchment UN-2: UN-2 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
10.20	0.89	0.00	0.15	12.80	3.57	1.16	26.96
10.25	0.90	0.00	0.19	12.85	3.58	1.18	24.29
10.30	0.91	0.00	0.23	12.90	3.60	1.19	22.04
10.35	0.92	0.01	0.27	12.95	3.61	1.20	20.13
10.40	0.93	0.01	0.32	13.00	3.63	1.21	18.51
10.45	0.95	0.01	0.37	13.05	3.64	1.22	17.17
10.50	0.96	0.01	0.43	13.10	3.66	1.22	16.03
10.55	0.97	0.01	0.49	13.15	3.67	1.23	15.05
10.60	0.98	0.01	0.55	13.20	3.68	1.24	14.18
10.65	1.00	0.01	0.62	13.25	3.70	1.25	13.43
10.70	1.01	0.01	0.69	13.30	3.71	1.26	12.77
10.75	1.03	0.01	0.77	13.35	3.72	1.27	12.17
10.80	1.04	0.02	0.85	13.40	3.73	1.28	11.65
10.85	1.06	0.02	0.94	13.45	3.74	1.28	11.19
10.90	1.07	0.02	1.04	13.50	3.76	1.29	10.76
10.95	1.09	0.02	1.15	13.55	3.77	1.30	10.35
11.00	1.10	0.03	1.26	13.60	3.78	1.31	9.99
11.05	1.12	0.03	1.38	13.65	3.79	1.31	9.66
11.10	1.14	0.03	1.51	13.70	3.80	1.32	9.36
11.15	1.16	0.03	1.65	13.75	3.81	1.33	9.10
11.20	1.18	0.04	1.80	13.80	3.82	1.33	8.86
11.25	1.20	0.04	1.96	13.85	3.83	1.34	8.64
11.30	1.23	0.05	2.15	13.90	3.84	1.35	8.42
11.35	1.25	0.05	2.35	13.95	3.85	1.35	8.21
11.40	1.28	0.06	2.58	14.00	3.85	1.36	8.02
11.45	1.30	0.06	2.83	14.05	3.86	1.36	7.83
11.50	1.33	0.07	3.12	14.10	3.87	1.37	7.65
11.55	1.37	0.08	3.43	14.15	3.88	1.38	7.47
11.60	1.44	0.10	3.79	14.20	3.89	1.38	7.30
11.65	1.54	0.12	4.27	14.25	3.90	1.39	7.14
11.70	1.67	0.16	4.98	14.30	3.90	1.39	6.99
11.75	1.82	0.22	6.13	14.35	3.91	1.40	6.85
11.80	2.02	0.30	8.01	14.40	3.92	1.40	6.72
11.85	2.31	0.43	11.02	14.45	3.93	1.41	6.61
11.90	2.67	0.62	15.61	14.50	3.94	1.42	6.50
11.95	2.98	0.80	22.55	14.55	3.94	1.42	6.41
12.00	3.12	0.88	32.29	14.60	3.95	1.43	6.33
12.05	3.16	0.91	44.69	14.65	3.96	1.43	6.25
12.10	3.21	0.93	58.40	14.70	3.97	1.44	6.18
12.15	3.25	0.96	71.28	14.75	3.98	1.44	6.11
12.20	3.28	0.98	80.69	14.80	3.98	1.45	6.04
12.25	3.32	1.00	85.02	14.85	3.99	1.45	5.98
12.30	3.35	1.02	84.29	14.90	4.00	1.46	5.92
12.35	3.38	1.04	80.01	14.95	4.00	1.46	5.86
12.40	3.41	1.06	73.03	15.00	4.01	1.47	5.79
12.45	3.43	1.08	64.81	15.05	4.02	1.47	5.74
12.50	3.45	1.09	56.43	15.10	4.03	1.48	5.68
12.55	3.47	1.10	48.99	15.15	4.03	1.48	5.62
12.60	3.49	1.12	42.95	15.20	4.04	1.49	5.56
12.65	3.51	1.13	37.97	15.25	4.05	1.49	5.51
12.70	3.53	1.14	33.76	15.30	4.05	1.50	5.45
12.75	3.55	1.15	30.11	15.35	4.06	1.50	5.39

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Type II 24-hr 10-Year Rainfall=4.70"

Printed 4/28/2016

Hydrograph for Subcatchment UN-2: UN-2 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
15.40	4.07	1.51	5.34	18.00	4.33	1.69	3.46
15.45	4.07	1.51	5.28	18.05	4.33	1.70	3.44
15.50	4.08	1.51	5.22	18.10	4.34	1.70	3.42
15.55	4.08	1.52	5.16	18.15	4.34	1.70	3.40
15.60	4.09	1.52	5.11	18.20	4.35	1.71	3.38
15.65	4.10	1.53	5.05	18.25	4.35	1.71	3.36
15.70	4.10	1.53	4.99	18.30	4.35	1.71	3.33
15.75	4.11	1.54	4.93	18.35	4.36	1.72	3.31
15.80	4.11	1.54	4.88	18.40	4.36	1.72	3.29
15.85	4.12	1.54	4.82	18.45	4.37	1.72	3.27
15.90	4.13	1.55	4.76	18.50	4.37	1.72	3.25
15.95	4.13	1.55	4.70	18.55	4.37	1.73	3.23
16.00	4.14	1.56	4.65	18.60	4.38	1.73	3.21
16.05	4.14	1.56	4.59	18.65	4.38	1.73	3.19
16.10	4.15	1.56	4.53	18.70	4.39	1.74	3.17
16.15	4.15	1.57	4.47	18.75	4.39	1.74	3.14
16.20	4.16	1.57	4.41	18.80	4.39	1.74	3.12
16.25	4.16	1.58	4.36	18.85	4.40	1.74	3.10
16.30	4.17	1.58	4.30	18.90	4.40	1.75	3.08
16.35	4.17	1.58	4.26	18.95	4.40	1.75	3.06
16.40	4.18	1.59	4.21	19.00	4.41	1.75	3.04
16.45	4.18	1.59	4.17	19.05	4.41	1.75	3.01
16.50	4.19	1.59	4.13	19.10	4.41	1.76	2.99
16.55	4.19	1.60	4.10	19.15	4.42	1.76	2.97
16.60	4.20	1.60	4.07	19.20	4.42	1.76	2.95
16.65	4.20	1.60	4.04	19.25	4.43	1.77	2.93
16.70	4.21	1.61	4.02	19.30	4.43	1.77	2.91
16.75	4.21	1.61	3.99	19.35	4.43	1.77	2.88
16.80	4.22	1.62	3.97	19.40	4.44	1.77	2.86
16.85	4.22	1.62	3.94	19.45	4.44	1.78	2.84
16.90	4.23	1.62	3.92	19.50	4.44	1.78	2.82
16.95	4.23	1.63	3.90	19.55	4.45	1.78	2.80
17.00	4.24	1.63	3.88	19.60	4.45	1.78	2.78
17.05	4.24	1.63	3.86	19.65	4.45	1.79	2.75
17.10	4.25	1.64	3.84	19.70	4.46	1.79	2.73
17.15	4.25	1.64	3.81	19.75	4.46	1.79	2.71
17.20	4.26	1.64	3.79	19.80	4.46	1.79	2.69
17.25	4.26	1.65	3.77	19.85	4.47	1.79	2.67
17.30	4.27	1.65	3.75	19.90	4.47	1.80	2.64
17.35	4.27	1.65	3.73	19.95	4.47	1.80	2.62
17.40	4.28	1.66	3.71	20.00	4.47	1.80	2.60
17.45	4.28	1.66	3.69				
17.50	4.28	1.66	3.67				
17.55	4.29	1.67	3.65				
17.60	4.29	1.67	3.63				
17.65	4.30	1.67	3.61				
17.70	4.30	1.68	3.59				
17.75	4.31	1.68	3.56				
17.80	4.31	1.68	3.55				
17.85	4.32	1.69	3.52				
17.90	4.32	1.69	3.50				
17.95	4.32	1.69	3.48				

Summary for Pond DB #2: Det. Basin #2

Inflow Area = 34.210 ac, 19.10% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 111.33 cfs @ 12.13 hrs, Volume= 7.840 af
 Outflow = 25.23 cfs @ 12.58 hrs, Volume= 7.306 af, Atten= 77%, Lag= 27.3 min
 Primary = 25.23 cfs @ 12.58 hrs, Volume= 7.306 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 409.78' @ 12.58 hrs Surf.Area= 48,563 sf Storage= 152,398 cf

Plug-Flow detention time= 92.5 min calculated for 7.282 af (93% of inflow)
 Center-of-Mass det. time= 68.7 min (860.5 - 791.7)

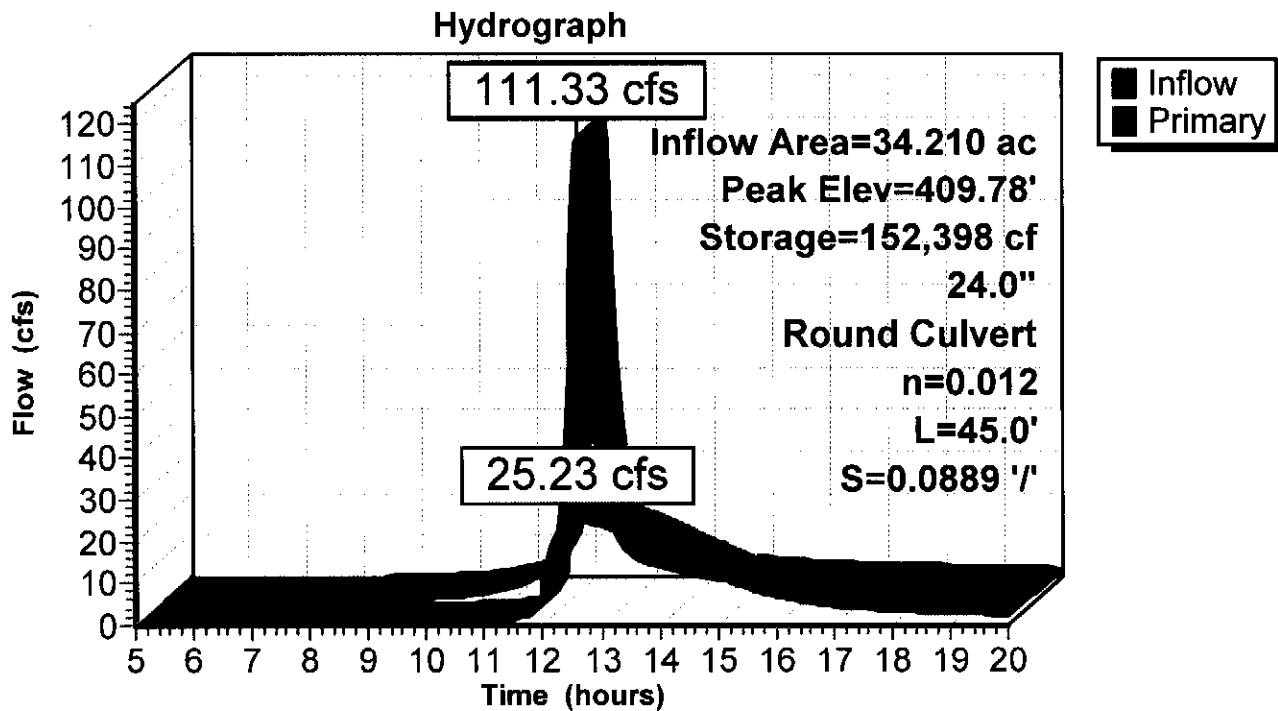
Volume	Invert	Avail.Storage	Storage Description
#1	406.00'	188,459 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
406.00	32,268	0	0
407.00	36,437	34,353	34,353
408.00	40,706	38,572	72,924
409.00	45,075	42,891	115,815
409.50	47,297	23,093	138,908
410.00	49,545	24,211	163,118
410.50	51,818	25,341	188,459

Device	Routing	Invert	Outlet Devices
#1	Primary	406.00'	24.0" Round Culvert L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 406.00' / 402.00' S= 0.0889 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=25.22 cfs @ 12.58 hrs HW=409.78' (Free Discharge)
 ↑1=Culvert (Inlet Controls 25.22 cfs @ 8.03 fps)

Pond DB #2: Det. Basin #2



Stage-Discharge for Pond DB #2: Det. Basin #2

Elevation (feet)	Primary (cfs)
406.00	0.00
406.10	0.06
406.20	0.25
406.30	0.55
406.40	0.96
406.50	1.48
406.60	2.09
406.70	2.79
406.80	3.57
406.90	4.43
407.00	5.35
407.10	6.32
407.20	7.34
407.30	8.39
407.40	9.46
407.50	10.54
407.60	11.60
407.70	12.63
407.80	13.60
407.90	14.47
408.00	15.13
408.10	15.87
408.20	16.57
408.30	17.25
408.40	17.90
408.50	18.53
408.60	19.13
408.70	19.72
408.80	20.29
408.90	20.85
409.00	21.39
409.10	21.92
409.20	22.44
409.30	22.94
409.40	23.43
409.50	23.92
409.60	24.39
409.70	24.86
409.80	25.31
409.90	25.76
410.00	26.20
410.10	26.63
410.20	27.06
410.30	27.48
410.40	27.89
410.50	28.30

Stage-Area-Storage for Pond DB #2: Det. Basin #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
406.00	32,268	0
406.10	32,685	3,248
406.20	33,102	6,537
406.30	33,519	9,868
406.40	33,936	13,241
406.50	34,353	16,655
406.60	34,769	20,111
406.70	35,186	23,609
406.80	35,603	27,148
406.90	36,020	30,730
407.00	36,437	34,353
407.10	36,864	38,018
407.20	37,291	41,725
407.30	37,718	45,476
407.40	38,145	49,269
407.50	38,572	53,105
407.60	38,998	56,983
407.70	39,425	60,904
407.80	39,852	64,868
407.90	40,279	68,875
408.00	40,706	72,924
408.10	41,143	77,016
408.20	41,580	81,153
408.30	42,017	85,332
408.40	42,454	89,556
408.50	42,891	93,823
408.60	43,327	98,134
408.70	43,764	102,489
408.80	44,201	106,887
408.90	44,638	111,329
409.00	45,075	115,815
409.10	45,519	120,344
409.20	45,964	124,918
409.30	46,408	129,537
409.40	46,853	134,200
409.50	47,297	138,908
409.60	47,747	143,660
409.70	48,196	148,457
409.80	48,646	153,299
409.90	49,095	158,186
410.00	49,545	163,118
410.10	50,000	168,095
410.20	50,454	173,118
410.30	50,909	178,186
410.40	51,363	183,300
410.50	51,818	188,459

Hydrograph for Pond DB #2: Det. Basin #2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	406.00	0.00
5.05	0.00	0	406.00	0.00
5.10	0.00	0	406.00	0.00
5.15	0.00	0	406.00	0.00
5.20	0.00	0	406.00	0.00
5.25	0.00	0	406.00	0.00
5.30	0.00	0	406.00	0.00
5.35	0.00	0	406.00	0.00
5.40	0.00	0	406.00	0.00
5.45	0.00	0	406.00	0.00
5.50	0.00	0	406.00	0.00
5.55	0.00	0	406.00	0.00
5.60	0.00	0	406.00	0.00
5.65	0.00	0	406.00	0.00
5.70	0.00	0	406.00	0.00
5.75	0.00	0	406.00	0.00
5.80	0.00	0	406.00	0.00
5.85	0.00	0	406.00	0.00
5.90	0.00	0	406.00	0.00
5.95	0.00	0	406.00	0.00
6.00	0.00	0	406.00	0.00
6.05	0.00	0	406.00	0.00
6.10	0.00	0	406.00	0.00
6.15	0.00	0	406.00	0.00
6.20	0.00	0	406.00	0.00
6.25	0.00	0	406.00	0.00
6.30	0.00	0	406.00	0.00
6.35	0.00	0	406.00	0.00
6.40	0.00	0	406.00	0.00
6.45	0.00	0	406.00	0.00
6.50	0.00	0	406.00	0.00
6.55	0.00	0	406.00	0.00
6.60	0.00	1	406.00	0.00
6.65	0.01	2	406.00	0.00
6.70	0.01	3	406.00	0.00
6.75	0.02	6	406.00	0.00
6.80	0.02	10	406.00	0.00
6.85	0.03	15	406.00	0.00
6.90	0.04	21	406.00	0.00
6.95	0.05	29	406.00	0.00
7.00	0.06	38	406.00	0.00
7.05	0.06	49	406.00	0.00
7.10	0.07	61	406.00	0.00
7.15	0.08	75	406.00	0.00
7.20	0.09	90	406.00	0.00
7.25	0.10	107	406.00	0.00
7.30	0.11	125	406.00	0.00
7.35	0.12	145	406.00	0.00
7.40	0.12	166	406.01	0.00
7.45	0.13	189	406.01	0.00
7.50	0.14	214	406.01	0.00
7.55	0.15	240	406.01	0.00

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Hydrograph for Pond DB #2: Det. Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
7.60	0.16	267	406.01	0.00
7.65	0.17	297	406.01	0.00
7.70	0.18	328	406.01	0.00
7.75	0.19	360	406.01	0.00
7.80	0.20	394	406.01	0.00
7.85	0.21	430	406.01	0.00
7.90	0.22	468	406.01	0.00
7.95	0.23	507	406.02	0.00
8.00	0.24	548	406.02	0.00
8.05	0.25	590	406.02	0.01
8.10	0.26	634	406.02	0.01
8.15	0.27	680	406.02	0.01
8.20	0.28	728	406.02	0.01
8.25	0.29	778	406.02	0.01
8.30	0.30	830	406.03	0.01
8.35	0.32	884	406.03	0.01
8.40	0.33	941	406.03	0.01
8.45	0.35	1,001	406.03	0.01
8.50	0.37	1,064	406.03	0.01
8.55	0.38	1,130	406.03	0.01
8.60	0.40	1,198	406.04	0.01
8.65	0.42	1,271	406.04	0.01
8.70	0.44	1,346	406.04	0.01
8.75	0.46	1,425	406.04	0.01
8.80	0.48	1,507	406.05	0.01
8.85	0.50	1,593	406.05	0.02
8.90	0.53	1,683	406.05	0.02
8.95	0.55	1,777	406.05	0.02
9.00	0.58	1,875	406.06	0.02
9.05	0.61	1,978	406.06	0.03
9.10	0.65	2,087	406.06	0.03
9.15	0.68	2,200	406.07	0.03
9.20	0.71	2,320	406.07	0.04
9.25	0.75	2,445	406.08	0.04
9.30	0.78	2,575	406.08	0.04
9.35	0.81	2,710	406.08	0.05
9.40	0.84	2,850	406.09	0.05
9.45	0.87	2,994	406.09	0.05
9.50	0.90	3,143	406.10	0.06
9.55	0.92	3,295	406.10	0.07
9.60	0.95	3,451	406.11	0.07
9.65	0.98	3,611	406.11	0.08
9.70	1.01	3,775	406.12	0.09
9.75	1.05	3,944	406.12	0.10
9.80	1.09	4,119	406.13	0.10
9.85	1.14	4,300	406.13	0.11
9.90	1.19	4,488	406.14	0.12
9.95	1.24	4,684	406.14	0.13
10.00	1.30	4,887	406.15	0.14
10.05	1.35	5,099	406.16	0.16
10.10	1.42	5,319	406.16	0.17
10.15	1.48	5,548	406.17	0.18

Hydrograph for Pond DB #2: Det. Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
10.20	1.55	5,786	406.18	0.20
10.25	1.62	6,034	406.18	0.21
10.30	1.70	6,293	406.19	0.23
10.35	1.78	6,562	406.20	0.25
10.40	1.87	6,844	406.21	0.27
10.45	1.96	7,138	406.22	0.30
10.50	2.06	7,444	406.23	0.32
10.55	2.16	7,763	406.24	0.35
10.60	2.26	8,096	406.25	0.38
10.65	2.37	8,442	406.26	0.41
10.70	2.49	8,802	406.27	0.44
10.75	2.62	9,179	406.28	0.48
10.80	2.76	9,572	406.29	0.52
10.85	2.91	9,983	406.30	0.57
10.90	3.06	10,415	406.32	0.61
10.95	3.23	10,867	406.33	0.66
11.00	3.41	11,339	406.34	0.72
11.05	3.59	11,834	406.36	0.78
11.10	3.78	12,352	406.37	0.85
11.15	3.99	12,893	406.39	0.92
11.20	4.23	13,461	406.41	0.99
11.25	4.50	14,059	406.42	1.08
11.30	4.81	14,695	406.44	1.17
11.35	5.17	15,373	406.46	1.28
11.40	5.55	16,097	406.48	1.39
11.45	5.97	16,872	406.51	1.52
11.50	6.41	17,701	406.53	1.66
11.55	6.89	18,586	406.56	1.81
11.60	7.51	19,540	406.58	1.98
11.65	8.62	20,616	406.61	2.19
11.70	10.82	21,949	406.65	2.45
11.75	14.67	23,768	406.70	2.83
11.80	20.51	26,374	406.78	3.40
11.85	28.74	30,115	406.88	4.28
11.90	40.22	35,430	407.03	5.63
11.95	56.28	42,918	407.23	7.67
12.00	76.76	53,249	407.50	10.58
12.05	97.20	66,691	407.85	14.01
12.10	109.94	82,561	408.23	16.80
12.15	110.00	99,109	408.62	19.27
12.20	99.21	114,295	408.97	21.21
12.25	83.16	126,762	409.24	22.64
12.30	67.01	136,112	409.44	23.63
12.35	53.83	142,674	409.58	24.29
12.40	44.09	147,075	409.67	24.72
12.45	36.95	149,894	409.73	24.99
12.50	31.52	151,543	409.76	25.15
12.55	27.24	152,299	409.78	25.22
12.60	23.79	152,352	409.78	25.22
12.65	20.96	151,845	409.77	25.18
12.70	18.65	150,887	409.75	25.09
12.75	16.80	149,573	409.72	24.96

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Hydrograph for Pond DB #2: Det. Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
12.80	15.33	147,984	409.69	24.81
12.85	14.16	146,188	409.65	24.64
12.90	13.22	144,235	409.61	24.45
12.95	12.45	142,164	409.57	24.24
13.00	11.82	140,004	409.52	24.03
13.05	11.27	137,777	409.48	23.80
13.10	10.78	135,499	409.43	23.57
13.15	10.33	133,178	409.38	23.33
13.20	9.94	130,827	409.33	23.08
13.25	9.60	128,455	409.28	22.82
13.30	9.30	126,071	409.23	22.56
13.35	9.02	123,682	409.17	22.30
13.40	8.77	121,295	409.12	22.03
13.45	8.54	118,912	409.07	21.76
13.50	8.32	116,538	409.02	21.48
13.55	8.10	114,175	408.96	21.20
13.60	7.89	111,824	408.91	20.91
13.65	7.68	109,488	408.86	20.62
13.70	7.49	107,168	408.81	20.33
13.75	7.30	104,866	408.75	20.03
13.80	7.13	102,586	408.70	19.74
13.85	6.96	100,328	408.65	19.43
13.90	6.80	98,096	408.60	19.13
13.95	6.64	95,890	408.55	18.82
14.00	6.49	93,713	408.50	18.51
14.05	6.34	91,564	408.45	18.20
14.10	6.19	89,445	408.40	17.88
14.15	6.05	87,357	408.35	17.56
14.20	5.92	85,302	408.30	17.24
14.25	5.80	83,283	408.25	16.92
14.30	5.70	81,302	408.20	16.60
14.35	5.62	79,363	408.16	16.27
14.40	5.54	77,468	408.11	15.94
14.45	5.47	75,619	408.07	15.62
14.50	5.41	73,817	408.02	15.29
14.55	5.35	72,058	407.98	15.02
14.60	5.30	70,338	407.94	14.74
14.65	5.24	68,662	407.89	14.42
14.70	5.19	67,035	407.85	14.09
14.75	5.14	65,461	407.81	13.74
14.80	5.09	63,940	407.78	13.38
14.85	5.04	62,475	407.74	13.03
14.90	4.99	61,064	407.70	12.67
14.95	4.94	59,707	407.67	12.33
15.00	4.89	58,403	407.64	11.98
15.05	4.83	57,151	407.60	11.65
15.10	4.78	55,949	407.57	11.32
15.15	4.73	54,796	407.54	11.01
15.20	4.68	53,690	407.52	10.70
15.25	4.63	52,628	407.49	10.41
15.30	4.58	51,610	407.46	10.12
15.35	4.53	50,633	407.44	9.85

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Hydrograph for Pond DB #2: Det. Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
15.40	4.48	49,695	407.41	9.58
15.45	4.43	48,794	407.39	9.33
15.50	4.38	47,930	407.36	9.08
15.55	4.32	47,099	407.34	8.85
15.60	4.27	46,300	407.32	8.62
15.65	4.22	45,531	407.30	8.41
15.70	4.17	44,792	407.28	8.20
15.75	4.12	44,080	407.26	8.00
15.80	4.07	43,395	407.24	7.81
15.85	4.01	42,733	407.23	7.62
15.90	3.96	42,095	407.21	7.44
15.95	3.91	41,480	407.19	7.27
16.00	3.86	40,885	407.18	7.11
16.05	3.81	40,310	407.16	6.95
16.10	3.76	39,753	407.15	6.80
16.15	3.71	39,215	407.13	6.65
16.20	3.66	38,694	407.12	6.51
16.25	3.62	38,190	407.10	6.37
16.30	3.58	37,703	407.09	6.24
16.35	3.55	37,233	407.08	6.11
16.40	3.52	36,780	407.07	5.99
16.45	3.50	36,345	407.05	5.87
16.50	3.48	35,925	407.04	5.76
16.55	3.45	35,521	407.03	5.65
16.60	3.43	35,133	407.02	5.55
16.65	3.41	34,758	407.01	5.45
16.70	3.40	34,398	407.00	5.36
16.75	3.38	34,051	406.99	5.27
16.80	3.36	33,716	406.98	5.18
16.85	3.34	33,393	406.97	5.10
16.90	3.32	33,082	406.97	5.02
16.95	3.30	32,781	406.96	4.94
17.00	3.28	32,491	406.95	4.87
17.05	3.27	32,210	406.94	4.80
17.10	3.25	31,939	406.93	4.73
17.15	3.23	31,676	406.93	4.67
17.20	3.21	31,422	406.92	4.60
17.25	3.19	31,175	406.91	4.54
17.30	3.17	30,937	406.91	4.48
17.35	3.16	30,705	406.90	4.42
17.40	3.14	30,481	406.89	4.37
17.45	3.12	30,262	406.89	4.32
17.50	3.10	30,050	406.88	4.26
17.55	3.08	29,844	406.88	4.21
17.60	3.06	29,643	406.87	4.16
17.65	3.05	29,448	406.86	4.12
17.70	3.03	29,257	406.86	4.07
17.75	3.01	29,072	406.85	4.03
17.80	2.99	28,891	406.85	3.98
17.85	2.97	28,714	406.84	3.94
17.90	2.95	28,542	406.84	3.90
17.95	2.93	28,373	406.83	3.86

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Type II 24-hr 25-Year Rainfall=5.40"

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Hydrograph for Pond DB #2: Det. Basin #2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
18.00	2.92	28,208	406.83	3.82
18.05	2.90	28,047	406.83	3.78
18.10	2.88	27,889	406.82	3.75
18.15	2.86	27,735	406.82	3.71
18.20	2.84	27,583	406.81	3.67
18.25	2.82	27,435	406.81	3.64
18.30	2.80	27,289	406.80	3.61
18.35	2.79	27,146	406.80	3.57
18.40	2.77	27,005	406.80	3.54
18.45	2.75	26,866	406.79	3.51
18.50	2.73	26,730	406.79	3.48
18.55	2.71	26,596	406.78	3.45
18.60	2.69	26,464	406.78	3.42
18.65	2.67	26,334	406.78	3.39
18.70	2.65	26,206	406.77	3.36
18.75	2.63	26,080	406.77	3.33
18.80	2.62	25,956	406.77	3.30
18.85	2.60	25,833	406.76	3.28
18.90	2.58	25,711	406.76	3.25
18.95	2.56	25,591	406.76	3.22
19.00	2.54	25,473	406.75	3.20
19.05	2.52	25,355	406.75	3.17
19.10	2.50	25,239	406.75	3.14
19.15	2.48	25,124	406.74	3.12
19.20	2.46	25,010	406.74	3.09
19.25	2.45	24,897	406.74	3.07
19.30	2.43	24,785	406.73	3.05
19.35	2.41	24,675	406.73	3.02
19.40	2.39	24,565	406.73	3.00
19.45	2.37	24,456	406.72	2.97
19.50	2.35	24,347	406.72	2.95
19.55	2.33	24,240	406.72	2.93
19.60	2.31	24,133	406.71	2.90
19.65	2.29	24,027	406.71	2.88
19.70	2.27	23,922	406.71	2.86
19.75	2.25	23,817	406.71	2.84
19.80	2.24	23,712	406.70	2.81
19.85	2.22	23,608	406.70	2.79
19.90	2.20	23,504	406.70	2.77
19.95	2.18	23,401	406.69	2.75
20.00	2.16	23,299	406.69	2.73

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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Summary for Subcatchment 1: #1 Dev

Runoff = 68.59 cfs @ 12.11 hrs, Volume= 4.616 af, Depth> 3.09"

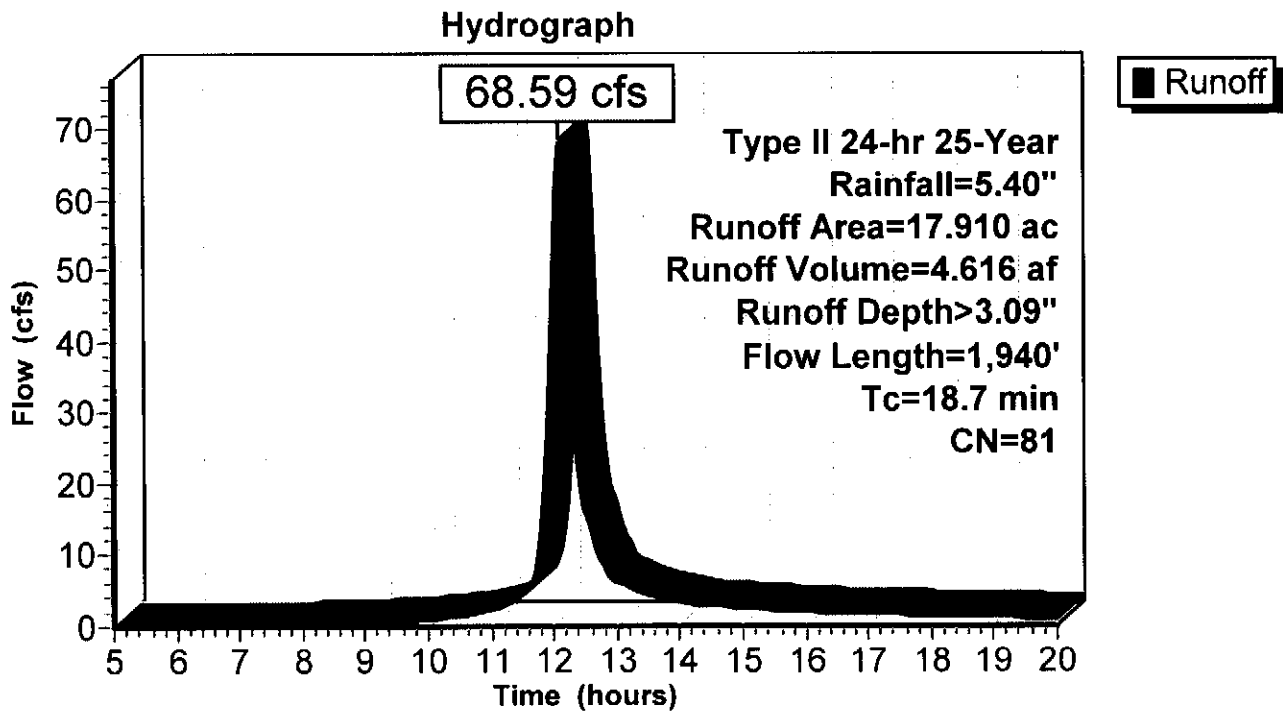
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
17.910	81	1/3 acre lots, 30% imp, HSG C
12.537		70.00% Pervious Area
5.373		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1118	0.16		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
5.3	112	0.1118	0.35		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"
0.4	97	0.0433	4.22		Shallow Concentrated Flow, Shallow Concentrated Flow Paved Kv= 20.3 fps
2.4	1,631	0.0303	11.21	19.81	Pipe Channel, Storm Sewer 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
18.7	1,940	Total			

Subcatchment 1: #1 Dev



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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Summary for Subcatchment OS-4: OS-4

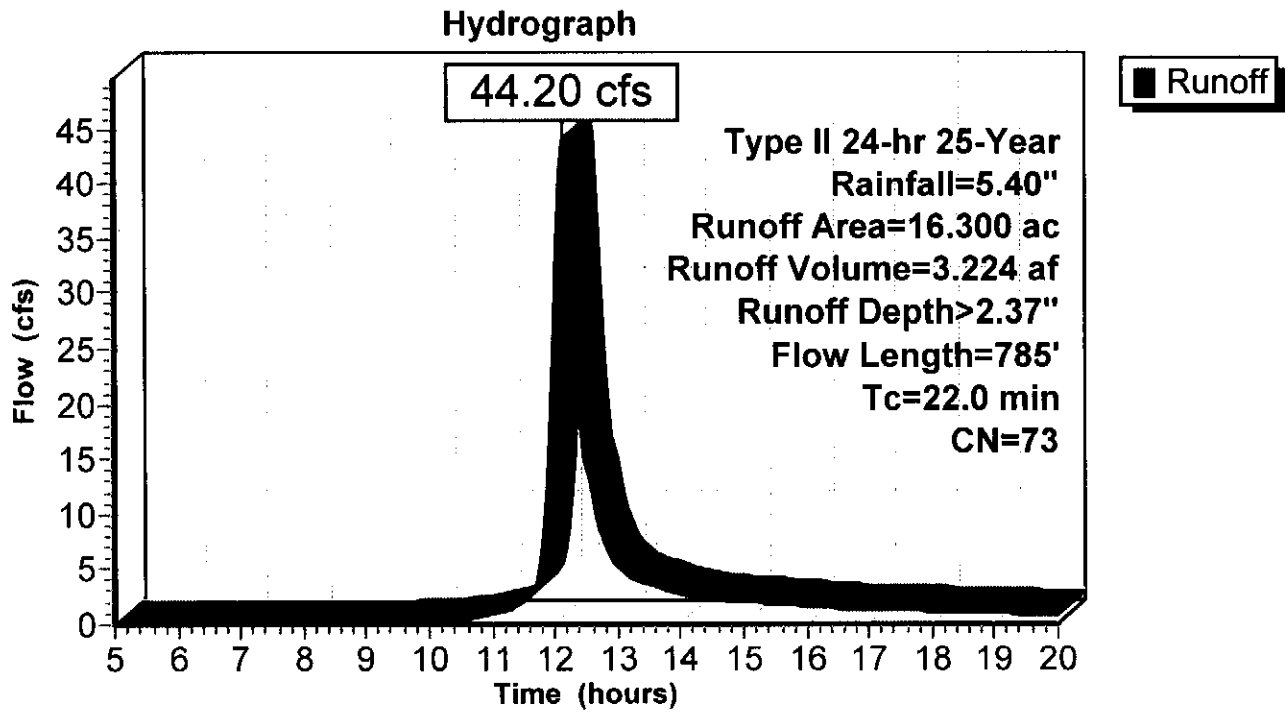
Runoff = 44.20 cfs @ 12.15 hrs, Volume= 3.224 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
15.140	71	Meadow, non-grazed, HSG C
0.660	98	Paved parking, HSG C
0.500	98	Water Surface, HSG C
16.300	73	Weighted Average
15.140		92.88% Pervious Area
1.160		7.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0933	0.27		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.30"
3.2	300	0.0500	1.57		Shallow Concentrated Flow, Shallow Concentrated Short Grass Pasture Kv= 7.0 fps
0.5	185	0.0378	5.87	17.62	Channel Flow, Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.035 Earth, dense weeds
22.0	785	Total			

Subcatchment OS-4: OS-4



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Type II 24-hr 25-Year Rainfall=5.40"

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Summary for Subcatchment 2: #2 Dev

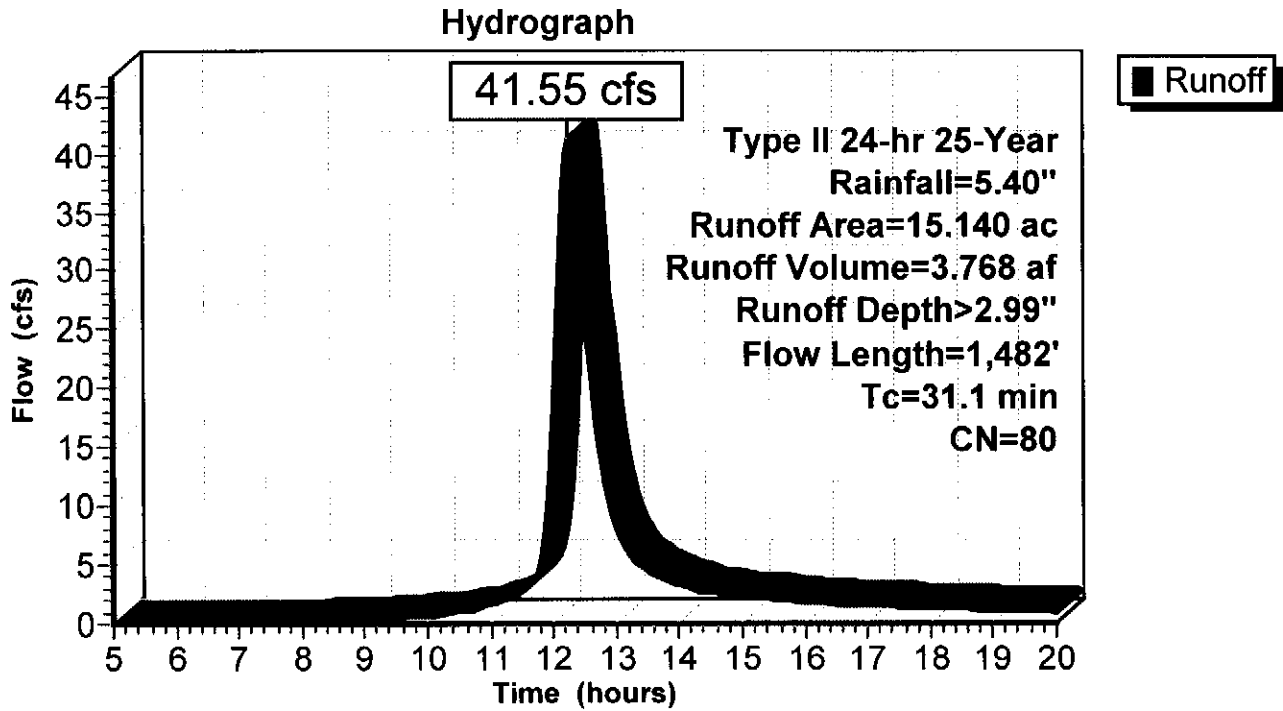
Runoff = 41.55 cfs @ 12.26 hrs, Volume= 3.768 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
15.140	80	1/2 acre lots, 25% imp, HSG C
11.355		75.00% Pervious Area
3.785		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	300	0.1367	0.21		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
5.5	300	0.0333	0.91		Shallow Concentrated Flow, Shallow Concentrated Flow Woodland Kv= 5.0 fps
2.0	882	0.0215	7.26	72.63	Channel Flow, Ditch Flow Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030
31.1	1,482	Total			

Subcatchment 2: #2 Dev



Hydrograph for Subcatchment 2: #2 Dev

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.00	7.60	0.60	0.00	0.06
5.05	0.34	0.00	0.00	7.65	0.61	0.00	0.07
5.10	0.35	0.00	0.00	7.70	0.61	0.00	0.08
5.15	0.35	0.00	0.00	7.75	0.62	0.01	0.08
5.20	0.36	0.00	0.00	7.80	0.62	0.01	0.09
5.25	0.36	0.00	0.00	7.85	0.63	0.01	0.10
5.30	0.37	0.00	0.00	7.90	0.64	0.01	0.11
5.35	0.37	0.00	0.00	7.95	0.64	0.01	0.11
5.40	0.38	0.00	0.00	8.00	0.65	0.01	0.12
5.45	0.38	0.00	0.00	8.05	0.65	0.01	0.13
5.50	0.38	0.00	0.00	8.10	0.66	0.01	0.14
5.55	0.39	0.00	0.00	8.15	0.67	0.01	0.14
5.60	0.39	0.00	0.00	8.20	0.67	0.01	0.15
5.65	0.40	0.00	0.00	8.25	0.68	0.01	0.16
5.70	0.40	0.00	0.00	8.30	0.69	0.01	0.17
5.75	0.41	0.00	0.00	8.35	0.69	0.01	0.18
5.80	0.41	0.00	0.00	8.40	0.70	0.01	0.19
5.85	0.42	0.00	0.00	8.45	0.71	0.02	0.20
5.90	0.42	0.00	0.00	8.50	0.71	0.02	0.21
5.95	0.43	0.00	0.00	8.55	0.72	0.02	0.22
6.00	0.43	0.00	0.00	8.60	0.73	0.02	0.23
6.05	0.44	0.00	0.00	8.65	0.74	0.02	0.25
6.10	0.44	0.00	0.00	8.70	0.74	0.02	0.26
6.15	0.45	0.00	0.00	8.75	0.75	0.02	0.27
6.20	0.45	0.00	0.00	8.80	0.76	0.02	0.29
6.25	0.46	0.00	0.00	8.85	0.77	0.03	0.30
6.30	0.46	0.00	0.00	8.90	0.78	0.03	0.32
6.35	0.47	0.00	0.00	8.95	0.79	0.03	0.33
6.40	0.47	0.00	0.00	9.00	0.79	0.03	0.35
6.45	0.48	0.00	0.00	9.05	0.80	0.03	0.37
6.50	0.48	0.00	0.00	9.10	0.81	0.03	0.38
6.55	0.49	0.00	0.00	9.15	0.82	0.04	0.40
6.60	0.49	0.00	0.00	9.20	0.83	0.04	0.42
6.65	0.50	0.00	0.00	9.25	0.84	0.04	0.44
6.70	0.50	0.00	0.00	9.30	0.85	0.04	0.45
6.75	0.51	0.00	0.00	9.35	0.85	0.04	0.47
6.80	0.51	0.00	0.00	9.40	0.86	0.05	0.49
6.85	0.52	0.00	0.00	9.45	0.87	0.05	0.50
6.90	0.52	0.00	0.00	9.50	0.88	0.05	0.52
6.95	0.53	0.00	0.00	9.55	0.89	0.05	0.54
7.00	0.53	0.00	0.00	9.60	0.90	0.05	0.55
7.05	0.54	0.00	0.01	9.65	0.91	0.06	0.56
7.10	0.55	0.00	0.01	9.70	0.92	0.06	0.58
7.15	0.55	0.00	0.01	9.75	0.93	0.06	0.59
7.20	0.56	0.00	0.02	9.80	0.94	0.06	0.61
7.25	0.56	0.00	0.02	9.85	0.95	0.07	0.63
7.30	0.57	0.00	0.03	9.90	0.96	0.07	0.65
7.35	0.57	0.00	0.03	9.95	0.97	0.07	0.67
7.40	0.58	0.00	0.04	10.00	0.98	0.08	0.69
7.45	0.58	0.00	0.04	10.05	0.99	0.08	0.71
7.50	0.59	0.00	0.05	10.10	1.00	0.08	0.74
7.55	0.60	0.00	0.06	10.15	1.01	0.09	0.77

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Type II 24-hr 25-Year Rainfall=5.40"

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Hydrograph for Subcatchment 2: #2 Dev (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
10.20	1.02	0.09	0.80	12.80	4.10	2.12	11.95
10.25	1.04	0.09	0.83	12.85	4.12	2.14	10.69
10.30	1.05	0.10	0.86	12.90	4.13	2.15	9.64
10.35	1.06	0.10	0.90	12.95	4.15	2.17	8.75
10.40	1.07	0.11	0.94	13.00	4.17	2.18	8.01
10.45	1.09	0.11	0.98	13.05	4.19	2.20	7.39
10.50	1.10	0.12	1.02	13.10	4.20	2.21	6.86
10.55	1.12	0.12	1.06	13.15	4.22	2.22	6.41
10.60	1.13	0.13	1.11	13.20	4.23	2.23	6.02
10.65	1.15	0.13	1.16	13.25	4.25	2.25	5.68
10.70	1.16	0.14	1.21	13.30	4.26	2.26	5.38
10.75	1.18	0.14	1.26	13.35	4.27	2.27	5.11
10.80	1.20	0.15	1.32	13.40	4.29	2.28	4.88
10.85	1.21	0.16	1.38	13.45	4.30	2.29	4.67
10.90	1.23	0.17	1.45	13.50	4.31	2.30	4.48
10.95	1.25	0.17	1.52	13.55	4.33	2.31	4.30
11.00	1.27	0.18	1.59	13.60	4.34	2.33	4.14
11.05	1.29	0.19	1.67	13.65	4.35	2.34	4.00
11.10	1.31	0.20	1.75	13.70	4.36	2.35	3.87
11.15	1.33	0.21	1.84	13.75	4.37	2.36	3.76
11.20	1.36	0.22	1.94	13.80	4.39	2.36	3.66
11.25	1.38	0.23	2.04	13.85	4.40	2.37	3.56
11.30	1.41	0.24	2.15	13.90	4.41	2.38	3.47
11.35	1.44	0.26	2.28	13.95	4.42	2.39	3.38
11.40	1.47	0.27	2.42	14.00	4.43	2.40	3.30
11.45	1.50	0.28	2.58	14.05	4.44	2.41	3.22
11.50	1.53	0.30	2.75	14.10	4.45	2.42	3.14
11.55	1.58	0.32	2.94	14.15	4.46	2.43	3.06
11.60	1.66	0.37	3.15	14.20	4.47	2.43	2.99
11.65	1.77	0.43	3.44	14.25	4.48	2.44	2.92
11.70	1.91	0.51	3.87	14.30	4.49	2.45	2.86
11.75	2.09	0.62	4.56	14.35	4.50	2.46	2.80
11.80	2.33	0.77	5.67	14.40	4.50	2.47	2.75
11.85	2.65	1.00	7.40	14.45	4.51	2.47	2.70
11.90	3.07	1.30	9.92	14.50	4.52	2.48	2.65
11.95	3.42	1.58	13.54	14.55	4.53	2.49	2.62
12.00	3.58	1.70	18.38	14.60	4.54	2.50	2.58
12.05	3.63	1.74	24.30	14.65	4.55	2.50	2.55
12.10	3.68	1.78	30.59	14.70	4.56	2.51	2.52
12.15	3.73	1.82	36.26	14.75	4.57	2.52	2.49
12.20	3.77	1.86	40.12	14.80	4.58	2.53	2.46
12.25	3.81	1.89	41.54	14.85	4.58	2.53	2.43
12.30	3.85	1.92	40.62	14.90	4.59	2.54	2.40
12.35	3.88	1.95	38.09	14.95	4.60	2.55	2.38
12.40	3.92	1.97	34.41	15.00	4.61	2.55	2.35
12.45	3.94	2.00	30.25	15.05	4.62	2.56	2.33
12.50	3.97	2.02	26.12	15.10	4.62	2.57	2.30
12.55	3.99	2.04	22.51	15.15	4.63	2.58	2.28
12.60	4.01	2.05	19.58	15.20	4.64	2.58	2.25
12.65	4.04	2.07	17.18	15.25	4.65	2.59	2.23
12.70	4.06	2.09	15.16	15.30	4.66	2.59	2.21
12.75	4.08	2.11	13.43	15.35	4.66	2.60	2.18

Hydrograph for Subcatchment 2: #2 Dev (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
15.40	4.67	2.61	2.16	18.00	4.97	2.87	1.38
15.45	4.68	2.61	2.13	18.05	4.98	2.87	1.37
15.50	4.69	2.62	2.11	18.10	4.98	2.88	1.36
15.55	4.69	2.63	2.09	18.15	4.99	2.88	1.35
15.60	4.70	2.63	2.06	18.20	4.99	2.89	1.34
15.65	4.71	2.64	2.04	18.25	5.00	2.89	1.33
15.70	4.71	2.64	2.01	18.30	5.00	2.89	1.32
15.75	4.72	2.65	1.99	18.35	5.01	2.90	1.32
15.80	4.73	2.66	1.97	18.40	5.01	2.90	1.31
15.85	4.73	2.66	1.94	18.45	5.02	2.91	1.30
15.90	4.74	2.67	1.92	18.50	5.02	2.91	1.29
15.95	4.75	2.67	1.89	18.55	5.02	2.91	1.28
16.00	4.75	2.68	1.87	18.60	5.03	2.92	1.27
16.05	4.76	2.68	1.85	18.65	5.03	2.92	1.26
16.10	4.76	2.69	1.82	18.70	5.04	2.93	1.26
16.15	4.77	2.69	1.80	18.75	5.04	2.93	1.25
16.20	4.78	2.70	1.77	18.80	5.05	2.93	1.24
16.25	4.78	2.70	1.75	18.85	5.05	2.94	1.23
16.30	4.79	2.71	1.73	18.90	5.06	2.94	1.22
16.35	4.79	2.71	1.71	18.95	5.06	2.94	1.21
16.40	4.80	2.72	1.69	19.00	5.06	2.95	1.20
16.45	4.81	2.72	1.67	19.05	5.07	2.95	1.19
16.50	4.81	2.73	1.66	19.10	5.07	2.96	1.18
16.55	4.82	2.73	1.64	19.15	5.08	2.96	1.18
16.60	4.82	2.74	1.63	19.20	5.08	2.96	1.17
16.65	4.83	2.74	1.62	19.25	5.08	2.97	1.16
16.70	4.84	2.75	1.61	19.30	5.09	2.97	1.15
16.75	4.84	2.75	1.60	19.35	5.09	2.97	1.14
16.80	4.85	2.76	1.59	19.40	5.10	2.98	1.13
16.85	4.85	2.76	1.58	19.45	5.10	2.98	1.12
16.90	4.86	2.77	1.57	19.50	5.10	2.98	1.11
16.95	4.86	2.77	1.56	19.55	5.11	2.99	1.11
17.00	4.87	2.78	1.55	19.60	5.11	2.99	1.10
17.05	4.87	2.78	1.54	19.65	5.12	2.99	1.09
17.10	4.88	2.79	1.53	19.70	5.12	3.00	1.08
17.15	4.89	2.79	1.52	19.75	5.12	3.00	1.07
17.20	4.89	2.80	1.51	19.80	5.13	3.00	1.06
17.25	4.90	2.80	1.51	19.85	5.13	3.01	1.05
17.30	4.90	2.81	1.50	19.90	5.13	3.01	1.04
17.35	4.91	2.81	1.49	19.95	5.14	3.01	1.03
17.40	4.91	2.82	1.48	20.00	5.14	3.02	1.03
17.45	4.92	2.82	1.47				
17.50	4.92	2.83	1.46				
17.55	4.93	2.83	1.45				
17.60	4.93	2.83	1.45				
17.65	4.94	2.84	1.44				
17.70	4.94	2.84	1.43				
17.75	4.95	2.85	1.42				
17.80	4.95	2.85	1.41				
17.85	4.96	2.86	1.40				
17.90	4.96	2.86	1.39				
17.95	4.97	2.87	1.39				

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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Summary for Subcatchment 4: #4 Dev

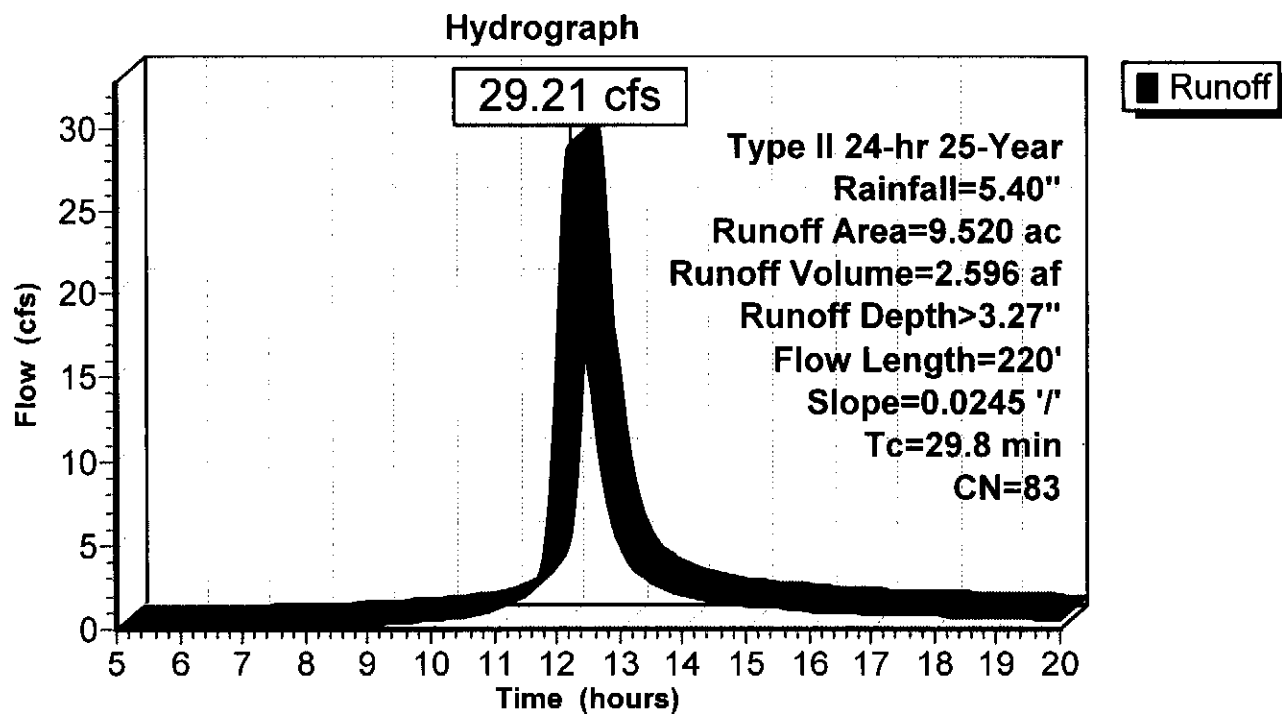
Runoff = 29.21 cfs @ 12.24 hrs, Volume= 2.596 af, Depth> 3.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
9.520	83	1/4 acre lots, 38% imp, HSG C
5.902		62.00% Pervious Area
3.618		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	100	0.0245	0.09		Sheet Flow, Sheet Flow
					Woods: Light underbrush n= 0.400 P2= 3.30"
10.3	120	0.0245	0.19		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.30"
29.8	220	Total			

Subcatchment 4: #4 Dev



Hydrograph for Subcatchment 4: #4 Dev

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.00	7.60	0.60	0.02	0.13
5.05	0.34	0.00	0.00	7.65	0.61	0.02	0.14
5.10	0.35	0.00	0.00	7.70	0.61	0.02	0.14
5.15	0.35	0.00	0.00	7.75	0.62	0.02	0.15
5.20	0.36	0.00	0.00	7.80	0.62	0.02	0.15
5.25	0.36	0.00	0.00	7.85	0.63	0.02	0.16
5.30	0.37	0.00	0.00	7.90	0.64	0.02	0.16
5.35	0.37	0.00	0.00	7.95	0.64	0.02	0.17
5.40	0.38	0.00	0.00	8.00	0.65	0.02	0.17
5.45	0.38	0.00	0.00	8.05	0.65	0.03	0.18
5.50	0.38	0.00	0.00	8.10	0.66	0.03	0.18
5.55	0.39	0.00	0.00	8.15	0.67	0.03	0.19
5.60	0.39	0.00	0.00	8.20	0.67	0.03	0.20
5.65	0.40	0.00	0.00	8.25	0.68	0.03	0.20
5.70	0.40	0.00	0.00	8.30	0.69	0.03	0.21
5.75	0.41	0.00	0.00	8.35	0.69	0.03	0.22
5.80	0.41	0.00	0.00	8.40	0.70	0.04	0.22
5.85	0.42	0.00	0.00	8.45	0.71	0.04	0.23
5.90	0.42	0.00	0.00	8.50	0.71	0.04	0.24
5.95	0.43	0.00	0.00	8.55	0.72	0.04	0.25
6.00	0.43	0.00	0.00	8.60	0.73	0.04	0.26
6.05	0.44	0.00	0.00	8.65	0.74	0.05	0.27
6.10	0.44	0.00	0.00	8.70	0.74	0.05	0.28
6.15	0.45	0.00	0.00	8.75	0.75	0.05	0.29
6.20	0.45	0.00	0.01	8.80	0.76	0.05	0.30
6.25	0.46	0.00	0.01	8.85	0.77	0.05	0.31
6.30	0.46	0.00	0.01	8.90	0.78	0.06	0.33
6.35	0.47	0.00	0.01	8.95	0.79	0.06	0.34
6.40	0.47	0.00	0.02	9.00	0.79	0.06	0.35
6.45	0.48	0.00	0.02	9.05	0.80	0.06	0.37
6.50	0.48	0.00	0.03	9.10	0.81	0.07	0.38
6.55	0.49	0.00	0.03	9.15	0.82	0.07	0.39
6.60	0.49	0.00	0.03	9.20	0.83	0.07	0.41
6.65	0.50	0.00	0.04	9.25	0.84	0.07	0.42
6.70	0.50	0.00	0.04	9.30	0.85	0.08	0.43
6.75	0.51	0.00	0.05	9.35	0.85	0.08	0.45
6.80	0.51	0.00	0.05	9.40	0.86	0.08	0.46
6.85	0.52	0.01	0.06	9.45	0.87	0.09	0.47
6.90	0.52	0.01	0.06	9.50	0.88	0.09	0.48
6.95	0.53	0.01	0.07	9.55	0.89	0.09	0.49
7.00	0.53	0.01	0.07	9.60	0.90	0.09	0.50
7.05	0.54	0.01	0.08	9.65	0.91	0.10	0.51
7.10	0.55	0.01	0.08	9.70	0.92	0.10	0.52
7.15	0.55	0.01	0.08	9.75	0.93	0.10	0.53
7.20	0.56	0.01	0.09	9.80	0.94	0.11	0.54
7.25	0.56	0.01	0.09	9.85	0.95	0.11	0.55
7.30	0.57	0.01	0.10	9.90	0.96	0.12	0.57
7.35	0.57	0.01	0.10	9.95	0.97	0.12	0.58
7.40	0.58	0.01	0.11	10.00	0.98	0.12	0.60
7.45	0.58	0.01	0.12	10.05	0.99	0.13	0.62
7.50	0.59	0.01	0.12	10.10	1.00	0.13	0.64
7.55	0.60	0.02	0.13	10.15	1.01	0.14	0.66

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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Hydrograph for Subcatchment 4: #4 Dev (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
10.20	1.02	0.14	0.68	12.80	4.10	2.37	7.52
10.25	1.04	0.15	0.71	12.85	4.12	2.39	6.73
10.30	1.05	0.15	0.73	12.90	4.13	2.40	6.07
10.35	1.06	0.16	0.76	12.95	4.15	2.42	5.52
10.40	1.07	0.16	0.79	13.00	4.17	2.43	5.06
10.45	1.09	0.17	0.82	13.05	4.19	2.45	4.68
10.50	1.10	0.17	0.85	13.10	4.20	2.46	4.35
10.55	1.12	0.18	0.88	13.15	4.22	2.48	4.08
10.60	1.13	0.19	0.92	13.20	4.23	2.49	3.83
10.65	1.15	0.19	0.95	13.25	4.25	2.50	3.62
10.70	1.16	0.20	0.99	13.30	4.26	2.51	3.44
10.75	1.18	0.21	1.03	13.35	4.27	2.53	3.27
10.80	1.20	0.22	1.07	13.40	4.29	2.54	3.13
10.85	1.21	0.23	1.12	13.45	4.30	2.55	2.99
10.90	1.23	0.24	1.17	13.50	4.31	2.56	2.87
10.95	1.25	0.24	1.22	13.55	4.33	2.57	2.76
11.00	1.27	0.25	1.28	13.60	4.34	2.58	2.67
11.05	1.29	0.26	1.33	13.65	4.35	2.59	2.58
11.10	1.31	0.28	1.40	13.70	4.36	2.60	2.51
11.15	1.33	0.29	1.46	13.75	4.37	2.61	2.44
11.20	1.36	0.30	1.53	13.80	4.39	2.62	2.38
11.25	1.38	0.31	1.60	13.85	4.40	2.63	2.31
11.30	1.41	0.33	1.69	13.90	4.41	2.64	2.25
11.35	1.44	0.34	1.78	13.95	4.42	2.65	2.20
11.40	1.47	0.36	1.89	14.00	4.43	2.66	2.14
11.45	1.50	0.38	2.00	14.05	4.44	2.67	2.09
11.50	1.53	0.40	2.13	14.10	4.45	2.68	2.04
11.55	1.58	0.42	2.27	14.15	4.46	2.69	1.99
11.60	1.66	0.47	2.43	14.20	4.47	2.70	1.95
11.65	1.77	0.54	2.64	14.25	4.48	2.70	1.90
11.70	1.91	0.64	2.97	14.30	4.49	2.71	1.86
11.75	2.09	0.76	3.52	14.35	4.50	2.72	1.82
11.80	2.33	0.93	4.40	14.40	4.50	2.73	1.79
11.85	2.65	1.17	5.74	14.45	4.51	2.74	1.76
11.90	3.07	1.50	7.68	14.50	4.52	2.75	1.73
11.95	3.42	1.80	10.41	14.55	4.53	2.75	1.70
12.00	3.58	1.93	14.03	14.60	4.54	2.76	1.68
12.05	3.63	1.97	18.36	14.65	4.55	2.77	1.66
12.10	3.68	2.01	22.83	14.70	4.56	2.78	1.64
12.15	3.73	2.05	26.58	14.75	4.57	2.79	1.62
12.20	3.77	2.09	28.82	14.80	4.58	2.79	1.60
12.25	3.81	2.12	29.15	14.85	4.58	2.80	1.59
12.30	3.85	2.16	27.95	14.90	4.59	2.81	1.57
12.35	3.88	2.19	25.62	14.95	4.60	2.82	1.55
12.40	3.92	2.21	22.68	15.00	4.61	2.82	1.54
12.45	3.94	2.24	19.56	15.05	4.62	2.83	1.52
12.50	3.97	2.26	16.70	15.10	4.62	2.84	1.50
12.55	3.99	2.28	14.34	15.15	4.63	2.84	1.49
12.60	4.01	2.30	12.46	15.20	4.64	2.85	1.47
12.65	4.04	2.32	10.91	15.25	4.65	2.86	1.45
12.70	4.06	2.34	9.59	15.30	4.66	2.86	1.44
12.75	4.08	2.35	8.47	15.35	4.66	2.87	1.42

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Type II 24-hr 25-Year Rainfall=5.40"

Printed 4/28/2016

Hydrograph for Subcatchment 4: #4 Dev (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
15.40	4.67	2.88	1.41	18.00	4.97	3.15	0.90
15.45	4.68	2.88	1.39	18.05	4.98	3.15	0.89
15.50	4.69	2.89	1.38	18.10	4.98	3.16	0.88
15.55	4.69	2.90	1.36	18.15	4.99	3.16	0.88
15.60	4.70	2.90	1.34	18.20	4.99	3.17	0.87
15.65	4.71	2.91	1.33	18.25	5.00	3.17	0.87
15.70	4.71	2.92	1.31	18.30	5.00	3.18	0.86
15.75	4.72	2.92	1.30	18.35	5.01	3.18	0.86
15.80	4.73	2.93	1.28	18.40	5.01	3.18	0.85
15.85	4.73	2.93	1.26	18.45	5.02	3.19	0.84
15.90	4.74	2.94	1.25	18.50	5.02	3.19	0.84
15.95	4.75	2.95	1.23	18.55	5.02	3.20	0.83
16.00	4.75	2.95	1.22	18.60	5.03	3.20	0.83
16.05	4.76	2.96	1.20	18.65	5.03	3.20	0.82
16.10	4.76	2.96	1.18	18.70	5.04	3.21	0.82
16.15	4.77	2.97	1.17	18.75	5.04	3.21	0.81
16.20	4.78	2.97	1.15	18.80	5.05	3.22	0.80
16.25	4.78	2.98	1.14	18.85	5.05	3.22	0.80
16.30	4.79	2.98	1.12	18.90	5.06	3.22	0.79
16.35	4.79	2.99	1.11	18.95	5.06	3.23	0.79
16.40	4.80	2.99	1.10	19.00	5.06	3.23	0.78
16.45	4.81	3.00	1.09	19.05	5.07	3.24	0.78
16.50	4.81	3.00	1.08	19.10	5.07	3.24	0.77
16.55	4.82	3.01	1.07	19.15	5.08	3.24	0.76
16.60	4.82	3.02	1.06	19.20	5.08	3.25	0.76
16.65	4.83	3.02	1.06	19.25	5.08	3.25	0.75
16.70	4.84	3.03	1.05	19.30	5.09	3.25	0.75
16.75	4.84	3.03	1.04	19.35	5.09	3.26	0.74
16.80	4.85	3.04	1.03	19.40	5.10	3.26	0.74
16.85	4.85	3.04	1.03	19.45	5.10	3.26	0.73
16.90	4.86	3.05	1.02	19.50	5.10	3.27	0.72
16.95	4.86	3.05	1.02	19.55	5.11	3.27	0.72
17.00	4.87	3.06	1.01	19.60	5.11	3.28	0.71
17.05	4.87	3.06	1.00	19.65	5.12	3.28	0.71
17.10	4.88	3.07	1.00	19.70	5.12	3.28	0.70
17.15	4.89	3.07	0.99	19.75	5.12	3.29	0.69
17.20	4.89	3.08	0.99	19.80	5.13	3.29	0.69
17.25	4.90	3.08	0.98	19.85	5.13	3.29	0.68
17.30	4.90	3.09	0.98	19.90	5.13	3.30	0.68
17.35	4.91	3.09	0.97	19.95	5.14	3.30	0.67
17.40	4.91	3.10	0.96	20.00	5.14	3.30	0.67
17.45	4.92	3.10	0.96				
17.50	4.92	3.10	0.95				
17.55	4.93	3.11	0.95				
17.60	4.93	3.11	0.94				
17.65	4.94	3.12	0.94				
17.70	4.94	3.12	0.93				
17.75	4.95	3.13	0.92				
17.80	4.95	3.13	0.92				
17.85	4.96	3.14	0.91				
17.90	4.96	3.14	0.91				
17.95	4.97	3.15	0.90				

2184 HydroCAD BASE

Type II 24-hr 25-Year Rainfall=5.40"

Prepared by HP

Printed 4/28/2016

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Summary for Subcatchment 5: #5 Dev

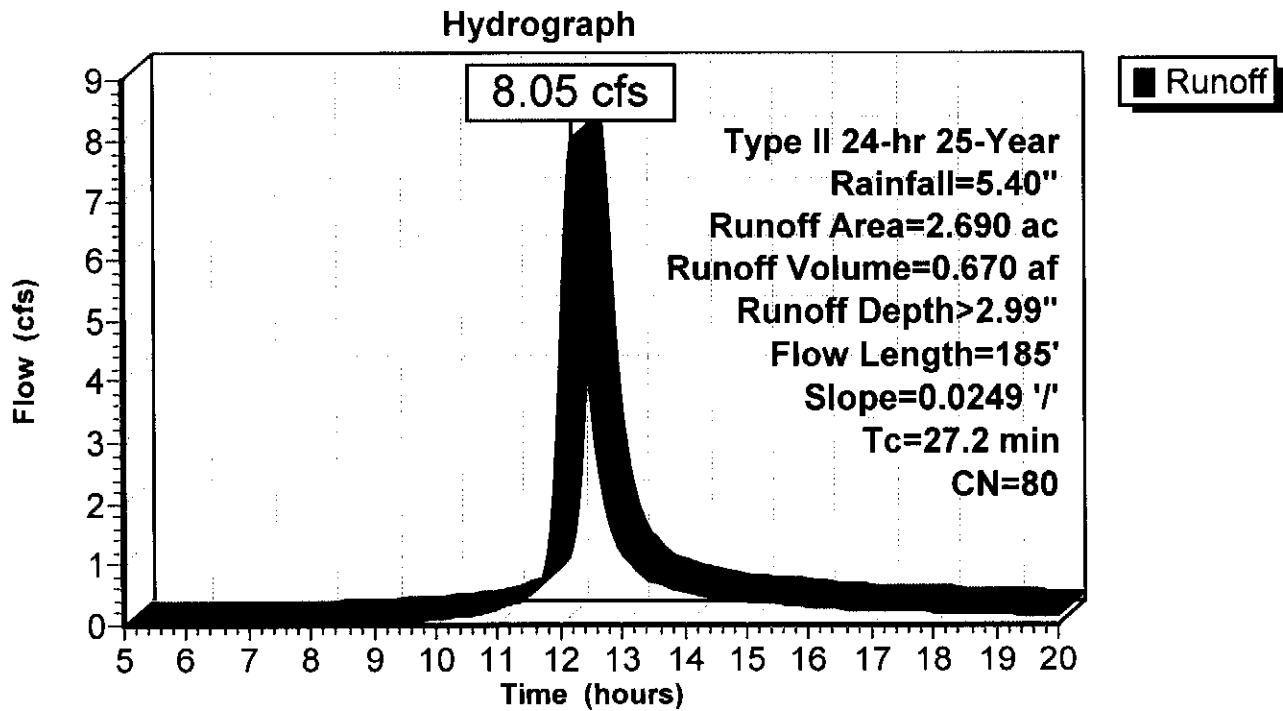
Runoff = 8.05 cfs @ 12.21 hrs, Volume= 0.670 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
2.690	80	1/2 acre lots, 25% imp, HSG C
2.017		75.00% Pervious Area
0.672		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	85	0.0249	0.18		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"
19.4	100	0.0249	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
27.2	185	Total			

Subcatchment 5: #5 Dev



Hydrograph for Subcatchment 5: #5 Dev

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.00	7.60	0.60	0.00	0.01
5.05	0.34	0.00	0.00	7.65	0.61	0.00	0.01
5.10	0.35	0.00	0.00	7.70	0.61	0.00	0.02
5.15	0.35	0.00	0.00	7.75	0.62	0.01	0.02
5.20	0.36	0.00	0.00	7.80	0.62	0.01	0.02
5.25	0.36	0.00	0.00	7.85	0.63	0.01	0.02
5.30	0.37	0.00	0.00	7.90	0.64	0.01	0.02
5.35	0.37	0.00	0.00	7.95	0.64	0.01	0.02
5.40	0.38	0.00	0.00	8.00	0.65	0.01	0.02
5.45	0.38	0.00	0.00	8.05	0.65	0.01	0.02
5.50	0.38	0.00	0.00	8.10	0.66	0.01	0.03
5.55	0.39	0.00	0.00	8.15	0.67	0.01	0.03
5.60	0.39	0.00	0.00	8.20	0.67	0.01	0.03
5.65	0.40	0.00	0.00	8.25	0.68	0.01	0.03
5.70	0.40	0.00	0.00	8.30	0.69	0.01	0.03
5.75	0.41	0.00	0.00	8.35	0.69	0.01	0.03
5.80	0.41	0.00	0.00	8.40	0.70	0.01	0.04
5.85	0.42	0.00	0.00	8.45	0.71	0.02	0.04
5.90	0.42	0.00	0.00	8.50	0.71	0.02	0.04
5.95	0.43	0.00	0.00	8.55	0.72	0.02	0.04
6.00	0.43	0.00	0.00	8.60	0.73	0.02	0.04
6.05	0.44	0.00	0.00	8.65	0.74	0.02	0.05
6.10	0.44	0.00	0.00	8.70	0.74	0.02	0.05
6.15	0.45	0.00	0.00	8.75	0.75	0.02	0.05
6.20	0.45	0.00	0.00	8.80	0.76	0.02	0.05
6.25	0.46	0.00	0.00	8.85	0.77	0.03	0.06
6.30	0.46	0.00	0.00	8.90	0.78	0.03	0.06
6.35	0.47	0.00	0.00	8.95	0.79	0.03	0.06
6.40	0.47	0.00	0.00	9.00	0.79	0.03	0.07
6.45	0.48	0.00	0.00	9.05	0.80	0.03	0.07
6.50	0.48	0.00	0.00	9.10	0.81	0.03	0.07
6.55	0.49	0.00	0.00	9.15	0.82	0.04	0.07
6.60	0.49	0.00	0.00	9.20	0.83	0.04	0.08
6.65	0.50	0.00	0.00	9.25	0.84	0.04	0.08
6.70	0.50	0.00	0.00	9.30	0.85	0.04	0.08
6.75	0.51	0.00	0.00	9.35	0.85	0.04	0.09
6.80	0.51	0.00	0.00	9.40	0.86	0.05	0.09
6.85	0.52	0.00	0.00	9.45	0.87	0.05	0.09
6.90	0.52	0.00	0.00	9.50	0.88	0.05	0.10
6.95	0.53	0.00	0.00	9.55	0.89	0.05	0.10
7.00	0.53	0.00	0.00	9.60	0.90	0.05	0.10
7.05	0.54	0.00	0.00	9.65	0.91	0.06	0.10
7.10	0.55	0.00	0.00	9.70	0.92	0.06	0.11
7.15	0.55	0.00	0.00	9.75	0.93	0.06	0.11
7.20	0.56	0.00	0.00	9.80	0.94	0.06	0.11
7.25	0.56	0.00	0.00	9.85	0.95	0.07	0.11
7.30	0.57	0.00	0.01	9.90	0.96	0.07	0.12
7.35	0.57	0.00	0.01	9.95	0.97	0.07	0.12
7.40	0.58	0.00	0.01	10.00	0.98	0.08	0.13
7.45	0.58	0.00	0.01	10.05	0.99	0.08	0.13
7.50	0.59	0.00	0.01	10.10	1.00	0.08	0.14
7.55	0.60	0.00	0.01	10.15	1.01	0.09	0.14

Hydrograph for Subcatchment 5: #5 Dev (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
10.20	1.02	0.09	0.15	12.80	4.10	2.12	1.77
10.25	1.04	0.09	0.15	12.85	4.12	2.14	1.59
10.30	1.05	0.10	0.16	12.90	4.13	2.15	1.45
10.35	1.06	0.10	0.17	12.95	4.15	2.17	1.33
10.40	1.07	0.11	0.17	13.00	4.17	2.18	1.23
10.45	1.09	0.11	0.18	13.05	4.19	2.20	1.14
10.50	1.10	0.12	0.19	13.10	4.20	2.21	1.07
10.55	1.12	0.12	0.20	13.15	4.22	2.22	1.01
10.60	1.13	0.13	0.21	13.20	4.23	2.23	0.96
10.65	1.15	0.13	0.22	13.25	4.25	2.25	0.91
10.70	1.16	0.14	0.23	13.30	4.26	2.26	0.87
10.75	1.18	0.14	0.24	13.35	4.27	2.27	0.83
10.80	1.20	0.15	0.25	13.40	4.29	2.28	0.79
10.85	1.21	0.16	0.26	13.45	4.30	2.29	0.76
10.90	1.23	0.17	0.27	13.50	4.31	2.30	0.74
10.95	1.25	0.17	0.28	13.55	4.33	2.31	0.72
11.00	1.27	0.18	0.30	13.60	4.34	2.33	0.70
11.05	1.29	0.19	0.31	13.65	4.35	2.34	0.68
11.10	1.31	0.20	0.33	13.70	4.36	2.35	0.66
11.15	1.33	0.21	0.35	13.75	4.37	2.36	0.64
11.20	1.36	0.22	0.36	13.80	4.39	2.36	0.63
11.25	1.38	0.23	0.38	13.85	4.40	2.37	0.61
11.30	1.41	0.24	0.41	13.90	4.41	2.38	0.59
11.35	1.44	0.26	0.43	13.95	4.42	2.39	0.58
11.40	1.47	0.27	0.46	14.00	4.43	2.40	0.57
11.45	1.50	0.28	0.49	14.05	4.44	2.41	0.55
11.50	1.53	0.30	0.52	14.10	4.45	2.42	0.54
11.55	1.58	0.32	0.56	14.15	4.46	2.43	0.53
11.60	1.66	0.37	0.60	14.20	4.47	2.43	0.52
11.65	1.77	0.43	0.66	14.25	4.48	2.44	0.50
11.70	1.91	0.51	0.76	14.30	4.49	2.45	0.49
11.75	2.09	0.62	0.93	14.35	4.50	2.46	0.48
11.80	2.33	0.77	1.20	14.40	4.50	2.47	0.48
11.85	2.65	1.00	1.61	14.45	4.51	2.47	0.47
11.90	3.07	1.30	2.20	14.50	4.52	2.48	0.46
11.95	3.42	1.58	3.04	14.55	4.53	2.49	0.46
12.00	3.58	1.70	4.15	14.60	4.54	2.50	0.45
12.05	3.63	1.74	5.45	14.65	4.55	2.50	0.44
12.10	3.68	1.78	6.72	14.70	4.56	2.51	0.44
12.15	3.73	1.82	7.65	14.75	4.57	2.52	0.43
12.20	3.77	1.86	8.04	14.80	4.58	2.53	0.43
12.25	3.81	1.89	7.86	14.85	4.58	2.53	0.43
12.30	3.85	1.92	7.25	14.90	4.59	2.54	0.42
12.35	3.88	1.95	6.40	14.95	4.60	2.55	0.42
12.40	3.92	1.97	5.47	15.00	4.61	2.55	0.41
12.45	3.94	2.00	4.62	15.05	4.62	2.56	0.41
12.50	3.97	2.02	3.92	15.10	4.62	2.57	0.40
12.55	3.99	2.04	3.37	15.15	4.63	2.58	0.40
12.60	4.01	2.05	2.93	15.20	4.64	2.58	0.40
12.65	4.04	2.07	2.56	15.25	4.65	2.59	0.39
12.70	4.06	2.09	2.25	15.30	4.66	2.59	0.39
12.75	4.08	2.11	1.99	15.35	4.66	2.60	0.38

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Type II 24-hr 25-Year Rainfall=5.40"

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Hydrograph for Subcatchment 5: #5 Dev (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
15.40	4.67	2.61	0.38	18.00	4.97	2.87	0.24
15.45	4.68	2.61	0.37	18.05	4.98	2.87	0.24
15.50	4.69	2.62	0.37	18.10	4.98	2.88	0.24
15.55	4.69	2.63	0.37	18.15	4.99	2.88	0.24
15.60	4.70	2.63	0.36	18.20	4.99	2.89	0.24
15.65	4.71	2.64	0.36	18.25	5.00	2.89	0.23
15.70	4.71	2.64	0.35	18.30	5.00	2.89	0.23
15.75	4.72	2.65	0.35	18.35	5.01	2.90	0.23
15.80	4.73	2.66	0.34	18.40	5.01	2.90	0.23
15.85	4.73	2.66	0.34	18.45	5.02	2.91	0.23
15.90	4.74	2.67	0.34	18.50	5.02	2.91	0.23
15.95	4.75	2.67	0.33	18.55	5.02	2.91	0.23
16.00	4.75	2.68	0.33	18.60	5.03	2.92	0.22
16.05	4.76	2.68	0.32	18.65	5.03	2.92	0.22
16.10	4.76	2.69	0.32	18.70	5.04	2.93	0.22
16.15	4.77	2.69	0.31	18.75	5.04	2.93	0.22
16.20	4.78	2.70	0.31	18.80	5.05	2.93	0.22
16.25	4.78	2.70	0.31	18.85	5.05	2.94	0.22
16.30	4.79	2.71	0.30	18.90	5.06	2.94	0.21
16.35	4.79	2.71	0.30	18.95	5.06	2.94	0.21
16.40	4.80	2.72	0.30	19.00	5.06	2.95	0.21
16.45	4.81	2.72	0.29	19.05	5.07	2.95	0.21
16.50	4.81	2.73	0.29	19.10	5.07	2.96	0.21
16.55	4.82	2.73	0.29	19.15	5.08	2.96	0.21
16.60	4.82	2.74	0.29	19.20	5.08	2.96	0.21
16.65	4.83	2.74	0.29	19.25	5.08	2.97	0.20
16.70	4.84	2.75	0.28	19.30	5.09	2.97	0.20
16.75	4.84	2.75	0.28	19.35	5.09	2.97	0.20
16.80	4.85	2.76	0.28	19.40	5.10	2.98	0.20
16.85	4.85	2.76	0.28	19.45	5.10	2.98	0.20
16.90	4.86	2.77	0.28	19.50	5.10	2.98	0.20
16.95	4.86	2.77	0.27	19.55	5.11	2.99	0.19
17.00	4.87	2.78	0.27	19.60	5.11	2.99	0.19
17.05	4.87	2.78	0.27	19.65	5.12	2.99	0.19
17.10	4.88	2.79	0.27	19.70	5.12	3.00	0.19
17.15	4.89	2.79	0.27	19.75	5.12	3.00	0.19
17.20	4.89	2.80	0.27	19.80	5.13	3.00	0.19
17.25	4.90	2.80	0.27	19.85	5.13	3.01	0.19
17.30	4.90	2.81	0.26	19.90	5.13	3.01	0.18
17.35	4.91	2.81	0.26	19.95	5.14	3.01	0.18
17.40	4.91	2.82	0.26	20.00	5.14	3.02	0.18
17.45	4.92	2.82	0.26				
17.50	4.92	2.83	0.26				
17.55	4.93	2.83	0.26				
17.60	4.93	2.83	0.25				
17.65	4.94	2.84	0.25				
17.70	4.94	2.84	0.25				
17.75	4.95	2.85	0.25				
17.80	4.95	2.85	0.25				
17.85	4.96	2.86	0.25				
17.90	4.96	2.86	0.25				
17.95	4.97	2.87	0.24				

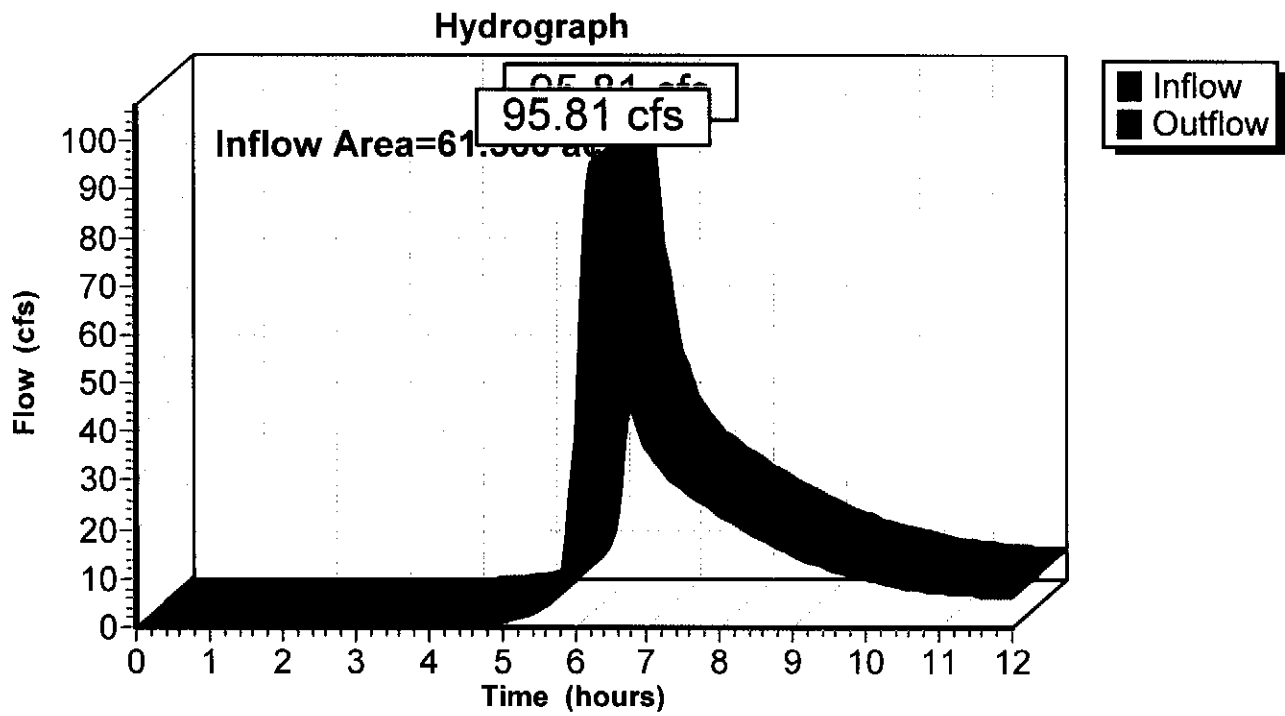
Summary for Reach Creek: Discharge Off-Site

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 61.560 ac, 23.73% Impervious, Inflow Depth > 2.38" for 25-Year 12hr event
Inflow = 95.81 cfs @ 6.26 hrs, Volume= 12.212 af
Outflow = 95.81 cfs @ 6.26 hrs, Volume= 12.212 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs

Reach Creek: Discharge Off-Site



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Type II 12-hr 25-Year 12hr Rainfall=4.69"

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Summary for Pond DB #2: Det. Basin #2

Inflow Area = 34.210 ac, 19.10% Impervious, Inflow Depth > 2.37" for 25-Year 12hr event
 Inflow = 105.11 cfs @ 6.13 hrs, Volume= 6.752 af
 Outflow = 23.53 cfs @ 6.60 hrs, Volume= 6.108 af, Atten= 78%, Lag= 28.3 min
 Primary = 23.53 cfs @ 6.60 hrs, Volume= 6.108 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
 Peak Elev= 409.42' @ 6.60 hrs Surf.Area= 46,936 sf Storage= 135,077 cf

Plug-Flow detention time= 84.6 min calculated for 6.108 af (90% of inflow)
 Center-of-Mass det. time= 60.9 min (484.4 - 423.5)

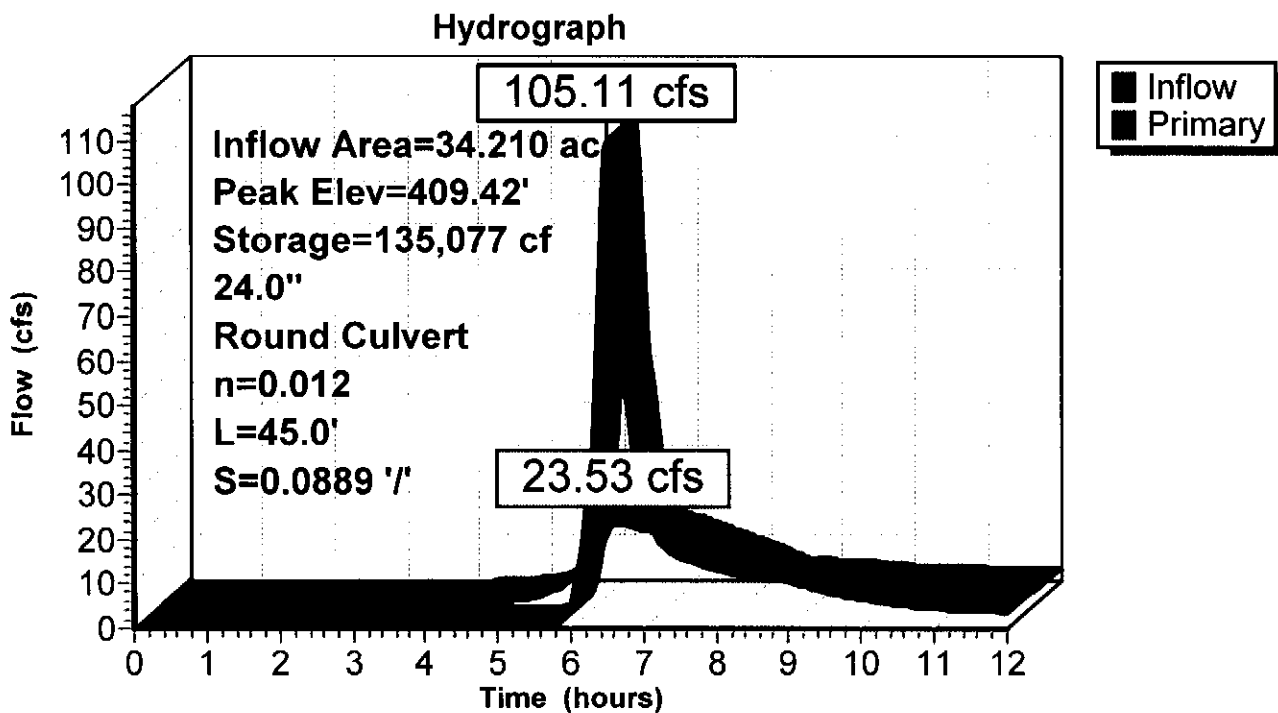
Volume	Invert	Avail.Storage	Storage Description
#1	406.00'	188,459 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
406.00	32,268	0	0
407.00	36,437	34,353	34,353
408.00	40,706	38,572	72,924
409.00	45,075	42,891	115,815
409.50	47,297	23,093	138,908
410.00	49,545	24,211	163,118
410.50	51,818	25,341	188,459

Device	Routing	Invert	Outlet Devices
#1	Primary	406.00'	24.0" Round Culvert L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 406.00' / 402.00' S= 0.0889 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=23.52 cfs @ 6.60 hrs HW=409.42' (Free Discharge)
 ←1=Culvert (Inlet Controls 23.52 cfs @ 7.49 fps)

Pond DB #2: Det. Basin #2



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Type II 12-hr 25-Year 12hr Rainfall=4.69"

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Stage-Discharge for Pond DB #2: Det. Basin #2

<u>Elevation (feet)</u>	<u>Primary (cfs)</u>
406.00	0.00
406.10	0.06
406.20	0.25
406.30	0.55
406.40	0.96
406.50	1.48
406.60	2.09
406.70	2.79
406.80	3.57
406.90	4.43
407.00	5.35
407.10	6.32
407.20	7.34
407.30	8.39
407.40	9.46
407.50	10.54
407.60	11.60
407.70	12.63
407.80	13.60
407.90	14.47
408.00	15.13
408.10	15.87
408.20	16.57
408.30	17.25
408.40	17.90
408.50	18.53
408.60	19.13
408.70	19.72
408.80	20.29
408.90	20.85
409.00	21.39
409.10	21.92
409.20	22.44
409.30	22.94
409.40	23.43
409.50	23.92
409.60	24.39
409.70	24.86
409.80	25.31
409.90	25.76
410.00	26.20
410.10	26.63
410.20	27.06
410.30	27.48
410.40	27.89
410.50	28.30

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Type II 12-hr 25-Year 12hr Rainfall=4.69"

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Stage-Area-Storage for Pond DB #2: Det. Basin #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
406.00	32,268	0
406.10	32,685	3,248
406.20	33,102	6,537
406.30	33,519	9,868
406.40	33,936	13,241
406.50	34,353	16,655
406.60	34,769	20,111
406.70	35,186	23,609
406.80	35,603	27,148
406.90	36,020	30,730
407.00	36,437	34,353
407.10	36,864	38,018
407.20	37,291	41,725
407.30	37,718	45,476
407.40	38,145	49,269
407.50	38,572	53,105
407.60	38,998	56,983
407.70	39,425	60,904
407.80	39,852	64,868
407.90	40,279	68,875
408.00	40,706	72,924
408.10	41,143	77,016
408.20	41,580	81,153
408.30	42,017	85,332
408.40	42,454	89,556
408.50	42,891	93,823
408.60	43,327	98,134
408.70	43,764	102,489
408.80	44,201	106,887
408.90	44,638	111,329
409.00	45,075	115,815
409.10	45,519	120,344
409.20	45,964	124,918
409.30	46,408	129,537
409.40	46,853	134,200
409.50	47,297	138,908
409.60	47,747	143,660
409.70	48,196	148,457
409.80	48,646	153,299
409.90	49,095	158,186
410.00	49,545	163,118
410.10	50,000	168,095
410.20	50,454	173,118
410.30	50,909	178,186
410.40	51,363	183,300
410.50	51,818	188,459

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Type II 12-hr 25-Year 12hr Rainfall=4.69"

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Summary for Subcatchment 2: #2 Dev

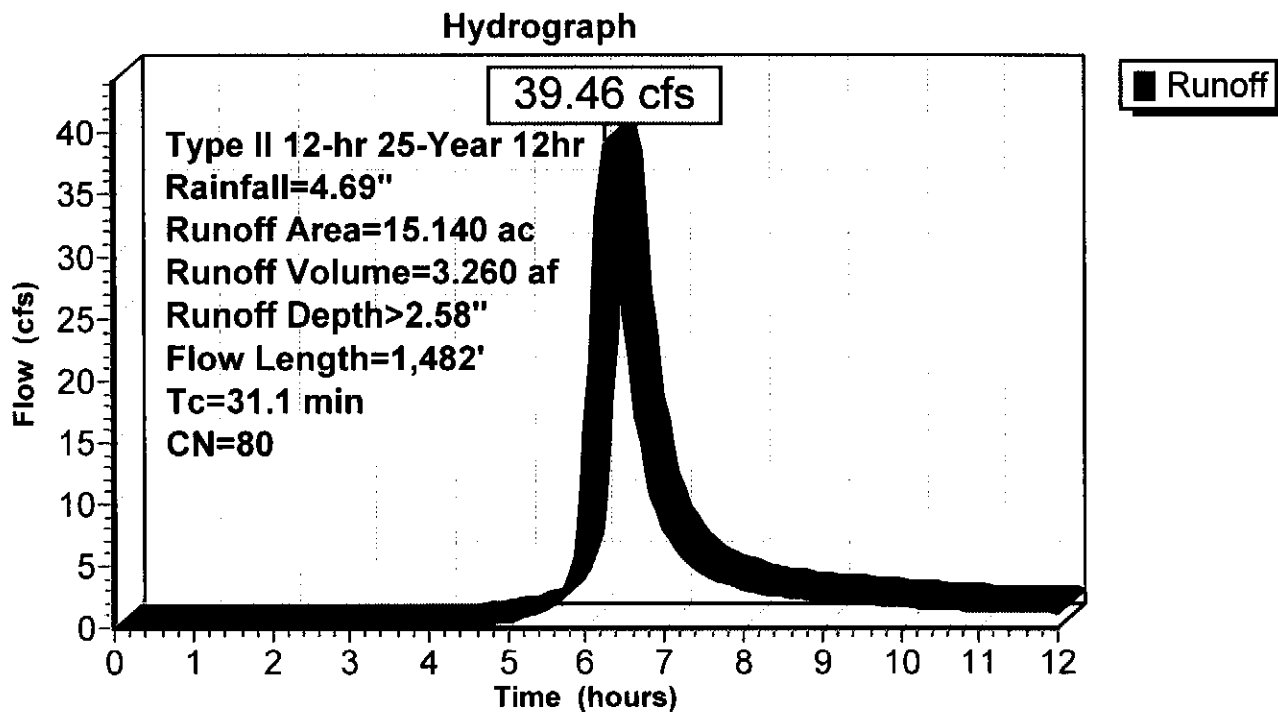
Runoff = 39.46 cfs @ 6.26 hrs, Volume= 3.260 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
 Type II 12-hr 25-Year 12hr Rainfall=4.69"

Area (ac)	CN	Description
15.140	80	1/2 acre lots, 25% imp, HSG C
11.355		75.00% Pervious Area
3.785		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	300	0.1367	0.21		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
5.5	300	0.0333	0.91		Shallow Concentrated Flow, Shallow Concentrated Flow Woodland Kv= 5.0 fps
2.0	882	0.0215	7.26	72.63	Channel Flow, Ditch Flow Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030
31.1	1,482	Total			

Subcatchment 2: #2 Dev



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Type II 12-hr 25-Year 12hr Rainfall=4.69"

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Summary for Subcatchment 4: #4 Dev

Runoff = 28.19 cfs @ 6.24 hrs, Volume= 2.265 af, Depth> 2.85"

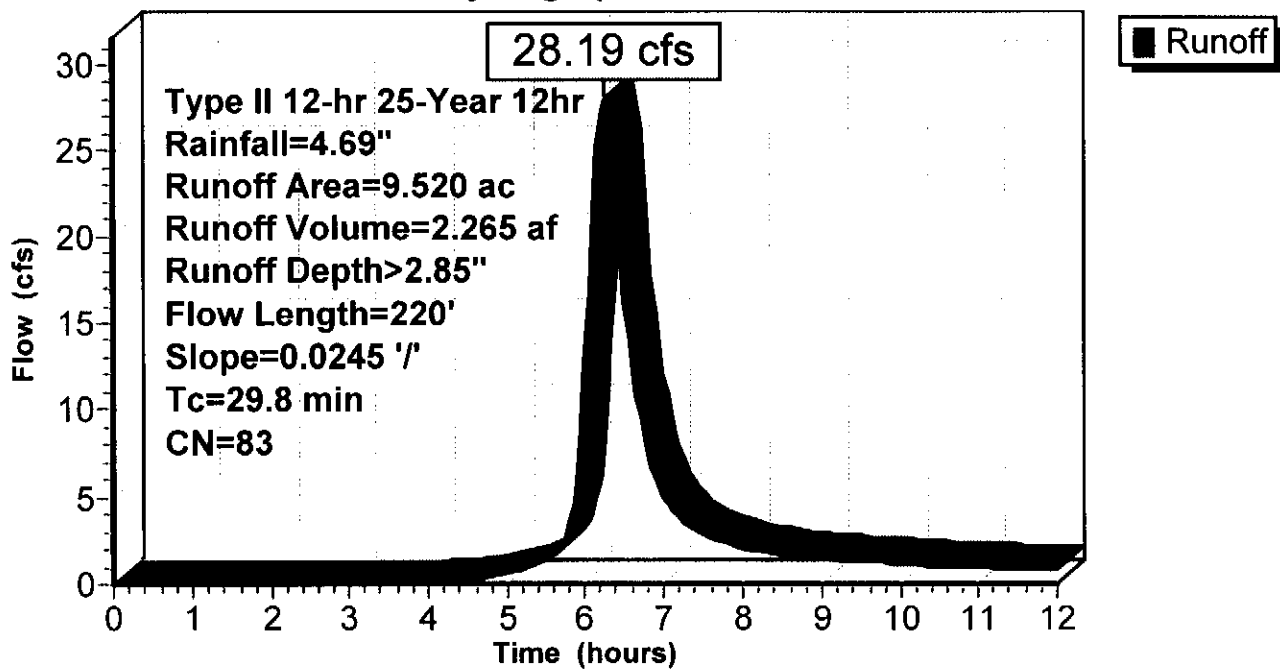
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
 Type II 12-hr 25-Year 12hr Rainfall=4.69"

Area (ac)	CN	Description
9.520	83	1/4 acre lots, 38% imp, HSG C
5.902		62.00% Pervious Area
3.618		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	100	0.0245	0.09		Sheet Flow, Sheet Flow
					Woods: Light underbrush n= 0.400 P2= 3.30"
10.3	120	0.0245	0.19		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.30"
29.8	220	Total			

Subcatchment 4: #4 Dev

Hydrograph



Summary for Subcatchment 5: #5 Dev

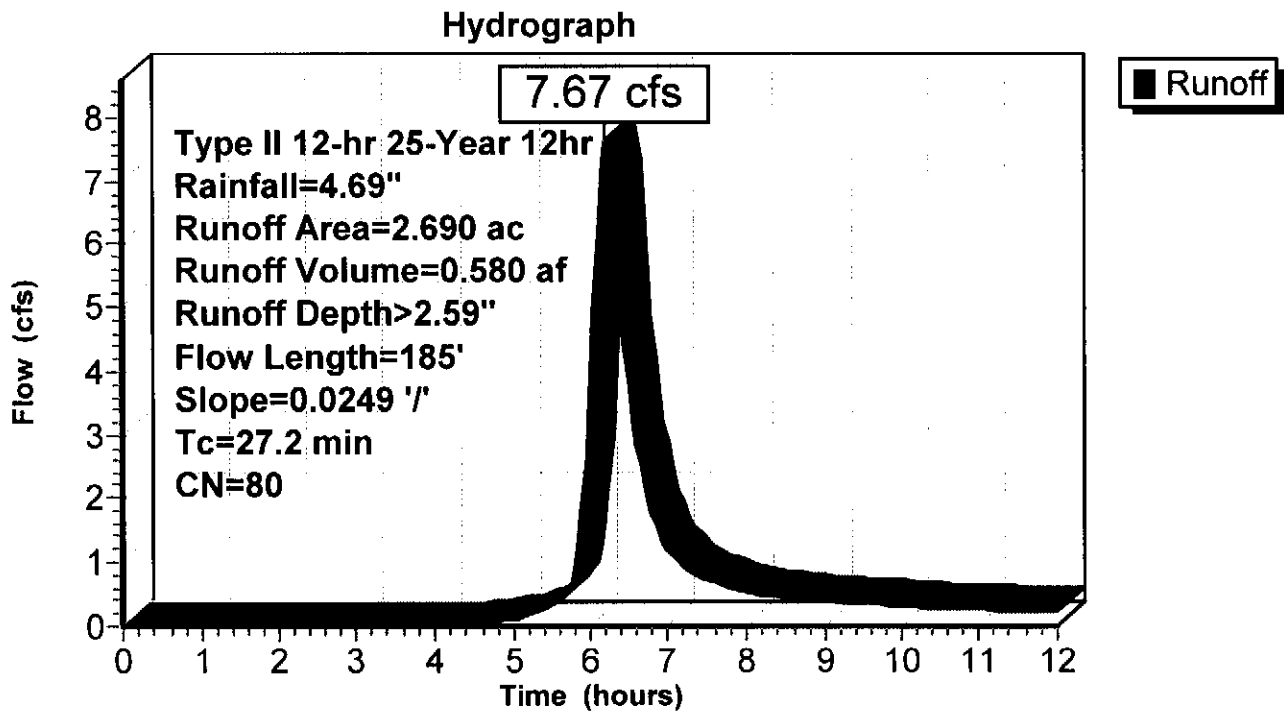
Runoff = 7.67 cfs @ 6.21 hrs, Volume= 0.580 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
 Type II 12-hr 25-Year 12hr Rainfall=4.69"

Area (ac)	CN	Description
2.690	80	1/2 acre lots, 25% imp, HSG C
2.017		75.00% Pervious Area
0.672		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	85	0.0249	0.18		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"
19.4	100	0.0249	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
27.2	185	Total			

Subcatchment 5: #5 Dev



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Type II 12-hr 10-Year 12hr Rainfall=3.93"

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Summary for Subcatchment UN-2: UN-2

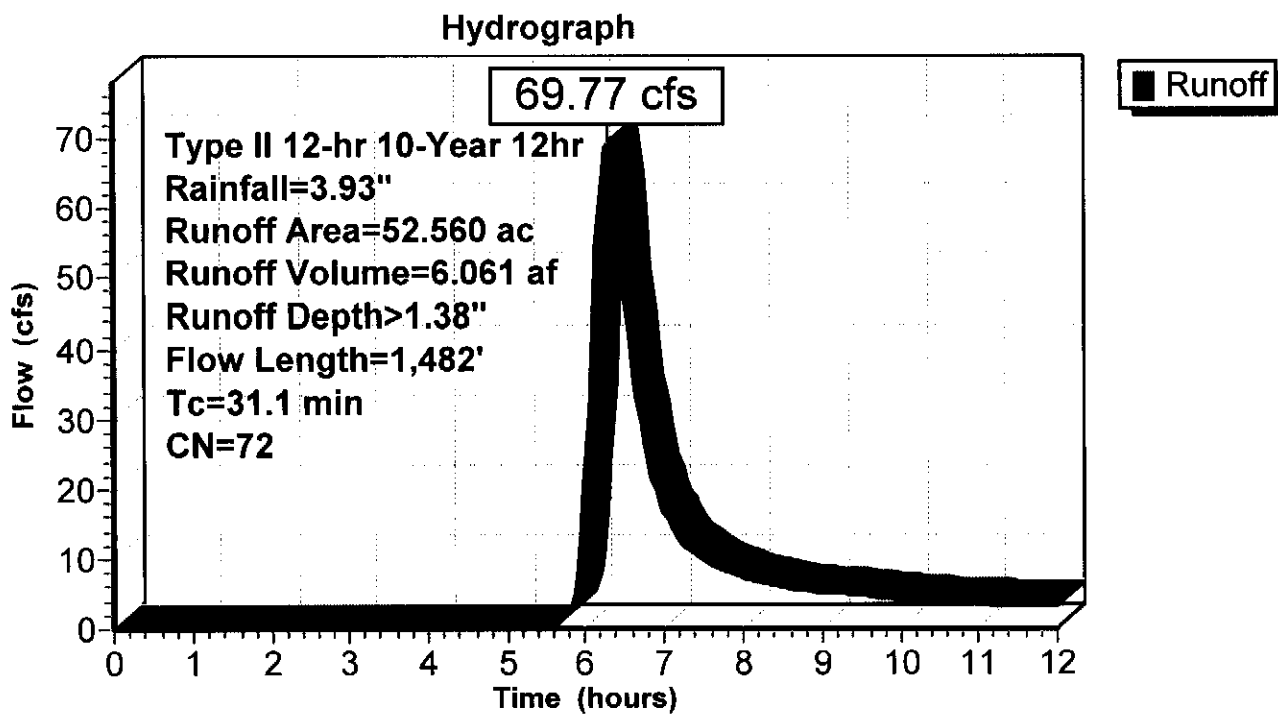
Runoff = 69.77 cfs @ 6.28 hrs, Volume= 6.061 af, Depth> 1.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
Type II 12-hr 10-Year 12hr Rainfall=3.93"

Area (ac)	CN	Description
7.940	85	Row crops, straight row, Good, HSG C
44.620	70	Woods, Good, HSG C
52.560	72	Weighted Average
52.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	300	0.1367	0.21		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
5.5	300	0.0333	0.91		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
2.0	882	0.0215	7.26	72.63	Channel Flow, Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Earth, clean & winding
31.1	1,482	Total			

Subcatchment UN-2: UN-2



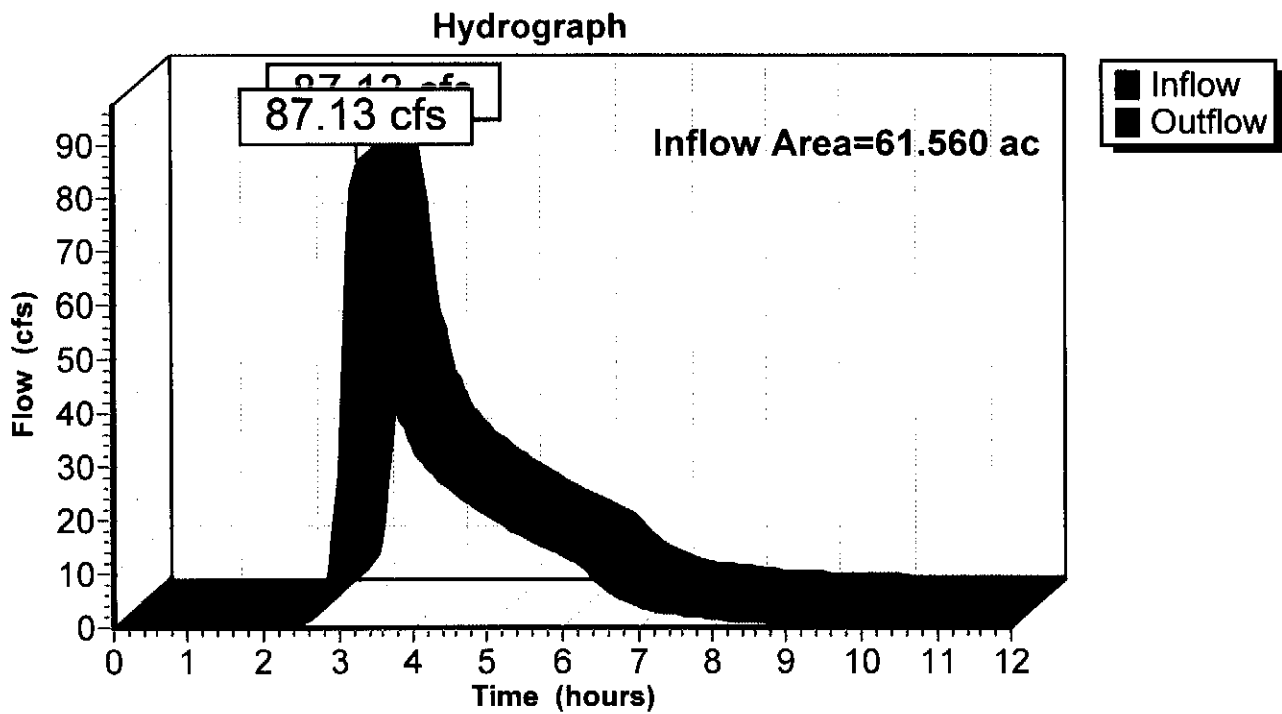
Summary for Reach Creek: Discharge Off-Site

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 61.560 ac, 23.73% Impervious, Inflow Depth > 1.94" for 25-Year 6 hr event
Inflow = 87.13 cfs @ 3.27 hrs, Volume= 9.956 af
Outflow = 87.13 cfs @ 3.27 hrs, Volume= 9.956 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs

Reach Creek: Discharge Off-Site



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Type II 6-hr 25-Year 6 hr Rainfall=4.01"

Prepared by HP

Printed 4/28/2016

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Summary for Pond DB #2: Det. Basin #2

Inflow Area = 34.210 ac, 19.10% Impervious, Inflow Depth = 1.85" for 25-Year 6 hr event
 Inflow = 95.20 cfs @ 3.14 hrs, Volume= 5.263 af
 Outflow = 21.30 cfs @ 3.63 hrs, Volume= 5.090 af, Atten= 78%, Lag= 29.3 min
 Primary = 21.30 cfs @ 3.63 hrs, Volume= 5.090 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
 Peak Elev= 408.98' @ 3.63 hrs Surf.Area= 44,997 sf Storage= 115,015 cf

Plug-Flow detention time= 84.3 min calculated for 5.069 af (96% of inflow)
 Center-of-Mass det. time= 80.5 min (301.1 - 220.6)

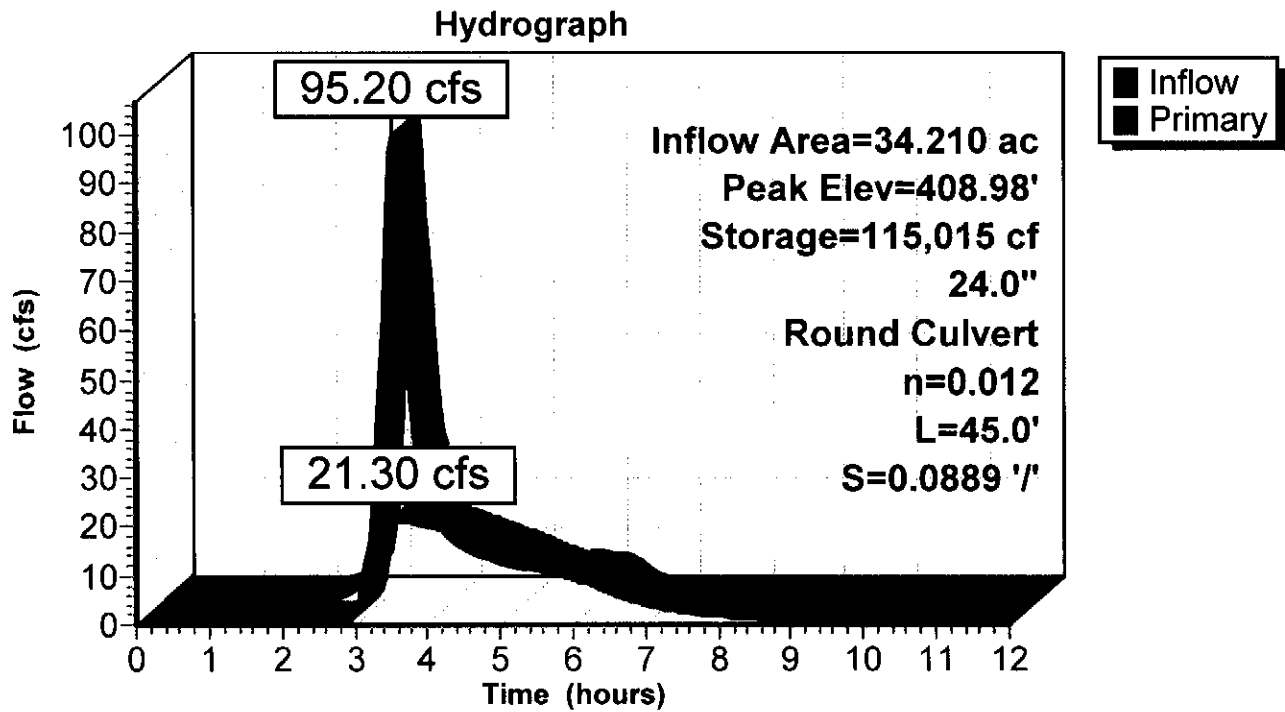
Volume	Invert	Avail.Storage	Storage Description
#1	406.00'	188,459 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
406.00	32,268	0	0
407.00	36,437	34,353	34,353
408.00	40,706	38,572	72,924
409.00	45,075	42,891	115,815
409.50	47,297	23,093	138,908
410.00	49,545	24,211	163,118
410.50	51,818	25,341	188,459

Device	Routing	Invert	Outlet Devices
#1	Primary	406.00'	24.0" Round Culvert L= 45.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 406.00' / 402.00' S= 0.0889 ' / Cc= 0.900 n= 0.012

Primary OutFlow Max=21.29 cfs @ 3.63 hrs HW=408.98' (Free Discharge)
 ↑1=Culvert (Inlet Controls 21.29 cfs @ 6.78 fps)

Pond DB #2: Det. Basin #2



Stage-Discharge for Pond DB #2: Det. Basin #2

<u>Elevation (feet)</u>	<u>Primary (cfs)</u>
406.00	0.00
406.10	0.06
406.20	0.25
406.30	0.55
406.40	0.96
406.50	1.48
406.60	2.09
406.70	2.79
406.80	3.57
406.90	4.43
407.00	5.35
407.10	6.32
407.20	7.34
407.30	8.39
407.40	9.46
407.50	10.54
407.60	11.60
407.70	12.63
407.80	13.60
407.90	14.47
408.00	15.13
408.10	15.87
408.20	16.57
408.30	17.25
408.40	17.90
408.50	18.53
408.60	19.13
408.70	19.72
408.80	20.29
408.90	20.85
409.00	21.39
409.10	21.92
409.20	22.44
409.30	22.94
409.40	23.43
409.50	23.92
409.60	24.39
409.70	24.86
409.80	25.31
409.90	25.76
410.00	26.20
410.10	26.63
410.20	27.06
410.30	27.48
410.40	27.89
410.50	28.30

Stage-Area-Storage for Pond DB #2: Det. Basin #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
406.00	32,268	0
406.10	32,685	3,248
406.20	33,102	6,537
406.30	33,519	9,868
406.40	33,936	13,241
406.50	34,353	16,655
406.60	34,769	20,111
406.70	35,186	23,609
406.80	35,603	27,148
406.90	36,020	30,730
407.00	36,437	34,353
407.10	36,864	38,018
407.20	37,291	41,725
407.30	37,718	45,476
407.40	38,145	49,269
407.50	38,572	53,105
407.60	38,998	56,983
407.70	39,425	60,904
407.80	39,852	64,868
407.90	40,279	68,875
408.00	40,706	72,924
408.10	41,143	77,016
408.20	41,580	81,153
408.30	42,017	85,332
408.40	42,454	89,556
408.50	42,891	93,823
408.60	43,327	98,134
408.70	43,764	102,489
408.80	44,201	106,887
408.90	44,638	111,329
409.00	45,075	115,815
409.10	45,519	120,344
409.20	45,964	124,918
409.30	46,408	129,537
409.40	46,853	134,200
409.50	47,297	138,908
409.60	47,747	143,660
409.70	48,196	148,457
409.80	48,646	153,299
409.90	49,095	158,186
410.00	49,545	163,118
410.10	50,000	168,095
410.20	50,454	173,118
410.30	50,909	178,186
410.40	51,363	183,300
410.50	51,818	188,459

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Type II 6-hr 25-Year 6 hr Rainfall=4.01"

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Summary for Subcatchment 2: #2 Dev

Runoff = 35.88 cfs @ 3.27 hrs, Volume= 2.586 af, Depth= 2.05"

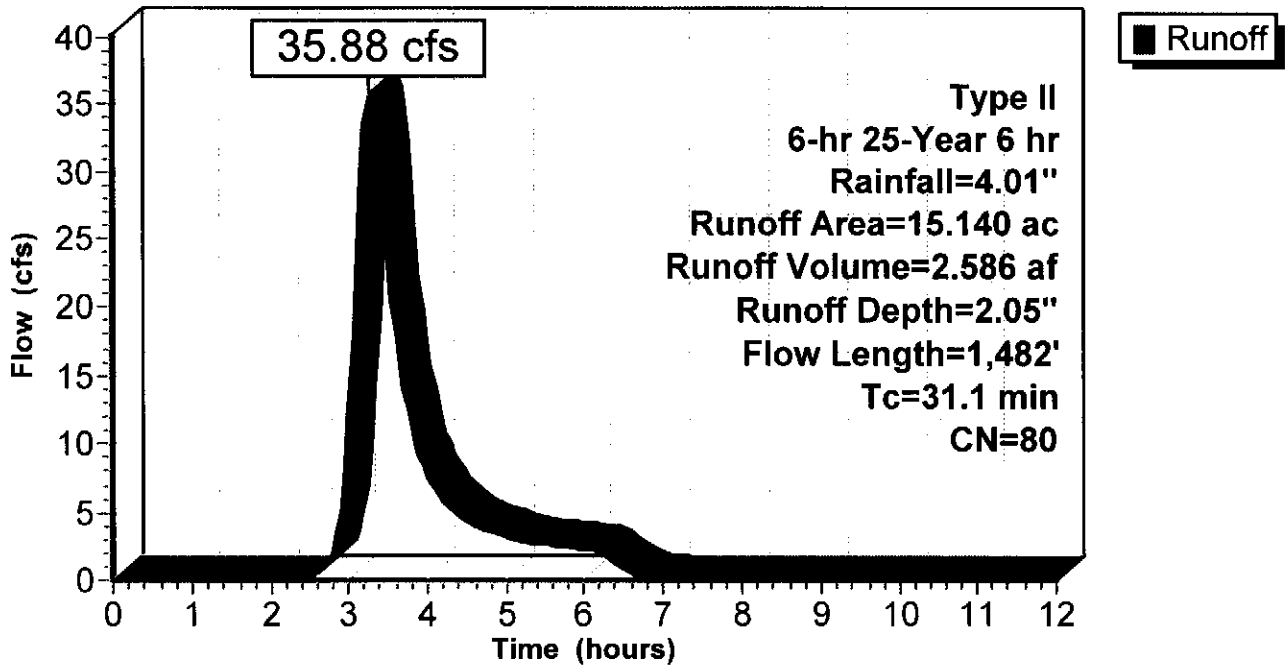
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
Type II 6-hr 25-Year 6 hr Rainfall=4.01"

Area (ac)	CN	Description
15.140	80	1/2 acre lots, 25% imp, HSG C
11.355		75.00% Pervious Area
3.785		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	300	0.1367	0.21		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
5.5	300	0.0333	0.91		Shallow Concentrated Flow, Shallow Concentrated Flow Woodland Kv= 5.0 fps
2.0	882	0.0215	7.26	72.63	Channel Flow, Ditch Flow Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030
31.1	1,482	Total			

Subcatchment 2: #2 Dev

Hydrograph



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Type II 6-hr 25-Year 6 hr Rainfall=4.01"

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Summary for Subcatchment 4: #4 Dev

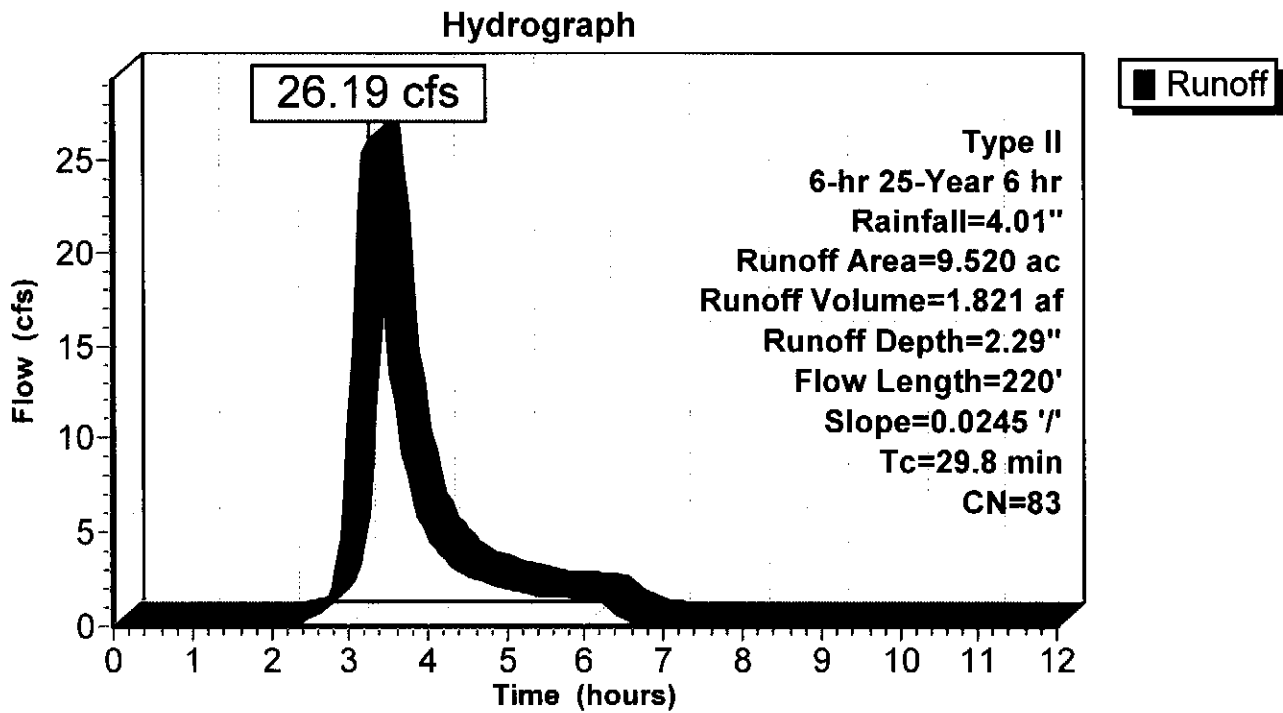
Runoff = 26.19 cfs @ 3.25 hrs, Volume= 1.821 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
Type II 6-hr 25-Year 6 hr Rainfall=4.01"

Area (ac)	CN	Description
9.520	83	1/4 acre lots, 38% imp, HSG C
5.902		62.00% Pervious Area
3.618		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	100	0.0245	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
10.3	120	0.0245	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
29.8	220	Total			

Subcatchment 4: #4 Dev



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Type II 6-hr 25-Year 6 hr Rainfall=4.01"

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Summary for Subcatchment 5: #5 Dev

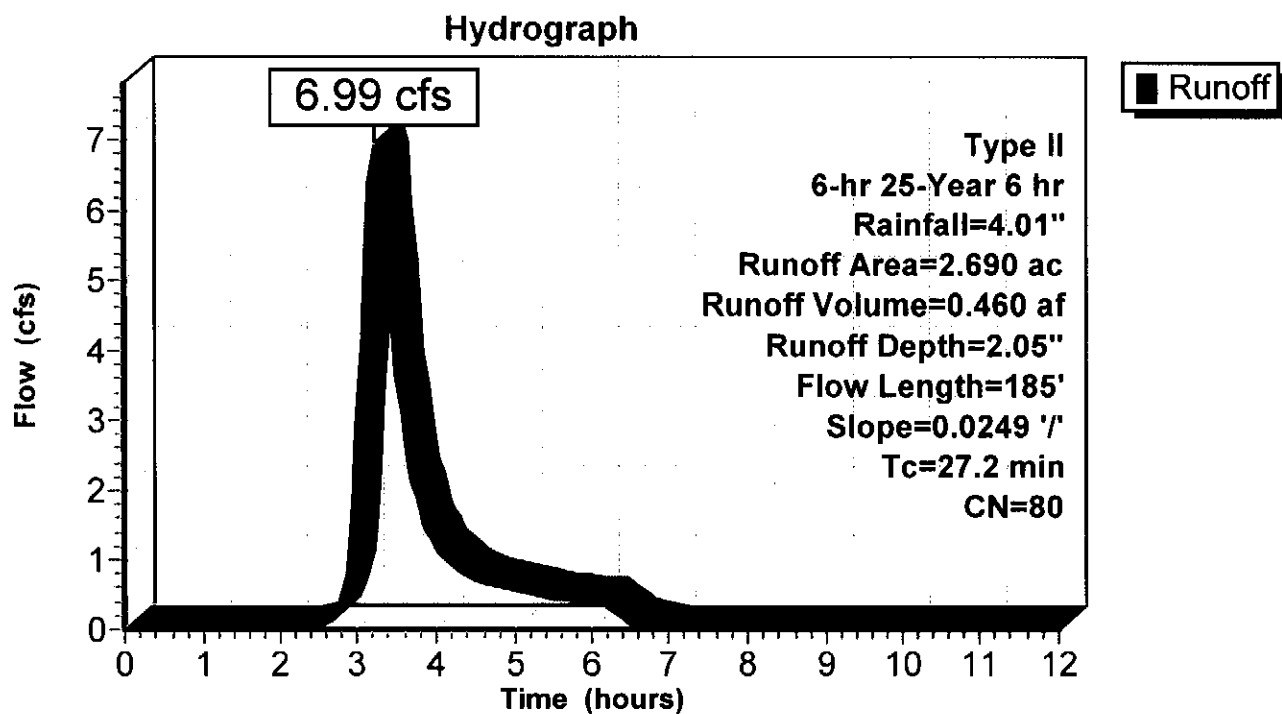
Runoff = 6.99 cfs @ 3.22 hrs, Volume= 0.460 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
Type II 6-hr 25-Year 6 hr Rainfall=4.01"

Area (ac)	CN	Description
2.690	80	1/2 acre lots, 25% imp, HSG C
2.017		75.00% Pervious Area
0.672		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	85	0.0249	0.18		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.30"
19.4	100	0.0249	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
27.2	185	Total			

Subcatchment 5: #5 Dev



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Type II 6-hr 10-Year 6 hr Rainfall=3.35"

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Summary for Subcatchment UN-2: UN-2

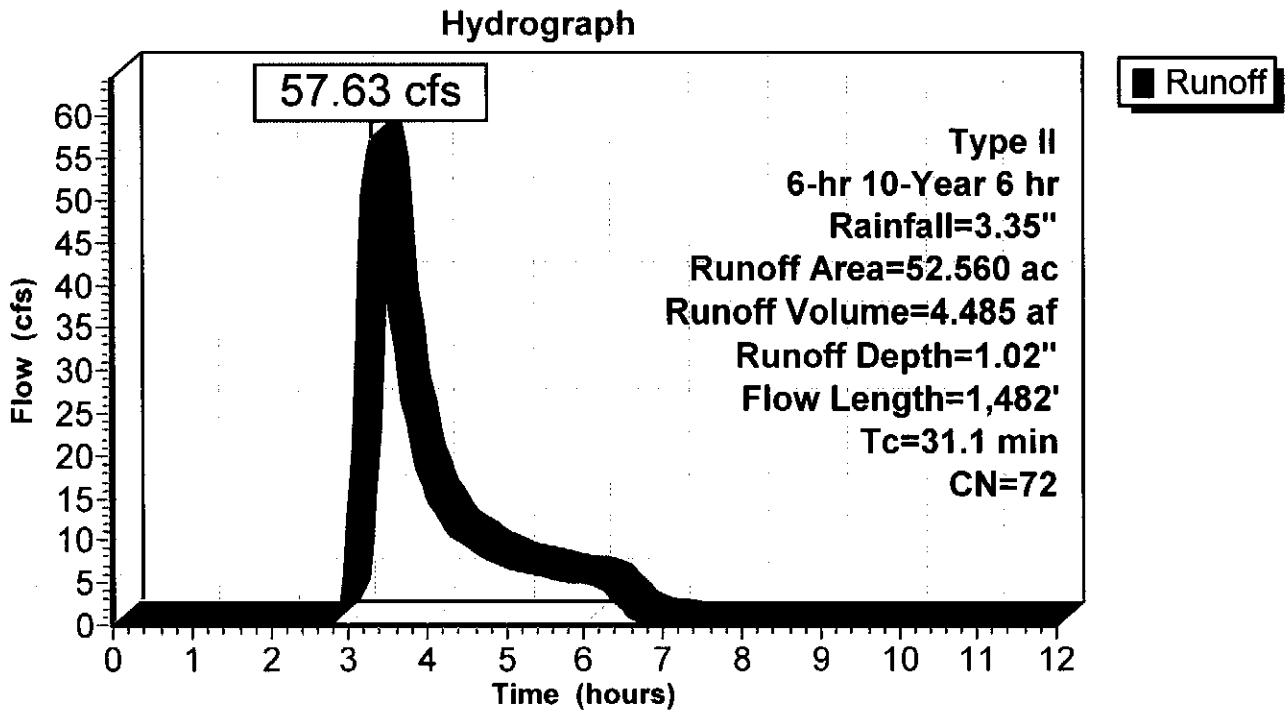
Runoff = 57.63 cfs @ 3.30 hrs, Volume= 4.485 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-12.00 hrs, dt= 0.05 hrs
Type II 6-hr 10-Year 6 hr Rainfall=3.35"

Area (ac)	CN	Description
7.940	85	Row crops, straight row, Good, HSG C
44.620	70	Woods, Good, HSG C
52.560	72	Weighted Average
52.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	300	0.1367	0.21		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.30"
5.5	300	0.0333	0.91		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
2.0	882	0.0215	7.26	72.63	Channel Flow, Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Earth, clean & winding
31.1	1,482	Total			

Subcatchment UN-2: UN-2





DATE: 04.25.16

ATTENTION: Jeff Mueller

PROJECT NO.: 15-2184

COMPANY: Vanderburgh County Surveyor

REFERENCE: Saddle Creek Estates

ADDRESS: Civic Center Complex - Room 325

YOUR FILE NO.:

CITY, ST, ZIP: Evansville, IN 47708

PHONE:

THE FOLLOWING ITEMS:

COPIES:	ORIG./LAST REV. DATE:	DESCRIPTION:
1	04.25.16	Drainage Plan (Sheet C-101 and C-102)
1	04.25.16	Undeveloped Sub-basin Exhibit
1	04.25.16	Developed Sub-basin Exhibit
1	04.25.16	Drainage Report

LETTER OF TRANSMITTAL

ARE TRANSMITTED:

- PER YOUR REQUEST
- FOR YOUR FILES
- FOR REVIEW & COMMENT
- OTHER

FOR YOUR:

- APPROVAL
- USE
- INFORMATION
- OTHER

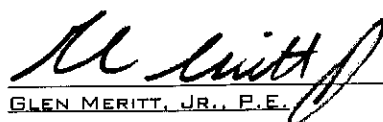
VIA:

- COURIER
- FOR PICK UP
- USPS
- NEXT DAY
- FED EX
- UPS
- DHL
- SATURDAY DELIVERY
- TRACKING # _____
- OTHER DELIVERED

COMMENTS:

Please review the attached drainage plan and report. If you have any questions or comments, please give me a call. Thank you

FROM:


 GLEN MERITT, JR., P.E.

cc: File

RECEIVED BY THE
 VANDERBURGH COUNTY
 SURVEYOR'S OFFICE

4/25/16 CA

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